Title: Factors Influencing Primary Care Career Choices of Harvard Medical School Graduates

Authors: Paulius Mui, B.A.[1,2]; Lucy Chen, B.S., B.A[3]; Chelsea Messinger, B.A.[3], Mugdha Joshi B.S., A.B.[3]; Russell S. Phillips, M.D.[1,3]; Erin Sullivan, Ph.D.[1]; Barbara Ogur, M.D[1,3,4].

Institutions: [1] Harvard Medical School Center for Primary Care, [2]Virginia Commonwealth University School of Medicine, [3] Harvard Medical School, [4] Cambridge Health Alliance

Corresponding author: Paulius Mui, Virginia Commonwealth University School of Medicine, Richmond, VA 23219; E-mail: muip@vcu.edu

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ABSTRACT

Background and Objectives: Growing evidence highlights the value that primary care physicians (PCPs) bring to health systems, yet a shortage of PCPs in the United States looms large. This study aimed to elucidate factors influencing medical students to choose primary care careers.

Methods: Harvard Medical School (HMS) graduates from 1980-2016 who matched in residencies that can lead to primary care careers were surveyed about factors influencing their career choice.

Results: The survey was distributed to 1,793 graduates and 457 (25%) completed the survey. The percentage of students entering HMS with an interest in primary care (55%) and those initially interested who pursued primary care careers (65%) remained constant over the time. More than 90% of primary care physicians (PCPs) would go into primary care again, and 93% would recommend it to current students. PCPs identified long-term patient relationships, a generalist approach, and meeting unmet needs through a focus on social medicine, patient advocacy, and underserved populations as important determinants of career choice. Non-PCPs ranked specialization, attitudes of mentors, and research opportunities as most important. Respondents highlighted that a culture that undervalued primary care and did not expose students to research opportunities made it less desirable, while exposure to positive role models helped counter cultural forces.

Conclusions: Educational programs that help medical students experience long-term relationships, positive role models, and opportunities for patient advocacy and research encourage students towards primary care. Aligning institutional efforts to create positive primary care experiences is of paramount importance in sustaining commitment to primary care.

Introduction

Growing evidence highlights the value that primary care physicians (PCPs) bring to health systems in the United States and internationally, including reduced healthcare costs, more equitable access to care, and the creation of healthier communities[1,2]. Primary care providers help reduce healthcare costs by coordinating care to prevent duplication of services and by being more judicious with diagnostic testing and hyper-utilization of expensive resources compared to non-PCPs[3]. PCPs often serve as the usual point for care, especially for underserved communities, for accessing most needed services[4]. Primary care services emphasize prevention and screening to decrease disease burden, reduce preventable hospitalizations, and improve health outcomes for chronic conditions. In addition to improved outcomes for chronic conditions, studies estimate that over 120,000 deaths per year in the U.S. could be prevented if more PCPs were in the workforce[5]. Yet a shortage of PCPs in the United States looms large, with estimates that the need for PCPs in all parts of the U.S. will exceed their supply by at least 23,000 within the next decade[6].

With the approaching shortage of PCPs, it is important to understand factors that influence medical school graduates to choose careers in primary care. Elucidating these factors might offer insights on how to foster and sustain interest in primary care among medical students. In addition, these data may inform future curricular initiatives and spur further innovations in medical education that align the missions of academic medical institutions and the needs of the U.S. medical workforce.

We sought to determine the percentage of Harvard Medical School (HMS) graduates who pursued residencies that could lead to primary care careers and to better understand which factors influenced HMS graduates to go into primary care.

Methods

Study Population

Using HMS residency match lists from 1980 to 2016 obtained from the HMS Office of Student Affairs, we identified 2,522 out of the total of 5,874 (43%) graduates who matched into residencies that could lead to primary care careers. These residencies included Categorical and Combined programs in Internal Medicine (includes Internal Medicine-Pediatrics), Family Medicine, and Pediatrics. The email addresses were obtained from the HMS Office of Alumni Affairs and Development.

Survey Development

We designed the survey using Qualtrics (Provo, Utah, USA) and included closed- and open-ended questions. We piloted the survey with HMS faculty to assess survey length and to improve question clarity. We sent the survey to the 1,793 of the 2,522 (71%) graduates for whom there were available email addresses. To ensure confidentiality of survey respondents, we did not collect any identifying information. This study was reviewed and deemed exempt by the Institutional Review Board of the Harvard University Faculty of Medicine.

We distributed the survey in April 2017, and it remained open for four weeks. We sent a total of three email reminders at one week intervals to participants who had not completed their surveys. We received 457 (25%) completed survey responses.

Analysis

We (P.M. and L.C.) independently read all qualitative data to identify consistent and recurring themes. We met with the broader team to develop, by consensus, a thematic codebook that would be applied to all qualitative data. We coded responses using NVivo 11 software (QSR

International, Melbourne, Australia) based on the codebook composed of four main themes and ten subthemes. During the coding process, we periodically refined codes and corrected any discrepancies in coding. After data analysis was completed, the calculated kappa values for assigned codes were greater than 0.70, which corresponds to good agreement between the two coders.

Results

Figure 1 displays the percentage of HMS graduates matching into primary care residencies (43% of all matched graduates) over a 37-year period from 1980 to 2016. Based on yearly averages of a given match class, Internal Medicine had the greatest proportion of matchers (29% of all matched graduates, Standard Deviation (SD) = 6%), followed by Pediatrics (11%, SD = 3%) and Family Medicine (3%, SD =2%). Of the 2,522 graduates who matched into residencies potentially leading to primary care careers, 1,706 (68%) chose Internal Medicine, 633 (25%) chose Pediatrics, and 183 (7%) chose Family Medicine.

Of the respondents, 48% (218/457) self-identified as PCPs, of which 64% (139/218) were female. Among non-PCPs, 46% (110/239) were female. The respondents describing themselves as PCPs tended to be white and to work in urban academic settings (Table 1).

Of the survey respondents, 75% (163/218) of those choosing primary care as a career started HMS with an interest in primary care, while only 36% (87/239) of non-PCPs started HMS with an interest in primary care. On average, the proportion of respondents who started medical school with an interest in primary care has remained between 50-60% over 37 years (Figure 2). Of those who started with an interest in primary care, the percentage who ultimately became PCPs has also remained stable at 65% (171/262). Of all PCPs, 90% (197/218) would go into

primary care again and 93% (203/218) would recommend a primary care career to current students.

In noting the factors that influenced their choice of a primary care career, PCPs (n=218) identified long-term relationships with patients (4.64 ± 0.55 based on Mean Likert Scores with 5 as most important and 1 as least important ± SD) as most important, approach to care (generalist vs. specialist) (4.25 ± 0.82) as second most important, and unmet needs of patient populations (4.20 ± 0.95) as third most important. Non-PCPs (n=239) ranked approach to care (specialist vs generalist) (3.72 ± 1.06) as most important, attitudes of mentors or educators in residency (3.54 ± 1.12) as second most important, and research opportunities (3.49 ± 1.32) as third most important. PCPs identified medical school performance (e.g. grades, test scores) (1.80 ± 1.01), while non-PCPs selected medical education debt (1.92 ± 1.09) as the least important factors influencing their career choice.

For every ten HMS graduates who matched into Internal Medicine, only one graduate matched into Family Medicine. However, Family Medicine residency graduates were more likely to practice primary care, with 89% of Family Medicine residency graduates practicing primary care compared to 41% of Internal Medicine and 50% of Pediatrics residency graduates (Figure 3).

Themes

The open-ended survey responses of factors that influenced graduates' career choices revealed four main themes: primary care experiences and perceptions, nature of work, unique patient interactions, and system-level challenges (Table 2).

The impact of primary care experiences and perceptions

Respondents noted that their own personal experiences in primary care while in training contributed significantly to their career decisions. In particular, having access to role models who inspired medical students and sustained a positive vision for primary care helped guide those students into primary care careers despite countervailing forces. Components of an excellent mentor included excitement for one's work, healthy work-life balance, and a scientifically rigorous approach to primary care. A lack of role models in primary care made this career path seem less attractive and contributed to dissuading students from the field of primary care.

For graduate medical education, some respondents reported that inadequate institutional support and lack of resources in residency for primary care clinic made the ambulatory training environment overwhelmingly challenging. This negatively impacted the decision of some residents to remain in primary care.

Respondents said that academic cultures that undervalued primary care and underappreciated the contributions of PCPs made it less desirable for students to choose primary care as a career option. Respondents shared that negative perceptions of the primary care field stem from and are perpetuated by patients, non-primary physicians, and PCPs themselves. Respondents observed that PCPs are not held in the same regard as their non-primary care counterparts. This status disparity has been a relevant consideration for graduates in their career decisions.

Nature of work

Respondents identified aspects of the traditional job description of a PCP as important considerations in their choice of career. The breadth of primary care challenges attracted many graduates to this field, while preference to have a narrowly-defined area of expertise drove some graduates to choose non-primary care specialties. The concept of service to the community and

the ability to care for patients in the context of their lives and communities positively influenced some graduates to pursue a primary care career. A number of respondents expressed their belief that primary care fields offer greater opportunities to care for patients beyond their biomedical maladies. Desire to focus on "intractable social problems," patient advocacy, underserved populations, and social justice issues motivated graduates to choose primary care careers.

Some respondents felt that lack of exposure to ongoing work on innovations in primary care translated into the perception of limited career research opportunities. Those who were interested in research careers said they would have been more likely to choose PCP careers if they had been exposed to health policy and systems innovation research opportunities.

Unique patient interactions

Many respondents highlighted the unique role that PCPs play throughout a patient's lifetime, especially for the most vulnerable populations. Long-term relationships are at the core of primary care and graduates who did not hold this component of patient care in high regard opted for careers outside of primary care. Conversely, many PCPs are drawn to this field because they cherish the opportunity to build lifelong relationships with their patients and reported that the ability to nurture deep relationships with patients over time has been one of the most rewarding experiences of their careers.

System-level challenges

Many respondents cited structural and administrative challenges at the level of health care systems in addition to lower compensation that deterred them from considering a career in primary care.

The fast pace and large volume of primary care patients with complex needs negatively influenced some respondents in their career choice. Respondents reported that administrative demands of PCPs negatively impact their job satisfaction and work-life balance. Increasing performance expectations make primary care less enjoyable for practicing physicians and less desirable for those considering it as a career.

Some respondents reported that lower primary care salaries and large debt burden drove them to pursue more lucrative, non-primary care fields. Other respondents identified that PCPs are not sufficiently compensated for important components of patient care occurring outside of the traditional patient encounter.

Discussion

Our study provides further insight into the specific factors that influence medical school graduates to choose primary care or non-primary care careers. Student values and demographic factors are important. Consistent with other studies, pre-matriculation interest in primary care was a strong predictor of going into primary care[7,8], as were a constellation of attitudes, including commitment to patient care[9], interest in helping people[7], and valuing physician-patient relationships[10-12]. Previous studies have identified several significant demographic factors, including female gender, older age, rural background and lower parental income[7,8].

Medical school factors have been related to student choice in several studies, with the presence of longitudinal ambulatory clerkships in the clinical years noted as important in some studies[7,13]. Ambulatory clerkship in pre-clinical years were not noted as significant, however rural community-based practices in any year appeared to matter[7]. Most studies have strongly

supported the importance of mentoring and role modeling in supporting students' interest in primary care[13-17].

Of major concern, many surveys have stressed the importance of a training culture that discounts or even denigrates careers in primary care for low prestige, difficulties with work-life balance and mastery of broad content, and the perception of limited intellectual challenge[13]. Studies also document a history of a pervasive culture of primary care disparagement at academic medical institutions[8,18,19], including HMS[11], and its negative impact on students' pursuit of primary care careers[16,19].

The literature on primary care physicians' motivations for leaving primary care provides further clarification of the perceptions of the difficulties with careers in primary care. Primary care practitioners describe bureaucratic workload, demands of patient care coordination, low pay, and being undervalued by specialists as contributing factors to leaving primary care practice[20-23]. In our study, PCPs similarly highlighted administrative challenges, increased paperwork demands, and scrutiny on efficiency and quality metrics as growing challenges in primary care while non-PCPs cited these issues among the reasons that drove them away from primary care careers. Graduates specifically noted concerns about burnout and work satisfaction in primary care careers. Given these difficulties and the importance of strong mentorship and role models in supporting students interested in primary care, solving the shortage of students entering primary care may require addressing some of the obstacles that are causing primary care providers to leave practice.

This data can help elucidate why the percentage of graduates entering primary care remains low nationally, especially at an academic institution without a family medicine department, and offers insight for how medical schools can better sustain students' interest in primary care.

However, our findings reveal a number of institutional and system-level factors in primary care that create barriers to pursuing primary care careers. Our research highlights the importance of providing students with advisors who support primary care career goals as worthy and prestigious, of recruiting positive primary care mentors, of creating longitudinal student-patient relationships, and of informing students about research opportunities in primary care and health policy.

Our findings also suggest the importance of addressing system-level challenges for the sustainability of students' interest in primary care careers. Medical schools and affiliated hospitals are uniquely positioned to address some of these challenges. Potential opportunities include creating primary care workplaces that are less burdensome within their own institutions, advocating for national and local policy changes to improve PCP reimbursement, and emphasizing to students that healthcare systems improvement is an active area of research through which they could have a large potential impact.

HMS is one of eight allopathic medical schools without a family medicine department or division,[24] and our study's results are similar to the results at another academic medical schools lacking a family medicine department, Yale School of Medicine.[25] In 2016-2017, such "orphan" school graduates matched into Family Medicine at a rate four times lower than graduates from schools with a family medicine department or division.[24] Since graduates matching into Family Medicine are more likely to practice primary care than those matching into Internal Medicine or Pediatrics, medical schools may consider focusing on nurturing student interest in Family Medicine or Internal Medicine Primary Care track residencies.[26]

The Agency for Healthcare Research and Quality (AHRQ) estimates that family medicine physicians made up 38% of practicing primary care workforce in 2010.[27] That same year, only

3% of HMS graduating class matched into Family Medicine. While this discrepancy is likely due in part to lack of exposure to family medicine at schools like HMS, it is also possible that graduates who pursue careers in primary care from these schools may have different career or practice goals in mind. One possible conclusion is that academic medical schools need to admit more students with a demonstrated interested in primary care.

Our study is limited by its focus on a single academic medical school which lacks a family medicine department and by its low completion rate. The collected responses may not capture true medical practice patterns of all HMS graduates from 1980 to 2016 or the full extent of the factors that influenced these graduates in selecting their careers. Additionally, the qualitative data reflects aggregate responses over the 37-year period with references to some experiences that may no longer represent the current state of institutional innovations and curricular developments.

Despite the considerable challenges, primary care remains an avocation for many. The fact that two-thirds of graduates who entered HMS with an interest in primary care ended up pursuing primary care careers suggests that many such students are able to maintain their interest throughout medical school. Furthermore, our findings clearly demonstrate that PCPs who graduated from HMS are committed to primary care and recognize its value, as fewer than one in ten would opt against a primary care career or advise medical students against it.

Conclusion

Our study suggests that increasing the percentage of students choosing a primary care requires both admitting students with pre-matriculation interest in a primary care career and also providing educational and mentoring experiences that support them. Survey respondents

suggested showcasing the breadth of primary care careers early in medical training by increasing exposure to primary care leadership and professional opportunities, including public health, health policy, epidemiology, and health services research. Survey respondents also suggested providing inspiring primary care mentors and role models, and fostering an institutional culture that recognizes the value of primary care and supports student interest in primary care.

Aligning institutional efforts to create positive and encouraging primary care experiences is of paramount importance in sustaining the interest and commitment to the field of primary care in the next generation of physicians.

Table 1: Characteristics of survey respondents.

	PCP (n=218) (%)	Non-PCP (n=239) (%)
Gender		
Male	79 (36)	129 (54)
Female	139 (64)	110 (46)
Race/Ethnicity*		
Asian	19 (9)	37 (15)
American Indian or Alaska Native	2 (1)	0
Black or African American	11 (5)	13 (5)
Hispanic or Latino/a	10 (5)	10 (4)
Native Hawaiian or Pacific Islander	1 (0.5)	0
White	180 (83)	179 (75)
Other	3 (1)	5 (2)
Prefer to not answer	0	2 (1)
Residency start year		
1980-1989	85 (39)	97 (41)
1990-2000	69 (32)	65 (27)
2000-2009	39 (18)	52 (22)
2010-2016	25 (11)	25 (10)
U.S. region*		
Northeast	103 (47)	128 (54)
South	30 (14)	27 (11)
Midwest	20 (9)	16 (7)
West	66 (30)	70 (29)
Outside of the US	1 (0.5)	3 (1)
Practice in community*		
Urban	141 (65)	196 (82)
Suburban	62 (28)	51 (21)
Rural	29 (13)	7 (3)
Other	5 (2)	2 (1)
Workplace setting*		
Academic center	101 (46)	153 (64)
Community center	48 (22)	17 (7)
Private practice	50 (23)	27 (11)
Administration	17 (8)	11 (27)
Policy	6 (3)	3 (1)
Industry	1 (0.5)	16 (7)
Retired	7 (3)	7 (3)
Other	41 (19)	36 (15)

*More than one applicable answer could be selected.

Table 2: Main themes and subthemes from open-ended responses.

Main Themes	**Quotes**
The impact of primary care experiences and perceptions • Availability and quality of mentorship • Experiences in residency • Prestige	• Without positive primary care role models and those who supported primary care [as] a rigorous, valuable career choice it would have been much harder to counteract the negative culture towards primary care ingrained in specialty-focused quaternary care settings. • When I was at HMS there were few mentors and little encouragement for this, you were considered less smart or worthy if [you] showed interest in primary care and valued only if doing surgery, medicine or focused on research. • I began to understand and experience first-hand the inefficiencies and challenges of primary care providers today, such as overbooked clinics, virtual encounters outside of work hours (emails, phone calls, etc), a difficult to navigate health care system (insurance restrictions). Unfortunately, residency programs may not have the support to help residents through these challenges, and we feel abandoned and turned-off from primary care. • I have been in academic medicine for my entire career, and it is clear that PCPs are viewed with disdain even though they have huge responsibilities. • It's hard to encourage medical students to pursue primary care when society does not value primary care.
Nature of work • Scope and expertise • Professional opportunities	• I preferred to specialize to have a deeper understanding of a narrower field of topics. Knowing "a little about everything" is too daunting! • I am a generalist. I see the world in terms of systems with interconnecting parts. People impact each other in families in workplaces in the community and the best training I could find was in family medicine. • It was only after medical school that I really understood what primary care research looks like, and that you can develop a niche as a general internist interested in health systems research. • I wish I had recognized more the potential for academic engagement in primary care fields as I think I would have thought more seriously about a primary care future.
Unique patient interactions	• I think primary care has many features that are challenging and that physicians must really want to have long-term relationships with patients to pursue this. I was not/am not highly interested in long-term

• Longitudinal patient relationships • Specific patient populations	patient relationships and therefore was never very interested in primary care as a career option. • Recognition that the longitudinal relationships with patients was one of the most sustaining, fascinating parts of being a physician • I feel passionately that physicians should work to end health care disparities along socioeconomic and racial lines in the US and this requires a more robust primary care work force. I believe in looking for root causes of chronic health issues, by exploring lifestyle factors, social factors, spiritual, etc., all this requires relationships.
System-wide challenges • Time constraints • Administrative burden • Compensation issues	• I would have to be totally insane to try to be a primary care physician. They see way too many patients per day, with insufficient time, they must limit their attention to the most superficial investigations of complex problems, and they get paid less! How can they manage a patient with diabetes, COPD, CAD, and depression in 15 minutes? I would die from this. • While my institution embraces primary care physicians, the profession appears to be unsustainable—the demands on PCPs is very high. The push for productivity goes against why most of went into primary care. • They need to be compensated adequately for things they do above and beyond simply seeing the patient. For example, coordinating the care, communicating with multiple specialists, and communicating with family members. These things take time and I [sic] really are not compensated at all.

Legends

Figure 1: Match list results over time. Percentage of HMS graduates matching into primary care residencies, which included Categorical and Combined programs in Internal Medicine (includes Internal Medicine-Pediatrics), Family Medicine, and Pediatrics.

Figure 2: Entered medical school with Primary Care interest. Proportion of HMS graduates who answered Yes to "Did you start medical school with an interest in primary care?" has remained relatively stable over 37 years. *Time range represents years of residency entry. PCP = self-identified primary care physicians. Non-PCP = self-identified non-primary care physicians.*

Figure 3: Primary care career selection by residency. Family Medicine residency graduates are most likely to practice primary care while Internal Medicine graduates are least likely to practice primary care.

Figures

Figure 1:

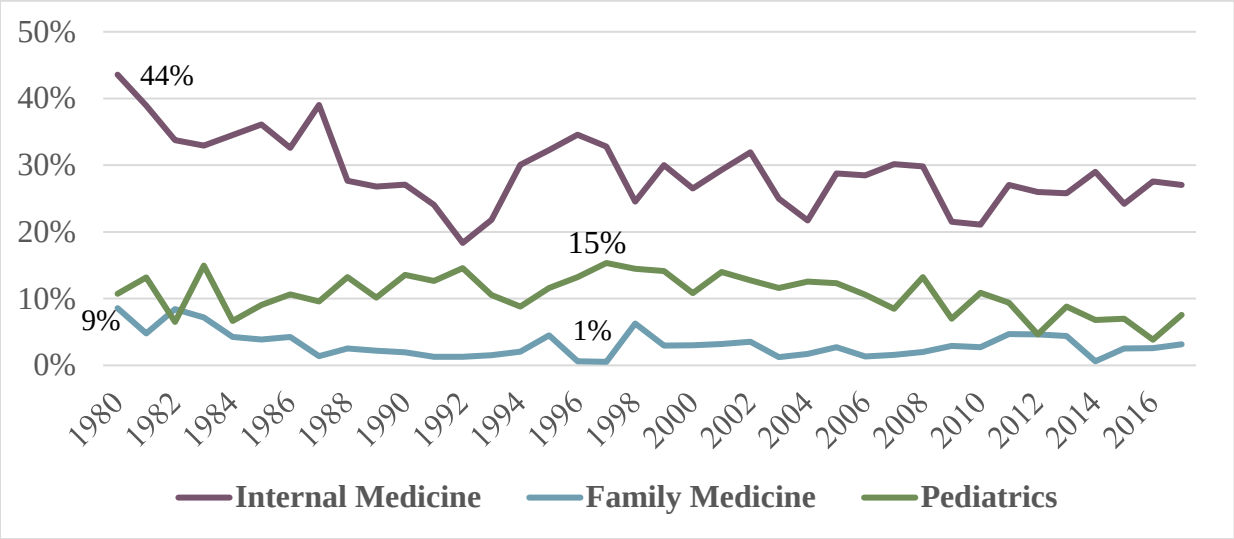


Figure 2:

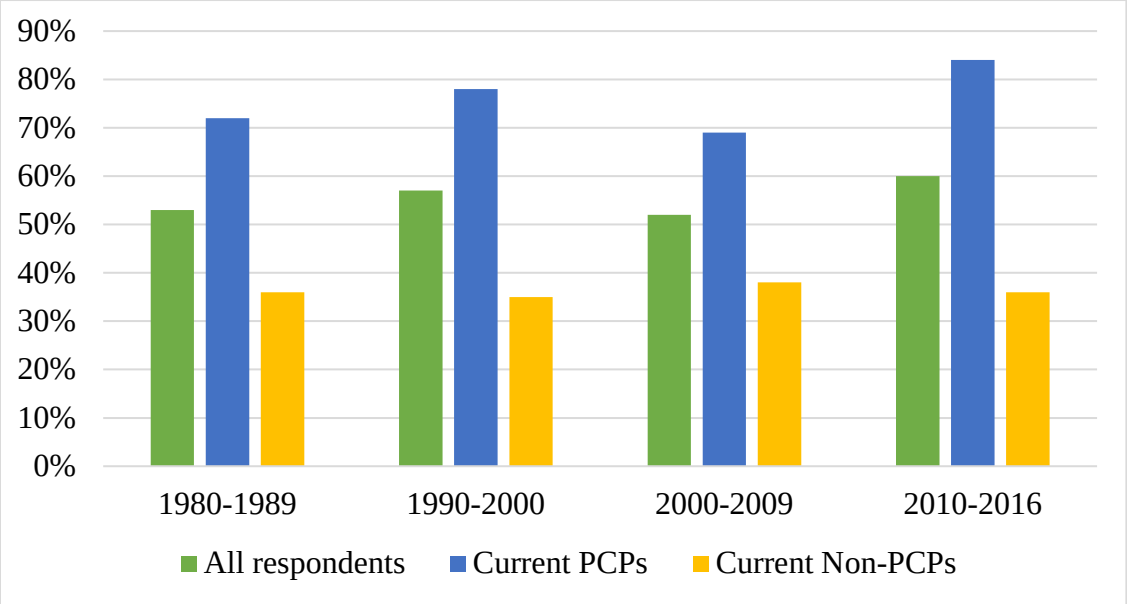
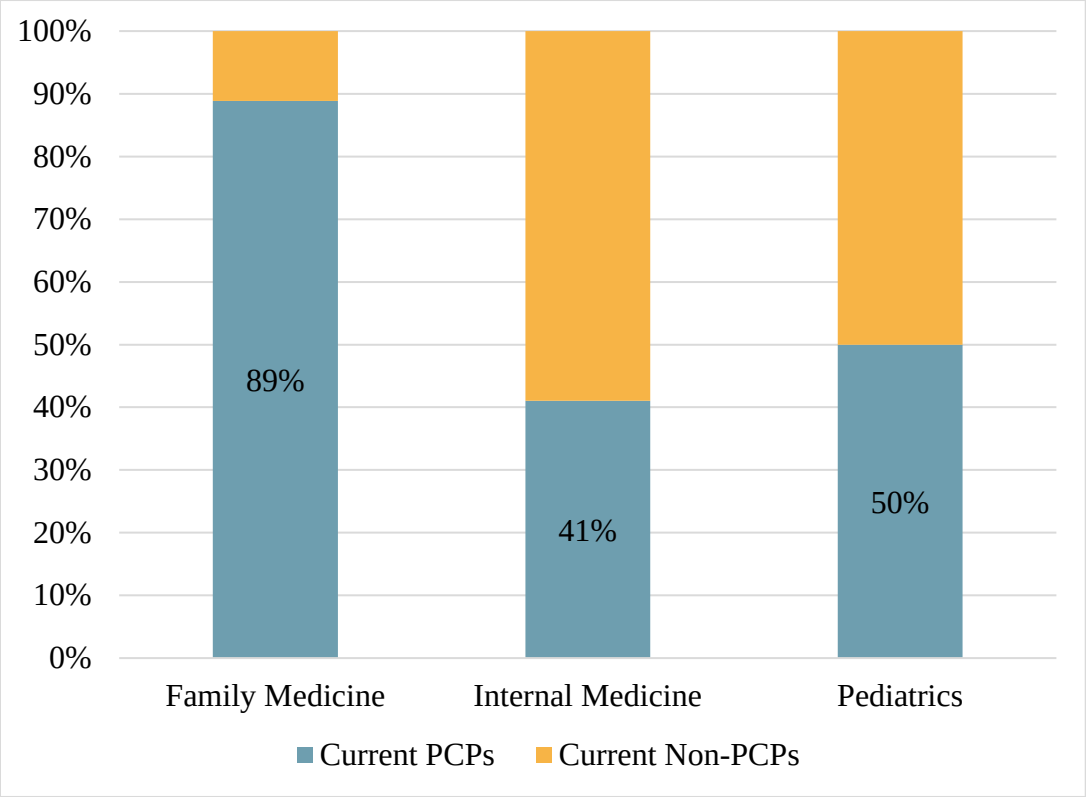

90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1980-1989
1990-2000
2000-2009
2010-2016
All respondents
Current PCPs
Current Non-PCPs

Figure 3:


100%
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40%
30%
20%
10%
0%
89%
41%
50%
Family Medicine
Internal Medicine
Pediatrics
Current PCPs
Current Non-PCPs

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