To promote a broad scope of practice for family physicians, the 2004 Future of Family Medicine Report proposed a model of practice offering a full “basket of services,” in which a comprehensive approach to care is provided. Comprehensive care is one of the pillars of primary care, particularly of family medicine. However, recent data indicate that in many family medicine practices the basket is missing a few items.

A 2011 study found that among family physicians taking the Maintenance of Certification exam, fewer than 40% reported providing more than half of the clinical services considered on the survey. In particular, between 1995 and 2004, the percentage of all prenatal visits provided by family physicians dropped from 11.6% to 6.1%, and between 2003 and 2009 the percentage of family physicians providing women’s gender-specific health care needs declined.

Reductions in the scope of family medicine have raised concerns about primary care physician training opportunities. In one recent study the majority of family medicine program directors surveyed reported using hospitalists (frequently internal medicine physicians) to run their inpatient teams. In addition, 64% of programs reported that less than half of their graduates provided inpatient care. This suggests that there are fewer family physicians to model the provision of inpatient care for family medicine residents and...
medical students. Changes in the scope of family medicine may most profoundly influence medical students who are making career choices. Given these declines, many students likely will be trained in clerkship settings with limited scopes of practice. Family medicine clerkship directors have reported difficulty finding clinical training sites for their medical students due to increases in medical school class sizes and competition from other types of learners such as physician assistants. Under pressure, some clerkship directors place students at sites that have even more constrained scopes of practice (eg, internal medicine sites). Studies have not examined the influence of changes in preceptor scope of practice on students’ decisions to pursue careers in family medicine.

This study examines the influence of scopes of practice on medical student career decisions by determining: (1) family medicine clerkship directors’ assessments of the current scopes of practice at their clinical training sites, (2) how often family medicine clerkship directors place students at internal medicine sites, and (3) the relationship of medical students’ exposure to scopes of practice on family medicine Match rates.

Methods

This study analyzes data obtained as part of the 2014 Council of Academic Family Medicine Education Research Alliance (CERA) Family Medicine Clerkship Director Survey. The study was approved by the American Academy of Family Physicians Institutional Review Board.

Survey Administration and Development

The CERA Family Medicine Clerkship Director Survey is distributed annually to the clerkship director (or his/her designate) at the main campus of qualifying medical schools. Qualifying medical schools are accredited by the Liaison Committee on Medical Education or the Committee on Accreditation of Canadian Medical Schools and are located within the United States, the Commonwealth of Puerto Rico, or Canada. Schools must have students who complete a family medicine clerkship or a primary care clerkship with a required family medicine component that is directed by a family medicine educator. CERA identified 121 US and 16 Canadian family medicine educators who met these criteria. As the US and Canadian medical education systems are quite different and have considerably different family medicine Match rates (9.5% and 42.8%, respectively) we restricted all analyses to US clerkship directors.

The survey was conducted during the fall of 2014 using SurveyMonkey. Three email invitations were sent, each including a personalized greeting, a letter urging participation, and a survey. Nonrespondents were contacted to encourage participation.

Investigators submitted survey questions for inclusion in the CERA survey. Questions were pretested with family medicine educators and modified for flow, timing, and readability.

Survey Items

Respondents were asked about their school location (US Census region) and whether the school is public or private. Clerkship demographics included the clerkship design (block, longitudinal, or both), clerkship duration (in weeks), and payment for community preceptors (yes/no). Community preceptors were defined as “teachers who practice off campus and who do not have a primary appointment in your department or institution.”

Respondents estimated the percentage of their family medicine clerkship preceptor sites providing each of nine different clinical services (scope of practice assessment). These services were selected to match the services that family physicians are asked about when taking the American Board of Family Medicine Maintenance of Certification examination, though some items were removed or combined due to CERA survey question number limits. We asked for the percentage of sites with National Committee for Quality Assurance (NCQA) rating as patient-centered medical homes (PCMH) since this growing and promoted model of care may influence students’ decisions to pursue family medicine. They also were asked to estimate the percentage of their clerkship students who are placed in internal medicine practices and to report the percentage of their 2013 medical school graduating class who matched in family medicine.

Analysis

All analyses were performed using SPSS version 21 and Stata/SE version 14.1. We performed descriptive statistics to examine characteristics of the US medical schools and clerkships and conducted bivariate analyses to assess the relationships between: (1) the percentage of sites providing each of nine clinical services and family medicine Match rates and (2) the percentage of students placed at internal medicine practices and family medicine Match rates.

Scope of Practice Index

To analyze the effects of exposing students to varying scopes of family medicine practice, we developed a measure called the Scope of Practice Index (SPI). The SPI is an ordinal value ranging from 0–10, with greater numbers indicating broader scopes of practice. Schools start with a score of 10, and points are subtracted: 1 point for each clinical service for which the percentage of sites providing that service was below the median value and 1 point if the school used internal medicine practices for their family medicine clerkship sites.

Relationship Between SPI and Family Medicine Match Rates

We used the Pearson correlation coefficient to examine the unadjusted relationship between the SPI and family medicine Match rates. We also used one-way ANOVAs to examine the SPI and family medicine
Match rates stratified across the four US Census regions (Northeast, South, Midwest, and West). Multiple linear regression was used to investigate the association between SPI and family medicine Match rates, adjusting for the duration of the family medicine clerkship (in weeks) and the census region, both of which were associated with Match rates.

We ran two sensitivity analyses to determine whether different ways of calculating the SPI influenced our outcomes. First, the SPI was calculated without consideration of using internal medicine practices as training sites (so that the SPI ranged from 0–9). It was also calculated by subtracting 1 point for each clinical service for which fewer than 50% of its sites provided the service.

Results
The overall survey response rate was 90.9%, with 110 out of 121 US clerkship directors responding.

Two thirds of the schools were public. Eighty percent had a block clerkship, with 5.5% having longitudinal clerkships and 14.5% having a combination of the two. The average duration of the family medicine clerkship, combining block and longitudinal clerkships, was 5.3 weeks (SD=1.5 weeks). About 20% of respondents reported paying the majority of their community preceptors to teach. Among those who reported paying, the average payment was $202.20 per week (SD=$147.80).

The overall family medicine Match rate was 9.5% (SD=5.2%) (Table 1).

Respondents estimated that community preceptors fail to provide a large number of clinical services (Figure 1). The majority of community preceptors provided preventive gynecologic care (82.9%), care of children under 13 years of age (72.2%), and dermatology and orthopedic procedures (65.7%). They least commonly performed pediatric inpatient care (21.1%), vaginal deliveries (23.3%), and prenatal care (31.0%). In general, schools in the West provided the most services, and schools in the Northeast provided the least (service-specific data not shown). With the exception of adult inpatient care, the rate with which each of the clinical services was provided was weakly to moderately correlated with the family medicine Match rate. Preventive gynecologic care was the most strongly correlated (correlation coefficient 0.39, P value <.001).

The percentage of students placed at internal medicine practices was negatively associated with the family medicine Match rate (correlation coefficient -0.34, P value=.006).

Bivariate analyses indicate that higher SPI (ie, broader scope of practice) is moderately correlated with Match rates (Pearson correlation coefficient=0.37, P value<.001) (Figure 2). Both the SPI and the family medicine Match rate varied by geographic region (Figure 3). The SPI was lowest in the Northeast and highest in the West. Similarly, the family medicine Match rate was lowest in the Northeast and highest in the West.

A multivariable model showed that the family medicine Match rate increases by approximately 0.5% with each 1-point increase in the SPI (95% CI=0.2 to 0.8). In addition, programs in the West had 5.9% higher Match rates than those in the Northeast (95% CI=2.7 to 9.2). Each 1-week increase in clerkship duration was associated with a 1.2% increase in the family medicine Match rate (95% CI=0.5 to 1.8). Overall, this model predicted 33% of the variability in Match rates. Sensitivity analyses using two different methods for calculating the SPI did not alter the overall results.

Discussion
This study demonstrates that higher family medicine Match rates are associated with the use of family medicine clerkship preceptors with broader scopes of practice and with avoidance of the use of internal medicine sites for training. This relationship holds when adjusting for geographic region and clerkship duration, both of which have been shown in previous studies to influence family medicine Match rates. Many other factors (eg, personality type, the presence of a family medicine department, etc) have been shown to affect medical students’

Table 1: Characteristics of the Schools and Clerkships Among US Schools

<table>
<thead>
<tr>
<th></th>
<th>US (n=110)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public medical school, n (%)</td>
<td>72 (66.1)</td>
</tr>
<tr>
<td># of students per class, n (SD)</td>
<td>148.3 (58.3)</td>
</tr>
<tr>
<td>Proportion of community preceptors who are paid, n (%)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>76 (69.7)</td>
</tr>
<tr>
<td>1%–25%</td>
<td>5 (4.6)</td>
</tr>
<tr>
<td>26%–50%</td>
<td>5 (4.6)</td>
</tr>
<tr>
<td>51%–75%</td>
<td>2 (1.8)</td>
</tr>
<tr>
<td>76%–100%</td>
<td>21 (19.3)</td>
</tr>
<tr>
<td>Dollars paid per student per week (SD)</td>
<td>202.2 (147.8)</td>
</tr>
<tr>
<td>Format of clerkship, n (%)</td>
<td></td>
</tr>
<tr>
<td>Block (only)</td>
<td>88 (80.0)</td>
</tr>
<tr>
<td>Longitudinal (only)</td>
<td>6 (5.5)</td>
</tr>
<tr>
<td>Both</td>
<td>16 (14.5)</td>
</tr>
<tr>
<td># of weeks of block rotation, n (SD)</td>
<td>5.3 (1.5)</td>
</tr>
<tr>
<td>FM Match rate, % (SD)</td>
<td>9.5 (5.2)</td>
</tr>
</tbody>
</table>
Figure 1: Average Estimated Percentage of Community Preceptors*

<table>
<thead>
<tr>
<th>Clinical Service</th>
<th>Percentage of students (above dashed line only)</th>
<th>Correlation (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students at IM site</td>
<td></td>
<td>-0.34 (0.006)</td>
</tr>
<tr>
<td>Pediatric inpatient</td>
<td></td>
<td>0.20 (0.05)</td>
</tr>
<tr>
<td>Vaginal deliveries</td>
<td></td>
<td>0.22 (0.03)</td>
</tr>
<tr>
<td>Prenatal care</td>
<td></td>
<td>0.26 (0.008)</td>
</tr>
<tr>
<td>NCQA-rated PCMH</td>
<td></td>
<td>0.27 (0.006)</td>
</tr>
<tr>
<td>Adult inpatient care</td>
<td></td>
<td>0.03 (0.76)</td>
</tr>
<tr>
<td>GYN procedures</td>
<td></td>
<td>0.39 (&lt;0.001)</td>
</tr>
<tr>
<td>Derm/Ortho procedures</td>
<td></td>
<td>0.21 (0.04)</td>
</tr>
<tr>
<td>Care of those &lt; 13</td>
<td></td>
<td>0.27 (0.006)</td>
</tr>
<tr>
<td>Preventive GYN care</td>
<td></td>
<td>0.27 (0.006)</td>
</tr>
</tbody>
</table>

* performing each of nine clinical services (below dashed line) as well as the percentage of students placed at internal medicine preceptor sites (above the dashed line) with standard error bars. Correlation coefficients assess the unadjusted association between all 10 percentages and the family medicine Match rate at each institution.

Figure 2: Average Family Medicine Match Rate (With Standard Error Bars) Broken Down by Scope of Practice Index (SPI)*

* A higher SPI indicates broader scope of practice among community preceptors. Pearson correlation coefficient for the relationship between SPI and the family medicine Match rate is 0.37 (P<.001).
choices to pursue careers in family medicine, but this is the first study to evaluate the relationship of family medicine preceptor scope of practice on family medicine Match rates.

We hypothesize that scope of practice influences medical students’ career choices in several ways. Exposure to the full scope of family medicine may have a powerful impact on a student’s view of the specialty. It may confirm the broad competencies of family physicians among students interested in primary care and help distinguish family medicine from other specialties. Comprehensiveness is clearly valued among people choosing careers in family medicine, as demonstrated by a recent study in which initial family medicine board certifiers report intending to practice a broader scope of practice than that reported by family physicians taking their recertification exam.

Our findings are concerning because they indicate that many US family medicine clerkship students are exposed to limited scopes of family medicine practice, which may negatively influence students’ interest in the specialty. These data reflect national trends in which family physicians are increasingly limiting their scope of practice. Family physicians are needed to fill gaps in the US primary care physician workforce, and broader scope of practice among family physicians has been associated with beneficial patient outcomes. Exposure of clerkship students to the full scope of practice may therefore be difficult to implement given the overall decrease in family physicians’ scope of practice and increasing competition for community preceptors.

Our findings suggest some possible solutions. Family medicine Match rates were lower when medical schools used internal medicine preceptors. This finding is consistent with a prior study showing that among schools with a primary care clerkship, those in which more than 30% of students were placed with family physicians had higher family medicine Match rates. Clerkship directors may place students with general internists because outside pressures have made it difficult to find family physicians to teach their students. Innovative solutions to recruit family medicine preceptors and decrease the number of internal medicine preceptors are needed. Paying preceptors for their time and more vigorous recruiting through state and national organizations may help. In our study, the provision of gynecologic procedures demonstrated the strongest correlation with family medicine Match rates. As such, family medicine clerkship directors may benefit from increasing medical students’ exposure to gynecologic procedures, either through didactic sessions or clinical exposures. Since internists are less likely than family physicians to comprehensively manage reproductive-aged women’s health care needs, this finding may partly explain the negative impact of placing students with general internists on family medicine Match rates. Lastly, in the present study the provision of adult inpatient medicine services did not correlate with Match rates, despite national concern about the decline in family physicians providing this service. This observation corroborates data showing declines in family medicine residency graduates’...
intentions to provide inpatient services. More research is needed to determine if displaying inpatient medicine skills during family medicine clerkships is important in recruiting students to the specialty.

Our study has several limitations. Data on the services provided by community preceptors are based on clerkship director estimates and may be inaccurate. It is possible that awareness of the family medicine Match rate may alter a clerkship director’s assessment of the provision of these services. Since our study is based on cross-sectional data, we cannot show causality: other factors associated with scope of practice (eg, rural location) may account for these findings. Additionally, the SPI is an unvalidated measure. We equally weighted the clinical services used to determine the SPI, and four of the nine services related to obstetrics and gynecology. Our sensitivity analyses of alternate scope of practice calculations did not vary the results, leading to increased confidence in the utility of this novel measure, but further research could investigate the optimal components of the index.

In conclusion, US medical students, particularly in the Northeast, are doing their family medicine clerkships in sites with limited scopes of practice, when exposure to broader scopes of practice appears to promote family medicine as a career choice. Clerkship directors, faced with challenges in finding broad-spectrum family medicine sites, should consider strategies to help students appreciate the full scope of family medicine despite not experiencing this clinically. Similarly, methods to recruit and support community preceptors who provide a broad scope of practice are needed. Such strategies may be essential to help the United States meet its primary care demands.

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References