Scholarly work is an important part of all medical specialties. A decline in publications by academic family medicine faculty during the 1990s was documented. The purpose of this study was to compare the publication productivity of family medicine academicians during the 2000s to that in the 1990s.

METHODS: A random sample of 1,500 individuals was drawn from the 2009 Society of Teachers of Family Medicine (STFM) membership. We then performed a PubMed search to identify publications by each of the subjects for the year 2009. Publications by STFM members in 1999 were identified from results of a previous study. We then compared differences between 1999 and 2009 in the percentage of STFM members publishing papers, the number of published papers per member, and the number of journals in which publications appeared.

RESULTS: The percentage of STFM members publishing at least one article increased from 8.5% (95% confidence interval [CI]=7.2%–10.0%) in 1999 to 20.9% (95% CI=18.9%–23.0%) in 2009. The mean number of publications by those who published increased from 1.73 (95% CI=1.68–1.78) to 2.22 (95% CI=2.13–2.31). STFM members were 2.85 (95% CI=2.29–3.55) times more likely to publish at least one paper in 2009 than in 1999. Publications appeared in 202 different journals in 2009 compared to 75 in 1999.

CONCLUSIONS: A higher percentage of family medicine academicians published papers in 2009 than in 1999. There were also more papers published per individual, and publications appeared in a wider range of journals.

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that used in the study of publication productivity during the 1990s, and compared publication productivity by family medicine academicians in 1999 and 2009.

**Methods**

**Subjects**

Potential subjects for this study were all members of the Society of Teachers of Family Medicine (STFM), the principal organization of family medicine academicians. STFM's membership includes both physician and nonphysician (eg, psychologists, social workers, pharmacists, dietitians, and others) faculty members at medical school family medicine departments and community-based family medicine residency programs, located primarily in the United States and Canada. The total STFM membership during 1999 was 4,571 members, and a sample of 1,500 individuals was used in the prior study. To allow for comparison with the prior study, we drew a random sample of 1,500 individuals from the 4,502 members of STFM in 2009.

**Data Collection**

**Publications in 2009.** A search of the medical literature was performed to identify publications by each of the randomly selected subjects for the year 2009. All indexed publications were counted, including research articles, review articles, editorials, and letters to the editor.

The searches were performed online with the PubMed (US National Library of Medicine, 2009) search engine. The specific search strategy was similar to that used in the prior study. It involved entering the subject’s last name and first initial and the subject’s last name and first and middle initial if the latter was provided in the STFM membership directory. Thus, for an individual listed in the directory as John C. Smith, a search was conducted using the search terms “Smith J” and “Smith JC.” The search was limited to the year 2009.

PubMed searches can identify multiple individuals with the same name (ie, there might be many JC Smiths), only one (or none) of whom is the STFM member whose publications were being sought. Therefore, when citations were identified for the name used in the search, further review of the individual citations was undertaken to assure that articles identified in the search were indeed written by the subject listed in the STFM membership directory. In many cases, it was easy to determine from the PubMed citation that the article originated from a family medicine department or from a city that corresponded to the city of residence listed for the subject in the STFM membership directory. When this could not be determined with certainty, citations were further reviewed by obtaining the abstract or full article to determine if an STFM member (ie, a family medicine academician) had plausibly written the cited article. Those not plausibly written by a family medicine author were excluded. For each citation identified, the journal in which the publication appeared was noted. It was also noted if the article appeared in a “family medicine journal,” defined as American Family Physician, Annals of Family Medicine, Family Medicine, Journal of the American Board of Family Medicine, and Journal of Family Practice. The indexing of family medicine journals was checked for both 1999 and 2009. There was one more indexed journal (10 versus 9) specific to family medicine in 2009 than in 1999.

**Publications in 1999.** Publications by family medicine academicians in 1999 were identified from the results of the previous study. That study reported the percentage of STFM members who had published an indexed article during the year 1999 and the journals in which the articles were published.

**Data Analysis**

The mean (and 95% confidence intervals) and maximum number of papers published per individual in 1999 versus 2009 were computed. Differences in mean values were tested for significance with a 2-sample independent t test.

We used the chi-square statistic to compare (1) the proportion of STFM members publishing articles in 2009 to the proportion publishing in 1999 and (2) the proportion of published articles that that appeared in family medicine journals in 2009 to the proportion in 2009.

Significance was defined as a P value of less than or equal to .05. Statistical analysis was performed using OpenEpi (Open Source Epidemiologic Statistics for Public Health, Version 2.3.1. www.OpenEpi.com).

**Results**

**Publication Rates**

A comparison of publication rates among STFM members between 1999 and 2009 is shown in Table 1. The percentage of STFM members in the sample that published at least one article in a PubMed-indexed journal in 2009 was 20.9% (95% confidence interval [CI]=18.9%–23.0%). This was a significant increase over 1999, when only 8.5% (95% CI=7.2–10.0%) of STFM members had published at least one article (P<.001). Overall, STFM members were 2.85 (95% CI=2.29–3.55, P<.001) times as likely to publish at least one paper in 2009 as they were in 1999.

The mean number of papers per individual in the 1999 sample was 0.15 (95% CI=0.12–0.18). This increased to 0.46 (95% CI=0.41–0.51) in 2009 (P<.001). For those who published at least one paper, the mean number of published papers increased from 1.73 (95% CI=1.68–1.78) papers per individual in 1999 to 2.22 (95% CI=2.13–2.31) papers per individual in 2009 (P<.001). In 1999, the maximum number of publications for an individual was eight; the maximum number of publications for an individual in 2009 was 14.

**Journals in Which Publications Appeared**

Family medicine journals accounted for 41.4% (95% CI=37.8–45.1) of all publications in 2009 compared to...
34.5% (95% CI=28.6-41.0) in 1999 (P=.07). The top 10 journals in which subjects most frequently published is shown in Table 2. A comparison of publications in family medicine journals is shown in Table 3.

In both 1999 and 2009, STFM members published articles in both family medicine journals and non-family medicine journals. In 2009, the top five journals in which STFM members published papers were all family medicine journals, whereas in 1999, three of the top five journals were family medicine journals. The total number of journals in which publications appear, however, was larger in 2009. There was at least one publication in 202 different journals in 2009 compared to 75 different journals in 1999.

### Discussion

The results of this study suggest an increase in publications by STFM members. This increase in publications is shown in both the proportion of individuals who published a paper as well as the number of papers per individual among those who had published.

#### Explanations for the Increase in Publications

There are a number of factors that may be involved in the increase in publications. With the decrease in managed care, one possibility is that academic family medicine faculty may have more time to pursue scholarly activity, a factor that has long been a limiting step. Arguing against this possibility are recent data that indicate that, at least for faculty with patient care responsibilities, clinical work has increased since the introduction of resident duty hour regulations in 2003, thereby leaving faculty with less time for scholarly activities.

Another possibility, however, is that the ACGME requirement for residents to participate in scholarly work may, in turn, have resulted in increased scholarly activity, and thus increased publication productivity, by faculty. A few reports have documented increased scholarly activity in residency programs since the ACGME requirement was adopted, so this requirement may indeed have contributed to the increase in publication productivity—though specific cause and effect cannot be demonstrated. There are also many fellowships available for family physicians interested in research and scholarship beyond residency, and perhaps there are more fellowship-trained STFM members in 2009 compared to 1999. These fellowships have been shown to produce family physicians that are productive in publication.

#### Table 1: Comparison of Production of STFM Members in 1999 and 2009

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th></th>
<th>2009</th>
<th></th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Percent (95% CI)</td>
<td>n</td>
<td>Percent (95% CI)</td>
<td></td>
</tr>
<tr>
<td>Individuals in the sample that published at least one paper</td>
<td>1,524</td>
<td>5% (7.2–10.0)</td>
<td>1,500</td>
<td>20.9% (18.9–23.0)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Primary professional degree of those who published at least one paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD/DO</td>
<td>98</td>
<td>76.0%</td>
<td>263</td>
<td>84.0%</td>
<td></td>
</tr>
<tr>
<td>PhD</td>
<td>17</td>
<td>13.2%</td>
<td>35</td>
<td>11.2%</td>
<td></td>
</tr>
<tr>
<td>MPH</td>
<td>1</td>
<td>0.8%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>MSW</td>
<td>2</td>
<td>1.6%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>8.5%</td>
<td>16</td>
<td>5.1%</td>
<td></td>
</tr>
<tr>
<td>Number of individuals who published:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>0 papers</td>
<td>1,395</td>
<td>91.5% (90.0–92.8)</td>
<td>1187</td>
<td>79.1% (77.0–81.1)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>1 paper</td>
<td>85</td>
<td>5.6% (4.5–6.9)</td>
<td>179</td>
<td>11.9% (10.4–13.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2 papers</td>
<td>19</td>
<td>1.2% (0.8–2.0)</td>
<td>51</td>
<td>3.4% (2.6–4.5)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3 papers</td>
<td>12</td>
<td>0.8% (0.4–1.4)</td>
<td>30</td>
<td>2.0% (1.4–2.9)</td>
<td>.002</td>
</tr>
<tr>
<td>4 papers</td>
<td>6</td>
<td>0.4% (0.2–0.9)</td>
<td>19</td>
<td>1.3% (0.8–2.0)</td>
<td>.008</td>
</tr>
<tr>
<td>5+ papers</td>
<td>7</td>
<td>0.5% (0.2–1.0)</td>
<td>34</td>
<td>2.3% (1.6–3.2)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

CI—confidence interval
Further, there has been an increase in support from the American Academy of Family Physicians regarding research, as shown by their support of the journal Annals of Family Medicine. Since the change also occurred in STFM members, the growth of publications may represent increased support from STFM as well. It is also possible that because we evaluated publications only at two points in time, observed differences in research productivity may have been due to year-to-year variations in publication productivity, rather than being indicative of a long-term trend.

One might argue that the increase in family medicine-specific journals from 1999 to 2009 may have contributed to this increase. However, we do not think this had much effect on the results with an increase of just one journal. On the other hand, we cannot discount the possibility that there were more journals overall, and we cannot exclude the possibility that this may have contributed to the increase in publications.

**Journals in Which Publications Appeared**

The proportion of articles published in family medicine journals was 41.4% in 1999 and 34.5% in 2009, a nonsignificant difference. These
proportions mirror those in other disciplines. For example, in a study evaluating emergency medicine literature, about 42% of articles were published in dedicated emergency medicine journals.14

One might also comment on the change in the top five journals in which most publications appeared, whereby in 1999 two of the top five journals were journals of other specialties, while in 2009 all of the top five journals were family medicine journals. This change could be interpreted as indicating that publications from STFM members were of less general interest in 2009 than in 1999, of less interest to anyone but those in family medicine, or even that they may have been of insufficient quality for acceptance in high-profile non-family medicine journals. However, this concern is easily refuted by examining the breadth of journals in which publications appeared. Indeed, there was an almost three-fold increase in the total number of journals in which STFM members appeared, suggesting that STFM members are reaching out even further into other fields than they did in 1999. Indeed, in 2009, STFM members had publications in major journals from a wide variety of fields such as blood, AIDS, and diabetes care as well as highly regarded general medicine journals such as Lancet, New England Journal of Medicine, JAMA, Annals of Internal Medicine, and Archives of Internal Medicine.

Finally, the fact that the top five journals were family medicine journals testifies to the success of new family medicine journals, notably the new Annals of Family Medicine, which began publication in 2003. More than 50 publications in our 2009 sample appeared in Annals.

**Limitations**

Only two points in time were used for analysis. Therefore, we do not know if a trend was observed throughout the 2000s or if 1999 and 2009 were atypical in comparison to other years. However, evaluating a point at the end of the decade likely reflected a culmination of changes throughout the decade.

Second, evaluating only STFM members may have excluded some family medicine academicians who are not members of STFM and may not be representative of the discipline as a whole. Although there are a variety of academic family medicine organizations represented in the Council of Academic Family Medicine (CAFM), STFM is the largest organization and includes medical student educators, residency faculty, behavioral scientists, and researchers. Not all faculty in academic family medicine are members of STFM, but STFM does include many of the individuals more active in academic pursuits and therefore should represent those with expectations for scholarly productivity.

There were some data that we did not collect, such as the type of scholarly activity represented by the publications we counted (eg, original research, clinical reviews, letters to the editor, etc), the number of authors per paper, and the impact factors of the journals in which publications appeared. Finally, limiting our search to the Index Medicus did not take into account other types of scholarship, such as chapters in medical textbooks and presentations at conferences, of which only about 50% ever become publications.15

**Conclusions**

A higher percentage of STFM members published papers in peer-reviewed journals in 2009 than they did in 1999. Of those who did publish, there were more papers published per individual, and they were published publications in a wider range of journals in 2009 as compared to 1999.
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CORRESPONDING AUTHOR: Address correspondence to Dr Post, Virtua Family Medicine Residency, 2225 Evesham Road, Suite 101, Voorhees, NJ 08043. 856-325-3732. Fax: 856-325-3705. rpost@virtua.org.

References