A Comprehensive Evaluation of Obstetrics and Gynecology Residencies’ Global Health Training Programs

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OBJECTIVE: To compile a comprehensive summary of obstetrics and gynecology global health training programs and to describe program type, global distribution of work, effect, and reciprocity within programs.

METHODS: This cross-sectional observational study identified all U.S. obstetrics and gynecology residencies with global health training programs, described residency and program characteristics, and evaluated the publications resulting from them. Eligible articles included those published in 2011–2016 about work done in a global health training location by global health training faculty. All eligible articles were evaluated for academic effect. The inclusion of host country authors on articles served as a proxy for reciprocity. Article content was assessed to evaluate whether programs addressed Millennium Development Goals.

RESULTS: Among 245 obstetrics and gynecology residencies, 196 (80%) had global health training programs. Location and faculty members were identified for 67 (34%) programs, of which 26 (39%) had global health training faculty who had published articles meeting inclusion criteria. Of 698 articles reviewed, 78% addressed at least one Millennium Development Goal, including 39% that addressed improving maternal health (Millennium Development Goal 5). Approximately half (48%) of authors were from host countries.

CONCLUSION: Most obstetrics and gynecology residencies are offering global health training. The majority of programmatic work addresses Millennium Development Goals and thus is aligned with global health priorities. The effect and reciprocity of global health training programs varies across institutions. Residencies could benefit from internal analysis of their global health training programs to evaluate whether knowledge gained is being disseminated and to ensure equitable partnerships and the creation of sustainable, influential initiatives.

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There has been a steady increase in the number of medical trainees at the undergraduate and graduate level who desire global health training. Medical schools have responded to this desire and the need for this training in rising physicians by expanding their curricula to include global health topics and global health training experiences. Many residents’ selection of graduate training program is heavily influenced by the availability of global health training during residency. At the graduate medical level, increased interest in global health training has been documented across surgical and medical specialties with a subsequent growth in program offerings.

Over the past 5 years there has been a substantial increase in the published literature describing involvement in global health training and the programs themselves within the field of obstetrics and gynecology. A previous publication on this topic used
a systematic internet search to describe the scope and distribution of global health training in obstetrics and gynecology residency programs. Eichelberger et al built on these results by conducting a survey of program directors to clarify the details of these programs, including whether formal didactics, predeparture training, or competency-based objectives exist, while evaluating the opportunities and barriers to global health training programs. Four subsequent publications in this field were also survey-based, evaluating the interest of medical students, residents, and faculty in participating in global health training programs, concluding that time and funding were the biggest barriers to participation and that there are not enough organized global health training programs to meet resident desires.

Each of these publications, along with national and international professional obstetrics and gynecology organizations, has stressed the role and responsibility of obstetricians and gynecologists in improving the health of women globally and addressing the higher burden of disease women face, evidenced by increased maternal morbidity and mortality. This has also been a focus of the United Nations. In 2000, 189 world leaders met and adopted the Millennium Declaration, which outlined eight Millennium Development Goals to be achieved by 2015. Half of these goals were related to maternal and child health: Millennium Development Goal 3, which promoted gender equality and empowerment of women; Millennium Development Goal 4, which aimed to reduce child mortality; Millennium Development Goal 5, which aimed to improve maternal health; and Millennium Development Goal 6, which worked to combat human immunodeficiency virus and acquired immunodeficiency syndrome, malaria, and other diseases.

Given the growing interest in global health training programs and the increased commitment to, and focus on, global health, we sought to describe the effect obstetrics and gynecology global health training programs are having through an analysis of their scholarly activity using the Hirsch or h-index. As a bibliometric tool, the h-index has the advantage of combining productivity (ie, number of publications) and academic effect (ie, number of citations) into one index. Publication of work done by global health training programs allows for the dissemination of information to similar and dissimilar partnerships worldwide, allowing for increased collaboration and sharing of knowledge on how to address needs in global women’s health. Moreover, ethical considerations are a crucial component of global health training programs to ensure meaningful, reciprocal, and sustainable practices. Inclusion of host country authors on publications can be representative of their inclusion in global health training projects and programs.

The primary aims of this study were to evaluate the effect of each global health training program and whether the work being done is in line with established public health needs. We hypothesize that this work is having an effect through publications. A secondary aim was to evaluate reciprocity in the global health training programs using host authorship as a proxy. We hypothesize that few publications include host country coauthors. The final aim was to compile a complete and extensive listing of obstetrics and gynecology global health training programs including their global distribution and program objectives to build on the current literature. We hypothesize that there is a much larger proportion of residency programs that offer global health training than previously described (Hung KJ, Tsai AC, Johnson TR, Walensky RP, Bangsberg DR, Kerry VB. In reply [letter]. Obstet Gynecol 2014;123:666–7). Descriptive data for each obstetrics and gynecology program were collected using FREIDA.

Programs were identified as having global health training if they met any of the following criteria: 1) self-identifying in FREIDA as having an “international opportunity,” 2) identified using the search function in FREIDA to search “global health” within the field of “obstetrics and gynecology,” 3) previously described in a publication about global health training in obstetrics and gynecology, or 4) providing information about global health training on the institution’s obstetrics and gynecology website.

A χ² test was used to identify characteristic differences between residency programs with global health training and those without. For all statistical analyses, a prespecified significance of P<.05 was used.

An a priori algorithm was developed to systematically review each included residency and sponsoring institution’s websites. Each residency and institution’s website was accessed from FREIDA. For each residency’s website, we surveyed the
following subsections in this order: global health, education and curriculum, elective, research, and applicant sections to confirm the existence of a global health training program, characterize its objectives, and identify associated faculty members. Next, we surveyed the following subsections of the sponsoring institution’s web page: global health, research, and faculty. If nothing was identified, the search feature on the department’s website was used to search “global health gynecology obstetrics residency,” as previously described. Programs were excluded if no information about the global health training was identified within a 1-hour time limit, if the international work described did not involve residents, or if the international work described was more than 5 years old.

The a priori algorithm was validated through a pilot study performed on 12 assorted residency programs (5% of all accredited residency programs). The 12 programs were varied in residency type but all had been identified and previously described by Hung et al. Through this pilot study we found our algorithm to be at least equivalent to the previously utilized web survey and was able to identify all of the 12 programs. The algorithm was applied to all included residency programs and global health training program objectives, locations, descriptive information, and key faculty members were extracted.

Descriptive information from the website was used to categorize the program into one of four previously described categories: elective, extended field training, research, or other. Thomas Reuters Web of Science was used to perform a comprehensive literature review of each faculty member identified from the website search to generate a list of articles he or she had authored between 2011 and 2016. One of four authors (S.T., J.N., E.W., S.K.) reviewed the abstracts of these articles; those describing work performed at one of the global health training program’s geographic sites were included. All published articles describing global health work at a nonglobal health training location were excluded. Articles with multiple authors from one institution were only included once. As a means to analyze total institution productivity, the articles meeting inclusion criteria for each institution were selected and a citation analysis was performed in Web of Science to calculate the h-index. All included abstracts were analyzed and categorized by relevant Millennium Development Goal when applicable. The number of host authors per article was tallied and represented as a percentage of the total number of authors for each article. The mean was calculated using these percentages as representation of each program’s overall incorporation of host authors.

This research did not involve human subjects, and the Emory University institutional review board determined that this research was exempt from review by the institutional review board. All FREIDA data were collected between June 2014 and December 2015 and all websites were reviewed between January 2015 and January 2017. Microsoft Excel 14.7.0 was used to compute means, medians, SDs, and interquartile ranges. Stata/SE 14 was used to calculate χ² statistics.

RESULTS

In the 2014–2015 academic year, 200 of 245 (82%) Accreditation Council for Graduate Medical Education-accredited obstetrics and gynecology residencies responded to the FREIDA survey. Of the 245 residencies, 100 (41%) programs reported “yes” to having an international opportunity on FREIDA, and 83 (34%) more programs were identified using the search feature on FREIDA. Eleven (5%) additional residencies that had been identified in previous publications were included, and two (1%) more were identified by surveying the institution’s website, resulting in a total of 196 (80%) residencies with global health training programs (Fig. 1). The websites of these 196 residencies were reviewed and 82 (42%) provided information about their global health training program on their website.

There were no statistically significant differences noted between the type, location, or size of residency programs with global health training (n=196) and those without (n=49) (Table 1). Of the 82 programs with global health training information on their website, 49 (60%) offer elective opportunities, eight (10%) offer a research-focused experience, 12 (15%) report a field-based training program, seven (8%) programs do not fall into any of these three categories, and six (7%) were mixed types (Fig. 2).

Of the 82 programs with global health training information on their websites, eight (10%) did not include a global health training location and were excluded from further analysis. Of the remaining 74 programs, more than half (n=41 [55%]) report global health training work in multiple sites that include residents. A total of 340 partnerships were identified in 81 unique countries that are concentrated in sub-Saharan Africa, Asia, and Latin America. The four countries with the greatest number of global health training partnerships are Kenya (n=20), Haiti (n=17), Ethiopia (n=15), and India (n=15) (Fig. 3).
Global health training faculty members were identified for 67 of these 74 (82%) global health training programs. The number of faculty members per program ranged from one to 28 with a median of two (interquartile range 1–4). Of these programs (n=67), 26 (39%) global health training programs had faculty members with publications meeting inclusion criteria. A total of 698 articles were included across these 26 global health training programs. The number of included articles per global health training program ranged from one to a maximum of 160 (Fig. 4). The calculated h-index based on the included published articles for each global health training program ranged from zero to 17 with a median of three (interquartile range 2–6.75) (Fig. 5). In the 698 included articles, there were a total of 7,538 authors, of which nearly half (48% [n=3,678]) were host authors. Almost all (n=633 [95%]) articles had at least one host author included. The mean percentage of host authors per article for each institution ranged from zero to 100%.

Of the 698 articles surveyed, 544 (78%) addressed at least one of the eight Millennium Development Goals with 418 focused on Millennium Development Goal 6, 211 focused on Millennium Development Goal 5, and 160 focused on Millennium Development Goal 4 with multiple articles addressing more than one Millennium Development Goal. Of the 211 articles focusing on Millennium Development Goal 5, 36% (n=75) addressed infectious diseases in pregnancy, including human immunodeficiency virus, whereas articles about general obstetrics care comprised 30% (n=63) and contraception (n=33) and abortion care (n=12) comprised another 22% together (n=45).

Fig. 1. Identification of 196 global health training programs. *International opportunity is listed as a question in the FREIDA (Fellowship and Residency Electronic Interactive Database Access) survey. †FREIDA website includes a text box that allows a search for keywords. ‡Algorithm described in the Materials and Methods section.

DISCUSSION

As global health training programs continue to proliferate and mature, it is imperative that the work done through these global health training programs continues to be reported and that the knowledge gained from successful and less successful initiative implementation be shared throughout the academic community. In this cross-sectional observational study, we found that although 80% of obstetrics and gynecology residencies have global health training, only 39% of programs with publicly available faculty and location information had peer-reviewed publications from their work. We proposed a unique proxy to evaluate effect through scholarly activity using the h-index and found a wide distribution of h-indices between these global health training programs with 75% of programs having an h-index below 7, emphasizing the need for improved reporting and analysis of the work done by global health training programs. This may also highlight the challenges with publication and reporting.

Table 1. Characteristics of 245 Accredited Obstetrics and Gynecology Programs With and Without Global Health Training

<table>
<thead>
<tr>
<th>Characteristics of Obstetrics and Gynecologic Residencies</th>
<th>Global Health Training Identified (n=196)</th>
<th>No Global Health Training Identified (n=49)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of institution</td>
<td></td>
<td></td>
<td>.21</td>
</tr>
<tr>
<td>University</td>
<td>82 (41.8)</td>
<td>25 (51.0)</td>
<td></td>
</tr>
<tr>
<td>Community (including military)</td>
<td>22 (11.2)</td>
<td>8 (16.3)</td>
<td></td>
</tr>
<tr>
<td>Community with university affiliation</td>
<td>61 (31.1)</td>
<td>11 (22.4)</td>
<td></td>
</tr>
<tr>
<td>Information not reported</td>
<td>31 (15.8)</td>
<td>5 (10.2)</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td>.29</td>
</tr>
<tr>
<td>North</td>
<td>66 (33.7)</td>
<td>9 (18.4)</td>
<td></td>
</tr>
<tr>
<td>Midwest</td>
<td>40 (20.4)</td>
<td>14 (28.6)</td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>60 (30.6)</td>
<td>21 (42.9)</td>
<td></td>
</tr>
<tr>
<td>West and territories</td>
<td>30 (15.3)</td>
<td>5 (10.2)</td>
<td></td>
</tr>
<tr>
<td>Information not reported</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Department size</td>
<td></td>
<td></td>
<td>.46</td>
</tr>
<tr>
<td>Fewer than 20 faculty</td>
<td>35 (17.9)</td>
<td>12 (24.5)</td>
<td></td>
</tr>
<tr>
<td>20 faculty or more</td>
<td>118 (60.2)</td>
<td>30 (61.2)</td>
<td></td>
</tr>
<tr>
<td>Information not reported</td>
<td>43 (21.9)</td>
<td>7 (14.3)</td>
<td></td>
</tr>
<tr>
<td>Residency size</td>
<td></td>
<td></td>
<td>.76</td>
</tr>
<tr>
<td>Fewer than 24 residents</td>
<td>95 (48.5)</td>
<td>25 (51.0)</td>
<td></td>
</tr>
<tr>
<td>24 residents or more</td>
<td>58 (29.6)</td>
<td>17 (34.7)</td>
<td></td>
</tr>
<tr>
<td>Information not reported</td>
<td>43 (21.9)</td>
<td>7 (14.3)</td>
<td></td>
</tr>
</tbody>
</table>

Data are n (%) unless otherwise specified.

Fig. 2. Classification of 82 global health training programs using information on websites. Categories previously described. Trivedi. Effects of Global Health Programs. Obstet Gynecol 2018.
dissemination of information.\textsuperscript{15} However, the h-indices of the top quartile ranged from 7 to 17, illustrating that when global health work is reported, it is both valuable and influential in the academic medical community.

On review of the articles published by these global health training programs, we found that a majority focus on areas identified in the Millennium Development Goals as global health priorities. In terms of specifically addressing maternal morbidity and mortality through Millennium Development Goal 5, the focus of global health training programs varies. It includes not only addressing complications of pregnancy such as hemorrhage and hypertensive disorders, but is also more preventive in nature—prevention of sexually transmitted infections in pregnancy, prevention of unintended pregnancy, and access to safe abortion care. It should be noted that after 2015, the Millennium Development Goals were replaced by the Sustainable Development Goals with new and adapted public health goals to be achieved by 2030. The Sustainable Development Goals largely build and expand on the goals laid out in the Millennium Development Goals. The American College of Obstetricians and Gynecologists Statement on Sustainable Development Goals has clearly identified four Sustainable Development Goals and specific deliverables to address the needs for global women’s health, which still generally align with the work performed by global health training programs reported in this study.\textsuperscript{11}

To most effectively and ethically address these public health goals, global health training programs should work to develop capacity-building, sustainable partnerships. As outlined by the Working Group on Ethics Guidelines for Global Health Training, programs should ensure that “host and sender...derive mutual, equitable benefit.”\textsuperscript{13} In our study we evaluated the presence of such reciprocity in research publications by evaluating the proportion of host authors included. We found that nearly half of the authors were from the host institution and that 95% of included articles had at least one host author. It has been stated that for global health training programs to have a greater effect, they must be initiated and nurtured by both partner institutions.\textsuperscript{4} We extrapolate that the incorporation of host authors in research endeavors represents mutual collaboration in the development of research priorities and in the execution of deliverables in a feasible, culturally sensitive,
sustainable, and appropriate manner in the host country setting. Future studies may evaluate the level of host author involvement by using first, second, or last author as a metric for this; however, this was outside of the scope of our study.

Strengths of our study include using scholarly activity and authorship as unique proxies for effect and reciprocity in the sphere of global health training program evaluation. Moreover, through utilization of the FREIDA database and website review, we were able to overcome the methodologic limitations of previous studies, identifying nearly 20% more programs than a previous publication that used an email survey to program directors and a nearly 100% increase compared with a previous publication that used a web-based design.\textsuperscript{1,2} The FREIDA database has been successfully utilized to identify global health training programs in other specialties.\textsuperscript{10} Institutions understand how highly utilized the FREIDA database is in recruitment of trainees and are thus highly motivated to complete the survey. We further built on the existing literature showing a continued trend that the majority of global health training programs are elective and field-based training experiences and that the geographic distribution of global health training programs worldwide continues to show a high concentration of work in sub-Saharan Africa, Latin America, and Asia.\textsuperscript{2}

Interpretation of our data has several limitations. First, we acknowledge that there is a large amount of global health work and related publications that were excluded from our study because they were not.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{fig4.png}
\caption{Identification of 26 global health training programs with included articles. *All numbers in this figure represent the number of global health training programs. Trivedi. Effects of Global Health Programs. Obstet Gynecol 2018.}
\end{figure}
conducted in one of the identified global health training locations and thus we underestimated the academic-affiliated work done globally. Moreover, resident-authored papers may have been omitted, especially if the faculty member had since moved to a different program. We hoped to limit these omissions by limiting our search to the past 5 years. Our goal was to evaluate the productivity and effect of global health training programs in obstetrics and gynecology residencies, not to evaluate the global contribution of specific faculty members. Given the limited number of programs identified, we may have been underpowered to identify some differences in our analysis. We recognize the limitation of using publications to evaluate global health training programs. We would like to emphasize that our research cannot draw conclusions about local in-country clinical effect, but instead was designed to evaluate the scholarly contributions of these academic global health training programs. Moreover, the validity of our systematically abstracted data is limited because we could only ascertain publicly available data. There has been some criticism of the use of publications and the requirement for evidence-based medicine as a means of evaluating and justifying the work being done in low- and middle-income countries; reporting this expectation can often be debilitating to the efforts of small nongovernmental organizations. We strongly believe that although this may be true for nongovernmental organizations and private partnerships, academic global health training programs have an opportunity to use their resources to publicize and disseminate their findings. Moreover, it is imperative that work done through global health training programs continues to be evaluated on their progress toward reducing the global burden of disease.

To our knowledge, in addition to providing the most extensive list and description of global health training programs, our study is one of the first to perform a comprehensive review of all literature associated with academic global health training programs in obstetrics and gynecology. Our results indicate that a wide array of programmatic work is being done by academic institutions. Although the work does try to address major issues facing women’s health globally, it remains heavily underreported. Academic institutions with global health training programs are uniquely poised to serve as leaders in global women’s health through the establishment of sustainable clinical and research capacity-building partnerships and we hope that our study will encourage these programs to report their work through...
publications. In this way, we believe that efforts across academic institutions can collaboratively improve global women’s health.

REFERENCES


