Recruiting Trainees for a Global Health Research Workforce: The National Institutes of Health Fogarty International Clinical Research Scholars Program Selection Process

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Abstract. Between 2004 and 2012, the National Institutes of Health Fogarty International Clinical Research Scholars (FICRS) Program provided 1-year mentored research training at low- and middle-income country sites for American and international health science doctoral students. We describe the centralized application process, US applicant characteristics, and predictors of selection/enrollment. FICRS received 1,084 applicants representing many health professions and biomedical disciplines at 132 US academic institutions; 219 students from 72 institutions were accepted and enrolled. Medical/osteopathic students comprised 88.9% of applicants and 85.8% of enrollees. Applicants from institutions with higher applicant numbers were two times as likely to be selected. In 2012, FICRS was decentralized among 20 institutions in five consortia (Global Health Fellows), with autonomous selection processes that emphasize post-doctoral trainees. If academia, government, or charitable foundations offer future opportunities to health professions students for international research, the FICRS experience predicts that they can attract substantial numbers of motivated trainees from diverse backgrounds.

INTRODUCTION

Interest in experiences and training in global health has increased substantially in recent years among students of medical, public health, and other health professions schools in the United States.¹ Structured training experiences in research, clinical care, and public health in resource-limited settings launched during this period have now matured.^{2–5} Between 2004 and 2012, the Fogarty International Clinical Research Scholars (FICRS; www.fogartyscholars.org) Program provided 1-year research training opportunities at research centers in low- and middle-income countries (LMICs) for US and international doctoral students in the health professions. The Program was funded by the Fogarty International Center (FIC) and 15 other institutes, centers, and offices of the US National Institutes of Health (NIH). The Program's structure and unique features have been described previously.¹ From 2004 to 2006, the Program was called the Fogarty–Ellison Program and administered by the FIC and the Association of American Medical Colleges (AAMC). From 2007 to 2012, the Scholars (i.e., students) Program was administered by the FICRS Support Center at the Vanderbilt Institute for Global Health (VIGH) through an R24 grant from the FIC. In 2008, the Program was expanded to include post-doctoral clinical and research fellows, and new international field sites were added in 2009. Through a new competition in 2012, FIC converted FICRS to a decentralized Global Health Program for Fellows and Scholars, focusing principally on post-doctoral trainees rather than students. The new Program comprises 20 institutions in five consortia that favor applicants from within their own institutions to create a continuum of training opportunity.⁶

The FICRS Program's goals were to foster the next generation of global health-focused clinical investigators and help build international health research partnerships between US

and international investigators and institutions. The 1-year mentored research training experience provided opportunities for US students in health professions and medical science doctoral programs to participate in clinical research along with twinned international trainees (who were often post-doctorates). Scholars gained hands-on experience at research centers funded by the NIH in LMICs in Africa, Asia, Central and South America, the Caribbean, and Eastern Europe.¹ To support local institutions in their efforts to mentor research trainees entirely in the international sites, the Program provided both training and capacity building for research in the foreign sites. Given the centralized nature of recruitment of US candidates, eligible students could apply regardless of home institution affiliation, resulting in a democratization of opportunity for all health science graduate students.

To share our experiences in recruiting scholars, we describe the FICRS Program's application procedures for US scholars (pre-doctoral students) and analyze factors associated with successful selection and enrollment in the Program. Because of the lengthy duration of medical training, only the first few cohorts of scholars have set clear post-training career directions. We are currently compiling data to evaluate the Program's outcomes to date.

RECRUITMENT AND SELECTION OF US SCHOLARS

The FICRS Program application requirements are summarized in Table 1. US applicants were selected through a four-stage process. (1) Candidates applied for the Program online annually. An external review committee met at the AAMC headquarters in Washington, DC, in late January to review applications and select finalists for in-person interviews. (2) Finalists and LMIC sites ranked their interview preferences based on the applications and written site descriptions. (3) Based on these rankings, finalists were interviewed individually by domestic and LMIC representatives of the LMIC sites at a 3-day scientific conference (first day), and selection meeting (second and third days) held on the NIH campus in early March. The interview process used a 30-minute short

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TABLE 1
Program application requirements and features for US pre-doctoral scholars in the NIH FICRS Program

Requirements and features
Applicants must be US citizens or permanent US residents with advanced standing and strong academic records in a US medical or osteopathic school or a doctoral-level program at a US school of public health, nursing, dentistry, pharmacy, optometry, veterinary, or health professions sciences (international trainees are selected by international sites using site-specific guidelines and processes).
Medical and osteopathic students must have completed their basic science courses and 1 year of clinical training. All other doctoral students must have completed their coursework and passed their qualifying exams before starting the Fogarty fellowship.
Applicants must exhibit a strong interest in and potential for a career in global health, including clinical research.
Support of the applicant's home academic institution, including a committed mentor, is required.
Applicants must commit to being present for the full duration of the fellowship (2 weeks of orientation at NIH in July followed by 10–12 months at the foreign site).

The application did not include an independent research project proposal; successful applicants are matched with sites by the FICRS Program, and the sites worked with the scholars to propose and/or develop the projects that were often nested within continuing research at the international sites.

interview approach (informally termed speed dating by mentors and applicants), in which each formal interview lasted only 30 minutes, but finalists, site representatives/mentors, Vanderbilt Support Center staff, and NIH staff could interact informally during other parts of the meeting. (4) At the end of the selection/interview meeting, applicants and site representatives submitted final independent rank order preference lists, and these lists were used to match applicants to sites according to an applicant-optimal algorithm identical to the algorithm used for the National Resident Matching Program (NRMP).⁷ All US scholars were subsequently matched or twinned with LMIC scholars chosen by the international research sites through individually administered, site-specific selection processes. The selection meeting also allowed investigators and faculty to provide input on the Program's features and processes and selected Program alumni to present their work and interact with applicants.

Recruitment outreach was conducted by the AAMC, the Association of Schools of Public Health (ASPH), and conference and university presentations by FIC staff members and faculty, staff, and consultants of the FICRS Support Center at Vanderbilt. The AAMC conducted outreach through emails, mailings, campus visits and presentations, and phone calls to a wide swath of stakeholders, including deans or representatives in all eligible disciplines, medical school public relations sources, contacts at the NIH, FICRS external review committee members, FICRS training site principal investigators, regional and national student groups in eligible disciplines, online student forums, representatives of relevant AAMC groups and councils, suitable AAMC constituents in Vanderbilt's in-house database (Schools, Teaching Hospitals, and Academic Societies Resource System [STARS]), executive directors of related associations, and historically black colleges and universities (HBCUs). ASPH advertised the Program through outreach to professional associations other than medicine, including public health schools and other non-medical school institutions, and attendees at relevant conferences.

Initially, recruitment efforts focused largely on medical and public health students who were receptive constituencies. The interdisciplinary nature of global health endeavors prompted broad interest from graduate students in the health sciences as well, including veterinary science, dentistry, osteopathic medicine, nursing, pharmacy, microbiology, and behavioral sciences; therefore, outreach efforts were expanded to these disciplines. Over the years, as the numbers of Program alumni grew, outreach greatly increased by word of mouth, presentations by alumni, visits to the Support Center website (www.fogartyscholars.org), alumni publications, and FIC newslet-

ters reporting Program outputs and sharing alumni narratives. This study assesses the processes and results of the selection of US scholars to document what was and was not achieved in this centralized approach to recruitment and selection.

METHODS

We examined records of US applicants to the FICRS Program who submitted complete applications for all years of the Program (applying in 2003–2010 for deployment in 2004–2011). The applicants' demographics, academic disciplines, degrees sought, and home institutions and US regions were used to compare accepted with non-accepted applicants. For some US applicant characteristics, reliable data were available only for a subset of the Program years. Summary statistics were tabulated by year of application. Graphics were generated to show trends. Selection processes for LMIC scholars were site-specific, and therefore, they are not described here.

The primary outcome examined in the present study was the offer and acceptance of a position in the FICRS Program (enrollment). χ^2 and Wilcoxon rank sum tests were used to compare the distribution of applicant characteristics by enrollment. Multivariable logistic regression modeling was used to assess the relationships between applicant characteristics and Program enrollment. Age, marital status, race, and ethnicity were not collected during the Fogarty–Ellison Program (2004–2008; predating the FICRS Program), and they were not included in our model. To relax our linearity assumption, we modeled applicant count using a restricted cubic spline with three knots. Multiple imputation techniques were used to account for missing values for applicant characteristics. Computation of variance inflation factors indicated that multicollinearity did not compromise the regression model. R-software version 2.11.1 (www.r-project.org) was used for data analyses.

RESULTS

Demographic characteristics of 1,084 enrolled and non-enrolled Program applicants are shown in Table 2. The degrees that they were seeking at the time, the professional disciplines with which they identified, and the Carnegie classifications and applicant numbers of institutions from which they applied were compared using χ^2 or Wilcoxon rank sum tests to compare the distributions of applicant attributes by enrollment status. There was steady numerical growth among all types of applicants for the cohorts deployed between 2004 (77 applicants) and 2009 (171 applicants), after which numbers leveled off through

TABLE 2
FICRS Program applicant characteristics by enrollment

Enrolled (matched and accepted offer)	No (<i>n</i> , non-enrolled applicants)	Yes (<i>n</i> , enrolled applicants)	Acceptance rate (%)	<i>P</i> value*
<i>N</i> (total = 1,084)	865	219	20.2	
Sex (<i>N</i> = 986)				0.07
Female	488 (63.5%)	124 (56.6%)	20.3	
Male	279 (36.4%)	95 (43.4%)	25.4	
Age, median (interquartile range; <i>N</i> = 414)†	26 (25, 27)	27 (26, 29)		< 0.001
Marital status (<i>N</i> = 421)†				0.645
Married	32 (9.5%)	6 (7.1%)	15.8	
Unmarried	305 (90.5%)	78 (92.9%)	20.4	
Race (<i>N</i> = 509)†				0.698
American Indian or Alaska Native	1 (0.3%)	1 (0.7%)	50.0	
Asian	90 (25.2%)	38 (25.0%)	29.7	
Black	31 (8.7%)	8 (5.3%)	20.5	
Other	12 (3.4%)	5 (3.3%)	29.4	
White	223 (62.5%)	100 (65.8%)	31.0	
Ethnicity (<i>N</i> = 508)†				0.149
Hispanic or Latino	22 (6.2%)	4 (2.6%)	15.4	
Not Hispanic or Latino	334 (93.8%)	148 (97.4%)	30.7	
Current degree sought				< 0.001
DDS/DMD	5 (0.6%)	3 (1.4%)	37.5	
DNP/DNSc	3 (0.4%)	1 (0.5%)	25.0	
DO	34 (4.0%)	5 (2.3%)	12.8	
DVM	6 (0.7%)	5 (2.3%)	45.5	
MD	718 (84.4%)	165 (75.3%)	18.7	
MD/MPH	23 (2.7%)	12 (5.5%)	34.3	
MD/PhD	0 (0.0%)	6 (2.7%)	100	
PharmD	15 (1.8%)	0 (0.0%)	0.0	
PhD	47 (5.5%)	22 (10.0%)	31.9	
Primary discipline				0.014
Basic biomedical sciences or informatics	5 (0.6%)	1 (0.5%)	16.7	
Clinical psychology	1 (0.1%)	1 (0.5%)	50.0	
Dentistry	9 (1.0%)	4 (1.8%)	30.8	
Medical anthropology	0 (0.0%)	1 (0.5%)	100	
Medicine	739 (85.4%)	179 (81.7%)	19.5	
Nursing	7 (0.8%)	3 (1.4%)	30.0	
Nutrition science	1 (0.1%)	0 (0.0%)	0.0	
Osteopathic medicine	43 (5.0%)	6 (2.7%)	12.2	
Pharmacy/pharmacology	14 (1.6%)	1 (0.5%)	6.7	
Public health, epidemiology, biostatistics, or health behavior	40 (4.6%)	16 (7.3%)	28.6	
Veterinary medicine	6 (0.7%)	7 (3.2%)	53.8	
Second discipline				0.002
None reported	784 (90.6%)	181 (82.6%)	18.8	
Administration	5 (0.6%)	0 (0.0%)	0.0	
Basic biomedical sciences or applied anatomy	6 (0.7%)	6 (2.7%)	50.0	
Bioethics, communications, or information technology	3 (0.3%)	1 (0.5%)	25.0	
Public health, community health, or epidemiology	67 (7.8%)	31 (14.2%)	31.6	
Studying for dual degrees	81 (9.4%)	36 (16.4%)	30.8	0.004
Applications contributed by institution				< 0.001
Less than 10	314 (36.3%)	44 (20.1%)	12.3	
10 or more	551 (63.7%)	175 (79.9%)	24.1	
Carnegie classification of institution				< 0.001
Research universities with very high research activity	532 (62.0%)	169 (77.5%)	24.1	
Research universities with high research activity	66 (7.7%)	3 (1.4%)	4.3	
Doctoral/research universities	9 (1.0%)	0 (0.0%)	0.0	
Master's colleges and universities (larger programs)	12 (1.4%)	1 (0.5%)	7.7	
Master's colleges and universities (medium programs)	1 (0.1%)	0 (0.0%)	0.0	
Special focus institutions—medical schools and medical centers	227 (26.5%)	44 (20.2%)	16.2	
Special focus institutions—other health professions schools	11 (1.3%)	1 (0.5%)	8.3	

* χ^2 or Wilcoxon rank sum test comparing distribution of applicant attributes by enrollment.

†Data available for 2009–2011 cohorts only.

DDS = Doctor of Dental Surgery; DMD = Doctor of Dental Medicine; DNP = Doctor of Nursing Practice; DNSc = Doctor of Nursing Science; DO = Doctor of Osteopathy; DVM = Doctor of Veterinary Medicine; MD = Doctor of Medicine; MPH = Master of Public Health; PhD = Doctor of Philosophy; PharmD = Doctor of Pharmacy.

2011 (Figure 1). Applicant growth occurred among allopathic medical students as well as other health science disciplines that were included in outreach from 2007 onward. After outreach to these other disciplines began, the proportion of applicants studying medicine decreased from > 90% to around 80%.

Women comprised a majority of applicants (62.1%) and enrollees (56.6%), and about 9 of 10 applicants and enrollees

were unmarried. The median age was 26 years, suggesting that many students had acquired extracurricular experiences or additional degrees (medical students who complete undergraduate studies at 21–22 years of age and proceed directly to medical school are typically 23–24 years old when applying during their third year of medical school to study abroad the following year). Older applicants were slightly more likely to

FIGURE 1. FICRS Program United States-based applicants by year of deployment.

be accepted and enroll. Of applicants who provided racial and ethnicity information ($N = 509$), 63.5% were white, 25.1% were Asian, 7.7% were black, 0.4% were American Indian or Alaska Native, and 3.3% were other (*e.g.*, multiethnic); 5.1% were Hispanic or Latino. Race and ethnicity were not associated with enrollment success ($P = 0.70$ and $P = 0.15$, respectively). Most applicants were pursuing the Doctor of Medicine (MD) degree, either alone (82.5%) or combined with a public health (Master of Public Health [MPH], 3.3%) or Doctor of Philosophy (PhD) degree (0.6%). Some applicants were studying for stand-alone PhD (6.4%), veterinary medicine (Doctor of Veterinary Medicine [DVM], 1.0%), osteopathic (Doctor of Osteopathy [DO], 3.6%), dental (Doctor of Dental Surgery/Doctor of Dental Medicine [DDS/DMD], 0.7%), and nursing (Doctor of Nursing Practice/Doctor of Nursing Science [DNP/DNSc], 0.4%) degrees. In addition to medicine, current or prior disciplines included public health, veterinary medicine, dentistry, pharmacy, pharmacology, nursing, clinical psychology, medical anthropology, business administration, basic biomedical sciences, and nutrition science.

Applicants came from 132 academic institutions (Table 3): 25 schools contributed ≥ 15 applicants each, 16 schools contributed 10–14 applicants, 44 schools contributed 4–9 applicants, and 47 schools contributed 1–3 applicants; 90% of applicants came from institutions in two Carnegie categories⁸: 65% were from research universities with very high research activity, and 25% were from medical schools and medical centers that were not within the former category. Compared with the regional distributions of US academic institutions with these two Carnegie designations, higher proportions of applicants came from mid-East and New England institutions, and proportionally fewer came from Plains and Rocky Mountains institutions (Table 4).

We accepted and enrolled 219 US scholars (20.2% of applicants) (Table 2); 41 institutions that contributed ≥ 10 applicants each accounted for 175 (79.9%) of enrolled scholars, whereas 44 (20.1%) came from 31 other institutions. Applicants from institutions that contributed ≥ 10 applicants achieved nearly two times the acceptance/enrollment rate of applicants from institutions contributing < 10 applicants (Table 2).

Our multivariable logistic regression model included sex, primary discipline, US region, Carnegie classification, and

number of applications submitted by the home institution over the course of the Program (Table 5). The model showed men to be proportionately more successful at enrolling in the Program (odds ratio [OR] = 1.39, 95% confidence interval [95% CI] = 1.01, 1.91); however, in 7 of 8 years (all except the first year of 2004), female enrollees outnumbered males. Primary discipline was associated with successful enrollment; veterinary medicine applicants had the highest likelihood of enrollment. Medical students comprised a majority of enrollees, proportionate to their applicant numbers (Table 5). There was no difference in proportional enrollment success among US geographic regions.

DISCUSSION

Applications to the FICRS Program for deployment between 2004 and 2011 reflected and confirmed substantial interest in global health research training among US doctoral students in the health sciences. For every enrolled student, four could not be accommodated. More than four of five applicants were medical students, and most were from research-intensive universities, reflecting the Program's design as a research training opportunity rather than a study abroad or service learning year. This finding also reflected the nature of the Program as a year-off research experience rather than an opportunity for students to conduct their own specific degree-related research. In particular, PhD students could not be guaranteed a research experience related to their dissertation, and thus, they may not have had the flexibility to participate in a year-long program that would interrupt progress on their dissertations. A diversity of institutions was represented, and many successful applicants came from non-research-intensive institutions, HBCUs, and schools of osteopathy, veterinary medicine, public health, nursing, dentistry, and others. A majority of applicants and enrolled scholars was female, although men were slightly more likely to have been selected proportionate to their numbers. Students pursuing degrees in veterinary medicine, public health, nursing, and basic sciences fared well in the selection process, and students from all regions of the United States achieved success in enrollment.

The FICRS selection process was distinguished by the use of a four-stage process beginning with review of written applications focusing on the applicant's characteristics, experience, and career goals; in-person interviews in a speed-dating format with domestic and LMIC site representatives; and matching of scholars and sites using the NRMP's algorithm. Process evaluation surveys indicated that both successful and unsuccessful applicants and site representatives found the process to be fair, balanced, and effective in identifying high-quality applicants and fitting them to the sites' characteristics and research projects. Not all highly qualified applicants who cleared the written application phase and came for final interviews matched with a site given the program's budgetary limits, and thus, they could not be accommodated through our match. However, some of these applicants were subsequently offered positions based on FIC staff engagement in highly successful partnerships with multiple NIH institutes and centers, which identified additional funding sources.¹

The matching system used by the FICRS Program is unique among year-abroad global health research training programs. Although Doris Duke International Clinical Research Fellowship applicants are selected by teams specific to each

TABLE 3
Institutions contributing applicants ($N = 132$)

Institutions
Albany Medical College
Baylor College of Medicine*
Boston University
Brown University*
Case Western Reserve University*
Chicago Medical School
Columbia University*
Cornell University
Creighton University
Dartmouth Medical School
Des Moines University–Osteopathic Medical Center
Drexel University
Duke University*†
East Carolina University
East Tennessee State University
Eastern Virginia Medical School
Emory University*†
George Washington University
Georgetown University
Harvard University*
Howard University
Indiana University/Purdue University–Indianapolis*
Jefferson Medical College*
Johns Hopkins University*†
Kansas City University of Medicine and Biosciences
Kent State University
Kirkville College of Osteopathic Medicine
Lake Erie College of Osteopathic Medicine
Loma Linda University
Louisiana State University Health Sciences Center at New Orleans
Loyola University Chicago
Mayo Medical School
Medical College of Georgia
Medical College of Wisconsin*
Medical University of South Carolina
Meharry Medical College†
Michigan State University*
Midwestern University
Morehouse School of Medicine†
Mount Sinai School of Medicine*
New York College of Osteopathic Medicine of the New York Institute of Technology
New York Medical College
New York University*
Northwestern University*
Nova Southeastern University
Ohio State University
Ohio University
Oregon Health and Science University*
Pennsylvania State University
Philadelphia College of Osteopathic Medicine
Philadelphia College of Pharmacy
Ponce School of Medicine
Rush University Medical College
St. George's University School of Medicine (Caribbean)
Stanford University*†
State University of New York Downstate Medical Center*
State University of New York Stony Brook University
State University of New York Upstate Medical University
Temple University
Texas A&M University
Texas Tech University
Touro University
Tufts University*
Tulane University*†
University at Buffalo
University of Alabama at Birmingham*
University of Arizona
University of Arkansas
University of California, Berkeley†

TABLE 3
Continued

Institutions
University of California, Davis†
University of California, Irvine
University of California, Los Angeles*†
University of California, San Diego*†
University of California, San Francisco*†
University of Chicago*
University of Cincinnati
University of Colorado Health Sciences Center
University of Connecticut
University of Florida
University of Illinois at Chicago
University of Illinois at Urbana–Champaign
University of Iowa
University of Kansas
University of Kentucky
University of Louisville
University of Maryland School of Medicine*
University of Massachusetts Medical School*
University of Medicine and Dentistry of New Jersey*
University of Miami
University of Michigan*†
University of Minnesota*†
University of Mississippi Medical School
University of Missouri–Kansas City
University of Nebraska
University of Nevada School of Medicine
University of New England
University of New Mexico
University of North Carolina*†
University of North Texas Health Science Center
University of Oklahoma
University of Pennsylvania*
University of Pittsburgh*
University of Rhode Island
University of Rochester*
University of South Alabama
University of South Carolina
University of South Dakota
University of South Florida
University of Southern California
University of Tennessee
University of Texas Health Science Center at Houston
University of Texas Health Science Center at San Antonio
University of Texas Medical Branch at Galveston
University of Texas Southwestern Medical School
University of Utah
University of Vermont
University of Virginia
University of Washington*†
University of Wisconsin*
Vanderbilt University*†
Virginia College of Osteopathic Medicine
Virginia Commonwealth University
Wake Forest University
Washington State University
Washington University in St. Louis*
Wayne State University
Weill Cornell Medical College*†
West Virginia School of Osteopathic Medicine
Western University of Health Sciences
Wright State University
Yale University*†
Yeshiva University/Albert Einstein College of Medicine*

*Schools that contributed ≥ 10 applications each. Institutions are listed alphabetically.

†Institutions participating in the new Fogarty Global Health Fellows consortia beginning in 2012. Florida International University and the University of Hawaii are also in participating new consortia.

(Continued)

TABLE 4

Regional distribution of FICRS applicants, enrollees, and academic institutions

Region*	Applicants (%)	Enrollees (%)	Academic institutions† (%)
Far West	13.2	18.3	15.7
Great Lakes	15.4	10.1	19.7
Mid-East	26.7	27.1	13.5
New England	13.6	15.6	5.8
Plains	5.5	6.9	12.6
Rocky Mountains	1.0	0.9	4.5
Southeast	18.1	18.3	18.4
Southwest	6.5	2.8	9.9

*Far West: AK, CA, HI, NV, OR, and WA; Great Lakes: IL, IN, MI, OH, and WI; mid-East: DE, DC, MD, NJ, NY, and PA; New England: CT, ME, MA, NH, RI, and VT; Plains: IA, KS, MN, MO, NE, ND, and SD; Rocky Mountains: CO, ID, MT, UT, and WY; Southeast: AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, and WV; and Southwest: AZ, NM, OK, and TX.

†Institutions with Carnegie designations as research universities with very high research activity or medical schools and medical centers.

international opportunity⁹ and the Fulbright–Fogarty Fellowship Program in Public Health selects scholars centrally,¹⁰ the FICRS Program was designed to expose individuals with general interest in global health to as many opportunities at the pre-selected global sites as they wished. We then relied on the match to connect them with optimal sites and projects. This system had the benefit of directly involving representatives from each training site in review and interview of multiple applicants. Interestingly, the interview experience led to subsequent training opportunities for some students, who

TABLE 5

Relationships of applicant characteristics to successful FICRS enrollment

	OR (95% CI)	P value
Male	1.39 (1.01, 1.91)	0.042
Primary discipline		0.044
Medicine (reference)	1	
Dentistry	2.18 (0.61, 7.78)	
Nursing	2.39 (0.52, 10.93)	
Osteopathic medicine	1.53 (0.56, 4.19)	
Other*	1.99 (0.49, 8.15)	
Pharmacy/pharmacology	0.29 (0.04, 2.31)	
Public health†	1.45 (0.77, 2.73)	
Veterinary medicine	6.06 (1.84, 19.98)	
US region		0.097
Great Lakes (reference)	1	
New England	1.70 (0.86, 3.37)	
Mid-East	1.65 (0.95, 2.88)	
Plains	2.48 (1.16, 5.30)	
Southeast	1.72 (0.96, 3.11)	
Southwest	0.82 (0.30, 2.23)	
Rocky Mountains	1.50 (0.27, 8.39)	
Far West	2.33 (1.27, 4.29)	
Carnegie classification‡		0.088
RU/VH (reference)	1	
RU/H	0.27 (0.08, 0.90)	
DRU/master	0.23 (0.03, 1.95)	
Spec/med	0.74 (0.48, 1.12)	
Spec/health	0.34 (0.04, 2.76)	
Applications contributed by institution		0.011
5 (reference)	1	
15	1.90 (1.24, 2.93)	
25	2.10 (1.28, 3.43)	
40	1.62 (0.88, 3.01)	

DRU = doctoral/research universities; RU/H = research universities (high research activity); RU/VH = research universities (very high research activity); Spec/health = other health profession schools; Spec/medical = medical schools and medical centers.

*Other includes basic science (2), biochemistry (1), clinical psychology (2), informatics (1), medical anthropology (1), microbiology (1), and nutrition science (1).

†Public health includes biostatistics (1), epidemiology (11), health behavior (4), and public health (40).

‡<http://classifications.carnegiefoundation.org/descriptions/basic.php>.

learned about a given school, hospital, or program in the FICRS interviews.

Applicants from institutions that represented a large overall number of applications were more likely to be accepted and enroll in the Program, possibly reflecting more intensive home institution mentoring in the application process. However, 20% of successful applicants were from institutions that contributed small overall numbers, indicating that the opportunity was accessible to students from institutions with less robust global health and/or research cultures. Although our data are not capable of capturing this information, additional factors that we observed to be associated with successful enrollment included the availability of cofunding for particular applicants (such as from an NIH institute or center or the applicant's home institution) and suitability for specific site-based research projects and priorities in a given year (e.g., sites looking for an epidemiologist or a veterinary, nursing, or dental student or applicants with prior affiliations with sites). The FICRS Program selection procedures made substantive, high-quality global health research training opportunities available to a diverse array of motivated students, regardless of their individual or institutional characteristics.

FICRS was a unique program in the Fogarty training grant portfolio, because it was open to all persons in doctoral health professional training, regardless of institution in the United States or LMIC. Typically, Fogarty Programs train persons from LMICs; except for career development (K award) programs and the FICRS Program and its successor (see below), Fogarty training programs are generally not available to Americans.

In 2012, FIC substantially restructured the FICRS Program into a Global Health Program for Fellows and Scholars using five R25 awards to consortia of four institutions each (Table 3).⁶ Of 1,084 doctoral student applicants to the FICRS Program, 325 (30%) students were from institutions included in the five new consortia. Although the new program may evolve based on the interests and priorities of FIC and its NIH institute, center, and office partners, it limits funding of doctoral students to 20% of funds awarded to grantee institutions and consortia, thus offering far fewer slots to doctoral students. Some of the new consortia do not accept applicants from non-consortium institutions, further limiting access to doctoral students. Some US academic health centers are committing institutional funds to support opportunities for doctoral students to spend a year in LMIC-based research centers affiliated with them. These opportunities are typically limited to the institutions' own students, leaving at present only the Doris Duke International Clinical Research Fellowship⁹ and Fulbright–Fogarty Fellowships in Public Health¹⁰ open to doctoral applicants from any US university. The new program does not include explicit twinning of international scholars to the US scholars, an aspect of the FICRS Program that enriched the experience¹¹ and post-training networks¹² of its US and LMIC Scholars and likely enhanced capacity-building at the LMIC sites substantially.

The FICRS Program found substantial interest among students from universities that are not research-intensive and noted competitiveness among a diverse pool of applicants. To ensure ongoing access to applicants from underserved minority backgrounds, the new Fogarty Global Health Fellows consortia are enhancing minority recruitment, including outreach to historically minority institutions as either principal

members or linked partners (e.g., the University of Hawaii, Morehouse School of Medicine, Meharry Medical College, Florida International University, Ponce School of Medicine, and the University of Puerto Rico). We predict that if academic, government, and/or charitable foundations offer future international research training programs to doctoral students, reaching across institutions and disciplines, they will likely attract substantial numbers of highly motivated trainees from diverse backgrounds and institutions into global health research. Expanded efforts are needed to ensure that motivated students are encouraged and the next generation of global health investigators is identified and equipped for global research partnerships.

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