Leveraging international research consortiums to train and mentor early career investigators: The design and implementation of two support programs in the Enterics for Global Health *Shigella* Surveillance Study

Sonia Rao[1], Alyson Shumays[1], Hannah Atlas[1], Anya Lewin[1], Sean Galagan[1], Erika Feutz[1], Olivia Schultes[1], Christine McGrath[1], Irene Njuguna[1], Kate Rankin[1], Stephanie Edlund-Cho[1], Kirsten Vannice[2], Jessica Long[2], Patricia Pavlinac[1], Kirkby Tickell[1]

[1]Department of Global Health, University of Washington, Seattle, USA; [2]Enterics, Diagnostics, Genomics & Epidemiology, The Bill & Melinda Gates Foundation, Seattle, USA

Background

The Enterics for Global Health (EFGH) Consortium aims to establish the incidence and consequences of *Shigella* diarrhea in 7 high burden countries **(Figure 1**). In three surveys of country sites soliciting input on capacity building and training priorities, **scientific writing and data analysis** consistently ranked in the **top 3 priority areas.** Similarly**,** early-career investigators (ECIs) surveyed identified **mentorship** and **funded training opportunities** as key facilitators of scientific training and capacity building, and top barriers cited were **protected time, analytic skills, and writing skills.**

In response, The EFGH Consortium launched:

- **Rising Star Seed Awards:** A 12-month research support grant to leverage EFGH to generate new data & answer new scientific questions in the enterics field
- **Manuscript Writing Program (MWP):** A 16-month structured training on the research-to-publication process culminating in a first-author publication using EFGH data

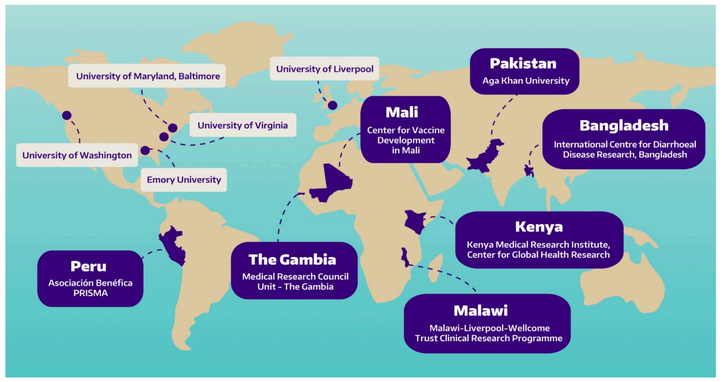


Figure 1. EFGH country sites

Program Participants

- Participants selected through competitive process with efforts to **balance gender and site representation (Table 1)**
- Participants in both programs are low- and middle-income country (LMIC) nationals at an **LMIC-based EFGH partner institution** actively participating in the EFGH project
- *Rising Stars: e*nrolled in, or < 5 years of graduation from, a PhD, Masters, or medical degree program in health-related field
- *MWP*: 1 or fewer first-author manuscripts published in a peer-reviewed journal & able to commit to the full 16-month cohort experience (~8-16 hours/ month)

Table 1. Characteristics of participants in EFGH ECI support programs

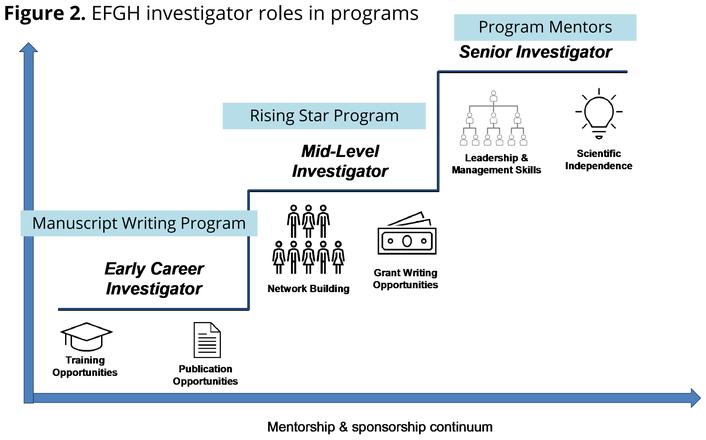
	Rising Star Program n (%)	MWP n (%)
EFGH Country Site		
Bangladesh	1 (16.6%)	2 (18.2%)
Kenya	1 (16.6%)	2 (18.2%)
Malawi	1 (16.6%)	2 (18.2%)
Mali	1 (16.6%)	1 (9.1%)
Pakistan	1 (16.6%)	1 (9.1%)
Peru	1 (16.6%)	1 (9.1%)
The Gambia	-	2 (18.2%)
Gender		
Male	3 (50%)	8 (72.7%)
Female	3 (50%)	3 (27.3%)
Highest education completed*		
Bachelors/undergraduate	-	7 (63.6%)
Masters	6 (100%)	2 (18.2%)
Doctoral	-	2 (18.2%)
Professional background		
Clinical	1 (16.6%)	4 (36.3%)
Lab	2 (33.3%)	2 (18.2%)
Research coordination	2 (33.3%)	5 (45.5%)
Data	1 (16.6%)	-

*3 Rising Stars currently pursuing PhDs and 5 MWP participants pursuing Master's degrees

Global WACh
Woman · Adolescent · Child · health

Mentorship Framework in Both Programs

Figure 2. EFGH investigator roles in programs



Rising Star Program

Manuscript Writing Program

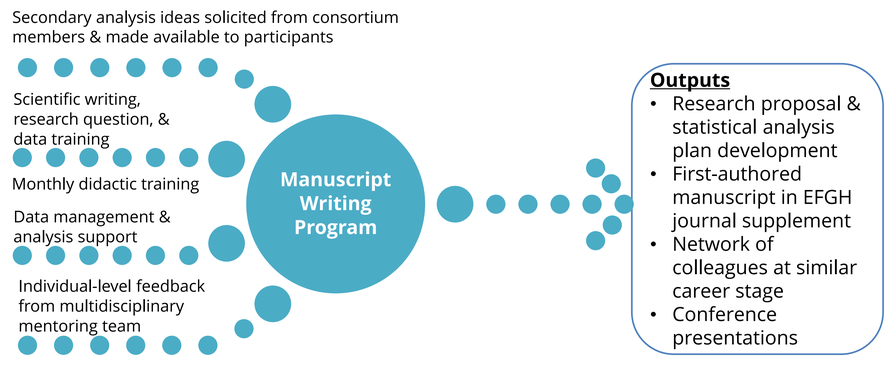


Table 2. Topics covered during 90-minute monthly meetings & associated milestones

	Topics	Milestones
1	•Program overview, participant goals and expectations •High-level epidemiology concepts •Formulating research questions	Identification of top 3 secondary analysis topics & formulating into testable research questions
2	•Anatomy of research articles •Literature review	Final research topic and outlining of potential exposure, outcome, & confounding variables
3	•Anatomy of a research proposal part 1: specific aims page	Mentorship teams formed & mentorship agreements signed
4	•Anatomy of a research proposal part 2: background/introduction section	Specific aims
5	•Statistical Analysis Plans Part 1: variable definition table, model selection	Aims presentations to EFGH consortium
6	•Statistical Analysis Plans Part 2: sample size/power calculations •Anatomy of a research proposal part 3: methods section	Draft statistical analysis plans (SAP) due
7	•Shell/dummy table development •Data organization/presentation	Completed NIH-style research proposal
8	•Data analysis part 1 - Importing, merging, basic data cleaning, exploratory data analysis, variable creation	Data requests submitted to central data team & manuscript shell tables drafted
9	•Data analysis part 2 - Running and interpreting statistical models	Practice in R or Stata using publicly available dataset
10	•Scientific writing workshop	Introduction & methods section of manuscript
11	•Anatomy of a manuscript: Results, tables and figures	Interim analysis (shell tables infilled)
12	•Anatomy of a manuscript: Results, text	Results section of manuscript
13	•Poster design and presentation, public speaking	Results presentations to EFGH consortium
14	•Anatomy of a manuscript: Discussion and abstract	Discussion section due
15	•Journal submission process	Compiled manuscript draft
16	•Final presentations	8-minute PowerPoint presentation

Discussion

Program Successes:

- Leveraging **strong network of mentors** in the EFGH consortium with **clear roles and responsibilities that they opt into**
- Participants in both programs have **opportunities to present their research** to the EFGH consortium and Global WACh faculty, staff and students **(Figure 3)**
- **Strong attendance** at cohort meetings and 1:1 check-ins
- **Leveraging professional training opportunities** through UW E-learning and Global WACh
- **Access** to UW library resources and DataCamp training
- **Buy-in** from EFGH senior scientists and funders

Program Challenges:

- Despite striving for gender equity, **recruiting female-identifying LMIC ECIs was difficult**- further understanding of the barriers they face is needed
- Ensuring **protected time** for participants to work on program materials outside of their normal EFGH study duties
- Conducting program remotely in a virtual setting- **internet connectivity issues**
- Tailoring and teaching **quantitative analysis concepts** (for the MWP) to investigators with varying quantitative backgrounds and heterogenous data-related goals
- Ambitious timeline for MWP assignments
- Language barriers with French and Spanish language sites
- Supporting **soft skills development -** working with and managing mentors, communication, and public speaking across different settings

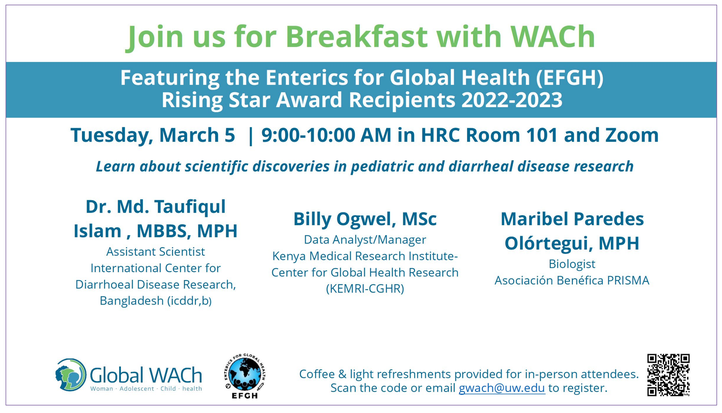


Figure 3. The flyer from one of the results dissemination opportunities for the Rising Stars Program

Next Steps

- MWP participants are completing research proposals and beginning development of data analysis plans
- Participants in both programs aim to submit first-authored manuscripts for peer review by early 2025
- Post-program surveys to evaluate and identify areas of strength and areas for improvement
- Assess the potential to package and scale MWP materials to other research consortiums

Our partners and funders:

ENTERICS FOR GLOBAL HEALTH
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