

Perspective Piece

The Emergence of Undergraduate Majors in Global Health: Systematic Review of Programs and Recommendations for Future Directions

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Abstract. Global health education has been expanding rapidly and several universities have created an undergraduate major degree (bachelor's degree) in global health or global health studies. Because there are currently no national guidelines for undergraduate degrees in global health, each of these programs was developed along individual lines. To guide the development of future global health majors, we conducted a systematic review of undergraduate majors in global health. We identified eight programs and invited program directors or representatives to a symposium at the Consortium of Universities for Global Health 2016 conference to review their existing undergraduate major in global health and to discuss lessons learned and recommendations for other colleges and universities seeking to develop undergraduate degrees in global health. We noted significant diversity among the existing programs in terms of required courses, international field experiences, and thesis research projects. In this review, we describe these global health programs, their student characteristics, as well as the key educational competencies, program requirements, and core global health courses. Based on program reviews and discussions, we identify seven recommendations for the development and expansion of an undergraduate major in global health and discuss issues that have arisen in the curricular development of these programs that warrant further exploration. As the field of global health education continues to expand, following these students after graduation will be essential to ensure that the degree programs in global health both meet student needs and launch students on viable career pathways.

INTRODUCTION

Global health is a highly interdisciplinary, rapidly evolving field that spans health sciences, including medicine and public health, and also bridges a broad range of academic disciplines, including agriculture, anthropology, business, engineering, environmental sciences, economics, history, law, psychology, public policy, and sociology. Global health aims to improve the lives of all people worldwide by reducing health disparities through addressing modifiable health determinants, providing sustainable health services, and promoting human development.¹ The objectives are achieved through sustainable provision of health services and human development, taking into account the complex transactions between societies, a defining feature of globalization.¹ Applying global health principles, skills, and knowledge may be critical to achieving healthy populations, but their incorporation into the curriculum of undergraduate health science and liberal arts programs has been slow.^{2,3}

Student interest in global health education has grown exponentially over the last decade.^{2,3} In 2010, the Commission on Education of Health Professions recommended changes to facilitate development of a generation of health professionals who will be better equipped to address present and future health challenges.^{4,5} The report called for harnessing global resources, experience, and knowledge through international

exchange programs to generate capacity for addressing local challenges.⁵ Until recently, most global health degree programs have focused on graduate students pursuing master's degrees in public health (MPH), PhD, or DrPH degrees. While some universities have created undergraduate global health programs, the majority grant either a certificate or minor in global health studies or have global health tracks within other majors. Recently, several colleges and universities have introduced undergraduate majors (bachelor's degrees) in global health or global health studies.

Given the trajectory of global health education, it is likely that additional colleges and universities will seek to develop undergraduate majors in global health in the coming years. Since there is little guidance on the competencies and requirements for a bachelor's degree in global health, we reviewed the existing programs to compare and contrast these components and other key characteristics. The goal was not to encourage uniformity, but to identify and learn from common elements and practices that might be used to guide the development of new academic global health degree programs.

METHODS

We conducted a systematic review of existing academic programs that offer a bachelor's degree in global health. We searched PubMed for “bachelor degree” or “undergraduate major” and “global health,” reviewed the Consortium of Universities for Global Health (CUGH) database and university websites known to offer global health education, and had discussions with key leaders in global health education. We included programs that already have conferred a

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bachelor's degree in "global health," "global health studies," or "global public health." We excluded programs that offered only an undergraduate track, concentration, certificate program, or minor in global health.

Through this process, we identified seven colleges or universities that have matriculated students into an undergraduate major program and conferred a bachelor's degree in global health. We then contacted each program to obtain detailed program data from the program director or an academic representative. Each of the seven colleges or universities agreed to participate and provide information.

In April 2016, we convened a satellite symposium at the CUGH conference in San Francisco to present and discuss each program. A representative from six of the seven identified programs attended the conference and provided a summary of their undergraduate major program, students, and requirements. After the presentations, we discussed the themes of existing programs and major recommendations for other colleges and universities seeking to develop a similar degree. During the conference, we learned that an eighth school, New York University, confers a co-major in global health, and we invited their participation in this review.

RESULTS

Development and focus of degree programs. A summary of the eight undergraduate global health degrees, students, key competencies, and program requirements reveals both marked similarities and striking differences (Table 1). Four programs (Arizona State University, Duke University, Mercer University, and University of California–San Diego) offer only a bachelor of arts (BA degree, two universities (Georgetown University and University of Southern California) offer only a bachelor of science (BS, and two programs (Allegheny College and New York University) offer BA and BS degrees. The title for most degrees is either "global health" or "global health studies" while one program degree (New York University) is "global public health," and another (Georgetown University) is "biology of global health."

The eight global health programs are housed within a wide variety of departments across the institutions, ranging from the Department of Biology (Georgetown University) to the Department of Anthropology (University of California–San Diego). In addition, global health programs are managed by a variety of schools and colleges, from the multidisciplinary School of Human Evolution and Social Change (Arizona State University) to the School of Medicine (University of Southern California).

All programs have been created within the last 10 years. In general, most programs started with a small number of students in the first graduating class before rapidly expanding. The largest program, Arizona State University, has conferred 264 undergraduate degrees. Only Arizona State University offers an online learning degree program.

Student career trajectories, and program competencies and requirements. The career trajectories of students enrolled in global health programs were similar across programs. Many students planned to pursue either a professional health science degree (i.e., medical or nursing degree) or an advanced degree in another field while some students wanted to engage in global health practices and/or international work experiences through nonprofit organizations and international

governmental organizations, including the Peace Corps, Teach for America, Global Health Corps, Fulbright, and AmeriCorps. However, we were unable to assess the long-term career trajectory of global health graduates after graduation, due to the relatively short time frame since establishment of these programs and limited follow-up information.

All degree programs had developed key objectives or educational competencies before the inception of their major degree program. Several programs are still revising their key educational competencies, and at least one university (Arizona State University) has mapped their objectives to the 39 competencies across 11 educational domains defined by the CUGH for professional global health education.⁶ Most undergraduate program objectives emphasize appreciation of multidisciplinary approaches to understanding both local and global health issues. Several programs also describe the need to maintain a cultural understanding of health and to recognize the ethical challenges that might arise in resource-limited settings. Other important learning objectives include understanding the social, economic, political and environmental factors that shape individual, community, and population health; and working collaboratively to develop sustainable solutions to global health issues. The majority of programs emphasize the need for students to be able to critically analyze global health issues and articulate key concepts across several disciplines.⁷

The major credit hours and other requirements varied considerably by program, which reflects differences in academic structures. A thesis is required by two programs (Allegheny College and University of California–San Diego), and recommended by two others (Duke University and Georgetown University). In two programs, students complete a required (Duke University) or recommended (Mercer University) research capstone project while the University of Southern California requires students to undertake directed research with a global health focus. Four programs require a practicum experience, and only two programs require an international experience. Two programs (Duke University and New York University) require the global health major to be paired with a co-major. Students at Duke University pair their global health major with a variety of different majors, including biology (20%), public policy (16%), anthropology (16%), psychology (11%), or another major (37%). New York University offers an undergraduate co-major degree in global public health that must be paired with one of 10 disciplines.

The core global health courses and requirements were similar among the programs (Table 2). Most require both introductory courses in global health that emphasize critical thinking and problem solving, and experience with community-based research design and methods. The programs diverge in more advanced courses. The majority of programs, including Allegheny College, Arizona State University, Duke University, and Mercer University, focus more on public health issues (e.g., epidemiology, biostatistics, health systems), social sciences (e.g., anthropology, psychology, sociology), and public policy. At Duke University, 15% of the students pair the global health major with a major in the humanities. The program at Georgetown University focuses on advanced courses in the biological sciences, including cellular biology, immunology, and ecology while still providing education on a broad array of current global health issues. Similarly, the program at University of Southern California has core

TABLE 1
Description of eight existing undergraduate Global Health major programs in the United States

	Allegheny College	Arizona State University	Duke University	Georgetown University	Mercer University	New York University	University of California—San Diego	University of Southern California
Global health program	BA or BS in Global Health Studies	BA in Global Health*	BA in Global Health	BS in Biology of Global Health	BA in Global Health Studies	BA or BS†	BA in Global Health	BS in Global Health Studies
Program degree	Allegheny College	School of Human Evolution and Social Change	College of Arts and Sciences	Department of Biology; Georgetown College	Department of International and Global Studies; College of Liberal Arts	College of Global Public Health	Department of Anthropology	Keck School of Medicine of University of Southern California
School/department granting degree								
Year of degree inception	2013	2007	2013	2008	2010	2013	2014	2008
Does the school also offer an undergraduate public health degree?	No	No	No	No	Yes	N/A	Yes	Yes
Student composition	All interested students	All interested students	All interested students	Biology students and other interested students who transfer into the Department of Biology	Pre-health students (premedical, pre-physical therapy, pre-pharmacy, pre-nursing), and social science students	All interested students	Biology, premedical, and general students	All interested students
Target audience	70–75	78	79	75–80	> 70	N/A	N/A	77
Percent female in average year								
Number of students in first graduating class	9 in 2014	1 in 2009	10 in 2014	2 in 2009	1 in 2012	N/A	2 in 2015	N/A
Number of students in current graduating class (2016)	16	63	58	40	22	N/A	29	18
Number of students currently enrolled in program (2016)	117	404 (265 in-person, 139 online)	147	103	46	N/A	123	84
Total number of students graduated from program	27	264	86	158	23	N/A	2	75

(continued)

TABLE 1
Continued

	Allegheny College	Arizona State University	Duke University	Georgetown University	Mercer University	New York University	University of California-San Diego	University of Southern California
Key educational competencies								
Have the key competencies of the degree program been defined?	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes
If yes, were the key competencies defined before program inception?	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Were key competencies revised after program inception?	Yes, still evolving	Yes, still under discussion and have mapped to CUGH competencies	Yes, still under discussion as we continue to refine the curriculum	Yes, revised with the WHO employment competencies	Yes	N/A	No	Yes, still evolving
Program requirements								
Major credit hours required for BA or BS degree	56 credits (of 128 total credits required for degree)	33 credits (of 120 total credits required for degree)	11 credits (of 34 total credits required for degree)	42 credits (of 120 total credits required for degree)	45 credits (of 53 total credits required for degree)	N/A (of 128-135 total credits required for degree)	68 credits (of 180 total units required for degree)	66 units (of 128 total units required for degree)
Is a thesis required for the degree program?	Yes (2 semesters)	No	No (~20% complete a thesis; all students complete a research-oriented capstone project) Yes (8 weeks)	No (recommended)	No (students complete a research capstone project)	N/A	Yes	No
Is a practicum experience required for the degree program?	Yes (the practicum topic and duration must be approved by the program)	Yes (1 semester at 10 hours/week)	No	No	No (an internship is recommended)	Yes (global public health internship)	Yes (100-hour, 5-week duration preapproved field experience required)	No
Is international experience required for the degree program?	No (recommended)	Yes	No (most practicums are international experiences)	No (recommended)	Yes	Yes	No	No
Does the degree require a co-major?	No	No	Yes (degree can be paired with any other major)	No	No	Yes† (degree can be paired with 10 majors)	No	No

BA = bachelor of arts; BS = bachelor of science; CUGH = Consortium of Universities for Global Health; N/A = not available; WHO = World Health Organization.

*Degree also available through online curriculum.

† Depends on the co-major, which may include the following: anthropology, applied psychology, food studies, history, media culture and communication, nursing, nutrition and dietetics, social work, sociology, and science.

TABLE 2

Description of core global health courses and requirements in undergraduate global health major programs

University	Core global health courses and requirements
Allegheny College	Intro to Global Health Topics and Approaches in Global Health Epidemiology Cultures and Health or Medical Anthropology Addressing Global Health Challenges Senior Seminar (year-long senior thesis) Language-specified proficiency Electives in 4 key dimensions Science and Environment Ethics and Social Responsibility Policy and Economics Cultures and Society Practicum seminar
Arizona State University	Intro to Global Health 1 Epidemiology or Statistics course 3 Global Health Foundation courses Medical Anthropology Disease and Human Evolution Environmental Health Poverty and Social Justice Global History of Health Health and Human Biology 1 Practicum course 3 Global Health electives (1 from Culture, Society, and Health track, 1 from Poverty and Social Justice track, and 1 from Time Depth and Health and Human Biology track) Study abroad
Duke University	Fundamentals in Global Health Global Health Research Global Health Ethics One course from 3 of the following 4 areas Social Determinants Health Systems and Policy Global Health Humanities Global Health Natural Sciences Statistics Global Health Capstone 3 electives focused on a theme of scholarly interest, research agenda, or career objective
Georgetown University	Introduction to Biology of Global Health Senior Seminar in Biology of Global Health At least 1 course in the Cell and Molecular Cluster At least 1 course in the Host and Disease Cluster At least 1 course in the Ecology and Evolution Cluster 2 semesters of General Chemistry; 1 semester of Calculus; 1 semester of Probability and Statistics; and 1 semester of Experimental Design, Biostatistics, or Epidemiology 2 courses among International Health; Science, Technology, and International Affairs; Bioethics; Economics; Business and Marketing; Government; History; etc.
Mercer University	Introduction to Global Health 3 Global Health Core Classes Epidemiology Global Health Policy Environmental Health 9 credits of electives Global Health Challenges Maternal and Child Health

(continued)

TABLE 2

Continued

University	Core global health courses and requirements
New York University	Medical Geography International Public Health Interventions Health in Africa Medical Anthropology Health and Gender Special Topics Study abroad experience Senior Capstone Project Biostatistics Epidemiology Health Policy Environmental Health Sociobehavioral Health Complete a Global Public Health Internship Complete additional requirements in co-major degree
University of California—San Diego	History of Public Health Global Health and Cultural Diversity Essentials of Global Health Project Management in the Health Services 1 Policy Analysis course 1 of the following Sociology courses Science, Technology, and Society Sociology of Health-Care Issues General Sociology for Premed Students Statistics Capstone: senior thesis preparation Require 8 electives among biological science courses and medical social science courses
University of Southern California	Introduction to Global Health Case Studies in Global Health Globalization: Issues and Controversies General Biology: Cell Biology and Physiology or Advanced General Biology: Cell Biology and Physiology General Chemistry or Advanced General Chemistry Biological and Behavioral Basis of Disease Principles of Microeconomics Calculus I Health Behavior Statistical Methods Health Behavior Research Methods Directed Research (with an international focus) At least eight elective units from Health Promotion or International Relations

courses in the biological sciences, and also requires electives on international relations and health behavior. At Arizona State University, “global” is incorporated in the anthropological sense—to understand disease, health, and well-being in ways that incorporate a variety of cultures, places, and time along with their social, biological, historical, and ecological significance. Although there was no clear consensus on course requirements, most programs choose either a public health-oriented, medical anthropology-oriented, or a biomedical-oriented approach in the core curriculum.

RECOMMENDATIONS FOR EMERGING UNDERGRADUATE GLOBAL HEALTH PROGRAMS

Based on the review and experience of existing programs during the CUGH symposium, we offer the following seven

TABLE 3

Suggestions for developing an undergraduate major in global health

Undergraduate major degree development
Create clear educational objectives at program inception
Build program capacity by starting with a certificate or minor degree program
Consider logistic and programmatic challenges of interdepartmental collaborations
Strengthen local, domestic, and international global health partnerships
Student education and requirements
Facilitate and encourage experiential practicum and internship experiences
Consider the risks/benefits of offering international experiences
Ensure strong ethical practices

recommendations for consideration by emerging programs developing an undergraduate major in global health (Table 3).

Create clear educational objectives at program inception. All of the programs had clearly defined objectives and/or competencies at the outset, which were helpful in guiding curriculum development, faculty recruitment, and student engagement. Universal educational competencies for global health have been proposed,^{6,8} but these competencies have been developed for graduate education and are not specific for undergraduate objectives. Since undergraduate education has a different goal, we suggest that program directors develop clear educational objectives before program inception, and that the global health community define key competencies designed to address the goals of undergraduate global health education. These objectives might include the following:

- To educate students to articulate fundamental global health concepts, tools, and frameworks.
- To prepare students for work with different types of organizations or to enroll in a graduate degree program related to global health issues.
- To enable students to understand the implications of international events and conditions related to global health inequalities and the social determinants of health.
- To develop students' capacity to analyze the growing complexities and interrelatedness of globalization, environmental change, economic development, and political forces that influence global health.
- To encourage students to participate in appropriate and sustainable initiatives intended to raise the standard of living, improve health and well-being, and reduce health inequalities both at home and abroad.

Build program capacity by starting with a certificate or minor degree program. Most of the existing global health programs, except Arizona State University and Georgetown University, introduced a global health certificate, concentration area, or minor program before offering a major degree. This allowed programs to build curriculum, student interest, and faculty engagement, while forging connections across disciplines that later proved essential. However, students pursuing a certificate or minor degree in global health often intend to pursue another primary career field. Conversely, those students who want to pursue a global health major are often committed to making global health the primary focus of their careers. The establishment of a global health co-major at

Duke University and New York University leaves open the question of what students identify as "primary" in a truly interdisciplinary curriculum. Existing programs have experienced rapid surges of student interest and enrollment immediately following the creation of the undergraduate major. By first having experience with a smaller program, existing program directors felt that this expansion process was easier. An ongoing challenge, however, has been maintaining faculty and administrative support to meet the student interest and rapid growth of matriculated students.

Consider logistic and programmatic challenges of interdepartmental collaborations. At most universities, global health degree programs have involved a wide variety of faculty, departments, schools, and colleges to cover the breadth and depth of global health education. Cross-departmental collaborations can create unique logistical, administrative, and financial challenges. At some universities, departmental funds are disbursed based on student enrollment, which may create conflict. An additional issue may be the conflict for faculty who have responsibilities of publishing research for promotion, but might be asked to spend more time advising and mentoring students. Any logistical, programmatic, and financial issues that might arise through a collaborative interdepartmental degree program should be discussed and addressed early in the process and repeatedly as the need arises.

Strengthen local, domestic, and international global health partnerships. Because global health involves reducing health disparities and improving the lives of people worldwide, exposing students to both local and international issues is important.⁹ Many of the programs have found that well-developed and sustained partnerships with both local and global organizations have strengthened their education programs, and for those programs that require practicum experiences, these partnerships are an essential part of the educational platform.

A recent report on global health partnerships, commissioned by the Center for Strategic and International Studies and conducted by the Department of Global Health at the University of Washington, concluded that "Partnerships are a key component of successful global health programs but could be strengthened by addressing inequities in relationships between high- and low-income institutions, developing additional collaborations and better preparing North American students for training in low-resource settings."¹⁰ The results of this report are consistent with the descriptions of global health partnerships described by the existing degree programs. Academic program directors should also recognize that "local is global" by ensuring that the program and curriculum reflect this important global health principle.

Facilitate and encourage experiential practicum or internship experiences. Program directors have consistently expressed that practicum or internship experiences are transformational learning components for undergraduates in many fields, including global health. They also often open doors to graduate programs and jobs. The experiences during a practicum can be critical for both students and their community partners for the success of a program. Protecting a partnership by ensuring oversight, training students on appropriate expectations, and preparing host supervisors to be effective mentors can maintain the quality of an experience and partnership.

Consider the risks/benefits of offering international experiences. Among universities that require or encourage an international global health experience, program faculty have indicated that this is an important component of their educational program. One successful model at Arizona State University includes a cross-cultural research training project—known as the Global Ethnohydrology Study—that is integrated into the global health study abroad programs through an intensive year-round teaching and research process.¹¹ However, including international experiences as a training requirement can create significant burdens on faculty, staff, and students. For this reason, most programs recommend, but do not require, an international global health experience. The risks of having unsupervised undergraduate students studying global health-related activities in resource-limited settings could cause logistical problems, safety issues, or ethical concerns.¹² Suggested strategies to mitigate these risks are having close supervision of students by university educators or officials, utilizing well-established partnerships in local communities that have resources to provide adequate supervision and support, developing specific guidelines for undergraduate involvement, and requiring predeparture curricula and training to prepare students for their assignment.

Ensure strong ethical practices. Awareness of ethical issues and professional behavior are critical, and global health educators and learners must be sensitive when learning across different cultures, ethnicities, and health beliefs.¹³ Students who complete a practicum or international experience should operate within the context of local needs and be aware of their own limitations, competencies, and skills.¹⁴ Health-care needs and priorities will change over time within countries and regions; therefore educators and students need to be able to access reliable information, critique and interpret complex data, and be socially aware of various cultural situations. Students should be encouraged to maintain a sense of humility when learning from a diverse community that may take an alternative approach.¹⁵ Integrating global health ethics into the core curriculum may help prepare future generations of global health leaders for some of the most difficult challenges.

CONCLUSION

Given the growing interest in global health by undergraduate students, additional colleges and universities are likely to prepare to offer an undergraduate major in global health, and we provide recommendations to help guide the development of new degree programs. Global health should become an integral aspect of clinical practice and public health intervention, and educators from various fields should make global health awareness a primary learning objective. However, complex real-world global health challenges require new interdisciplinary educational models. These global health curricula should integrate knowledge of health's social, historical, political, biological, and ecological dimensions while preparing students to think critically and identify problems to create effective solutions.

Undergraduate students have recognized the interconnectedness of society, the impact of health inequalities, and the need to provide adequate health care for all people—which has led to the rapid rise of global health education. As educators, our responsibility is to ensure that students are learning

content-appropriate material and to support students eager to learn from a practicum or international experience. In addition to fostering critical analysis and reasoning, a global health major should provide students with a set of core skills and an understanding of the broad range of issues that influence health around the world. Although an undergraduate global health degree can open doors to many career pathways, most students will either explore international work or pursue a professional degree. As global health majors become more common, educators should consider how an undergraduate major can best dovetail with an advanced degree.¹⁶ For example, related master's degrees should build upon an undergraduate global health major with minimal duplication, but without excluding students from other undergraduate disciplines.

A primary benefit of establishing an undergraduate program in global health includes developing the framework for an international, interdisciplinary understanding to address socioeconomic determinants of health and health inequalities. Global health undergraduate major degree programs offer the higher education community an opportunity to prepare the next generation for global citizenship using a new, highly interdisciplinary approach that recognizes the interconnectedness of our world in the twenty-first century and links health with critical issues such as economic development, environmental sustainability, and social justice. As is sometimes the case, the vision and appetite of students on many campuses for undergraduate global health programs have outpaced that of faculty. The lessons from the eight undergraduate majors discussed here provide a strong foundation for the development of future undergraduate global health programs. It is time to rise to the challenge.

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