Global Health Education in Pulmonary and Critical Care Medicine Fellowships

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Abstract

A growing number of pulmonary and critical care medicine fellowship programs in the United States offer global health training opportunities. Formal, integrated global health programs within pulmonary and critical care fellowships are relatively new but are built on principles and ideals of global health that focus on the mutually beneficial exchange of knowledge and social justice. Although core competencies consistent with these overarching themes in global health education have not been formalized for pulmonary and critical care trainees, relevant competency areas include clinical knowledge, international research training, cultural competency, and clinical and research capacity building. Existing global health education in U.S. pulmonary and critical care medicine training programs can generally be classified as one of three different models: integrated global health tracks, global health electives, and additional research years. Successful global

health education programs foster partnerships and collaborations with international sites that emphasize bidirectional exchange. This bidirectional exchange includes ongoing, equitable commitments to mutual opportunities for training and professional development, including a focus on the particular knowledge and skill sets critical for addressing the unique priorities of individual countries. However, barriers related to the availability of mentorship, funding, and dedicated time exist to expanding global health education in pulmonary and critical care medicine. The implementation of global health training within pulmonary and critical care medicine programs requires continued optimization, but this training is essential to prepare the next generation of physicians to address the global aspects of respiratory disease and critical illness.

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Education in global health, defined by Koplan and colleagues as “an area for study, research, and practice that places a priority on improving health and achieving health equity for all people worldwide” (1), is

expanding among medical training programs (1–3). There are several reasons for this. First, the focus on global health reflects a wave of social justice activism among students (4). Second, trends in

globalization and mass migration highlight the importance of understanding global epidemiologic, geographic, cultural, social, and economic determinants of disease (5). Third, recent infectious disease epidemics,

including severe acute respiratory syndrome (SARS, 2002), H1N1 influenza (2009), Middle East respiratory syndrome coronavirus (MERS-CoV, 2012), Ebola (2014), and Zika virus (2016), vividly demonstrate the implausibility of medical isolationism. Fourth, global health training opportunities afford tangible benefits in physician knowledge, skills, and attitudes in caring for diverse patient populations (6). Global health is especially important in pulmonary and critical care medicine (PCCM) fellowship training, as respiratory and critical illness contribute tremendously to the global burden of disease (7–11).

Despite the growing interest in global health training, optimal implementation of such training is challenging. Global health education in medical training often involves targeted coursework as well as domestic and/or international electives. However, isolated clinical or research rotations at international sites are unlikely to provide lasting benefits to the trainee or host institution and, when implemented improperly, pose substantial opportunity for harm (12). Successful global health education programs in medical training maintain comprehensive, longstanding partnerships and collaborations that emphasize bidirectional exchange with international host sites. This bidirectional exchange includes ongoing, equitable commitments to mutual opportunities for training and professional development for both institutions (12), including a focus on the particular knowledge and skill sets that are critical for addressing the unique medical, research, and public health priorities of individual countries.

In this Perspective, we offer a framework for core competencies and highlight three existing models of global health education within United States–based PCCM fellowship programs. We do not attempt an exhaustive review of PCCM training programs and acknowledge that some data about training programs may be incomplete. However, we aim to initiate conversation about the role and future direction of global health education for U.S. PCCM trainees.

Core Competencies for Global Health Education in Pulmonary and Critical Care Medicine Fellowship Training

Core competencies for global health education among PCCM trainees have not

been formalized, but a framework can be derived from national and international bodies of global health education as well as from the experience of numerous academic institutions in implementing global health educational programs (13–19). Building on this foundation, we propose four areas of core competencies for PCCM global health training (Table 1): clinical knowledge, international research training, cultural competency, and clinical and research capacity building.

Some data suggest that formalized, directed didactic education is required to achieve core competencies (20–25). For example, participation in a global health certificate course was associated with increased recognition of a tropical disease, whereas participation in international clinical electives was not (25). Developing and adhering to standardized PCCM global health core competencies will assure a basic level of “global health competence” among PCCM trainees.

Existing Models of Global Health Education in Pulmonary and Critical Care Medicine Fellowship Training

Integrated Global Health Tracks

Integrated global health tracks aim to teach core competencies in global health over the course of PCCM fellowships. We mention as examples two U.S. institutions—University of Washington and Duke University—that offer formal global health tracks in PCCM. The global health tracks currently implemented within these two training programs combine local global health–oriented didactics and journal clubs with rotations at international sites. Although the focus of these tracks is largely research oriented, this model can be extended to those who desire in-depth clinical training or exposure to clinical education in global health.

The duration of training for individuals enrolled in these two training programs ranges in length from 3 to 4 years, with the option of obtaining a Master’s in Health Science or Public Health from an affiliated School of Public Health. Duke University’s program brings together fellows and mentors from different specialties into a diverse, multidisciplinary global health track, whereas the University of Washington has created a global health

pathway within the PCCM Division that supports fellows in leveraging interdisciplinary collaborations with mentors who provide complementary expertise. These models build on longstanding relationships with host institutions and emphasize bidirectional exchange of skill sets and research prioritized by host countries.

Established investigators with ongoing research collaborations provide mentorship and opportunities to join ongoing projects. For instance, the University of Washington created the Kenya Research Program (now the Kenya Research and Training Center) more than 20 years ago to provide an academic forum to support both U.S. and Kenyan trainees and investigators in the planning, implementation, analysis, and presentation of research conducted in Kenya. The PCCM global health pathway leverages these longstanding collaborations in Kenya to conduct studies of chronic lung diseases and air pollution, in line with the Kenya Ministry of Health strategic plan to curb noncommunicable disease burden (26). Established partnerships between U.S. institutions and international sites generate a wide array of projects that can be adapted to locally relevant clinical and research concerns, simultaneously benefiting PCCM trainees and international collaborators.

Global Health Electives

Several U.S. PCCM programs offer structured, recurrent global health electives during fellowship at established international sites. For example, Columbia University and Black Lion Hospital in Addis Ababa, Ethiopia have partnered to develop a 2-year pulmonary training program for Ethiopian physicians, led by faculty from the Divisions of PCCM at Columbia University and Brown University. Teaching and mentorship are provided by visiting American and European faculty, who also supervise Columbia PCCM fellows during clinical rotations in Addis Ababa. This program serves as a model for bidirectional exchange of clinical and research skills as well as capacity building and is ultimately aimed at creating an independent Ethiopian training and research center.

Additionally, a few U.S. programs emphasize domestic global health experiences encompassing work with immigrant populations and returning U.S. travelers, both important components of

global health. These rotations can include tuberculosis, asylum, or travel clinics as well as site visits to local nonprofit organizations, which can provide exposure to tropical diseases, global health systems, and cross-cultural exchange.

Additional Research Years

Many U.S. PCCM programs offer additional research training years beyond the 3 years required by the Accreditation Council for Graduate Medical Education, typically contingent on securing independent funding through institutional, foundation, or federal funding mechanisms, that can be used to undertake global health research. Similar to United States-based fellowship research, these opportunities require senior mentors with established collaborations and projects. Fellows are offered uninterrupted time at the international site to develop professional relationships and work with local collaborators in research development and implementation.

Advanced training in research methodology is often pursued, leveraging important intrainstitutional collaborations with global health programs at Schools of Public Health; the aforementioned programs, Johns Hopkins University, and Harvard-affiliated programs, to name a few, provide trainees with these opportunities. Additional research years allow PCCM trainees to structure global health educational and research experiences to best suit future career plans.

Bidirectional Exchange and Capacity Building beyond Fellowship Programs

Respiratory and critical care societies have also taken up the mantle of global health. For instance, the American Thoracic Society has developed the Methods in Epidemiologic, Clinical and Operations Research (MECOR) and Global Scholars Programs, initiatives that focus on research and clinical training of physicians and other health care professionals from low- and middle-income countries to build clinical and research capacity and develop leadership (27–29). These platforms can connect U.S. PCCM trainees with colleagues from around the world to create opportunities for bidirectional educational,

Table 1. Proposed core competency areas for global health education in pulmonary and critical care medicine fellowship training programs

Core Competency Areas	Objectives
Clinical knowledge	Develop a comprehensive understanding of the global burden of respiratory and critical illness, including: Knowledge of the global epidemiologic distribution of major infectious and noncommunicable diseases imparting morbidity and mortality. Social, environmental, and economic determinants of health, including how host-, environmental-, and health systems-based factors govern health worldwide. Identification of the clinical presentation and management of complex diseases in resource-limited settings through completing didactic coursework concerning major pathological processes (e.g., malaria, tuberculosis, viral hemorrhagic syndromes, HIV), their biological alterations, and how they affect specific organ systems.
International research training	Complete didactic coursework and receive mentorship from domestic and international investigators, focused on developing an understanding of the unique cultural, legal, and societal considerations required of research conducted in low- and middle-income countries, including: International research ethics and human subjects protection. Needs assessment, including community-based involvement, to generate locally relevant research. Study design and implementation.
Cultural competency	Cultivate and develop awareness of the attitudes, beliefs, and processes that facilitate the doctor–patient relationship and allow effective partnership across international clinical and research collaborations by: Actively participating in seminars regarding cultural beliefs and practices of international training sites. Establishing mechanisms to address conflict resolution in international clinical and research settings.
Clinical and research capacity building	Actively participate in clinical and/or research capacity building with a focus on sustainable, longitudinal partnerships by developing: “Train the trainer” educational models to develop local subspecialty expertise, ultimately aimed at local clinical and research independence. Multilevel participatory needs assessments with international stakeholders.

clinical, and research collaborations and peer mentoring.

Barriers to Pulmonary and Critical Care Medicine Training in Global Health

Several barriers exist to expanding dedicated global health education tracks among PCCM programs. First, global health is a

relatively new field, and thus there are few senior PCCM faculty members to provide requisite career and research mentorship. Second, funding has been largely restricted to communicable disease–related research (i.e., tuberculosis, HIV, childhood pneumonia), although this is changing with the National Institutes of Health’s recent focus on noncommunicable diseases (30–32). Third, Accreditation Council for

Graduate Medical Education fellowship requirements often impede prolonged international clinical or research blocks, thus limiting time for project development and implementation. Last, but perhaps most significantly, the prerequisite meaningful bilateral exchange of knowledge and resources internationally requires strong and sustained commitment to this process at individual and institutional levels, despite competing demands or logistical challenges. Overcoming these hurdles requires thoughtful and creative solutions.

Conclusions

Given the substantial burden of respiratory and critical illness worldwide and increased globalization, global health education is emerging as an increasingly important component of PCCM training.

Formal, integrated global health programs within PCCM training are relatively new but are built on principles and ideals of global health that focus on the mutually beneficial exchange of knowledge and social justice. PCCM fellowship programs that incorporate global health education intend to “train socially accountable professionals who will be change agents in their societies to improve equitable distribution of health care resources and who will be leaders in advocating for better health care for all and in building stronger health care systems” (2). National and international organizations can also facilitate bidirectional academic exchanges between U.S. PCCM training institutions and others worldwide.

Careers in global health encompass a broad spectrum of clinical, research, and educational opportunities within the emerging, multidisciplinary model of the

field. Global health training should be a relevant focus of PCCM training programs, and where infrastructure and international relationships do not already exist, cross-institutional and/or interdisciplinary collaborations can be harnessed to bridge gaps.

At the turn of the 20th century, Sir William Osler prophetically described tuberculosis as a “social disease with a medical aspect.” One hundred years later, the social aspects of respiratory and critical illness are global phenomena; global health training in PCCM prepares the next generation of physicians to tackle these issues. ■

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