

Perspective Piece

Challenges and Strategies for Biomedical Researchers Returning to Low- and Middle-Income Countries after Training

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Abstract. The brain drain of professionals from low- and middle-income countries (LMICs) to developed countries is well documented and partially due to the challenges faced by biomedical researchers to establish themselves back at home, after training abroad. These challenges may result in the loss of highly trained individuals from LMICs and reduce the availability of local expertise to develop/inform best practices in health care and to direct locally relevant research. The path of training of LMIC researchers in high-income countries is well documented. However, strategies for a successful reintegration of biomedical researchers back to their home research institutions in LMICs are less clear. We report observations of workshops addressing repatriation needs of researchers returning to their home countries after training abroad during the American Society of Tropical Medicine and Hygiene (ASTMH) 2017 and 2018 annual meetings. Strategies proposed include maintaining connections with the home research institution, ideally through collaborations, planning 18 months ahead before returning with grants applications submitted, and engaging in networking throughout the training period. In addition to presenting our observations, we hope to build a network to facilitate this process, compile resources, and identify expertise within the ASTMH to develop robust strategies to allow young biomedical researchers to flourish in LMICs.

INTRODUCTION

Biomedical researchers including health professionals and clinicians improve the health systems of their countries through the generation of evidence to inform public health and guide national healthcare policy.^{1,2} Developing a robust training pipeline in all aspects of research and health care is a critical building block of developing countries' level of expertise.^{2–4} However, building research capacity in low- and middle-income countries (LMICs) is challenging because of limited resources and requires commitment at the individual, institutional, and national levels.⁵ Students from LMICs commonly seek training abroad to develop relevant skills and advance their careers,^{5–7} as such opportunities may not be available in their home countries. However, after completion of their training, young LMIC biomedical researchers are often faced with limitations in basic research infrastructure, scientific equipment, cross discipline expertise, funding, local mentorship and transition plan, and job opportunities in their home countries.^{4,8–11} Lack of guidance to address these challenges and successfully establish or integrate into an LMIC-based research program at this critical juncture may result in the loss of highly trained and capable professionals. Low- and middle-income country-based mentors with expertise in navigating a successful transition back to home countries at the completion of training are relatively scarce.^{8,12–14} These potential mentors may need to focus on establishing and maintaining their own careers. Thus, the highly qualified returnees may have limited local mentorship and resources to develop and implement a smooth transition plan. These challenges have been recognized, and global health programs focused on the needs of trainees from developed countries returning to LMICs are available.¹⁵ To address some of the issues faced by newly

trained researchers and build capacity in this area, we conducted two workshops in consecutive annual meetings of the American Society of Tropical Medicine and Hygiene (ASTMH). Here, we report the needs and strategies for successful repatriation of LMIC research trainees to their home countries.

METHODOLOGY

Ninety-minute workshops were held at the 2017 and 2018 ASTMH annual meetings, led by guest scientists from sub-Saharan Africa and Latin America who had successfully repatriated to their home countries and established successful research careers. Workshops were developed by the ASTMH Committee on Global Health after gathering input from select global health professionals (doctoral students, postdocs, and clinicians) and reviewing the literature to identify the challenges faced by research health professionals with a desire to repatriate to LMICs. The workshops were open to all ASTMH members and announced via the traditional dissemination method of ASTMH activities. The workshops opened with guest speakers describing their repatriation journey and challenges they faced early and later in their careers. A question and answer session followed on selected topics such as best approaches for networking, reintegration into nascent or rudimentary research infrastructure, maintaining ties to developed countries, and skills acquired as well as grant funding and economic/financial considerations. Questions were led by attendants, allowing specific feedback from speakers. Expert responses and opinions from the attendees were recorded and collated, removing identifying details to provide a safe space and ensure a candid discussion.

RESULTS AND DISCUSSION

Each workshop had five speakers who ranged from 6 to 12 years post-repatriation. Most attendees were from Africa and a few from Latin America. Attendance increased from 21 to 40

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participants in the second year. The second workshop had a more robust discussion possibly because of a more directed facilitation of questions and answers and a larger number of participants. Repatriation experiences and their associated challenges were diverse, and it was noted that the difficulties were greater in the absence of a continued link to the home country institution during the training period abroad. Discussions were lively around successful reintegration struggles and strategies and extended beyond the allocated workshop time frames. A summary of the main points are presented in Table 1.

Limited infrastructure and equipment in laboratories.

Laboratories in LMICs are often poorly equipped. This is in contrast to the high-income countries (HICs) where many LMIC biomedical professionals train. Strategies to bridge this distance to generate groundbreaking work in resource-limited settings were discussed. Some strategies included dividing time during training and after repatriation between resource-limited and HIC research environments to facilitate skill acquisition. Association with networks of senior professionals in both settings for structured mentorship was also identified as a key step for success. The long-term strategy of securing grant funding for in-country capacity building was identified as essential.⁹

Limited local funding. Limited locally-available funding mechanisms of research support were seen as a major impediment in LMICs. One identified strategy was collaboration among colleagues to secure funding as well as accelerate and ensure the successful completion of research projects.^{2,16} Participants were advised to leverage initiatives that encourage public-private institutes partnership, also between institutes from HICs and LMICs, and to obtain support such as the Fogarty Global Health Fellowships as well as National Institutes of Health (NIH) K43, R21, and R03 grants.¹⁶⁻¹⁸ In addition, other donors exist in regional and international global health schemes outside academic institutions such as the WHO-Special Programme for Tropical Disease Research and Training that are good avenues to pursue for grant funding.^{19,20} Furthermore, researchers from LMICs are encouraged to take advantage of established regional and international initiatives and partnerships led by HICs to support South-to-South collaboration, funding and building the research capacities in LMICs. These include the African Academy of Sciences, the European and Developing Countries Clinical Trials Partnership, the Training Health Researchers into Vocational Excellence in East Africa, and the Netherlands-African Partnership for Capacity Development and Clinical Interventions against Poverty-related Diseases.⁷

Lack of familiarity with home country local health issues.

Lack of awareness of local health issues and research concerns was deemed a significant liability for successful reengagement into the community on returning.^{3,16} Proactive steps were recommended to remain connected with home countries during time abroad. Sustaining connections and awareness through participation in local and international professional organizations as well as leveraging personal connections of mentors and faculty advisers to build richer networks of information was advised.²¹ Thus, knowing the landscape of local research issues and public health questions could inform training while abroad and allow for the development of highly relevant research programs on return.

Lack of suitable job opportunities. Demand for expertise in specialized research methods and techniques was reported as low in many LMICs, resulting in sparse employment opportunities. Persistence and flexibility were deemed essential along with consideration of unconventional opportunities such as obtaining a research assistant position or part-time work. An ideal reintegration strategy was to design a research project with the needs of the LMIC in mind and obtain funding before repatriation.² Second, those who spent time in their home countries during their training were more likely to maintain networks that facilitated job searches on their return.¹¹ Developing a multi-disciplinary skill set as previously reported also was seen as an effective means of enhancing marketability.

Sustainable pipeline of repatriated research professionals: Mentorship and career support.

A crucial component of a successful research career is having a skillful mentor that provides guidance, support, and inspiration to facilitate the development of medical research professionals to achieve their full potential.⁶ An additional component of mentorship critical for trainees from LMICs is guidance in strategies for the successful repatriation to research institutions in their home countries. A desire was expressed for successfully transitioned senior researchers to form mentorship networks and collate strategies for successful reintegration of those more junior. In tandem, there is need for younger returning biomedical researchers to help peers, to mentor students, and to help in managing research groups and projects.² Improving means for the communication of findings and data sharing are also needed: how to publish in peer review journals, understanding the requirements for grants, funding opportunities in LMICs, and sharing grant writing expertise.^{22,2} However, limited mentorship is available in LMICs to successfully share the experience and support the young returning biomedical researchers toward the establishment of a research

TABLE 1
Challenges identified for repatriation of biomedical researchers to LMICs

Needs	Challenges
Mentorship	Limited available mentorship in LMICs. Few mentors with advanced research training and expertise
Access to state-of-the-art laboratory technologies and equipment	Largely limited to regional research centers
Advanced training	Commonly needed to be acquired abroad
Career support services	Rare in LMICs because of limited capacity of local institutions
Global engagement with peers and colleagues.	Limited to national and subnational meetings because of a paucity of funds to participate in international conferences
Acquisition of new techniques for personal growth and capacity building after repatriation	Limited to local or regional opportunities because of cost barriers
Access to up-to-date information	Very limited with few institutional routes of access (e.g., database access)
Funding and research support	Challenging because of the paucity of local funding and high competition for international funding opportunities

LMIC = low- and middle-income country.

program and sustainable career locally. Returning biomedical researchers were advised to actively maintain and foster good relationships with their mentors and research advisers abroad for continued support.² Identifying a local mentor or research co-supervisor during their training abroad was deemed as extremely helpful in facilitating a successful return.^{16,23,24} Local co-supervisors were deemed important contacts and advocates in obtaining employment in the local job market.²

CONCLUSION AND RECOMMENDATIONS

Overall, many strategies exist for biomedical researchers from LMICs to establish their careers in global health upon repatriation. The key is having a nuanced and strategic plan, ideally before departing for training. Such a plan involves establishing robust networks and identifying local colleagues for mentorship and collaboration. While in training, biomedical researchers should contact senior colleagues in their country and establish their mentorship and remain involved in the planning and implementation of the local capacity building activities, share up-to-date knowledge and advanced skills, and offer their experience to help in their home countries. Identifying and developing the skills most needed in the LMIC of interest is a sound strategy to fit within the local system on returning. In addition, participating in research projects with the local peers in the country before the completion of training and writing grants demonstrates knowledge, commitment, and productivity. Returnees should consider pre-repatriation submission of grant applications and early implementation to ensure a successful transition while using both local and international networks and mentors.

On completion of training, biomedical research professionals should take advantage of even seemingly small opportunities in the country to grow while exploring and cultivating the ideal opportunity. When possible, they should present the skills and experience obtained abroad to local and international decision makers and donors along with research ideas, publications, and relevant scientific achievements as building blocks to a wider collaboration and a larger goal. Generally, being aware of one's professional needs and keeping the status of the relevant LMIC in view are the main keys to establishing a successful research career back home.

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