

## Opportunities and Challenges for Strengthening Biomedical Research in Sub Saharan Countries: The Mozambique Experience

Emilia Virginia Noormahomed<sup>1,2,3\*</sup>

<sup>1</sup>Department of Microbiology, Faculty of Medicine, Eduardo Mondlane University, Maputo, Mozambique

<sup>2</sup>Department of Medicine, Infectious Disease Division, University of California, San Diego, USA

<sup>3</sup>Mozambique Institute for Health Education and Research (MIHER), Maputo, Mozambique

**\*Corresponding Author:** Emilia Virginia Noormahomed, Department of Microbiology, Faculty of Medicine, Eduardo Mondlane University, Maputo, Mozambique.

**Received:** July 08, 2019; **Published:** August 27, 2019

### Background

As of a decade ago, Sub Saharan Africa bore roughly 24% of the global disease burden but contributed only with 1% of the total global research output. At that time, the continent had only 3% of the needed work force [1]. Mozambique is not even within the top ten countries publishing in the WHO's African region, indicating a great need to develop strategies to foster research capacity directed to the most pressing health problems in the country and within the region [2].

### Introduction/opportunity

The Eduardo Mondlane University (UEM) in Mozambique and the University of California San Diego (UCSD) in the US began a partnership in 2008 to collaborate in areas of mutual interests in Global Health, via research and training. With support from the US Department of State through the President's Emergency Plan for AIDS Relief (PEPFAR) and the Forgarty International Center of the National Institutes of Health, the UEM-UCSD consortium was granted funds through a peer review process under the medical education partnership initiative (MEPI). Twelve additional Sub-Saharan Africa universities were awarded partnerships with peer institutions in the US under the program at the same time. MEPI aims were to develop innovative strategies for training physicians, to develop research capacity and bioinformatics and to build communities of practice as a way to sustain its goals and achievements [1,3].

### Needs assessment and interventions

We convened a multi-institutional group of faculty members and mentors to undertake a comprehensive analysis of the research environment at Mozambique's major public universities and to identify barriers that challenged efforts to expand research capacity [3].

Among the barriers identified were limited funding and research laboratory infrastructure, limited skills for grant and manuscript writing, peer review rejection fatigue, lack of dedicated time to conduct research and a reticence of some journals to publish manuscripts from low income countries and limited proficiency in English language [2,3].

Based on these findings we designed a comprehensive plan to overcome these barriers that began with the development of training courses in research methods, grant and manuscript writing human subjects, biostatistics and data analysis. We then developed multiple joint collaborative research projects and four master's degree programs. These were the first of the kind in Mozambique and included master's programs in Health Professional's Education; Tropical Medicine and International Health; Nutrition and Food Security; and Bioscience. These degree programs were designed and implemented with support from our partners and faculty members from additional universities both inside and outside of Mozambique. To date these master's degree programs have resulted in training of more than

76 students. Research projects were emphasized on local research priorities, so that results could be used for quality improvement and translation into policies and practice as these goals are so important for Mozambique's sustainable development. It has been noted that the development of countries proceeds in parallel with the research capacity of its people and with its Gross domestic production [2,4].

In addition, investments were done in bioinformatics and laboratory enhancements at the UEM Faculty of Medicine and UEM's primary teaching hospital, Maputo Central Hospital, to train technical staff in molecular biology, immunochemistry, and serological techniques. Additional support for purchasing equipment was obtained from several organizations such as the Gilead Foundation (Foster City, CA, USA), the James B. Pendleton Trust (Bellevue, WA, USA), MBio Diagnostics (Boulder, CO, USA) based on the existing collaboration with our partners from UCSD. In order to provide administrative and fiscal management support to the Mozambican scientific community and to identify funding agencies interested in supporting research activities we created a research support centre (the Mozambique Institute for Health Education and Research (MIHER; [www.miher.org](http://www.miher.org)). We also trained 7 research administrators in Biomedical and Behavioral Sciences, financial management and research ethics administration. Within the MEPI family we networked with other African, American and European institutions and we created the AFREhealth association, an African forum for research and education in health that seeks to provide leadership in health professions education and research capacity building on the continent [3,5,6].

### Outcomes

Since the beginning of the partnership with our colleagues from UCSD we have organized more than 50 short courses on research methods, grant and manuscript writing. We have now partnered with 35 Universities in US, Europe and Africa. To date the program generated 38 research projects funded by international agencies from US and European Institutions, totalizing about \$14,255,439.63. These funds were managed by MIHER, and in addition MIHER has secured about \$4,555,996 for the next 4 years for research, training and health system strengthening [5,7]. We have published 58 manuscripts in peer reviewed journals with 78% of Mozambicans as the first authors and several additional manuscripts are in development. The scientific growth of several members of our academic community was such that now they are internationally recognized and invited by northern institutions to provide their contributions to training faculty members from northern institutions in issues related to tropical medicine.

### Challenges

As a Lusophone country Mozambican researchers can be challenged with limited English proficiency, which limits their ability to apply for international grants and to publish in peer reviewed journals. In seeking new collaborations, on a few occasions we found ourselves partnered with groups and agencies outside US who have different understandings about the meaning of partnerships in Global Health. One example of this is funding agencies or partners that impose administrative rules that are in conflict with rules and regulations of the Republic of Mozambique. When efforts were made to bring funding agency rules into compliance with Mozambican law, the response was to threaten to cease funding the collaboration. These threats were made while forgetting that the benefits rising from this partnership are mutual and sometimes more beneficial for the northern partner. Partnerships of this type are destructive and ignore realities of the constraints under which local investigators must function. In addition to overwhelming academic partners with unachievable expectations, these partnerships impose incompletely funded administrative obligations and transmit a clear message that they do not trust the research capabilities and accountability of their local partners. This situation is faced also by researchers from other African countries.

### Conclusion

Building biomedical research capacity is a long-term and time-consuming process, that requires committed champions as well as strong local leadership and ownership. The nature of our partnership with UCSD has fully sustained our research capacity development and has provided mentorship in multiple areas. We have established multiple post graduate courses that are so important for career development, improvement of the working environment, motivation of personnel and retention of health professionals within home institutions [3].

The successes achieved in such a short period can be attributed to our conviction that Global Health Partnerships require transparency, equity, mutual and institutional respect, trust and accountability, as well as, respect for local culture and ethics. Strong coordination and collaboration among the involved teams and institutions were also critical to our success in implementing and sustaining this program. Each success opens new opportunities as the snow ball effect begun by MEPI continues to grow [5,7].

This dissertation is meant to share our experiences in building research and educational capacity through strong and sustainable partnerships and to encourage researchers at all career stages to build their partnerships based on mutual interest, respect and ethics. It is critically important to develop local leadership that takes ownership of the process to ensure sustainability and accountability. This unique experience within Mozambique and in other MEPI Institutions in other sub-Saharan African countries can be replicated elsewhere. Partnerships of this type can contribute substantially to sustainable institutional and can build administrative, research and academic infrastructure that will enable ongoing development for over the decades to come.

### Acknowledgements

The publication of this manuscript was supported by the Fogarty International Center of the National Institutes of Health (Office of the Director, National Institutes of Health), Eunice Kennedy Shriver National Institute of Child Health & Human Development (NICHD) and National Institute of Neurological Disorders and Stroke (NINDS) under Award Number D43TW010135. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Fogarty International Center or the National Institutes of Health. Furthermore, I am thankful to Professor Robert Schooley from University of California San Diego, Infectious Disease Division, USA for revising and editing this manuscript.

### Bibliography

1. Collins FS, *et al.* "Developing health workforce capacity in Africa". *Science* 330.6009 (2010): 1324-1325.
2. Uthman OA, *et al.* "Increasing the value of health research in the WHO African Region beyond 2015--reflecting on the past, celebrating the present and building the future: a bibliometric analysis". *BMJ Open* 5.3 (2015): e006340.
3. Noormahomed EV, *et al.* "Strengthening research capacity through the medical education partnership initiative: the Mozambique experience". *Human Resources for Health* 11 (2013): 62.
4. Man JP WJ, *et al.* "Why do some countries publish more than others? An international comparison of research funding, English proficiency and publication output in highly ranked general medical journals". *European Journal of Epidemiology* 19.8 (2004): 811-817.
5. Noormahomed EV, *et al.* "The Medical Education Partnership Initiative Effect on Increasing Health Professions Education and Research Capacity in Mozambique". *Annals of Global Health* 84.1 (2018): 47-57.
6. Omaswa F, *et al.* "The Medical Education Partnership Initiative (MEPI): Innovations and Lessons for Health Professions Training and Research in Africa". *Annals of Global Health* 84.1 (2018): 160-169.
7. Noormahomed EV, *et al.* "The Medical Education Partnership Initiative (MEPI), a collaborative paradigm for institutional and human resources capacity building between high- and low- and middle-income countries: the Mozambique experience". *Global Health Action* 10.1 (2017): 1272879.

**Volume 15 Issue 9 September 2019**

**©All rights reserved by Emilia Virginia Noormahomed.**