



Medical Education Partnership Initiative YEAR 5 REPORT

MEDICAL EDUCATION
PARTNERSHIP INITIATIVE

MEPI Year 5 Report



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Eduardo
Mondlane



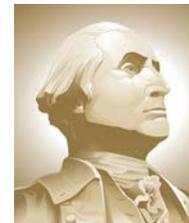
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SOCIAL TRANSFORMATION



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WASHINGTON
UNIVERSITY

WASHINGTON, DC

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On behalf of the entire MEPI community, we, the MEPI Principal Investigators Council, wish to salute the generosity and commitment of the American people and the partnership, enterprise and innovation of our African colleagues.

With enormous appreciation for past accomplishments and great expectations for the future,

MILIARD DERBEW

Chairman, PI Council, 2015-16
Addis Ababa University
Ethiopia

PETER DONKOR

Vice Chairman, PI Council, 2015-16
Kwame Nkrumah University of Science
& Technology
Ghana

OATHOKWA NKOMAZANA

University of Botswana
Botswana

ISAAC KIBWAGE

University of Nairobi
Kenya

STEVE KAMIZA

University of Malawi
Malawi

EMILIA NOORMAHOMED

Universidade Eduardo Mondlane
Mozambique

DAVID OLALEYE

University of Ibadan
Nigeria

MARIETJIE DE VILLIERS &

JEAN NACHEGA

Stellenbosch University
South Africa

SANDY PILLAY

University of KwaZulu-Natal
South Africa

KIEN ALFRED MTETA

Kilimanjaro Christian Medical University
College
Tanzania

NELSON K. SEWANKAMBO

Makerere University College of Health
Sciences
Uganda

YAKUB MULLA

University of Zambia
Zambia

JAMES HAKIM

University of Zimbabwe College of
Health Sciences
Zimbabwe

FRANCIS OMASWA

African Center for Global Health &
Social Transformation
MEPI Coordinating Center

ELSIE KIGULI-MALWADDE

African Center for Global Health &
Social Transformation
MEPI Coordinating Center

SEBLE FREHYWOT

The George Washington University
MEPI Coordinating Center

FITZHUGH MULLAN

George Washington University
MEPI Coordinating Center

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MILIARD DERBEW

Addis Ababa University
Ethiopia

NELSON SEWANKAMBO

Makerere University
Uganda

SEBLE FREHYWOT

George Washington University
USA

PETER DONKOR

Kwame Nkrumah University of Science
& Technology, Ghana

FRANCIS OMASWA

ACHEST
Uganda

FITZHUGH MULLAN

George Washington University
USA

JAMES HAKIM

University of Zimbabwe
Zimbabwe

ELSIE KIGULI-MALWADDE

ACHEST
Uganda

They were ably assisted by staff from the MEPI Coordinating Center who contributed to compiling, drafting, circulating, editing, and formatting the report:

GERALDINE AGIRAEMBABAZI

SARAH BAIRD

SELAMAWIT BEDADA

LEIGH ANNE BUTLER

JOSEPH KOLARS

KRISTINE KORHUMEL

LINDEN KORHUMEL

PARITA KOTAK

SOLOME MUKWAYA

VINCENT OJOOME

MARY RUBINO

JIM SCOTT

HENRY SONDEIMER

JULIANNE STENNES

ZOHRAY TALIB

YIANNA VOVIDES

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Table of Contents

11	Table of Acronyms
18	Executive Summary
25	Chapter 1 Background, Objectives, Design & Key Stakeholders
35	Chapter 2 Year 5 Report Methodology
39	Chapter 3 Capacity Building
55	Chapter 4 MEPI Impact on Retention
67	Chapter 5 MEPI Research Capacity & Environments
79	Chapter 6 MEPI Impact on HIV Service Delivery
89	Chapter 7 Linked Awards
101	Chapter 8 Communities of Practice & Partnerships
123	Chapter 9 MEPI Sustainability
135	Chapter 10 Achievements, Challenges & Lessons Learned

MEPI Year 5 Report Appendix ([Separate Document](#))

Appendix A School Summary Reports

Appendix B Outcome Measures Indicators

Appendix C MEPI Publications

Appendix D MEPI Presentations

Appendix E MEPI Newsletters

Appendix F Lessons Learned

Appendix G School Achievements Table

Appendix H Major Participants

Table of Acronyms

AAU	Addis Ababa University
ABU	Ahmadu Bello University
ACHEST	African Centre for Global Health and Social Transformation
AHEC	Area Health Education Centre
AIDS	Acquired Immune Deficiency Syndrome
AITRP	AIDS International Training and Research Program
AMREF	African Medical and Research Foundation
AMSA	African Medical Schools Association
APIN	Aids Prevention Initiative of Nigeria
AS	Annual Survey
ART	Anti-Retroviral Treatment or Therapy
ARV	Anti-Retroviral
BAP	Be a Professional
BHP	Botswana Harvard Partnership
BN	Bachelor of Nursing
BoMEPI	Botswana MEPI program
BREC	Bioresearch Ethics Committee
BRTI	Biomedical Research and Training Institute
BU	Busitema University
BUP	Botswana University of Pennsylvania Partnership
CBU	Copperbelt University
CC	Coordinating Center
CCAC	Cross Cutting Academic Committee
CDC	Centers for Disease Control and Prevention
CHEER	Community Health Engagement in Education and Research
CHRIS	Cerebrovascular
CIDRZ	Centre for Infectious Disease Research in Zambia
COBERS	Community-based Education
CoP	Communities of Practice
CUGH	Consortium of Universities for Global Health
CVD	Cardiovascular Diseases
DOS	US Department of State
EBHC	Evidence Based Health Care
E-BSN	Electronic Bachelor of Science in Nursing
ECI	Enhancing Care Initiative
EM	Emergency Medicine
EMA	Ethiopian Medical Association
EmONC	Emergency Obstetrics and Newborn Care
EN	Emergency Nursing
ENTRÉE	Enhancing Training Research Capacity and Expertise in HIV Care

ESMOE	Essential Steps in Managing Obstetric Emergencies
FHS	Faculty of Health Sciences
FIC	Fogarty International Center
FOA	Funding Opportunity Announcement
FUCHS	Forum for University Colleges of Health Sciences
GAC	Ghana AIDS Commission
GCPS	Ghana College of Physicians and Surgeons
GE	General Education
GHWA	Global Health Workforce Alliance
GU	Gulu University
GWU	The George Washington University
HCWs	Health Care Workers
HEALZ	Health Education Advanced Leadership for Zimbabwe
HHS	US Department of Health and Human Services
HIV	Human Immunodeficiency Virus
HPE	Health Professions Education
HRH	Human Resources for Health
HRSA	Health Resources and Services Administration
HSPH	Harvard School of Public Health
HSRU	Health Services Research Unit
HSSIP	Health Sector Strategic Investment Plan
HSSR	Health Systems Strengthening Research
IAWP	Integrated Annual Work Pplan
ICT	Information Communications Technology
IMCI	Integrated Management of Childhood Illnesses
IMHERZ	Improving Mental Health Education and Research Capacity in Zimbabwe
INTEREST	International Workshop on HIV Treatment
IRB	Institutional Review Board
iRIM	Initiative on Research and Innovation Management
JHU	Johns Hopkins University
KATH	Komfo Anokye Teaching Hospital
KCH	Kamuzu Central Hospital
KCL	King's College London
KCMUCo	Kilimanjaro Christian Medical University College
KITSO	Knowledge
KIU	Kampala International University
KNUST	Kwame Nkrumah University of Science and Technology
KTU	Knowledge Translation Unit
LAMU	Lusaka Apex Medical University
LCMS	Learning Content Management System
LMIS	Learning Management Information Systems
LMIS	Library Information Management Systems
M&E	Monitoring and Evaluation
MakCHS	Makerere University College of Health Sciences
MARPs	Most-at-Risk Populations

MBChB	Bachelor of Medicine and Bachelor of Surgery
MCH	Maternal and Child Health
MCSP	Mentored Clinical Scholars Program
MDGs	Millennium Development Goals
MEPI	Medical Education Partnership Initiative
MEPIN	Medical Education Partnership in Nigeria
MESAU	Medical Education for Equitable Services to All Ugandans
MIHER	Mozambique Institute for Health Education and Research
MIT	Medical Internship Training
MLCs	MEPI Learning Centers
MMeds	Master of Medicine
MNCH	Maternal
MoE	Ministry of Education
MoH	Ministry of Health
MOH&SW	Ministry of Health and Social Welfare
MOHCC	Ministry of Health and Child Care
MOHTESTD	Ministries of Higher and Tertiary Education
MOOC	Massive Open Online Course
MOU	Memorandum of Understanding
MPH	Master of Public Health
MRSP	Mentored Research Scholars Program
M RTP	Mentored Research Training Program
MUST	Mbarara University of Science and Technology
NAC	National AIDS Commission
NACA	National AIDS Coordinating Agency
NACC	National AIDS Control Council
NACP	National AIDS Control Programme
NCDs	Non-communicable diseases
NCI	National Cancer Institute
NCK	Nursing Council in Kenya
NECTAR	Novel Education Clinical Trainees and Researchers Program
NEPI	Nursing Education Partnership Initiative
NGOs	Non-governmental Organizations
NHLBI	National Heart
NIH	National Institutes of Health
NIMART	Nurse-Initiated Management of Anti-Retroviral Treatment
NIMH	National Institute of Mental Health
NINDS	National Institute of Neurological Disorders and Stroke
NMSE	Network of Medical Schools in Ethiopia
NMSF	National HIV and AIDS Multisectoral Strategic Framework
NOP	National Operating Plan
NSF	National Strategic Framework
NSP	National Strategic Plan
NU	Northwestern University
OGAC	Office of the US Global AIDS Coordinator

ORA	Office of Research Administration
OSCE	Objective Structured Clinical Exams
PALSA PLUS	Practical Approach to Lung Health and HIV/AIDS and STIs in South Africa
PBL	Problem Based Learning
PEPFAR	President's Emergency Plan for AIDS Relief
PERFECT	Promote Excellence in Research and Faculty Enhanced Career Training
PI	Principal Investigator
PI Council	Principal Investigator Council
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission
PRIME-K	Partnership for Innovative Medical Education in Kenya
QECH	Queen Elizabeth Central Hospital
RCS	Rural Clinical School
RCT	Randomized Control Trial
REDCap	Research Electronic Data Capture
REMETH	Research Methodology
RESCAP	Building Research Ethics Capacity
RFA	Requests for Applications
RSC	Research Support Center
SACORE	Southern Africa Consortium for Research Excellence
SADC	Southern African Development Community
SAMSS	Sub-Saharan African Medical Schools Study
SANAC	South African National AIDS Council
SANC	South African Nursing Council
SDFs	Staff Development Fellows
SOM	School of Medicine
SOPs	Standard Operating Procedures
SPM	Strategic Plan for Intensifying the Multisectoral HIV and AIDS response
SSA	Sub-Saharan Africa
SSR	School Summary Report
STI	Sexually Transmitted Infections
SVR	Site Visit Report
SU	Stellenbosch University
SURMEPI	Stellenbosch University Rural Medical Education Partnership Initiative
TA	Technical Assistance
TBL	Team Based Learning
TRREE	Training and Resources in Research Ethics
TWG	Technical Working Group
UB	University of Botswana
UB SOM	University of Botswana School of Medicine
UC Davis	University of California
UCSD	University of California
UCT	University of Cape Town
UEM	Universidade Eduardo Mondlane
UI	University of Ibadan

UJ	University of Jos
UK	United Kingdom
UKZN	University of KwaZulu-Natal
UL	University of Lagos
ULu	Universidade Lúrio
UNC	University of North Carolina at Chapel Hill
UNZA	University of Zambia
UoM	University of Malawi
UoM COM	University of Malawi College of Medicine
UoN	University of Nairobi
UPenn	University of Pennsylvania
US	United States
USAID	United States Agency for International Development
USG	United States Government
UTH	University Teaching Hospital
UW	University of Washington
UZa	University of Zambia
UZ SOM	University of Zimbabwe School of Medicine
UZCHS	University of Zimbabwe College of Health Sciences
WHO	World Health Organization
WSF	World Sight Federation
ZEPACT	Zambia Education Partnership for Advanced Care and Treatment
ZIM ASSET	Zimbabwe Agenda for Sustainable Socio-Economic Transformation
ZNASP	Zimbabwe National HIV and AIDS Strategic Plan

Executive Summary

BACKGROUND

In 2010, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the National Institutes of Health (NIH), and the Health Resources and Services Administration (HRSA), collaborated to launch the Medical Education Partnership Initiative (MEPI), a visionary project to support medical health training and research development in sub-Saharan Africa. MEPI was funded by PEPFAR through the Office of the U.S. Global AIDS Coordinator (OGAC) in the Department of State and by the NIH. It was administered by the NIH Fogarty International Center and the HIV/AIDS Bureau of HRSA in the Department of Health and Human Services. The core tenets underlying MEPI were outlined by the United States Global Health Initiative and included health systems strengthening and country ownership. Awards worth \$130 million for the five-year project were made to thirteen medical schools in twelve sub-Saharan African countries and to a Coordinating Center (CC).

The awardees were:

- University of Botswana, Botswana
- Addis Ababa University, Ethiopia
- Kwame Nkrumah University of Science and Technology, Ghana
- University of Nairobi, Kenya
- University of Malawi College of Medicine, Malawi
- Universidade Eduardo Mondlane, Mozambique
- University of Ibadan, Nigeria
- University of KwaZulu-Natal, South Africa
- Stellenbosch University, South Africa
- Kilimanjaro Christian Medical University College, Tanzania
- Makerere University College of Health Sciences, Uganda
- University of Zambia, Zambia
- University of Zimbabwe, Zimbabwe
- MEPI Coordinating Center - George Washington University, United States, and the African Center for Global Health and Social Transformation, Uganda

MEPI was a response to the health workforce crisis in Africa that HIV/AIDS highlighted as it swept across the continent causing massive morbidity and mortality. The severe shortage of skilled health workers proved to be a key limiting factor in combating the crisis despite the considerable resources that were mobilized through PEPFAR and others. MEPI, conceived as part of the PEPFAR response to this challenge, was guided by five themes:

- Increasing the numbers and improving the quality of graduates

- Promoting retention of graduates where they are most needed
- Improving capacity for regionally relevant research
- Building communities of practice within Africa and globally
- Ensuring sustainability

THE PROGRAM

MEPI implementation was overseen by OGAC, NIH, and HRSA working with the Principal Investigators Council (PI Council) and facilitated by the CC. Each school received grants directly from the US Government (USG) and collaborated with external partners from other African countries, the US, the United Kingdom, Brazil and Canada. The purpose of this collaboration was to augment the educational and research capacities of the participating schools and to increase the quality and quantity of medical and other health professional graduates. Many schools formed consortia with other medical schools all of whom participated in annual symposia, hosted annual site visits, and responded to annual surveys. Eight thematic Technical Working Groups (TWGs) worked to develop and share expertise on commonly identified technical topics:

- eLearning
- Community Based Education
- Competency Based Medical Education
- Monitoring and Evaluation
- Graduate Tracking
- Library and Information Sciences
- Medical Education Research
- Research Support Centers

The participating schools, partners and international interest groups met annually at the MEPI Symposium hosted by MEPI schools at different locations in Africa. They shared knowledge and experiences at the symposia and through the MEPI website, a robust platform for information exchange and dissemination that served the MEPI community and medical educators around the world. Monthly newsletters, webinars and workshops, and more than 300 scholarly publications communicated many of MEPI's research findings and accomplishments. This report has been compiled and written through the collaborative efforts of the PI Council, representatives of the USG funding agencies, and the CC.

ACCOMPLISHMENTS, CHALLENGES & LESSONS LEARNED

MEPI schools identified their priorities and developed and implemented individual programs to improve and expand health care professional recruitment, training, and retention. The resources provided by the project played a catalytic role in launching new programs and reenergizing pre-existing ones in the schools. Teaching and learning environments were transformed through curricula reviews, information and communications technology (ICT) capacity improvements, and new pedagogic approaches supported by new medical education

units. Research capacity improved for faculty and students, often assisted by new research support centers. Community based education, partnerships with governments, and better teaching and research resources combined to influence faculty retention. Many schools integrated the new initiatives into school programs and worked with their universities and governments to assure sustainability. A vibrant medical education community that includes faculty in medicine, nursing, pharmacy, dental and other health professions has been created in Africa. The MEPI PI Council is poised to carry forward this work.

MEPI SCHOOLS & ACHIEVEMENTS

In October 2015, MEPI's PIs listed the achievements of their programs and selected three that they felt were the most important. These are listed below.

University of Botswana (UB SoM), Botswana

- Established and strengthened distributed teaching sites leading to the graduation of the first ever locally trained doctors: 80 Bachelor of Medicine and Bachelor of Surgery and 4 residents.
- Facilitated doctors retention initiative leading to a record 216 Botswana junior doctors (graduated locally and in other countries) starting a mandatory one year internship, between October 2014 and August 2015 in the country.
- Created a child mortality audit program leading to a reduction of in-hospital mortality

Addis Ababa University (AAU), Ethiopia

- Introduced eLearning and expansion of the network infrastructure and connectivity
- Developed and implemented the modularization of medical curriculum
- Expanded multidisciplinary and team based rural community learning program across all disciplines of health sciences

Kwame Nkrumah University of Science and Technology (KNUST), Ghana

- Mounted a new emergency medicine curriculum with 21 specialists and 59 nurses graduated and retained in-country
- Built research capacity through training, publications and establishment of a research support center for entire university
- Wrote guidelines and SOPs for HIV care in emergency room that were adopted by Ministry of Health for training of EM personnel

University of Nairobi (UoN), Kenya

- Increased student intake capacity at the school of nursing and retention at their places of work through e-learning platform
- Implementation of decentralized training
- Establishment of an Office of Research Grants Promotion at the College of Health Sciences

University of Malawi College of Medicine (UoM CoM), Malawi

- Assembled and trained a multi-disciplinary team to holistically tackle a clinically complex problem (AIDS related cancers)
- Ensured retention of new skills within the system through close collaboration with the Ministry of Health (MOH), prioritizing training of MOH employees
- Strengthened the cancer diagnostic and clinical service, leading to a strong cancer registry database facilitating cancer research activities

Universidade Eduardo Mondlane (UEM), Mozambique

- Built medical research capacity for Mozambique
- Opened education programs at a developing university that will strengthen faculty and increase services
- Created a rigorous, structured, post graduate medical training program as a model for other specialties

University of Ibadan (UI), Nigeria

- Leadership: Strengthening leadership of Nigerian investigators through collaboration with US partners and among the six MEPI consortium universities in Nigeria
- Education: Implementation of competency based curriculum, development of reproductive health course for first year students, online and short courses for HIV prevention, ART, pediatrics and laboratory in Nigeria
- Research: Introduction of formal mentored research training for junior faculty and approved career pathway for university research administrator

University of KwaZulu-Natal (UKZN), South Africa

- Built research ethics capacity and innovation at UKZN, provincially and nationally
- Scaled up critical educational programs including support for 51 faculty obtaining PhDs and 1,195 nurses gaining accreditation in initiation of antiretroviral therapy
- Introduced a decentralized training platform with a Primary health care approach.

Stellenbosch University (SU), South Africa

- Transformed the medical curriculum to train socially accountable graduates
- Built capacity in medical education and health systems in South Africa and Africa
- Implemented an eLearning strategy with online learning, 7000 podcasts, and bring your own device (BYOD)

Kilimanjaro Christian Medical University College (KCMUCo), Tanzania

- Strengthened teaching and learning through use of information technology including the internet,

a computer based class room, student tablets, the Learning Content Management System Plus, and online examinations

- Promoted practical research experiences for students through 55 mentored research training projects
- Expanded medical student class size and tracking graduates through the Office of Alumni Affairs and Career Counseling

Makerere University College of Health Sciences (MakCHS), Uganda

- Established the Medical Education for Equitable Services to All Ugandans Consortium (MESAU) consortium that enabled collaboration of Ugandan medical schools to address national education and health system challenges like delivery of HIV care/prevention services
- Strengthened community-based education (CBE) across Ugandan medical schools and evaluated the impact of CBE on the students, faculty, community, and CBE sites.
- Markedly enhanced student and faculty research capacity (to conduct nationally relevant research) leading to increased scholarly output

University of Zambia (UNZA), Zambia

- Implemented the MEPI Staff Development Program which supported 45 trainee faculty over five years, many of whom are now on faculty and are helping to strengthen teaching, particularly the basic sciences
- Strengthened infrastructure including skills lab, computer lab, IT equipment, and improvements to the local area network and Wi-Fi infrastructure
- Built the school's research culture and outputs in terms of scholarly writing, workshops, publications, weekly epidemiology and biostatistics clinics, and establishment of the Research Support Center

University of Zimbabwe College of Health Sciences (UZCHS), Zimbabwe

- Established a Research Support Center that rapidly became the nerve center of research activity in the College
- Established a Department of Health Professions Education that now champions faculty development and health professions leadership in the College
- Implemented a comprehensive mentored scholars program encompassing the programmatic and the two linked-awards

A major challenge that faced MEPI from the beginning was the capacity of MEPI schools and their national governments to support scale up of medical education innovations and to sustain the gains set in motion by MEPI. The lessons of MEPI still need to be shared widely with key stakeholders within their countries, the region and the world. The PI Council is committed to continuing to implement and promote innovation in African medical education and to broadly disseminating the program results and the lessons learned.

LESSONS LEARNED

Lessons learned during the five years of MEPI are mentioned throughout this report and in detail in Chapter 10. The following highlights important observations:

- The direct award of the MEPI grants to African institutions represents a new model for U.S. funding that is empowering grantees and leads to greater ownership and sustainability.
- Partnering between schools -- North-South, South-South, and especially within countries -- has enhanced and accelerated education and research progress in all dimensions.
- MEPI investment in Africa's medical schools has stimulated educational capacity development that is having an enormous positive effect on the quantity and quality of medical and other health professions graduates.
- MEPI-led curriculum improvements have emphasized HIV education and training of medical and other health professional graduates, optimizing their ability to help to tackle the pandemic on the African continent.
- MEPI-led improvements in teaching and learning, community based education, and the integration of ICT into education and practice hold promise to graduate better trained doctors and other health professionals who, in turn, will provide role models in retention to future graduates.
- Rural training and decentralized community-based education has provided transformative learning opportunities that are improving prospects for retention in rural and underserved areas.
- MEPI has assisted many participating schools to expand their research programs and to serve as focal points for developing similar capacities in other medical schools within the country or region.
- Research training and opportunities have proven important factors in building medical school faculties and in retaining graduates on faculty.
- Engagement with national governments and the university leadership is critical to the attainment and sustainability of the achievements of MEPI.
- MEPI activities that were facilitated by the CC included the annual symposium, the website and newsletter, site visits, surveys, technical working groups, and jointly authored scholarly publications and helped create a vibrant MEPI community.

RECOMMENDATIONS:

Based on the five year, joint MEPI experience, the PI Council wishes to make the following recommendations:

1. That the universities of the recipient schools and their national governments, together with the respective development partners, immediately provide the additional resources that are needed to maintain and expand the gains that have been achieved with the support of MEPI.
2. That other health professions schools be invited to join an expanded PI Council with immediate effect and that development partners in the interim provide catalytic support to the expanded MEPI PI Council.

3. That the PI Council, possessing competencies in health professions education, research training, health systems and workforce planning, establish a secretariat funded as an integral component of the expanded PI Council.
4. That the expanded PI Council, together with partners, take the initiative to disseminate widely the experiences and lessons learned from MEPI and link them with other initiatives within their respective countries, sub-regions, development partners, the African Union and the WHO Regional Office for Africa during the next 12 to 24 months.
5. That PEPFAR and other agencies of the USG take full advantage of these competencies in implementing PEPFAR priorities such as the Human Resources for Health (HRH) strategy, work in fragile states, and global health security.
6. That an evaluation of the impact of the MEPI program be conducted no sooner than three years after the program's closure to determine how its impacts and innovations have been sustained at the national and regional levels. Such an evaluation can shed light on effective ways to integrate and sustain other large scale collaborative efforts of this nature.
7. That building, maintaining, and strengthening domestic, regional, and international partnerships, including north-south and south-south partnerships, continue, so that MEPI's innovations and achievements are recognized and integrated into national and international funding priorities.
8. That, recognizing the important contributions of the MEPI TWGs to building thematic communities of practice, support for the TWGs should be maintained, either through the auspices of the PI Council or as separate entities.

CHAPTER 1

Background, Objectives, Design & Key Stakeholders

1

Background, Objectives, Design & Key Stakeholders

BACKGROUND

The African & Global Health Workforce Crisis: the Stimulus for MEPI

Development in medical education in sub-Saharan Africa over the past 100 years has been characterized by the continent's unique history.¹ From a handful of medical schools in the 1960s, the number of medical education institutions grew to over 165 medical schools in sub-Saharan Africa by the early 21st century.²

However, existing medical education institutions were unable to keep up with the demand for skilled health workers, especially once HIV/AIDS struck the continent. Following decades of neglect, medical education received much needed attention in 2004 when the Rockefeller Foundation sponsored the Joint Learning Initiative, a global study that highlighted the alarming global shortage of health workers.³ The report estimated health workforce shortages at over four million, and described the mal-distribution and poor working conditions plaguing this sector.⁴ This report was quickly followed by multiple global consultations under the high level forum on health related Millennium Development Goals (MDGs) and the World Health Organization's (WHO) publication of World Health Report 2006, "Working Together for Health."⁵ This report focused on human resources for health and identified 57 countries, 36 of them in Africa, where critical shortages of health workers severely constrained the delivery of basic health care. The release of this report coincided with the launch of the Global Health Workforce Alliance (GHWA), a multi stakeholder alliance hosted by the WHO with a mission to coordinate a global movement to raise the visibility of this crisis and to galvanize the international community to identify and implement solutions.

The Bill and Melinda Gates Foundation (Gates Foundation) and the United States' President's Emergency Plan for AIDS Relief (PEPFAR) were part of this global movement. Members of the GHWA Governing Board contributed to funding and supporting multiple activities to address the health workforce crisis. In 2008, the Gates Foundation funded academic twinning projects between the United States (US) and sub-Saharan African medical schools, as well as the Sub-Saharan African Medical Schools Study (SAMSS) which examined the state of medical education in sub-Saharan Africa.⁶

¹ Monekosso G. A Brief history of Medical Education in Sub-Saharan Africa. *Acad Med.* 2014;89:S11-S15.

² Mullan F, Frehywot S, Omaswa F, et al. Medical schools in sub-Saharan Africa. *Lancet.* 2011;377:1113-1121.

³ Joint Learning Initiative Report. 2004. http://www.who.int/hrh/documents/JLI-hrh_report.pdf. Accessed 19 September 2015.

⁴ There have been no continent-wide surveys of the supply of nurses, pharmacists, or community health workers. World Health Report 2006 states critical shortages of health care workers (less than 2.3/1000).

⁵ World Health Report: Working Together for Health. Geneva, Switzerland: World Health Organization; 2006. <http://www.who.int/whr/2006/en/>. Accessed 19 September 2015.

⁶ Kolars JC, Cahill K, Donkor P, Kaaya E, Lawson A, Serwadda D, Sewankambo DK. Partnering for medical education in Sub-Saharan Africa: seeking the evidence for effective collaborations. *Acad Med.* 2012;87(2):216-220.

The Genesis of the Medical Education Partnership Initiative

By this point in the early 21st century, the severe scarcity of human resources for health in sub-Saharan Africa was well documented, with estimates of a ratio of only 18 physicians for every 100,000 people.⁷ In some countries, skilled health workers were entirely absent in the vast rural areas where most of the population lived. The impact of HIV/AIDS, in particular, among sub-Saharan African populations “brought into stark relief the urgency to increase the capacity of health professionals and health systems to provide effective care for chronic and progressive diseases.”⁸ Resources were mobilized to increase access for African and other resource constrained populations to lifesaving anti-retroviral (ARVs) drugs through the Global Fund to Fight AIDS, TB and Malaria (GFATM) and PEPFAR. However, it became abundantly evident that the single most important rate limiting factor was the lack of skilled and motivated health workers. PEPFAR supported the development of WHO Guidelines on Task Shifting,⁹ and together with the United States Agency for International Development (USAID), PEPFAR also supported the WHO Guidelines on Increasing Access to Health Workers in Rural and Remote Areas through Retention.¹⁰ It was in this environment that MEPI and the Nursing Education Partnership Initiative (NEPI) had their genesis. MEPI was envisioned by Ambassador Eric Goosby, Ambassador-at-Large and the former United States Global AIDS Coordinator, and Dr. Francis S. Collins, Director of the National Institutes of Health (NIH).

MEPI was launched in 2010 as a five-year initiative to strengthen the academic and clinical training of students and faculty in sub-Saharan African countries heavily burdened by HIV/AIDS.¹¹ The MEPI Funding Opportunity Announcement (FOA) reflected the continued commitment of the United States Government (USG) to support the efforts of national and local governments to meet wide reaching domestic health challenges by developing local capabilities.

OBJECTIVES OF MEPI

The core tenets underlying MEPI were outlined by the US Global Health Initiative and included health systems strengthening and country ownership.¹² Through PEPFAR and NIH, the US provided about \$130 million in MEPI grants that were awarded directly to academic institutions in 12 countries in sub-Saharan Africa, and a US-based Coordinating Center (CC). By investing in medical education and the allied health sciences, through MEPI, it was hoped that the resulting strengthened medical education systems would be able to build and enrich the human capacity for health in Africa. A particular focus was on cultivating an environment that valued and nurtured research.¹³ A strong research culture would create opportunities to develop locally relevant strategies



⁷ World Health Report: Working Together for Health. Geneva, Switzerland: World Health Organization; 2006. <http://www.who.int/whr/2006/en/>. Accessed 19 September 2015

⁸ Goosby EP, von Zinkernagel D. The Medical and Nursing Education Partnership Initiatives. *Acad Med.* 2014; 89(8):S5-S7.

⁹ Task Shifting: Global Recommendations and Guidelines. Geneva, Switzerland: World Health Organization; 2008. http://www.who.int/workforcealliance/knowledge/resources/taskshifting_guidelines/en/. Accessed 19 September 2015.

¹⁰ Global Policy Recommendations: Increasing access to health workers in remote and rural areas through improved retention. Geneva, Switzerland: World Health Organization; 2010. <http://www.who.int/hrh/retention/guidelines/en/>. Accessed 19 September 2015.

¹¹ RFA TW-10-008. <http://grants.nih.gov/grants/guide/rfa-files/RFA-TW-10-008.html>. Accessed 19 September 2015.

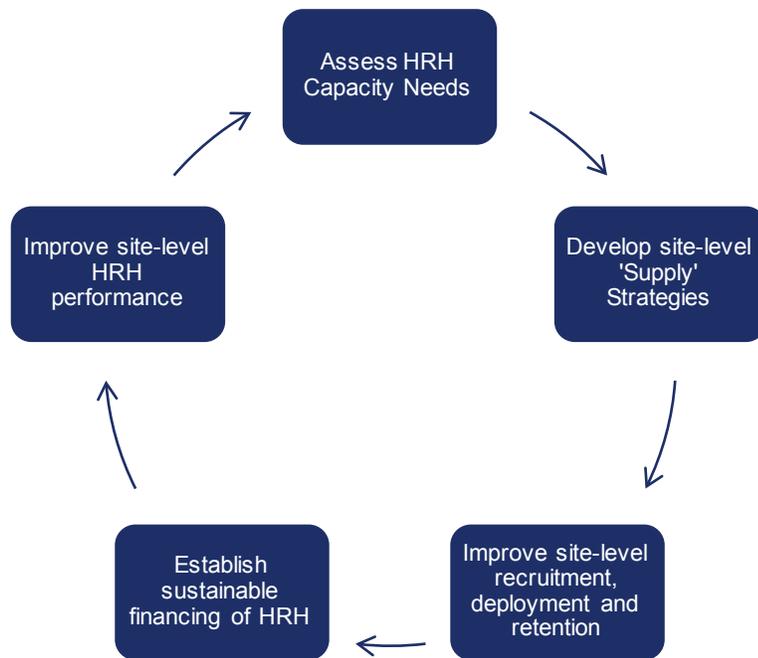
¹² The United States Global Health Initiative Strategy. <http://www.pepfar.gov/documents/organization/136504.pdf>. Accessed 19 September 2015.

¹³ Glass RI, Razak MH, Said M. The Importance of Research in the MEPI Program: Perspectives From the National Institutes of Health. *Acad Med.* 2014;89(8):S9-S10.

to meet domestic health needs and also provide additional incentives for health care professionals to continue to serve their populations. The proposed programs aimed to develop the specific skills needed to address the health needs of national populations, to improve retention of medical graduates, and to promote regionally relevant research in sub-Saharan African medical schools.

“From the start, when the MEPI schools first came together as a dynamic group at the first MEPI symposium in March 2011, relationships have grown and thrived and a true community of learning has developed, with collaborations and sharing of knowledge and resources catalyzing and sustaining the transformations that were already in motion.”¹⁴ MEPI's goals correspond with and complement PEPFAR's human resources for health objectives, as presented in PEPFAR Health Strategy 3.0 illustrated below (Exhibit 1.1). PEPFAR investments in MEPI directly target these objectives and contribute to achieving an AIDS-free generation.¹⁵

EXHIBIT 1.1 PEPFAR Human Resources for Health Objectives



SOURCE: PEPFAR Human Resources for Health Strategy PEPFAR 3.0 (<http://www.pepfar.gov/documents/organization/237389.pdf>)

¹⁴ Cheever L. Transforming the Health Care Workforce through Partnerships. Acad Med. 2014;89(8):S8.

¹⁵ PEPFAR Human Resources for Health Strategy-PEPFAR 3.0. <http://www.pepfar.gov/documents/organization/237389.pdf>. Accessed 19 September 2015.

MEPI was funded by PEPFAR through the Office of the US Global AIDS Coordinator (OGAC) in the US Department of State (DOS) and by NIH. It was administered by NIH Fogarty International Center and the HIV/AIDS Bureau of the Health Resources and Services Administration (HRSA) in the US Department of Health and Human Services (HHS).

Thirteen African universities in 12 countries and one university in the US received awards through a competitive peer review process managed by NIH. Programmatic awards targeted PEPFAR priority areas that complemented host-nation health strategies, while linked awards focused on non-communicable diseases and priority health areas related to and/or beyond HIV/AIDS. Pilot linked awards specifically targeted strengthening emergency medicine and cancer research. Of the 13 African schools, six were awarded programmatic awards, five were awarded both programmatic and linked awards, and two were awarded pilot-linked awards.



Five overarching themes guided the work of the MEPI schools.

EXHIBIT 1.2 MEPI Themes

Theme 1	INCREASING CAPACITY	Enhancing the quality of medical education & quantity of graduates in funded schools & in their respective countries.
Theme 2	RETENTION	Working to retain medical graduates & faculty in-country & to improve the distribution of medical doctors in underserved areas of all countries.
Theme 3	REGIONALLY RELEVANT RESEARCH	Enhancing research training to augment national research capacity & support faculty development & retention.
Theme 4	COMMUNITIES OF PRACTICE	Strengthening partnerships around common areas of interest in medical education.
Theme 5	SUSTAINABILITY	Working to ensure the durability of MEPI accomplishments & the continued investment in medical education & health workforce scale-up.

MEPI schools developed strategies consistent with the work plans submitted in response to the FOA to address these themes. These are discussed in detail in subsequent chapters of this report. (The methodology used to develop this Year 5 report is discussed in Chapter 2.) Briefly, Chapter 3 describes school activities related to building capacity by thoroughly assessing the medical school curriculum and implementing innovative strategies to increase enrollment and address student attrition. MEPI schools addressed the challenge of faculty and medical workers retention in a number of ways, as described in Chapter 4. To develop and support locally relevant research, MEPI schools initiated an array of projects and resources that supported training and mentoring, including health professions fellowships to qualified candidates to support research. These are discussed in Chapter 5.

Chapter 6 highlights the particular work of MEPI schools to improve HIV/AIDS service delivery by integrating HIV/AIDS in curricula and training, by expanding treatment programs, and by conducting data-driven research. MEPI schools that were awarded linked awards used curricula development, research, and training to address the growing burden of non-communicable diseases, including heart disease and diabetes. Their



activities are the focus of Chapter 7. The goal of creating sustainable communities of practice wherein medical professionals created national, regional, and international networks to share best practices and innovations was integral to many MEPI school activities and topics. Several examples of MEPI's unique role as a catalyst for the formation of such communities of practice are discussed in Chapter 8. Looking ahead, an important aspect of the success of MEPI will be determined by the sustainability of its efforts. Chapter 9 provides insights and examples of schools' experience in engaging local stakeholders to build sustainable connections within and beyond their national constituents. Chapter 10 concludes the report with highlights of MEPI accomplishments, challenges encountered, and lessons learned for the future.

KEY STAKEHOLDERS

Key stakeholders in MEPI include the USG, the MEPI Principal Investigators Council (PI Council) which includes the PIs of MEPI schools and the MEPI CC, the respective national and local government ministries of health and education, and US and other partnering institutions.

United States Government

Stakeholders within the USG include OGAC, PEPFAR, NIH and HRSA.¹⁶ NIH administered the awards for nine MEPI schools, and HRSA administered the awards for four MEPI schools and the MEPI CC (Exhibit 1.3).

MEPI Principal Investigator Council

A PI Council was formed in the second year of the award to provide a leadership forum for the schools in regard to meetings, common initiatives, collaborative education and research projects, and any issues of joint interest that might emerge. The PI Council participated in the overall leadership of MEPI and was a key governing body in contributing to the direction of MEPI activities.

The PI Council is composed of the PIs of the 11 MEPI programmatic award schools, the two linked pilot award schools, and the MEPI CC. Over the course of the award period, the PI Council contributed to structuring and strengthening linkages between the schools and their respective ministries of health and education.

USG representatives from OGAC, NIH, and HRSA attended PI Council meetings as observers. The PI Council, in turn, shared its plans and suggestions with program officers at HRSA and NIH.

The PI Council planned and implemented the MEPI annual symposia, handled policy issues such as publication policy, assisted in coordinating collaborative initiatives in education and research, and identified

¹⁶ NIH funding partners included the NIH Common Fund/Office of the Director (OD/OSC/CF/NIH), the Office of AIDS Research, Office of the Director (OAR/NIH), the Office of Research on Women's Health (ORWH/NIH), the National Heart, Lung, and Blood Institute (NHLBI/NIH), the National Human Genome Research Institute (NHGRI/NIH), and the National Institute of Mental Health (NIMH/NIH). Other MEPI collaborators included the Centers for Disease Control and Prevention, the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Global AIDS Program (GAP/NCHHSTP/CDC), the Department of Defense (DoD) HIV/AIDS Prevention Program, the United States Agency for International Development (USAID), and NIH Institutes and Centers.

opportunities for sharing and disseminating MEPI initiatives and partnering with other interested parties. In addition, the PI Council approved the formation of Technical Working Groups (TWGs) to share expertise and lessons learned, and to build communities of practice within MEPI.

MEPI Schools & Partners

Schools that received programmatic awards aimed to (i) develop new training and career development opportunities for the students and faculty to engage in hands on, community-based and problem-based clinical education and research training; (ii) create an enabling academic environment to promote locally relevant research; and (iii) develop education models with potential to demonstrate a sustainable increase in the recruitment and retention of students and faculty. MEPI schools partnered with academic institutions in other countries in Africa, the US, the United Kingdom, Brazil, and Canada.

Schools that received linked awards were expected to (i) substantially increase the expertise of faculty and students in chronic non-communicable diseases; (ii) strengthen the implementation and sustainability of education and research training related to chronic non-communicable diseases; and (iii) strengthen faculty contribution and student participation in medical education and locally driven research for chronic non-communicable diseases.¹⁷ They also worked to strengthen and contribute to the communities of practice they developed, to ensure the sustainability of their efforts within their universities and regionally.

Exhibit 1.3 lists the MEPI awards and schools and their respective partner institutions, by country, and includes the title of the awards.

EXHIBIT 1.3 MEPI Awards, Schools & Partners

COUNTRY	SCHOOL & PARTNERS	PROJECT
PROGRAMMATIC AWARDS		
BOTSWANA (a)	University of Botswana, in partnership with Harvard School of Public Health & the University of Pennsylvania	Programmatic Award: “Creating Sustainable Medical Education & Health Research Capacity in Botswana”
ETHIOPIA (a)	Addis Ababa University, in partnership with a consortium of Ethiopian medical schools including Hawassa University, Haremaya Universities, & the Defense Forces Medical Colleges, as well as Emory University, Johns Hopkins University, University of California, San Diego, University of Alabama-Birmingham, & University of Wisconsin	Programmatic Award: “Ethiopia’s Medical Education Consortium for Quality Medical Education & Retention”
KENYA (b)	University of Nairobi, in partnership with the University of Maryland-Baltimore & the University of Washington	Programmatic Award: “Strengthening Medical Education for Improved Health Outcomes in Kenya” Linked Award: “Strengthening Maternal, Newborn & Child Health Research Training in Kenya”
MOZAMBIQUE (b)	Universidade de Eduardo Mondlane (UEM), in partnership with University of California, San Diego (UCSD), Universidade Lurio, Universidade Zambeze, the World Health Organization, the Canadian Network for International Surgery, & the American College of Surgeons	Programmatic Award: “The Universidade Eduardo Mondlane/UCSD Medical Education Partnership” Linked Award: “UEM-UCSD Surgery Partnership”

COUNTRY	SCHOOL & PARTNERS	PROJECT
NIGERIA (b)	University of Ibadan, in partnership with University of Jos, University of Nigeria, University of Maiduguri, Ahmadu Bello University, University of Lagos, the AIDS Prevention Initiative Nigeria Ltd., Northwestern University, & the Harvard School of Public Health	Programmatic Award: “Medical Education Partnership Initiative in Nigeria (MEPIN)”
SOUTH AFRICA (b)	University of KwaZulu-Natal, in partnership with Columbia University	Programmatic Award: “Enhancing Training, Research Capacity & Expertise in HIV Care (ENTRÉE)”
SOUTH AFRICA (a)	Stellenbosch University, in partnership with the University of Cape Town Lung Institute, Makerere University, & Johns Hopkins University	Programmatic Award: “Stellenbosch University Rural Medical Education Partnership”
TANZANIA (a)	Kilimanjaro Christian Medical University College (KCMUCo), in partnership with the Duke University School of Medicine	Programmatic Award: “KCMC-Duke Medical Education Partnership Initiative”
UGANDA (b)	Makerere University College of Health Sciences (MakCHS), in partnership with Johns Hopkins University, Mbarara University of Science & Technology, Kampala International University, Case Western Reserve University, Yale University, Medical Research Council Program of AIDS in Uganda, Busitema University, & Gulu University	Programmatic Award: “Medical Education For Equitable Services To All Ugandans (MESAU)” Linked Award(s): “Building Capacity for Cardiovascular Research & Training in Uganda”
ZAMBIA (b)	University of Zambia, in partnership with Vanderbilt University & University of Alabama-Birmingham	Programmatic Award: “Expanding Innovative Multidisciplinary Medical Education in Zambia” Linked Award: “Improving Maternal & Child Health Through Specialty Training in Zambia”
ZIMBABWE (b)	University of Zimbabwe, in partnership with the University of Colorado-Denver & Stanford University, the University of Cape Town, University College London, & the Institute of Psychiatry at King’s College London	Programmatic Award: “Novel Education Clinical Trainees & Researchers (NECTAR) Program” Linked Award(s): “Improving Mental Health Education & Research Capacity in Zimbabwe Program” & “Cerebrovascular, Heart Failure, Rheumatic Heart Disease Interventions Strategy Initiative”
PILOT AWARDS		
GHANA (b)	Kwame Nkrumah University of Science & Technology, in partnership with University of Michigan, Ghana Ministry of Health, Komfo Anokye Teaching Hospital, Ghana College of Physicians & Surgeons, & Ghana Ambulance Service	Pilot Award: “Ghana Emergency Medicine Collaborative Training Program”
MALAWI (b)	University of Malawi College of Medicine, in partnership with University of North Carolina, University of Cape Town, & Johns Hopkins University Bloomberg School of Public Health	Pilot Award: “HIV-associated Malignancies in Malawi”
COORDINATING CENTER AWARD		
UNITED STATES (a) UGANDA (a)	George Washington University, subcontracting with African Center for Global Health & Social Transformation (ACHEST)	Coordinating Center Award: Fostering African Medical Education: Community of Excellence

SOURCE: Directory of Awards and Collaborating Partners for the Medical Education Partnership Initiative (MEPI) <http://www.fic.nih.gov/Grants/Search/Pages/Awards-Program-MEPI.aspx> Accessed 19 September 2015

NOTE: (a) Award administered by HRSA; (b) Award administered by NIH

In the FOA application process, MEPI applicants named US and other academic institutions as partners with whom they would collaborate to achieve the aims of MEPI. The partner schools were integral parts of the schools' MEPI program during the application process and throughout the MEPI program. Their role is discussed in Chapter 8. Throughout the five years of MEPI, they also provided assistance in capacity building within the areas of medical education, including emergency medicine and other post-graduate medical education, research, and eLearning/distance learning when needed.



MEPI Coordinating Center

The MEPI CC was established at the George Washington University (GWU) with an African partner, the African Center for Global Health and Social Transformation (ACHEST) in Kampala, Uganda, as a sub-contractor. Per the requirement of the FOA,¹⁸ the responsibilities of the MEPI CC were to: (i) coordinate activities across the programmatic programs, including linked awards; (ii) work with their African partner(s) to develop an African leadership network to guide, support, and advocate for the effort, and utilize this network to share knowledge and resources; (iii) evaluate educational models identifying best practices, provide technical assistance to the individual site evaluations, and conduct focused evaluation studies; (iv) provide technical assistance to build capacity, provide technical support to all aspects of the multi-site initiative, and provide methodological consultation and technical assistance to improve the quality of medical education, research, and care; (v) promote educational models that demonstrate success in meeting the program objectives; (vi) the African partner should be one that has the potential capacity to, either singularly or dually, function in the CC role, and by the end of the initial five year project period be able to contribute substantially to the sustainability of the initiative. Other listed CC responsibilities were to perform a needs assessment across all sites within the first six months of the initiative; identify gaps and develop working groups to respond to the same; develop a web-based data system for the collection of output, outcome, and impact data elements; and coordinate grantee meetings, conference calls, and site visits.

CHAPTER 2

Year 5 Report Methodology

2

Year 5 Report Methodology

Central to MEPI's mission was the creation of an enhanced and expanded healthcare workforce through investments in medical education in participating countries. In order to assess MEPI's effectiveness in achieving this goal, several key monitoring and evaluation (M&E) elements were developed at the start of the award and were employed throughout the MEPI project. These included both quantitative and qualitative data collection exercises that generated valuable comparative information over time, as well as additional site and time specific information. Principal responsibility for school specific M&E rested with the individual MEPI schools and is beyond the scope of this report.¹ The MEPI CC was tasked with compiling and reporting MEPI activities, accomplishments, and lessons learned; this is the focus of this report. The report compiled data from four survey rounds, annual site visit reports (SVR), and school summary reports (SSR) for all the MEPI schools and the CC, as well as from publications, TWG reports, and teleconferences among the report writing leadership² group members.

M&E planning began in late 2010, with the design and development of two principal tools to describe MEPI accomplishments: annual surveys of the schools to collect both quantitative and qualitative data, and annual site visits to each of the 13 MEPI schools to collect qualitative data. These tools were developed in close collaboration with MEPI stakeholders and representatives of each of the supporting USG agencies and MEPI schools. The annual surveys (AS) and SVRs, together with the individual SSRs prepared by the 13 MEPI schools and the CC, served as the key data sources for this report. This report reflects this collaborative endeavor and is presented as a document developed jointly by the MEPI PI Council and the MEPI CC.

MEPI activities were expected to contribute to a better health workforce, and ultimately to a strengthened health system, including improved HIV/AIDS care, prevention and treatment. Activities, programs, and innovations were expected to contribute to achieving intermediate outcomes that furthered the five thematic areas: 1) increased quality and quantity of graduates; 2) increased retention and better distribution of practitioners; 3) greater capacity to undertake regionally relevant research; 4) creating functional communities of practice, or professionals who share interest in the practice and development of health education and 5) maximizing sustainability of the activities and their effects.

¹ The school summary reports, in Appendix A, provide a summary of each school's own site-specific activities and achievements.

² The Year 5 Report writing leadership group was comprised of the PI Council chair and vice chair, two MEPI schools' PIs and the three MEPI CC PIs.

MEPI SURVEY

The MEPI Annual Survey (AS) was a tool developed for each school to record its educational program and activities. It was used to document achievements at each of the schools, across the life of the project. The five themes described above were used as the organizing structure for the survey and subsequent analysis. The first three themes described the fundamental areas of education where it was anticipated MEPI would have an impact, while the latter two areas focused on aspects critical to MEPI's long term success: the sustainability of the changes and outcomes the initiative supported and hoped to achieve. The survey also captured activities specifically focused on HIV/AIDS and some reflections on lessons learned.



Specifically, the survey aimed to answer the following key questions:

1. How did MEPI impact the number and quality of students and faculty at participating institutions?
2. How did MEPI impact faculty and student retention at participating institutions?
3. How did MEPI impact the volume and quality of country-relevant research at participating institutions?
4. How did MEPI impact HIV/AIDS care, prevention and treatment?
5. How did MEPI contribute to developing communities of practice locally, nationally, regionally and internationally?
6. What are participating medical education institutions doing to ensure that the gains achieved through MEPI continue and are sustained in the future?

The survey was administered four times, beginning with a baseline round in year 1 (2011), and concluding in year 5, in August 2015.³

Survey data tracked details on faculty and student recruitment, enrollment, training, retention, research efforts, activities and instruction related to HIV/AIDS, communities of practice, and sustainability. Data were also used to monitor progress toward meeting MEPI's overall objectives. Completion of the survey took considerable time and effort by the MEPI schools, as the vast breadth of MEPI activities led to a long survey that, in the final round, took the MEPI schools on average 35.5 hours to complete.⁴ The baseline survey in early 2011 collected a wide range of demographic data from the schools and helped provide some context for each school's existing medical education program, resources, and plans. Rounds two and three of the survey focused on how MEPI specifically impacted each school and its goals. The final survey, like the baseline survey, was more comprehensive in that it collected data on system-wide changes that were associated with MEPI, such as measures that improved the overall quality of education and activities directed at HIV/AIDS related care, prevention, and treatment. It also had an extensive section on sustainability and

³ The year 1 survey was administered between February 9, 2011-March 31, 2011. Round two of the survey took place between April 23, 2012 and June 15, 2012, and the third round survey occurred between February 22, 2013 and April 19, 2013. The fourth survey round was not administered. The final survey took place between June 2015 and August 2015.

⁴ MEPI AS, Year 5, 2015



lessons learned. The survey instruments for the four rounds are available on the MEPI website.⁵

For this report, the data collected from the four surveys was converted to Stata 13 for analysis. A set of indicators focused on the MEPI themes was constructed and matched to the relevant chapters of the report. The majority of this analysis focuses on a snapshot of MEPI's impact as measured in August 2015, with certain analysis showing trends over time.⁶ The survey analysis focuses on 12 MEPI schools unless otherwise indicated.⁷ SVRs, SSRs, and reviewer comments for all 13 MEPI schools supplied the qualitative data presented in this report. Instances in which data is incomplete are noted as appropriate.

MEPI SITE VISIT REPORTS

Each year, the MEPI schools welcomed site visit teams composed of representatives of the USG, CC, MEPI PIs from other schools, and other stakeholders. The purpose of these visits was to provide face-to-face exchange among representatives of the MEPI schools, USG project officers responsible for oversight of the MEPI awards, and the CC at the program sites. Site visits also often included a within-country USG representative.

Data collected during the site visits was compiled in the form of a SVR that supplied valuable qualitative data to support the annual survey. Site visits were an important component of the monitoring process as they offered in-depth exposure to and understanding of the schools' ongoing activities, successes, innovations, challenges, and progress. In addition, during the site visits, team members learned of schools' specific technical assistance needs and met with representatives of other MEPI schools, facilitating increased interpersonal and institutional communication. The site visits contributed to building trust and cohesion among the diverse members of the MEPI network. Each school that received a programmatic award was visited annually; schools awarded pilot linked awards were visited every other year.⁸

The key document stemming from the site visits was the SVR. At baseline, this report focused on documenting relevant background on the MEPI school, as well as providing a summary of the planned MEPI program. In round two, the SVR focused on the status of activities, as well as any changes in the MEPI program since the baseline site visit. In this way, the SVR offered a two-way tool to identify needs, recognize accomplishments, and suggest modifications. In subsequent rounds, the SVR was largely designed to collect in depth, structured information on key activities with a focus on the MEPI themes, with adjustments based on feedback from the previous round.

⁵ MEPI survey instruments. <http://mepinetwork.org/competency-based-education/advances-in-medical-education-and-practice/item/1604-survey-instruments>. Accessed 23 September 2015.

⁶ The full set of indicators analyzed for this report is available in Appendix B.

⁷ The survey analysis focuses on 12 MEPI schools unless otherwise indicated. Data was not collected from the consortium schools, which should be considered a limitation of this data. (Qualitative data from the site visit reports and school level reports from all 13 schools was available and therefore elements of all schools' programs are represented in the report.) Data limitations, such as missing or incomplete data, are noted as appropriate, in the text and in notes to the exhibits.

⁸ Five rounds of site visits have taken place: Round 1: January 10, 2011-August 26, 2011; Round 2: February 6, 2012-June 27, 2012; Round 3: January 23, 2013-April 30, 2013. Round 4: February 24, 2014-May 5, 2014; Round 5: February 25, 2015-August 20, 2015.

A codebook was constructed to analyze the SVRs. Using NVivo, these codes were applied to the SVR content from all schools, for all five years and then used to generate a summary report. Data from this summary report is incorporated throughout the chapters of this report, to provide context to the quantitative data and to highlight stand-out MEPI activities.

INDIVIDUAL SCHOOL REPORTS

Each MEPI school and the CC also compiled an individual summary report that briefly documented the experiences, accomplishments, and lessons learned over the five years of the MEPI program. These reports are available in Appendix A: School Summary Reports.

SUMMATIVE ACHIEVEMENTS & LESSONS LEARNED

Unlike Chapters 3-9 which utilize the above mentioned data sources, the final chapter on Achievements, Challenges and Lessons Learned was developed using a different approach. For this chapter, MEPI schools concisely summarized achievements and lessons learned during the MEPI program. In addition, each MEPI school and the CC identified three to five lessons learned during the MEPI program that should be shared with national and international policymakers, potential funders, and medical educators. The resulting list, organized by MEPI themes, was abridged to reduce redundancies, and reviewed and approved by the PI Council for inclusion in this report.⁹

The chapters that follow present and discuss the experiences and findings from the MEPI program, and provide a comprehensive look into the achievements, challenges and lessons learned over the course of the initiative.

⁹ The list of MEPI Achievements is included in Chapter 10; the complete unabridged list of school achievements is available in Appendix G.

CHAPTER 3

Capacity Building

3

Capacity Building

BACKGROUND

The goal of MEPI was to increase the capacity of the healthcare systems in MEPI-participant countries to meet their healthcare workforce needs. To this end, MEPI schools explored new and innovative ways to recruit, train, and retain faculty and students in existing and new health professions programs. MEPI schools also explored new ways to deliver training, expand training sites, and better match the training and care delivery settings. Schools initiated and supported opportunities to pursue professional development and research by faculty and students, contributed to greater research competency, and increased the volume of locally and regionally relevant medical research.

These “capacity building” goals required participation and support from many quarters within MEPI schools’ countries, including the ministries of health and education, professional associations, training institutions, universities, and health professions councils. Collaborating northern partners and international organizations also played major roles. After five years, MEPI has made substantial progress: the expanded capacity in health education, resources, graduates, and research has produced more and better trained health care professionals, and is contributing to health systems strengthening in each country and in the region. Countries are using this expanded capacity to improve HIV/AIDS prevention, care, treatment, and support. This chapter presents MEPI experience and accomplishments in embracing and implementing new and alternative learning approaches and tools, and integrating these into the medical education formation of current and future health professionals.

Alignment with National Policies & Strategies

MEPI schools worked with their respective governments to ensure that the MEPI initiatives were responsive to, and aligned with, national health workforce needs, health systems strengthening, and sustainability. African governments committed to support MEPI in their letters of commitment accompanying schools’ response to the FOA, and this support continued throughout program implementation. Annual school site visits provided opportunities to reinforce and strengthen working relationships with national stakeholders in government ministries and elsewhere. These ties were further developed during the annual symposia.

STUDENT ENROLLMENT

A larger pool of students enrolled and completing studies in medical and other health care professions was recognized as key to expanding the supply and quality of the health workforce. It was also important to remove barriers to enrollment by making training available in areas beyond the capital cities. To this end, MEPI schools devised new ways to deliver curricula, expanded and repurposed teaching facilities, and implemented new strategies to increase enrollment of both undergraduates and postgraduates. The creation of academic consortia of medical schools enabled some countries to enroll more students and deliver instruction in more locations. MEPI schools also advocated for, and assisted in, the development and launch of new medical schools.

Faculty shortages were another concern. Some schools increased postgraduate enrollment by offering more training, and the opportunity to be recruited to faculty positions. For example, at the University of Zimbabwe College of Health Sciences (UZCHS) and at Mozambique's Universidade Eduardo Mondlane (UEM), enrollment in internal medicine increased by 200%. At the University of Zambia (UNZA), where enrollment in the basic sciences was historically low, recruitment efforts yielded new graduates in basic sciences. By the beginning of the academic year 2015-2016, 70 postgraduate students were enrolled and scheduled to fill basic sciences staff positions for the Zambia consortia. Some MEPI schools targeted recruitment and training efforts at specific specialties which were in short supply. At the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana, for example, the need for trained emergency physicians drove a focus on expanding training for this specialty. Impressively, 15 Emergency Medicine (EM) Specialists and 59 Emergency Nurses have graduated. Five hundred medical students were trained in emergency medicine, and 300 district health care workers (HCWs) in emergency units and HIV clinics across Ghana were trained in HIV/AIDS care in the emergency department.

In Malawi, a serious shortage of trained pathologists limited the ability to diagnose pathologies, including cancers, in a timely way. The MEPI pilot award at the University of Malawi (UoM) expanded the pathology training program, and enrollment and graduation increased. At the beginning of MEPI, Malawi had one pathologist. Through MEPI two more were recruited, two were sent for training supported by MEPI, and the Government of Malawi supported training for two more students.

At the University of Nairobi (UoN) in Kenya, the School of Nursing was supported to create a blended learning "sandwiched" degree program that made the cost affordable to students. (So called "sandwich" degrees allow students to pursue their education while working, mixing periods of study and work, akin to US cooperative or experiential learning degree



Medical school enrollment peaked at over 2,500 students per year across the MEPI schools...due, in large part, to increased faculty retention, updated educational approaches and enhanced access to technology.



programs.) This change increased enrollment, and 449 students were in training in late 2015.

MEPI schools helped establish or enhance several new health professions schools, including Busitema University (BU), in Uganda, part of Uganda's medical education consortium, Medical Education For Equitable Services To All Ugandans (MESAU). MEPI helped establish or enhance new schools in the region, including University of Botswana School of Medicine (UoB SOM); Copperbelt University (CBU), Cavendish University and Lusaka-Apex Medical School in Zambia; and University of Lurio (ULu) in Mozambique.

IMPROVING QUALITY

Curriculum Review & Reform

Curriculum review and reform is an ongoing part of the health professions education agenda, and MEPI schools were at the forefront of this reform. Curricula have evolved to respond to the different challenges faced by the healthcare systems, and to adopt new teaching methodologies and new technologies that facilitate decentralized learning and radically different formats.

Faced with the need to substantially increase the number of health workers, but limited by existing infrastructure and faculty supply, MEPI partners embraced the opportunity to evaluate and redesign their medical training programs.¹ They fully recognized medical education's transformative role in strengthening their countries' health systems.²

Among the 13 MEPI schools, most had not reviewed their curricula for a long time. The five newly established medical schools (BU, Cavendish University, CBU, Lusaka-Apex Medical School, and UB SOM) were particularly receptive to new approaches. All the MEPI schools undertook curriculum reviews or developed new curricula, content enhancement, and innovative delivery methods to provide more relevant training for students and address faculty shortages. Seven schools developed new curricula and eight implemented curriculum review initiatives across a wide range of topics and levels of training.

At Stellenbosch University (SU), the curriculum renewal took place across four domains: Health Systems Strengthening; Evidence-based Health Care; Infection Prevention Control; and Public Health. This work has influenced change across the medical undergraduate curriculum.³ Many of these efforts have been shared in scholarly publications (see for example, Appendix C: MEPI Supported Publications).

Competency-based medical education (CBME) received considerable attention. This is a disciplined systematic approach to identify health

¹ Kiguli S, Baingana R, Paina L, et al. Situational analysis of teaching and learning of medicine and nursing students at Makerere University College of Health Sciences. *BMC International Health and Human Rights* 2011, 11(Suppl 1):S3 doi:10.1186/1472-698X-11-S1-S3

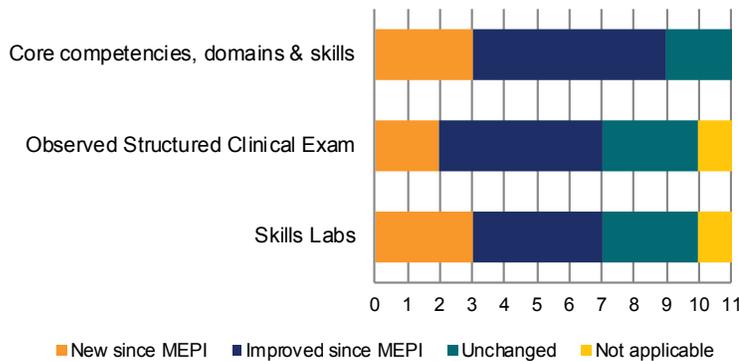
² Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376(9756):1923–1958.

³ Mukinda FK, Goliath C, Willems B, Zunza M, Dudley LD. Equipping medical graduates to address health systems challenges in South Africa: An expressed need for curriculum change. *African Journal of Health Professions Education*. 2015; 7(1)86-91

problems to be addressed; pinpoint the requisite competencies required of graduates for health-system performance; tailor the curriculum to achieve competencies; and assess achievements and shortfalls. Seven universities revised their curricula to competency-based to embrace standards in critical thinking, information management, communication skills, clinical skills, population health, scientific foundations, and professional values and attitudes. The MEPI consortia in Uganda is illustrative: all the medical schools in the MESAU consortium identified nine core competencies required for a Ugandan health professional, and Makerere University College of Health Sciences (MakCHS) revised its curriculum to be competency-based. In Nigeria, the University of Ibadan (UI) revised its curriculum to competency-based and has developed a template for curriculum revision that has been adopted by the entire country. Ten schools revised their assessment methods to include Objective Structured Clinical exams (OSCE), a recognized standard in medical education (see Exhibit 3.1 MEPI's Impact on Medical School Curriculum).

Curricula were revised to reflect best practices in adult education, integrate simulation experiences, and leverage new mobile technologies.

EXHIBIT 3.1 MEPI's Impact on Medical School Curriculum (2015)



SOURCE: MEPI Annual Survey, Year 5, 2015
NOTE: Includes data from 11 schools

Another important aspect of curriculum review was the integration of HIV/AIDS into the training curriculum. For example at the University of KwaZulu-Natal (UKZN), HIV/AIDS training was incorporated into the Bachelor of Medicine and Bachelor of Surgery (MBChB) degree, pharmacy, nursing, and family medicine programs. At MakCHS, HIV/AIDS content and training was enhanced in the Community-based Education, Research and Service (COBERS) clerkship, while at KNUST, the emergency medicine curricula incorporated training in recognizing and treating HIV in emergency settings (see Chapter 6: MEPI Impact on HIV Service Delivery).

Other unique additions to curricula included Bioethics at UKZN and SU, and Health Systems Strengthening Research (HSSR), Public Health, Epidemiology, and Biostatistics at SU⁴, which now offers a master's

⁴ Dudley LD, Young TN, Rohwer AC, Willems B, Dramowski A. Fit for purpose? A review of a medical curriculum and its contribution to strengthening health systems in South Africa, African Journal of Health Professions Education. 2015; 7(1):81-85.

Critical shifts in the quality of medical education included adoption of competency based education that prepares graduates to be ready to apply training in care situations.

degree program that enrolls students from several countries in sub-Saharan Africa (see Chapter 8: Communities of Practice).

Community-Based Education (CBE)

Scaling up medical education in Africa requires not only an increase in enrollment (in some MEPI schools, enrollment levels are set by the governments), but investment in the quality of learning and teaching environments. Teaching and learning environments are highly contextual, and are dictated by local needs, the local curriculum, and the pedagogy used. This variation is reflected in MEPI schools' investments.

Most MEPI schools expanded or strengthened their CBE over the years of the program. Some added new community sites, others sent more students to their existing sites, and some schools expanded the curriculum to provide new learning experiences in the community setting.

Investments to improve clinical skills included expansion of skills laboratories, and improving and increasing clinical sites at tertiary and community health facilities. For example, MESAU expanded its capacity for CBE and increased the number of community-based training sites by over 40 percent, to 162 sites in 72 of Uganda's 113 districts.

Ethiopia provided an illustrative example of how local government policy can influence capacity development. In 2003 the Ethiopian government mandated medical schools to quadruple class sizes in an effort to train 5,000 health workers by 2009, overwhelming the health science college faculty and facilities. By 2010 and the start of MEPI, classrooms were severely overcrowded and there were not enough preceptors to provide the hands-on training students required. This situation prompted AAU to send students to train in existing community care sites in rural areas. There students could receive clinical training on site and learn to work in the local conditions, where most patients first seek and receive care. MEPI provided resources, including a minibus to transport students to the sites, computers and internet access, and laboratory facility improvements, to improve the learning environment and accommodate the larger numbers of students. In a similar effort in Kenya, the MoH allocated hospitals in 16 counties for UoN to use as decentralized training sites for medical, pharmacy, nursing and dental students to get hands-on learning exposure.

CBE at the different medical schools was typically tailored to the training program and the community needs. In 2013, the MEPI CBE TWG conducted a study of MEPI schools' CBE curricula and rotations. Curricular revisions that occurred with MEPI funding included:

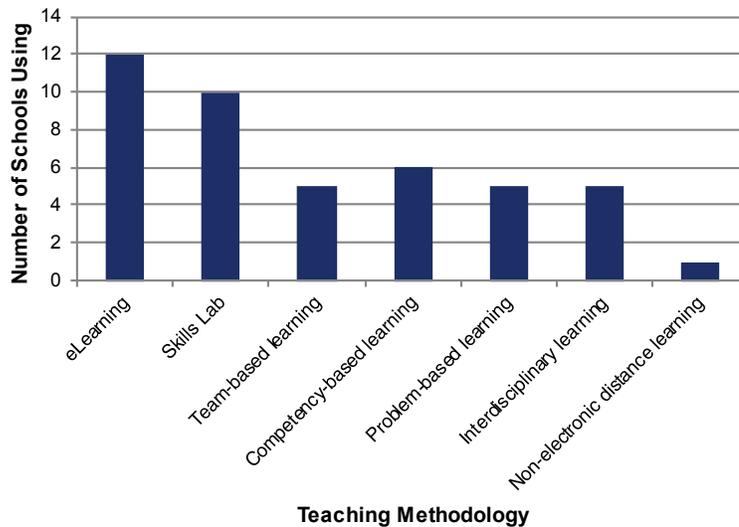
- In Uganda, the CBE and service curriculum at Kampala International University (KIU) was expanded to include research and management training. The new program included opportunities for students to do community research,

and develop leadership and management skills. At Mbarara University of Science and Technology (MUST), for example, the activity was extended from four to eight weeks to enable the students to cover more activities while in the field.

- At the University of Jos (UJ), Nigeria and UoN, Kenya, undergraduate and postgraduate students went to community and district hospitals for core rotations in obstetrics, surgery, and pediatrics, giving students experience in rural areas and supplementing the number of staff there. The step also relieved the crowded tertiary hospitals.
- SU used MEPI funding to support a unique year-long immersion experience for a handful of students to work alongside community family physicians (see Appendix C: MEPI Supported Publications).
- At UKZN, ten MEPI learning centers were established at community training sites where dedicated teaching space was equipped with computers and internet access. Two sites also offered virtual conferencing facilities. These facilities were used in training both medical and nursing students, and considered a form of interdisciplinary learning.

The exhibit below (Exhibit 3.2) shows the new teaching methods MEPI schools adopted, or strengthened with MEPI support.

EXHIBIT 3.2 MEPI Supported New Teaching Methodologies (2011 - 2015)



SOURCE: MEPI Annual Survey, Year 5, 2015
 NOTE: Includes data from 13 schools



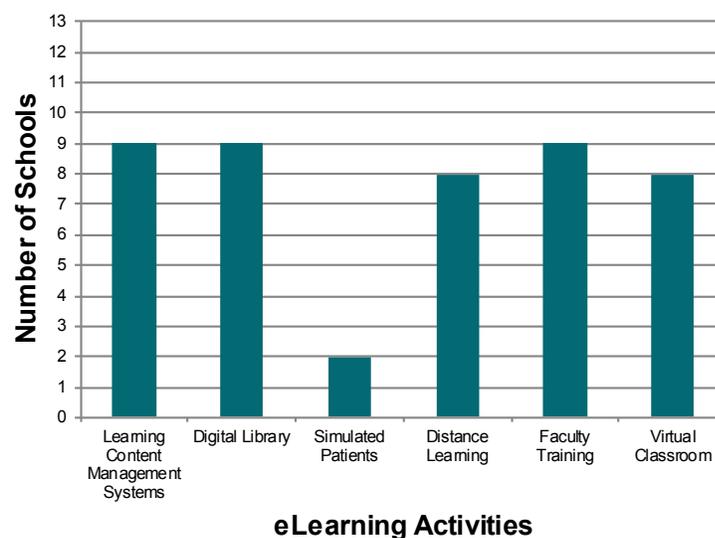
Information Communications Technology, Virtual Learning/eLearning

Medical education is evolving to deliver instruction and training using online, computer-based, or eLearning technologies to prepare students to practice medicine. These methods complement the traditional classroom and clinic-based training that has characterized medical training in the past.

During the first two years of MEPI, most schools focused on enhancing their infrastructure to be able to offer eLearning to students. Once the information communications technology (ICT) infrastructure was in place, the schools introduced training and support for staff and students to progressively adopt and use these new technologies for teaching and learning. This continued in Years 3 and 4 as both faculty and students began to use the technology-enhanced education environments. In Year 4, a workshop was conducted in Botswana to support the schools in creating a sustainable eLearning strategy (action plan) for their schools. (Exhibit 3.3 and Exhibit 3.4 below)

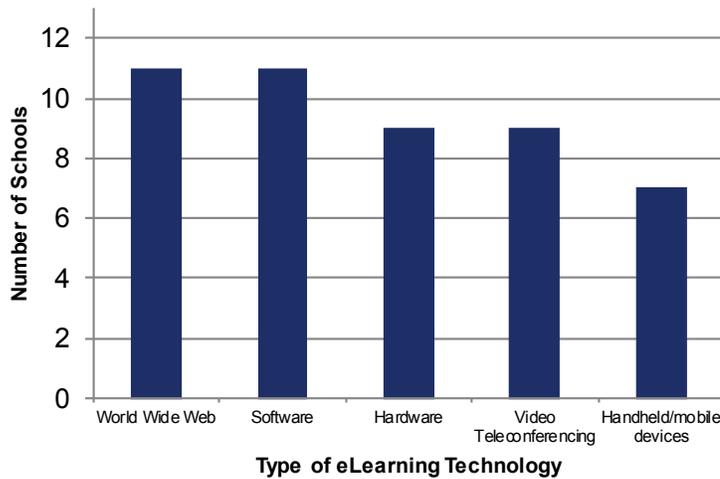
Twelve of the MEPI schools reported using eLearning to support over 65 courses, from basic sciences (five schools), to family medicine (five schools), to CBE (four schools), to nursing (four schools). Schools used different technologies to access eLearning instruction, including hardware and software, to access the internet, virtual conferencing, tablets, and handheld devices. Exhibit 3.3 highlights types of MEPI supported eLearning activities and Exhibit 3.4 highlights types of technologies used.

EXHIBIT 3.3 MEPI Supported eLearning Activities (2011-2015)



SOURCE: Cumulative data from MEPI Annual Survey, Year 2, 2012; MEPI Annual Survey, Year 3, 2013; MEPI Annual Survey, Year 5, 2015
 NOTE: Includes data from 13 schools

EXHIBIT 3.4 Types of eLearning Technologies Used in MEPI Supported eLearning Activities (2011-2015)



SOURCE: Cumulative data from MEPI Annual Survey, Year 2, 2012; MEPI Annual Survey, Year 3, 2013; MEPI Annual Survey, Year 5, 2015
 NOTE: Includes data from 13 schools

eLearning was used to provide didactic content (ten schools); experiential content (three schools); access to content (11 schools); and to assess understanding of content (5 schools). Schools reported that undergraduate health professionals were utilizing the new technologies, as were postgraduate health professions students (ten schools), faculty members (nine schools), and non-teacher physicians (five schools). They reported multiple rationales for investing in eLearning, including the ability to reach more students (nine schools), improve the quality of education (11 schools), improve faculty workload (four schools), and improve health services provided by students and faculty (six schools).

UoN established an eLearning center in the library and set up wireless access points, and adopted an eLearning approach to teaching. Addis Ababa University (AAU) and UB provided tablets to their medical and health sciences students for use during their training. AAU and UNZA implemented Learning Content Management Systems (LCMS) (Moodle) to manage student use of eLearning content. UI also utilized this open source eLearning platform to teach reproductive health, HIV, and other STIs course for freshmen and distance learning students using articulate software. SU used podcasts and the Kilimanjaro Christian Medical University College (KCMUCo) introduced a Massive Open Online Course (MOOC).⁵ Most schools improved the eLearning infrastructure by improving internet connectivity, installing more computers, linking community sites to the internet, renovating library spaces for eLearning, and acquiring e-books and Learning Management Information Systems (LMIS) or LCMS.

⁵ Walsh S, de Villiers M. Enhanced pod-casting for medical students: Progression from pilot to e-learning resource. Afr J Health Prof Ed. 2015; 7(1)125-129



Five schools modified or developed institutional policies to support eLearning, and three schools initiated evaluations of their eLearning initiatives.⁶

Clinical Skills Laboratories

Clinical skills laboratories are learning resource centers where students can learn and practice specific clinical skills without jeopardizing patient care, and can get immediate feedback on their techniques and practice.^{7,8} Such training builds confidence as well as skills, and reduces some of the difficulties students experience when they first encounter patients in wards and clinics. Skills laboratory training is an integral part of competency-based training.⁹

MEPI schools created and improved skills laboratories to improve the quality of teaching and learning. Five schools developed clinical skills curricula around the skills laboratories, five trained faculty in how to use skills laboratories, and two hired new staff to support the skills laboratories. Some skills laboratories served multi-disciplinary students, while others targeted skills specific to specialties such as emergency medicine or nursing.

MEPI supported the construction of skills laboratory infrastructure in the different schools, for example at UI and MakCHS. The schools built capacity by training faculty on how to write training modules; these faculty members were then expected to train others.

At UoN, the Partnership for Innovative Medical Education in Kenya (PRIME-K), 400 learners, including 47 faculty, from multiple health disciplines were trained at UoN's fully accredited skills laboratory, and more medical and health professions faculty were expected to use the skills lab in the future. The use of skills laboratories by departments across the medical school has increased. Examples of the PRIME-K skills laboratory achievements and challenges in skills lab development can be viewed at <https://www.youtube.com/watch?v=8aNWx6CA0J0>.

At AAU, an expanded skills lab helped to address the problem of limited patient exposure due to the dramatic increase in student intake, and gave students a much needed opportunity for hands-on practice. AAU also launched a program to integrate standardized patients into the curriculum to improve skill development, feedback and student assessments, and reduce burden on conventional patients.

At UNZA, students and staff from different disciplines, including those from consortia medical schools and nursing students supported through the NEPI Zambia award, used the skills lab. OSCEs were incorporated into various clinical programs for evaluation of students by staff and faculty trained in the use of OSCE. The strong foundation and administration support for the skills lab will help facilitate its sustainability.

⁶ De Villiers M, Walsh S. How podcasts influence medical students' learning – a descriptive qualitative study. *Afr J Health Prof Ed.* 2015; 7(1):130-133.

⁷ Dent J, Ronald M, eds. *A Practical Guide for Medical Teachers.* 4th ed. 2012.

⁸ Sebiyan AM. New trends in medical education. The clinical skills laboratories. *Saudi Med J.* 2003;24(10):1043-1047.

⁹ Lund F, Schultz JH, Maatouk I, et al. Effectiveness of IV cannulation skills laboratory training and its transfer into clinical practice: a randomized, controlled trial. *PLoS One.* 2012;7(3):e32831. doi: 10.1371/journal.pone.0032831.

Despite all the achievements in skills laboratory development, MEPI schools reported some challenges, including limited and poor physical infrastructure, lack of laboratory equipment, and the large number of students being trained in these facilities. Unlike the students, faculty did not make full use of the technology-enhanced teaching and learning facilities which were available in the skills laboratories. This might be due to the students being more facile with new technology. However, most schools offered additional faculty training to overcome this problem. Despite these challenges, clinical skills laboratories were regular features of MEPI schools. Their effectiveness and value in training health care professionals will be measured over time.

Faculty Development Activities

One of the biggest challenges in sub-Saharan African medical education is the shortage of the senior and experienced medical faculty.¹⁰ It has been reported that the increasing exodus of human capital from academic and research sectors in Africa adds to the continent's decreasing contribution to global scientific output.¹¹ Many universities are operating with overburdened and underpaid faculty, who often resort to consultancies to maintain a basic living standard.¹² The emigration (external brain drain) of faculty and specialized doctors poses a problem to the stability and growth of medical education, while an internal brain drain of faculty from universities to Non-Governmental Organizations (NGOs), that often offer better salaries and benefits than the universities, compounds this loss.

Faculty development is important for increasing capacity and retention of faculty. Faculty development also improves teacher effectiveness at all levels of the education continuum. Regular opportunities for training enhance instruction and increase professional qualifications and competencies.

The most significant way MEPI contributed to enhancing teaching quality was through faculty training and continuing medical education. This was mainly through short courses that trained clinicians in research skills and academic career development, leadership, teaching methods; epidemiology and biostatistics; and innovative teaching. Examples include: Problem Based or Case Based Learning (PBL), Team Based Learning (TBL), and ICT. Additional training and mentoring activities, including writing skills, faculty exchange programs, and establishment of medical education units have also been helpful. Many faculty members pursued advanced training including master's and PhD programs. The introduction of Masters in Health Professions Education at AAU, UEM, and MakCHS and complete review of SU Master in Philosophy in Health Professions Education program are examples of MEPI investments that will contribute to producing specialists in Health Professions Education (HPE), who will guide education processes at MEPI schools long into the future.

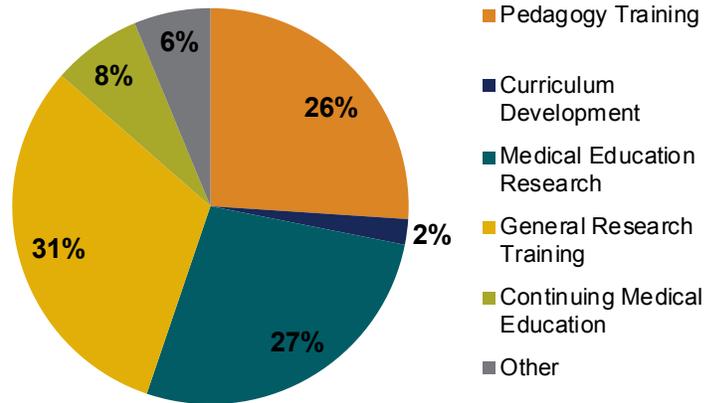
¹⁰ Chen C, Buch E, Wassermann T, et al. A survey of Sub-Saharan African medical schools. *Hum Resour Health*. 2012;10:4. doi: 10.1186/1478-4491-10-4.

¹¹ Tebeje A. Brain drain and capacity building in Africa. <http://www.idrc.ca/EN/Resources/Publications/Pages/ArticleDetails.aspx?PublicationID=704>. Accessed 24 November 2015.

¹² Wight D. Most of our social scientists are not institution based... they are there for hire --Research consultancies and social science capacity for health research in East Africa. *Soc Sci Med*. 2008;66(1):110-6. doi: 10.1016/j.socscimed.2007.07.019.

At UNZA, a shortage of faculty in the basic sciences prompted more than 36 faculty to improve their training in basic sciences, by studying basic sciences at UNZA and the three new medical schools in Zambia.

EXHIBIT 3.5 Types of MEPI Supported Faculty Training and Continuing Medical Education Activities



SOURCE: MEPI Annual Survey, Year 5, 2015
NOTE: Includes 96 activities across nine MEPI schools

Medical Education Units

The establishment of medical education units which focus on enhancing the quality of physician training is a valuable initiative to support Africa’s health workforce needs.¹³ The demand for more physicians globally, coupled with the need for high quality education, has led to the proliferation of medical education units across the world.¹⁴ In sub-Saharan Africa, these units are called department, unit, and center. They support medical education research, teaching, program evaluation and the use of educational technologies, and can impact undergraduate, postgraduate, and continuing medical education. Nine of the 13 MEPI schools established or strengthened medical education departments in their schools. MEPI funding stimulated both the creation and strengthening of medical schools’ infrastructure to support faculty development and scholarship in medical education.

A study carried out in four MEPI schools (UNZA, UZCHS, UI, and SU) found that, over the course of the initiative, sound and well-functioning medical education departments had the potential to provide critical support to institutions and health professionals in their medical education endeavors.¹⁵ The medical education units supported schools by leading curriculum development and evaluation and serving as the driving force behind curriculum change, assisting in teacher training through HPE programs, scrutinizing the education process and teacher qualifications by carrying out audits of teaching, and encouraging school self-evaluations

¹³ Adkoli BV, Sood R. Faculty development and medical education units in India: a survey. *Natl Med J India*. 2009;22(1):28-32.

¹⁴ Al Shawwa LA. The establishment and roles of the Medical Education Department in the faculty of Medicine, King Abdul Aziz University, Jeddah Saudi Arabia. *Oman Med J*. 2012;27(1):4-9. doi: 10.5001/omj.2012.02.

¹⁵ Kiguli-Malwadde E, Talib ZM, Wohltjen H, et al. Medical education departments: a study of four medical schools in Sub-Saharan Africa. *BMC Med Educ*. 2015;15:109. doi:10.1186/s12909-015-0398-y.

based on World Federation of Medical Education standards.¹⁶ Other schools that have established or improved their medical education units include UB, AAU, UEM, UoN, and UI.

Education Infrastructure

MEPI funding supported important investments in enhancing capacity through classroom renovations, skills laboratory renovations, and improvement of community site accommodations. At UB, MEPI funds were used to purchase an “anatomage” table to aid students learning anatomy. Lecture rooms were enhanced by adding LED screens, LCDs, microphones, and speakers. MakCHS, UoN, KCMUCo, UEM, UKZN, and KNUST have all installed or updated video conferencing equipment. The UoM introduced and equipped histopathology labs. The quality of learning facilities was reported to affect the quality of teaching and learning activities.¹⁷ These investments addressed documented deficiencies, and supported the learning environment.

Library Resources

Library resources are an integral part of learning, teaching, and research, and were a vital component of the MEPI program. Most MEPI schools had old libraries and lacked ICT capability to increase access for students and faculty. MEPI funding supported acquisition of books (in most cases e-books) and electronic subscriptions to journals. Some schools supported library infrastructure and provided computers, printers, and photocopiers, and created office space for ICT. AAU bought over 10,000 books and distributed them to their consortia. UI distributed 3,000 e-books and set up e-libraries in several MEPI Nigeria (MEPIN) consortia schools. A number of schools introduced courses on library use. The eLearning and LMIS TWGs supported training for librarians and ICT staff to enhance their capacity to use these resources and technologies.

In addition to the infrastructure and curriculum investments described above, students at MEPI schools benefited from opportunities to pursue advanced studies. Some postgraduate students benefited from fellowships at partner universities in the US and countries in Europe, and returned with new skills. For example, at UZCHS, postgraduate students reintroduced a stroke unit at the hospital, and learned new procedures including bronchoscopy and cardiac pacemaker insertions. The fellowships provided new skills and confidence to these students, who expressed willingness to take on greater leadership and teaching roles within the academic setting.

MEPI schools have registered increased enrollment over the MEPI period, and the opening of new medical schools increased the capacity to train even more students in the health care field. The UoB award supported the rollout of a brand new medical school. The school graduated the very first cohort of 36 graduates in 2014 and 44 in 2015 with considerable



¹⁷ Ayeni AJ, Adelabu MA. Improving learning infrastructure and environment for sustainable quality assurance practice in secondary schools in Ondo State, South-West, Nigeria. *IJRSE*. 2012;1(1):61-68.

support from the MEPI grant. BU in Uganda, part of the MESAU consortium, was able to open the Busitema University School of Medicine in eastern Uganda in 2013, and has reported three annual intakes of 60 students to date. MEPI funding support contributed to encouraging the government to pursue and support this new medical education venture. In Zimbabwe, discussions between MEPI site visitors and the ministry of higher education supported the reopening of a medical school at the National University of Science and Technology in Bulawayo. In Zambia, MEPI supported the training and supply of teachers of basic sciences to staff two new medical schools, one private and the other public.

In Ethiopia, MEPI supported the government's priorities to develop new capabilities to generate medical and other health care workers, by participating in a new medical school consortium that shared faculty and other resources.

Student Activities Connected to Retention

Though it is too early to confirm that graduates will be retained where they are most needed because of the MEPI investment, many activities were put in place toward achieving this key objective. These included expanded Community Based Education (CBE) and clinical training opportunities in upcountry clinical sites. University of Lagos in the MEPIN consortium offered a similar program which they called a preceptorship program. In some cases, practitioners in the community based sites were offered honorary teaching appointments as incentives to remain and continue teaching in sometimes isolated areas. These have helped to expose medical students to rural practice, improved the quality of services provided at those sites and lifted the morale of the practitioners who work in those upcountry locations.

At UZCHS, a Mentored Scholars Program for postgraduate students has enabled a cluster of students to pursue excellence in their work with attachment and the support of mentors selected from the local and international faculty. UI offers a mentored research program for postgraduate students and junior faculty. Further exposure and motivation was achieved by the award of fellowships to partners' universities abroad. Five recipients enrolled as academic staff. At SU, SURMEPI annually made grants available to doctoral and Master's students involved in studies that complemented MEPI objectives and several of these students have already graduated.

At the beginning of MEPI, 80% students at the UZCHS indicated by a show of hands that they had no intention of remaining to work in that country. However, during the last two years of MEPI, there was already evidence of a change in attitudes: in a similar informal poll 82% of undergraduate students indicated that they were willing to stay and work in Zimbabwe.¹⁸

¹⁸ UZCHS SVR 2015.

Student Activities Connected to Research

There are many examples where research opportunities have served as an incentive for students not only to improve the quality of their education, but also to affect their intention to stay in the country after graduation. The UZCHS employed a number of strategies to support its Mentored Research Scholars Project including financial support toward students' research projects, ongoing mentoring, research seminars, administrative support and skills training. Students are matched to supervisors in Zimbabwe and partner universities abroad. This has provided new research skills and many students enrolled as university teaching assistants. MEPI consortia, including MEPIN, MESAU and SURMEPI have also provided support and research training to their postgraduate students under the supervision of faculty. Student recipients of these funds have made impressive scientific presentations at the MEPI symposia each year. Many faculty have also benefitted from the research training and have passed on these skills to their students.



Student Activities Connected to HIV/AIDS

All MEPI schools are engaged in activities that address PEPFAR priorities and efforts to achieve an AIDS-free generation in their respective countries. As discussed in greater detail in Chapter 6, MEPI Impact on HIV Service Delivery, HIV/AIDS related topics have been introduced into the MEPI school curricula to address treatment and care of children and adults, prevention among high risk populations including prevention of mother-to-child transmission (PMTCT) and laboratory services. For example, UB developed the Botswana Primary Care Guideline, which is symptom-based, entirely through MEPI support. The Guideline addresses the four aspects of care and treatment of HIV and AIDS listed above through the revised national HIV guidelines. The mLearning computer tablet project, another fully MEPI funded initiative at the UB, provides a quick platform for accessing the guidelines electronically for service, teaching and learning not only for HIV related information but for the entire curriculum.

Student Organizational Activities

Over the MEPI period students have been active participants in many MEPI programs. Student representatives from all medical schools have attended the MEPI symposia; some have made presentations on their research as well. During the 4th MEPI symposium in Maputo, Mozambique, in August 2014, students established the MEPI Students' Network (MEPInet). The stated purpose of this new organization was to coordinate, link and strengthen collaboration among medical students in the various MEPI schools and foster their contributions toward expanding training and research opportunities for students in their respective schools, communities and countries. At the 5th MEPI symposium in Harare, Zimbabwe, students held a MEPInet preconference meeting and officially

launched the organization and produced a report. They announced plans to open a secretariat, establish a journal, start a discussion forum and establish chapters at each school. They also hope to hold a student symposium in 2016. At this meeting the students requested ACHEST support as they build their organization, specifically requesting office space for their Secretariat. ACHEST agreed to provide a desk for the president of the students' association.

As the PI Council is expected to continue beyond the MEPI grant period, it is important to consider the student community and the support they need to remain active. These young students will likely be practitioners in the health systems of the near future. They represent the fulfillment of MEPIs efforts to expand capacity and strengthen national health systems.

CHAPTER 4

MEPI Impact on Retention

4

MEPI Impact on Retention

A key goal of the MEPI project was to identify and implement measures to retain health care professionals in participating countries and, importantly, those professionals who were engaged in training the next generation of health care providers. To this end, MEPI explored innovative ways to attract and retain medical and other health professionals for service in areas where they were most needed.¹ Schools invested at various points along the training process, examining student and faculty recruitment strategies, revising curricula, and improving relationships with the government. The impact of these investments would be expected in the years to come. At the five-year mark, there were clearly systems in place to continue these investments and to track their success. In some cases there were even early results demonstrating successful retention strategies.

To increase the number and quality of new health care graduates, MEPI recognized that existing faculty needed support, especially as national governments called for more trained health care personnel, and in some cases mandated expanded enrollment in existing schools. MEPI schools worked to develop and institute new training methods to maximize existing staff resources and exploit new technologies that broadened their reach, thereby increasing the number of students that could be trained. In different ways, in different institutions, MEPI schools introduced measures to support faculty and provided administrative and facilities support for research, exchange, and educational innovation. Such support, MEPI theorized, could inspire and invigorate professionals, and provide the incentive to continue their professional services within the region.

These innovations and their impact on efforts to maintain and grow the health care workforce in MEPI-participating countries are discussed below.

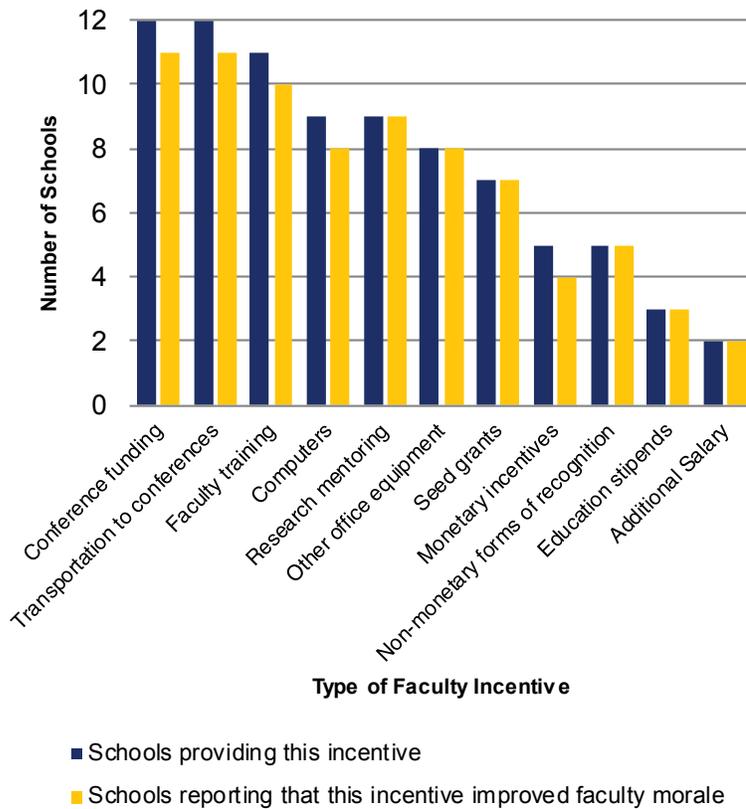
FACULTY RETENTION

All MEPI schools developed incentives strategies to retain faculty. These included support for research activities, advanced training opportunities, and increased access to technology, to improve the quality and efficiency of teaching. MEPI school faculty cited the opportunity to attend conferences and present their research as one of the most valued incentives (Exhibit 4.1 Incentives for Faculty). This support enabled them to network with peers, disseminate their work, and engage in collaborative research. Advanced training opportunities and seed funding for research empowered faculty to explore new areas, develop their skills, and made them feel valued and

¹ World Health Organization. Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations. <http://www.who.int/hrh/retention/guidelines/en/>. 2010. Accessed 23 November 2015.

acknowledged by their institutions. At UoN, for example, faculty who were trained in scientific writing later went on to obtain external funding for a research proposal.

EXHIBIT 4.1 MEPI Supported Faculty Incentives (2011-2015)



SOURCE: MEPI Annual Survey, Year 5, 2015
 NOTE: Includes data from 12 schools

Improvement to Academic Infrastructure

For many schools, MEPI represented the first substantive investment in medical education in many years, and, as such, it provided a unique opportunity to examine and strengthen the quality of medical education. Some schools invested in medical education quality by training faculty, introducing new approaches to teaching, and new equipment as a strategy to retain teachers in the schools’ training programs.

Among the 12 MEPI schools reporting in the Year 5 Annual Survey, there were over 1,367 individuals (combined part-time and full-time) teaching in the basic science faculty and almost 1,600 clinical faculty engaged in teaching medical students. The renewed focus on education quality highlighted the importance of strengthening the faculty’s teaching skills and the value and need for medical education research. Building up the academic environment for medical educators was seen as a way

Students who come from, train in, and are comfortable in rural settings are more likely to return to these sites after graduation.

- WHO guidelines on retention





“...MEPI’s support helped to improve the quality of teaching and learning processes...the year long attachment was a critical component of my medical training, as gaining hands-on training is a challenge for most medical students.”

- AAU student

to improve the work environment and job satisfaction, provide career opportunities for faculty, and thereby retain them. To this end, many schools including UNZA, UI, UoN, UZCHS, and SU established medical education departments or units to anchor these activities. These units were expected to drive and coordinate faculty development programs that advanced the quality of teaching and research in medical education. Many invested in advanced training in medical education pedagogy for faculty leads in medical education. For example, four members of the UoN faculty pursued a MSc in Medical Education. At AAU, a medical education unit was in place and a master’s degree was launched in Year 5 with about 15 students, all faculty from the consortium schools. This was the first master’s degree program in medical education in Ethiopia.²

MEPI schools also invested in strengthening the physical and digital work environment for teaching faculty. Many schools invested in establishing skills labs to supplement classroom and bedside teaching. All schools invested in using technology not only to improve the reach and quality of teaching, but also to reduce the workload on faculty. At KCMUCo, where the school significantly invested in technology and implemented online exams, the faculty reported a significant reduction in workload. With MEPI support for research and investments in modern teaching methods, KCMUCo was able to attract more faculty, increasing faculty from 96 to 167 members after the introduction of MEPI.

Advanced Training & Research Opportunities for Existing Faculty

Advanced training opportunities in teaching and research were offered by many schools as a means to retain faculty. Some schools focused on faculty at the tertiary sites and others expanded this offering to community providers involved in teaching. Increasing class sizes (up to four-fold) meant classrooms and teaching hospitals were saturated. As such, many schools decentralized instruction and training by working with district and community health facilities to host student rotations. This prompted a need to recruit, train, and retain faculty from these non-tertiary health facilities to support and oversee students. Schools reported that effective incentives included appointment as adjunct faculty and providing access to library resources. UoN was one of the first MEPI programs to implement decentralized training sites, wherein well-trained health experts from decentralized sites were appointed as adjunct faculty to teach students.³ This innovation has played a key role in sustainability at UoN. The relationship with decentralized training sites was formalized through signing of memoranda of understanding, further contributing to the sustainability of the UoN program.

In Zambia, MEPI identified a stronger research environment as one of the major strategies to retain faculty at UNZA and the consortia schools. A strong foundation which included research training and greater research

² AAU SVR, 2015

³ UoN SVR, 2015

support was established to support students and faculty in their research activities and facilitate retention.⁴ In Mozambique, the development of master's degree programs at UniLurio and the associated requirement for a research project was expected to facilitate retention of both graduates and faculty by providing an avenue for advanced degrees and research training within the country.⁵

Increased Recruitment of New Faculty

The limited pool of faculty (all schools had open faculty positions) working to keep up with the demands of increasing class sizes was a major bottleneck and threatened both teaching quality and new faculty recruitment. These high demands resulted in faculty fatigue and turnover, and compromised retention of existing talent in the faculty pool. One of the ways schools coped with gaps in faculty was to recruit from other countries. This could be costly and could have negative impacts on local health workforce dynamics. Therefore, a number of MEPI schools employed strategies directed at training and retaining junior faculty. Because the pool of potential faculty was limited in the region (especially in basic science fields such as pathology and anatomy), some schools established or expanded master's level programs to train their own faculty. In Zambia, UNZA scaled up their existing master's programs and started new programs to expand the pipeline for medical school faculty for the country. By 2013, they were able to recruit 36 Staff Development Fellows (SDFs) who enrolled in master's degree programs. This represented a 30% increase in one year. Once the fellows completed their studies and were qualified, they were expected to become faculty at UNZA and its partner universities. The SDFs would be bonded for a minimum of two years and could also choose to go on and do PhDs in their respective disciplines. New universities in Zambia sponsored some SDFs with the expectation that they would return as faculty to the sponsoring universities.⁶

Six schools used MEPI funding to directly hire new staff for a variety of positions. These schools reported hiring a total of 51 staff; all but four positions were expected to continue beyond the grant period. The department/faculty planned to absorb 24 of these positions, 19 would be supported by other grants, and government ministries committed to support four.

RETENTION OF GRADUATES & ADDRESSING MAL-DISTRIBUTION

All five education retention focused recommendations included in the WHO Retention guidelines were addressed in various ways, to some extent, by MEPI schools.⁷ The first recommendation stresses the importance of targeted admission policies for students with a rural background. Five schools reported recruitment programs specifically



⁴ UNZA SVR, 2015

⁵ UEM SVR, 2015

⁶ UNZA SVR, 2013

⁷ WHO Op cit.

“...they have always taught us that you learn medicine not from the textbook but from the patient...You really learn a lot when you see a patient, from history taking right up to diagnosis, management, and follow up...you never forget.”

- UKZN 4th year medical student after rural rotation

aimed at rural or underserved students.⁸ In Uganda, the MEPI consortia, MESAU, conducted a study of admissions trends at consortia schools, to better inform recruitment strategies. The results were expected to enable data-driven advocacy at the national level to push for rural recruitment and more diverse admissions criteria. The study found that there was an imbalance in the distribution of admitted students, with more than 90% of students coming from schools within a 50 km radius of Kampala, Uganda’s capital city, though these schools constituted just 2% of all high schools in the country. There was a recognized need for geographical and socio-economic equity in the admissions into medical schools, with an emphasis on Uganda’s rural areas.⁹ MESAU has also started to generate evidence regarding the student population from rural and/or underserved areas in order to justify and advocate for an admissions system that would include affirmative action for rural students. In South Africa, at SU, rural and underserved learners were given priority in the selection process for medical school. These approaches to increase the recruitment of students from rural areas may have important future implications for rural health worker retention.¹⁰

The second recommendation in the WHO retention guidelines refers to locating training programs outside of capital and major urban cities. There were a number of new schools that MEPI supported and many formed in-country consortia with other MEPI schools. For example, MEPI participated in Uganda’s newly opened school of medicine at Busitema University (BU) in Mbale, a city over 150 miles northeast of the capital, Kampala. Other new schools, located outside capital cities, were supported in Zambia, Ethiopia, and Kenya.

The third and fourth recommendations of the WHO retention guidelines refer to creating rural community experiences and rotations for students, as well as including rural health topics in the curricula for training undergraduate and post-graduate students. Exhibit 4.2 lists multiple barriers to retention reported by MEPI schools. Many schools in MEPI examined and revised their community-based training programs with an effort to improve student comfort, confidence, and competence in working in underserved areas, and to ultimately improve the distribution of graduates. Such activities included expanding the number and quality of community-based learning sites, and providing faculty and student support during community rotations.

Driven by a need to offload crowded tertiary hospitals, to provide hands-on experiences for students, and to train in the setting where providers were most needed, many schools expanded the number of clinical sites outside of the tertiary hospital. In South Africa, MEPI supported the decentralized training platform at UKZN by supporting the introduction of a six-week rural rotation known as the Integrated Primary Care 3 attachment. MEPI also helped to establish Decentralized Centers of Excellence (Medical

⁸ Moodley K, Fish T, Naidoo S. The role of socially accountable universities in improving the selection of medical students from rural and under-served areas, *Afr J Health Prof Ed*.2015;7:1

⁹ MakCHS SVR, 2015

¹⁰ SU SVR, 2015

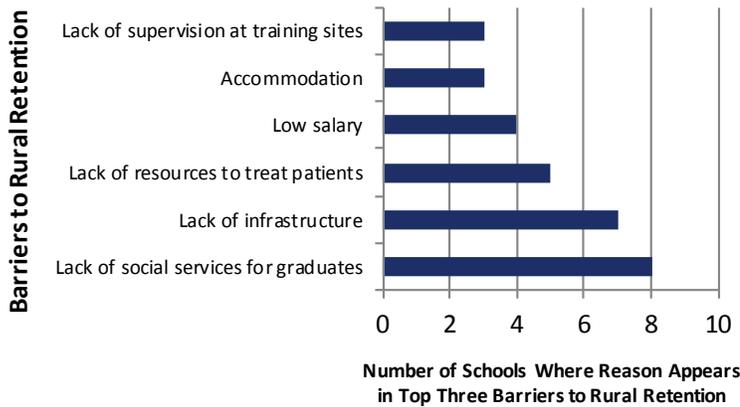
Learning Centers) at ten district hospitals in KwaZulu-Natal where students were placed.

One of the greatest achievements of UoN's Partnership for Innovative Medical Education in Kenya (PRIME-K), was its successful decentralized training program. Through this program, students from multiple health professions training programs at UoN were sent to district hospitals for their clinical rotations. This model of decentralized training, triggered in part by tertiary hospitals crowded with trainees, also aimed to increase healthcare worker (HCW) retention at rural sites to improve access to healthcare. PRIME-K successfully met its five-year target of partnering and building capacity at 18 sites. A total of 519 medical, pharmacy, nursing, and dental students completed rotations at these sites in 2011 to 2014; an additional 250 students were scheduled for Year 5. Eighty-one medical students and 46 pharmacy students completed their rotation in Year 5.¹¹ Students who participated in training at the decentralized sites stated that they enjoyed these rotations and benefited from the ample opportunities to practice clinical skills. Students also said that they would continue to choose to go to these sites even if the stipend was taken away.¹²

“Participation in curriculum development is compulsory for all staff ...to continuously revise our curriculum in order to train better medical doctors.”

- Dean, Faculty of Medicine, Gulu University, part of MESAU

EXHIBIT 4.2 Top Barriers to Rural Retention (2015)



SOURCE: MEPI Final Year Survey (2015)
 NOTE: Includes data from the 10 schools that reported difficulties with rural retention

Over the course of MEPI, as the number of non-tertiary sites used for training expanded, careful consideration was given to site selection. In Uganda, the medical schools established standard criteria for health facilities that participated in their Community-Based Education, Research and Service (COBERS) program. This created a pool of sites where an institution could potentially place students and support increased student intake and community-based training capacity. MESAU's original goal was to have around 60 hospital/COBERS sites fully operational; the program actually exceeded this goal, with 162 sites in 72 districts across the country. From Years 2 to 4, COBERS sites increased by 43%.

Community-based education (CBE) activities were seen by MEPI schools

¹¹ UoN Source: MEPI Annual Survey, Year 5, 2015 Note: Includes data from the 10 schools that reported difficulties with rural retention. SVR, 2015

¹² UoN SVR, 2013

For the 1st time in the 90-year history of medical education in Uganda, students from years 1-4 are traveling to all regions in the country to provide services under supervision as they learn. The expectation is that students who feel comfortable and competent providing care in these settings will be more likely to return to these areas after graduation, addressing both retention and distribution challenges in Uganda.

- MakCHS Site Visit Report, 2015

as a strategy to give students opportunities to strengthen clinical skills, care for the underserved, and develop a sense of social accountability through community engagement. Several schools reviewed their CBE curricula to ensure their activities and objectives were aligned. In Year 5 of MEPI, the CBE TWG worked with a consultant to conduct a peer review of the CBE program at UZCHS. The method of peer review was adapted from one used by the Community Health Engagement in Education and Research (CHEER) group of health professions schools in South Africa. Peer reviewers included faculty from the CC and other MEPI schools. The team conducted a review of the curriculum and provided UZCHS with recommendations on how to strengthen their CBE program to align it with their intended objective of retention. Both the UZCHS team and the peer reviewers reported that the process was informative and highly valued. As a result of the review, UZCHS recognized the need to identify an academic lead for the overall CBE program in the curriculum and began the process of revising the governing structure for the same.

Improving Evaluation of CBE

Expanding CBE and decentralizing medical education is resource intensive. Schools need to invest in providing faculty support and logistics support for students. Similarly, those who govern the health facility need to invest in providing necessary supplies and resources to host students. The evaluation of CBE, therefore, becomes of paramount importance to demonstrate the return on investment. An evaluation workshop was run by the CC and a technical assistance consultant to strengthen efforts to monitor and evaluate CBE.¹³ Workshop participants developed a logic model for their CBE program, and subsequently developed a specific evaluation plan for their program. Schools with established tools shared them with the group.

In Uganda, to assess the effect of COBERS, an Impact Evaluation Study was initiated to examine the impact of CBE on participating students, providers, and the community. Five manuscripts from this study were developed by mid 2015; as many as eight scientific manuscripts were expected to result from the baseline study¹⁴ (see Appendix C, MEPI Supported Publications).

Following the CBE evaluation workshop, the CBE TWG embarked on a collaborative research effort, coordinated by the CC, to design a study across ten countries and all 11 programmatic awarded MEPI schools. The study sought to examine the contribution medical students made to the health facilities when they were placed outside of the tertiary hospital. The study team, with representation from each school, developed qualitative and quantitative evaluation tools. In Nigeria, following the implementation of the tool developed by the TWG, there were plans to examine the experiences of students, doctors and patients using an adapted version of the MEPI CBE working group questionnaire. It would be applied to all 50

¹³ Bailey RJ, Baingana RK, Couper ID, et al. Evaluating community-based medical education programmes in Africa: A workshop report. *African Journal of Health Professions Education*. 2015; 7(1): 140-144.

¹⁴ MakCHS SVR, 2015

facilities where the students had been sent and compared among those where training of the preceptors had been done and those where it had not taken place.¹⁵ SU and UKZN similarly expressed intentions to adapt the evaluation tool for use across additional CBE sites.

SU leveraged MEPI resources to conduct a robust evaluation of their rural training platform, Stellenbosch University Rural Medical Education Partnership Initiative (SURMEPI). SURMEPI funds were used to enhance the exposure of the medical students to rural and underserved areas, and to improve the quality of those experiences. SU offered a Rural Clinical School (RCS) where select students were immersed in rural communities for the duration of a year. The first cohort of eight RCS students completed their two years of mandatory internship, and 75% returned to rural and/or underserved communities to practice. The evaluation also revealed that students who were attached to the RCS had very positive experiences, and, on common exams, performed as well as students who were in the traditional training programs.^{16,17,18}

Continuing Education for Faculty

The fifth and final education recommendation within the WHO retention guidelines is to provide continuing education and professional development opportunities for rural physicians. Opportunities for professional advancement would presumably enable rural physicians to overcome some other barriers to rural practice, which include limited resources as well as inadequate infrastructure and social services. Where medical schools established decentralized training sites at peripheral hospitals, providers engaged in teaching were offered advanced training opportunities. Faculty from UoN who participated in decentralized training reported that their new academic responsibilities increased their job satisfaction and made them more inclined to stay in their posting away from the urban center.¹⁹ In Ethiopia, the MoH and the Ethiopian Medical Association partnered with AAU to support research endeavors for physicians in rural practice. Two cohorts of junior medical doctors (17 and 21 respectively) from different regions of the country received introductory research methods training and support in developing their research proposals. The first cohorts completed their research and have disseminated and published their results²⁰ (see Appendix C: MEPI Supported Publications).

Graduate Tracking & Retention

In an effort to assess and monitor the retention and distribution of graduates, MEPI schools invested in establishing or strengthening graduate tracking systems. From Year 1, it was clear that data about where graduates went to work following their MEPI supported studies could be useful in demonstrating the success of investments in improving in-country retention. MEPI schools employed a number of strategies to identify where existing graduates are currently placed. Most used alumni

“The community attachment experience improves medical education by providing hands-on learning, new case studies and clinical work...”

- AAU instructor

¹⁵ UI SVR, 2015

¹⁶ SU SVR, 2014

¹⁷ Van Schalkwyk SV, Kok N, Conradie H, van Heerden E, Academic achievement of final year medical students on a rural clinical platform: Can we dispel the myths? *Afr J Health Prof Ed.* 2015; 7(1) 115-118.

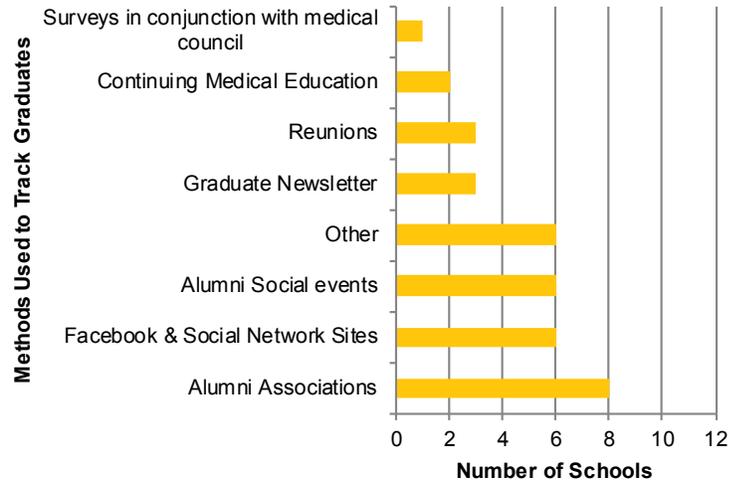
¹⁸ Voss M, Coetzee F, Conradie H, van Schalkwyk S ‘We have to flap our wings or fall to the ground’: The experiences of medical students on a longitudinal integrated clinical model. *Afr J Health Prof Ed.* 2015;7(1) 119-124

¹⁹ Dramowski A, Marais F, Goliath C, Methar S, Impact of a quality improvement project to strengthen infection prevention and control training at rural healthcare facilities. *Afr J Health Prof Ed.* 2015; 7(1)73-75.

²⁰ AAU SVR, 2014

associations to follow up on graduates, and many (50%) reported using social media for this purpose.

EXHIBIT 4.3 Methods Schools Used to Track Graduates (2015)



SOURCE: MEPI Final Year Survey (2015)
 NOTE: Includes data from 12 schools.

The PI Council established the Graduate Tracking TWG to explore options to establish an electronic system to capture, maintain, and monitor graduate data. The working group brought together representatives from each school to share ideas, resources, and examples. In Year 2, the TWG worked with another USG-funded project, CapacityPlus, and the CC to identify methods to support the schools in developing tracking systems. Two workshops were held during the MEPI grant period. The first focused on determining the minimum data set and characteristics required of a tracking system. Following the workshop, technical experts customized existing open access tracking software to the agreed upon metrics. During the second workshop, school representatives were offered training in how to use the system and upload their existing data. In the final year of MEPI, schools were at different stages of launching and integrating the graduate tracking system. Some schools have identified or recruited staff to continue the work of maintaining the system beyond the MEPI time frame. The MESAU consortium launched their tracking system at the Year 5 site visit and expressed their clear intent to use it beyond the MEPI grant period. A staff member was identified to oversee the implementation going forward. The MESAU team anticipated a high rate of success using the tracking system to capture information about new and currently enrolled students, but also acknowledged challenges in capturing information about alumni who had graduated in the past.

At KCMUCo, the tracking software has replaced the paper-based program. Current students were entered in Year 5. Approximately 31% of students

from KCMUCo have already been tracked, and staff were engaged in creative and persistent efforts to track the rest of the alumni. One hundred percent of 2013 graduates were in the system and 116/119 of the 2014 graduates were in the system. The school has proposed funding a cohort study to examine KCMUCo graduates' contributions to Tanzania's rural-urban distribution gap.²¹

STRENGTHENING LINKS TO KEY STAKEHOLDERS

Across the MEPI network, stronger relationships between medical schools and their respective ministries of health have facilitated better alignment between the competencies taught and the country's health issues, linking those who train with those who employ. Looking again at Exhibit 4.2, a number of the most commonly stated barriers to retention related to conditions of employment, including salary and social services for graduates, and infrastructure at rural sites. Relations with MoH are therefore critical in ultimately improving rural retention. Many MEPI schools have improved their relationships with government and other regulatory agencies. For example, MESAU enjoys vibrant stakeholder relationships and partnerships with the Uganda Medical and Dental Practitioners Council and the MoH and district and local governments. As a result of the partnerships between MESAU and the government, BU's vice chancellor was able to negotiate with the Ministry of Education and Sports and the Ministry of Finance, Planning and Economic Development to support salaries of staff in the new school. The academic registrar and the dean of the medical school have met with MoH officials to discuss plans for scaling up health training at the school. This strong relationship with the government is therefore informing health workforce planning and development. Such advocacy efforts around healthcare worker planning at the national level will require sustained dialogue and advocacy.²²

The MEPI program has strengthened efforts to improve the retention and distribution of graduates. Given the finite and relatively short time frame for the investment, much of the progress has been in strengthening the system. Increasing faculty recruitment and retention to expand the capacity of training programs was a major achievement of MEPI. The impact on graduate retention will be observed in the years to come, as students graduate from programs with curricula strengthened to produce health professionals motivated to work in areas where they are most needed. Graduate tracking systems will be useful in documenting the success of these efforts.



²¹ KCMUCo SVR, 2015

²² MakCHS SVR, 2015

CHAPTER 5

MEPI Research Capacity & Environments

5

MEPI Research Capacity & Environments



One of the key aims of MEPI was to help medical schools in sub-Saharan Africa build the capacity to conduct locally driven and regionally relevant research (Theme 3). MEPI schools faced several challenges in this area, including limited faculty time, expertise, and administrative support. Over the life of the MEPI project, MEPI support contributed to scaling up a variety of research efforts in the participating schools, many related to building research infrastructure and providing direct training to support research. These research efforts were translated into practice in service environments, spawned South-to-South partnerships, and produced numerous publications (see Appendix C: MEPI Publications, for complete list of publications supported by MEPI). A great deal of the research was done as part of the programmatic awards, but there were also six linked awards, and two pilot linked awards, which were predominantly research awards. This chapter describes how MEPI activities impacted research environments from the perspective of students, faculty, and institutions in both the direct programmatic award recipient schools and in each of the linked award sites.

THE ROLE OF RESEARCH SUPPORT CENTERS

Building a sustainable research environment is crucial to the development and maintenance of strong research programs.¹ Establishing a research office that supports faculty research design, grant writing and reporting, and other research management capacity enhancements contributes to building a sustainable research environment and bolsters the institution's ability to attract funding and recruit and retain research-interested faculty. MEPI has provided fundamental support for this activity. In addition, over the course of the MEPI award, MEPI schools have demonstrated strong growth in research related to medical education design, delivery and evaluation. This has created opportunities for medical educators to publish in the peer review literature, pursue faculty advancement, and improve educational quality.

MEPI schools determined where to focus their research efforts in the core areas of training and mentoring and infrastructure development (Exhibit 5.1). Each school independently determined its research priorities. It is important to note that the NIH recently awarded a total of \$36M to 11 MEPI schools over the next five years to strengthen their capacity to participate in and carry out locally relevant research that contributes to improved

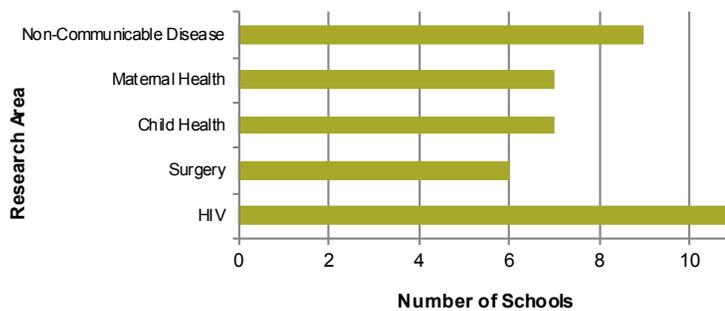
¹ "Research must play an integral part in generating sustainable, quality health care in sub-Saharan Africa, which is the ultimate goal...it is critical that we increase research capacity so Africans can carry out locally relevant investigations themselves..." Francis S. Collins, NIH Director, Global Health Matters, Sept-Oct 2015. (available at www.fic.nih.gov/News/GlobalHealthMatters/september-october-2015/Pages/mepi-junior-faculty-awards.aspx). Accessed 30 October 2015

human health, and to foster the next generation of faculty researchers in Africa after the original MEPI award concludes.²

RESEARCH AREAS BEING SUPPORTED BY MEPI

As part of the yearly surveys MEPI schools identified research areas that were pursued with MEPI support. Schools selected from a list that included: HIV/AIDS, Maternal Health, Child Health, Cancer/Non-Communicable Diseases, and Surgery. Exhibit 5.1 shows the distribution of support across these research areas. Schools also noted other areas of research, including emergency medicine, health systems, medical education, herbal medicine, malaria, mental health, pharmacy, nursing and public health.³

EXHIBIT 5.1 Research Areas Supported by MEPI (2011-2015)



SOURCE: MEPI Final Year Survey (2015)
NOTE: Includes data from 11 schools

RESEARCH SUPPORT CENTERS

All MEPI schools included activities to increase research capacity, many of which can be classified as the creation of components of Research Support Centers (RSCs). By 2015, all 13 MEPI schools had established a center to assist in grant writing, research design, protocol development, IRB/eIRB compliance, faculty mentoring, and clearinghouses for research opportunities. The RSCs are housed in the medical school, college of health sciences, or at the university level.⁴ Strengthening capacity in the RSCs was an early goal and in the first two years of the grant, RSCs hired a total of 261 full time employees (faculty, writing specialists, award administrators, technical and legal experts).⁵ Exhibit 5.2 shows the types of support provided by RSCs and how they have increased.

Twelve MEPI schools created research support centers to assist in grant writing, research design, protocol development, IRB/eIRB compliance, faculty mentoring, research opportunity clearinghouses... 10 schools reported 26 successful grant awards independent of MEPI funds.

² <http://grants.nih.gov/grants/guide/rfa-files/RFA-TW-14-003.html>

³ MEPI AS, Year 5, 2015

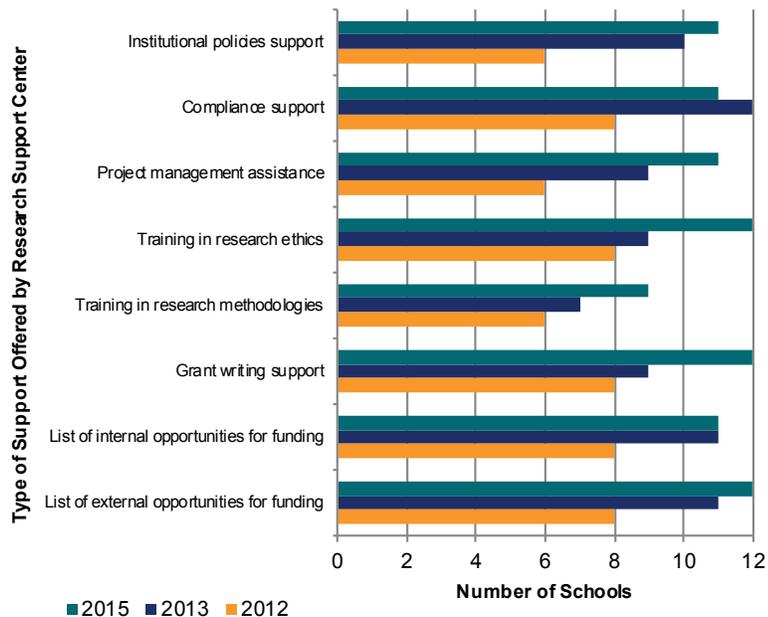
⁴ MEPI AS, Year 5, 2015

⁵ MEPI AS, Year 5, 2015

“I was able to pursue a Masters degree in Microbiology, thanks to MESAU research funds, that enabled me to carry out a study on the level of resistance to first and second line anti-tuberculosis drugs among treatment naïve pulmonary TB patients in Southwestern Uganda. [the work] was published in a peer reviewed journal.. MEPI_MESAU provided training in scientific writing, mentorship, grants writing, all of which has made me a better researcher and trainer.”

-MESAU fellow

EXHIBIT 5.2 Type of Support Offered by School's Research Support Centers (2012-2015)



SOURCE: Data from MEPI Round 2 Survey (2012), MEPI Round 3 Survey (2013), and MEPI Final Year Survey (2015).

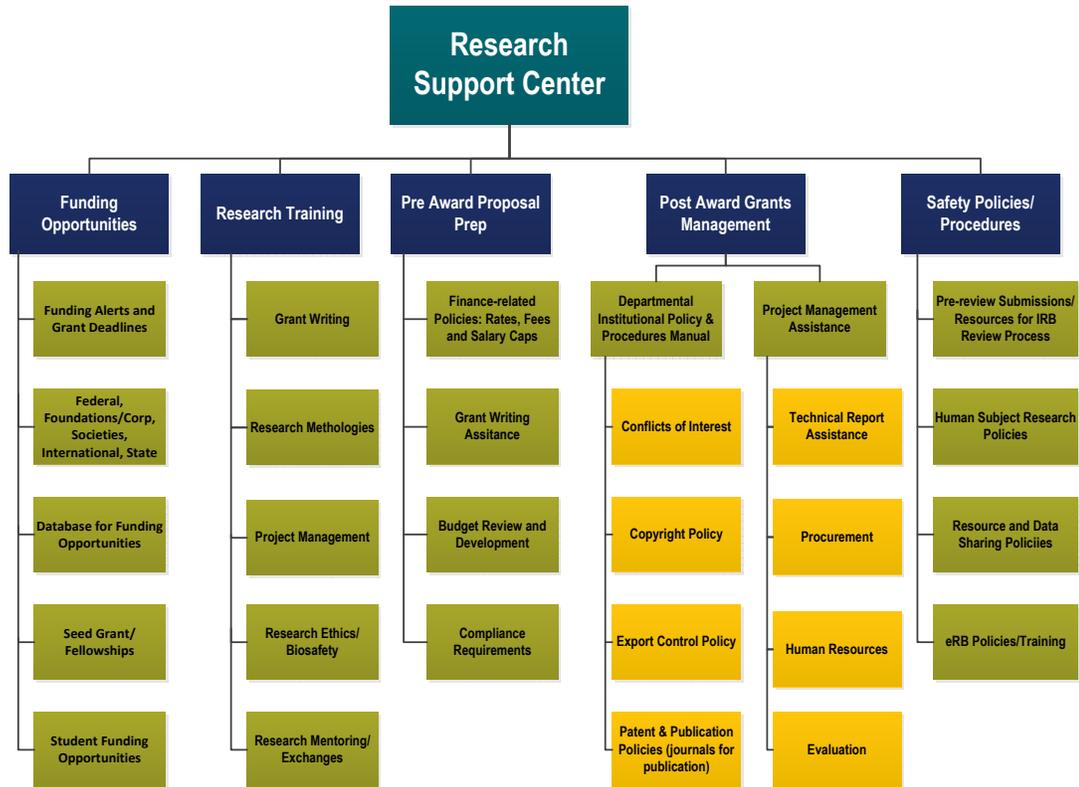
NOTE: Includes data from 12 schools

RSCs provide needed support to researchers, but setting one up requires a strategic approach to enlisting support from multiple stakeholders (and occasionally from different institutions), developing an overarching research policy, and developing and providing research training opportunities.⁶ Experience at MEPI schools demonstrated that creating an RSC can lead to rapid scale up of grant applications, increased funding, and increased faculty satisfaction. The UZCHS identified an impressive progression of grant applications through their RSC. They submitted three applications in 2011, three in 2012, four in 2013, six in 2014, and 15 in the first eight months of 2015. Of those applications, 11 were awarded and nine were pending as of August 2015. In addition, UZCHS reported a high level of satisfaction (83%) with the RSC from faculty survey respondents who reported using one or more of the RSC services.⁷ At UoN, an office of research promotion was created, further highlighting the value of research.

⁶ Mashaah T, Hakim J, Chidzonge M, et al. Strengthening Research Governance for Sustainable Research: Experiences From Three Zimbabwean Universities. Acad Med. 2014; 89(8), S69-S72.

⁷ UZCHS SSR, 2015

EXHIBIT 5.3 RSC Roadmap



SOURCE: Konopka K, Bedada S, Scott J. RSCTWG Documents, 2012

NOTE: Early in MEPI, the Research Cluster of the MEPI Coordinating Center developed a list of activities and areas of expertise commonly provided by RSCs by looking at programs in the United States and Africa. It was shared with the MEPI grantees by the Research Support Center Technical Working Group (RSCTWG) as a roadmap, but not necessarily what would be implemented at each institution

RESEARCH FUNDING & FELLOWSHIPS

Effective research cannot flourish without sustained support and strong administrative and fiscal management. Many schools worked to develop research capabilities as a strategy to enhance the capacity and retention missions of MEPI. For example, at MEPI schools, faculty members, especially junior faculty, were awarded “seed” funding to support and encourage their pursuit of research careers.

Prior to the introduction of MEPI at UEM in Mozambique, research support was limited. The “overall shortage, sporadic availability, and inefficient administration of research funding severely limited research development. Inconsistent administrative policies and lack of fiscal management infrastructure have been particularly damaging. Such capacity is fundamental to attract and properly manage research activities.”⁸ A MEPI-supported needs assessment and some early interventions contributed to improving research capacity and flexibility to leverage resources within the Mozambique universities.

Fellowships to support research are another vehicle to develop research capabilities among faculty and students. By year five, MEPI schools

⁸ Noormahomed E, Mocumbi A, Prezi-osi M et al. Strengthening research capacity through the medical education partnership initiative: the Mozambique experience. *Human Resources for Health* 2013;11(1):62.



reported an increase in fellowships or funding to health professions students at their institutions, and the number of schools that provided such funding increased as well. In 2011, six MEPI schools reported that fellowships or funding was made available to postgraduate trainees and faculty members at their institution and by the end of 2015, nine schools were providing such funding.⁹ From 2012-2015, a total of 458 fellowship/funding programs were awarded with MEPI support. This funding ranged from implementation science fellowships, to career development fellowships, to supporting community based education. In round five of the MEPI survey, almost 3,000 undergraduates, 552 postgraduates, and 129 PhD candidates were reported to be participating in MEPI-funded research.¹⁰

As a direct result of MEPI, by 2015, 26 new research projects were underway with funding that was independent of the MEPI grants. This figure includes five iRIM grants from the NIH.¹¹

INSTITUTIONAL REVIEW BOARD (IRB)/ETHICS

Several MEPI schools utilized funding to enhance IRB processes and provide research ethics trainings for their faculty. Some schools set up electronic IRBs as a way of processing applications for research funding in a more streamlined manner. Some MEPI schools, such as SU, developed toolkits for faculty and students interested in doing research that include sections on informed consent, how to handle data/information, and other relevant ethical issues.¹²

At UKZN, the Building Research Ethics Capacity (RESCAP) program had 453 participants over the past four years complete the online research ethics module.¹³ UKZN also developed a research ethics module specific to South Africa, the Training and Resources in Research Ethics Evaluation (TRREE) module. This free resource was available online as of early 2014 on the TRREE online platform, elearning.treee.org.

STUDENT & FACULTY MENTORING

Experienced faculty are an invaluable resource as mentors to peers, junior faculty and students. MEPI supported research mentoring through peer-to-peer training, small funding awards for research activities, and local mentorship of postgraduate students.¹⁴ Research mentorship is increasingly important when developing junior-level faculty researchers. Six MEPI schools have research mentoring programs specifically for faculty, three of which were supported by MEPI, and ten have research mentoring for students, nine of which were supported by MEPI (Exhibit 5.4). The total number of MEPI supported research trainees are: 2,991 undergraduates, 552 postgraduates, and 129 PhDs.

⁹ MEPIAS, Years 1 and 5, 2011 and 2015

¹⁰ MEPI AS, Year 5, 2015

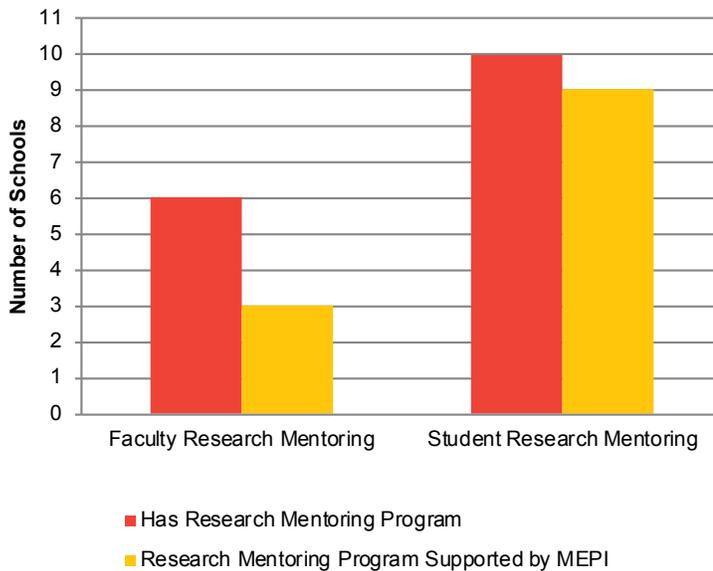
¹¹ MEPI AS, Year 5, 2015

¹² This faculty and student research toolkit is a self-produced product of Stellenbosch University. Van Schalkwyk et al, 2012.

¹³ UKZN SSR, 2015

¹⁴ Examples of mentoring programs used by universities in the US were compiled by the CC and made available on the MEPI website at <http://www.mepinetwork.org/research-support-centers>.

EXHIBIT 5.4 Research Mentoring Programs, Total and MEPI-Supported (2015)



SOURCE: Data from MEPI Final Year Survey (2015).
NOTE: Includes data from 11 schools

Two examples of MEPI school mentoring programs include those at UB and KCUMCo listed below:

- “In addition to the mLearning and other training infrastructure investment, UoB has supported mentored research for residents and medical students both directly and indirectly. All residents are required to conduct a research project as part of their master of medicine degree while medical students have to complete a research project in their public health rotation in the fourth year. MEPI has supported training, through indirect and direct faculty support, data collection, and manuscript publication costs. Students have also been supported to present their findings at regional and international conferences.”¹⁵
- “The Mentored Research Training Program (MRTP) was implemented to enable senior scientists and faculty at KCMUCo to mentor undergraduate students in the practical aspects of research and to enhance their interest in the pursuit of research after graduation. By June 2015, more than half of the KCMUCo faculty members (61 faculty) and nearly 1/5th of medical students (144 students) were engaged in MRTP. The overflow of mentorship to other non-medical students such as nursing, physiotherapy and laboratory sciences has also been realized.”¹⁶

FUNDING SUPPORT

MEPI schools supported improving the research capacities of their faculty. Twelve schools reported that MEPI funds were used to train researchers

The mentorship program at MEPIN makes competitive seed funding awards for junior faculty... Applications have more than doubled, from 33 in year three to 77 in year four, although MEPIN only has funds to support 17 faculty projects. For the first time, the number of excellent applications exceeded the funding available within MEPIN. To date, eight projects have been completed and published papers, while 26 are ongoing, and 23 are awaiting IRB approval.”¹⁷

¹⁵ UB SSR, 2015

¹⁶ KCUMCo SSR, 2015

¹⁷ UI SVR, 2014



in grant writing. Ten schools reported that MEPI helped facilitate access to new funding opportunities, including 26 successful awards, independent of the original MEPI awards.¹⁸ These largely international funding opportunities supported research on topics ranging from mental health, to HIV co-infection, to strengthening overall research capacity. MEPI helped drive this additional funding largely through helping with grant writing and mentorship.

PEPFAR, in conjunction with the NIH, facilitated \$2.3M to strengthen research management at five MEPI schools.¹⁹ Awarded in June 2012, the Initiative on Research and Innovation Management (iRIM) aimed to provide African institutions that had research management training experience the opportunity to develop and host innovative research administration training; and to enable African institutions that had limited research administration capacity to obtain the infrastructure necessary to develop and/or strengthen a centralized institutional research and innovation management.

FACULTY-RELATED TRAINING

Previous studies have indicated that “investing in African training institutions has provided a regional training resource whose graduates stay in Africa after graduation.”²⁰ MEPI supported faculty training and education in medical or general education research at nine of the 13 schools. There were a total of 96 different research trainings offered during the award period including trainings on grant writing, research ethics, and systematic literature reviews.²¹ In addition, MEPI supported the creation of dedicated and structured writing workshops for MEPI staff wishing to take their research and/or evaluation activities forward to publication. SURMEPI’s 2015 special edition of the African Journal of Health Professions Education (AJHPE) that contained 14 peer-reviewed articles was a direct outcome of two such initiatives.

¹⁸ MEPI AS, Year 5, 2015

¹⁹ Kwame Nkrumah University of Science and Technology; University of Nairobi; University of Ibadan; Makerere University; and University of Zimbabwe received the iRIM awards. (<http://www.fic.nih.gov/Programs/MedicalEducation/Pages/mepi-irim-supplements.aspx> accessed 23 September 2015)

²⁰ Kellerman R, Klipstein-Grobusch K, Weiner R, Wayling S, Fonn S. Investing in African research training institutions creates sustainable capacity for Africa: the case of the University of the Witwatersrand School of Public Health masters programme in epidemiology and biostatistics. *Health Res Policy Sys.* 2012;10(1):11

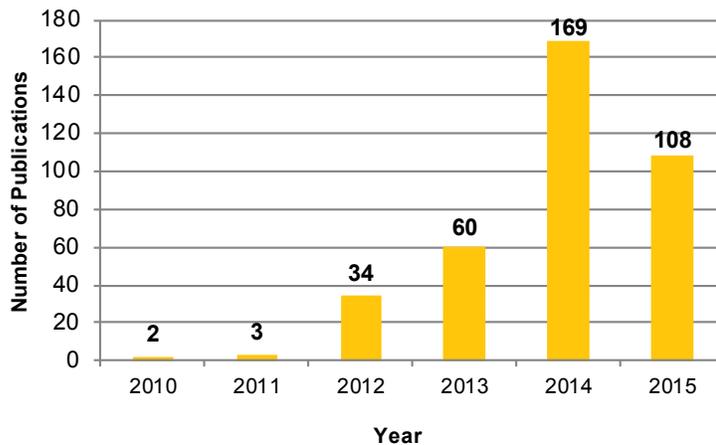
²¹ MEPI AS, Year 5, 2015

DISSEMINATING KNOWLEDGE THROUGH SCHOLARLY PUBLICATIONS & PRESENTATIONS

Scholarly Publications

Publication generation has grown dramatically over MEPI’s five years (Exhibit 5.5). As of mid-2015, MEPI institutions had published 376 original research papers. Approximately 35 percent are related to medical education research. (See Appendix C: MEPI Publications for a comprehensive list of publications resulting from MEPI research, listed alphabetically by author.)

EXHIBIT 5.5 Number of MEPI Publications by Year (2010-2015)

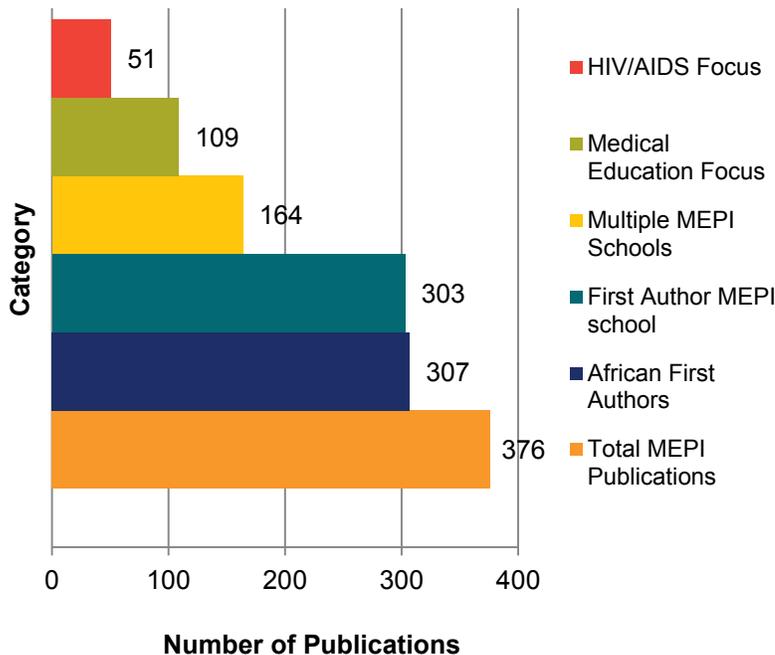


SOURCE: Data compiled from MEPI Final Year Survey (2015), 13 school level reports, and CC report.
 NOTE: Includes data from 13 schools and CC. Data was captured mid-2015.

It is notable that 307 of these publications were first-authored by faculty from the MEPI schools (Exhibit 5.6) and contributed to the body of knowledge about medical education as well as HIV/AIDS. A significant publication was the Academic Medicine supplement in August 2014: The Medical Education Partnership Initiative: Investing in Medical Education in Sub-Saharan Africa. This publication of 33 articles represented the work of 225 authors, more than 60 percent of whom hailed from Africa (22 papers featured African first authors).

At MakCHS, "Supporting faculty to do research is a means of retention: Thirty research funding awards were made to junior and mid-level faculty and received support from RSCs. Thirty faculty research groups and 122 student teams were competitively awarded funds for research on national health priorities."²²

EXHIBIT 5.6 MEPI Publications, by Category (2010-2015)



SOURCE: Data compiled from MEPI Final Year Survey (2015), 13 school level reports, and CC report.
 NOTE: Includes data from 13 schools and CC. Data was captured mid-2015.

²² MakCHS SSR, 2015



Presentations at Academic Meetings

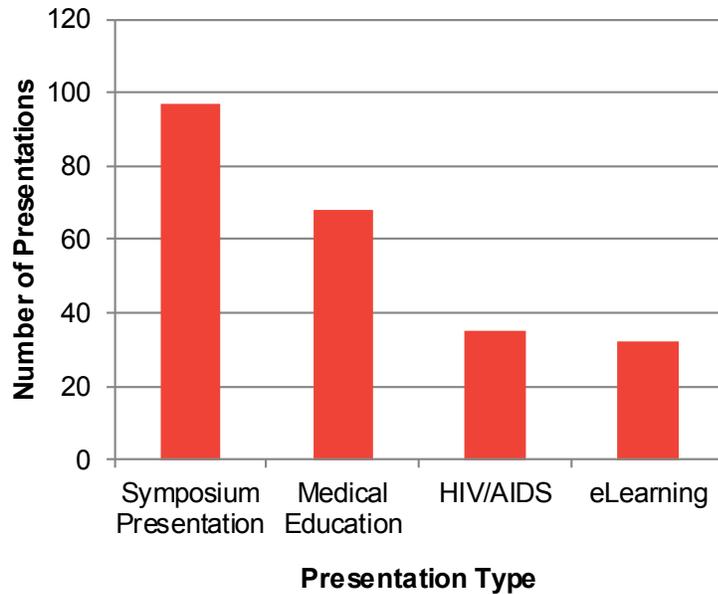
By mid 2015, MEPI faculty and staff had delivered over 400 presentations related to MEPI activities or research at academic meetings around the world, in 69 cities on six continents (Exhibit 5.7, 5.8, and 5.9).

EXHIBIT 5.7 Distribution of MEPI Presentations (2010-2015) (Map)



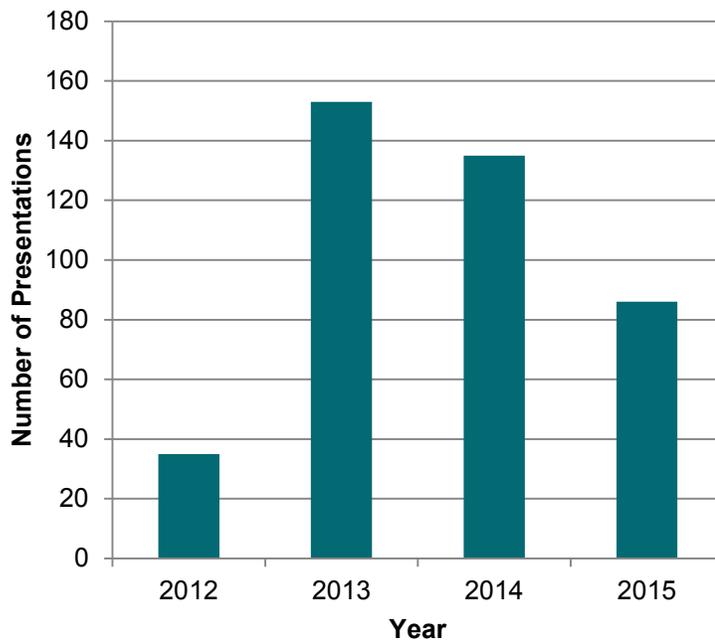
SOURCE: Compiled from School Summary Reports, August 2015

EXHIBIT 5.8 MEPI Presentations, by Type (2012-2015)



SOURCE: Data compiled from MEPI Final Year Survey (2015) and 13 school level reports.
NOTE: Includes data from 13 schools. Data was captured mid-2015.

EXHIBIT 5.9 MEPI Presentations (2012-2015)



SOURCE: Data compiled from MEPI Final Year Survey (2015) and 13 school level reports.
NOTE: Includes data from 13 schools. Data was captured mid-2015.

“The MSRP taught us the importance of research as the engine behind progress in science...I am keen to make my contribution in science through research.”

- UZCHS MRSP scholar

RESEARCH BASED IN THE COMMUNITY

Enhancing opportunities for research in the community allowed clinicians in rural environments opportunities for professional development and career growth, and gave students skills and experiences that are difficult to create in the classroom, but were needed to meet their country’s needs. Some examples of MEPI school-sponsored research in the community include:

- An agreement between AAU and the Ethiopian Medical Association to work jointly on the retention of medical doctors and faculty working in rural areas by providing advisory and financial support to train twenty physicians from rural areas on research methodology.
- Fourth year medical school students at KCMUCo in Tanzania undertake individual research projects on a topic within the national, regional, and institutional priorities at established field research sites and model villages set up for teaching.
- Students at MESAU in Uganda participate in mentored research projects as a component of their community based education, research and service (COBERS) training.
- At UZCHS in Zambia, second year students develop research proposals to learn approaches to evidence-based practice.

“A lot of faculty members are now actively involved in research. MEPI encouraged a research culture at UZCHS... As research output increases, other members coming into this system will also get absorbed into the same culture...self-perpetuating over time.”

- UZCHS researcher

- AAU and SU also incorporate community research in their MEPI programs, as described in Chapter 3.²³
- In Kenya, postgraduate students at UoN conducted research related to maternal, newborn, and child health at decentralized sites with support through the linked MEPI award.
- In Nigeria, the six MEPI supported medical schools established six- to eight-week community based clerkships as a requirement of their curriculum. MEPI provided support to enhance these clerkships through infrastructure improvements and programmatic shifts to team-based learning, integration with PEPFAR supported services and strengthened monitoring and evaluation.

CONCLUSION

As a result of MEPI, faculty and student research grew stronger at each of the participating institutions.²⁴ Many schools now have demonstrable research accomplishments as result of these new opportunities as evidenced by the impressive list of presentations and publications (Appendix C and Appendix D). Additionally, the research infrastructure at all the MEPI schools has been improved, which should contribute to continued grant opportunities and success.

This fortified research expertise enables researchers to pursue a breadth of research interests related to enhanced wellness in sub-Saharan Africa including population health, maternal and child health, infectious diseases, non-communicable diseases, prevention, and acute care. Together with the tremendous accomplishments in medical education research, this rich research portfolio is shaping a better prepared health workforce for the future.

²³ Blitz J, Bezuidenhout J, Conradie H, De Villiers M, Van Schalkwyk SC. “I felt colonised’: emerging clinical teachers on a new rural teaching platform. *Rural and Remote Health*. 2014;14:2511

²⁴ Van Schalkwyk, S. Medical education to strengthen health systems in Africa: MEPI as a catalyst for change. *Afr J Health Prof Ed*, 2015;7(1) Suppl 1:68-69.

CHAPTER 6

MEPI Impact on HIV Service Delivery

6

MEPI Impact on HIV Service Delivery



BACKGROUND

Sub-Saharan Africa has the highest incidence of HIV and AIDS in the world and the greatest number of people living with HIV. Multifaceted efforts to contain the epidemic have reduced, but not eliminated the number of new cases, and millions of people are now in treatment to control the disease.

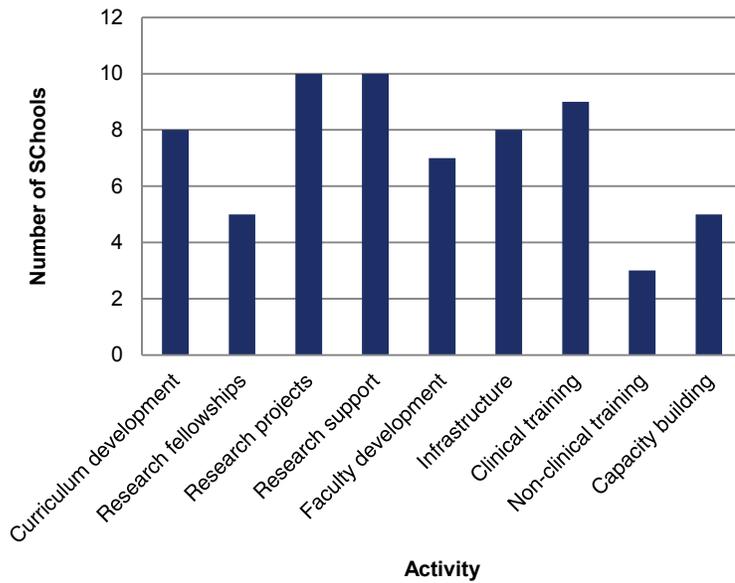
Efforts to strengthen health systems and to build long-term capacity to address the epidemic have focused on different aspects of prevention and care including health services and research. Improving the capacity of the health workforce to provide high quality care and drive locally relevant research was the focus of the MEPI investment. In this chapter we describe MEPI schools' activities that specifically support building and expanding the skills health care workers require to better meet the HIV/AIDS care, prevention and treatment needs of their communities. These activities include investments in research, faculty and student training, curriculum development, clinical and non-clinical training, and infrastructure.¹

ACTIVITIES DIRECTED AT HIV/AIDS CARE, PREVENTION & TREATMENT

MEPI investments helped build a robust community of knowledge and practice across the continent aimed at serving a multitude of health needs with a particular focus on HIV/AIDS. MEPI supported activities that targeted HIV/AIDS (Exhibit 6.1) included research projects and grant writing, faculty development and clinical and non-clinical training. MEPI schools modified and revised undergraduate and post graduate curricula to incorporate new HIV/AIDS guidelines, evidence based treatments, care management and diagnostics. MEPI schools improved pre-service training on HIV/AIDS related topics for nurses, midwives, technicians, physician assistants, and other non-physicians (Exhibit 6.2), as well as in-service training for physicians on co-infection management, prevention, and medication access and adherence (Exhibit 6.3). Several programs and activities MEPI schools delivered in support of HIV/AIDS care, treatment, and prevention are highlighted below. Through these activities, health workers from multiple disciplines gained new knowledge that enabled them to better care for patients.

¹ AS 2015 and SSRs 2015

EXHIBIT 6.1 MEPI-Supported Activities Related to HIV/AIDS Care, Treatment, and Prevention (2011-2015)



SOURCE: Data from MEPI Final Year Survey (2015).
NOTE: Includes data from 12 schools.

MEPI enhanced the number and quality of health professionals trained throughout 40 schools in sub-Saharan Africa, substantially contributing to the provision of HIV/AIDS services.

HIV/AIDS RESEARCH, RESEARCH SUPPORT & FELLOWSHIPS

As discussed in Chapter 5, MEPI support has been instrumental in developing a growing body of research and a cadre of researchers, with a focus on HIV/AIDS. All schools that reported on their research activities indicated that MEPI strengthened research in HIV/AIDS through support for research fellowships, research projects, and research support centers. A total of 51 papers related to HIV/AIDS were published as of mid-2015 across the MEPI schools (see Exhibit 5.6 in Chapter 5, and Appendix C: MEPI Supported Publications). Several examples of HIV/AIDS related research illustrate the range of activities in this domain.²

At KNUST, a team comprised of MEPI investigators, staff from the KATH Research and Development office, and KATH trainees in the Accident and Emergency (A&E) department, designed a pilot research project to assess HIV/AIDS related emergencies at the KATH A&E Center. Research questions considered HIV prevalence and the types of HIV/AIDS emergencies and associated care provided by the staff at the A&E Center. Findings revealed a tenfold greater prevalence rate of HIV among patients presenting at the emergency department compared with national rates. The results of this study informed modifications to the training programs for physicians and nurses and led to the development of new guidelines and SOPs for HIV/AIDS care in Emergency Units.

² AS 2015 and SSRs 2015

Medical professionals in Malawi were trained in detection, diagnosis, and treatment of HIV-associated cancers ... impacting services in clinics that reached 15,000 HIV-infected women per year.

At UKZN, through the Research Methodology (REMETH) programs, MEPI supported 22 PhD candidates who conducted HIV/AIDS research projects in the fields of clinical services, laboratory sciences and health systems. Two illustrative examples are i) HIV prevention in high-risk women in South Africa: Condom use and need for change and ii) Genital tract inflammation during early HIV 1 predicts higher plasma viral load set point in women (See Appendix C: MEPI Supported Publications). A similar program at UI, the Seed Scholarship Award, supported 29 junior investigators (postgraduates and junior faculty members) at affiliated MEPI-Nigeria consortium schools to design innovative HIV/AIDS research projects. At the UoM, MEPI funding supported research to improve diagnostic capabilities for HIV-related cancers including HIV associated lymphoma. MEPI supported a UoB study on reducing rates of maternal-child HIV/AIDS transmission at Mahalapye, a small town in Botswana's central district. Research around HIV/AIDS was implemented through 32 micro-research projects and five mentored research and fellowship projects at UoN, where PRIME-K also sponsored eight research projects related to maternal and neonatal children's health and HIV/AIDS. Another effort at UoN focused on mental health and substance abuse issues related to HIV/AIDS.³

FACULTY DEVELOPMENT RELATED TO HIV CARE & RESEARCH

Almost half of MEPI schools indicated that several MEPI supported faculty had specific areas of expertise in HIV/AIDS. In addition, MEPI schools invested in faculty development activities that increased capacity for research on HIV/AIDS. For example, faculty at UoN participated in three research-training courses with integrated HIV/AIDS content. In Malawi, the linked MEPI pilot award focused on building research capacity among specialists working in HIV-associated cancers in the country. The program used MEPI funds to train cancer registry staff. At UEM, 12 firm chiefs were trained in Good Clinical Practices; Good Laboratory Practices; Human Subjects Protection for Research; Research Methodology & Basic Epidemiology; Protocol Writing & Grant application; and Writing and Publishing Scientific Papers, all of which increased local capacity to engage in HIV-related research.

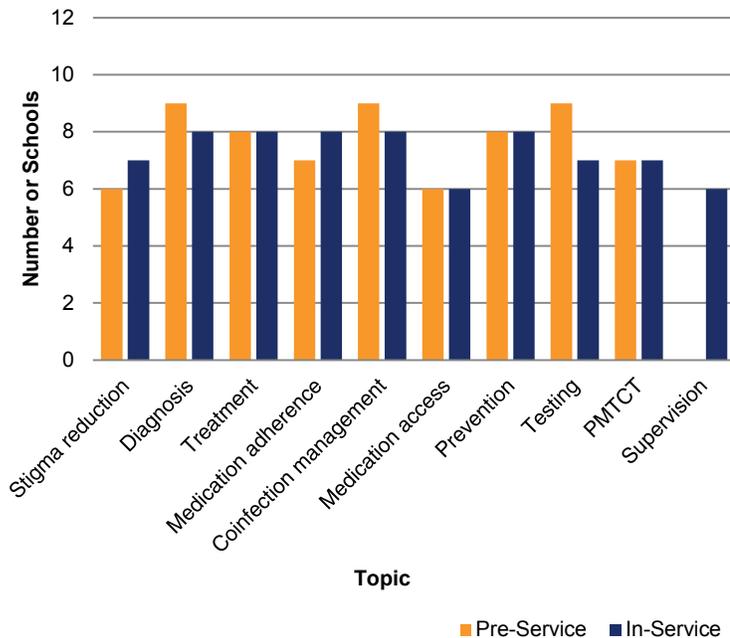
Eight schools used MEPI funds to support courses for faculty related to HIV/AIDS care, treatment, and prevention. Topics included diagnosis; treatment supervision; medication access; research ethics; nutrition; palliative care; and prevention, among others (see Exhibit 6.2). Faculty at SU participated in a clinician-mentoring program that focused on care management of patients co-infected with HIV and TB. Some schools utilized MEPI funds to support advanced training in infectious diseases, and to build leadership capacity for teaching and high quality services in

³ UoN SVR 2015

HIV/AIDS. The Masters of HIV Science degree program developed at UI, for example, aimed to produce highly trained specialists in HIV/AIDS for Nigeria.

At AAU and the other universities in the Ethiopian consortium, a fellowship program trained faculty members in HIV/AIDS care and prevention through clinical rotations at partner universities in the US, Canada and India. It was anticipated that the initial cohort of fellows would be instrumental in training other faculty within their respective institutions. Similarly, at UKZN, MEPI supported visiting faculty from US partner universities to present at grand rounds and share case studies in HIV/AIDS.

EXHIBIT 6.2 Topics Covered in MEPI-Supported Courses (Pre- & In-Service) Related to HIV/AIDS Care, Treatment, and Prevention (2011-2015)



SOURCE: Data from MEPI Final Year Survey (2015).
NOTE: Includes data from 12 schools.

TRAINING TO IMPROVE HIV CLINICAL CARE

MEPI schools are in the forefront of training clinicians and non-clinicians in the care, treatment and prevention of HIV/AIDS. Many MEPI programs strengthened HIV clinical care through improved or expanded offerings in their undergraduate and graduate programs while others provided training to current staff in the clinical setting. Nine schools reported that they utilized MEPI funds for HIV/AIDS related clinical training and five schools reported delivering HIV/AIDS related training for non-clinicians.

MEPI trainees at UEM in Mozambique have cared for over 2,100 HIV-infected patients.

An estimated 27,000 people living with HIV/AIDS have received treatment from MEPI trainees in Ghana.

In Ethiopia, for example, AAU leveraged MEPI support to establish an in-service training unit that delivered a series of courses on HIV. In Zimbabwe, clinical teaching in medicine, pediatrics and obstetrics/gynecology at UZCHS predominantly involved teaching the requisite knowledge, skills, and attitudes related to the prevention, care, and treatment of HIV/AIDS and related conditions.⁴

At Botswana's new medical school, all medical interns in the revamped medical internship-training program (MIT) are required to participate in the Knowledge, Innovation and Training Shall Overcome (KITSO) AIDS Training. KITSO AIDS Training Program provides sustainable and standardized training in HIV and AIDS care, crafted specifically for Botswana's health professionals. Students participate in monthly outreach visits to teach and train other healthcare workers at district and primary hospitals outside the capital city. In Ghana, supplemental funding from NIH to Ghana's MEPI program at KNUST supported the development of guidelines and standard operating procedures (SOPs) for care of patients with HIV/AIDS presenting in the emergency department (see chapter 5). The new SOPs were introduced in training sessions for 274 health staff in six regions and included doctors, pharmacists, nurses, laboratory technicians, and others. Similar training was scheduled for late 2015 in four additional regions of the country.⁵

In South Africa, UKZN funded 30 doctors to attend the school's two-year HIV diploma program, from which 25 have graduated. The school also worked with the National Department of Health (DOH) to train postgraduate nurses in Nurse-Initiated Management of HIV (NIMART), part of the government's task-shifting strategy to meet the demands related to HIV care. NIMART is an accredited five-day training program the DOH developed which allows registered nurses, once they have been trained, mentored and certified, to initiate ART for HIV infected patients. This innovative program was first introduced to UKZN undergraduate nursing students in 2011 and since then has become an integral part of the nursing curriculum.⁶

The MEPI program in Malawi at UoM aimed to improve the detection, diagnosis, treatment and care of a range of malignancies, especially HIV-associated cancers. Trainees included pharmacy assistants, colposcopy screeners, oncology nurses, palliative care nurses, clinical officers and counselors. Following training, trainees returned to their duty stations, where they trained their colleagues in cervical cancer screening through Visual Inspection with Acetic Acid (VIA), cryotherapy and colposcopy. For women living with HIV, Malawi provides integrated services including cancer screening, family planning and HIV care. Screening services were implemented at three integrated clinics that deliver care to 15,000 HIV infected women per year. The MEPI program also provided training for palliative care nurses and for counselors to support pre and post HIV-test

⁴ UZCH SSR 2015

⁵ KNUST SVR 2015

⁶ UKZN SSR 2015

counseling at Lilongwe's two central hospitals.

In Mozambique, UEM improved HIV care by training undergraduate and postgraduate medical students in the basic applications of ultrasound in HIV care. The training also included ultrasound in emergencies, in point of care internal medicine, as well as evidence-based medical practice and research competency.⁷

In Nigeria, the MEPIN program sponsored resident doctors to take a graduate level course on clinical management of HIV offered through the University of Washington, and at UI two- to 12-week clinical rotations (which included caring for HIV/AIDS patients) were developed for residents in community medicine, obstetrics and gynecology and palliative care.



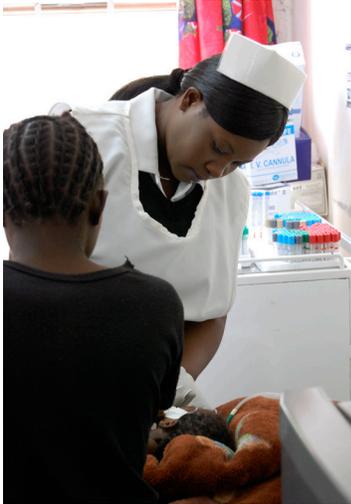
STRENGTHENING TEACHING ON HIV THROUGH CURRICULUM DEVELOPMENT & REFORM

Eight MEPI schools utilized MEPI funds to reform their curricula on elements of HIV care, diagnosis, and treatment. At AAU, UoB, and KNUST, MEPI supported a curriculum review, which facilitated the integration of HIV/AIDS into the core curriculum. At UKZN, the undergraduate pharmacy and nursing curricula were revised to include HIV/AIDS throughout the four-year undergraduate degree. This is part of UKZN's efforts to train health care workers to recognize and manage HIV/AIDS as a chronic disease. In MakCHS MEPI funds were used to develop HIV competencies and incorporate these into the curriculum. Specifically, an undergraduate student portfolio was designed to capture student involvement in HIV activities during community-based education activities as well as clinical rotations. UoN utilized MEPI funding to develop curricula for HIV/AIDS for MMed students and supported the development of training material for the online Bachelors of Nursing program.

In addition to revisions of existing curricula, new programs and courses related to HIV/AIDS were also developed. At UNZA MEPI funds were used to introduce a Masters of Medicine in Infectious Diseases (MMed ID) sub-specialty program and an HIV Nurse Practitioner training program. In Zimbabwe, UZCHS developed a 17-month (two-three hours/month) comprehensive HIV/AIDS curriculum for MMed students from all disciplines, as well as a 10-week (two hour/week) HIV/AIDS curriculum for final year medical students using a team-based learning approach. MEPIN in Nigeria developed a course on reproductive health, HIV and other STIs and introduced HIV/TB content into the medical and dental curriculum.

Nine schools reported using MEPI funds to support pre-service HIV/AIDS courses for undergraduate students related to HIV care, treatment,

⁷ UEM SVR 2015.



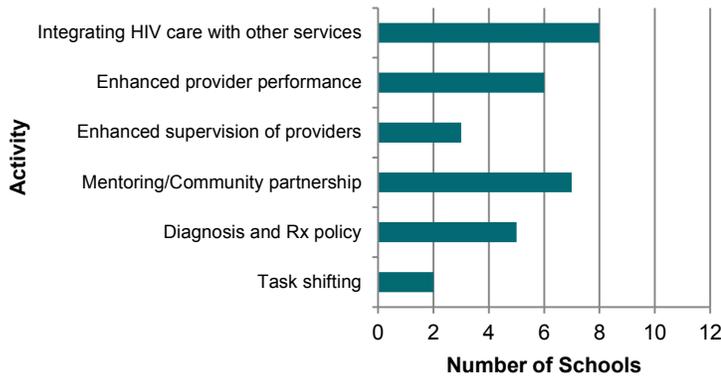
and prevention. The range of topics (Exhibit 6.2) covered in the curricula includes diagnosis, testing, and management of co-infections, treatment, and medication adherence, PMTCT among others. Courses offered included a crash course on HIV prevention, care and treatment for final year medical students at AAU and in South Africa, SU implemented a course titled PACK 101 which teaches undergraduate students algorithmic approaches to the management of HIV.

TRAINING NON-PHYSICIAN CLINICIANS IN HIV CARE

An important strategy to expand the number of skilled health care workers available to care for HIV/AIDS affected patients includes task shifting. Task shifting is defined as “the rational redistribution of tasks among health workforce teams.” Faced with a shortage of doctors, other skilled health workers, including non-physician clinicians, nurses, and community health workers, can be trained to undertake tasks that a highly trained doctor would have performed. This expanded pool of healthcare workers can facilitate the integration of HIV care with other services as well as provide mentoring and partnering with communities living with HIV/AIDS. Eight institutions reported using MEPI funds to support HIV/AIDS care, treatment, and prevention related to task shifting. Exhibit 6.3 lists MEPI-supported activities related to task shifting and the strengthening HIV/AIDS care in the clinical environment.

Non-physician clinicians are often at the front line and well positioned to impact clinical care and improve the capacity for training in the clinical environment. Five schools report training non-physician cadres of health care workers including nurses and midwives, laboratory technologists and others. Almost 2,100 non-physician health care workers directly participated in training related to HIV/AIDS care, treatment, and prevention with MEPI support. This included 1,667 RNs, 212 midwives, 115 lab technicians, 38 pharmacists, and 11 non-physician clinicians. These figures likely underestimate the total number of non-physician healthcare workers trained with MEPI support, as they include reported data from less than 100% of MEPI schools through the first half of 2015.

EXHIBIT 6.3 Other MEPI-Supported HIV/AIDS-Related Activities, 2015



SOURCE: Data from MEPI Final Year Survey (2015).
 NOTE: Includes data from 12 schools.

HIV INFRASTRUCTURE DEVELOPMENT

Three quarters of MEPI schools reported investments in infrastructure for research and/or health services including improvements to facilities and procuring new equipment and technologies. Many of these investments translated into improvements in HIV care and expansion of research capacity.

In Malawi, two histopathology laboratories at the two large central hospitals were renovated and equipped with specialized equipment, reagents and supplies with MEPI support. Chemotherapy preparation rooms with hoods were equipped at both central hospitals. These inputs made it possible to process more cancer screening in HIV patients and also improved diagnosis and care of HIV cancer patients and others suffering from opportunistic infections. Similarly, in Mozambique, UEM MEPI funds were used to reinforce the translational laboratory in the Department of Parasitology, which provided technical support for several ongoing HIV/AIDS-related research projects. At KCMUCo the laboratory infrastructure that was created by current and past HIV research grants (including the NIH's International Studies of AIDS-Associated Co-infections program) was used by MEPI for HIV/AIDS training and research.⁸ At UJ, part of the MEPI Nigeria network, MEPI funds were used to renovate and upgrade an existing PEPFAR infrastructure for HIV clinics and to foster HIV research.

In Ethiopia, at AAU, the adult and pediatric ART clinics benefitted from the IT infrastructure expansion project and internet connectivity upgrades funded by MEPI. In Uganda, MakCHS used MEPI funds to purchase echocardiogram and electrocardiogram machines and ancillary equipment for the skills lab used to train technicians who work with HIV/AIDS patients.

⁸ KCMUCo SVR 2015



GAUGING THE REACH & IMPACT OF MEPI ON HIV SERVICE DELIVERY

MakCHS has worked to integrate HIV treatment and care into both outpatient and inpatient services of all teaching hospitals associated with MESAU institutions. Postgraduate students actively participate in the management of HIV-infected patients in wards, outpatient clinics, and communities. HIV-positive patients are sent to specific health centers to receive treatment at the infectious disease wards, immune suppression syndrome/HIV clinics, the Uganda Cancer Institute for patients with HIV-related malignancies, Makerere-Mbarara Joint AIDS program, Makerere University-JHU (MUJHU) program, and the Infectious Disease Institute. All other inpatient wards, including the emergency ward, provide free health provider-initiated voluntary HIV counseling and testing.⁹

In Ghana, where the MEPI program at KNUST has provided HIV training to 180 health care workers who work at emergency departments and HIV clinics in several hospitals around the country, it is estimated that a total of 27,000 persons with HIV/AIDS have received treatment and care to date. It is estimated that over the past two years an additional 11,000 persons from these hospitals have been cared for directly by MEPI trainees. The services provided include treatment of injuries in patients with HIV/AIDS, HIV associated illnesses or complications of treatment, HIV counseling, and laboratory testing. In Kumasi, Ghana, a total of 16,000 HIV-positive patients have received direct treatment and care over the duration of Ghana MEPI. This is based on MEPI Ghana's estimated 13.5% HIV prevalence rate in the emergency department, combined with an annual attendance of 30,000 patient visits. In addition, approximately 4,000 HIV patients receive care from MEPI trainees annually.¹⁰ Another remarkable output of this program is the Guidelines and Standard Operating Procedures for HIV/AIDS care in Accident and Emergency Departments described earlier, which have been adopted for use throughout the country.¹¹

In Zimbabwe, the MEPI program has provided training to doctors and students at multiple clinical facilities. It is estimated that 1,222,000 treatment, care, and prevention services have been provided to people with HIV/AIDS in Zimbabwe from 2011 to 2014 by doctors and health workers trained through MEPI during and after their medical training.¹²

Tuberculosis is the leading cause of death among people with HIV in South Africa. SURMEPI has actively contributed to improving the quality of HIV/AIDS and TB care in the clinical environment. For example, SURMEPI facilitated monthly outreach and support sessions by infectious diseases specialist physicians to the rural Brewelskloof TB Hospital in Worcester. Problem based, bedside teaching and training of doctors contributed to improved patient care and increased resident doctors' knowledge in the management of complicated HIV/TB co-infected patients. Each outreach session concluded with a 20-30 minute guideline update discussion or

⁹ MakCHS SVR 2015

¹⁰ KNUST SVR 2015

¹¹ KNUST SVR 2015 and AS 2015

¹² ZCHS SVR 2015

other problem specific discussion. It also included a lunchtime seminar with junior doctors in the region. These sessions covered a broad variety of HIV related topics. Improved and sustained knowledge of the management of severe and complicated diseases and easier access to expert advice improved the confidence of junior doctors and their general work experience. These efforts increased expertise among rural clinicians, and are also expected to improve retention in rural areas.

In Mozambique, it is estimated that HIV prevalence on the Medicine Wards and Emergency Departments at UEM is 69.1% and the annual attendance is 8,298 patients. From those, roughly 2,120 patients receive care from MEPI trainees each year. The UEM MEPI Program has also been providing training to doctors at different clinical facilities. Approximately 200 health care workers from different areas in seven hospitals around the country have directly benefitted from MEPI training focused on HIV and AIDS related aspects. The trainees including doctors, medical technicians and surgical technicians were trained from 2011 to 2014. Collectively, we estimate that approximately 12,000 persons around the country with HIV/AIDS have received treatment and care services from MEPI Mozambique.

CHAPTER 7

Linked Awards

7

Linked Awards

OVERVIEW

Linked awards were formulated as part of MEPI to support research capacity-building and research education in priority health areas, including chronic non-communicable diseases (NCDs), maternal and newborn child health, cardiovascular disease, surgery, and mental health. These awards were built on the objectives of MEPI programmatic awards to assist universities in sub-Saharan Africa in offering faculty and students more training and varied pathways to address critical local clinical and research needs. In addition, two pilot linked awards were funded independently of the MEPI programmatic awards. Pilot linked awards were awarded to Kwame Nkrumah University of Science and Technology (KNUST) in Ghana and University of Malawi College of Medicine (UoM). These pilot linked awards were aimed at strengthening emergency medicine and cancer research respectively.

¹ The linked awards were funded by multiple institutes within the NIH including the Office of the Director, the National Institute of Mental Health (NIMH), the National Heart, Lung and Blood Institute (NHLBI), the National Cancer Institute (NCI), the National Institute of Neurological Disorders and Stroke (NINDS), and the Fogarty International Center.

As noted in Chapter 2, the linked and pilot linked awards were funded and administered by the NIH.¹ Six linked awards were funded in five universities, which were also recipients of programmatic awards. These were UoN in Kenya, UEM in Mozambique, MakCHS in Uganda, the UNZA in Zambia, and the UZCHS in Zimbabwe, which received two linked awards. Also, some linked award programs partnered with other universities in order to leverage their own and partner institutions' expertise and experience.

EXHIBIT 7.1 MEPI Linked Awards at Year 5 Overview

LINKED AWARD	RELATION TO PROGRAMMATIC AWARD	PLANS TO SUSTAIN ACTIVITIES	INFLUENCE ON POLICY	EFFECT ON DISEASE BURDEN
UNIVERSITY OF NAIROBI (UON)				
Strengthening Maternal, Newborn & Child Health (MNCH) Research Training in Kenya	The linked award has supported the University of Nairobi Partnership in Innovative Medical Education for Kenya (PRIME-K) in improving human resources with appropriate skills	UoN plans to establish a multi-disciplinary center for MNCH research & training, & will take steps to seek other funding mechanisms	Adoption of umbilical cord care & neonatal resuscitation practices in Kisii county hospital High quality of care for children admitted with dehydration & malnutrition at Mbagathi Hospital	Contributed to health system strengthening by building leadership & management skills capacity for 350 individuals spread across the decentralized sites, including 130 midwives & 40 other health workers in obstetrics

LINKED AWARD	RELATION TO PROGRAMMATIC AWARD	PLANS TO SUSTAIN ACTIVITIES	INFLUENCE ON POLICY	EFFECT ON DISEASE BURDEN
UNIVERSIDADE EDUARDO MONDLANE (UEM)				
UEM-USCD Surgery Partnership	<p>Provided financial support to:</p> <p>Building capacity in pediatric trauma & burns.</p> <p>eLearning room established for surgical residents.</p> <p>Development of diagnostic protocols for surgical pediatric patients.</p>	Training programs have been institutionalized.	Experience with using evidence to support decision making for building health interventions strategies has influenced the national health policy design at a broader level within Mozambique.	Contributed to building surgical & research capacity among surgeons, thus improving surgical diagnosis & treatment of surgical & related conditions
MAKERERE UNIVERSITY COLLEGE OF HEALTH SCIENCES (MAKCHS)				
Building Capacity for Cardiovascular Diseases (CVD) Research & Training in Uganda	Built capacity in prevention, management, & research for cardiovascular diseases in Uganda	Outputs have been incorporated into day to day functions & processes of the university	<p>Participated in carrying out surveys for NCDs in rural & urban populations; results have been shared with the Ministry of Health, non-communicable diseases unit.</p> <p>Influenced policies for the integration of NCDs into the MoH programs</p>	Provided an opportunity to determine the prevalence & incidence of some of the common non-communicable diseases in Uganda & formulate interventional strategies to combat the same
UNIVERSITY OF ZAMBIA (UNZA)				
Improving Maternal & Child Health through Specialty Training in Zambia	Tied to the aims of the larger programmatic award focusing on improvement in the overall quality of health care workers training	<p>Contributed to:</p> <p>Creation of the MNCH center (ongoing)</p> <p>Adoption of leadership & management courses in two MMed curricula</p> <p>More post graduate students carrying out research outside the tertiary hospital</p>	Adoption of clinical care protocols & guidelines in obstetrics & pediatrics at national & provincial hospitals, with support from the Ministry of Health	<p>Contributed to:</p> <p>Building capacity</p> <p>The adoption of guidelines & monthly clinical audits, which have helped reduce mortality</p>
UNIVERSITY OF ZIMBABWE COLLEGE OF HEALTH SCIENCES				
<p>Cerebrovascular, Heart Failure, Rheumatic Heart Disease Interventions Strategy Initiative (CHRIS)</p> <p>Improving Mental Health Education & Research Capacity in Zimbabwe (IMHERZ)</p>	<p>The CHRIS linked award focused on developing expertise in cardiovascular diseases through training of undergraduate & MMed students</p> <p>Skills building & knowledge development led to the revival of child, forensic, & community psychiatry services in Zimbabwe</p>	Handed over some activities to the MoH & continue to seek financial support from other entities in order to sustain other activities	<p>Enabled evaluation of the adequacy & effectiveness of current practices, & stimulated going forward with the effectiveness of potential health reforms</p>	<p>The CHRIS & IMHERZ awards have addressed human resource constraints & training needs in cardiovascular disease & mental health at UZCHS</p> <p>The awards also ameliorated the high burden of mental & cardiovascular diseases in Zimbabwe</p>

SOURCE: MEPI School Summary Reports & 2015 MEPI Site Visit Reports

AWARDS & ACHIEVEMENTS

A brief description of each award and achievements follows.

Linked Award (Kenya): Strengthening Maternal, Newborn & Child Health Research Training in Kenya

UoN, in partnership with the University of Maryland-Baltimore and the University of Washington in the US, received a linked award aimed at strengthening Maternal, Newborn and Child Health (MNCH) research training in Kenya, specifically by expanding their capacity in implementation science and launching research in non-tertiary MoH facilities. Through the mentored implementation science project and training on leadership and management, the linked MNCH award complemented the goals of the MEPI programmatic grant, and expanded the supply and skills of health care workers serving this population.

Over 350 postgraduate students and health workers from pediatrics, obstetrics and gynecology, pharmacy, nursing, and public health were trained in implementation science, program management, and integrated MNCH short courses.²

A total of 83 postgraduate students, constituted into 15 multidisciplinary teams, received support to conduct MNCH research projects in seven MoH facilities.³

A total of 170 midwives and related professionals were trained in an obstetric emergency newborn resuscitation team training (PRONTO). A post-training evaluation showed significant improvement in skills level. Local training capacity was built, resulting in 18 locally certified and one master trainer of PRONTO.⁴ With funding from USAID, UoN launched a cluster randomized trial in Western Kenya to determine the impact of PRONTO training on 24-hour neonatal mortality.

Finally, five individuals with a background in MNCH were sponsored to participate as fellows in Global Health Leadership and Management in partnership with the Afya Bora Consortium Fellowship (a 12-month health professions fellowship). All completed the fellowship within the stipulated duration. Two of these fellows accepted teaching positions in local universities.⁵

The UoN is committed to sustaining the activities of this linked award through a multidisciplinary center that promotes research and training in MNCH and will actively seek funding support to this end. The MNCH award has influenced policy in health care practice by initiating several projects including: enhanced uptake of immediate postpartum contraceptive implants; better umbilical cord care and neonatal resuscitation practices in Kisii County Hospital; and high quality of care for children admitted with dehydration and malnutrition at Mbagathi District Hospital. This training

² UoN SSR, 2015

³ UoN SSR, 2015

⁴ UoN SSR, 2015

⁵ UoN SSR, 2015

has contributed to a decline in pediatric mortality in this facility from 11 percent to six to seven percent.

The linked award has also addressed the disease burden by contributing to health system strengthening through building leadership and management skills capacity for health care workers across decentralized sites in Kenya.

Linked Award (Mozambique): UEM-UCSD Surgery Partnership.

UEM, in partnership with the UCSD in the US, received a surgery partnership linked award. The award provided financial support to identify the best strategies for building emergency and essential surgical capacity in the rural areas of Mozambique.

Training to strengthen clinical skills related to pediatric trauma and pediatric burns was provided to 61 health professionals from across the country, including professionals from Gaza (20), Beira (24), and Nampula (17). Medical residents from US universities including UCSD, Yale, Dartmouth, and Harvard, and surgeons from Vanderbilt University, visited Maputo Central Hospital and participated in training courses at UEM that targeted pediatricians and surgical residents.

Community and Hospital Surveys: This linked award conducted eight research studies in three rural areas in Mozambique (Ribaué, Nhamatanda and Chokwe) to better understand the resources available for surgical care, the state of surgical care provided, and the unmet need for surgical care. Seven of the eight studies have been completed and results have been published or manuscripts are in progress (see Appendix C: MEPI Supported Publications).⁶

UEM surgical residents and faculty from the linked award participated in research training activities supported under the MEPI programmatic award. In addition, a faculty exchange program between UCSD and UEM faculty has enabled transfer of knowledge and skills among students and faculty from the two universities.

The training programs developed through the linked award have been integrated into the institutional programs at UEM. The expanded surgical and research capacity among surgeons has improved surgical diagnosis and treatment, thus reducing the number and burden of surgical and related conditions. Experience with using evidence to support decision making for building health interventions strategies has influenced the national health policy design at a broader level within Mozambique.



⁶ UEM SVR, 2015



Linked Award (Uganda): Building Capacity for Cardiovascular Diseases (CVD) Research & Training in Uganda

MakCHS in Uganda, in partnership with Johns Hopkins University (JHU) and Case Western Reserve University in the US, University of Cape Town in South Africa, and the Uganda Virus Research Institute, received a linked award to build capacity for research and training in cardiovascular disease (CVD). Since its inception, the program has made enormous progress through building capacity and generating baseline data on the state of cardiovascular disease in Uganda. Over 1,700 medical students and other health professions' students have been trained in CVD risk assessment, formulation of appropriate diagnostic and management strategies, and primary care for CVD patients at COBERS sites, as described in Chapter 3. The PhD program has supported three PhD fellows building leadership in the management of CVDs including rheumatic heart disease, hypertension, and stroke. Some PhD students have become recognized leaders in interventional cardiology. They have utilized the cardiac catheterization laboratory at Uganda Heart Institute and mentored cardiology fellows. The CVD training module has been integrated into the curriculum. MakCHS has written competitive grants to advance the work on CVD.

The linked award has also supported work of the MoH by participating in conducting surveys for non-communicable diseases in rural and urban populations in Uganda and sharing the results with the MoH non-communicable diseases unit. Policies that integrate non-communicable disease into the MoH programs have also been developed.

Lastly, the linked award has provided an opportunity to determine the prevalence and incidence of some of the common non-communicable diseases in Uganda, and formulate interventional strategies to combat the same.

Linked Award (Zambia): Improving Maternal & Child Health through Specialty Training in Zambia

UNZA, in partnership with the Center for Infectious Disease Research in Zambia and the University of Alabama-Birmingham in the US, received an award to examine the high burden of maternal and early childhood death in Zambia. The aims of the linked award were tied to those of the larger programmatic award that focused on improving the overall quality of healthcare workforce training and enhancing research in the academic environment. The award specifically targeted training medical personnel in Emergency Obstetrics and Newborn Care (EmONC), and encouraging a more equitable distribution of quality health care services as part of an overall effort to improve emergency care for mothers and newborn infants. It provided clinical training to staff at provincial and district level facilities.

Nurses and midwives received targeted and standardized clinical training at primary and secondary care facilities. The EmONC training aimed to assist in establishing emergency response teams for obstetrics and neonatology at the University Teaching Hospital (UTH) and other hospitals in Zambia. More than 80 staff members were trained in emergency obstetrics and newborn care at UTH, among them five doctors who have also become national trainers.

Provincial outreach: UNZA, through the linked award, conducted outreach visits to offer knowledge and update skill acquisition in maternal and newborn care and health to provincial and district sites. Emphasis was placed on common conditions that lead to poor maternal and early newborn outcomes, like immediate care of the newborn, active management of the third stage of labor, conduction of normal delivery, manual removal of the placenta, infection prevention, and neonatal resuscitation. Training emphasized communicating with and respecting the mothers; use of the partograph; management of cord prolapse; management of eclampsia; breech delivery; and postpartum and antepartum hemorrhage. Provincial and district staff were also trained on procedures such as caesarean deliveries and management of abnormal labor. Over 120 middle grade staff and 19 doctors were trained. Other outputs of the linked award included revised obstetrics and pediatrics clinical care guidelines; monthly inter-departmental audit conferences between pediatrics, obstetrics, and gynecology departments; and a perinatal emergency response system with standard operating procedures (SOPs). These have contributed to a reduction in maternal and neonatal mortality in some of the provincial and district health institutions.⁷

**Linked Award(s) Zimbabwe: 1) Improving Mental Health Education & Research Capacity in Zimbabwe (IMHERZ)
2) Cerebrovascular, Heart Failure, Rheumatic Heart Disease Interventions Strategy Initiative (CHRIS).**

UZCHS, in partnership with the University of Colorado-Denver and Stanford University in the US, the University of Cape Town in South Africa, University College London, and the Institute of Psychiatry at King's College London received two linked awards for two different programs. These awards addressed human resource constraints and training needs in cardiovascular disease and mental health in Zimbabwe. The awards were a platform to study and reduce the high burden of mental and cardiovascular diseases in the country.

The Cerebrovascular, Heart Failure, Rheumatic Heart Disease Interventions Strategy Initiative (CHRIS) linked award focused on developing expertise in cardiovascular diseases through training of undergraduate and MMed students. Trainees were recruited from the basic sciences departments (anatomy and physiology) and clinical departments (internal medicine and pediatrics). The program trained a total of 52 undergraduate and MMed

⁷ A manuscript on the impact of the MEPI Linked Award on maternal and early neonatal outcomes is currently being developed.

“Research conducted by the team to determine HIV prevalence in a major emergency center was very significant...as there existed no data on HIV prevalence....Training using the [revised] curriculum increased [our] capacity to manage HIV cases...”

- Health Administrator in Ghana

scholars in various disciplines, including cardiology, neurology, respiratory medicine, and endocrinology. Capacity improvements also enhanced the provision of cardiovascular clinical services at the two teaching hospitals in Harare. Scholars were exposed to advanced health systems in South Africa (University of Cape Town) and the US (University of California, Davis), which inspired them to reintroduce specialist clinics and establish the nation's first stroke unit at Parirenyatwa Hospital, Harare's largest medical center. Weekly specialist clinics (neurology, cardiac, diabetes, and echocardiography), which had been discontinued, were reinstated, and a pacemaker-implantation program was re-introduced. By August, 2015, 22 pacemakers had been successfully implanted.⁸

Improving Mental Health Education and Research Capacity in Zimbabwe (IMHERZ): The IMHERZ program aimed to strengthen mental health services in Zimbabwe through capacity-building and retention of psychiatrists and mental health trainees. IMHERZ worked in conjunction with partners in South Africa (UCT) and the UK (University College London and Kings College London (KCL)). Prior to IMHERZ, the Department of Psychiatry had the highest faculty vacancy rate at UZCHS, and had only one psychiatrist on staff. Through the IMHERZ award, the department has succeeded in recruiting and retaining five psychiatrists in the department. There have been five MMed psychiatry graduates over the past five years. This was a milestone considering that records indicate that, since 1978, there have only been twelve MMed psychiatry graduates in Zimbabwe. Of the five graduates, one has joined the faculty, two were in the process of applying to join, and two have been recruited by Zimbabwe Prison Services. The mentored scholars program has specifically contributed to retention by providing additional subspecialty training opportunities, as well as by providing mentoring. All scholars have indicated their intention to remain in Zimbabwe.

The linked awards have enabled the evaluations of the adequacy and effectiveness of current practices and the stimulated future efforts to measure the effectiveness of potential health reforms.

PILOT LINKED AWARDS (TWO AWARDS)

Ghana Emergency Medicine Collaborative Training Program

The MEPI Ghana Emergency Medicine (EM) Training Initiative was a collaboration between the KNUST, the Komfo Anokye Teaching Hospital (KATH), and the University of Michigan. The University of Michigan was involved at KNUST in the early stages of designing a start-up residency program, before the MEPI Pilot Linked Award was received in 2010. The goal of this program was to improve the provision of emergency medical care in Ghana through innovative and sustainable physician, nursing, and

⁸ UZCHS SSR 2015

medical student training programs. These programs aimed to increase the number of qualified emergency health care workers retained over time in areas where they were most needed, and to increase emergency medicine capacity by creating high quality, locally-based training programs. This program and its results in expanding emergency medicine training have been described in greater detail in Chapter 3 of this report.

The Ghana College of Physicians and Surgeons (GCPS) and the MoH were essential partners in the program. The GCPS has worked closely with KNUST and KATH in developing a post graduate certification program to award EM graduates certification as GCPS members, following successful completion of the requisite three to five years of training and examination. The KNUST/KATH EM program is expected to play a catalytic role in increasing local, national, and possibly regional capacity in many cadres of emergency medical care practitioners. It can also serve as a model for how external funding can be used in a synergistic manner, pooling multiple institutional and individual efforts, to increase EM HRH capacity in other sub-Saharan African countries. The MoH funded the residency positions and guaranteed placements for EM specialists in hospitals following completion of training. This collaboration assured a program that was quality based, transparent, and sustainable.

Ghana Emergency Medicine Collaborative Training Program has succeeded in graduating 15 Emergency Medicine Specialists and 59 Emergency Management nurses. In addition, 500 medical students have received training in emergency management, and 300 district health care workers in emergency units and HIV Clinics across Ghana have been trained in HIV/AIDS care in the Emergency Department. This pilot award and its impact on care, especially among patients with HIV/AIDS, has been described in greater detail in Chapter 6 on MEPI impact on HIV service delivery.

An estimated 27,000 people living with HIV/AIDS have received treatment from personnel trained in Emergency Management, Emergency Nursing, and district health care workers.

Another output of this program is the Guidelines and Standard Operating Procedures for HIV/AIDS care in Accident and Emergency Departments which have been adopted for use throughout the country.^{9,10}

By developing emergency medicine skills in a range of health workers in accident and emergency units in Ghana, the pilot linked award has improved the quality of care patients receive in these units.

HIV-Associated Malignancies in Malawi

UoM College of Medicine, in partnership with University of North Carolina (UNC) in the US, University of Cape Town in South Africa, and Johns Hopkins University Bloomberg School of Public Health in the US,



⁹ KNUST SVR, 2015

¹⁰ MEPI AS, Year 5, 2015



“The MEPI EM initiative, an effective partnership with the University of Michigan has contributed to emergency medical patient care as well as HIV services. The products are poised to be the leaders in developing EM structures in Ghana and neighboring countries.”

- Ghana Pilot Linked Award

received a pilot linked award aimed at HIV-associated malignancies in Malawi. This award was designed specifically to enhance the care of patients with HIV/AIDS malignancies throughout Malawi, by focusing on creating a comprehensive approach to complex HIV-related malignancies. The project aimed to increase cancer screening at the district hospital level; enhance the definitive diagnosis of cancer by increasing pathology services at major hospitals throughout the country; expand the treatment options for cancer patients, especially chemotherapy and palliative care; and improve health workers’ skills for epidemiologic research on HIV related malignancies.

This program has achieved most of its objectives by training pathologists, pathology technicians, nurses, and public health officials to improve the screening, diagnosis, and management of HIV related malignancies, especially those associated with cervical cancer. A range of skills in cancer diagnosis, management and care were developed for a number of staff in Malawi.

- Two pathologists were sponsored for training in South Africa and are scheduled to complete training by May 2016.
- Three nurses and one clinical officer completed palliative care training at Hospice Uganda affiliated with Makerere University in Uganda.
- Four nurses were trained in basic oncology technologies in India at the beginning of MEPI and are now working in Malawi.
- Three pharmacy technicians were trained in the preparation of chemotherapeutic agents in Lilongwe and Blantyre.
- Four cytopathology technicians were trained in South Africa and Zambia, and now prepare specimens for the pathologists to examine.
- Four clinicians were trained in loop electrosurgical excision
- Thirty nine health care workers were trained in visual inspection with acetic acid (VIA) cryotherapy
- Fourteen health care workers were trained in fine needle aspiration; ten health care workers were trained in bone marrow aspiration; and one health care worker completed a Masters in Public Health (MPH)

MEPI increased pathology faculty: At the beginning of the MEPI program, Malawi had one active pathologist based at the medical school, who provided diagnostic services for the country with a population of seventeen million. The University of Malawi increased its pathology academic faculty

by recruiting a pathologist who had completed specialist training with MEPI support and by rehiring a retired pathologist to assist in teaching and diagnostic services.

The Malawi pilot linked award supported the purchase of an Aperio-telepathology system to enable real-time external consultations on prepared tissues, thus reducing delays in diagnosis and care for patients with cervical cancers and other malignancies.

PUBLICATIONS

More than fifty research publications have been generated as a result of MEPI linked award programs (see Appendix C: MEPI Publications). Additional publications are in preparation.

CONCLUSION

The MEPI-linked awards have contributed to progress on several fronts, and have achieved their objectives. The awards addressed important health issues in their countries as well as in the sub-Saharan African region. In several areas, research carried out within these programs has translated into specific policy and practice in most MEPI countries. The partnerships have enabled knowledge exchange, built research capacity, and demonstrated how research can contribute to improvement of care and health system strengthening. The resulting research work contributed in creating a foundation on which more work can be developed. All of the services established or improved are critical in advancing the quality of health care in the countries and the region.

“Histopathology laboratory services were not available at both Lilongwe and Blantyre Central Hospitals. The MEPI program has renovated old buildings into lab spaces, procured equipment, commissioned the labs, and supported reagents. This has reduced the turnaround time from months to within a week at both hospitals, and has directly impacted the care of cancer patients.”

- Malawi Pilot Linked Award

CHAPTER 8

Communities of Practice & Partnerships

8

Communities of Practice & Partnerships

Communities of Practice (CoPs) are groups of people who share a concern or a passion for something they do, and learn how to do it better as they interact regularly. Five years after the launch of MEPI, a very robust community of practice (CoP) exists comprising of the MEPI schools' faculty and staff, agencies of the USG,¹ the schools' partner institutions, and the larger national, regional, and global community that is involved in the health education field. A successful CoP takes advantage of the knowledge of the members to create an environment that supports individual learning through knowledge exchange opportunities. Over 40 medical schools in Africa and 20 in the US make up the MEPI network, and together model a collaborative approach to developing CoPs that displaces the one-sided nature of many partnerships.² The communities share best practices and innovations and might ultimately promote MEPI's sustainability.³

Several forces contributed to building and nurturing the evolving MEPI CoP. These included virtual communication tools that enabled all MEPI schools to share information through the MEPI website and MEPI newsletter, as well as the face to face meetings made possible through site visits and the annual symposia. MEPI support to attend conferences and exchange research with peers enabled schools to meet and learn from one another in multiple settings. All these helped foster the growth of the south-south and the north-south collaborations, which helped build rich CoPs at the national, regional, and international level. These will be discussed in greater detail in the paragraphs that follow.



TECHNICAL WORKING GROUPS

MEPI schools identified a number of common areas of technical need during the course of Year 1 site visits, in response to Year 1 survey questions, and during the first annual symposia. To address these common challenges, Technical Working Groups (TWGs) were created around several common interests, to pool efforts, exchange knowledge, experience, and expertise. Priority areas were identified, and groups were formed to address the following eight areas of need: Community-Based Education (CBE) activities; eLearning systems and innovative uses; Graduate Tracking mechanisms; Research Support Center design and utilization; Competency-Based Medical Education (CbME); Medical Education Research; Monitoring and Evaluation; and Library Information Science. Schools joined TWGs that focused on technical areas of interest

¹ The USG agencies that have been working closely with the MEPI programs are OGAC, NIH, and HRSA.

² Oluwabunmi Olapade-Olaopa E, Baird S, Kiguli-Malwadde E, Kolars JC. Growing Partnerships: Leveraging the Power of Collaboration Through the Medical Education Partnership Initiative. *Acad Med.* 2014;89(8):S19–S23.

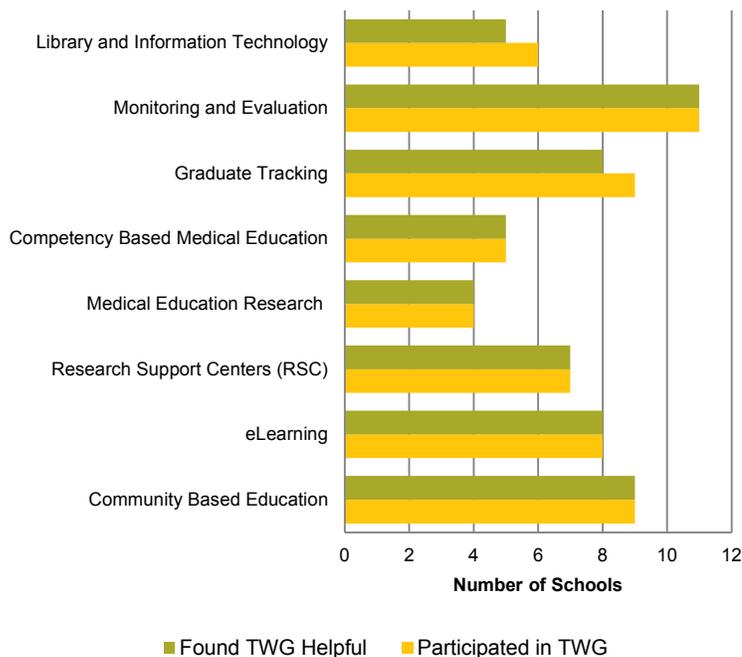
³ Frehywot S, Mullan F, Vovides Y, et al. Building Communities of Practice: MEPI Creates a Commons. *Acad Med.* 2014;89(8):S45–S49.

to the PIs or in which they could offer expertise. Representatives from NIH and HRSA also joined each of the eight TWGs. The groups met as needed to deliberate and plan presentations. Group technical training sessions delivered on site and through webinars enabled broad participation in the TWGs, and dedicated listservs and website pages on the MEPI website guaranteed wide access to their innovations and resources. Three TWGs, i.e., CBE, eLearning, and graduate tracking held and facilitated workshops to develop and share technical support with other MEPI schools. The MEPI CC provided logistical and content expertise to support some of these activities. In addition, TWGs conducted breakout sessions during the annual symposia to directly share insights and solutions with the MEPI community.

Role of the Technical Working Groups in Building Communities of Practice

The TWGs proved to be an effective vehicle for information exchange and joint learning. MEPI schools reported that the TWGs were helpful to their institutions (Exhibit 8.1). They contributed to the steady development of stronger south-south technical assistance and CoP. Each TWG had both a listserv and a web page established for its members, by the MEPI CC. These resources served as communication platforms and the webpage provided broad access to relevant and up to date resources.

EXHIBIT 8.1 School reportage on helpfulness of TWGs to their Institution (2015)



SOURCE: Data from MEPI Final Year Survey (2015).
NOTE: Includes data from 12 schools.



"I have benefitted from relationships or links with other faculty members... when I wanted to write up a grant proposal, the first people that came to mind were the people I met through HEALZ. This is what MEPI has built...it is like a foundation for us."

- HEALZ Scholar & Lecturer, UNZCHS

Several TWGs convened workshops to explore and discuss substantive issues related to their topics, initiated publications, and organized webinars, as noted in Exhibit 8.2, that were made available to all MEPI schools. Several were archived and can be accessed directly through the MEPI website (www.mepinetwork.org).

EXHIBIT 8.2 MEPI TWG Technical Assistance Webinars, 2011-2015

YEAR	TITLE	TA(TWG) FOCUS AREA
July 2015	A Synthesis of Digital Resources for Medical Education (synDRME): Utilizing digital medical education resources to address faculty shortage in African medical schools	E-Learning
April 2015	Sustainability of Research Management Offices in Low Resource Settings	Research Support Centers
April 2015	MEPI eLearning Strategic Planning Webinar	E-Learning
November 2014	MEPI eLearning Strategic Efforts Webinar	E-Learning
May 2014	Getting Published the Rules of the Game	Medical Education Research
January 2014	Transitioning to an Electronic Library Collection: Experiences from the George Washington University's Himmelfarb Library	Library and Information Science
July 2013	Key Considerations & Challenges of Setting Up Research Support Centers in Low Resource Settings	Research Support Centers
April 2013	Scholarly Writing in Medical Education	Medical Education Research
December 2012	Monitoring and Evaluation	Monitoring and Evaluation
November 2011	Retention	Community Based Education
September 2011	Social Accountability	Community Based Education
July 2011	Open Education Resources Africa	E-Learning
June 2011	eGranary Digital Library	E-Learning

SOURCE: MEPI website (www.mepinetwork.org)

Several schools shared their views on the value of the MEPI TWGs in providing valuable technical assistance and building CoPs (Exhibit 8.3).

EXHIBIT 8.3 MEPI Schools Building Communities of Practice via the TWGs

MEPI SCHOOL	Excerpts of comments on the value of TWG activities in Building MEPI CoP, extracted from MEPI School Summary Reports, Year 5 [in the MEPI schools' own voices]
AAU MEPI PROGRAM	"MEPI has continued to be a catalyst for the development of several communities of practice with AAU at the center. The countrywide medical education, eLearning, and research support centers TWGs established under the NMSE have been running smoothly and serving as communities of practice. In addition, the MEPI team has been actively participating in the function of various MEPI TWGs. For example, two of the team members are involved in writing academic articles in eLearning, community-based learning, and graduate tracking. Two faculty members of AAU are also co-chairing the Medical Education Research and Community-based learning TWGs."
UB MEPI PROGRAM	"BoMEPI has been actively involved in the eLearning, community based education, graduate tracking and monitoring and evaluation technical working group. The PI co-chairs the eLearning technical working group with the PI from Kilimanjaro Christian Medical School. In March 2014, the eLearning TWG workshop on developing eLearning strategies for the MEPI schools was hosted by the University of Botswana in Gaborone."

MEPI SCHOOL	Excerpts of comments on the value of TWG activities in Building MEPI CoP, extracted from MEPI School Summary Reports, Year 5 [in the MEPI schools' own voices]
KCMUCO MEPI PROGRAM	"The community of practice has played a great role in engaging the members of the MEPI teams. The technical working groups (TWG) have run as informal in a friendly environment, stimulating discussions and creating an interaction among the TWG members that fosters team building and greater cohesion within the TWGs. This has paved the way to share news and progress as well as encouraging one another. Through community of practice, ideas have been generated on how the community will be managed and grown beyond MEPI schools thereby developing a self-sustaining community of practice. The TWG activities have included shared abstracts, publications, focused webinars, individual presentations, quarterly newsletters, and collaborative implementation of community action plans at schools' level."
UKZN MEPI PROGRAM	"Family Medicine and Rural Health are part of the Community Based Education Technical Working Group (TWG) and in the process of data analysis for the multi-center study. Our graduate tracking program being developed is based on our interaction with the Tracking TWG and the sharing of the information and tools with us."
MAKCHS MEPI PROGRAM	"A network of community-based education faculty members is working together in the CBE TWG. The MESAU consortium faculty participated in the MEPI CC/CapacityPlus CBE Workshop in April 2014 in Kampala and benefitted from CBE TWG by co-authoring 3 articles published by the CBE TWG. MESAU very actively participates in the Graduate Tracking TWG. Three faculty, who are members of the eLearning TWG attended the MEPI e-Learning TWG workshop in Botswana in February 2014 and subsequently developed e-learning strategies. Research administrators and 4 faculty subscribed to the RSC TWG and actively participate in the activities of the TWG where they share experiences and best practices. In addition the MESAU research administrators formed a network and a listserv for communication between them."
UON MEPI PROGRAM	"The University of Nairobi leads the M&E Technical Working Group (TWG) of MEPI Schools. Through virtual meetings, MEPI institutions had a chance to discuss M&E matters by sharing M&E plans, shared best practices and identified challenges in conducting M&E in these institutions. One face-to-face meeting was held in Kampala, Uganda in 2013 bringing together key M&E personnel from participating institutions. This culminated in a publication entitled "Evolution of a multi-university M&E technical working group". The TWG is in the process of identifying approaches to conducting cross-country impact evaluation of the MEPI program."
SU MEPI PROGRAM	SURMEPI has been responsible for leading the Medical Education Research Technical Working group (TWG) and in this role has been instrumental in encouraging medical education research activities through the sharing of relevant research, facilitating a collaborative study (which has been published), and presenting a webinar via the MEPI platform. SURMEPI also facilitated a scientific writing retreat in Botswana to assist the BoMEPI project to publish their work. An invitation has been extended to all MEPI schools to call on SURMEPI expertise in facilitating such writing workshops. In addition, SURMEPI staff have had substantial input in the activities of the eLearning TWG (providing expert input into two workshops), the Graduate Tracking and Monitoring and Evaluation TWG, and the CBE TWG (co-authoring the first article from the TWG and participating in the multi-site CBE study)."
UNZA MEPI PROGRAM	Over the course of the five year programme UNZA MEPI participated in a number of communities of practice comprised of the various MEPI technical working groups (TWGs). The Graduate Tracking TWG, under the leadership of UNZA MEPI and with support from CapacityPlus and the MEPI CC, carried out structured key informant interviews with 11 MEPI schools and held a Graduate Tracking Functional Requirements Development Workshop in Lusaka, Zambia in October 2013. The meeting brought relevant stakeholders together to reach a consensus on the core data elements and processes required to meet their graduate tracking needs. Following this a work plan for activities to design and roll out an electronic graduate tracking system for the MEPI schools was made and is under implementation. This culminated in a subsequent Proof of Concept session and a Software Development Workshop in Moshi, Tanzania at the Kilimanjaro Christian Medical University College (KCMUCo). This culminated in the development of the MEPI Connect Tracking Software. The TWG has been communicating and engaging its members through its list-serve as well as through social media such as Twitter and Facebook, where it has a dedicated group."
UZCHS MEPI PROGRAM	"The NECTAR funding and networking platform has enabled UZCHS to benefit from a number of MEPI related and non-MEPI related communities of practice experiences. MEPI communities of practice experiences have been drawn mainly through the Technical Working Groups (TWG). The UZCHS is a member of several MEPI TWGs (Research Support Centres, Community Based Education, Monitoring and Evaluation, Graduate Tracking and e-Learning). These TWGs provide platforms for sharing best practices through various interactions, including Skype calls, webinars and meetings during MEPI Symposia. The UZCHS Research Support Centre is the lead on the RSC TWG. The e-learning TWG assisted schools to develop eLearning strategies."

SOURCE: MEPI School Summary Reports, 2015

PI SITE VISIT EXCHANGES

Based on the Bill and Melinda Gates funded SAMSS experience that “lateral” site visits among faculty of different medical schools in sub-Saharan Africa were enormously valuable in building networks, solving problems, and sharing challenges,⁴ MEPI PIs selected programs/institutions they wished to visit, and, over the course of five years, each PI had the opportunity to participate in the site visits to other school programs. The result was robust PI participation as members of the annual site visit teams and, as a result, schools established collegial and lasting relationships with fellow medical educators across the continent. PIs observed institutions facing challenges often similar to their own, exchanged problem solving approaches with faculty, and considered solutions for possible application in their respective institutions. PIs reviewed the institutional innovations and challenges with the site visit team, and participated in developing an enriched networking and community building environment. These exchanges provided a foundation for further developments in medical education leadership throughout the MEPI network and across the region.⁵



ANNUAL SYMPOSIUM

The annual MEPI symposia were an opportunity to network and build the MEPI CoP, share experiences and innovations, interact with donors, and promote research. Five symposia were held over the MEPI period. These gatherings also provided a valuable forum for representatives of host country ministries of health and ministries of education, and others, to interact with the MEPI schools, learn about their activities, and establish channels of communication. This contributed to broadening the CoP to include these important government policy makers. In addition, the annual symposia also provided a forum for networking with other development agencies such as the World Bank, African Development Bank, and Wellcome Trust, and promoted engagement with similar Asian initiatives in medical education.

Each symposium was organized around a theme developed by a symposium steering committee⁶ based on school recommendations (Exhibit 8.4).

⁴ Mullan F, Frehywot S, Omaswa F, et al. Medical Schools in Sub-Saharan Africa. *Lancet*. 2010; 377(9771): 1113-1121. doi:10.1016/S0140-6736(10)61961-7.

⁵ Frehywot S, Mullan F, Vovides Y, et al. Building Communities of Practice: MEPI Creates a Commons. *Acad Med*. 2014;89(8):S45–S49.

⁶ The Symposium Steering Committee was constituted of the MEPI PI Council representatives, the USG (OGAC, NIH, and HRSA), and the MEPI CC.

EXHIBIT 8.4 MEPI Symposia

DATE	SYMPOSIUM THEME	LOCATION
2011 March 7-10	Medical Education Partnership Initiative	Johannesburg, South Africa
2012 August 7-9	Building Partnerships & Enhancing Capacity	Addis Ababa, Ethiopia
2013 August 6-8	Sharing Innovations, Enhancing Sustainability	Kampala, Uganda
2014 August 5-7	Optimizing Impact in MEPI by Catalyzing Change and Building Sustainability	Maputo, Mozambique
2015 July 14-16	Sustaining MEPI Achievements: Leadership Built, Lessons Learnt and Partnerships Created Towards an AIDS Free Generation	Harare, Zimbabwe

SOURCE: MEPI Symposia Steering Committee Yearly Report

The annual symposia provided a supportive forum for sharing innovations, best practices, challenges, and ideas and opportunities to strengthen partnerships and joint learning. During the symposia, schools reported on programs, innovations, and progress towards achieving their program goals, and shared critical examinations of their performance.

VIRTUAL COMMUNITIES OF PRACTICE

The MEPI web-based environment sought to create a CoP modeled on social learning systems,⁷ and built on the idea of “learning from and with others” through knowledge exchange opportunities. Social Learning Systems are systems built on the idea of “learning from and with others.” In addition to the CoP that formed as a result of face-to-face meetings, MEPI also fostered the ongoing development of CoP across the MEPI schools and amongst national, regional, and international stakeholders through virtual means.

THE MEPI WEBSITE

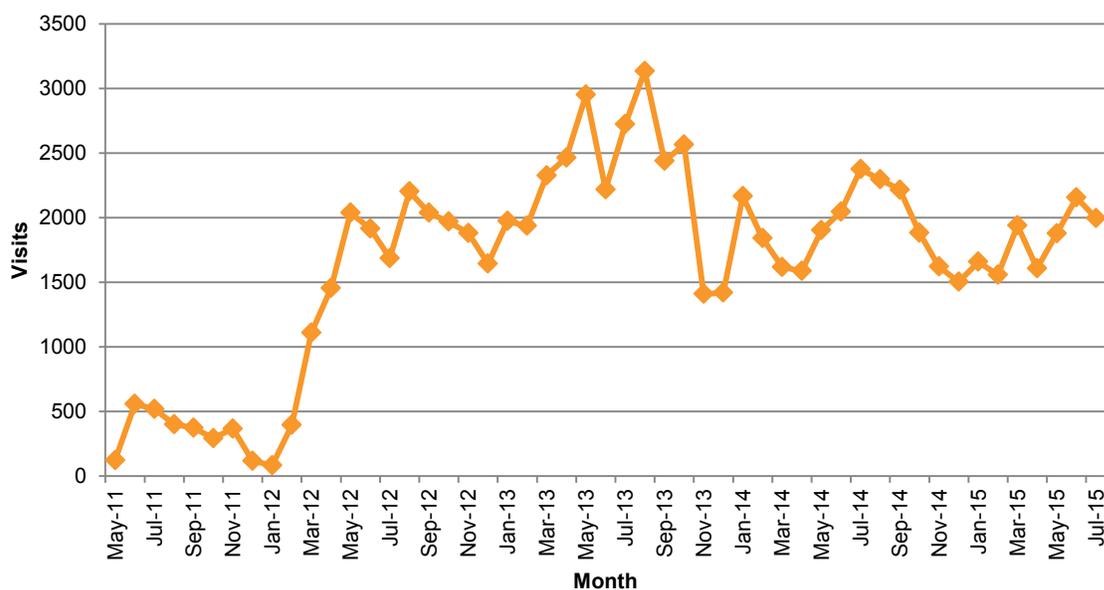
The MEPI Website, www.MEPINetwork.org, served as a platform for communications and knowledge exchange activities between, and among, MEPI schools, the USG, and the broader international community. Launched in January 2011, the website became a popular source of information on medical education, and a resource for schools and others, as news spread about its usefulness through word-of-mouth (Exhibit 8.5). The website showcased school activities and accomplishments, allowing others in Africa and beyond to learn from and about the program.



Outreach was supported electronically through the MEPI website, where forums, webinars, and technical articles were accessed by individuals in over 190 countries.

⁷ Wenger E, McDermott R, Snyder WM. *Cultivating Communities of Practice*. 1st ed. Harvard Business Press; 2002.

EXHIBIT 8.5 Monthly Website Visits, May 2011-July 2015



SOURCE: MEPI Coordinating Center

As more resources were made available through the site, access expanded from sites in Africa and traffic increased. Twenty-one African countries accessed the website in 2011, while 51 African countries accessed it by November 2013. As of August 2015 there were almost 85,000 individual visits to the MEPI website from users in 190 countries. The most visited pages were the library, TWG, noteworthy news, and symposia pages. The website home page served as a “town square” for the MEPI community, highlighting medical education stories, important publications, webinars, and upcoming conferences and international meetings. In addition, a robust and sustainable framework was created to provide a virtual library that could grow and adapt as new resources were added. With links to over 1300 resources, the website created a portal for research and information exchange. From the library page, the site’s most visited page, visitors could access over 900 scholarly articles on medical education in Africa, organized in 16 categories.

All the MEPI webinars and annual symposia, including videos of the speakers’ presentations and slide presentations, were archived and made readily available on the site. Populating the MEPI website with relevant articles, documents, and reports helped expand the larger MEPI community. It was an effective vehicle for documenting and disseminating MEPI findings and innovations, and remains a valuable open-access resource for the CoP and beyond.

The MEPI newsletter, accessed through the MEPI website, served as another vehicle to disseminate explicit knowledge, and inform and strengthen the CoP. Published monthly from June 2011 to August 2015 (a total of 32 issues), each issue focused on topics relevant to medical education in sub-Saharan Africa and related to the MEPI themes (see Appendix E, MEPI Newsletters). The newsletter was also used to share tools, literature, and best practices developed or shared by the TWGs. The newsletter provided a permanent repository of information on shared learning, and connected the community. Issues could be downloaded directly from the website and were shared with an initial list of 278 contacts; this list grew to over 1,000 contacts among the global CoP.

COLLABORATIVE SCHOLARSHIP: THE MEPI SUPPLEMENT

To share the progress and challenges associated with expanding health workforce resources and quality in sub-Saharan Africa with an even broader audience, the PI Council embraced the idea of publishing articles that documented the MEPI experience. It was hoped that these data-based or narrative reports would contribute to wider educational and policy dialogues.

MEPI overcame initial obstacles in assembling research papers for a joint publication and identifying potential publication outlets. MEPI was a new initiative, its track record was limited, and outcomes and data were scarce and uncertain. However, ultimately, an impressive number of articles were published in highly regarded, peer reviewed journals. (Appendix C presents a comprehensive catalogue of MEPI related research publications).

One notable example of the success of the research and dissemination effort was the 2014 dedicated supplement in *Academic Medicine*, the journal of the Association of American Medical Colleges. A total of 225 authors contributed to the 33 articles of the *Academic Medicine* special issue; 70 percent of the articles were authored by African lead authors. This scholarly report documented the largest focused investment in medical education in African history, and demonstrated the rigor of the CoP that emerged across the MEPI network.

BUILDING NATIONAL, REGIONAL & GLOBAL COMMUNITIES OF PRACTICE

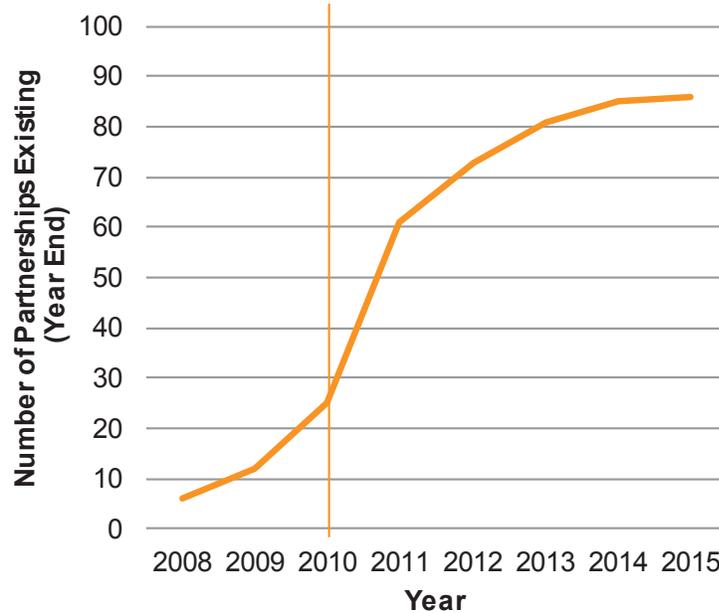
After five years, a young but robust MEPI community of CoP developed that transcended national and regional borders. MEPI was designed and envisioned to strengthen medical education and health systems in sub-Saharan Africa through partnerships.⁸ These partnerships have increased steadily since the inception of MEPI (Exhibit 8.6).

Technical Working Groups shared best practices among education leaders, enhancing the quality of medical education across the continent.

⁸ Oluwabunmi Olapade-Olaopa E, Baird S, Kiguli-Malwadde E, Kolars JC. Growing Partnerships: Leveraging the Power of Collaboration Through the Medical Education Partnership Initiative. *Acad Med.* 2014;89(8):SS19–S23.



EXHIBIT 8.6 Development of MEPI Partnerships Over Time



SOURCE: Data from MEPI Round 2 Survey (2012), MEPI Round 3 Survey (2013), MEPI Final Year Survey (2015).

NOTE: Data from 12 schools. Ten partnerships are excluded from this exhibit because their starting year is unknown.

The range and depth of MEPI partnerships, which were MEPI program-related associations between two or more partners, varied and grew as the initiative advanced. These were categorized in different ways, such as regional academic partners between African institutions (south-to-south), international academic partners between Africa and developed countries' institutions (north-to-south), and intercollegiate and internal partnerships between MEPI schools and their respective governments and/or with international non-academic organizations. In-country partnerships have enabled schools to pool and mobilize limited resources creatively, and generate locally-relevant curricula based on best practices. More importantly, older and more established medical schools have provided critical support to new schools.⁹

Consortia

MESAU

A major development for medical education in Uganda was the formation of new, and strengthening of existing, partnerships (pre-MEPI) to support and enhance medical education across the five Ugandan medical schools, thus creating the MESAU-MEPI partnership consortia. At the national level, the MESAU consortium, formed with MEPI funding, has become a thriving CoP in Uganda. The consortium shared a common mission to deliver transformative medical education for Uganda. Informal

⁹ Talib ZM, Kiguli-Malwade E, Wohltjen H, et al. Transforming health professions' education through in-country collaboration: examining the consortia among African medical schools catalyzed by the Medical Education Partnership Initiative. *Hum Resour Health.* 2015;13:1. doi: 10.1186/1478-4491-13-1.

CoPs were also formed within the consortium. These groups showed promise of sustainability, and may be considered in strategic planning and funding. MEPI MESAU's consortium partnership with the Ugandan government, particularly with the ministries of education and health, was the first partnership between these ministries and Ugandan medical schools, as a block, in the last 20 years. Also, very strong partnerships were established with local district governments, supported by signed memoranda of understanding. Partnership with NGOs in districts (e.g., Mercy Corps) had excellent working relationships with communities, and provided resources, including transport and accommodation, for students participating in MESAU's community-based education program, COBERS. Additional funders, including NIH, Wellcome Trust, the NACCAP II (the Netherlands' Infectious Disease Network for Treatment in Africa), and Africa Routine Immunization System Essentials (ARISE) project, supported the development of the RSC at MakCHS.

Partnerships with organizations invested in Health Professional Education (HPE): MUST, Gulu, and Busitema medical schools received Peace Corps volunteers (e.g. nurses/midwives, physicians) annually as adjunct faculty, and these volunteers participated in teaching, clinical care, and supported students' research. They helped build capacity of departments and provided teaching materials (e.g., skills lab equipment provided to the MUST nurses' skills lab).

Zambia

UNZA MEPI forged partnerships at various levels including with new and emerging medical schools in Zambia, other complementary and synergistic grants at the school of medicine, as well as relationships with other training and research institutions within and outside Zambia. The MEPI program continued to support partner universities in order to increase their capacity in providing medical education. The three partner universities, Copperbelt University (CBU), Lusaka Apex Medical University (LAMU), and Cavendish University all received assistance in the form of classroom equipment, learning materials, and salary support for MEPI coordination. Over the course of the five-year program, UNZA MEPI supported a total of 27 student doctoral fellows from the three partner schools, who agreed to contracts that required them to serve as faculty at their sponsoring institutions following graduation. In-country partnerships with other institutions included working with the MoH and MoE to support the needs of the two ministries, as well as obtain their support and buy-in for ongoing school programs, including UNZA MEPI. The two ministries were key in getting many of the new masters level training programs started, and in formalizing and recognizing some of the qualifications to be obtained into the current structures. Emergency Medicine and Family Medicine qualifications were two examples where the MoH was critical in



getting the programs accepted and started.

Addis Ababa University

Prior to the MEPI consortium, there had been virtually no collaboration or coordination among the Ethiopian medical schools. MEPI catalyzed the establishment of the Network of Medical Schools in Ethiopia (NMSE) to encourage, coordinate, and develop collaboration among medical schools in the country. This fulfilled expectations of the government, which envisioned MEPI serving a supportive role in facilitating resource sharing, particularly amongst the newly established medical schools. To this end, 13 medical schools signed the memorandum of understanding to establish NMSE. Cooperation between the community of senior and new medical schools has continued, and includes efforts to better support medical and other health professions' teaching at Ethiopia's 13 Millennium Schools through the Ministry of Education's Hub.

MEPIN

The MEPIN project has connected investigators from the six network universities in regional and national CoP while also facilitating development and implementation of competency-based medical and dental curricula in Nigeria and some other MEPI institutions in Africa. MEPIN also supported review of curricula of other health professions courses, including nursing, physiotherapy, nutrition, and medical library science. MEPIN also helped to establish medical education units and community-based education among MEPI universities in Africa.

The six MEPIN universities worked together on HRH training, research capacity building, and introduction of information technology to enhance health professional education and health research in the country. Ongoing collaboration continued among and between MEPIN universities, the Medical and Dental Council of Nigeria, and the Nigeria Nursing and Midwifery Council to map the distribution of doctors and nurses in the country. The data collected through the mapping exercise was expected to contribute to education and advocacy tools to convince health policymakers of the country's unequal distribution of HCWs. MEPIN engaged the MoH in academic discussion, and provided relevant publications, to promote evidence-based health policy programs in Nigeria, to the MoH and the National Universities Commission. MEPIN conceptualized the strategy and supported the memoranda of understanding process between the University of Jos Teaching Hospital, state government, and other faith-based facility owners. A memorandum of understanding was also developed between the state MoH and the University of Nigeria Teaching Hospital, to allow students and doctors to rotate through the Enugu state general hospitals. Existing government strategies to increase rural student enrollment were also being implemented through MEPIN.

Universidade Eduardo Mondlane

Over the years, MEPI UEM created and nurtured consortia among the universities of UniLurio and UniZambeze in Mozambique, providing training events that included medical professionals from Beira (UniZambeze) and Nampula (UniLurio) and cultivating student research and training, as well as a Masters in administration and management at UniLurio.

South-to South Partnerships & Collaborations

African medical schools have historically turned to northern partners for technical assistance and resources to strengthen their education and research programs. In 2010, this paradigm shifted when MEPI triggered a number of south-to-south collaborations between medical schools in Africa.¹⁰ Exhibit 8.7 displays the reach and expanse of the robust MEPI-inspired and supported south-south collaborations.

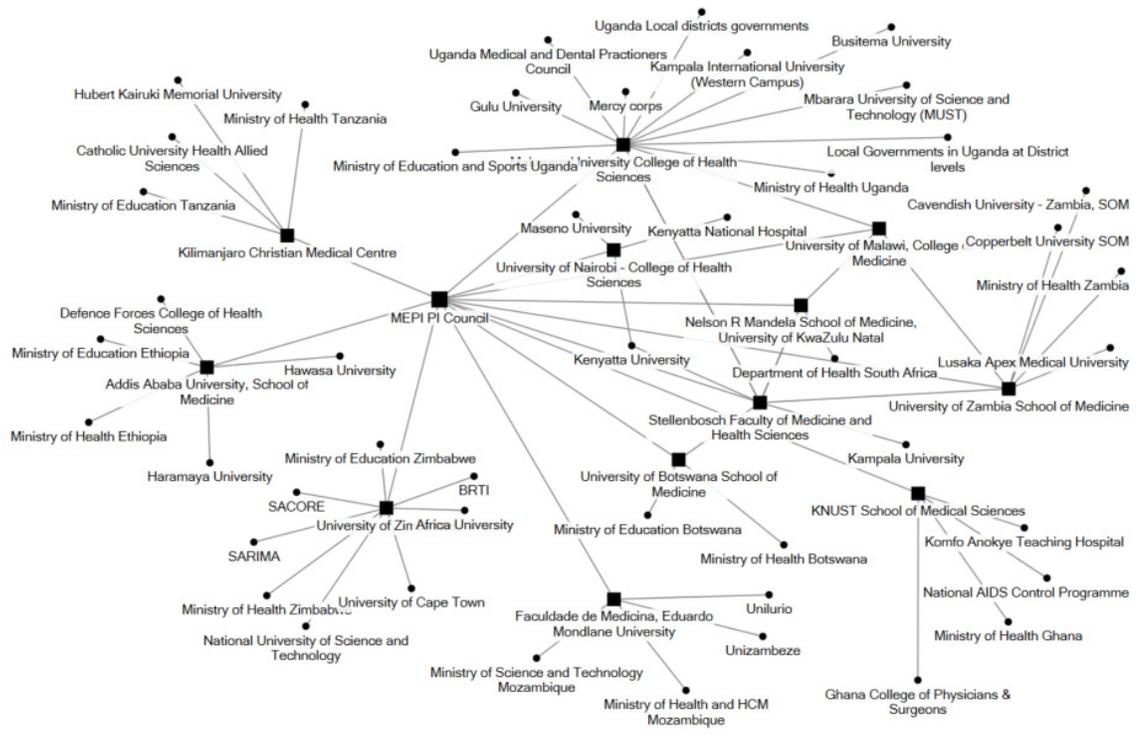


EXHIBIT 8.7 MEPI South-to-South Collaborations

¹⁰ Talib ZM, Kiguli-Malwadde E, Wohltjen H, et al. Transforming health professions' education through in-country collaboration: examining the consortia among African medical schools catalyzed by the Medical Education Partnership Initiative. *Hum Resour Health.* 2015;13:1. doi: 10.1186/1478-4491-13-1.

Durable south to south collaborations were established [among African leaders]...for technical assistance, troubleshooting and support.

SOURCE: Constructed by MEPI Coordinating Center from MEPI Schools Qualitative Data

Stellenbosch^{11,12}

SURMEPI collaborated with 12 universities in eight content areas, as listed in Exhibit 8.8. These included rural elective exchanges with nine countries; Infection Prevention and Control (IPC) training (Ebola) in four countries; MSc Clinical Epidemiology for students from eight African countries; MPhil in Health Systems Strengthening enrolled 50 percent of students from other African countries; and MPhil in Health Professions Education enrolled four first year students from fellow MEPI schools outside South Africa. In addition, the SURMEPI program collaborated with institutions in Africa to build biostatistics capacity in the region.

A summary of SURMEPI south-to-south collaborations appears in the table below (Exhibit 8.8).

EXHIBIT 8.8 Stellenbosch’s SURMEPI Program South-to-South Collaborations

UNIVERSITIES	CONTENT AREAS
University of Botswana	Family Medicine, Grants Management,
University of Cape Town	EBHC, PALSA PLUS (HIV/AIDS training)
Kenyatta University, Kenya	Family Medicine, Medical Education
University of Namibia	EBHC
KwaZulu-Natal University	EBHC
Kwame Nkrumah University of Science & Technology, Ghana	Grants Management
Makerere University, Uganda	Family Medicine, HSSR, EBHC, eLearning
University of Malawi	HSSR
Muhimbili University, Tanzania	HSSR
University of Nairobi, Kenya	Medical Education, EBHC
University of Zambia	Family Medicine
University of Zimbabwe	Biostatistics

SOURCE: Stellenbosch University Site Visit Report, 2015

Mozambique

UEM established vibrant south-to-south collaborations, with resident exchanges and collaborative research with several universities in southern Africa including UNZA, KCMUCo, SU, UKZN, UCT, and also with universities in South America, including the Universidade Federal da Bahia and Fio Cruz in Brazil.

Ghana

The core CoP in Ghana for the Emergency Training program included the MoH, GCPS, KNUST, and KATH. This was strengthened by the

¹¹ Machekano R, Young T, Conradie W, et al. Workshop report: building biostatistics capacity in sub-Saharan Africa-taking action. *Pan Afr Med J.* 2015; 21:167. doi:10.11604/pamj.2015.21.167.5827.

¹² Mash B, De Villiers M, Moodley K, Nachega JB. Guiding the Development of Family Medicine Training in Africa through Collaboration with the Medical Education Partnership Initiative. *Acad Med.* 2014;89(8):S73-S77.

University of Michigan and other universities and organizations, including the University of Utah, University of Cincinnati, and Project Hope. Over the course of MEPI, south-to-south collaborations were developed with three MEPI institutions across Africa. UKZN provided emergency medicine faculty exchange, trainee exchange, and other research and training opportunities to strengthen the Ghana program, especially in the area of HIV/AIDS. The Emergency Medicine curriculum was also shared with UNZA. KNUST also collaborated with UI and SU in building research administration capacity.

Zimbabwe

The Ministries of Higher and Tertiary Education, Science & Technology Development (MOHTESTD) and Ministry of Health and Child Care (MOHCC) were active participants in the implementation of NECTAR activities in Zimbabwe. The MOHTESTD also provided a grant to support NECTAR activities in Zimbabwe. In partnership with MOHCC and other stakeholders, IMHERZ played a key role in the development of the Zimbabwe National Strategic Plan for Mental Health Services (2014-2018). IMHERZ facilitated the formation of a working group that would oversee implementation of mental health operations research in all districts in Zimbabwe. A memorandum of understanding was entered with SU, for Family Medicine. NECTAR also partnered with Africa University and National University of Science & Technology to implement the iRIM grant in strengthening centralized research offices in the respective institutions.

KCMUCo

As a result of KCMUCo's improved ICT infrastructure and successful establishment of eLearning, the Government of Tanzania planned to develop IT as a primary teaching and learning tool for all higher learning institutions and the Ministry of Health and Social Welfare (MOH&SW) identified KCMUCo as a collaborating center for eLearning nationally. KCMUCo's learning content management system (LCMS) has raised national visibility of the college as a leader in medical education innovation, prompting visits from many schools to learn about the program. KCMUCo hosted the Forum for University Colleges of Health Sciences in Tanzania (FUCHS) to share and raise awareness of opportunities the MEPI program offers, and facilitate implementation of the LCMS in other medical schools.

University of Nairobi

Over a period of five years, 35 linkages with Kenyan, African, and global

MEPI fostered an international community of practice among the leadership at MEPI schools in Africa and the United States.

institutions were achieved, as illustrated in Exhibit 8.9.

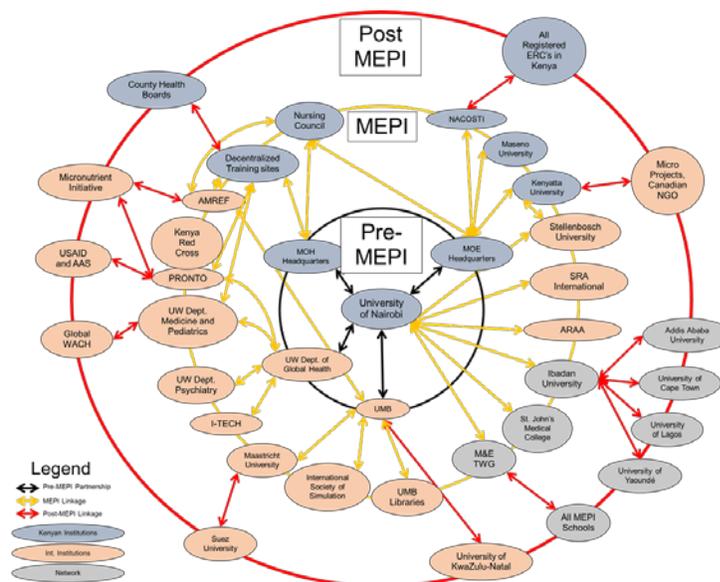


Exhibit 8.9 University of Nairobi MEPI Partnerships, Before and After MEPI

Source: MEPI University of Nairobi Program Year 5 Summary Report

Four of these existed before MEPI, while the rest were developed with MEPI support. These partnerships helped support decentralized medical education, research training, and mentorship and research administration and management. The results included improvement of library facilities, expansion of the multi-disciplinary skills lab, support for research training and mentorship, and establishment of a Medical Education Unit. In total, 17 international organizations, ten African, two Kenyan universities, and eight Kenyan government entities in health and education form the current partnership network around the PRIME-K program, and it continues to expand. Partnerships were integral in enhancing quality of trainings, and expanding medical education and research opportunities in Kenya.

Malawi

Collaborations with the MoH, JHU, and UNC were long-term relationships. The Malawi government continued to remodel the Queen Elizabeth Central Hospital oncology ward, which, when completed, was expected to improve care delivery there.

Ibadan



BoMEPI has successfully implemented partnerships with the University of Pennsylvania (UPenn) and the Harvard School of Public Health (HSPH). UPenn was instrumental in clinical training and research support, and provided part-time teaching for undergraduate and post-graduate training at UB. UPenn also significantly led the set-up of the Molecular Genetics laboratory funded by MEPI, and was also implementing an NIH specialized center-cooperative agreement (U54) consortium research grant with UB, with the BoMEPI PI being a co-Lead for a research mentoring core of the grant. HSPH played a key training role in post-graduate public health teaching in the first three years, as well as grants management capacity building. Four public health residents and a faculty member attended a one

“MEPI, designed to enhance medical education at sub-Saharan African institutions such as Addis Ababa University in Ethiopia, has also greatly benefitted the U.S. partners including Emory University. MEPI provided an opportunity for faculty, residents, fellows and medical students at AAU and Emory to become engaged in a bi-directional collaboration. Emory was able to leverage this collaboration to establish the Global Health Residency Scholars Program, which provided a global health rotation for senior residents, fellows and faculty and allowed them to contribute to efforts to enhance medical education at AAU. Department to department collaborations contributed to the goals of MEPI and enhanced medical education and postgraduate research training at AAU. MEPI also provided opportunities for AAU fellows and faculty to have rotations/observerships at the Emory University affiliated hospitals.”

- Emory University School of Medicine

month biostatistics and epidemiology training at HSPH in Boston resulting in successful completion of their training.

Zimbabwe

The NECTAR Program was designed around a pre-existing partnership among the UZCHS, University of Colorado, Denver, and Stanford University. The partnership was pivotal in the implementation of NECTAR activities via curriculum review, faculty development, Health Education Advanced Leadership for Zimbabwe (HEALZ), Mentored Clinical Scholars (MCSP) and Mentored Research Scholars (MRSP) programs, visiting professors program, setting up of ICT infrastructure and acquisition of ICT resources, and capacity building of research administrators and managers.

South Africa, Stellenbosch

Over the last five years, SURMEPI has partnered with JHU, which contributed to various training sessions and workshops offered. This partnership, which involved JHU faculty annually, aimed to increase capacity for locally relevant research by providing training on how to write a successful NIH Grant for postgraduate students, postdocs, and faculty members. Junior faculty participants were successful in securing an NIH research project (R01) Grant or received promising impact scores for re-submission. A firm collaboration was also established with Morehouse University in Atlanta, USA. Prof Daniel Blumenthal, a member of the SURMEPI Advisory Committee, will be doing a Fulbright Fellowship at the

“The MEPI program at UZCHS was a unique collaborative partnership between Stanford University, University of Colorado, Denver, University College London, King’s College London, Bristol University and University of Cape Town with Zimbabwe’s premier medical teaching school. The seven schools worked on unique evidence based teaching methods, strengthening faculty development and regional relevant research programs. Two linked awards targeted cerebrovascular disease and mental health in Zimbabwe. Bilateral exchange of scholars and visiting professors provided rich relationships as well as cross-fertilization of ideas and long-lasting friendships. Strengthening of curriculum, and partnering increased medical student enrollment by 116% while increasing fulltime faculty by 30%. At the beginning of MEPI there was virtually no internet access at the hospital. With IT support the MEPI program established a secure virtual private network, increased bandwidth and developed a large array of e-resources including e-Granary, Up-to-Date, REDCap, Claroline and Khan Academy materials. The MEPI program was unique at the UZCHS site and hopefully the newly Fogarty funded PERFECT grant will continue partnered research training for the next several years. The success of obtaining this grant highlights the benefits of collaborative partnerships formed during MEPI.”

- Michele Barry, MD, FACP, Senior Associate Dean for Global Health,
Stanford University School of Medicine

RCS later in 2015. Morehouse advised SURMEPI in setting up the SU-Area Health Education Centre (AHEC), and has done an evaluation of the SU-AHEC project.



Uganda, MESAU

MEPI and US schools like JHU have greatly assisted in MESAU's education and research activities (e.g. curriculum development and M&E, eLearning, research administration capacity enhancements). Stanford University-MakCHS created a popular five-week distance learning program on essential emergency medical care. BU partnership with Kissito Health Inc. and Virginia Tech Carilion School of Medicine provided an eLearning

“Duke University was pleased to partner with the Kilimanjaro Christian Medical Center/Kilimanjaro Christian Medical University College (KCMC/KCMU College) MEPI. The partnership engaged faculty and staff across multiple entities at Duke including clinical faculty, medical school administration, Center for Instructional Technology, medical libraries, and laboratory and IT support services. In addition, faculty and staff from the Duke-National University of Singapore were involved. A principal area of focus was the introduction of new technologies and teaching methods, and assessing their impact. These impact assessments are resulting in publications from interventions such as the Learning Content Management System+ (Killewo et al 2014), team-based learning (Nyindo et al 2014), electronic library and administration of the US National Board of Medical Examiners tests for the first time on the African continent (Lisasi et al 2014), and introduction of diagnostic laboratory techniques for medical students (Mimano et al 2015). Several Duke faculty served as mentors in the Mentored Research Training Program, which generated preliminary data to support proposals for external research funding. The focus on undergraduate medical education added a new dimension to the KCMC-Duke Collaboration, and included both faculty-student and student-student interactions, with resulting exchange, fulfillment and joy. Overall the KCMC/KCMU College MEPI strengthened the partnership between our institutions, including visits from the Duke University President and Dean of the School of Medicine”

-John Bartlett, Professor, Medicine and Global Health, Co-Director, The Center For AIDS Research

suite, 40 computers, 19,000 medical text books, an anatomy suite, and laboratory equipment. A partnership was created with the Royal Society of Medicine and the Uganda Diaspora Health Foundation to develop a collaborative training program for evidence-based medicine.

Ghana, KNUST

From the beginning of the MEPI program, KNUST has partnered with the University of Michigan in the Emergency Medicine Program development. KNUST also partnered with the Texas State University for its work within MEPI.

Ethiopia, AAU

AAU MEPI has also maintained existing academic relationships, and actively fostered new ones globally. In addition to the five US-based partner universities, new partnerships were developed with universities in the US, Canada, Europe, and sub-Saharan Africa.

Kenya, UoN

The University of Washington (UW) in the US has been a strong partner with the UoN MEPI program, since the inception of the MEPI application process and development of the program. This bilateral relationship existed many years before MEPI and will exist after MEPI concludes.

Zambia, UNZA

UNZA MEPI's achievements overlapped with those of other complimentary projects which were all aimed at capacitating the SOM to make it a center of training excellence. The Southern Africa Consortium for Research Excellence (SACORE) project, supported by the Wellcome Trust and the Zambia Education Partnership for Advanced Care and Treatment (ZEPACT), and CDC-MPH Projects (both supported by CDC), substantively contributed to efforts to enhance training at the highest level, while providing the necessary resource base for sustainability, especially with reference to research. The Vanderbilt-CIDRZ AIDS International Training and Research Program (AITRP), supported by a CDC-sponsored supplement, continued to partner with UNZA to build HIV-related research capacity. That program has successfully focused on supporting Masters of Medicine students' (clinical residents') clinical research, with recent trainees presenting their results at the International AIDS Conference (AIDS 2012) and the International Workshop on HIV Treatment, Pathogenesis and Prevention Research in Resource-Limited Settings (INTEREST). Other collaborations included one with the World Sight Federation (WSF) where a memorandum of understanding was signed for WSF to send faculty to teach on the MMed Ophthalmology program. A second memorandum of understanding was entered into with the Calcutta School of Tropical Medicine in India for support in teaching on the MSc Pharmacology program.

Inter-professional Collaborations

MEPI facilitated and inspired valuable collaborations among the MEPI

MEPI included nursing, laboratory, pathology, and other allied services essential to a functioning health system, in its programs. More than 1660 nurses benefited from MEPI sponsored trainings, as did over 200 midwives, 115 lab technicians, and 38 pharmacists.



schools to train students from multiple health professions, including nursing, pharmacy, dentistry, and public health students, and equip them with a range of skills, building HRH capacity through faculty development and training, curriculum development and reform, and infrastructure development. For example, UB School of Medicine developed a clinical skills lab in collaboration with the School of Nursing. This allowed medical and nursing students to practice their clinical skills as well as practice teamwork before they encountered real patients.¹³ AAU developed a standard inter-disciplinary community health curriculum for medical, pharmacy, and laboratory technology students, with expansion to three additional sites at Bulbula, Abosa, and Meki.¹⁴ KCMUCo expanded the LCMS to include curricula support for nursing, physiotherapy, health laboratory sciences, biostatistics, epidemiology, and Master's in Medicine programs.¹⁵ Almost 60 Emergency Nurses (35 diploma and 25 degree) have graduated from KNUST, and 50 more are currently in training. MESAU graduated 895 medical, nursing, dentistry, pharmacy, radiography, palliative care, and diploma in Community HIV/AIDS Care and Management Counseling students.¹⁶ Additionally, Mbarara University in Uganda introduced new programs in physiotherapy and pharmaceutical sciences, and KIU has implemented a new degree program, Bachelor of Medical Laboratory Technology, over the course of MEPI.¹⁷ MakCHS also taught programs in Biomedical Engineering, Speech and Language Therapy, Cytology, and Biomedical Sciences.¹⁸ UKZN implemented short courses in Integrated Management of Childhood Illnesses (IMCI) and Practical Approach to Lung Health in high-HIV prevalence countries (PALSA Plus), and trained 17 facilitators in the Advanced Midwifery and Primary Health Care program in the same. These activities were aimed at improving nursing training and to better prepare nursing students to work in communities.¹⁹ UKZN also incorporated the Nurse Initiated Management of Antiretroviral therapy (NIMART) into the Bachelor of Nursing program. UKZN was the first university in South Africa to successfully incorporate NIMART into its undergraduate curriculum, and more than 509 nurses have completed the training.²⁰ As discussed in Chapter 6, UKZN integrated HIV/AIDS training into all parts of its curriculum so that students recognize this as best practice for care of HIV/AIDS as a chronic disease.²¹ UoN, in partnership with African Medical and Research Foundation (AMREF), an African-based non-profit global health organization, rolled out an upgraded Electronic Bachelor of Science in Nursing (E-BSN) Program, aimed at nurses with diploma qualifications. (UoN approved the E-BSN curriculum in a record time of three years.) This innovative program is completed almost entirely through an online format, with the exception of in-person teaching for two weeks per trimester at UoN. The sustainability plan of the E-BSN program includes charging fair tuition fees from the students. The program received support from the Nursing Council of Kenya (NCK), which certifies all training sites in Kenya and participated in curriculum review and development of the electronic content.²²

¹³ UB SSR, 2015

¹⁴ AAU SVR, 2014

¹⁵ KCMUCo SSR, 2015

¹⁶ MakCHS SVR, 2015

¹⁷ MakCHS SVR, 2015

¹⁸ MakCHS SVR, 2015

¹⁹ UKZN SVR, 2015

²⁰ UKZN SVR, 2014

²¹ UKZN SSR, 2015

²² UoN SVR, 2015

At UNZA, a total of 12 new masters level training programs were introduced during UNZA MEPI implementation, and all enrolled students over the years. MEPI also assisted with the development of a new BSc Nursing Distance Learning program.²³ UNZA also developed a research methods course for MSc candidates in pathology, nursing, physiological sciences, and biomedical sciences, as well as a foundational public health research course for all MPH specialties, MSc Physiotherapy, and other research students.²⁴

Mozambique introduced two masters degrees at UniLurio, Master of Health Professional Education and Masters in Tropical Medicine and Global Health, in 2014 through MIHER support and MEPI funding. Two additional masters degree programs were established at UniLurio in 2015, Master in Clinical Nutrition & Master in Nutrition and Food Safety. Together these programs reduced the potential for brain drain by providing in country opportunities to obtain masters degrees that are required for faculty appointment. Over 50 percent of the 49 masters' students enrolled in the program in 2014 were faculty members. In addition, half of the current students are women.²⁵

PRINCIPAL INVESTIGATORS COUNCIL

The mission of the MEPI PI Council was to provide a leadership forum for the medical schools participating in MEPI in regard to meetings, common initiatives, and collaborative education and research projects. The PI Council met twice a year in person (at the annual MEPI symposia and every January at one of the MEPI schools). Interim meetings occurred via Skype conference call or via the MEPI PI listserv. The PI Council members, both from the MEPI schools and the MEPI CC, were part of the leadership in the planning and implementation of the five MEPI annual symposia. The PI Council handled policy issues such as publication policy, assisted in the coordination of collaborative initiatives in education and research, and identified opportunities for sharing and disseminating MEPI initiatives and partnering with other interested parties. It is hoped that the sustainability of the partnerships created, and the CoPs developed, will continue to grow beyond the life cycle of MEPI.

CONCLUSION

A very young, but strong CoP has developed and been enriched and fortified through MEPI. This CoP may end up being one of the strong legacies of MEPI. The components that helped create and build it are needed to continue its growth. Among other factors, the MEPI website that fostered the growth of MEPI's virtual CoP beyond the national borders, and the peer to peer PI site visit exchanges are two of the best MEPI CoP success stories. Lack of programmatic coordination, human resources, information technology, and financial support for these components may stunt the growth of the MEPI CoP.

²³ UNZA SSR, 2015

²⁴ UNZA SSR, 2015

²⁵ UEM SSR, 2015

CHAPTER 9

MEPI Sustainability

9

MEPI Sustainability

Recognizing that MEPI was a time-limited funding commitment on the part of the USG, the MEPI FOA called for applicant schools to include a plan for how the activities initiated under the MEPI award would be sustained at the conclusion of the five-year award period. As the MEPI program progressed over five years, the challenge of ensuring this sustainability became more central to the schools and to the program as a whole.

MEPI schools regularly documented activities they initiated to integrate MEPI-specific activities within the larger educational missions of their institutions. Curriculum changes, enrollment strategies, and faculty support, for example were, in many cases adopted by MEPI schools which committed funds to make such changes part of ongoing budgets. Investments in ICT were noted to support the educational mission of many schools and won both recognition and budgetary support commitments. (Chapter 3, Capacity Building and Chapter 5, MEPI Research Capacity and Environments, describe examples.) MEPI schools reported that MEPI-supported initiatives such as the creation of Research Support Centers and Medical Education Units that serve multiple communities within schools have already reaped benefits that ensure sustainability. At the same time, schools noted that some MEPI inspired changes to pedagogy call for a change in the culture of instruction and education that require time to become deeply rooted.

MEPI school summary reports,¹ surveys and site visit reports documented efforts and challenges in this area while site visits were occasions for thoughtful discussions among multiple stakeholders about these issues. The following are a selection of those observations shared in the MEPI school reports which convey the breadth of success in embedding MEPI initiatives within MEPI schools' ongoing programs.

The UKZN's summary statement on sustainability captured precisely that strategy.

“Sustaining the impetus of MEPI will be a result of the ways in which the program has been strategically positioned within the existing (UKZN) structures or the repurposing of existing resources and coordination of complementary activities. For example, all of the MEPI activities relating to the undergraduate program in medicine, nursing and pharmacy will be sustainable because they are entrenched within the curriculum and the activities are aligned

¹ School Summary Reports can be found in Appendix A

with the vision of the College of Health Sciences for UKZN and that of national and KZN Department of Health. All the relevant academic and support staff have been part of this initiative and some of the MEPI-employed staff will become part of the teaching establishment at UKZN. UKZN Information and Communication Services will continue the maintenance activities of all IT infrastructure and upgrading of the technology. The MOU signed with DOH will ensure that the decentralized training platform will continue and expand in the future.”²



A further case in point is provided by the Health Professions Education Department at the UZCHS.

“To address the gap in faculty health professions education training at the University of Zimbabwe College Of Health Sciences, the MEPI program in Zimbabwe implemented two new programs. The first was a two-to-three day faculty development workshop conducted three times a year. The second was entitled Health Education Advanced Leadership for Zimbabwe program (HEALZ), an intensive one-year program consisting of three 5-day residential workshops, online and face-to-face mentorship, and implementation of a curriculum change project. To date a total of 44 faculty members have gone through the HEALZ program. A concerted campaign by the college convinced the University Senate of the transformative role that these programs have played in the college culminating in the approval of the establishment of the Department of Health Professions Education in 2013, in the third year of the MEPI program. Space and staff (chairperson, 3 faculty positions and 5 support staff) were made available through the University budget. This has ensured the sustainability of these health professions education programs at the University of Zimbabwe with a plan to promote HEALZ to a masters and doctoral program.”³

MEDICAL EDUCATION UNITS

Dedicated medical education units were at the center of MEPI long term planning at a number of schools.

“Implementation of MEPI in Nigeria (MEPIN) capacity development programs is facilitated through the administrative structures of participating institutions. The Universities of Ibadan and Lagos established Medical Education Units to work with MEPIN to implement development strategies. Other MEPIN universities are

² UKZN SSR, 2015

³ UZCHS SSR, 2015

A quarter of MEPI schools have commitments of monetary support from governmental agencies to continue MEPI activities, two-thirds have support in the form of lab space, staffing and research training support...Each school has evidence of unique and creative approaches to ensuring MEPI's investments continue to benefit students, faculty, and ultimately, patients.

in the process of establishing similar units. MEPIN has already transferred some of its activities to the Medical Education Unit and Research Management Offices in the universities to ensure sustainability.”⁴

At many schools, medical education units became active repositories of MEPI sponsored innovation, preserving the new teaching modalities and strengthening the role of the medical education department in the school. This was indeed the case at UBSOM which reported this sustainability progression.

“The training materials developed over the past five years by the Clinical Audit Unit and the Health Services Research Unit (HSRU) are being packaged for handover to the Medical Education and Public Health Departments respectively. These will enable the departments to continue the trainings without MEPI resources.”⁵

INFORMATION & COMMUNICATIONS TECHNOLOGY

ICT applied to medical education was a prominent feature of most MEPI programs – a huge educational asset, but one that will require ongoing investment and maintenance. The UNZA reported:

“A lot of improvements to the internet infrastructure have been made by MEPI. This infrastructure is being supported and maintained by the School of Medicine as a sustainability strategy beyond the grant period. Similar continuation of support and maintenance will also apply to other improvements that have been made such as the skills laboratory, eGranary, Moodle, and IT equipment. The internet bandwidth has almost doubled since the start of MEPI and this will continue as MEPI's contribution has greatly promoted the buy-in and support by central administration for the university. The University is supporting additional ICT personnel and bandwidth.”⁶

At KCMUCo, a computer-based classroom and the extensive use of tablets by every student has been the centerpiece of their MEPI sponsored innovations which, they now report, are being incorporated into the college's budget.

“The use of ICT to enhance teaching and learning at KCMUCo has gained support from the college administration that consequently led to the financing of the computer laboratory that established institutional ownership of the project. The college has now budgeted for maintenance of the ICT infrastructure.”⁷

⁴ UI SSR, 2015

⁵ UB SSR, 2015

⁶ UZ SSR, 2015

⁷ KCMUCo SSR, 2015

AAU has gradually migrated their coursework to the use of tablets for which they have developed a practical sustainability plan.

“The tablet program introduced by MEPI Ethiopia is now part of the Ministry of Health. The ministry has now purchased and distributed tablets for other schools. The tablet program was designed with a pay-back mechanism which establishes a revolving fund to be able to address human resource capacity expansion and retention.”⁸



NEW COURSES, PROGRAMS & MEDICAL SCHOOLS

Many new courses were pioneered with MEPI support and now face the common challenge of stability of staffing and funding. Schools have found many ways to address this challenge. SU reported establishing permanent positions for the faculty teaching in the new programs.

“SURMEPI has also been strengthening the programmatic offering of these courses. New courses have been developed and implemented with SURMEPI support and over the coming year these will be handed over to Stellenbosch University faculty with dedicated teaching portfolios on permanent posts.”⁹

UEM has started groundbreaking training programs at the Universidade Lúrio (ULu) in Nampula, Mozambique, over 800 miles to the north of Maputo.

“Two programs, a Masters of Health Professional Education and a Masters in Tropical Medicine and Global Health, established at UniLurio with funding from MEPI and the Mozambique Institute for Health Education and Research (MIHER). These programs, along with masters programs in Clinical Nutrition and in Nutrition and Food Safety, are reducing the potential for brain drain by providing advanced degrees that are now required for faculty appointment in Mozambique. Over 50% of the 49 current masters students are already faculty members. In addition, half of the current students are women.”¹⁰

Developing post-graduate professional tracks for program graduates will help with program visibility and the likelihood of having future professional allies for sustainability. The emergency medicine program at KNUST is engaged in this strategic use of its graduates.

“One of the strategies employed by the program to ensure sustainability is to facilitate faculty development for graduates. A

⁸ AAU SSR, 2015

⁹ SU SSR, 2015

¹⁰ UEM SSR, 2015

graduate from the first residency cohort of Emergency Medicine specialists has completed fellowship training and 10 more Emergency Medicine specialists are at different stages of fellowship training with the Ghana College of Physicians and Surgeons. The success of these training programs has led to interest from several other countries. Ethiopia is now exploring the idea of sending their residents to train at KATH in Kumasi, Ghana. Three nurses from the first Emergency Nursing (EN) cohort were selected as EN trainers based on leadership, teaching, and clinical skills. These nursing trainers, who are on a faculty development track, are involved in all aspects of program delivery and have assumed greater responsibility including supervising students in clinical training.”¹¹

The MEPI program at the College of Medicine of the UoM, focused on HIV related oncology, supported expanding skills among existing salaried staff.

“The MEPI-Malawi program in liaison with the Ministry of Health deliberately recruited salaried staff from the public service for the various training opportunities. Upon completion, the staff went back to their positions and some were even promoted in recognition of their additional qualification. This has not only provided assured retention, but also sustainability of their competencies within the system.”¹²

MESAU, the coalition of MEPI schools in Uganda, nurtured strong relationships with national government ministries and professional associations that encouraged a government decision to fund a new medical school in the country.

“Medical Education for Equitable Services to All Ugandans (MESAU), the coalition of MEPI schools in Uganda, played an influential role in persuading the government to fund a new medical school in the country. As a result of MEPI-MESAU’s work with the ministries of health and education, the government of Uganda funded the start-up of Busitema Medical School and paid for the construction of the school’s basic sciences labs. MESAU’s influence was a key factor since the consortium enjoys vibrant partnerships with local and international stakeholders, the Uganda Medical and Dental Practitioners Council, and professional associations. Busitema University received supplementary funding to support additional staff.”¹³

¹¹ KNUST SSR, 2015

¹² UoM SSR, 2015

¹³ MakCHS SSR, 2015

RESEARCH

Research is a key theme of many MEPI programs and its sustainability presents special challenges. AAU, like many other MEPI schools, has established an Office of Research Administration, often called a Research Support Center.

“MEPI, through the Initiative on Research and Innovation Management (iRIM), has catalyzed and supported the establishment of an Office of Research Administration (ORA) within the College of Health Sciences, Addis Ababa University. This office is working to facilitate opportunities in grant writing and development, research and bioethics training, as well as collaborative activities for research and organizational development. As the ORA is being established as a supportive wing of the Office of Research and Technology Transfer at the college, it will ensure the sustainability of the activities within the enhancement of research and capacity building strategic objective.”¹⁴

Research training and mentorship have been important assets in many MEPI programs, as is reflected in this testimonial from a PhD candidate at the UoN, in Kenya.

“Research produced by the linked award, Strengthening Maternal, Newborn & Child Health (MNCH) Research Training in Kenya, at the University of Nairobi is affecting care delivered at district hospitals and is being translated into policy by the Ministry of Health. One example of this can be found in the results of a research project at Mbagathi District Hospital regarding the uptake of contraceptive implants in immediate postpartum period. Site physicians didn’t expect high uptake, but results showed the opposite. As a result, the Ministry of Health is working to scale-up postpartum implants at Mbagathi District Hospital. The post-graduate student who did this work has presented her research at the Consortium of Universities for Global Health (CUGH) conference in Washington, DC.”¹⁵

MESAU, the MEPI sponsored consortium of medical schools in Uganda, supports doctoral candidates like Dr. Lydia Nakiyingi, who wrote the following in her report:

“I am a MEPI-MESAU PhD fellow registered with Makerere University and studying ‘Improving the diagnosis of smear-negative TB and mycobacteremia in HIV infected individuals in Uganda.’

As faculty at Makerere University, my dream had been to grow to



¹⁴ AAU SSR, 2015

¹⁵ UoN SVR, 2013

the highest level in the academic profession and to become an internationally recognized independent clinical researcher, who is capable of leading a group of investigators in the field of tuberculosis research in Uganda. It was about 3 years ago when I received joyous news that I had been selected as one of the candidates for the highly competitive MESAU PhD fellowship program. I knew then that this had opened doors for me to achieve my dreams. Since then I have been able to achieve my dreams and even much more than what I had anticipated.”¹⁶

FINDINGS FROM SCHOOL SURVEYS & SITE VISITS CONCERNING POST-MEPI SUPPORT

Support for the maintenance or expansion of MEPI initiated activities could come from a number of sources and could be monetary or in-kind contributions. Analysis of the Year 5 Survey provides an informative overview of these activities.

Three out of 12 MEPI schools indicate commitments of monetary assistance from governmental agencies, listed in one country as the Ministry of Education and the Ministry of Health, as the Human Resources Development Council in another, and the Ministry of Higher and Tertiary Education Science and Technology Development in a third country. Major investments were made in IT infrastructure, upgrades for libraries, computers, and faculty development. Financial support was also provided for community based learning and the continuation of a medical internship training program. Non-monetary support from governmental sources was much more common with eight of 12 schools benefiting in this fashion. Government supported learning, m-learning, and internet connectivity. In addition, decentralized training and the establishment of satellite MEPI learning centers were being supported by ministries of health. Other areas of in-kind support included assistance with lab space, research training support, and staffing.¹⁷

To date, MEPI schools have not reported receiving financial support from non-governmental sources to sustain MEPI activities. Four schools, however, have been beneficiaries of non-monetary support from sources other than their own governments including PEPFAR and USAID, the Mercy Corps, and in one instance, the parent university. Schools identified receiving assistance in areas such as simulation, capacity building, networking with other medical schools in-country, and training for residents, students and pre-internship placements for students.

Nonetheless, the schools anticipate a reduction in MEPI activities following the termination of the grant funds. Responding to questions about the

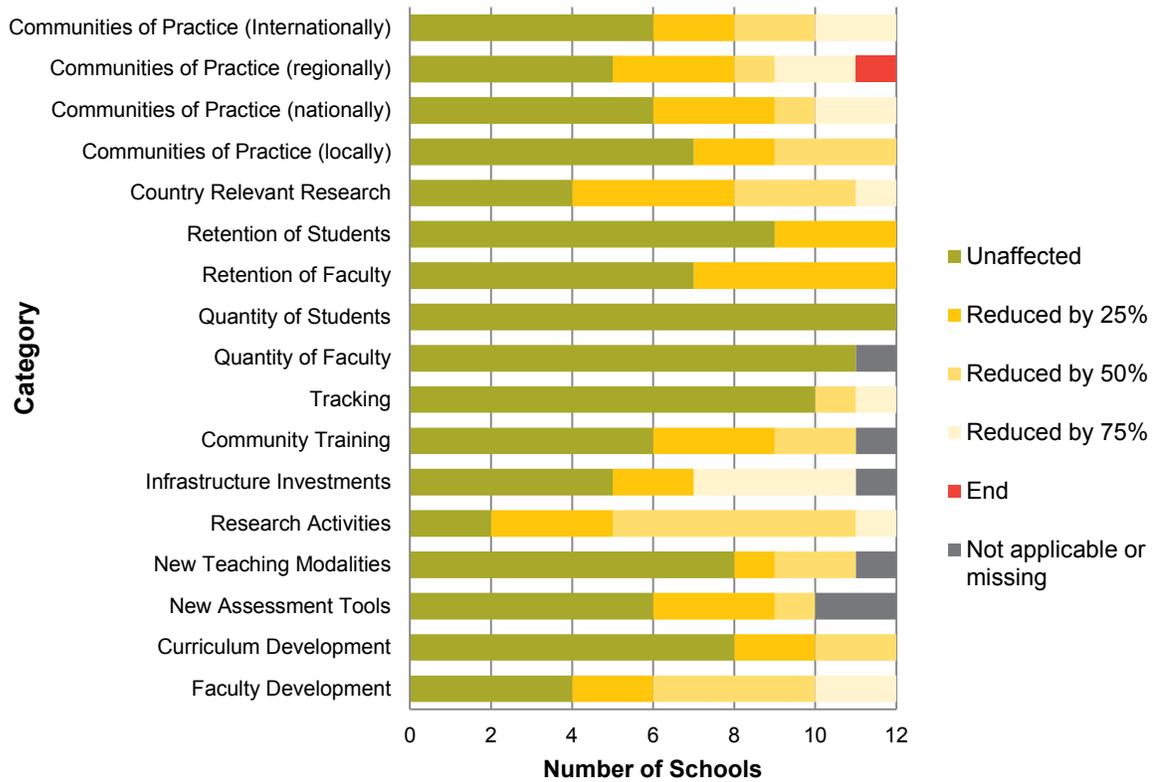
¹⁶ MakCHS SSR, 2015

¹⁷ MEPI AS, Year 5, 2015

impact on specific areas developed with MEPI funding, the schools as a group anticipated different levels of sustainability/non-sustainability. Exhibit 9.1 indicates that the quantity of students and faculty seems unlikely to be reduced; however, research activities seem likely to be diminished at ten of the schools and faculty development at eight of the schools. While the schools anticipate likely moderation in many MEPI sponsored activities, few envision programs ending entirely. Most programs cut-backs are thought likely to be in the 25-50% range.¹⁸

It is difficult to project precise levels of reduced activity, but Exhibit 9.1 and its underlying data from each school provide a potential work plan as MEPI school leadership consider approaches to harnessing resources and external sources of support to sustain MEPI gains.

EXHIBIT 9.1 Estimated Percentage Reduction in Activity After MEPI Funding is Concluded (2015)



SOURCE: Data from MEPI Final Year Survey (2015).
NOTE: Includes data from 12 schools.

Under worst case scenarios, if funding were to become very restricted, MEPI PIs indicated how they would prioritize funding to various parts of MEPI if funds were available at reduced levels. Of the eleven schools reporting, six indicated a priority for research or research training; three would focus on decentralized training in one form or another; three would continue eLearning; and one would prioritize partnerships among medical

¹⁸ MEPI AS, Year 5, 2015

schools within the country. (Exhibit 9.2)

EXHIBIT 9.2 If MEPI funding was to continue at a much lower rate (10%), what MEPI activity would you choose to receive ongoing funding?

SCHOOL	ANSWER
Addis Ababa University (AAU), Ethiopia	e-learning and faculty development
University of Botswana School of Medicine (UB SoM), Botswana	e-learning and Medical Education Department
Universidade Eduardo Mondlane (UEM), Mozambique	Research support center; decentralized training center; e-learning and distance education; tracking system, Mozambique Medical Council
Kilimanjaro Christian Medical University College (KCMUCo), Tanzania	Mentored Research Training Program
Kwame Nkrumah University of Science and Technology (KNUST), Ghana	External Faculty Support
University of KwaZulu-Natal (UKZN), South Africa	Decentralized Training Platforms
Makerere University College of Health Sciences (MakCHS), Uganda	Quality improvements in medical education; emphasis in continuing curriculum evaluation; partnerships across medical schools in the country and enhancing student and faculty mentored research
University of Malawi College of Medicine, Malawi	Research activities
University of Nairobi (UoN), Kenya	Research financing
Stellenbosch University (SU), South Africa	Decentralized medical education training
University of Zambia (UNZA), Zambia	(data missing)
University of Zimbabwe College of Health Sciences (UZCHS), Zimbabwe	Mentored Research Training Program

SOURCE: MEPI Annual Survey, Year 5, 2015

When asked which MEPI initiated programs are likely to be most durable as measured by being in existence five years hence, there was, again, a broad spread of opinion. Significantly, six schools identified that the impact of ICT in the medical education setting would be the most enduring. This was characterized as eLearning, ICT infrastructure, distance learning, podcasting and infrastructure. Enhanced and innovative educational programs were seen as the second most likely to endure, characterized as special masters programs, new post-graduated training programs, and medical education quality improvements. Two schools listed decentralized

¹⁹ MEPI AS, Year 5, 2015

and distance learning as the most likely to endure (Exhibit 9.3).¹⁹

EXHIBIT 9.3 Description of MEPI investments that will most likely exist in 2020 (five years after the conclusion of this award)

SCHOOL	ANSWER
Addis Ababa University (AAU), Ethiopia	Medical education masters program
University of Botswana School of Medicine (UB SoM), Botswana	eLearning as the infrastructure has been set up and adopted by the UB departments.
Universidade Eduardo Mondlane (UEM), Mozambique	Master programs for faculty development of mentorship capacity
Kilimanjaro Christian Medical University College (KCMUCo), Tanzania	ICT infrastructure
Kwame Nkrumah University of Science and Technology (KNUST), Ghana	Training program and curriculum
University of KwaZulu-Natal (UKZN), South Africa	MEPI Learning Centers - First phase of the Decentralized training platform
Makerere University College of Health Sciences (MakCHS), Uganda	Medical education quality improvement efforts
University of Malawi College of Medicine, Malawi	Pathology lab service
University of Nairobi (UoN), Kenya	Distance Learning
Stellenbosch University (SU), South Africa	Podcasting
University of Zambia (UNZA), Zambia	Infrastructure investments
University of Zimbabwe College of Health Sciences (UZCHS), Zimbabwe	Infrastructure

SOURCE: MEPI Annual Survey, Year 5, 2015

Two related challenges that have been part of the MEPI themes from the outset of the program have been retention of graduates and improving the distribution of graduates in rural and underserved settings. (These efforts and activities are described in greater detail in Chapters 3 and 4.) Neither of these is directly controlled by the MEPI school, but a physician’s choice of practice locale and type can be influenced by his/her experience in medical school and postgraduate training. MEPI emphasized strategies that were intended to promote retention of graduates within the country as well as to improve access to health care services throughout the country.

MEPI PIs identified efforts their institutions made to develop relationships with rural sites in ways that might favorably influence their graduates’ longer term career decisions about service in rural health. Schools also reported their efforts to encourage graduates to remain in the country as practitioners for the long term. Seven of twelve schools responded affirmatively to the rural career development question.²⁰ The UKZN developed rural training centers with MEPI funds and reported that “students may want to return

²⁰ MEPI AS, Year 5, 2015



to the sites they trained in after they qualify.” It was an expectation that the MEPI trained graduates would be more likely to provide staff at these same sites, thereby influencing the next generation of graduates. UKZN noted that they are developing a research training program associated with both urban and rural sites in poor communities. MakCHS reported that support for rural site staff and mentorship for students has promise to recruit students back to those sites. Overall the schools noted that MEPI has increased their interaction with rural sites considerably. SU used funds to support family medicine specialists through joint appointments in rural areas and the UNZA has used MEPI support to identify and maintain rural sites for student and resident attachments.

Six schools commented on in-country retention as influenced by MEPI support. The UB used MEPI funds to establish new residency programs. These have attracted local doctors who, for the first time, can do postgraduate training in Botswana. This is anticipated to be instrumental in keeping those physicians in Botswana. KNUST in Kumasi, Ghana, reported that the emergency medicine residency they developed with MEPI assistance has populated new emergency departments of teaching hospitals and regional hospitals in Ghana to the considerable benefit of those institutions. The UZCHS used exchange programs with international partners to assist in the establishment of specialty clinics which encourages the retention of specialty inclined physicians. Their Mentored Research Scholars Program reinforced these promising developments. The UKZN reported that the bursary contract for PhD students requires that they remain within the Southern African Development Community once they graduate.

Although retention is not precisely the same as sustainability, the likelihood that MEPI graduates will stay in their country after training and contribute to strengthening that country’s health system, is a sustained outcome of considerable importance. Retention emphasis and analysis remain key contributions to MEPI sustainability.

THE FUTURE

The five-year investment by the USG in MEPI, the creative array of teaching, research and service initiatives launched by the schools, multiple resourceful partnerships and consortia, and the growing support of many governmental agencies all position MEPI to remain a force for educational development. Each MEPI school made adjustments in anticipation of the need to transition support and many MEPI-generated programs have become permanent parts of the programs and budgets of the schools. Implicitly and explicitly, ministries of education, health, and finance have adopted MEPI programs and contributed to long term sustainability. Most MEPI programs are actively looking for additional funding for their programs in the philanthropic and private sectors with some early signs

of success. While these efforts can divert energy from teaching and research, this sort of entrepreneurship is characteristic of the way many university-based programs all over the world prosper today. MEPI has become a vibrant community of educational institutions distinguished by their individual innovations and their group commitment to transformative education. Sustaining that momentum and disseminating MEPI's important messages widely will be the work of the immediate future.

CHAPTER 10

Achievements, Challenges & Lessons Learned

10

Achievements, Challenges & Lessons Learned

INTRODUCTION

The Medical Education Partnership Initiative was a five-year project to support health workforce education and training in twelve countries in sub-Saharan Africa. Over the life of the project, the 13 participating medical schools initiated multiple projects to increase the long term capacity to train and retain health workers in Africa and in the communities where they are most needed; to develop research that focused, in particular, on regional health challenges; and to create a sustainable culture of medical education that would strengthen health systems through the HIV crisis and beyond. The initiative aimed to create communities of practice in which medical education expertise could be developed, shared, and enriched through dialogue, professional development, research and publication.

MEPI schools explored new ways of recruiting and retaining students and faculty, delivering instruction, and strengthening research capacity. Individual schools developed working relationships with government ministries in regard to student and faculty recruitment, rural attachments, post-graduate training, and program support. The schools evaluated and employed ICT to enhance educational opportunities at the pre-clinical and clinical levels. Professional exchanges and partnerships with other medical schools in Africa, North America and Europe were developed and the experiences were shared at professional symposia and in refereed journals.

After five years of collaboration, MEPI institutions individually identified numerous achievements, challenges, and important lessons learned through their MEPI experiences. These summative perspectives were recorded in school summary reports completed in August of 2015 and a separate listing of achievements in October of 2015. This chapter is a compilation of those observations organized as 1) achievements, 2) challenges, and 3) lessons learned. The latter category, the lessons reported by the leadership of each MEPI program, were sorted and organized under the principal MEPI themes, resulting in 51 items in a comprehensive list of lessons learned. The MEPI report writing leadership group condensed this list to highlight those that are the most illustrative and actionable. The comprehensive list of Lessons Learned will be found in Appendix F.

ACHIEVEMENTS

In five years, there are already areas in which MEPI's impact has been felt and is likely to be long-lasting. In October 2015, MEPI's Principal Investigators listed the achievements of their programs and selected three that they felt were the most important. Exhibit 10.1 lists by school the three leading achievements reported by the PIs. The list of all achievements is a rich inventory of school accomplishments, many of which were cited by multiple schools. Table 10.2 presents a distillation of the frequently reported achievements. The full school responses are available in Appendix G.

EXHIBIT 10.1 Three Leading Achievements Reported by PIs for Each MEPI School

UNIVERSITY OF BOTSWANA (UB SOM), BOTSWANA
<ul style="list-style-type: none"> • Established & strengthened distributed teaching sites leading to the graduation of the first ever locally trained doctors: 80 Bachelor of Medicine & Bachelor of Surgery & 4 residents. • Facilitated doctors retention initiative leading to a record 216 Batswana junior doctors (graduated locally & in other countries) starting a mandatory 1 year internship, between October 2014 & August 2015 in the country. • Created a child mortality audit program leading to a reduction of in-hospital mortality
ADDIS ABABA UNIVERSITY (AAU), ETHIOPIA
<ul style="list-style-type: none"> • Introduced eLearning & expansion of the network infrastructure & connectivity • Developed & implemented the modularization of medical curriculum • Expanded multidisciplinary & team based rural community learning program across all disciplines of health sciences
KWAME NKRUMAH UNIVERSITY OF SCIENCE & TECHNOLOGY (KNUST), GHANA
<ul style="list-style-type: none"> • Mounted a new emergency medicine curriculum with 21 specialists & 59 nurses graduated & retained in-country • Built research capacity through training, publications & establishment of a research support center for entire university • Wrote guidelines & SOPs for HIV care in emergency room that were adopted by Ministry of Health for training of EM personnel
UNIVERSITY OF NAIROBI (UON), KENYA
<ul style="list-style-type: none"> • Increased student intake capacity at the school of nursing & retention at their places of work through e-learning platform • Implementation of decentralized training • Establishment of an Office of Research Grants Promotion at the College of Health Sciences
UNIVERSITY OF MALAWI COLLEGE OF MEDICINE (UOM COM), MALAWI
<ul style="list-style-type: none"> • Assembled & trained a multi-disciplinary team to holistically tackle a clinically multi-disciplinary problem (cancer) • Ensured retention of new skills within the system through close collaboration with the MOH, prioritizing training of MOH employees • Strengthened the cancer diagnostic & clinical service, leading to a strong cancer registry database facilitating cancer research activities

UNIVERSIDADE EDUARDO MONDLANE (UEM), MOZAMBIQUE
<ul style="list-style-type: none"> • Built medical research capacity for Mozambique • Opened education programs at a developing university that will strengthen faculty & increase services • Created a rigorous, structured, post graduate medical training program as a model for other specialties
UNIVERSITY OF IBADAN (UI), NIGERIA
<ul style="list-style-type: none"> • Leadership: Strengthening leadership of Nigerian investigators through collaboration with US partners & among the six MEPI consortium universities in Nigeria • Education: Implementation of competency based curriculum, development of reproductive health course for first year students, online & short courses for HIV prevention, ART, pediatrics & laboratory in Nigeria • Research: Introduction of formal mentored research training for junior faculty & approved career pathway for university research administrator
UNIVERSITY OF KWAZULU-NATAL (UKZN), SOUTH AFRICA
<ul style="list-style-type: none"> • Built research ethics capacity & innovation at UKZN, provincially & nationally • Scaled up critical educational programs including support for 51 faculty obtaining PhDs & 1195 nurses gaining accreditation in initiation of antiretroviral therapy • Introduced a decentralized training platform with a Primary health care approach.
STELLENBOSCH UNIVERSITY (SU), SOUTH AFRICA
<ul style="list-style-type: none"> • Transformed the medical curriculum to train socially accountable graduates • Built capacity in medical education & health systems in South Africa & Africa • Implemented an eLearning strategy with online learning, 7000 podcasts, & BYOD
KILIMANJARO CHRISTIAN MEDICAL UNIVERSITY COLLEGE (KCMUCO), TANZANIA
<ul style="list-style-type: none"> • Strengthened teaching & learning through use of information technology including the internet, a computer based class room, student tablets, the Learning Content Management System Plus, & online examinations • Promoted practical research experiences for students through 55 Mentored Research Training Projects • Expanded medical student class size & tracking graduates through the Office of Alumni Affairs & Career Counseling
MAKERERE UNIVERSITY COLLEGE OF HEALTH SCIENCES (MAKCHS), UGANDA
<ul style="list-style-type: none"> • Established the MESAU consortium that enabled collaboration of Ugandan medical schools to address national education & health system challenges like delivery of HIV care/prevention services • Strengthened community-based education (CBE) across Ugandan medical schools & evaluated the impact of CBE on the students, faculty, community, & CBE sites. • Markedly enhanced student & faculty research capacity (to conduct nationally relevant research) leading to increased scholarly output
UNIVERSITY OF ZAMBIA (UNZA), ZAMBIA
<ul style="list-style-type: none"> • Implemented the MEPI Staff Development Program which supported 45 trainee faculty over 5 years, many of whom are now on faculty & are helping to strengthen teaching, particularly the basic sciences • Strengthened infrastructure including skills lab, computer lab, IT equipment, & improvements to the local area network & Wi-Fi infrastructure • Built the school's research culture & outputs in terms of scholarly writing, workshops, publications, weekly epidemiology & biostatistics clinics, & establishment of the Research Support Center

UNIVERSITY OF ZIMBABWE (UZCHS), ZIMBABWE
<ul style="list-style-type: none"> • Established a Research Support Centre that rapidly became the nerve center of research activity in the College • Established a Department of Health Professions Education that now champions faculty development & health professions leadership in the College • Implemented a comprehensive mentored scholars program encompassing the programmatic & the two linked-awards

EXHIBIT 10.2 MEPI School Achievement Summary, Frequency Reported

MEPI SCHOOL ACHIEVEMENT SUMMARY AS REPORTED BY PIS, OCTOBER 2015 N=11	
CAPACITY BUILDING	NUMBER OF SCHOOLS REPORTING ACHIEVEMENT
Augmented faculty training and continuing medical education (CME) activities	7 schools
Curriculum review/reform underway	9 schools
New teaching methodologies	7 schools
Improved medical education infrastructure (teaching resource centers, medical education units and departments of medical education)	7 schools
E-learning programs in place	9 schools
Increased Clinical specialty/residency training programs	6 schools
MEPI supported physical infrastructure renovation (renovation of classrooms, laboratories, skills labs, rural sites etc.)	7 schools
MEPI supported digital infrastructure renovation (improving internet connectivity and access to computing devices etc.)	8 schools
Investments in skills labs	5 schools
RETENTION	
Incentives provided to faculty through MEPI	9 schools
Faculty hired with MEPI funds	4 schools
Mechanism to recruit graduates as junior faculty	2 schools
Graduate tracking systems in place	4 schools
Community-based/rural training	7 schools
RESEARCH	
Development of research support centers	9 schools
Research Training for Students	10 schools
Research Training for Faculty	10 schools
Access to new research funding opportunities as a result of MEPI	5 schools
Research mentoring program for students	8 schools
SUSTAINABILITY	
Commitment of monetary and non-monetary support from government and non-government sources to continue MEPI programs	10 schools
Future Plans in place to promote sustainability of MEPI programs	10 schools

**MEPI SCHOOL ACHIEVEMENT SUMMARY
AS REPORTED BY PIS, OCTOBER 2015 N=11**

COMMUNITIES OF PRACTICE	
South to south consortia/partnerships	10 schools
North to south consortia/partnerships	9 schools
Technical Working Group participation	10 schools

SOURCE: Correspondence with MEPI School PIs (2015)

CHALLENGES

Over the course of MEPI, challenges were inevitably encountered. In planning the year 5 Report, MEPI PI Council decided that sharing areas in which MEPI experienced challenges could be useful to others contemplating educational collaborations like MEPI in the future. The list that follows is taken from the MEPI School Summary Reports where MEPI program leaders reported challenges they encountered during the course of the five years.

1. Five year grants have enabled MEPI schools to embark on a number of essential educational innovations but the five year period is often not long enough for these innovative programs to become part of the culture of the institution and establish their own funding.
2. Scarcity of faculty experienced in research and research management will be a challenge to the ability of some schools to expand on the research legacy of MEPI. Retaining newly trained grants management specialists in the face of competition from the market in general will be a challenge.
3. Faculty recruitment and retention remain important challenges for MEPI schools. This challenge is likely to continue for the foreseeable future given the disproportion between the size of the schools and dimensions of the burden of disease. In addition to efforts to train and retain faculty, the use of virtual-learning and distance-learning will be essential to continued educational growth plans.
4. New medical schools report a special struggle with faculty recruitment and retention due to the high mobility of doctors.
5. Information Communications Technology (ICT) is a powerful tool for medical education. However, without adequate planning, training and change management, its full impact may not be realized. Slow internet connectivity continues to challenge some ICT initiatives such as video conferencing and m-Learning.

6. Complex programs with multiple awardees such as MEPI are difficult to evaluate. Establishing a monitoring and evaluation framework at the beginning of the program which is maintained throughout would help to ensure a sound record for the legacy of the program.
7. Since MEPI projects are aimed at improving teaching and learning, honest engagement in challenges facing students is important to the incremental introduction of new initiatives.
8. Clear definition of roles, good lines of communication, and mutual accountability are important features of multiple stakeholders projects such as MEPI. Collaboration between the 13 MEPI grantee schools, three agencies of the USG (OGAC, HRSA and NIH), and the CC proved challenging at certain points.

LESSONS LEARNED* (CORE)

*Derived from comprehensive list of Lessons Learned in Appendix F.

Consensus Lesson Learned

Grants such as MEPI in which funds are awarded directly to African institutions with those institutions contributing to the leadership of the project represent a new model for US funding that is both empowering and leads to greater sustainability of achievements in the long run, while supporting and maintaining crucial North-South collaboration for learning and development.

Capacity Building

1. The MEPI investment has promoted broad and substantial capacity development in medical schools that stands to have a transformative impact in improving health care delivery by helping educate a new generation of better trained medical doctors and other health professionals. There is good evidence that MEPI innovations in one department of one school have influence on programs in other departments as well as in other schools.
2. Information and communications technology (ICT) offers powerful, multi-faceted tools to improve the learning environment including classroom instruction, distance learning, information retrieval, library enhancements, and virtual classes.

3. Medical education scale-up activities that involve in-country partner schools and ministries of health have been particularly successful.

Retention

1. MEPI-led improvements in teaching and learning, community based education, and the integration of ICT into education and practice hold promise to graduate better trained doctors and other health professionals who, in turn, will provide role models in retention to future graduates.
2. Relevant rural training and decentralized community-based education can provide transformative learning opportunities and lead to improved retention in rural and underserved areas.
3. Graduate tracking programs will be necessary to understand long term trends in retention and distribution. Medical schools will need to partner with ministries and medical councils to establish and maintain tracking systems.

Research

1. MEPI has positioned many participating schools to expand their research footprint and to serve as focal points for developing similar capacity in other medical schools within the country or region.
2. The development of research support centers, including technical mentorship, grants management, and resources administration at many MEPI schools has had a transformative impact on research potential and output.
3. Research training and research opportunities have proven important factors in building medical school faculties, strengthening evidence-based interventions, and in retaining graduates on faculty.

Sustainability

1. A program of grants like MEPI needs a structured and well considered plan for sustainability from the outset which should be assessed on an ongoing basis. This plan should pay particular attention to partnerships with in-country institutions including the ministries of health, education and finance.

Communities of Practice

1. Collaborations with local, regional and international partners have been essential to many of the goals of the MEPI program. New partners who bring different strengths and capacities can expand the scope and impact of collaborative projects. National collaborations buttressed by clear leadership mechanisms with a common purpose add benefits to all participating institutions.
2. The MEPI Coordinating Center facilitated many inter-school activities including the annual symposium, the website and newsletter, site visits, surveys, and technical working groups. These activities helped create a vibrant MEPI community.

MEPI's achievements, challenges, and lessons learned tell the story of a five year experiment in medical education program development and expansion in sub-Saharan Africa. Collectively, the schools of MEPI pioneered new norms in teaching and learning, embraced the oncoming ICT revolution in education, re-doubled commitments to outreach and community engagement, and built impressive new research capacity. Medical education in the sub-continent will not be the same again if the efforts started can be sustained and scaled up. MEPI has left a huge imprint for the good.

