VIGH PROGRAMS OVERVIEW

The Vanderbilt Institute for Global Health
(www.globalhealth.vanderbilt.edu)

The Institute for Global Health facilitates the expansion and coordination of global health research, integrated services and training initiatives at Vanderbilt University/Vanderbilt University Medical Center, and reflects the university’s commitment to improve health services and outcomes in resource limited settings. Its “center-without-walls” philosophy nurtures noncompetitive partnerships among and within departments and schools on campus, and with partner institutions around the globe.

RESEARCH INITIATIVES AND GRANT-FUNDED INTEGRATED PROGRAMS

MOZAMBIQUE
FRIENDS IN GLOBAL HEALTH (FGH, NASHVILLE, MOZAMBIQUE)

FGH is a nongovernmental organization (NGO) that serves as the primary in-country implementation body for VIGH programs in LMICs. To that end, FGH facilitates and oversees fiscal and administrative matters and hires local and expatriate technical expertise in LMICs where VIGH is actively implementing health and development programs. With its headquarters within the VIGH offices, FGH is currently implementing programs in Mozambique. Since 2006, FGH has been registered with the Mozambican government for the implementation of programmatic evaluations and the design and implementation of Monitoring and Evaluation (M&E) systems. FGH also implements the CDC PEPFAR-funded HIV care and treatment program providing technical assistance to the Ministry of Health at the central level and to the provincial health authorities of Zambézia province. FGH maintains a national headquarters office in Maputo as well as a provincial headquarters office in Quelimane, Zambézia province.

Avante Zambézia: Technical Assistance to the Ministry of Health (MOH) for HIV Services CDC-GAP (U2GHO000812) (Wester, PI) Vanderbilt University (VU)/FGH provides technical assistance to the provincial and district health authorities of Zambézia province to develop, establish, roll-out and scale up effective and sustainable anti-retroviral treatment (ART) and other HIV-related programs. Program activities include strengthening of clinical, pharmaceutical and laboratory services, as well as community-based activities aiming to improve linkages and retention in HIV-related clinical services. VU/FGH supports 113 health facilities sites across 14 districts in Zambézia province. VU/FGH has established an M&E system for the program, including an Electronic Patient Tracking System (OpenMRS) which is currently in place in an impressive 108 (99%) of 113 supported health facilities.

Avante Zambézia II: Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique; CDC/PEPFAR (NU2GGH001943, Wester, PI) Avante: Towards Epidemic Control: The purpose of the Avante program is to control the HIV epidemic by supporting the sustainable implementation of Ministry of Health (MOH) HIV and TB services in Zambézia province; and specifically will expand the technical assistance it provides to the large provincial capital district of Quelimane where the team will support and additional 18 health facilities; 5 of which are currently caring for >2,000 people that are currently
receiving ART. Avante 2 will provide technical assistance (TA) to the Government of the Republic of Mozambique (GRM) at the national, provincial, district and health facility level for activities that have a significant impact to control the epidemic, leveraging community structures that can catalyze program implementation. Key programmatic areas include: i) prevention; ii) adult care, support and treatment; iii) HIV/TB; and iv) pediatric care, support, and treatment.

MONITORING & EVALUATION INITIATIVES

**Aspires (Moon, PI)** VU/FGH was granted a sub-award for the project 'Evaluating Economic and Social Empowerment Interventions in Zambézia Province, Mozambique', under the USAID-funded Accelerating Strategies for Practical Innovation and Research in Economic Strengthening (ASPIRES) consortium activities. In collaboration with FHI 360, VU/FGH is responsible for data collection for a mixed-methods evaluation that utilizes qualitative and quantitative data collection methodologies in Zambézia Province. This has included all coordination and logistical tasks related to the planning, scheduling and relationship-building with surveyed communities, as well as training and related programming for data collection. The evaluation targets the Women First program, an economic and health intervention that trains women to sell appropriate and in-demand products door-to-door in their communities.

**HIVQUAL International HRSA/AIDS Institute New York State (U1NHA08599)** Wester PI of VU subcontract: This project provides technical assistance, coaching, and mentoring for quality improvement in accordance with the work of HEALTHQUAL-Mozambique. Vanderbilt provides these services in Zambézia Province in the areas of PMTCT, adult and pediatric TARV, and will also assist the process of identification of appropriate performance measures for VCT and integration of HIV/TB and HIV/STI services.

ADDITIONAL MOZAMBIQUE PROGRAMS

**Traditional Healers as Adherence Partners for PLHIV in Rural Mozambique NIH/NIMH (K01MH107255 Audet, PI, 2015-2019)** This career development award seeks to foster the advancement of the applicant’s career as an independent HIV/AIDS researcher with a research focus on developing effective strategies to engage the army of community health workers – including traditional healers and traditional birth attendants – as adherence partners, referral agents, and educators. The goal of Dr. Audet’s research is to improve health outcomes among rural community members who seek alternative care and treatment for illness, specifically those with chronic disease, including HIV/AIDS, with a geographic focus in Mozambique

**Partners-based HIV Treatment for Sero-concordant Couples attending Antenatal Care NIH/NIAID/NIMH (R01MH113478, NOA Pending: Audet, PI, 2017-2022)** The purpose of this R01 proposal is to evaluate the clinical impact, hypothesized mechanisms of behavior change, and cost-effectiveness of a partners-focused integrated elimination of mother-to-child transmission of HIV (EMTCT) package comprised of: 1) antenatal care-based couples HIV testing, ART enrollment, and care for sero-concordant HIV+ expectant couples; (2) Couples-based treatment in the post-partum period; (3) Couple-based education and skills building; and (4) Treatment continuity with the support of expert-patient (peer) supporters from couples who have successfully navigated EMTCT. This innovative approach to scaling up EMTCT services, if proven feasible and effective, will be adopted in PEPFAR programs to accelerate progress toward EMTCT and helping families with HIV infection live long, healthy lives.
Scaling up comprehensive positive prevention in the Republic of Mozambique (U2GPS002770 Dawson Rose, PI; Audet, PI of VU subcontract, 2010-2015): Positive prevention programming is designed to improve the quality of HIV care and treatment, including social support, linkage to non-HIV clinical care services, and adherence coaching, to those living with HIV in Mozambique. Vanderbilt Institute for Global Health PI Carolyn Audet, Ph.D., and the Vanderbilt affiliated organization Friends in Global Health (FGH) is monitoring and evaluating the effectiveness of several interventions aimed at improving HIV knowledge, increasing clinical referrals, and reducing risky behavior in HIV positive individuals. The program developed a monitoring system for tracking referrals to other services within the health system and between health services and community support groups. It also evaluates message delivery to patients by health providers during routine encounters and at support groups and meetings for People Living with HIV (PLHIV).

Bacteremia in HIV-Infected children under 5 years old, hospitalized in Mozambique NIH/NIAID (R01AI112295 Sacarlal PI, Moon, Co-Investigator, 2014-2019) The goal of this study is to perform a prospective hospital-based observational study of HIV-infected Mozambican Children <5 years old to determine the incidence, etiology, antibiotic sensitivity patterns and molecular characterizations of culture confirmed bacteremia.

NIGERIA

Decreasing Interruptions and Losses from HIV Care in Nigeria NIH/NIAID (K23AI1106406 Ahonkhai, PI, 2013-2018):

The objective of the study is to identify and explore health system-level factors associated with LTFU and unplanned care interruption from HIV care in a multi-site treatment program supported by, AIDS Prevention Initiative in Nigeria (APIN). The specific aim of the study is to identify health system-level factors associated with LTFU and unplanned care interruption from a large HIV treatment program in Nigeria.

Optimizing Integrated PMTCT Services in Rural North-Central Nigeria NIH/NICHD (R01HD075075 Aliyu, PI, 2012-2016): This study is implementing and evaluating the impact of a family-focused integrated PMTCT package comprising task shifting, point-of-care CD4 testing, and a prominent role for influential family members (particularly male partners) in rural primary health centers in Nigeria. This innovative approach to scaling up PMTCT service provision, if proven feasible and effective, will be adopted in PEPFAR programs to accelerate progress toward eliminating mother-to-child transmission of HIV and helping women with HIV infection live long, healthy lives.

Primary Prevention of Strokes in Nigerian Children with Sickle Cell Disease NIH/NINDS (R21NS080639 Aliyu/DeBaun/Jordan, PI, 2012-2016): Sickle cell disease (SCD) is the most common genetic disease in the world. Approximately 150,000 Nigerian children are born each year with SCD, making it the country with the largest burden of sickle cell disease in the world. SCD is the most common cause of stroke in children and results in considerable morbidity in affected children. The current primary prevention approach of regular monthly blood transfusion therapy of children at high risk of stroke (identified by elevated transcranial Doppler measurements) is not feasible in a low income country such as Nigeria due to scarcity of supply, cost, and high rate of blood borne infections. In the United States, hydroxyurea (HU) is standard therapy for adults with SCD and may be a reasonable prevention alternative to regular blood transfusion for treatment of primary stroke in high-risk children. This project is a feasibility study to determine the acceptability of randomization to HU vs. placebo for primary
prevention of strokes in Nigerian children with sickle cell anemia (SCA) in preparation for a NIH sponsored multicenter, phase III Trial. We will establish a safety protocol for using HU in a clinical trial setting and complete the necessary preparations for a definitive phase III trial. Nigeria has the largest burden of the disease in the world, but the standard therapy for primary prevention of stroke in these high-risk children (recurrent transfusions) is not readily available. A feasibility trial of hydroxyurea for primary prevention of stroke in sickle cell disease will provide evidence for an alternative approach to recurrent transfusions in a part of the world where safe blood services are not readily accessible.

**Primary prevention of stroke in children with SCD in Sub-Saharan Africa II NIH (R01NS094041 Aliyu, Co-PI, 2015-2020)** This dual-center randomized Phase III clinical trial is a continuation of our successful feasibility trial (NCT01801423; 1R21NS080639-NCE), with a goal of determining the efficacy of moderate (20 mg/kg/day) vs. low dose (10 mg/kg/day) hydroxyurea therapy for primary stroke prevention in children with sickle cell anemia in Ghana and Nigeria.

**Hydroxyurea for Stroke Prevention in Children with Sick Cell Disease in Sub-Saharan Africa, E.W. “Al” Thrasher Award (DeBaun/Aliyu, Co-PI, 2016-2019)** Hydroxyurea for Stroke Prevention in Children with Sickle Cell Disease in Sub-Saharan Africa Our goals are: 1) to assess the efficacy of moderate dose HU therapy for secondary stroke prevention when compared to low dose HU therapy among children with SCA; and 2) to determine whether moderate HU therapy decreases the rate of all-cause hospitalizations when compared to low dose HU therapy.

**Monitoring and Coordinating Personal Protective Equipment (PPE) in Healthcare to Enhance Domestic Preparedness for Ebola Response U.S. Centers for Disease Control and Prevention (CDC; Yarbrough, PI, Aliyu, Investigator, 2015-2018)** The PRO project seeks to develop a prototype for a national surveillance system to monitor Personal Protective Equipment (PPE) supply and effective use in preparation for pandemic pathogen events or a bioterrorist attack.

**Engaging Indigenous Organizations to Sustain HIV/AIDS program in Nigeria CDC-GAP (U2GGH00922: Gebi, PI, Aliyu, Investigator, 2013-2018)** This service program supports the provision of sustainable, high quality HIV/AIDS services to target populations in Kano, Kaduna, and Gombe states of Nigeria in the most cost effective manner with the active involvement of government, civil society and host communities.

**Northern Nigeria Regional Center of Excellence in Pediatric Hematology Oncology NIH/NCI (P20CA217200: Friedman, DeBaun, Aliyu, 2017-2022)** The initial goal of this project is to establish the Northern Nigeria Regional Center for Research Excellence in Pediatric Hematology/Oncology at Aminu Kano Teaching Hospital (AKTH), in Kano, Nigeria, herein referred to as the Center for Research Excellence. The long-term goals are to 1) create a self-sustainable infrastructure to conduct pediatric hematology and oncology clinical trials; and 2) set the stage for sustainability of scholarly activity.

**Optimal Management of HIV Infected Adults at Risk for Kidney Disease in Nigeria NIH/NIDDK (R01DK112271, NOA Pending, Wester, Aliyu, PI, 2017-2021)** In this study, we plan to determine the optimal means to manage and thereby reduce the risk of kidney and potentially other end organ complications among genetically at-risk northern Nigerian HIV-infected adults. Based on data from the diabetic literature using medications that block the renin angiotensin aldosterone system (RAAS), we plan to evaluate whether or not RAAS inhibition (with the ACE-inhibitor lisinopril) in HIV-infected adults produces similarly promising results. This is a placebo-controlled randomized clinical trial where we will randomize HIV-infected adults (on ART for 6+ months).
having low-moderate levels of albuminuria to either receive combination antiretroviral therapy (ART) alone (standard of care) versus ART plus the ACE-inhibitor Lisinopril (n = 100 per arm) and follow each for 24 months.

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**SOUTH AFRICA**

**Population mobility and retention in HIV care among postpartum women in South Africa NIH/NIMH (K01MH107256 Clouse, PI, 2015-2019)** This mentored K01 career development award supports training and research to explore the impact of population mobility on retention in postpartum HIV care and gathers critical information for the development of future interventions to improve retention in HIV care.

**Women’s mobility and the continuum of HIV care in South Africa. NIH/NIAID CFAR Research Project Award (Clouse, PI, 2016-2017)** This one-year award aims to engage pregnant and postpartum, HIV-positive women as potential users to develop and evaluate a smartphone application to assist these women with linkage to new HIV facilities and prospectively describe the mobility of this population. This work will result in development of an application poised for widespread adoption within the public health sector and will inform future health systems strengthening efforts.

**Regional Prospective Observational Research (RePORT) South Africa**

**U.S. Civilian Research and Development Foundation (Sterling, PI, 2016-2018)** In partnership with the Africa Health Research Institute in Durban, South Africa, we are assessing novel biomarkers of tuberculosis treatment response.

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**ZAMBIA AND TANZANIA**

**Nutritional Support for Africans Starting Antiretroviral Therapy (NUSTART) EDCTP (IP_2009_33011, 2010-2013) (Filteau, PI; Heimburger, Co-Investigator):** This project addressed the high early mortality (8-26%) among Africans starting antiretroviral therapy (ART) by investigating whether improved management of nutritional metabolism and status can increase survival. The hypothesis, based on Dr. Heimburger’s published research, was that a portion of this early mortality can be prevented by providing Africans who are undernourished (BMI < 18.5 kg/m²) when they qualify for ART with several weeks of nutritional supplements rich in micronutrients and bulk minerals, especially phosphorus. While this hypothesis was not confirmed, multiple papers on secondary findings have been published, and additional ones are in review or preparation. NUSTART is a collaboration between Zambia, Tanzania, Ethiopia, the United Kingdom, Denmark, and Vanderbilt. Together we have obtained funding to investigate the development of diabetes within the cohort after several years of ART, and an R01 grant application is in review on this theme.

**Assessment of capacity to prevent and manage major non-communicable diseases (NCDs) in primary care centers in Zambia: A health systems approach NIH/FIC (R21TW010471 Mutale/Heimburger MPIs, 2016-2018).** The goal of this study is to assess health systems capacity to provide Non-Communicable Diseases (NCDs) related services. The study will adopt and apply the WHO recommended NCD tool in the Zambian context. The adapted tool will help in benchmarking interventions aimed at addressing NCDs in low-income settings.
CCASAnet: Caribbean, Central and South American Network NIH/NIAID (U01AI069923 McGowan/Cahn, Co-PI, 2011-2021): The Caribbean, Central and South America network for HIV epidemiology (CCASAnet) is an established and productive network that is responsive to scientific opportunities arising in the region and across International Epidemiologic Databases to Evaluate AIDS (JeDEA) regions worldwide. This successful collaboration, created during the first JeDEA funding cycle in 2006, has resulted in the productive enrichment and merging of human and technological resources from HIV clinical care and research sites in Port-au-Prince, Mexico City, Tegucigalpa, Lima, Rio de Janeiro, Sao Paulo, Belo Horizonte, Buenos Aires, and Santiago, and the Vanderbilt Data Coordinating Center (DCC). The goal of the CCASAnet project is to create a shared repository of HIV data from Central and South America and the Caribbean, and use the combined data to answer questions about the characteristics of the regional HIV epidemic that cannot be answered by any single source. CCASAnet researchers develop and test new biostatistical methods for HIV epidemiology and conduct a program of education to assist participating sites in improving the quality and consistency of their clinical research activities. Studies are proposed or underway to determine the impact of infections other than HIV, particularly tuberculosis, hepatitis, and human papillomavirus. This research will increase the understanding of similarities and differences in patterns of HIV care and disease outcomes in the Caribbean and Latin America, and will address issues that are also compelling in other regional settings.

BRAZIL

Predictors of Treatment Toxicity, Failure, and Relapse in HIV-related Tuberculosis NIH/NIAID (R01 AI20790-01A1, Sterling, PI, 2016-2021) The over-arching goal of this project is to optimize the treatment of HIV-related tuberculosis in a large, genetically diverse cohort in Brazil. These results will lay the groundwork for drug dosing and regimens that improve outcomes and treatment effectiveness of HIV-related tuberculosis.

Regional Prospective Observational Research for TB (RePORT)-Brazil NIH/NIAID (U01AI069923 Sterling, PI, 2016-2017) Supplement to Caribbean, Central and South America network for HIV epidemiology (CCASAnet). With joint funding from the NIH and the Brazilian Ministry of Health, this is a prospective, multi-center cohort of TB cases and close contacts in Rio de Janeiro, Salvador, and Manaus, Brazil. There is a biorepository of M. tuberculosis isolates, cells, DNA, and RNA. Studies will be performed of host and pathogen determinants of TB treatment response, recurrence, acquiring M. tuberculosis infection, and progressing to TB disease.

PERU

TB Trials Consortium CDC Universidad Cayetano Heredia, Lima, Peru (CDC10FED: Sterling, PI, 2009-2019) This consortium conducts programatically relevant studies of tuberculosis treatment and prevention.

CHINA

Multi-component HIV intervention packages for Chinese MSM NIH/NIAID Special Emphasis Panel Methods for Prevention Packages (MP3II) NIH/NIAID (R01AI094562 Vermund, PI, 2011-2017): This project developed and pilot tested a package of Test and Link-to-Care (TLC)-based interventions in preparation for a
future community-level randomized clinical trial (RCT). Collaborators on this initiative include Virginia Commonwealth University, University of Connecticut, and the Chinese CDC.

**TENNESSEE**

**Phylogenetic Characterization the HIV-1 Epidemic in Middle Tennessee, CFAR Supplement (P30AI110527, Kalish, Investigator, 2016-2017.** Understanding HIV transmission dynamics is critical for implementing targeted testing, treatment and prevention, and successful modification and public access to the 'nextHIV' program will have utility for health departments and organizations beyond middle Tennessee. This project is using retrospective phylogenetic, socio-demographic, and clinical data to characterize the HIV-1 epidemic in middle Tennessee. We will assess the extent to which continued HIV transmission is driven by local social/sexual networks or introductions from outside this area. In addition, the project aims to develop a near real-time tracking system for HIV phylodynamics ('nextHIV'), based on the 'nextstrain' platform.

**GLOBAL HEALTH INFORMATICS**

Five faculty and more than 10 staff members at VIGH and the Department of Biomedical Informatics directly support Global Health Informatics projects in LMICs. Activities include:

**mHEALTH**

**Clinical mHealth Initiatives:** With support by AbbVie Foundation, Astra Zeneca, Regenstrief Institute Inc., and Medtronics Foundation, faculty at VIGH helped develop and implement several mobile applications in the Kenyan setting that formed the foundation for the mUzima suite of mobile applications ([www.muzima.org](http://www.muzima.org)). These applications have been used during screening of over 1 million people for HIV in Western Kenya. The Mobile Clinical Decision Support tools were recognized by the mHealth Alliance / Rockefeller Foundation / UN Foundation as being among the most innovative mHealth Solutions. The mUzima suite of applications is currently being used by community health workers and clinic health providers in Kenya for the care of patients with hypertension and diabetes and will be leveraged for this proposal. mUzima has functionality for data collection, data retrieval, store-and-forward tele-consultation, media management and clinical decision support, among others.

For our *Avante Zambezia* project for HIV care in Mozambique, we support SMS-based mobile technologies for HIV care and data collection.

**Mobile Device Security & Management Solutions:** Our team has led the development and implementation of a device-level system (both mobile and server based) to allow organizations to manage mobile device security for large-scale mHealth deployments. This system allows organizations to track the status and ownership of all devices, to remotely wipe data and lock devices when the devices are reported as lost, to detect SIM card changes, and have GPS-based geo-fencing capabilities to disable use of devices outside a particular radius, among other features.

**mLearning Initiatives:** Our faculty have worked with Kenya’s Ministry of Health to develop an open-source mLearning application for training on the use of chlorhexidine for cord care, leveraging the Moodle platform. We have also spearheaded use of mLearning / eLearning for Health Informatics courses at Moi University.
OTHER GLOBAL HEALTH INFORMATICS PROGRAMS

Strengthening Mozambican Capacity in Strategic Information Systems under the President’s Emergency Plan for AIDS Relief (PEPFAR) CDC-GAP (Were, Co-Investigator) Under this award VIGH will be subcontracted by UCSF to provide technical assistance to the Mozambican Ministry of Health related to roll-out of its electronic patient tracking system as well as in-country capacity to conduct implementation science research and quality assurance.

Health Informatics Training and Research in East Africa (HI-TRAIN) Norad (QZA-0484: Were, PI)

The goal is to develop capacity for Health Informatics and conduct research in the field in partnership with Makerere University (Uganda) and University of Bergen (Norway)

HIS Evaluation Framework for CDC project HQ Building Effective Health Information Systems under PEPFAR CDC (NU2GGH001449: Were, Co-Investigator) The HIS Evaluation Framework project is one of three projects within the grant. Under this project, I-TECH will lead and develop framework and associated tools that decision makes can apply to carry out HIS evaluation, covering all phases: design and piloting, implementation, integration and scalability, and sustained operation. VIGH’s contribution lead by Dr. Were is to provide support in the rigorous evaluation of eHealth, to assist in the generation of evidence, and to promote integration and use of technologies into already existing partner projects.
EDUCATION & TRAINING INITIATIVES

As of December 2016, The VIGH Education & Training team includes 7 faculty and staff members who operate multiple training grants from NIH and CDC focused on global education.

PROGRAMS LOCATED PRIMARILY IN LOW- AND MIDDLE-INCOME COUNTRIES (LMICS) OR FOCUSED ON LMIC TRAINEES

MULTI-COUNTRY

The Vanderbilt-Emory-Cornell-Duke Consortium for Global Health Fellows NIH/FIC (R25TW009337 Heimburger/Aliyu, Co-PIs, 2012-2022) The VECD program provides a one-year, mentored research training experience in a low- or middle-income country (LMIC) setting for pre- and postdoctoral fellows in the health professions. VECD is open to US and LMIC applicants who must have the support of mentors from a US Consortium institution and the desired LMIC institution. Currently, VECD has 17 affiliated international training sites in 14 countries throughout Africa, Asia, Latin America, and the Caribbean. This program succeeded the Fogarty International Clinical Research Scholars and Fellows Program (FICRSF), also administered through VIGH in 2007-2013. VECD competed successfully to renew this program through 2022.

VIGH Institute for Research Development and Ethics. This annual intensive research training program directed by VIGH is designed to facilitate LMIC trainee research productivity. It occurs at Vanderbilt but is open only to LMIC partners and is supported by our various training and research grants. This month long program is intended to bolster and further develop the skill sets necessary for conducting responsible human subjects’ research and developing a grant proposal for submission. Attendees participate in Grant Writing and Research Ethics/Scientific Integrity seminars. Additionally, they attend the Vanderbilt Institute for Global Health (VIGH) Grand Rounds. Each attendee is paired with a faculty mentor at the Vanderbilt Institute for Global Health to promote their scientific research development. Elite health professionals, including Fogarty training grant alumni, engaged in research have the opportunity to gain fundamental skills in grant proposal development.

MOZAMBIQUE

VU-Mozambique Collaborative Research Ethics Education Program (FoCEP) NIH/FIC (R25TW009722 Moon, Heitman, PI, 2014-2018) The VU-Collaborative Research Ethics Education (Formação Colaborativa na Ética em Pesquisa, FoCEP) program aims to nurture a new generation of global health researchers from Mozambique in the ethical review of human participant research and the responsible conduct of research (RCR). This program will also strengthen the development and institutionalization of a system for ethical review of human research protocols in Mozambique’s biomedical research institutions and newly developed Research Ethics Committees (REC). The present program was developed in response to focused and carefully considered requests from the leadership of UEM and the Mozambican National Bioethics Committee for VUMC’s assistance in developing national capacity for ethical review of human studies protocols and teaching research ethics to biomedical and public health investigators.
UEM Partnership for Research in Implementation Science Mozambique (PRISM) NIH/FIC (D43TW009745 Vermund/Moon/Sidat, PI, 2015-2020). Mozambique has enormous potential to conduct biomedical research, given its high rates of infectious diseases and recent international investments in its health care infrastructure and HIV care and treatment scale-up. In order to improve health service delivery and its contribution to medical advancements, Mozambique has a pressing need to further grow its pool of qualified health professionals with the requisite methodological skills in implementation science focused on HIV/AIDS. Aligned with the goals of the Fogarty HIV Research Training Program for Low- and Middle-Income Country (LMIC) Institutions, we have designed a comprehensive training program that is built upon the foundations laid by our joint University Eduardo Mondlane (UEM)-Vanderbilt Institute for Global Health (VIGH) efforts to date and introduces a new partner, Federal University of São Paulo (UNIFESP). VIGH faculty members have worked intensively with UEM and Government of Mozambique Ministry of Health (Ministério de Saúde [MISAU]) partners since 2007 to train Mozambican research scientists at both UEM and Vanderbilt University (VU), and to launch high-impact public health interventions linked to the VIGH-led PEPFAR HIV scale-up program in Zambézia Province. Vanderbilt and UEM faculty or alumni have co-authored 41 manuscripts in the HIV/AIDS field since 2009. We expect to help raise UEM-led implementation science research and training substantially in productivity, quality, and sustainability through the proposed UEM-Partnership for Research in Implementation Science, Mozambique (PRISM). Our focus is to further bolster the existing MPH program at UEM and its faculty using both VU-based Masters of Public Health (MPH) and UNIFESP-based Masters of Science (MSc) degrees; as well as UEM faculty development fellowships at VU.

NIGERIA

Clinical and Translational Research Training in Northern Nigeria (Doris Duke Charitable Foundation: DeBaun/Aliyu, MPIs, 2013-2016)

This career development training for physicians and students nurtures future leaders in clinical and translational research in northern Nigeria.

ZAMBIA

UNZA-Vanderbilt Training Partnership for HIV-Nutrition-Metabolic Research (UVP) NIH/FIC (D43TW009744 Heimburger/Nzala, MPIs, 2015-2020). The UNZA-Vanderbilt Training Partnership for HIV-Nutrition-Metabolic Research (UVP) continues a longstanding training collaboration of the University of Zambia School of Medicine/University Teaching Hospital (UNZA/UTH) and Vanderbilt University (VU) and its Institute for Global Health (VIGH). With PEPFAR’s successes turning HIV into a chronic condition, many Africans are living full lives with HIV, but they are facing non-communicable diseases that come with lifelong antiretroviral therapy (ART), lifestyle changes accompanying the epidemiologic transition, and aging. Nutritional factors are central to many of these, especially in low-income countries, affecting pathogenic processes in the gastrointestinal tract, kidneys, nervous system, and cardiovascular system. UNZA-VIGH collaborations have discovered multiple nutritional influences on ART outcomes. UVP support this by training UNZA PhD-level HIV research leaders in nutritionally- and metabolically-related complications and comorbidities of HIV, while expanding UNZA/UTH’s research training and investigative capacities.

Vanderbilt-Zambia Network for Innovation in Global Health Technologies (VZNIGHT) NIH/FIC (D43TW009348 Wright/Heimburger/Haselton, Co-PIs, 2012-2017): The Vanderbilt-Zambia Network for
Innovation in Global Health Technologies (VZNIGHT) identifies and nurtures American and Zambian research trainees in an integrated training environment to develop and deploy new low-resource diagnostic technologies to enable Zambia to advance its malaria control campaign. Annual cohorts of US and Zambian postdoctoral researchers – ideally one trainee each from the basic sciences, engineering sciences, and clinical or public health sciences – develop and implement unique innovative solutions for malaria detection in a multidisciplinary environment that includes the basic sciences, engineering sciences, and global health and clinical sciences at Vanderbilt University and Zambia partner institutions, principally the Macha Research Trust in Zambia’s Southern Province (Phil Thuma, MD, Director). VZNIGHT is establishing a network for innovation that develops an ongoing pipeline of technologies and products that improve diagnostic capabilities and assist the Zambian health system to realize its goal of a malaria-free Zambia.

**SIERRA LEONE**

**Partnership for Research in Emerging Viral Infections-Sierra Leone (PREVSL) NIH/FIC (D71TW010411 Moon/Schieffelin/Grant, co-PIs, 2016-2017)** The University of Sierra Leone, College of Medicine and Allied Health Sciences, in partnership with Tulane University and the Vanderbilt Institute for Global Health, propose to train a new generation of researchers with a focus on implementation science and clinical trial capacity. During this one year Planning grant our anticipated emphasis will be to prepare a submission for a D43 Global Infectious Disease training grant whose goal is to advance clinical and translational health services research focused on efficacy studies of novel and existing therapeutics for endemic viral hemorrhagic fevers like Lassa fever, while simultaneously building indigenous capacity on how to conduct higher-level clinical trial research during an epidemic like Ebola.

**LATIN AMERICA**

**University of Guyana Master of Public Health Program, (CDC, Heimburger, PI, 2012-2015):** Supported by a two-year grant from the U.S. Centers for Disease Control and Prevention as part of the President’s Emergency Plan for AIDS Relief (PEPFAR), educators from the Vanderbilt Institute for Global Health worked with partners from the University of Guyana, the Guyana Ministry of Health, and the University of California San Francisco (UCSF) to design and implement the first MPH program in Guyana. To address needs specific to the health system in Guyana, the MPH program was designed by Guyanese health professionals and educators with support and input from partners at Vanderbilt and UCSF. In addition to didactic coursework in epidemiology, biostatistics, environmental health sciences, social and behavioral sciences, and public health management, field practicum training emphasizes clinical epidemiology, surveillance, and applied public health. The project was fully transitioned to the University of Guyana Faculty of Health Sciences by the end of the grant.

**EDUCATION & TRAINING PROGRAMS LOCATED AT VANDERBILT**

**COURSE DEVELOPMENT**

Strengthening education and training opportunities in global health is an essential component of VIGH’s overarching mission. VIGH offers a foundations course in global health and competency-building courses in essential skills, ethics, leadership and management, tropical diseases, and global health politics and policy. Since 2011, we have offered an average of 8 global health courses per year.
MEDICAL SCHOOL GLOBAL HEALTH INTEGRATED SCIENCE COURSE

This course is a one-month clinical rotation that introduces students to key topics and concepts in global health including diseases, conditions, and health interventions common in low-resource settings. Health and developmental issues across nations and cultures that require collective (partnership-based) action are highlighted. Placements at ISC sites are at Vanderbilt partner locations around the world including Guatemala, Honduras, Jordan, Kenya, and Nicaragua. This didactic course is taught through both a series of online global health modules that introduce students to key topics and concepts in global health and weekly Skype mentoring sessions with their VUSM faculty mentor. Students generally participate in an immersion block in August, October, or February of their 3rd or 4th year of medical school. Fifty-four students have participated in this course since it was established in 2013.

MEDICAL SCHOOL ADVANCED ELECTIVES

This four-week AE is an extension of the Global Health ISC and aims to provide clinical experience in the care of patients in low- and middle-income countries (LMICs), most often in resource-constrained environments. Students will assess the most common health problems encountered at the site, the usual treatment protocols, and how management differs from that in the U.S. or other developed countries.

MEDICAL STUDENT GLOBAL HEALTH RESEARCH

VIGH supports medical students interested in expanding their knowledge of health issues of international significance through research projects in developing countries. Potential projects span over two dozen countries where VIGH has established partnerships and include a broad range of current themes in global health; from medical sciences and clinical investigation to socio-cultural correlates of health and health care delivery. This global health research opportunity allows students to complete a 3-6 month research project that encompasses both public health and biomedical science. Areas of investigation often include the assessment of community needs and plans to meet those needs, socio-cultural determinants of health and health behavior, health care delivery, basic science, clinical investigation, and implementation science. Students receive mentoring from a VUSM faculty. Since 2008, VIGH has supported 136 students to conduct global health research through the curriculum.

GRADUATE CERTIFICATE IN GLOBAL HEALTH

This interdisciplinary graduate-level certificate program in the study of global health is a vital step in initiating and promoting education and training opportunities in global health. It is open to graduate students from all Vanderbilt colleges and schools. Sixty students from across the university have graduated with the certificate since 2010.

MASTER OF PUBLIC HEALTH, GLOBAL HEALTH TRACK

Launched in 2012, the interdisciplinary Global Health track in Vanderbilt's CEPH-accredited Master of Public Health Program is designed to educate innovative public health leaders to manage global health initiatives and to contribute to public policy that improves global health. Since 2014, it has graduated 40 students who have joined non-governmental, governmental, and academic institutions dedicated to improving health outcomes. In addition to the core public health coursework, students in the two-year program benefit from Vanderbilt faculty's expertise.
in global health. The program also includes global health electives leveraging the university’s strengths in management, education, or biomedical informatics.

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**GLOBAL HEALTH OPPORTUNITIES DATABASE**

In partnership with the Medical Student Global Health Committee, VIGH compiles resources for Vanderbilt graduate and professional students and trainees who are want to pursue global health research, training, education or service projects. This password-protected database allows anyone at Vanderbilt to search current ongoing projects led by Vanderbilt faculty and international funding opportunities. It is updated annually.

**Vanderbilt Training Program in Molecular and Genetic Epidemiology of Cancer (MAGEC) NIH/NCI (R25CA160056 Shu/Heimburger, Co-PIs, 2012-2017):** The Vanderbilt Training Program in Molecular and Genetic Epidemiology of Cancer (Vanderbilt-MAGEC) equips postdoctoral fellows from a variety of disciplines with the methodological tools, practical laboratory and survey-research knowledge, and hands-on research and grant writing experience necessary to launch an independent career in the molecular and genetic epidemiology of cancer. Candidates are recruited locally and nationally from among persons who have recently completed PhD degrees in relevant sciences (particularly epidemiology, genetics, biology, chemistry, biostatistics) or MDs with serious interests in cancer epidemiology research. MAGEC is designed to address the urgent need to build an elite class of epidemiologists to lead the new era of multidisciplinary collaborative research in cancer.