



CHIEF> **PAUL FARMER, M.D., PH.D.** (2003–2005, 2009–PRESENT)

*Division of*

# GLOBAL HEALTH EQUITY

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**T**he Division of Global Health Equity (DGHE) is committed to strengthening healthcare delivery, training, and research; to reducing disparities in disease burden; and to improving treatment outcomes for the neediest, both domestically and abroad.

## **STRUCTURE**

Dr. Paul Farmer serves as division chief and sets the overall vision for the range of critical global and domestic equity efforts in which faculty and staff engage. Dr. Joseph Rhatigan serves as associate division chief and director of the Doris and Howard

Hiatt Global Health Equity residency in which Drs. Daniel Palazuelos and Michelle Morse serve as associate residency directors. Ms. Jennifer Goldsmith serves as administrative director of the division, which includes 40 faculty and 17 trainees.

## HEALTH SYSTEM STRENGTHENING ACTIVITIES

The division engages in numerous domestic and international initiatives to strengthen health systems through clinical and research activities.

### *Navajo Nation and Rosebud Reservation*

Founded in 2009, the Community Outreach Patient Empowerment (COPE) program is a collaboration among the division, the Navajo Nation Community Health Representative (CHR) Program, the Navajo Area Indian Health Service, and Partners In Health (PIH). Led by Drs. Sonya Shin and Sara Selig, COPE works to eliminate health disparities in American Indian and Alaskan Native populations, at the invitation of tribal leadership. Brigham and Women's Hospital (BWH) serves as the research partner for COPE while faculty dedicate effort to its operation. In 2015, COPE began working with local partners on the Rosebud Reservation in South Dakota to help strengthen the healthcare system of the Sicangu Lakota Nation, a community of 27,000.

COPE's model is to partner with healthcare providers and community advocates addressing structural barriers to good health, to respond to the burden of disease, and to fill gaps in the healthcare delivery system identified by patients, families, and providers.

COPE established the CDC-funded Fruit and Vegetable Prescription (FVRx) partnership in Navajo Nation, in which doctors prescribe vouchers for fruits and vegetables to families facing food insecurity and increased risk of diet-related disease. These families receive health coaching sessions and redeem the vouchers with local stores and growers. COPE also leads efforts to expand the Community Health Worker (CHW) workforce through certification programs. As for disease-specific programming, COPE has developed and disseminated the Cancer Journey Roadmap, which identifies priorities to improve healthcare care and support services to patients. COPE's community-wide efforts raise cancer awareness, including through the third Annual Navajo Cancer Survivorship Conference and the

launch of Circle of Life, a cancer curriculum developed by the American Cancer Society specifically for Native communities. COPE's Youth Empowerment Program mentors Navajo and Rosebud high school youth. By teaching traditional stories, youth develop their own collective and individual narratives to build resilience and promote wellbeing in their communities.

### *Guatemala and Maya Health Alliance*

Dr. Peter Rohloff is co-founder of Maya Health Alliance (MHA), one of the largest providers of primary healthcare and related social services in indigenous Maya communities in central Guatemala. Since many indigenous people do not speak Spanish, they are not well served by the health system. MHA addresses the cultural, linguistic, and logistical barriers that prevent these patients from receiving necessary health services. MHA develops effective community-based strategies for noncommunicable diseases (NCDs) and for maternal-child health including smartphone decision-support tools, improving both the continuum of obstetrical and neonatal care and the evaluation of care navigation strategies to improve emergency obstetrical care. They have also implemented behavior-change strategies to improve dietary quality and diversity for infants and children at high risk of stunting. MHA has launched a three-year regional scale-up of a CHW-led self-management intervention for adults with type 2 diabetes, in collaboration with several NGOs and regional academic partners, and has developed population-based survey tools for chronic illnesses.

### *Haiti and Partners In Health*

The division has a long history of developing health systems in Haiti working with PIH. For over 25 years, division faculty have collaborated with Zanmi Lasante (ZL), a leading healthcare provider in the country, to increase access to health services and improve the overall standard of living for residents in the country's rural central plateau.

In partnership with Haiti's Ministry of Health, Harvard Medical School (HMS), and other partners, division faculty work with PIH and ZL to provide care and medical education at the Hôpital Universitaire de Mirebalais (HUM). HUM is a regional referral facility and teaching hospital that was built following the near-destruction of Haiti's main teaching hospital in Port-au-Prince in the devastating 2010 earthquake. The 300-bed hospital offers services not previously available at a public hospital in Haiti, including computed tomography scans, advanced surgical care, a neonatal intensive care unit, and endoscopy. HUM has a 24-hour emergency department, a women's health clinic, general medicine clinic, infectious diseases clinic, and specialty clinics for orthopedic surgery, general surgery, NCDs, mental health, internal medicine, pediatrics, urology, oncology, and ear, nose, and throat care. HUM opened a state-of-the-art clinical lab facility in 2017. The hospital is staffed by over 800 people.

#### *Liberia: Last Mile Health and PIH*

The division began working in Liberia in 2010 through Last Mile Health (LMH), a nongovernmental organization founded by faculty member Dr. Raj Panjabi with other survivors of Liberia's civil war and with American health workers. LMH addresses lack of access to healthcare for 1.2 million people in some of the most remote areas on earth by training and deploying cadres of Community Health Assistants (CHAs). Over the past year, LMH has trained nearly 500 community health professionals to deliver care in

over 460 communities, extending primary care to over 80,000 people. Partnering with the Liberia Ministry of Health (MOH), LMH is implementing the National Community Health Assistant Program, which will deploy over 4,000 health workers to provide lifesaving healthcare to the 1.2 million Liberians who live more than five kilometers from the nearest health center. To date, 2,330 CHAs have been fully trained and are serving an estimated 680,000 people in 2,500 remote communities.

In 2015, in close collaboration with LMH, division faculty, and PIH, the division faculty delivered care during an Ebola Virus Disease (EVD) outbreak. Those same teams were asked by the MOH to help rebuild and revitalize the health system. Since June 2016, PIH has renovated J.J. Dossen Hospital and Pleebo Health Center in Maryland County and has set up a comprehensive health system including the deployment of CHAs and improving the quality of care in the health centers and the referral hospital. The team has improved the workforce, built a radiology department with digital x-ray and ultrasound capacity, and worked closely with the MOH to build the TB and multidrug-resistant TB (MDR-TB) program in Liberia. In 2017, Dr. Corrado Cancedda was awarded a five-year grant by the Health Resources and Services Administration to lead a consortium in the development of the Resilience and Responsive Health System Initiative (RRHS) in Liberia. Partners include Yale University, New York University, and PIH. Division faculty member Dr. Jason Beste serves as medical director for this project.

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*Madagascar and PIVOT*

In 2013, faculty member Michael Rich co-founded the NGO PIVOT and continues to be a leader in its system-strengthening work. PIVOT partners with communities, combining accessible healthcare delivery with rigorous scientific research to save lives and break cycles of poverty and disease. PIVOT collaborates directly with the Madagascar Ministry of Health to provide an evidence-based, research-supported health-system model for rural Madagascar. In the past four years, PIVOT has launched programs to support and strengthen the public health system serving 200,000 people at community, health center, and district hospital levels. In 2016, results from a longitudinal cohort study of 1,520 households in the Ifanadiana district showed the impressive impact of PIVOT's first three years. Between 2014 and 2016, utilization rates of health facilities quadrupled and delivery rates in facilities doubled. Neonatal and under-five mortality declined by 36% and 19%, respectively. The next data point from the longitudinal cohort study will come in 2018 and give information about the first four years of impact in the district.

*Malawi and Abwenzi Pa Za Umoyo (APZU)*

The division's primary activity in Malawi is Abwenzi Pa Za Umoyo (APZU). APZU supports the Ministry of Health (MOH) in delivery of health services at two hospitals and 12 health centers. In 2013, the first-ever surgical suites were opened at both hospitals. In 2014, the hospital began operating the only publicly available oxygen plant in Malawi, and a 70-bed maternity ward opened in early 2015. Early 2016 saw the opening of the Dambe Health Center, a facility serving one of the most remote areas of Malawi. With the help of division faculty, APZU has supported the Ministry in running a decentralized HIV program in all 14 facilities with the best retention and survival outcomes in Malawi, a program that was found to be cost-effective in a research study published in AIDS in 2017. Today, there are almost 8,000 HIV patients and over 2,000 NCD patients receiving care through the Integrated Chronic Care Clinic, which was established in 2015. Neno District's CHW program offers 1,200 CHWs. The team has launched a study of the CHW program aiming to address malnutrition, TB, HIV, NCDs, and maternal health at the household level.



Emily Wroe, M.D. - Global Health Delivery Intensive Course in Malawi

Final results are expected in early 2019. Division faculty member Dr. Emily Wroe leads programs with APZU.

In 2017, working with APZU and the MOH, Dr. Wroe rolled out a chronic disease program at all 14 facilities. In addition to caring for over 8,000 HIV patients, the program also cares for over 3,000 patients with NCDs such as epilepsy, asthma, and diabetes. At the policy level, this partnership is reflected by the hosting of a Technical Advisor at the national NCD Unit and having division faculty co-chair the Malawi NCDI Poverty Commission. Education programs at APZU focus on the next generation of healthcare providers and global health practitioners by developing a rural primary care training site and hosting cohorts of Malawian medical students on their family medicine electives. APZU also supports rotating students and fellows from multiple academic programs, including Global Health Equity residents from BWH.

### *Mexico and Partners In Health/Compañeros En Salud (PIH/CES)*

Partners In Health/Compañeros En Salud (PIH/CES), a sister organization of PIH, launched in 2011 under the leadership of Drs. Daniel Palazuelos and Hugo Flores. PIH/CES revitalizes rural government clinics in the Sierra Madre de Chiapas – one of the most marginalized regions in the country. In partnership with the MOH, PIH/CES operates in ten rural public clinics providing over 30,000 consults yearly to vulnerable people who previously had no reliable health services. Since August 2017, with support from the federal government in Mexico, PIH/CES has operated the maternity department of a community hospital, where it seeks to set a model of safe and patient-centered care for other parts of the state and the country.

Among the notable results to date, PIH/CES has surpassed national benchmarks in chronic disease detection and outcomes, pioneered rural access to mental healthcare, and achieved outstanding rates of patient satisfaction, particularly in maternal care. By designing its service footprint as a learning laboratory for effective care delivery, PIH/CES is able

to recruit top Mexican social service physicians and obstetric nurses (including Licenciadas en Enfermería y Obstetricia [LEOs], Enfermeras Perinatales, and Parteras Técnicas) to participate in career-defining training experiences aimed at preparing the next generation of “change agents” working toward a more equitable health system. In addition, by establishing a research committee, PIH/CES promotes equitable access to research opportunities for staff, and mentorship in all aspects of the research process.

### *Nepal and Possible*

Drs. Duncan Maru, Ryan Schwarz, and Dan Schwarz work in partnership with Possible, a nonprofit healthcare entity in rural Nepal offering senior technical guidance and mentorship to the Nepali leadership team. Since its founding in 2008, Possible has worked in partnership with the MOH treating over 750,000 patients in addition to providing tens of thousands of community-based visits in their catchment area population of 120,000 in the remote Achham and Dolakha districts. Possible has deployed a unique digital continuous-surveillance system that combines longitudinal care delivery by community health workers at the household level, a mobile phone application for vital events registration and care coordination, GPS location with unique household identifiers, biometrics integration, and a facility-based electronic medical record. Through this system, Possible measures population health outcomes for impact evaluation and implementation research in collaboration with the Healthcare Systems Design Group at Harvard. Collectively, their work has led to over a dozen publications in the past year.

### *Russia and PIH*

Division faculty and PIH have been working since 1998 in collaboration with the Russian Ministry of Health to combat one of the world’s most severe epidemics of MDR-TB in Tomsk Oblast, Siberia. The project has focused on improving clinical services for patients while undertaking training and research to catalyze change across the entire Russian Federation.

Key components of the clinical effort include improving diagnostics to detect cases earlier, developing a comprehensive strategy to strengthen the adherence to treatment among patients, and enhancing infection control in hospitals.

### *Rwanda and Inshuti Mu Buzima (IMB)*

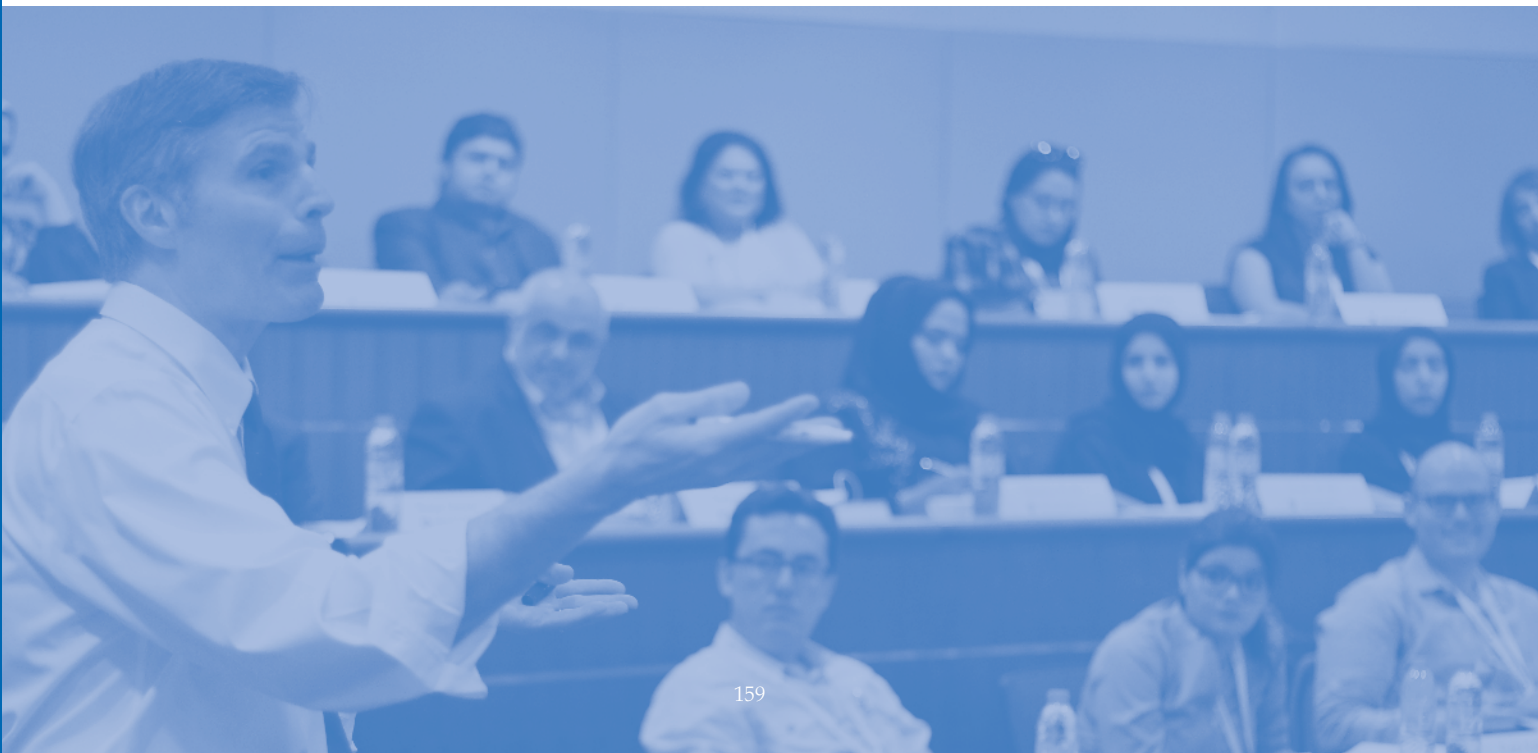
Division faculty and PIH launched a program in 2005 in partnership with PIH's sister organization, Inshuti Mu Buzima (IMB), to bring high-quality healthcare to three districts in Rwanda that previously had some of the country's worst health outcomes. Division faculty and IMB provide direct services to over one million people at three hospitals and 45 health centers, with the help of approximately 7,200 CHWs. Building on their previous work in diagnosing and managing chronic conditions such as HIV and TB, IMB has continued to develop an innovative platform for delivery of services for NCDs.

Since 2012, seven Harvard-affiliated institutions (led by BWH and HMS) have deployed over 70 faculty to Rwanda and supported 22 training programs (11 of which did not exist before), which are on track to train over 4,600 community health professionals by 2019. In 2018, the division co-launched a set of toolkits describing implementation of mentor-enhanced supervision for healthcare quality improvement. The dissemination of these tools has amplified our

nine years of effort working with the Doris Duke Charitable Foundation in Rwanda. In 2017, division administrator Jennifer Goldsmith collaborated with PIH and IMB leaders to develop training toolkits on mentorship and on costing methodologies. These tools were shared through onsite trainings in Rwanda, Haiti, and Boston, and through electronic distribution.

### *Vietnam – Partnership for Health Advancement in Vietnam (HAIVN)*

Through the Partnership for Health Advancement in Vietnam (HAIVN), Dr. Lisa Cosimi studies ways to strengthen health systems and the quality of healthcare in resource-limited settings. Her group partners with the Ministry of Health to reform medical education and training, build systems to routinely measure and improve access and quality of care in hospitals and community clinics, and increase clinician access to evidenced-based knowledge and continuing medical education. Recent efforts include work with five medical universities to reform undergraduate medical education, policy development for establishment of post-graduate residency training programs, and partnerships with national institutions to improve the quality of HIV care and treatment, as well as responses to current and emerging health threats such as hospital-acquired infections and antimicrobial resistance.



### *Advocacy for Healthcare Access and Addressing Inequities in Care Delivery*

Division faculty and the Social Medicine Consortium (SMC) – a collection of more than 700 health professionals from more than 50 institutions – have created a platform for reimagining education of health professionals and advocating for systems-level change towards achieving global health equity through advocacy, education, and research on the root causes of illness using the practice and teaching of social medicine to health professionals. They have advocated for the teaching of the social determinants of health and for healthcare coverage for all Americans in collaboration with Harvard Medicine Indivisible and other grassroots groups. Drs. Michelle Morse and Joia Mukherjee spoke at several city-wide and national events including at HMS and the Massachusetts State House, fighting policy proposals that would strip healthcare from at least 23 million Americans.

They have also been the leading voices of the SMC movement that has launched an international campaign against racism in healthcare.

Dr. Morse has also taken a leadership role in the Department of Medicine (DOM) Health Equity Committee. This group, which includes faculty, staff, and trainees from across the DOM, reflects a commitment to understanding inequities and building on existing infrastructure to achieve institutional health equity goals. As a component of this work, Dr. Morse and division administrator Jennifer Goldsmith are participating on a national Institute for Healthcare Improvement (IHI) initiative to address racial inequity in healthcare. This two-year commitment involves both the DOM and Southern Jamaica Plain Health Center and will develop into an enduring commitment to name and rectify inequities in care through a collaborative institutional approach.

## RESEARCH ACTIVITIES

Global Health Equity research activities focus on addressing inequalities in disease burden and treatment outcomes and range broadly, including HIV/AIDS, MDR-TB, cholera vaccines, surgery, cardiology, hepatitis, health-system benefits of community health workers, school-based community trials, and high-tech innovations in remote rural settings. The division has seen growth in cross-disciplinary biosocial research on diseases of the poor. In FY18, total research expenditures were \$10 million.

The division has an active TB research program focused on optimizing treatment outcomes in patients with MDR-TB. This work is a collaboration with PIH and the Department of Global Health and Social Medicine at HMS. Drs. Salmaan Keshavjee, Mercedes Becerra, Carole Mitnick, Michael Rich, KJ Seung, Joia Mukherjee, Serena Koenig, Sonya Shin, Dylan Tierney, and Ed Nardell are currently conducting retrospective studies that apply novel analytic methods to clinical data from Peru, Russia, South Africa, and Haiti.

- They have produced multiple peer-reviewed publications, for example, that provide evidence that patients with MDR-TB who receive at least five likely effective drugs have significantly lower risks of death and recurrence, and significantly speedier response to therapy, compared to patients who receive fewer than five likely effective drugs.
- Dr. Nardell's work at the Witbank Airborne Infection Research (AIR) facility in South Africa focuses on developing innovative approaches to understanding sustainable airborne infection control based upon a human-to-guinea pig transmission model. The question of how to measure the actual impact of building design and use on airborne infection control continues to be a challenge. Working with collaborator Dr. Ruvandhi Nathavitharana, he is building new data collection models to better understand this issue.



- Based upon earlier research, Dr. Nardell and colleagues will be testing an egg-crate ceiling with germicidal ultraviolet (GUV) air disinfection in an actual clinical setting; they also have plans to test the first LED UV prototype GUV fixtures. These are the first significant advances in GUV in almost 50 years. LED UV can run off solar or alternative power sources, thus holding great potential for use in low-resource, high-TB-burden settings.
- Drs. Michael Rich and KJ Seung are working to revolutionize the way MDR-TB treatment is conceived and delivered. Their endTB project is expected to have significant global impact, by changing World Health Organization (WHO) policy in respect to the clinical management of MDR-TB.

The division's HIV research agenda spans multiple countries and sites. Dr. Serena Koenig is the primary investigator for a randomized trial funded by the National Institutes of Health (NIH) evaluating the effectiveness of same-day HIV testing and treatment, compared to standard care. Dr. Koenig's study on same-day antiretroviral therapy (ART) initiation was one of the main studies that resulted in the change in WHO guidelines in July 2017, to recommend rapid or same-day ART initiation for all HIV-infected patients. In Haiti, Dr. Koenig continues her work on rapid response ART and has expanded treatment populations to those patients who are both HIV and TB positive.

In 2016, Dr. Neil Gupta established the "Simplifying Hepatitis C Antiviral Treatment in Rwanda for Elsewhere in the Developing World" (SHARED) study to bring new hepatitis treatments to Rwanda and demonstrate the efficacy and safety of these medications in a sub-Saharan African context. Hepatitis C is a chronic infectious disease that afflicts more people globally than HIV and can result in severe liver failure, cancer of the liver, and premature death.

Treatment for chronic hepatitis C infection has traditionally been of limited efficacy, highly toxic, and difficult to administer. Recently developed and marketed medications have provided a safe, easy, and highly effective cure; however, use of these medications has been limited due to their high cost and regulations, resulting in less than 2% of patients accessing treatment worldwide, and even lower in sub-Saharan Africa and other poor countries.

Dr. Gupta's team has used the findings of this study to support the development of hepatitis C care and treatment programs in low-income countries and advocate for expansion of availability and access to these medications for poor populations worldwide.

Dr. Shin and her team have completed a five-year study funded by the Patient-Centered Outcomes Research Institute demonstrating that Community Health Representative support to Navajo individuals living with diabetes results in improved diabetes and cholesterol control, compared with matched controls. Utilization of primary care, medication refills, and behavioral health services also increased among cases, matched with controls. These study findings contribute to the growing body of evidence that supports the role of integrated community health workers to reduce health disparities.

The work of the Rwanda Population Health Implementation and Training Partnership, co-led by Drs. Peter Drobac and Lisa Hirschhorn, was completed in 2017. The partnership sought to improve the capacity and performance of the health system in two rural districts with targeted financial and technical investments focused on health centers, coupled with quality-improvement initiatives designed to improve service delivery and to strengthen monitoring and evaluation systems. In 2017, Dr. Anatole Manzi, Jean Claude Mugunga, and division administrative director Jennifer Goldsmith developed toolkits to support training and best practices based on the work.

Dr. MaryCatherine Arbour's work focuses on improving maternal and child health at scale in the U.S. and Chile. She directs the health component of a randomized controlled trial of a preschool-based child development intervention by applying continuous quality improvement methods in public health home-visiting programs. From 2013-2016, the trial enrolled eight states and over 50 local home-visiting teams across the country to participate in the first national Breakthrough Series Collaborative in home visiting. The results — including significant declines in maternal depression treatment and increases in breastfeeding rates and early detection of developmental risk and associated linkage to services — demonstrate that home-visiting programs are capable of improving key maternal and child health outcomes in the vulnerable populations they serve, and that continuous quality improvement holds promise for realizing home visiting's potential to improve population health outcomes and for improving implementation of federal public health programs.

Dr. Arbour is also principal investigator on an innovative pediatric-care-based intervention through which primary care clinical sites proactively address social determinants of health, promote the healthy development of infants from birth to six months of age, and provide support to their parents. Results show greater immunization rates and preventive care visits and fewer emergency room visits among infants, as well as accelerated access to concrete resources.

Dr. Rohloff is building research capacity and promoting research collaborations with other Guatemalan and Central American research institutions through the MHA, guiding health information technology and quality improvement efforts. MHA's randomized clinical trial of a home-based complementary feeding intervention showed the impact on both diet quality and developmental outcomes. In follow-up, MHA is developing more comprehensive, integrated home-based programming that incorporates both nutrition education and early child development activities.

A second exploratory feasibility trial will evaluate the added benefit of home gardens on food security and child nutrition outcomes. Another major project area is the evaluation of lifestyle and behavior-change interventions for rural populations at high risk of cardiovascular and diabetes morbidity and mortality. MHA, in collaboration with Dr. Ann Miller from the HMS Department of Global Health and Social Medicine, is conducting the first representative, population-based survey of chronic kidney disease in rural Guatemala. The study, the largest of its kind to date in Central America, will provide insight into both traditional kidney disease risk factors as well as risk factors for Mesoamerican nephropathy, an emerging nontraditional kidney disease of local importance.

Over the past four years, Dr. Katherine Semrau has led a research team at Ariadne Labs, founded by Dr. Atul Gawande, to implement the BetterBirth trial in Uttar Pradesh, India. This matched-pair, cluster-randomized-controlled trial in maternal and newborn health is one of the world's largest tested, coaching-based implementation of the WHO Safe Childbirth Checklist for impact on birth attendant adherence to evidence-based practices, and maternal mortality, morbidity, and perinatal mortality. Across 120 health facilities in 24 districts of Uttar Pradesh, the trial enrolled more than 160,000 laboring women and followed 99.7% of enrollees and their newborns to obtain health outcomes at seven days postpartum. The trial demonstrated significant increase in adherence to essential birth practices for women and their infants but did not improve health outcomes. Over the past year, Dr. Semrau led the team in additional analyses to better understand these results, discovering critical facilitators and barriers of health interventions in complex systems.

Dr. Ruma Rajbhandari was awarded an anonymous grant to develop local evaluation and research capacity in Nepal to understand and ultimately improve rural healthcare there. Her goals are both to identify fertile research opportunities and to evaluate existing programs including an anesthesia assistant program and the Minimum Service Standards for district hospitals in Nepal with regard to specific areas of care: Emergency Room, OT/Surgery, Inpatient, Lab, X-ray.

During the past year, research in global health economics and implementation science in the division mainly focused on tracking and analyzing the level and trend of investments in global healthcare, serving as a convening and analytic body on best practices in clinical trials globally, evaluating approaches to protect health systems in conflict and crisis-afflicted states, and developing best policy practices in care for NCDs.

Dr. Chunling Lu led a WHO-funded study that identified 91 countries that have a high burden of children in poor development and estimated prevalence and level of young children at risk of poor development from 2005 to 2015 and their inequalities by gender and residence in the 91 countries. The study shows that, for the 91 countries, the prevalence of children at risk of poor development reduced from 55% in 2005 to 41% in 2015. Results were integrated into WHO's progress report for the Global Strategy for Women's, Children's and Adolescents' Health.

Dr. Lu's team has also been leading studies on how much development assistance has been contributed to adolescent health and mental health of children and adolescents in developing countries. Published in *PLOS Medicine*, her work found that donors paid little attention to mental health for children and adolescents in developing countries.

Under the leadership of Dr. Barbara Bierer, the Multi-Regional Clinical Trials (MRCT) Center of BWH and Harvard improves the design, conduct, and oversight of multi-regional clinical trials, focusing on trials sited in or involving the developing world, simplifying research using best practices, and fostering respect for research participants. Over the last five years, the MRCT Center has worked closely with Indian leaders and with Mexican regulatory agencies to identify solutions to improve regulatory capacity for clinical trials processes. In 2017, the MRCT Center sought to address the issue of the

lack of representation of diverse populations in clinical trials, in particular women, ethnic and racial minorities, children, and the elderly. The MRCT Center convened a working group of stakeholders, including academic- and industry-based leaders, not-for-profit institutional representatives, and patients/patient advocates to define guiding ethical principles, establish standards of approach and practice, and explore solutions to common scientific and sociocultural barriers to meaningful diversity in clinical trials.

Dr. Margaret Bourdeaux launched the Threatened Health Systems Project (THSP) that aims to improve global responses to health systems threatened with disruption by armed conflict and social crisis. The THSP works through developing multi-sectoral educational programs, conducting groundbreaking research on the causes and remedies to health system fragility, and engaging policymakers on the importance of health-system protection and recovery. In 2017, the THSP spearheaded critical research in the causes and consequences of health-system disruption, with a focus on governance challenges in conflict-affected states.

Dr. Gene Bukhman is leading the *Lancet* Commission on Reframing Non-communicable Diseases and Injuries (NCDI) for the Poorest Billion. During the past year, this Commission synthesized the results of investigations from its four associated working groups and 11 National NCDI Poverty Commissions, involving more than 200 policy makers, academics, and practitioners. The Nepal and Mozambique NCDI Poverty Commissions have already launched their reports, and Kenya, Malawi, Liberia, and Haiti are on track to launch this year. The global report is planned for publication in 2019. The report will influence future domestic investments and development assistance for the poorest countries working toward universal health coverage.

## EDUCATIONAL ACTIVITIES

The division is committed to the education and training of future leaders in global healthcare delivery in the U.S. and globally, across the career continuum. In addition to the division's Doris and Howard Hiatt Residency in Global Health Equity at BWH, division faculty support the development and content of residency programs and administrative fellowships in partnership with HUM in Haiti, and develop courses, curriculum, and learning communities domestically and globally, each of which focuses on a deepening understanding of how to fundamentally reduce inequities in global health.

### *Doris and Howard Hiatt Residency in Global Health Equity and Internal Medicine*

The Doris and Howard Hiatt Residency in Global Health Equity and Internal Medicine was established in 2004 as a comprehensive program that includes training in internal medicine; coursework in research methods, public policy, global health advocacy; and research and patient-care experiences in impoverished settings at PIH sites around the world. The program adds an additional training year to Internal Medicine and Internal Medicine and Pediatrics residencies. In the most recent year, the division trained a cohort of 11 residents. To date, of the 51 graduates of the residency, 85% have built careers in global health, while others have focused on primary care, health policy, research, and innovation in care delivery.

In 2017, DGHE residents were leaders at BWH and in the public sphere. Residents Drs. Lauren Eberly and Aaron Richterman were instrumental in leading a cross-department health equity initiative addressing inequities in access to cardiovascular care at BWH. Resident Dr. Nick Cuneo was a regular contributor to WBUR, speaking on issues including immigration and healthcare and the need for physicians to make their voices heard on policy issues. Graduating residents earned M.P.H. degrees from the Harvard T.H. Chan School of Public Health and presented original research. Dr. Bram Wispelwey designed, implemented, and measured the impact of a CHW

program in refugee camps in Palestine. Dr. Peter Olds studied the impact of NCD interventions in Madagascar. Notably, Dr. Anne Becker, a DGHE resident, won the DOM Resident Mentor Award.

The division has also supported several residency initiatives at HUM in Haiti. Dr. Morse served as deputy chief medical officer for PIH from 2013 to 2016, and established the first three residency programs offered at HUM in 2013: general surgery, internal medicine, and pediatrics. In 2014, the country's first emergency medicine residency program was launched with collaboration from the division and BWH faculty members Drs. Shada Rouhani and Regan Marsh. Emergency medicine is a new specialty in Haiti, now hosting six residency programs with over 100 residents in training annually and working towards being the first resource-poor country to achieve international accreditation through ACGME International.

In 2015, the division launched the David Walton Administrative Fellowship to develop the managerial and leadership skills of healthcare administrators working at PIH Haiti under the guidance of division administrator Jennifer Goldsmith. Participants gain a rich understanding of the functional areas and operations that might be transferable to their own settings, rotating through meetings with BWH and Partners HealthCare leaders to better understand program operations and enhancing their English skills. Each Walton Fellow develops a capstone project that is authentic and practical, while building internal administrative leadership capacity at ZL. In 2017-18, three administrative fellows were engaged in HR and administration learning while in Boston. Fellow Ornella Sainterant jointly participated in the EqualHealth Marshall Wolf Medical Education Fellowship. In the joint program, she focused both on strengthening her competencies as an educator and her skills as a leader, gaining a deeper understanding of hospital-based operations and quality improvement initiatives.

### *Continuing Education*

In 2016 the division began offering a Continuing Medical Education (CME) Course, “Understanding Global Healthcare Delivery,” which is taught by 15 faculty. The syllabus addresses the biosocial determinants of health and disease and explores how programs to deliver healthcare in low-resource settings address these factors to improve the health of the communities they serve. The division began offering monthly grand rounds in 2014 as an interactive forum for both speakers and attendees to keep abreast of their colleagues’ work, share best practices, and receive constructive feedback from peers in the global health community.

### *Global Health Delivery Courses*

The Global Health Delivery Intensive Summer Program is a concentrated three-week session with classes in epidemiology, management science, and healthcare delivery. Now in its tenth year, the program has trained over 300 practitioners from around the world and serves as the foundational course to a two-year Master of Medical Science in Global Health Delivery at HMS. This year, fifteen students were funded with support from the HMS Center for Global Health Delivery—Dubai.

Dr. Emily Wroe leads the annual Global Health Delivery Course — Malawi with participants from Ministry of Health (MOH) leadership in seven districts in the southwest zone and national MOH leadership. The group uses case-based learning and workshops to produce such tools as PIH Malawi’s “District Leadership for Universal Health Coverage and Coordination of Stakeholders” Toolkit. This toolkit, which has

been piloted in seven districts, helps the MOH to produce visionary health plans for their district, align implementing partners, and utilize a structured monitoring and evaluation approach to assess progress in achieving program goals. Dr. Wroe also supports the Malawi College of Medicine to deliver global health delivery curriculum to students in the new Master’s in Global Health Implementation program. Division faculty are supporting the College of Medicine in the development of additional curricular materials for the master’s program. This follows from the success of previous years of hosting annual Global Health Delivery courses for Malawi MOH leadership.

Dr. Salmaan Keshavjee has been leading the HMS Center for Global Health Delivery—Dubai since 2014. Under his direction, the Center addresses some of the most pressing health challenges in the region by focusing on research, medical education, and training that promises to improve healthcare delivery systems and patient outcomes for diseases prevalent in the United Arab Emirates, Middle East, North Africa, and neighboring regions. The Center also provides opportunities for faculty and students to pursue research related to the delivery of existing or new interventions that can cure or prevent disease, specifically in the following priority areas: diabetes and obesity, infectious disease, mental health, and surgery. This year, the Center provided scholarships for students to participate in the Global Health Delivery Intensive Summer Program and the Program in Clinical Effectiveness at HSPH, creating valuable synergy between division faculty and efforts in many countries.

THE GLOBAL HEALTH DELIVERY INTENSIVE SUMMER PROGRAM IS A CONCENTRATED THREE-WEEK SESSION WITH CLASSES IN EPIDEMIOLOGY, MANAGEMENT SCIENCE, AND HEALTHCARE DELIVERY. THE PROGRAM HAS TRAINED OVER 300 PRACTITIONERS FROM AROUND THE WORLD AND SERVES AS THE FOUNDATIONAL COURSE TO A TWO-YEAR MASTER OF MEDICAL SCIENCE IN GLOBAL HEALTH DELIVERY AT HMS.

In 2017, Dr. Joia Mukherjee's undergraduate global health textbook, *An Introduction to Global Health Delivery: Practice, Equity, Human Rights*, was published. Hers is the first text designed to meet the strong interest among undergraduates in this critical work. Dr. Mukherjee spans the history of policy-level global health commitments and the practical elements of global health implementation.

### *Policy and Educational Programming*

Division faculty have developed numerous opportunities to share their experience and broaden the community of leaders in areas ranging from community health efforts to multiregional clinical trials, to system-strengthening in post-conflict states.

Serving on the leadership committee for the Getting to Zero Statewide Initiative, Dr. Bisola Ojikutu organized the first annual HIV Innovations Conference and awarded pilot implementation grants to support organizations in addressing disparities within the four key populations in the state: people who inject drugs, non-U.S. born individuals, MSM, and transgender individuals. This work both invests in efforts and amplifies impact in an educational setting.

Dr. Rebecca Weintraub continues to oversee the publication of Harvard Business School teaching cases, which are publicly available. In 2017, she and her team published the case "Improving Mental Health Services for Survivors of Sexual Violence in the Democratic Republic of Congo" and the accompanying teaching note. DGHE resident Nick Cuneo co-authored the case.

Dr. Ed Nardell teaches his "Building Design and Airborne Infection Control" course to 40 students from around the world annually. He has taught similar courses in Lima, Peru, and Pretoria, South Africa. The focus is understanding how to develop environments that minimize the risk of transmission of TB.

Dr. Ruma Rajbhandari has committed to strengthening research capacity in Nepal working with the Nick Simons Institute. In this work, she is creating opportunities for students to attend the GHDI course,

the Harvard Global Clinical Scholars course, the HSPH Clinical Effectiveness course, and MicroMasters opportunities with the MIT Poverty Action Lab.

Under the leadership of Dr. Raj Panjabi, Drs. Dan Palazuelos and Ryan Schwarz are among the faculty developing a community health worker academy that aims to reinvent the education of CHWs and the leaders who support them. Using a blended learning approach, these free online courses will be accompanied by in-person learning opportunities and the establishment of a global community of practice. Over the next four years, the Academy will build skills for at least 16,000 CHWs and train at least 15,000 current and next-generation health systems leaders. Their goal is "to recruit the largest army of community health workers the world has ever known, by creating the Community Health Academy, a global platform to train, empower, and connect."

Dr. Margaret Bourdeaux has established the Threatened Health Systems Project (THSP), which aims to provide the academic resources—the education, research and policy translation—necessary to better secure and reconstruct health systems in conflict- and crisis-affected states. Dr. Bourdeaux has collaborated with faculty at the Harvard Kennedy School to launch the first HMS-HKS course in global health and security with the guidance of a 20-member multi-agency multi-sectoral advisory board.

Dr. Barbara Bierer leads the MRCT Center's education efforts. In 2017, the Center hosted trainings focused on the global standards that address best practices for the design, conduct, and oversight of clinical trials, including multi-regional clinical trials. These were developed by the International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use. The courses were attended by regulatory professionals from over 20 different countries and were facilitated by senior professionals including from European Medicines Agency, U.S. Food and Drug Administration (FDA), Pharmaceuticals and Medical Devices Agency Japan, industry partners, and MRCT Center leadership.

The division's Global Health Delivery Project, led by Dr. Rebecca Weintraub, partnered with UpToDate, a leading evidence-based clinical information resource, to expand access to medical resources globally through the UpToDate African Donation Program. Through this partnership, division faculty and staff manage the UpToDate subscription donation program and have helped to coordinate nearly 3,000 free UpToDate subscriptions to individuals and institutions in resource-limited settings in 120 countries.

DGHE faculty Drs. Joia Mukherjee, Michelle Morse, and Joseph Rhatigan helped to establish the University

of Global Health Equity (UGHE) in Rwanda, a private institution designed to leverage expertise and resources from the government of Rwanda, BWH leadership, HMS, and key partners to create a forum for delivery-focused teaching, research, clinical care, and implementation. International and local experts in global health delivery, including division faculty Drs. Peter Drobac, Joseph Rhatigan, Joia Mukherjee, Michelle Morse, and Paul Farmer, all taught at UGHE in 2018. Dr. Stephanie Smith serves as adjunct faculty at UGHE, where she supervises master's students on their mental health-related theses.




NCDI Poverty National Commission Initiators Workshop

## Future Directions

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The division will undertake the following new and expanded initiatives in the coming academic year:

- Dr. Barbara Bierer will expand the efforts of the MRCT Center with the initiation of a collaborative forum the Research, Development, and Regulatory Roundtable (R3).
- Dr. Gene Bukhman, who leads the *Lancet* Commission on Reframing NCDs and Injuries for the Poorest Billion, will submit the Commission's global report, which will be published in 2019, influencing future domestic investments and development assistance for the poorest countries.
- Dr. Margaret Bourdeaux will launch the first Harvard Medical School-Harvard Kennedy School course in global health and security.
- Dr. Paul Farmer will publish his book on Ebola Virus Disease reflecting his own fieldwork on the Health Systems Strengthening Framework.
- Dr. Salmaan Keshavjee will partner with Open Health Institute to expand his zero TB work in Russia.
- Dr. Regan Marsh will serve as Principal Investigator on the Health Resources and Services Administration grant, "Strengthening Health Professional Training in Liberia and Achieving Sustainability through Synergy and Coordination."
- Dr. Michelle Morse will lead the Department of Medicine's efforts to address inequities in healthcare delivery leading with a racial justice lens, stewarding the IHI Pursuing Equity initiative as a BWH equity strategy.
- Dr. Bisola Ojikutu will continue to serve on the leadership committee for the Getting to Zero Statewide Initiative, which is a partnership between the Massachusetts Department of Public Health and community-based organizations throughout the state.
- Dr. Daniel Palazuelos will take the position of senior policy advisor for Community Health at PIH, bridging planning and practice around critical partners of healthcare delivery.
- Dr. Katherine Semrau will be presenting her Better Birth research at the end of 2018 at the Partnership in Maternal, Newborn, Child Health meeting in New Delhi, India.
- Dr. Marla McKnight will join Human Resources for Health (HRH) Rwanda in Kigali as a nephrologist.
- Dr. Joseph Rhatigan will continue the medical education collaborative with Cuban medical educators to strengthen the teaching of social medicine at HMS.
- Dr. Emily Wroe will serve as co-chair of the Malawi NCDI Poverty Commission. 



## FACULTY ROSTER

**Professor**

Barbara Bierer, M.D.  
 Paul Farmer, M.D., Ph.D.  
 Howard Hiatt, M.D.\*  
 Edward Nardell, M.D.

**Associate Professor**

Salmaan Keshavjee, M.D., Ph.D.  
 Joia Mukherjee, M.D.  
 Megan Murray, M.D., Sc.D.  
 Joseph Rhatigan, M.D.  
 Sonya Shin, M.D.  
 Norma Ware, Ph.D.

**Assistant Professor**

MaryCatherine Arbour, M.D.  
 Gene Bukhman, M.D., Ph.D.  
 Augusto Caballero-Robles, M.D.  
 Corrado Cancedda, M.D., Ph.D.  
 Lisa Cosimi, M.D.\*  
 Andrew Ellner, M.D.  
 Serena Koenig, M.D.  
 Chunling Lu, Ph.D.  
 Duncan Maru, M.D., Ph.D.  
 Bisola Ojikutu, M.D.  
 Michael Rich, M.D.  
 Peter Rohloff, M.D., Ph.D.  
 Katherine Semrau, Ph.D.  
 Kwonjune Seung, M.D.  
 Rebecca Weintraub, M.D.

**Assistant Professor, Part-time**

Peter Drobac, M.D.  
 Regan Marsh, M.D. (Emergency Medicine)  
 Daniel Palazuelos, M.D.  
 Rajesh Panjabi, M.D.  
 Shada Rouhani, M.D. (Emergency Medicine)  
 Sara Stulac, M.D.

**Instructor**

Margaret Bourdeaux, M.D.  
 Avik Chatterjee, M.D.  
 Ranvir Dhillon, M.D.  
 Hugo Flores Navarro, M.D.  
 Neil Gupta, M.D.  
 Jonathan Iralu, M.D.  
 Fernet Leandre, M.D.  
 Rebecca Li, Ph.D.  
 Hema Magge, M.D.  
 Ruma Rajbhandari, M.D.  
 Marla McKnight, M.D.  
 Eugene Richardson, M.D., Ph.D.  
 Dan Schwarz, M.D.  
 Ryan Schwarz, M.D.  
 Sara Selig, M.D.  
 Neo Tapela, M.D.  
 Dylan Tierney, M.D.  
 Andrew Van Wieren, M.D.  
 David Walton, M.D.  
 Emily Wroe, M.D.  
 Courtney Yuen, Ph.D.

**Instructor, Part-time**

Jason Beste, M.D.  
 Morgan Esperance, M.D.\*  
 Matthew Gartland, M.D.\*  
 Ravi Kavasery, M.D.  
 Alishya Mayfield, M.D.  
 Michelle Morse, M.D.  
 Paul Park, M.D.  
 Jonathan Quick, M.D.  
 William Rodriguez, M.D.

\*Denotes secondary or tertiary hospital appointment in division (Department) indicates faculty appointment is held in another department

## SELECTED FACULTY ACCOMPLISHMENTS

**MaryCatherine Arbour, M.D.**

- Promoted to Assistant Professor, HMS

**Barbara Bierer, M.D.**

- Co-chair, Public Policy Committee, Public Responsibility in Medicine and Research
- Wallace H. Coulter Distinguished Lecturer, International Society for Laboratory Hematology

**Margaret Bourdeaux, M.D.**

- Roundtable, Munich Security Conference

**Corrado Cancedda, M.D., Ph.D.**

- Invited Presentation, Consortium of Universities for Global Health

**Paul Farmer, M.D., Ph.D.**

- Public Welfare Medal, National Academy of Sciences

**Hugo Flores Navarro, M.D.**

- Ricardo Salinas Scholarship, The Aspen Institute

**Neil Gupta, M.D.**

- “Best of ILC” Distinction, International Liver Conference

**Serena Koenig, M.D.**

- Co-chair, AIDS Clinical Trials Group Study, NIH

**Chunling Lu, Ph.D.**

- Publication Award, *International Journal of Public Health*
- Invited Presentation, Countdown to 2030 Scientific Meeting, WHO

**Hema Magge, M.D.**

- Invited Presentation, IHI Improvement Africa Forum on Quality and Safety

**Regan Marsh, M.D.**

- Appointed in the Department of Emergency Medicine, BWH
- Invited Presentation, Consortium of Universities for Global Health

**Michelle Morse, M.D.**

- Curriculum Design Committee, UGHE Medical School
- 40 Under 40 Leaders in Minority Health Award, National Minority Quality Forum
- Award of Excellence in Humanitarian Services, Society of Hospital Medicine
- Faculty Mentor Award, BWH Department of Medicine
- Keynote Speaker, Massachusetts Medical Society Global Health Conference

**Edward Nardell, M.D.**

- Promoted to Professor, HMS

**Bisola Ojikutu, M.D.**

- Associate Director, Bio-behavioral and Community Science Core, Harvard University Center for AIDS Research
- Appointed Editor, *HIV/AIDS in U.S. Communities of Color*, Second Edition
- Community Hero, Action for Boston Community Development
- Invited Presentation, International AIDS Society Meeting
- Invited Presentation, U.S. Department of Health and Human Services & Office of Adolescent Health

## SELECTED FACULTY ACCOMPLISHMENTS (continued)

**Daniel Palazuelos, M.D.**

- Promoted to Assistant Professor, Part-time, HMS
- Named Senior Policy Advisor for Community Health, PIH
- Marshall Wolf Hiatt Global Health Equity Residency Award, BWH
- Invited Presentation, Center for Global Health Delivery – Dubai, HMS

**Paul Park, M.D.**

- Named Director of Implementation for NCD Synergies, PIH
- Panelist, “Addressing Non-communicable diseases globally,” NCD Capitol Hill Briefing, Washington, DC

**Joseph Rhatigan, M.D.**

- Pillar Award for Educational Program Leadership, Brigham and Women's Physicians Organization

**Eugene Richardson, M.D., Ph.D.**

- Appointed Assistant Professor of Global Health and Social Medicine, HMS
- Fulbright Specialist – U.S. Department of State, Bureau of Educational and Cultural Affairs
- Visiting Scholar, Institute for Advanced Study, Princeton University

**Peter Rohloff, M.D., Ph.D.**

- Promoted to Assistant Professor, HMS
- Hospital Medicine Award for Excellence in Humanitarianism, BWH
- Chair's Research Award, BWH Department of Medicine
- Invited Panelist, Charles Hood Foundation 75th Anniversary Celebration

**Dan Schwarz, M.D.**

- Named Associate Director of Primary Healthcare Team, Ariadne Labs
- Adviser to the Nepal NCDI Poverty Commission, affiliated with the *Lancet* NCDI Commission
- Conference Co-Director and Speaker, “Primary Care 2030: Creating an ecosystem to enable disruptive care models and acceleration down the path to UHC,” HMS Center for Global Health Delivery – Dubai

**Ryan Schwarz, M.D.**

- Invited Presentation and Panel Discussion, The World Bank

**Sonya Shin, M.D.**

- Invited Presentation, American Public Health Association

**Dylan Tierney, M.D.**

- Certificate of Excellence in Tutoring, HMS

**Emily Wroe, M.D.**

- Co-chair, Malawi NCDI Poverty Commission, affiliated with the *Lancet* NCDI Commission

**Courtney Yuen, Ph.D.**

- Invited Workshop, HMS Center for Global Health Delivery – Dubai

## SELECTED PUBLICATIONS

- Dr. Barbara Bierer, “A framework for ethical payment to research participants,” *New England Journal of Medicine*
- Dr. Barbara Bierer, “Development of a plain-language library of educational resources for research participants,” *Journal of Clinical Translational Science*
- Dr. Barbara Bierer, “On scarcity and the value of clinical trials,” *American Journal of Bioethics*
- Dr. Avik Chatterjee, “The family team at Boston Healthcare for the Homeless Program: an integrated approach to care in outreach settings,” *Journal of Social Distress and the Homeless*
- Dr. Paul Farmer, Dr. Joia Mukherjee, and Dr. Daniel Palazuelos, “Community Health and Equity of Outcomes: the Partners In Health experience,” *The Lancet Global Health*
- Dr. Hugo Flores and Daniel Palazuelos, “Community health workers improve disease control and medication adherence among patients with diabetes and/or hypertension in Chiapas, Mexico: an observational stepped-wedge study,” *BMJ Global Health*
- Dr. Neil Gupta, “A novel combined mother-infant clinic to optimize post-partum maternal retention, service utilization, and linkage to services in HIV care in rural Rwanda,” *International Journal of Maternal and Child Health and AIDS*
- Dr. Neil Gupta, “Exploring drivers of infant deaths in rural Rwanda through verbal social autopsy,” *Annals of Global Health*
- Dr. Neil Gupta, “Is hepatitis C elimination possible in sub-Saharan Africa? The case of Rwanda,” *The Lancet Gastroenterology & Hepatology*
- Dr. Serena Koenig, “Same-day HIV testing with initiation of antiretroviral therapy versus standard care for persons living with HIV: a randomized unblinded trial,” *PLOS Medicine*
- Dr. Chunling Lu, “Inequalities in socio-emotional development and positive parenting during childhood: evidence from China 2010-2014,” *Social Science & Medicine – Population Health*
- Dr. Chunling Lu, “Health inequality and community-based health insurance: a case study of rural Rwanda with repeated cross-sectional data,” *International Journal of Public Health*
- Dr. Hema Magge, “Moving the needle in newborn health: implementation experience and lessons learned from the Africa Health Initiative,” *BMC Health Services Research*
- Dr. Duncan Maru, Dr. Dan Schwarz, Dr. Ryan Schwarz, “Management challenges in mHealth: failures of a mobile community health worker surveillance programme in rural Nepal,” *BMJ Innovations*
- Dr. Paul Park, “NCD Chronic Care Toolkit,” NCD Synergies Website
- Dr. Joseph Rhatigan, Dr. Corrado Cancedda, Dr. Paul Farmer, “Building workforce capacity abroad while strengthening global health programs at home: Participation of seven Harvard-affiliated institutions in a health professional training initiative in Rwanda,” *Academic Medicine*
- Dr. Peter Rohloff, “Indigenous language and global health,” *The Lancet Global Health*
- Dr. Ryan Schwarz, “An integrated community health worker intervention in rural Nepal: a type 2 hybrid effectiveness-implementation study protocol,” *Implementation Science*

**SELECTED PUBLICATIONS** *(continued)*

- Dr. Dan Schwarz, "Surgical referral coordination from a first-level hospital: a prospective case study from rural Nepal," *BMC Health Services Research*
- Dr. Sonya Shin, "Primary care and survival among American Indian patients with diabetes in the Southwest United States: evaluation of a cohort study at Gallup Indian Medical Center, 2009-2016," *Primary Care Diabetes*
- Dr. Emily Wroe, "Impact and economic evaluation of a novel HIV service delivery model in rural Malawi," *AIDS*
- Dr. Courtney Yuen, "The global burden of tuberculosis mortality in children: a mathematical modelling study," *The Lancet Global Health*



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WOMEN'S HOSPITAL