



JOHNS HOPKINS
CENTER FOR CLINICAL
GLOBAL HEALTH EDUCATION

GLOBAL IMPACT

INFECTIOUS DISEASE RESEARCH

CLINICAL EDUCATION

HEALTH TECHNOLOGY

LEADERSHIP DEVELOPMENT

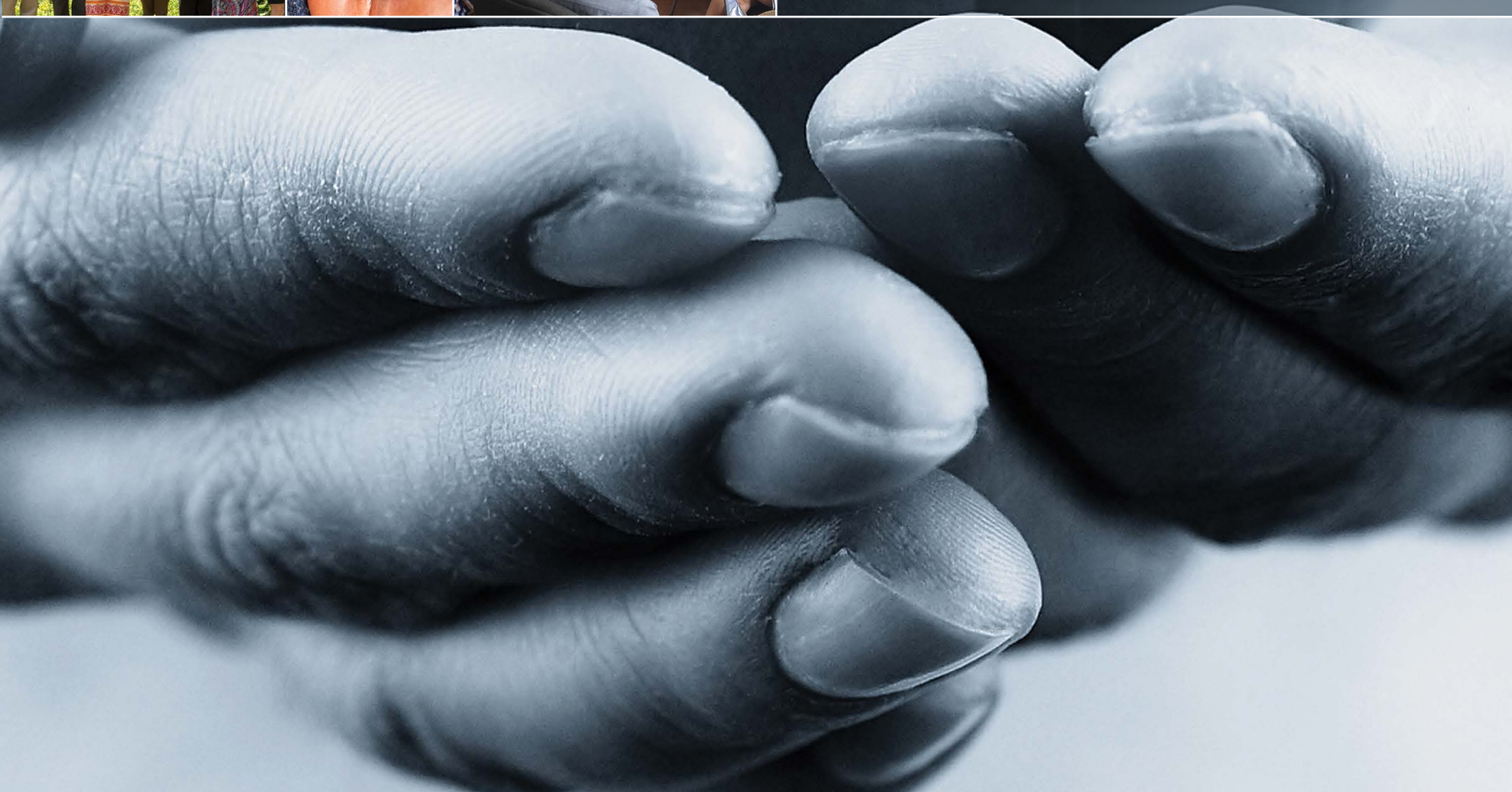






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ABOUT

JOHNS HOPKINS MEDICINE

Mission

The mission of Johns Hopkins Medicine is to improve the health of the community and the world by setting the standard of excellence in medical education, research and clinical care. Diverse and inclusive, Johns Hopkins Medicine educates medical students, scientists, health care professionals and the public; conducts biomedical research; and provides patient-centered medicine to prevent, diagnose and treat human illness.

Vision

Johns Hopkins Medicine pushes the boundaries of discovery, transforms health care, advances medical education and creates hope for humanity. Together, we will deliver the promise of medicine.

More information about

Johns Hopkins Medicine is available online:

www.hopkinsmedicine.org

The Center for Clinical Global Health Education resides within the Division of Infectious Diseases, Department of Medicine, Johns Hopkins University School of Medicine. Our faculty members are infectious disease care providers at the Johns Hopkins Hospital, and are researchers and educators at the Johns Hopkins Schools of Medicine, Nursing, Education, and Bloomberg School of Public Health. We are grateful for the support of University Administration across the schools, and we are proud to be part of Hopkins' tradition of clinical and educational excellence.

MISSION

CCGHE works to improve health outcomes in resource limited countries through infectious disease research and education. We:

- Conduct groundbreaking clinical research to prevent and treat many of the world's gravest health issues
- Design and implement high quality medical education and research training programs for care providers and health researchers
- Develop and leverage innovative technologies that improve clinical care
- Ensure sustainability by mentoring in-country professionals and Johns Hopkins students to become clinical leaders

We can't bring the world to Johns Hopkins, but we can bring Johns Hopkins to the world.



PAKISTAN

Islamabad

Lahore

New Delhi

Allahabad

Katma

Mumbai (Bombay)

Hyderabad

Bangalore

Chennai

C. Comorin

Colombo

MALDIVES

Malé

SRI LANKA





LETTER FROM THE DIRECTORS

A NEW DECADE OF GLOBAL HEALTH IMPACT

The CCGHE recently marked its 10-year anniversary, prompting us to reflect on the progress we've been able to achieve, and to envision what lies ahead. We are encouraged by the changes we've seen in health outcomes for people living with infectious diseases in resource-limited countries, and we are committed to sustaining momentum.

We attribute our longevity to successful and meaningful global partnerships with collaborators who share our vision for a connected network of top quality health researchers. Our clinical research partnerships in India, particularly, have produced sweeping changes in global health prevention and treatment recommendations, and are the foundation for explosive growth of our programs. When we reflect on having provided HIV testing and counseling for more than 260,000 pregnant mothers, and having protected more than 2,000 infants from acquiring HIV infection, we see how powerful these partnerships are.

We are enormously proud of our education platforms. We've designed and delivered scores of courses for care providers and students around the world—classroom courses, videoconference medical seminars, and open source learning platform courses. We've provided instruction on conducting clinical research and delivering care in remote settings, and we've trained in-country medical education professionals to establish such programs on their own.

Our work on HIV in Uganda catalyzed the development of emocha®, a mobile health platform that aids clinical care and provides health education resources. Now available commercially through Baltimore-based emocha Mobile Health, Inc., the platform is being used all over the world to refer patients into care quickly and keep them engaged in treatment.

As much as we are able to accomplish in a year, or ten, we are deeply committed to sustaining progress over generations. The formal mentorships and experience-based learning opportunities we provide for researchers from in-country partner institutions and for students here at Hopkins help ensure a steady flow of regional and global leaders who are bold and ambitious.

We enter our second decade grateful for continued opportunities to make a difference in the world, and humbled by the trust our supporters show in us to do so.

Bob Bollinger, MD, MPH
Director

Amita Gupta, MD, MHS
Deputy Director

Jane McKenzie-White, MAS, MEd
Managing Director

BACKGROUND & FOCUS

Bob Bollinger was a highly regarded clinical researcher in 2001 when the National Institutes of Health began the renowned Six-Week Extended Nevirapine (SWEN) Studies. SWEN was an 8-year effort comprising 3 separate but coordinated clinical trials conducted in Ethiopia, India, and Uganda to determine if it was possible to prevent newborns from becoming infected by their HIV-positive mothers during breastfeeding. Bollinger led the India trials, in partnership with the Byramjee Jeejeebhoy Government Medical College (BJGMC) and the National AIDS Research Institute in Pune, India.

At the time, standard treatment to prevent mother-to-child transmission was to give a single dose of nevirapine to the mother during labor, and a single dose to the newborn. The SWEN Studies concluded that administering nevirapine to newborns each week over the first 6 weeks of life reduced HIV transmission. The results were groundbreaking and spurred the World Health Organization to reissue its HIV treatment guidelines, saving countless lives.

Formally established in 2005, CCGHE addresses grave health issues in places where disease burden outstrips the resources available to address it. Our focus is determined by the health priorities of our global partners, and we work collaboratively to change the state of:

DISEASE PREVENTION, DIAGNOSIS, AND TREATMENT:

- Infectious diseases including HIV and tuberculosis
- Acute febrile illness, antimicrobial resistance, and emerging infectious diseases

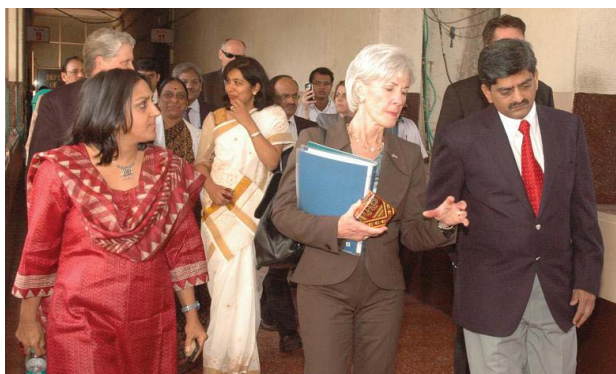
DISEASE MANAGEMENT:

- Preventing transmission of disease from mother to child
- Diagnosing people in remote settings and linking them to healthcare resources
- Facilitating patient adherence to treatment
- Retaining patients in the care system

FACTORS THAT UNDERMINE POSITIVE HEALTH OUTCOMES:

- Chronic diseases (including diabetes, cancer, cardiovascular disease, gastrointestinal disease, non-TB pulmonary disease)
- Malnutrition
- Environmental pollutants (for example, from indoor cooking stoves or tobacco use)
- Gender-based violence (a public health issue in its own right that also prevents women from seeking care for infectious diseases)





Dr. Amita Gupta leads CCGHE's clinical research programs. Dr. Amita Gupta, US Health Secretary Kathleen Sebelius, BJGMC Dean Dr. Ajay Chandanwale

CLINICAL RESEARCH

Our research advances prevention and treatment strategies for many of the gravest health issues affecting resource-limited regions—HIV, tuberculosis, acute febrile illness, emerging infectious diseases, antimicrobial resistance, and chronic illnesses including diabetes, cancer, cardiovascular disease, gastrointestinal disease, and non-TB pulmonary disease. We have directed and participated in more than 100 clinical trials and studies, and we have published more than 200 papers that:

- Identify effective therapies and dosages
- Examine disease issues or behaviors across groups of patients who share common health factors—for example, HIV-positive pregnant women, or patients with acute febrile illness.
- Inform global policies on disease diagnosis, prevention, and treatment

We work to provide valuable insight about the science associated with therapy administration; incidence and prevalence of disease; risk factors for developing illness; how pregnancy, comorbidities, chronic health issues, and environmental factors compound the challenges of treatment; and patient management issues such as what behaviors and interventions are effective for helping people make healthy choices, seek care, and maintain therapy.





A background image showing three women wearing colorful, patterned headscarves. The woman in the center is looking directly at the camera, while the two women on either side are looking slightly away. The background is a blurred outdoor setting.

RESEARCH PARTNERSHIPS IN INDIA:

Under the leadership of Dr. Amita Gupta, CCGHE partners with several Indian medical institutions to conduct research that informs disease prevention and treatment, and these studies serve as a formal channel for educating and involving emerging professionals in clinical research. Field placements are often life changing experiences that lead to careers in global health. We have employees on the ground in India that operate an NIH-funded clinical trial and research site at BJGMC, and we have MOUs with 3 additional institutions:

BYRAMJEE JEEJEEBHOY GOVERNMENT MEDICAL COLLEGE. PUNE

- Among the top 10 medical schools in India; 200 medical students, 130 residents, 50 nursing students trained each year; state-funded 1500-bed tertiary-care public hospital, with 21 outpatient clinics and links to multiple NGOs in the community
- Partnership initially established in 1999 for HIV studies; JHU field office established in 2011
- US and India funded research; Dr. Vidya Mave provides site-based leadership for research, and rotations and field studies; more than a quarter of a million people screened for HIV and TB

DR. D.Y. PATIL MEDICAL COLLEGE, HOSPITAL & RESEARCH CENTRE. PUNE

- Clinical electives and rotations for Johns Hopkins students, residents, fellows
- Clinical site for ongoing studies on tuberculosis and diabetes, antimicrobial resistance, use of mobile health technology for directly-observed therapy

NATIONAL INSTITUTE FOR RESEARCH IN TUBERCULOSIS. CHENNAI

- Internationally renowned TB research institution, Supranatural Reference Laboratory, and WHO Collaborating Centre for TB Research and Training
- Research collaboration on enduring effects of TB and TB therapies in adults, pregnant women, and children

P.D. HINDUJA HOSPITAL & MEDICAL RESEARCH CENTRE. MUMBAI

- Academic teaching hospital; chest clinic is a known authority on drug-susceptible and multidrug-resistant TB and played a significant role in identifying totally-drug-resistant TB
- Partnership to develop a clinical cohort and database of MDR-TB patients, work on whole genome sequencing and TB diagnostics

SELECTED HIGHLIGHTS

- HIV screening for more than a quarter of a million pregnant women in southeast India, and referrals into care, as needed
- More than 100 clinical trials and observational cohort studies on HIV and TB prevention and treatment during the last decade resulting in findings that have changed global standards of care, including official WHO guidelines
- Groundbreaking studies covering a wide range of health issues including: preventing transmission of HIV from mother to infant during breastfeeding, antimicrobial resistance, diagnosing and treating tuberculosis among pregnant women, whole genome sequencing for HIV and TB in India, what effect the human microbiome has on disease treatment, the impact that diabetes has on TB patient outcomes, how exposure to environmental pollutants compounds disease, identifying effective treatments for children with TB-meningitis, recombinant BCG tuberculosis vaccine for adults, the effect that malnutrition has on HIV treatment outcomes, how mobile health technology improves access to care and health resources



Dr. Vidya Mave directs clinical operations in India.

- Research operations in India include more than 20 people on staff, employ another 100 people through in-country partnerships, a large NIH-funded HIV clinical trial site
- Highly successful clinical research portfolio, and a \$5.25 million annual operating budget funded by federal and private foundation grants
- Published more than 200 peer-reviewed papers highlighting research findings
- Ongoing research mentorship and training for more than 200 scholars through clinical fellowships, graduate and post-doctoral studies, and global health field placements at partnering institutions





The Johns Hopkins Global Health TIME Course, run by Natasha Chida (left), links medical students from around the world through video conferencing, and includes panelists from the local Baltimore community.

EDUCATION

A central part of our mission is to address the global health workforce crisis by providing high quality education. Led by Jane McKenzie-White and Dr. Natasha Chida, CCGHE instructs students at Johns Hopkins, and we instruct students and faculty in resource-limited countries using online education platforms.

Specifically, we:

- Develop and administer online courses for clinicians in remote settings
- Provide medical educators in resource-limited regions with training on open source online education platforms to build and expand in-country capacity for medical education
- Provide classroom instruction for medical students at Johns Hopkins about concepts in global health that are relevant for future clinical and research practice
- Connect medical students and providers from around the world through live exchanges designed to facilitate greater understanding of clinical science and global health challenges

During the last decade, CCGHE has offered more than 1900 educational presentations and courses, and provided training to more than 8,000 providers and technicians in countries around the world. Our live monthly web events link clinicians in resource-limited countries with each other and with clinicians at Johns Hopkins.





Jane McKenzie-White meets with MEPI partners in Uganda.

ENHANCING MEDICAL EDUCATION IN AFRICA

The Medical Education Partnership Initiative is a substantial US government investment to improve medical and health science education in sub-Saharan Africa. Funded through NIH's Fogarty International Center, the goal of MEPI is to increase the quality and quantity of health professionals in countries that receive PEPFAR funding for AIDS relief.

CCGHE collaborated with 2 grant recipients to:

- Help medical faculty develop online education programs that can be used by students and care providers in remote areas. We provide intensive workshops on e-learning theory, curriculum design, content development, assessments, program evaluation, and platform use
- Enhance professional development capacity among PhD candidates for research activities including grant writing and peer-review publishing

SELECTED HIGHLIGHTS

- Designed and created scores of self-paced and facilitated online courses on infectious disease research, diagnosis, and treatment, medical procedures, and developing online education
- Developed concept and curriculum for the Johns Hopkins Topics in Interdisciplinary Medicine Global Health course, which connects medical students at partnering universities in Uganda and India through video conferencing, and is a requirement for first year medical students at JHU
- Developed several course offerings specifically for care providers on gender-based violence
- Established a live, online exchange series that connects providers all over the world through video conferencing to discuss clinical aspects of HIV and TB cases and to participate in Grand Rounds. Our video archive is a valuable clinical care resource
- Provide career mentoring for junior faculty wishing to specialize in medical education and academic medicine



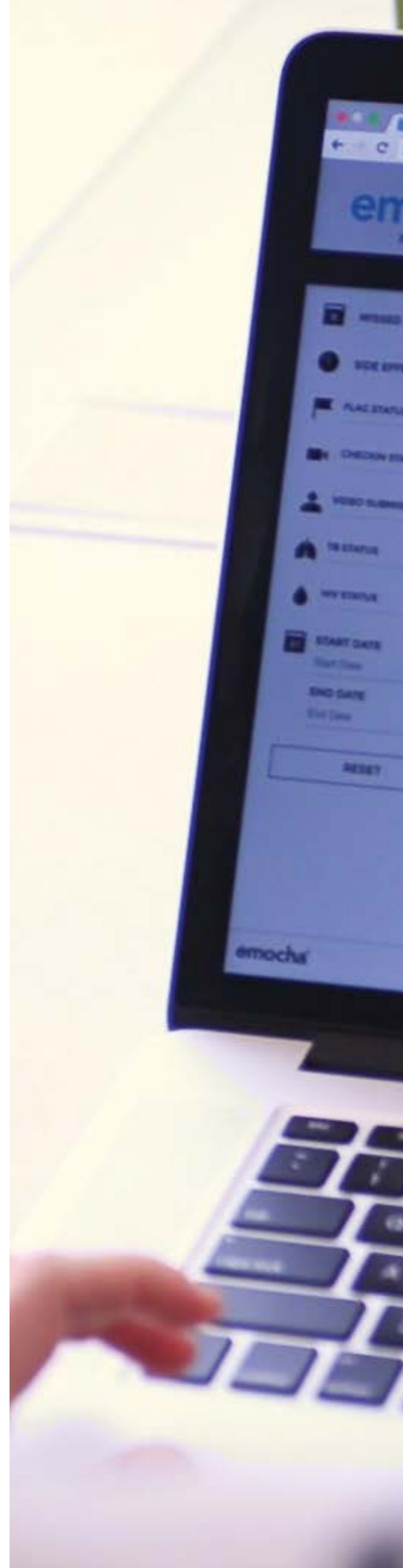
LINKING MDR-TB PATIENTS TO CARE IN SOUTH AFRICA

South Africa's National Health Laboratory Service is one of the largest national labs in the world, and it processes clinical data for one of the largest populations of patients with multi-drug-resistant tuberculosis. CCGHE is partnering with Johns Hopkins School of Nursing, JHPIEGO South Africa, emocha® Mobile Health, Inc., the South Africa National Health Laboratory Service and the National Department of Health in South Africa to improve health outcomes of patients with multidrug-resistant tuberculosis. An innovative set of integrated applications using the emocha® mobile health platform is now helping Regional Linkage Officers get people into care swiftly and improving patient monitoring throughout treatment.

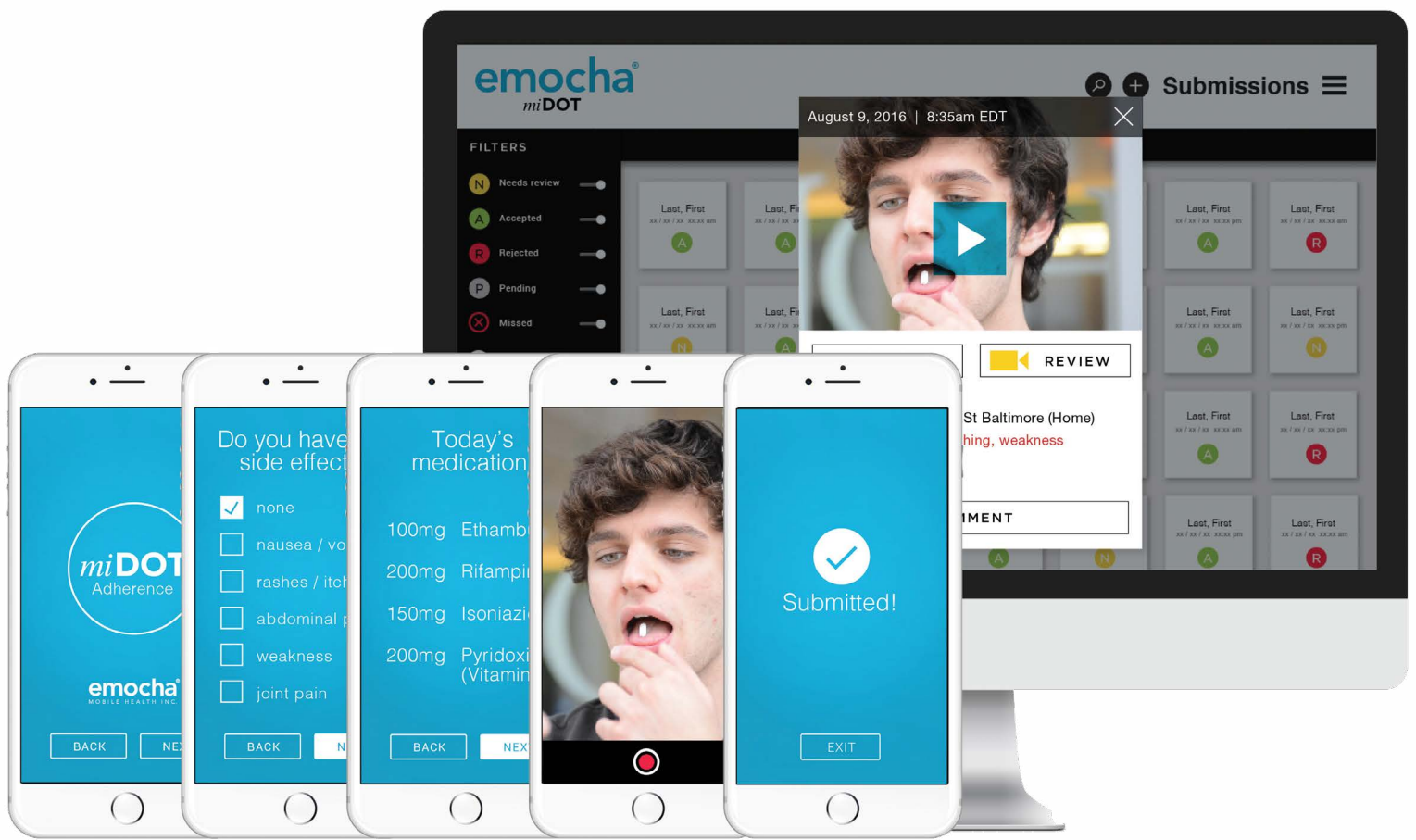
TECHNOLOGY

The rapidly accelerating pace at which information is exchanged globally is revolutionizing our ability to quickly identify and work to solve big issues. Internet-based data repositories, low-cost point-of-need diagnostics, live video conferencing capabilities, tablet and mobile-phone based technologies are available globally, even in rural, resource-limited regions.

We look for ways that technology can deliver clinical resources and education where they are needed, and we've developed tech solutions to improve patient care.



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INNOVATIONS

CCGHE develops and tests technologies that show promise for delivering fast and affordable patient care wherever it's needed.

In one such effort, a multidisciplinary team of JHU experts led by Bob Bollinger is collaborating with a Belgian silicon chip company and miDiagnostics to develop a clinical lab on a chip. The technology is being designed to provide diagnostic testing at the point of need. The end result of this public-private partnership has the potential to radically transform healthcare.

- Designed for mobile platforms: highly portable, no temperature control required, able to reach people in remote areas and people who are not ambulatory
- Requires only a few drops of blood, rather than vials, to process cell, protein, nucleic acid, and small molecule samples
- Provides results within minutes, without the need for a laboratory. Has potential to get patients into care quicker, and provide enormous costs savings
- Potential to help conserve medical resources in regions where they are scarce
- Potential for reporting real-time data about disease clusters and outbreaks, which can inform better and more efficient decision making about international aid and resource allocation



We invented the emocha® mobile health platform. Initially developed to help community health workers in Uganda better serve patients in remote areas, the platform is now licensed by emocha Mobile Health, Inc., and available commercially.

CCGHE developed and tested numerous emocha® applications to:

- Link TB patients to health authorities for remote treatment monitoring. Using the miDOT app, patients are able to securely record themselves taking TB medication and report side effects. Clinicians on the other side are able to access videos and manage patients. miDOT is being used successfully all over the world, and is part of Harris County, Texas's TB elimination strategy, which was recognized in 2016 by the US Centers for Disease Control and Prevention.
- Refer multidrug-resistant TB patients in South Africa into care within 72 hours of a confirmed diagnosis, improving treatment outcomes
- Screen for, and provide care referrals to patients with, oral cancer in Southeast India
- Help visiting care workers identify pregnant women who are at risk for domestic abuse, and deliver interventions intended to reduce intimate partner violence
- Manage retention in care for HIV-positive intravenous drug users
- Deliver patient care reminders and health education resources, and facilitate provider-patient communication
- Collect clinical trial and study participant data in real-time



BJGMC-JHU Fogarty Training Program

For the last 25 years, the BJGMC-JHU Fogarty HIV-TB Training Program has provided research training and professional development for mid-career clinicians to conduct basic, clinical, and applied research on HIV-TB in Southeast India. Led by CCGHE Director Bob Bollinger, the program has trained more than 100 people here at Johns Hopkins and thousands more in India, to design studies, conduct clinical research, apply for funding, and prepare research findings for publication.

SHAPING FUTURE LEADERS

The core of CCGHE's work is to build capacity for and promote leadership in global health research, education, and technology here in the US and globally. We administer formal professional development, provide traditional academic mentoring, and offer internship exchanges to intergenerational global health professionals throughout the spectrum of their careers. By immersing scholars in CCGHE research, education programs, and technology efforts, we help prepare them to one day lead their own transformative initiatives.



SELECTED HIGHLIGHTS

- Emerging clinical researchers are supported by Scholars programs funded by the Ujala Scholars Fund and the Wyncote Scholars Fund
- Mentored more than 100 students and early career professionals to conduct research that improves health outcomes in resource limited countries. Many CCGHE scholars are now setting policy at the global level, leading health research institutes, and designing and implementing clinical research programs
- Established opportunities for career advancement in academic medicine and medical education
- Fostered clinical and behavioral health research skills among scores of Johns Hopkins junior researchers



SANJAY MEHENDALE, MD, MPH
Additional Director General,
Indian Council of Medical Research

FOGARTY IN FOCUS: **DR. SANJAY MEHENDALE**

The biggest opportunity that the Fogarty Fellowship provided to me was the opportunity for training in epidemiology, and research support while getting my MPH from Johns Hopkins University. I stayed in the US for one year, and worked with Dr. Bollinger, with whom I had been collaborating in our Indo-US research partnership. Although I already possessed a doctoral degree at the time of enrollment in the MPH program, with Fogarty support, my knowledge, understanding, and analytical and practical skill sets improved considerably, as did my computer and communications skills. The Fogarty program at Hopkins is unique because it brings together scholars from all regions and countries in the world, and it provided an opportunity to understand global public health in the eyes of my batch mates and immediate seniors and juniors from different parts of the world.





GLOBAL CONNECTIONS

CCGHE is pleased to collaborate with esteemed institutions around the world.

BRAZIL

- Laboratório Integrado de Microbiologia e Imunorregulação, Salvador

CENTRAL AMERICA

- Centro de Investigación Epidemiológica en Salud Sexual y Reproductiva (CIESAR), Guatemala
- Gorgas Memorial Institute, Panama
- Pan American Health Organization (PAHO)

COLOMBIA

- Centro de Estudios e Investigación en Salud of the Fundación Santa Fe, Bogotá
- Government of Armenia
- Government of Aruca
- Government of Girardot
- Universidad Nacional de Colombia, Bogotá

MALAWI

- Tidziwe Centre & Kamuzu Central Hospital, Lilongwe

EUROPE

- iHEED Institute, Dublin, Ireland
- imec, Brussels, Belgium
- University College Cork, Cork, Ireland
- University of Liverpool, England

ETHIOPIA

- Addis Ababa College of Health Sciences
- Arba Minch Hospital, Addis Ababa
- Black Lion Hospital, Addis Ababa
- Ethiopian Civic Service College, Addis Ababa
- Hawassa University, Awassa
- Jimma University College of Health Sciences, Jimma
- Ministry of Education Universities
- World Bank Global Distance Learning Center, at the Civic Service College, Addis Ababa

INDIA

- LEPRASociety-Blue Peter Public Health & Research Centre
- Byramjee Jeejeebhoy Government Medical College (BJGMC), and Sassoon General Hospitals, Pune
- Chest Research Foundation, Pune
- CMC Vellore, Vellore
- Dr. D.Y. Patil Medical College, Hospital & Research Centre
- HIV Medicine Association of India, Pune
- Human Healthcare Research Foundation, Mumbai
- Institute of Bioinformatics, Bangalore
- Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry
- Krishna College, Karad
- Lakshya, Pune
- M.V. Diabetes Research Centre, Chennai
- National AIDS Research Institute, Pune
- National Centre for Cell Science, Pune
- National Institute for Research in Tuberculosis, Chennai
- P.D. Hinduja Hospital & Medical Research Centre, Mumbai
- Persistent Systems, Pune
- St. John's Medical College, Bangalore
- Serum Institute, Pune
- Translational Health Science and Technology Institute, Faridabad

PAKISTAN

- Aga Khan University, Karachi
- Indus Hospital, Karachi

PALESTINE

- Al-Quds University

SOUTH AFRICA

- JPS South Africa
- Perinatal HIV Research Unit, Johannesburg
- South Africa National Department of Health, Pretoria
- South Africa National Health Laboratory Service, Johannesburg
- Stellenbosch University, Stellenbosch
- University of Cape Town, Cape Town



UGANDA

- Busitema University. Busitema
- Gulu University. Gulu
- Integrated Community Based Initiatives (ICOBIs). Kampala
- Infectious Disease Institute. Kampala
- Kampala International University. Kampala
- Makerere College of Health Sciences. Kampala
- Makerere University Faculty of Nursing. Makerere
- Mbarara University of Science and Technology. Mbarara
- Rakai Health Sciences Program. Rakai
- Ugandan Nursing Council

UNITED STATES

- I5Four. Baltimore, MD
- Baltimore City Health Department. Baltimore, MD
- Boston University. Boston, MA
- Centro de Sol. Baltimore, MD
- Columbia University. New York, NY
- Cornell University. Ithaca, NY
- East Carolina University. Greenville, NC
- emocha® Mobile Health Inc. Baltimore, MD
- Global Partnerships Forum
- Johns Hopkins Bayview Medical Center. Baltimore, MD
- Johns Hopkins Bloomberg School of Public Health. Baltimore, MD
- Johns Hopkins Center for TB Research. Baltimore, MD
- Johns Hopkins Center Global Health. Baltimore, MD
- Johns Hopkins Global mHealth Initiative. Baltimore, MD
- Johns Hopkins School of Nursing. Baltimore, MD
- Johns Hopkins Whiting School of Engineering. Baltimore, MD
- Mayo Clinic. Rochester, MN
- New York University. New York, NY
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- Rutgers University. New Brunswick, NJ
- University of California. San Francisco, CA
- University of Maryland. College Park, MD
- University of North Carolina. Chapel Hill, NC
- University of Texas. Austin, TX
- University of Washington. Seattle, WA
- Whitman Walker Health. Washington, DC

THE CENTER FOR CLINICAL GLOBAL HEALTH EDUCATION LEADERSHIP TEAM



Bob Bollinger, MD, MPH
Director
Professor of Medicine, International Health,
and Nursing, Johns Hopkins University



Amita Gupta, MD, MHS
Deputy Director
Associate Professor of Medicine and
International Health, Johns Hopkins University



Jane McKenzie-White, MAS, MEd
Managing Director
Senior Program Officer,
Johns Hopkins School of Medicine

INDIA LEADERSHIP TEAM



Vidya Mave, MD, MPH
Director and Clinical Research Site Leader,
Baltimore-Washington-India Clinical Trials Unit



Nikhil Gupte, PhD
Deputy Director and Data Manager,
Baltimore-Washington-India Clinical Trials Unit



Nishi Suryavanshi, PhD
Clinical Research Site Coordinator,
Baltimore-Washington-India Clinical Trials Unit

US-BASED FACULTY



Larry Chang, MD, MPH
Associate Professor of Medicine
and International Health,
Johns Hopkins University



Natasha Chida, MD, MSPH
Assistant Professor of Medicine
Johns Hopkins University



Andrea DeLuca, MHS
Research Associate, Johns Hopkins
Bloomberg School of Public Health;
Program Director BJGMC-JHU Fogarty
HIV-TB Training Program



Kelly Dooley, MD
Associate Professor of Medicine,
Pharmacology, and Molecular
Sciences, Johns Hopkins University



Jonathan Golub, MPH, PhD
Associate Professor of
Medicine and Epidemiology,
Johns Hopkins University



Bhakti Hansoti, MBCHB, MPH
Assistant Professor of Medicine
Johns Hopkins University



Jyoti Mathad, MD
Instructor of Medicine
Weill Cornell Medical College



Yukari Manabe, MD
Professor of Medicine,
International Health, and Molecular
Microbiology and Immunology,
Johns Hopkins University



Kathleen Page, MD
Associate Professor of Medicine,
Johns Hopkins University



Maunank Shah, MD, PhD
Associate Professor of Medicine,
Johns Hopkins University



Anita Shankar, PhD
Research Associate, Johns Hopkins
Bloomberg School of Public Health



Rupak Shivakoti, PhD, MSPH
Instructor of Medicine, Johns Hopkins
University

INDIA-BASED RESEARCH TEAM



Mallika Alexander, MBBS
Project Manager

Sachin Atre, PhD
Study Coordinator

Shri Vijay Balayogendra Shivakumar, MD
Project Coordinator

Sona Deshmukh, MBBS, MPH
Study Coordinator

Gauri Dhumal, MSc
Fogarty Program Manager

Sadaf Inamdar
Pharmacist of Record

Savita Kanade, MSc
Community Coordinator

Sameer Khan
Data Manager

Rewa Kohli, MSc, PhD
Study Coordinator

Vandana Kulkarni, MS
Laboratory Manager

Neetal Nevrekar, MD
Clinical Research Officer

Mandar Paradkar, MBBS, DCH, MPH
Study Coordinator

Sandesh Patil, MBBS, DGO
Clinical Coordinator

Neeta Pradhan
Tuberculosis Lab Coordinator

RESEARCH & GRANTS MANAGEMENT



Katharine Bergstrom, MS
IRB & Regulatory Specialist

Sagar Bhagwat, MBA/MS
Budget Analyst

Katie McIntire, MD
Science Writer

Amita Nagaraj
Senior Financial Administrator
Pune, India

Smita Nimkar, MSc
Regulatory Coordinator
Pune, India

Gabriela Smit
Financial Manager

Rosemarie Warlick
Regulatory Affairs Coordinator

COMMUNICATIONS



Molly Bowen
Communications Associate

Matt Williams
Multimedia Specialist

ADMINISTRATION



Gail Jessop
Administrative Coordinator for Amita Gupta

Ana Cervantes
Senior Administrative Coordinator

SUPPORTERS

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INDIVIDUAL

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Hewlett-Packard
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JOHNS HOPKINS
CENTER FOR CLINICAL
GLOBAL HEALTH EDUCATION

Johns Hopkins School of Medicine
600 N. Wolfe Street, Phipps 540
Baltimore, MD 21287, USA

Telephone: 410.502.2032 • Online: www.main.ccghe.net