Building Global Health Resilience in the Face of COVID-19

AT THIS PIVOTAL MOMENT in global health, Vanessa Kerry, MD, MSc, is among the Mass General leaders working tirelessly to address the deep-rooted health disparities that have put the world’s most vulnerable populations at higher risk of COVID-19 infection and death.

In the U.S., the death rate in areas with majority populations of color is six times higher than in majority non-Hispanic white areas, according to analysis by the Harvard T.H. Chan School of Public Health. People living in impoverished, crowded and racially and economically polarized regions are at the greatest risk.

Internationally, across low-income countries, disparities are exacerbated by already over-burdened health systems, a shortage of health workers, gaps in health system infrastructure and longstanding critical care capacity issues. For example, the World Health Organization reports that 83 countries do not meet the minimum threshold of 23 health workers (nurses, doctors, and midwives) per 10,000 people. Forty-three of those 83 countries are in Africa.

To raise the quality of patient care globally, Dr. Kerry says, it’s critical to remember that we’re only as strong as our weakest link. Making long-term investments in health workers and systems in resource-limited settings today provides a foundation for them to continue to evolve to solve new community health challenges tomorrow.

“Responding to COVID actually should have started 10 years ago,” Dr. Kerry said. “One of the great investments that we [as an international community] have failed to make has been investing in people: the doctors, nurses, midwives and the places that we work that are a critical backbone of providing care.”

Through her work as Associate Director of Partnerships at the Mass General’s Center for Global Health (CGH) and co-founder and CEO of Seed Global Health—a nonprofit that invests in strengthening health systems by training health professionals in low-resourced communities—Dr. Kerry and her colleagues have focused on mounting a COVID response that is both real-time and enduring, given the likelihood of future pandemics and global health crises.

At the onset of the pandemic, Dr. Kerry and CGH Executive Director Louise Ivers, MD, MPH, DTM&H, collaborated to launch a series of weekly COVID-19 webinars whose topics were determined by listening to the needs of international colleagues. Each webinar gathered an international panel of health experts to provide health workers and administrators with immediate, actionable information and best practices for responding to COVID-19 in low-resourced settings.

(continued on back page)

Lab Collaboration Increases COVID-19 Testing Capacity in Haiti, Bangladesh

THE MASS GENERAL Center for Global Health (CGH) played a key role in the dissemination of MGH’s COVID ELISA (enzyme-linked immunosorbent assay) antibody test to support the urgent need for accurate testing and disease surveillance in Haiti and Bangladesh.

Once Mass General had its ELISA test developed in March, Jason Harris, MD, MPH, Chief of Pediatric Global Health at Mass General Hospital for children, CGH Executive Director Louise Ivers, MD, MPH, DTM&H, and Richelle Charles, MD, FIDSA, Principal Investigator in the MGH Division of Infectious Diseases and CGH Associate in Global Health, in concert with other MGH staff, quickly joined forces with international colleagues at the Haitian National Laboratory, the Haiti CDC, Bangladesh’s Institute of Epidemiology Disease Control and Research (icddr,b), and the International Center for Diarrhoeal Disease Research, Bangladesh (icddr,b) regarding sharing antibody testing procedures and reagents.

The MGH ELISA antibody test study is currently in peer review, but findings indicate the test is highly accurate with 100 percent specificity (no false positives out of more than 1,500 negative samples tested) and 97 percent sensitivity when administered over 14 days after symptoms were experienced.

“It’s hard to intervene and be aware of how COVID is spreading unless you know who’s at greatest risk—and you can’t determine that accurately without testing,” said Dr. Harris.

(continued on back page)
New COVID Treatment Center in Mbarara to See First Patients

ON APRIL 1, Mass General Center for Global Health (CGH) partner Mbarara Regional Referral Hospital (MRRH) broke ground on a new temporary COVID-19 Treatment Center that will more than triple the hospital’s capacity to properly manage, isolate and treat patients with COVID-19 as well as other highly infectious diseases.

MRRH is a 600-bed hospital with a current full isolation capacity of only 16 beds housed in a temporary shed. The current Isolation Unit received its first COVID-19 patient on May 17. As of September 10, MRRH health workers have treated 66 confirmed COVID-19 cases—managing and discharging 59 of those patients (with an average stay of 17 days), and mourning the loss of one health worker. The six current IU admissions include two MRRH nurses.

“The new 58-bed facility will be crucial in the event that the pandemic worsens the need for in-patient hospitalization and care,” said Stephen Asiimwe, MBChB, MS, DrPH, Program Director of the Mbarara University of Science and Technology (MUST) Global Health Collaborative (GHC), CGH’s anchor program in Uganda.

Dr. Asiimwe and Annet Kembabazi, Program Manager for the MUST GHC, worked closely with key partners at MRRH, MUST, CGH Boston, the Uganda Ministry of Health (MOH) and the Mbarara regional COVID-19 task force to initiate construction of the additional facility on government-secured hospital land, using First Mile funding and leveraging structural drawings and building plans provided by Build Health International (BHI).

The First Mile program was launched in June 2018 in Mbarara, supported by the philanthropy of the Wyss Medical Foundation. Uganda’s Ministry of Health will ultimately contribute to the completion of the center.

Dr. Asiimwe reports that, even before COVID, the hospital was usually full, since the catchment area and population in the region includes more than 16 districts and 5–6 million people.

“From the onset of the pandemic, we realized that preparation for surge capacity was an urgent priority,” said Dr. Asiimwe. “The hospital and university leadership and the government of Uganda embraced this and were able to find land to build this facility quickly.”

Even before the hospital received its first positive case, First Mile support procured initial PPE and laid infrastructure for the community referral and monitoring of COVID patients. Resources were also used to train the current first responders at MRRH, the local clinical team, and screeners stationed at each entry and exit of the hospital, as well as to execute an initial Information Education and Communication (IEC) campaign about COVID-19 identification and prevention measures.

“I was inspired by the collaboration between the university (MUST) and the hospital (MRRH) and how rapidly they sprang into action to make this important initiative happen for their community,” said Emily Cable, First Mile Program Manager.

The structure received its roofing during the first week of July, and a 50-bed capacity was set up. The Uganda Ministry of Health (MOH) added a supplementary eight-bed epiTent and plans to add more tents as needed.

Although the structure is not set to be completed until October, the new facility will house its first patients soon.

“With the cases increasing currently, plans are underway to utilize this facility beginning with hosting several positive but asymptomatic cases that are currently quarantined at treatment centers in regional referral hospitals, per current MOH guidelines,” Dr. Aslimwe said.

The community, led in particular by the Mbarara regional COVID task force, is invested in the longevity of the development. The task force is led by the resident district commissioner and has multisectoral membership, with members representing the regional hospital, regional medical facilities, MUST, medical workers, political and religious leaders, as well as community representatives.

Sustained support for the community health system will be crucial to continue strengthening its COVID-19 and infectious disease response capacity. The hospital is faced with a health care worker shortage and running low on PPE; resource allocation between COVID cases and non-COVID patients is becoming challenging, and electricity is irregular in the existing ICU—a problem that completion of the new treatment center should help mitigate.

For now, the priority is managing the current outbreak of COVID-19. In the future, however, the facility will be used to isolate, observe, investigate, manage, and train medical workers in the care and management of highly infectious diseases such as COVID-19 and various viral hemorrhagic fevers like Ebola. MRRH also plans to add a reference clinical and research laboratory for highly infectious agents.

Webinar Series: COVID-19 Response in Low-Resourced Settings

IN AN EFFORT to address the unique challenges faced by health workers responding to COVID-19 in lower-resourced settings, the MGH Center for Global Health (CGH) began hosting a series of weekly Durant Technical Panels in March, which brought together international experts to exchange meaningful data, solutions and ideas for facing the pandemic.

The webinar panels, which drew hundreds of attendees from around the globe, focused on sharing practical data and insights that could be translated into real-world response work.

Topics were guided by the concerns of international partners, including triaging and PPE management, pregnancy and childbirth, testing, clinical care of patients with COVID-19, and preparedness in migrant and refugee populations.

All recordings are available on demand at the Center for Global Health YouTube page.
Nurses Deployed to Navajo Nation

THIS SUMMER, the Massachusetts General Hospital (MGH) Center for Global Health (CGH) Office of Global Disaster Response and Humanitarian Action (GDRHA), in response to a request for support from longtime GDRHA partner Project Hope, deployed four experienced nursing staff to the Navajo Nation to assist with the care of patients admitted to Indian Health Service facilities amid the COVID-19 pandemic.

Team Lead and Director of Global Disaster Response and Humanitarian Action Lindsey Martin, NP (Surgical Intensive Care Unit), Director of Global Nursing Mary Sebert, RN, MPH (CGH), Jennifer Samiotes, RN (Pediatric Intensive Care Unit), and Skeeter Welder, RN (Medical Intensive Care Unit), worked with the Chinle Comprehensive Care Facility in Chinle, Arizona, to provide clinical care.

The Navajo Nation, the largest American Indian reservation in the United States, has a population of fewer than 200,000 yet has seen one of the highest per capita rates of COVID-19 infections of any US state. By the time of the July deployment, Chinle had seen more than 8,000 positive cases and 386 confirmed deaths.

As Martin told NPR’s All Things Considered in late June: “what we’re not seeing on the news is the fact that they’ve really instituted a very community-based response instead of an individualistic effort.” She went on to add: “People are taking this effort and really being protective, particularly about vulnerable populations...People are what they call ‘hauling water’, so distributing water to those people so they don’t have to leave their homes. They’re nominating certain individuals to be the ones that go to the grocery store.”

With the help of CGH’s nurses, the Chinle facility converted a pediatric ward into a COVID Respiratory Care Unit and repurposed the facility’s dining room into a sewing room for masks and gowns; the facility also ensured that traditional medicine practitioners were available by phone to support care efforts.

Asylum Clinic Advocates for Release of ICE Detainees

THE MGH ASYLUM CLINIC, led by Matt Gartland, MD, Director of the Center for Global Health (CGH) Asylum Clinic, has been instrumental in securing the release of several immigrants from a detention facility in North Dartmouth.

Gartland recently co-authored an article published in Lancet Infectious Diseases examining the elevated risk of COVID-19 to incarcerated individuals, including immigrants in ICE detention. In collaboration with Nathan Praschan, MD, MGH Psychiatry, he also wrote a declaration in a lawsuit brought by Lawyers for Civil Rights against ICE on behalf of individuals in ICE detention at the MA Bristol County House of Corrections.

The suit, which Lawyers for Civil Rights called the first coronavirus class action case against ICE, petitioned for the release of 147 individuals from detention, citing unsafe and inhumane conditions. District Judge William G. Young cited Gartland and Praschan’s declaration in his decision ordering detainees’ release; as of early May, 50 individuals had been released.

Through the Asylum Clinic, MGH clinicians volunteer their time to provide independent, forensic medical assessments of individuals seeking asylum based on a past history of physical or mental abuse. Evidence has found asylum applicants who underwent a medical exam received asylum 89 percent of the time, compared with under 38 percent of all asylum seekers nationally. Throughout the pandemic, the clinic has continued to pursue its mission by providing comprehensive virtual exams to clients.

Increasing Safe Isolation and Surge Capacity in Mass.

IN APRIL, Massachusetts General Hospital and Boston Healthcare for the Homeless opened Boston Hope, a 1,000-bed medical center inside the Boston Convention and Exhibition Center designed to safely isolate, test and treat COVID-19 patients experiencing homelessness while reducing density at area hospitals.

Geren Stone, MD, Director of the MGH Global Medicine Residency and Fellowship Program, was among the clinical staff of the field hospital, which served 700 COVID-positive patients before its doors closed in June.

Mass General Brigham also set up a similar facility in Revere: A 147-room Quality Inn was repurposed as an isolation hotel, serving those from Revere, Chelsea, and other hot spot cities who did not have a place to safely self-isolate. Patients were provided individual rooms and three meals a day at no cost; with medical staff available 24/7, and behavioral health specialists also on site.

MGH Global Nursing Director Mary Sebert, RN, MPH, and former International Nurse Program Manager Monica Staples, RN, MSN, were critical in the community response, serving as nurse managers for the Isolation Inn until completion of the program in June. Kristen Giambusso, MPH, MGH Global Health Deputy Director of Global Disaster Response and Humanitarian Action (GDRHA), served as the lead Practice Manager and Kerry Phelan, MBA, MGH Global Health Program Manager, provided additional project support.

Lynn Black, MD, MPH, and Lindsey Martin, NP, Director of GDRHA, also helped direct a Surge Clinic at MGH, which was designed to relieve the strain on emergency department resources by providing COVID-19 testing and evaluations for those experiencing respiratory illness.
Holyoke COVID-19 Community Antibody Study

HOLYOKE has been one of the communities in Massachusetts hit hardest by COVID-19. Even in the context of the state’s overall decrease in cases, it remains in the highest-risk category and in August was added to Massachusetts’s Stop the Spread initiative, a program providing free widespread COVID-19 testing in places with higher rates of the disease.

To help assess the risk, the Mass General Center for Global Health (CGH) is conducting a community antibody study planned to last for approximately four weeks from late September to early October. The study aims to determine how many people in Holyoke have had COVID-19, which groups are most at risk, and better understand the spread of disease.

The knowledge gained will help the Board of Health and the mayor’s office in Holyoke make informed decisions about public health response measures such as reopening activities, addressing needs of families and other efforts that will contribute to the safety of citizens in the Holyoke community and elsewhere.

New Protective Booths Improve COVID Testing

AN INNOVATIVE SOLUTION from Mass General employees is helping increase testing capacity while limiting risk to health care providers and patients and conserving limited supplies of personal protective equipment. Kristian Olson, MD, Director of CAMTech and Mass General Hospital's Springboard Studio, in conjunction with an external design firm, has developed “Hexapods”—personal protective booths equipped with three gloved external hand ports, allowing clinicians to administer a swab test to patients without making direct contact. The concept increases safety for both health care providers and patients, ameliorates testing capacity, and has cut down consumption of scarce PPE such as N95 masks by 96 percent.

CGH Launches Global Health Research Collaborative

The GHRC is chaired by CGH Executive Director Louise Ivers, MD, MPH, DTM&H and Ken Freedberg, MD

FEBRUARY 25 marked the official launch of the Mass General Global Health Research Collaborative (GHRC)—a formal network of research groups and global health research faculty across MGH departments, institutes and centers.

Convened by the Mass General Center for Global Health (CGH), the Collaborative meets quarterly and focuses on the exchange of meaningful research findings and the creation of pioneering bench, clinical and population health research partnerships, the results of which will be leveraged to inform global health care and influence policy in underserved populations.

The Collaborative also provides a platform for students, residents, fellows, and junior faculty to develop global health partnerships and mentorship, and research career development opportunities.

Founding members include CGH partners the Mongan Institute, the Ragon Institute and the Mass General Division of Pediatric Global Health, as well as 28 faculty from across the Mass General Cancer Center and Mass General Departments of Medicine, Emergency Medicine, Dermatology, OB/GYN, Surgery, Neurology and Psychiatry.

We invite you to visit globalhealth.massgeneral.org for more information about the Collaborative.

The concept, based on testing “phone booths” used in South Korea, was being tested at Newton-Wellesley Hospital just nine days after conception. That prototype was eventually sent to Mass General’s Chelsea HealthCare Center, where area residents have been particularly hard-hit by the virus.

As of the end of August, more than 25,000 tests have been performed via Hexapods at four sites across MGH, with a daily average of 99 tests performed on each Hexapod since mid-April. Hexapods have enabled a testing capacity increase of more than 320 percent compared to pre-booth testing capacity (the average patient can be tested in 46 seconds), and have enabled more than $42,000 in cost-savings from gown supplies alone.

“We’ve worked to combine the skills and talents of engineers, designers and care providers with the feedback and experience of actual users—like our colleagues in South Korea and here at home—to develop a device that works well for both patients and caregivers,” Olson said.
— **Global Health Resilience**

(continued from front page)

By remaining in near-constant communication with scientists, policymakers, caregivers and educators across their global health networks, Dr. Kerry and Dr. Ivers were able to facilitate collaborations and vital discussions around PPE shortages, testing, contact tracing, maternal health and delivery, and more. Seed partnerships with key training and clinical institutions and ministries of health in Malawi, Sierra Leone, Uganda and Zambia have also enabled the execution of broad, collaborative COVID-19 responses on the ground in those countries. Results have included the co-development of guidelines for maintaining essential health services, the implementation of COVID treatment training activities for clinical staff and support for clinical site preparation.

When Zambia’s Chilenje Hospital experienced its first COVID-19 patients, visiting Seed physicians remained there to deliver health services and provide clinical mentorship. And as of August 20, Seed has helped train more than 292 trainers and clinical staff in Uganda alone. “The way we approach this is by working with our local colleagues to understand their challenges, their priorities, and then thinking together about how we solve those, bringing evidence to bear to guide what those changes should be, and then enacting actual trainings on the ground to see those processes roll out rather than just dropping them on a desk,” Dr. Kerry said.

By consistently engaging in the adaptation of processes on the ground, CGH and Seed are able to help support innovation locally and disseminate those approaches across the health community. In Zambia, for example, Bassim Birklad, MD, MPH, and Seed Physician Educator Matthew Haldeman, MD, helped train other residents and clinicians on the use of lung point-of-care ultrasound to help diagnose COVID-19 cases when testing is unavailable.

Domestically, Dr. Kerry has brought her global lens to bear on the systemic disparities that also underlie the U.S. health care system—such as in preexisting conditions and health care coverage. As a Mass General critical care physician, she’s seen firsthand how social determinants put certain demographic and geographic groups at higher risk of coronavirus-related death.

In a recent Globe op-ed, she highlighted the relative resilience of nations that have invested in public health and health equity: “In Rwanda, which 25 years ago was seen as a post-genocide failed state, investments in training of its local health workforce, increases in access to primary care, and the development of a health-financing system has resulted in some of the most precipitous declines in HIV, tuberculosis, and maternal mortality of any country in the last 20 years.” The country of 12 million people had only seen 22 of the African continent’s 936,000 COVID-19 deaths as of September 15.

Dr. Kerry has two major hopes for the global health community as we enter new stages of the pandemic. The first is that people stop focusing on finding silver bullets to solve health care challenges.

“I hope that we realize we’re going to have to dig deep to build the kind of capacity needed to respond to COVID,” she said. “It’s important to think about how to close gaps quickly, but the enduring and resilient changes are going to take time.”

Second, she hopes that “those outside of global health—the ones who are the power brokers, the policymakers, billionaire finance holders—reinvest in the communities and the people around them in a meaningful way. Because without health, and without education, we cannot achieve sustainable progress. And frankly, we go the other way.”

— **Testing Capacity**

(Continued from front page)

Scientists in Haiti and Bangladesh are eager to increase testing in order to characterize the virus and pinpoint hot spots, which will help them mitigate the spread of COVID-19 in those areas.

“We are still deciding in Bangladesh on the use of antibody tests for diagnosis...However, the transfer of technology from MGH very quickly after the pandemic started gave us the capacity to study immune responses. This was the only antibody test available in Bangladesh, and we could quickly carry out studies on COVID-19,” said Dr. Firdausi Qadri, MD, Director of the Center for Vaccine Sciences (CVS), icddrb.

Dr. Harris is hopeful the test will be utilized in Haiti soon, where the CDC and Haitian National Lab also plan to use testing to comprehensively map the spread of COVID-19 across the country.

“The partnership with Mass General Center for Global Health will help us to advance our public health goals related to COVID-19,” Stanley Juhn, MD, CDC Haiti Surveillance Chief said.

In both locations, testing capacity challenges have been compounded by staff and equipment shortages, lab closures and regional factors that put their populations at potentially higher risk for viral transmission, including high population density in major cities like Dhaka and Port-au-Prince.

Dr. Harris (whose connection to treating and studying infectious diseases in Bangladesh dates back to 2001) cited Mass General’s strong global network as key to the successful testing collaborations.

Dr. Qadri echoed this sentiment: “We have been working together on different projects of cholera, ETEC and typhoid over the last 25 years based on funding from NIH and from Fogarty training grants. Based on this, we have a close relationship...and both our teams were well prepared with techniques and experience in studies on immune responses on infectious disease.”

While information, such as testing protocols, could be shared virtually, shipping testing materials and reagents to each country required added ingenuity due to international flight restrictions. For example, sending materials to Bangladesh ultimately required trucking the supplies from Boston to Chicago, then repacking them in dry ice to ensure the shipment would remain frozen until it could reach Dhaka and pass through customs five days later.

Damien Slater, PhD, manager of the Harris-LaRocque Lab in Infectious Diseases, was instrumental in the sourcing and preparation of testing supplies, tailoring testing protocols to suit the equipment available in each region, and arranging the delivery of testing materials. “Collective flexibility, persistence and good communication were key in seeing this through,” Slater said.

Going forward, Dr. Qadri reports the antibody measurements will be used in Bangladesh to study herd immunity as well as to study vaccine responses in upcoming trials.

Although COVID-19 has disproportionately impacted many low-resourced countries, broad international funding and support in those regions has been noticeably lacking. Dr. Harris said this fact underscores the significance of sustained global health collaborations: “It’s important to not neglect our international partners, even when we’re facing our own problems at home.”