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Front cover image: A mother and her two children near the UNC Project-Malawi site.  
Photo by Paul Joseph Brown, globalhealthphoto.com
Director’s Letter

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL is a global university. In the 2018 launch of the campaign for growth, UNC has committed to global experiences for all of its students, and to initiate a “global accelerator program” to allow the faculty to design and execute projects to better mankind. Indeed, the logo for the campaign is to emphasize that the work of UNC is “for all kind.”

The Institute of Global Health and Infectious Diseases (IGHID) is central to the work and goals of UNC. The Institute has now completed its first 10 years. We have worked hard to fulfill the IGHID core missions – research, teaching and service – across the health sciences campus. The IGHID has catalyzed collaboration with all health science schools and focused on the growth of targeted collaborative sites in Asia, Africa and Central America.

The growth of the IGHID reflects the success of the UNC faculty and the generous financial assistance we receive from the Office of the Executive Vice Chancellor and Provost. UNC Global continues to be a champion of our work as it strives to infuse a global dimension in the University’s teaching, research and service projects. Since its inception, the IGHID research support has grown to more than $70 million in 2018. The research undertaken has served as a focus for training at all levels of education and service.

This report summarizes a partial view of a truly vast amount of work in global health and infectious diseases at UNC. A highlight of the year was the exciting visit of Chancellor Carol Folt to the IGHID sites in Malawi and Zambia. Upon her return, and at the UNC campaign launch, Chancellor Folt offered a simple summary of the UNC aspiration – to be the leading “global, public research University” on the planet. The IGHID will work toward achieving this goal.

MYRON S. COHEN, MD
Yeargan-Bate Eminent Professor of Medicine, Microbiology and Immunology, and Epidemiology
Director, Institute for Global Health & Infectious Diseases

Growth in IGHID Funding

2017 Trainees
From HIV and malaria to emerging infections like Ebola and Zika, UNC’s Institute for Global Health & Infectious Diseases (IGHID) is changing the delivery of health care around the world. Celebrating 10 years since its creation, learn how the IGHID has become a leader in global health clinical care, research and education.

**2007**
- UNC begins participating in the Doris Duke International Clinical Research Fellowship to send medical students to developing countries for one year. This same year, the UNC Department of Surgery launches a surgical residency program at Kamuzu Central Hospital in Lilongwe, Malawi.

**January 2008**
- UNC Project-Malawi in Lilongwe and UNC Project-China in Guangzhou emerge as the IGHID’s first two sites with a focus on HIV prevention and treatment.

**April 2008**
- UNC and the University of Nicaragua (UNAN) sign a memorandum of understanding to begin joint research on gastrointestinal diseases and preventable childhood illnesses.

**March 2009**
- UNC begins participating in the NIH Fogarty AIDS International Training and Research Program as well as pharmaceutical company Gilead support Malawians interested in a clinical career. As of 2017, 18 Malawians have completed advanced medical training.

**October 2007**
- UNC Chancellors James Moser, in collaboration with the Health Sciences Schools, establishes the IGHID.

**January 2011**
- Grants from the NIH Fogarty AIDS International Training and Research Program as well as pharmaceutical company Gilead support Malawians interested in a clinical career. As of 2017, 18 Malawians have completed advanced medical training.

**May 2011**
- IGHID Director Dr. Myron Cohen leads a study proving treating people living with HIV leads to a 96 percent reduction in transmission. The journal Science names the results its 2011 Breakthrough of the Year.

**July 2013**
- Dr. Satish Gopal becomes cancer director of UNC Project-Malawi and the country’s only medical oncologist. This same year, UNC’s Department of OB/GYN begins a residency program with the Malawi College of Medicine in Lilongwe.

**September 2013**
- Dr. Vivian Go accepts a position at UNC, bringing with her a 12-year relationship with researchers in Vietnam. Dr. Go’s studies focus on HIV interventions.

**April 2012**
- UNC begins participating in the NIH Fogarty Global Health Fellows Program, which supports mentored research training for pre- and postdoctoral fellows. As of 2017, 133 fellows have completed the program.

**June 2012**
- A team of OB/GYNs working in Zambia led by Jeffery Stringer join UNC and the IGHID, launching UNC’s global women’s health program in Africa.

**July 2014**
- IGHID becomes the second largest research organization at UNC with more than $43 million in revenue.

**May 2014**
- UNC clinician-researchers respond to the Ebola outbreak in West Africa. Once under control, they begin investigating the effects of the virus on survivors, including how long Ebola can live in genital secretions.

**September 2013**
- UNC marks a milestone by opening three HIV prevention studies for enrollment.

**January 2016**
- In partnership with the University of Witswatersrand in South Africa, UNC enrolls the first cohort of master’s in implementation science trainees. It is the only program of its kind in Africa.

**March 2016**
- UNC Project-Malawi Scientific Director Dr. Mina Hosseinipour co-leads the HTPN 084 study, the first trial to test a long-acting injection to prevent HIV in women.

**November 2017**
- UNC Project-Malawi to study and treat HIV-associated cancers.

**August 2017**
- UNC researchers discover Ebola can persist in the semen of survivors more than two years after infection.

**September 2014**
- The NIH funds the Malawi Cancer Consortium at UNC Project-Malawi to study and treat HIV-associated cancers.

**August 2016**
- The Collaboratory of AIDS Researchers for Eradication or CARE, led by UNC’s Dr. David Margolis, receives $23 million from the NIH to identify a cure for HIV.

**June 2017**
- UNC marks a milestone by opening three HIV prevention studies for enrollment.

**September 2016**
- Dr. Lisa Hightow-Weidman receives $18 million from the NIH to establish the Tech Center. The center focuses on developing mobile apps to reach youth at risk for or living with HIV.

**2017**
- UNC IGHID faculty begin studying Zika virus, including developing diagnostic tests and a vaccine.

**May 2015**
- UNC and pharmaceutical company GSK announce a novel public-private partnership to work on a cure for HIV on Carolina’s campus, launching a new company, QURA Therapeutics.

**March 2016**
- UNC IGHID faculty begin studying Zika virus, including developing diagnostic tests and a vaccine.

**October 2013**
- UNC Project-China Director Dr. Joseph Tucker receives $3 million from the NIH to examine the use of crowdsourcing to promote HIV testing and linkage to care in South China.

**September 2014**
- The NIH funds the Malawi Cancer Consortium at UNC Project-Malawi to study and treat HIV-associated cancers.

**May 2015**
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IGHID in
Southern Africa

HIGHLIGHTS

UNC Project-Zambia supports 20 research grants and employs 104 Zambians.

The implementation science master’s degree program in South Africa is the only training of its kind on the continent.

UNC Project-Malawi is a site for all five U.S. National Institutes of Health (NIH) HIV research networks.
UNC faculty have been working in Africa for more than 20 years. The Institute for Global Health & Infectious Diseases has sites in Malawi, Zambia and South Africa, and has partnered with local universities and ministries of health to strengthen efforts to improve health outcomes.

**HIV**

UNC has a large number of clinical trials devoted to prevention, treatment and cure of HIV infections. Since sub-Saharan Africa is home to nearly two-thirds of the world’s 37 million people living with HIV, treatment and research efforts have focused on preventing and managing HIV infection. Women and girls account for more than half of HIV cases worldwide. Novel prevention methods are needed. That is why UNC Project-Malawi in Lilongwe is participating in the HIV Prevention Trials Network (HPTN) 084 study testing a long-acting injection to prevent HIV in women. UNC Project-Malawi Scientific Director Mina Hosseinipour, MD, MPH, is the study’s co-chair.

Audrey Pettifor, PhD, led the HPTN 068 trial in South Africa investigating whether providing cash transfers to young women and their household, conditional on school attendance, reduced the young women’s risk of acquiring HIV. In line with the original hypothesis of the trial, young women who stayed in school and attended school more of the time across both arms of the study had a two-thirds reduced risk of acquiring HIV. In mid-2017 the study completed post-intervention visits with the participants to understand their behavior and HIV risk after the intervention had completed. Analysis of that data is underway.

**CANCER**

In Zambia, Groesbeck Parham, MD, is the country’s only gynecologic oncologist. His day-to-day focus is to provide life-saving surgeries, often made possible by private donations, for underserved women with cancer. At the same time, he has launched a gynecologic surgical training program to build these skills in the next generation of Zambian surgeons. All research takes place in public health facilities, and UNC faculty and fellows rotate at the country’s University Teaching Hospital. Research studies focus on breast and cervical cancer.

Cancer, especially HIV-associated malignancies, impacts the health of people living in southern Africa. In 2014, UNC Project-Malawi received a $3.7 million grant from the National Cancer Institute to create the Malawi Cancer Consortium to study and treat HIV-associated cancers. Cancer Director Satish Gopal, MD, MPH, is Malawi’s only medical oncologist. UNC Project-Malawi is also home to the country’s first female pathologist Tamiwe Tomoka, MBBS. In 2017, construction of a new annex building in Lilongwe was completed. This building is home to the site’s pathology laboratory, providing 70 percent of the country’s population with cancer and pathology services.

**TECHNOLOGY IN ACTION**

Pathology services were not available in Lilongwe, the capital of Malawi, until 2011 when joint efforts between UNC and the Malawi Ministry of Health led to the establishment of a pathology laboratory. At the same time, establishment of a telepathology service using Aperio online virtual microscopy was considered. The Aperio virtual microscopy system is a technology that allows a complete scanned image of a pathology slide to be uploaded to a server and then reviewed in its entirety in real time simultaneously by pathologists and clinicians in both Malawi and at UNC-Chapel Hill. In 2013, UNC-Chapel Hill and UNC Project-Malawi pathologists began weekly teleconferences, taking full advantage of the Aperio virtual microscopy system. Telepathology has become a platform for training and capacity building for pathologists and clinicians both in Malawi and the United States. Researchers and trainees have been stimulated to develop projects. Dr. Tomoka is the main collaborator in Malawi, while Yuri Fedoriw, MD, is the main collaborator in Chapel Hill.

Prior to the establishment of pathology services on site, samples had to be sent to a lab in Blantyre causing patients to wait months for a diagnosis. Timely testing and treatment at UNC Project-Malawi in Lilongwe prompted the current construction of a cancer hospital at the adjacent Kamuzu Central Hospital.

UNC Project-Malawi expanded to include a new Annex building in 2017. The pathology lab on the ground floor was named in honor of Francis Martinson, MB ChB, PhD, MPH. He served as country director for UNC Project-Malawi from 1999 until his retirement in 2017. Innocent Mofolo, MSc, and Debbie Kamwendo, MS, have been selected to lead all UNC activities in Malawi as country and associate country directors respectively.

**PEDIATRICS**

UNC Project-Malawi sponsors physicians who have supported pediatric inpatient clinical care and research at Kamuzu Central Hospital (KCH) in Lilongwe since...
2009. KCH has approximately 300 pediatric beds. The pediatric ward admits more than 27,000 patients per year.

KCH is overseen by the Ministry of Health and is affiliated with the Malawi College of Medicine with on-site facilities for third-year Malawian medical students and Clinical Officer Pediatric bachelor students. UNC pediatric residents have done short-term rotations through the clinical areas of the hospital since 2002.

The in-country Pediatric Director of UNC Project-Malawi is Tisu Mvalo, MMED, and the U.S. Director is Elizabeth Fitzgerald, MD. In 2016, UNC Pediatrics became part of the PACHMAKE consortium (Pediatric Alliance for Child Health Improvement in Malawi at KCH and Environ), a novel consortium of US-based and Malawian institutions dedicated to working together to improve the outcomes of acutely ill children admitted to KCH through focused educational, clinical and research initiatives. Examples of pediatric research projects at UNC Project-Malawi include creating an acute care database, improving treatment of childhood cancers and investigating the epidemiology of acute kidney injury.

**TRAINING**

UNC faculty along with colleagues at the University of Witwatersrand in South Africa made history in 2016 when they enrolled their first cohort of 17 trainees earning a master’s degree in implementation science. Implementation science is a rather new field that addresses an old question: how do you translate research into practice? This is the only program of its kind on the continent.

Malawi has maintained a four-year medical school since 1980. However, until recently, there were no opportunities for residency training in the country. Students were required to train initially in the United Kingdom then in South Africa. This system resulted in a significant “brain drain” where less than 30 percent of students returned to Malawi following their training.

Irving Hoffman, PA, MPH, is UNC Project-Malawi’s international director. For the past 25 years, he has worked tirelessly to ensure Malawians who seek specialty training in clinical medicine receive the training they need to work in Malawi’s academic or public settings. Among the 13 Malawians who have completed training, 12 are currently practicing in Malawi. A new library on the Project’s campus honors Hoffman’s passion for making an education available to all. A plaque outside the library recognizes his “untiring effort to provide medical education to the people of Malawi.”

UNC has been at the forefront of providing in-country residency training for young and promising Malawian doctors in the areas of surgery and OB-GYN. The UNC Department of Surgery, led by Anthony Charles, MD, MPH, began its program at Kamuzu Central Hospital in Lilongwe in 2009. To date, 15 surgeons have been enrolled and seven have completed training and are operating in Malawi.

The OB-GYN program was initiated with the Malawi College of Medicine in 2013 with a campus in Lilongwe. UNC faculty

Jennifer Tang, MD, MSCR, and Lameck Chinula, MBBS, have led this program. To date, 20 OB-GYN residents have begun training. Two have completed training and are practicing in Malawi.

UNC urology residents began three-week rotations at UNC Project-Malawi in 2017. UNC Professor of Urology and Residency Program Director Eric M. Wallen, MD, said the experience provides UNC urology residents with global training and assists Malawian surgeons with clinical care. Fis-tula repair, prostate enlargement, urinary diversion and schistosomiasis, or chronic inflammation of the bladder caused by a parasite, are conditions residents treat while in Malawi. UNC urology residents will return to Malawi in 2018 and Wallen hopes to expand the program to allow UNC urology faculty to guest lecture to trainees in Kamuzu Central Hospital’s urology residency program.

The latest specialty at UNC to offer training at the Malawi site is neurosurgery. Eldad Hadar, MD, and Carolyn Quinsey, MD, lead these efforts. First- through fourth-year neurosurgery residents will be able to participate in short-term trainings in Malawi,
while fifth-year residents can apply for a long-term opportunity. This experience will expose the UNC residents to the medical landscape of a resource-limited country and provide Malawian surgeons with assistance treating two important clinical conditions – head injuries and hydrocephalus. Hadar and Quinsey hope to use iPads to offer virtual mentoring to Malawian surgeons when residents are not in-country.

The University of Zambia has embraced online education. eLearning has developed an intensive curriculum in applied public health informatics, with two online courses through the University of Zambia focused on statistical programming, data management and basic biostatistics. UNC, the University of Zambia and the University of Witwatersrand recently launched a D43 training program that will support Zambian doctoral and post-doctoral fellows focusing on HIV research in pregnancy, contraception and cervical cancer. Its first trainees are being recruited now.

THE MOREHEAD-CAIN PROGRAM

Since 2010, the IGHID has been offering summer research or service opportunities in Malawi to Morehead-Cain Scholars. Morehead-Cain Scholars receive a four-year merit scholarship to UNC. Through a selection process to insure the scholars chosen have a long term interest in global health and biomedical research, one to two scholars are chosen each year to travel to UNC Project-Malawi. This program has been very successful. The scholars are highly motivated and are supervised by one of the many UNC faculty living full-time in Malawi. The areas of study for the scholars have been broad, from HIV to malaria, from surgery to cancer, and from pediatrics to community development. The scholars have successfully participated in clinical research as data assistants and analysts; in clinical care as clinical assistants; and in the community helping with special projects such as to establish better water, sanitation and hygiene (WASH) standards. The most successful model has been developing a three- to four-year plan with a scholar and a Malawi-based mentor, adding skills over several summers and academic year terms resulting in a senior thesis and first authorship of a manuscript.

SERVICE

UNC Project-Malawi is home to the country’s only two board-certified infectious diseases specialists. The Sexually Transmitted Infections Clinic provides testing and care for more than 7,000 patients each year. Surgeons staff the burn unit, one of only two such units nationwide. The first Malawian OB/GYN came on board in 2014 and is now the only surgeon to perform radical hysterectomies as treatment for cervical cancer in the central region of Malawi.

UNC Project-Malawi has the only board-certified oncologist in the nation. The cancer research and care unit are the first in the region to transfer immunohistochemistry to the UNC Project-Malawi pathology lab. This has resulted in correct diagnoses, treatment and survival for scores of children with lymphoma, who had previously been misdiagnosed. In early 2015, UNC-Project Malawi’s general lab earned four-star status from the Honorable Minister of Health.

Chancellor Folt Visits IGHID Sites in Africa

UNC’S HEELPRINT EXTENDS far beyond the borders of North Carolina. To better understand just how Carolina’s faculty and researchers are impacting lives around the world, Chancellor Carol L. Folt traveled to the IGHID’s sites in Zambia and Malawi in the summer of 2017.

“The experience really underscored what it means for Carolina to be a global university,” she said. “Without question, the discoveries our faculty and staff have made and continue to make in Africa are impacting the world.”

In Zambia, Folt visited with Carolina faculty members who are partnering with the Ministry of Health, Kabwe General Hospital and the University Teaching Hospital of Zambia to provide training in diagnostic and surgical techniques for treating breast and cervical cancer. Part of the UNC Global Women’s Health division, the program serves as a proving ground for new technologies that improve efficacy and patient outcomes with the mission of eradicating cervical cancer in Zambia. In just seven years, the program has screened more than 50,000 Zambian women for cervical cancer.

Folt also worked with University of Zambia leaders to formalize Carolina’s partnership with the African university. Through the partnership, the two
UNC's work in Malawi began more than 20 years ago with a small team working out of a single rented office on the second floor of the Dulux Paint Building in Old Town Lilongwe. From those beginnings, the dedicated scientists and staff at UNC Project-Malawi have led research studies that changed the course of global health, trained a generation of Malawian physicians and scientists, provided transformative learning experiences for UNC students, and helped to improve the health care infrastructure of the southeast African nation.

In her first visit to the country, Chancellor Folt participated in a dedication ceremony for a new UNC Project Annex building, which houses state-of-the-art laboratories, and a new UNC Project Library, which will connect faculty and learners in Lilongwe with the Health Sciences Library in Chapel Hill. Folt also toured the UNC Project facilities, met faculty and staff, and heard from students spending their summer doing research work on site.

“UNC Project-Malawi is the embodiment of our research, teaching and service mission and a shining light of Carolina’s work around the world,” Folt said. “We are very proud to count you as fellow Tar Heels.”
home to the UNC Malawi Cancer Consortium. The U.S. National Cancer Institute awarded the consortium $3.7 million in 2014 to investigate HIV-associated cancers.

And Gopal is working with an incredibly dedicated team including Tamiwe Tomoka, MBBS, the first female pathologist in Malawi, and Lameck Chinula, MBBS, the only surgeon in Lilongwe able to perform a radical hysterectomy to treat cervical cancer, which is diagnosed in high rates in Malawi. The team in Malawi maintains a close connection with colleagues in Chapel Hill, connecting weekly via video conference to review pathology slides and discuss difficult diagnoses. This is all thanks to the Aperio virtual microscopy system, a technology that allows a complete scanned image of a pathology slide to be uploaded to a server and then reviewed in its entirety in real time simultaneously by pathologists and clinicians in both Malawi and at UNC-Chapel Hill.

“The only way to make these programs work is to be on the ground, actively partnering, identifying research priorities, identifying the most promising young clinicians and investigators and helping them propel their careers forward,” Gopal said. “Because of that approach we are scientifically productive, but also valued as a key partner in moving cancer care forward in Malawi. This is how global health should be done.”

Prior to UNC Project-Malawi investing in pathology services in Lilongwe, patients’ samples were sent to Blantyre. Diagnoses took months. Now the lab provides timely information to patients.

“What I enjoy most about my job is the fact that we diagnose patients’ diseases, especially cancer, which informs appropriate treatment,” Tomoka said. “Without tissue diagnosis, a cancer cannot be treated. Without tissue diagnosis, a patient can be erroneously treated for cancer for a swelling that clinically mimics cancer, and hence, subjected to unnecessary harmful effects of chemotherapy.”

Improved clinical care informs new research questions. Unlike in the US, women in Malawi are unaware of the importance of self-breast exams. Gopal and his team conducted a pilot study that trained lay women to conduct breast examinations. In all, study staff screened 1,000 women. By the researchers’ count, the project was a success: lay women without formal medical training could be taught to provide high-quality breast exams, and Malawian women were eager to receive screening when it was offered.

Researchers are also identifying ways to improve the survival rate of childhood cancers in Malawi. Kate Westmoreland, MD, a fellow in pediatric hematology/oncology at UNC, is tackling pediatric Burkitt lymphoma. The five-year survival rate for pediatric Burkitt lymphoma in the United States is 90 percent, but only 29 percent in Malawi. Westmoreland led a study proving testing for Epstein-Barr virus, a virus linked to Burkitt lymphoma, can be useful in resource-limited settings to help diagnose pediatric disease, predict prognosis and measure the tumor’s response to treatment. She is continuing her research to overcome obstacles to recovery including side effects of chemotherapy and combating malnutrition.

At the end of 2017, Westmoreland received a two-year $50,000 grant from the Burkitt Lymphoma Fund for Africa to develop educational materials and a tablet application to improve communication between patients and providers with the goal of helping children remain in care throughout their treatment.

“The main recurring barriers to retention include lack of patient education, leading to misconceptions about Burkitt lymphoma diagnosis or treatment, logistical barriers such as transportation costs because our patients often travel more than five hours on a mini-bus to the hospital for treatment, and lack of continued communication and support of patients when home,” said Westmoreland. “We hope that this improved emphasis on patient education and additional layers of support through the use of mobile phones will improve retention in care, and ultimately, outcomes of our patients.”
IGHID in Asia

HIGHLIGHTS

- The UNC-South China STD Research Training Center received a U.S. NIH grant in addition to support from Chinese partners.
- UNC Project-Vietnam developed a new site for conducting research at the Yen Hoa Health Clinic in Hanoi.
Infectious diseases faculty at UNC have been working in China since the country opened to the West through the work of Gail Henderson, PhD, and Myron Cohen, MD. Currently, Joseph Tucker, MD, PhD, leads the UNC Project-China site in Guangzhou.

China is a nation amidst tremendous transition, leading to substantial social and behavioral changes. These changes create the conditions for increasing infectious diseases transmission. Syphilis, a curable sexually transmitted infection, remains one of the most commonly reported communicable diseases in many Chinese cities. Long-standing partnerships and relationships in China establish a strong foundation for collaborative programs. Most recently, Weiming Tang, PhD, MD, MS, has joined the UNC faculty to expand research activities.

UNC has developed strong collaborations with Southern Medical University, the provincial government of Guangzhou and the Guangzhou Eighth People’s Hospital. The latter hospital provides HIV care to the greatest number of people in the province.

In 2013, Vivian Go, PhD, joined UNC, bringing with her a 12-year relationship conducting research in Vietnam. She leads UNC Project-Vietnam, which includes an 11-person staff with sites in Hanoi and the Thai Nguyen province. This team oversees NIH grants focused on the development and evaluation of HIV-related interventions among key at-risk populations, specifically injection drug users and men who have sex with men (MSM). The UNC Vietnam site has joined the NIH HIV Prevention Trials Network (HPTN).

**CLINICAL CARE**

UNC Project-China started a new model for encouraging STD testing based on the “pay-it-forward” principle. The rationale is that many gay men do not receive regular STD testing services. This pilot project at the Southern Medical University is nested within the gay men’s health clinic. In this case, the clinic provides a free STD test and then asks if the participant would be willing to donate an STD test to the next man. The pilot program was successful and is now being institutionalized within the clinic. The Guangdong Provincial STD Clinic supports this project.

Over the past two years, UNC Project-Vietnam has enhanced clinical, laboratory and pharmacy capacity to meet international quality assurance standards for conducting investigational drug trials in Vietnam. The site has established memorandums of understanding with the 198 Hospital, Hanoi Medical University (HMU), and Bach Mai Hospital.

**RESEARCH**

**HIV**

In Vietnam, research focuses on HIV. The prevalence among the general population aged 15-49 is 0.4 percent. Yet among people who inject drugs, men who have sex with men and sex workers, the prevalence of HIV is 11, 8 and 3 percent respectively.

UNC Project-Vietnam is a site for two HIV Prevention Trial Network (HPTN) studies. HPTN 074 aims to determine the feasibility of a future trial that will assess whether an integrated intervention combining psychosocial counseling and supported referrals for antiretroviral therapy (ART) at any CD4 cell count and substance use treatment for HIV-infected people who inject drugs (PWID) will reduce HIV transmission to HIV-uninfected injection partners, as compared to routine care dictated by national guidelines for HIV-infected PWID. HPTN 083 will test the efficacy of a long-acting injection to prevent HIV in transgender women who have sex with men and men who have sex with men. Enrollment for this study began in December of 2017 in the Yen Hoa Health Clinic site in Hanoi.

UNC Project-Vietnam is also a site for the U.S. National Institute on Drug Abuse’s REDART study. This is a randomized controlled trial comparing the effectiveness of two evidence-based interventions in reducing alcohol use among people living with HIV on antiretroviral therapy who are hazardous drinkers. Baseline data collection has been completed and follow-up data collection will end in May 2018.

**SYPHILIS**

The Immunology and Biology of Infectious Syphilis (IBIS) research study has successfully launched its bio-repository. The team has collected detailed biological, behavioral and related data from individuals presenting with...
syphilis infection in South China. This project has been supported by training resources from an NIH D43 grant and Chinese provincial grants. The Guangzhou team now has access to a cell sorter that will allow more detailed investigations of the B-cell response to syphilis infection. The team is led by Heping Zheng, PhD, in Guangzhou at Southern Medical University and Arlene Seña, MD, MPH, in Chapel Hill.

**Antibiotic Resistance**

The Consortium on resistance against carbapenems in *Klebsiella* and other Enterobacteriaceae (CRACKLE) is an international, observational study of hospitalized patients with carbapenem-resistant Enterobacteriaceae (CRE). CRE are Gram-negative bacteria that are resistant to the carbapenem class of antibiotics, considered the drugs of last resort for such infections. Under the leadership of David van Duin, MD, PhD, the first CRACKLE sites in China started enrollment. Working with Minngui Wang, MD, PhD, of Fudan University in Shanghai, who is the country lead for CRACKLE-China, the CRACKLE team will study similarities and differences in the epidemiology, treatment and outcomes of CRE infections in China, the US and across the world.

**Training**

UNC has had annual meetings in China for many years. In partnership with the World Health Organization and the Southern Medical University, the UNC Project-China team organized its annual meeting in 2017. The meeting focused on implementation science related to HIV, syphilis and hepatitis in Asia. This included capacity building workshops for junior investigators as well as high-level meetings for senior leadership. Over 300 individuals from China, Japan, Korea, Mongolia, Cambodia, Vietnam, Malaysia, Australia, and the Philippines attended the week-long series of meetings.

The UNC-South China STD Research Training Center received an NIH D43 supplemental international research training grant to continue short-term and long-term educational efforts. The purpose of the training center is to nurture the next generation of STD/HIV researchers, drawing on the growing pool of Chinese junior investigators who are ready to undertake mentored HIV/STD research. Recent long-term trainees have been successful in terms of identifying faculty positions, obtaining independent research funding and writing grants. The project is unique because of substantial co-funding from colleagues at the Southern Medical University Dermatology Hospital.

UNC Project-Vietnam has hosted Doris Duke International Clinical Research Fellows and student interns from the UNC School of Medicine and the UNC Gillings School of Global Public Health. Fellows and interns have the opportunity to shadow and practice at local hospitals as well as conduct research projects in Vietnam. Examples of recent projects include a study of depression, alcohol and violence among 20 women living with HIV in the Thai Nguyen province; a chart review to examine tuberculosis and HIV co-infection; and a confidential risk survey of men who have sex with men in Hanoi.

The Guangzhou Eighth People’s Hospital has hosted UNC Project-Vietnam Fellows and student interns from the UNC School of Medicine and the UNC Gillings School of Global Public Health. Fellows and interns have the opportunity to shadow and practice at local hospitals as well as conduct research projects in Vietnam. Examples of recent projects include a study of depression, alcohol and violence among 20 women living with HIV in the Thai Nguyen province; a chart review to examine tuberculosis and HIV co-infection; and a confidential risk survey of men who have sex with men in Hanoi.

UNC Project-Vietnam is a site for two NIH-funded HIV Prevention Trials Network Studies.

"UNC Project-Vietnam is a site for two NIH-funded HIV Prevention Trials Network Studies."

HIV AND GUANGZHOU EIGHTH PEOPLE’S HOSPITAL

UNC Project-China continues a close collaboration with the Guangzhou Eighth People’s Hospital in Guangzhou, China. It is southern China’s largest hospital specializing in infectious diseases with a domestic center dedicated to comprehensive HIV care and extensive HIV and hepatitis research since 1999. The hospital provides inpatient care for more than 1,000 people each day and over 7,500 people living with HIV each year. In addition to individualized patient care, the hospital monitors and provides expert technical support for the entire province. The hospital also organizes training for HIV health care professionals from across China, who are on the front line of caring for people living with HIV.

The Guangzhou Eighth People’s Hospital signed a memorandum of understanding with UNC in 2017, paving the way for sustained research, education and training. For example, UNC infectious diseases physician Andrea Shahum, MD, PhD, spent two years at the Guangzhou Eighth People’s Hospital, facilitating collaborative training and research. Current UNC-Guangzhou Eighth People’s Hospital research projects include the social science and ethics of HIV cure research and a project using crowdsourcing to improve hepatitis testing among men who have sex with men.
Leveraging the Wisdom of the Crowd to Improve Health in China

When UNC Project-China Director Joseph Tucker, MD, PhD, realized the community was not connecting with typical expert-driven messages promoting sexual health, he had an idea. What if he and his colleagues on the Social Entrepreneurship to Spur Health (SESH) team sought input directly from the audience they were trying to reach?

“Instead of using a top-down, expert approach, we wanted to turn this upside down and draw on crowd wisdom to better inform HIV testing campaigns,” Tucker said.

Thus, the site in Guangzhou began focusing its research on crowdsourcing. They ran campaigns soliciting images that promoted condom use and safe sexual health practices. The community responded with hundreds of submissions.

This success led Tucker to apply for and receive a $3 million, five-year grant from the NIH to examine the use of crowdsourcing to promote HIV testing and linkage to care in South China.

The SESH team has now conducted three randomized controlled trials evaluating the effect of using crowdsourcing to promote sexual health. The first trial found that crowdsourcing was as effective as a conventional approach to developing HIV testing promotional videos, and saved money. The second trial also supported the effectiveness of using crowdsourcing. The final, largest trial is an eight-city study that examines routine implementation of a crowdsourcing approach. Analysis is underway now and final results will be presented in 2018.

Extending this crowdsourcing research, the team is now implementing a pilot project that will use crowdsourcing to create a community platform that links gay men and gay-friendly physicians. Many gay men in China face challenges in identifying local physicians that are comfortable and well-trained to provide evidence-based services. This project is in partnership with BlueD, the world’s largest mobile application for gay men to find friends. The project is supported by the Shenzhen Nanshan Centers for Disease Control and Prevention.

“The general premise of these projects is to use the wisdom, ideas and innovative concepts from a broader group of individuals to come up with new programs,” Tucker said.
IGHID in Central and South America

**HIGHLIGHTS**

- **Rapid initiation of research in response to the *Zika epidemic*** in Nicaragua captured important data during the peak of transmission.

- **IGHID received a $2.5 million five-year NIH grant** to study social determinants of HIV outcomes among female sex workers in the Dominican Republic and Tanzania.

- **UNC School of Nursing** is helping implement a **staff development plan** for the new hospital on San Cristóbal Island in the Galápagos.
UNC Project-Nicaragua

RESEARCH

UNC’s relationship with the University of Nicaragua, León (UNAN) arose through a series of service and teaching initiatives, with funded research projects beginning in 2003. Unlike many other potential research sites in Central America, UNAN has a core of PhD-trained faculty. This has led to a standard of world-class research among UNAN faculty. UNAN is the site of the largest public medical school and university hospital in Nicaragua. This has facilitated hospital-based research studies. The UNC-UNAN collaboration has an excellent relationship with the local Ministry of Health. This has been fostered by UNC-led evaluations of pediatric immunization programs in Nicaragua using data collected through the system of public health clinics and hospitals.

Eight active research projects are underway at UNC Project-Nicaragua. The portfolio of research initiatives during the past five years has focused on understanding the clinical spectrum of Zika infection and epidemiology, gastrointestinal disease epidemiology and pediatric immunizations, including studies of childhood diarrhea and rotavirus vaccine effectiveness, and evaluation of Nicaragua’s national pneumonia immunization program. Findings from UNC-UNAN studies have been presented widely and have led to changes in clinical care guidelines.

TRAINING

Students and trainees have also been involved in UNC activities in Nicaragua. UNC medical students and residents have performed clinical electives at the University Hospital (HEODRA) and outlying public clinics, have enrolled in medical Spanish programs in León, and have contributed to existing research projects with one-on-one mentorship. In 2018, a D43 Capacity Building Grant entitled “The Nicaraguan Emerging and Endemic Diseases (NEED) Training Program” was funded by the NIH to provide PhD training in epidemiology at UNC and to develop a new PhD program in microbiology at UNAN-León.

SERVICE

UNC cardiologists Michael Yeung, MD, and Carlos Espinoza, MD, lead trips twice a year to Nicaragua. They perform valvular heart repairs that have never before been done in Nicaragua, and save lives. They work in partnership with Project Health for Léon.

Operation Smile is a UNC student group, started by dental student Ryan Cody. In March 2018, the group traveled to Nicaragua and worked with international partners to provide needed multi-disciplinary dental care to 228 patients.

Dominican Republic

UNC has been collaborating with the HIV Vaccine and Research Unit at the Instituto Dermatologico y Cirugia de Piel Dr. Huberto Bogaert Diaz (IDCP) in Santo Domingo since 2001. In 2011, UNC and colleagues at Johns Hopkins Bloomberg School of Public Health (JHBSPH) developed Abriendo Puertas, interventions to improve HIV care and treatment for female sex workers living with HIV and their regular partners. Interventions included health education and counseling, peer health navigation, provider sensitization and community mobilization. With support from the USAID LINKAGES program, UNC, JHBSPH and IDCP developed new intervention content focused on substance use and violence, and trained clinic staff and navigators from nine governmental and non-governmental HIV clinics across three provinces in the Dominican Republic in the Abriendo Puertas model.

In addition to the scale-up of Abriendo Puertas, the research team has also received $2.5 million from the NIH to improve understanding of social determinants of HIV outcomes among female sex workers in the Dominican Republic and Tanzania. This five-year R01 from the National Institute of Mental Health is continuing to follow women from the original Abriendo Puertas cohort to establish the role of socio-structural and behavioral factors along the pathway to viral suppression.

Guatemala

In 2008, UNC began collaborating with the HIV Program of the Center for Health Studies at the Universidad del Valle Guatemala (UVG) in Guatemala City on HIV research. Through a series of formative, qualitative studies, the team established a nuanced knowledge base on the social networks of sexual and gender minorities to inform interventions to improve outcomes along the HIV prevention, care and treatment continuum. A chapter on the structural determinants of HIV among transgender women in Guatemala was recently published in the 2017 book, Structural Dynamics of HIV: Risk, Resilience and Response.
Building on this work, the UNC/UVG team designed two innovative implementation science projects funded by CDC/PEPFAR. The first was a pilot intervention of health navigators to improve early diagnosis and linkage to care among MSM and transgender women in Guatemala City. The team found that navigation was highly acceptable and facilitated linkage to care within days of diagnosis. The second project entails decentralizing HIV care and treatment for MSM from a large hospital in Guatemala City to three key population-friendly clinics. Initial findings reflect a high level of acceptability of decentralization as well as the other intervention components.

UNC has also been working with a local gay health and rights organization, Colec-tivo Amigos Contra el SIDA (CAS), which established the first community-based clinic for pre-exposure prophylaxis (PrEP) in the Latin American region. UNC faculty and students have worked with CAS to conduct a case study of the process of creating the clinic and to develop strategies for scaling up the services.

Cuba

With support from the IGHID, the UNC Institute for the Study of the Americas, and the Gillings School of Global Public Health, UNC along with faculty and students at the Pedro Kouri Tropical Medicine Institute (known locally as IPK) in Havana, Cuba, have engaged in several visits to work on collaborative research and training in the areas of HIV and arboviruses. One early product of this collaboration is a commentary written by UNC and IPK researchers on the role of community participation in Zika prevention and control in the American Journal of Tropical Medicine and Health. Faculty and students from UNC participated in IPK’s 80th anniversary research symposium in Havana in December 2017. Future research plans include examining the lived experience of HIV as a chronic condition among MSM living with HIV in Cuba.

UNC Center for Galápagos Studies

The UNC Center for Galápagos Studies (CGS) is a collaboration between UNC and Ecuadorian university partner Universidad San Francisco Quito (USFQ). In May 2011, UNC and USFQ dedicated a research station on San Cristóbal Island, Galápagos. The hospital on San Cristóbal is supported by the Ministry of Health in Ecuador and opened in the summer of 2015. The hospital is state-of-the-art with the capacity to provide health services for all residents of the inhabited islands and care for the nearly 200,000 tourists who visit each year. In partnership with the Gillings School of Global Public Health, the UNC School of Nursing made an initial visit in spring 2016 and has had two faculty and student visits in the summer of 2016 and 2017 to implement a hospital staff development plan and assess other opportunities. Plans are to have expert clinicians enrolled in the school’s graduate programs make one to two visits annually with oversight from the Associate Dean for Global Initiatives.

“THE GALÁPAGOS PROVIDES STUDENTS AN UNPARALLELED OPPORTUNITY TO STUDY LINKAGES BETWEEN HEALTH AND THE ENVIRONMENT THROUGH A STUDY ABROAD PROGRAM.
RESEARCH

A group of USFQ scientists along with faculty from UNC’s Departments of Anthropology and Nutrition was awarded a two-year R21 from the Fogarty International Center. Their project, “Water, Food and the Triple Burden on Disease in Galápagos, Ecuador,” will establish a research collaboration and training opportunity between the universities to examine the pathways linking water and food access, quality, and security to the triple burden of psychological distress, infectious disease, and overweight and cardiometabolic disease in households on the island.

TRAINING

Scientists at the CGS are providing outreach and opportunities for project engagement to students and other residents in the Galápagos Islands. For example, students from the local “Ecology Club” are recruited to participate in a water quality monitoring project. Students are trained on methods to collect and analyze water, and they take monthly measurements and understand trends even when USFQ/UNC supervisors are not on the islands. For outreach, the CGS hosts a seminar series open to the public to inform interested stakeholders about the research being conducted. The center also hosts a two-day research symposium co-sponsored by the Galápagos National Park and attended by park guides, school groups, fishermen and other members of the island community.

The CGS is also providing students an unparalleled opportunity to study linkages between health and the environment through a study abroad program offered each summer in the Galápagos. The UNC Department of Environmental Sciences and Engineering offered courses in the summer of 2017 addressing air quality, climate change and health, and also provided interested students with opportunities to pursue independent research. The program will be offered again in the summer of 2018.

South America

In collaboration with Johns Hopkins, George Mason University, Universidad Cayetano Heredia, and Universidad Católica Boliviana, UNC faculty are studying clinical and epidemiological aspects of parasitic opportunistic infections affecting the central nervous system (CNS) in HIV-infected persons with a focus on toxoplasmosis and Chagas disease. These diseases can present with nearly identical clinical syndromes, but misdiagnosis can be fatal, as untreated CNS Chagas disease is deadly in up to 80 percent of patients. Additional work includes using DNA sequencing techniques to characterize which genotypes of *Trypanosoma cruzi* (the parasite that causes Chagas disease) are causing disease to determine if there are multiple strains of the parasite causing infection, and to look for compartmentalization of parasite in the CNS.

UNC is also collaborating with investigators at Universidad Nacional de la Amazonía Peruana to study the effect of prior and acute Zika virus infection on male fertility. This is a multi-site study that also includes subjects from León, Nicaragua (UNAN-León). The study will assess changes in sperm count, morphology and viability as well as advanced studies of sperm health to see if Zika causes durable derangements in human male reproductive function.

Latinos in North Carolina

In addition to the work in Latin America, UNC faculty has been conducting applied HIV research with Latinos in North Carolina to explore questions related to HIV, migration and social networks. In 2013, UNC faculty received a five-year Health Resources and Services Administration (HRSA) Special Programs of National Significance grant to strengthen linkage to HIV care and retention among Mexican men and transgender women in NC. UNC faculty developed a tailored personal health navigator intervention, informed by the transnational framework as well as findings from studies in Latin American and North Carolina. Nearly 100 Mexican men and transgender women living with HIV have been enrolled and are being followed to assess HIV outcomes and experiences.
Progress in the Management of Infectious Diseases

HIGHLIGHTS

UNC investigators have been following the survivors of the 2014 Ebola outbreak, discovering a test for the virus in semen.

A multidisciplinary group from across UNC has formed IDEEL – Infectious Disease Epidemiology and Ecology Lab – to further the study of illnesses like malaria, hepatitis and Chagas disease.
ZIKA
The World Health Organization (WHO) declared Zika an international public health emergency in February 2016. Although sexual transmission is possible, mosquitoes primarily infect people. The virus has been linked to microcephaly in infants.

IGHID researchers are investigating Zika at sites around the world. A collaboration with investigators at Universidad Nacional de la Amazonía Peruana in Peru will study the effect of prior and acute Zika virus infection on male fertility. This is a multisite study that also includes subjects from León, Nicaragua (UNAN-León).

Other Zika research being conducted by UNAN-León and IGHID investigators includes:
1. Surveillance for Zika infection in populations of pregnant women using remnant blood;
2. Evaluation of neurodevelopment of infants;
3. Study on Zika shedding and its implications for sexual transmission by testing for Zika in different bodily fluids; and
4. Collaboration with RTI International in Durham, N.C., to understand neurological sequelae of Zika infection.

UNC is also investigating returned travelers with risk of arbovirus infection to define key determinants of the human adaptive immune response to Zika virus. A deeper understanding of how the immune system interacts with Zika as a primary flavivirus infection, as well as in the context of prior infection by related flaviviruses, such as dengue, will elucidate mechanisms of pathogenesis and protection that advance important research priorities.

EBOLA
Since the 2014 Ebola outbreak, IGHID investigators have continued their work understanding this virus and caring for survivors in Liberia. William Fischer, MD, and David Wohl, MD, quickly established a translational hemorrhagic virus research group, focusing on Ebola and Lassa fever infections.

Together with Dr. Jerry Brown, a Liberian surgeon and Ebola care expert, the UNC investigators established a cohort of 330 men and women who survived Ebola. In addition to tracking long-term physical and mental impacts of prior Ebola infection, the team has been studying the persistence of the virus in genital fluids since sexual transmission has been documented. Working with colleagues in Liberia, they proved in 2016 that the Cepheid Xpert Ebola assay test can reliably detect the RNA of the Ebola virus in semen. While a test for measuring Ebola in the blood exists, this is the first validated test for Ebola in semen.

In 2017, the team reported the discovery of Ebola RNA in the semen of male survivors more than two years after the onset of infection. These findings led the study team to suggest revision of the 2016 WHO guidelines relating to the sexual transmission of Ebola, which calls for men who survive Ebola to undertake measures such as abstinence and the use of condoms for at least 12 months after the onset of symptoms or until their semen has tested negative for Ebola virus RNA twice.

The longitudinal cohort continues and in 2018 will provide additional information regarding the infectiousness of Ebola RNA-containing semen, the detection of Ebola in female genital fluid, the long-term immune and inflammatory response to Ebola infection, and the persistent stigmatization of survivors.

INFECTIOUS DISEASE EPIDEMIOLOGY AND ECOLOGY LAB (IDEEL)
Within the UNC IGHID, a group of faculty members came together in 2015 to form the Infectious Disease Epidemiology and Ecology Lab (IDEEL). IDEEL is a collaborative research group that seeks to perform high quality science and leverage the results to improve the health of the world’s poorest populations. IDEEL investigators are engaged in large-scale molecular epidemiology and genetics studies designed to understand how pathogens evolve and interact with humans. Through close collaboration with ministries of health and local partners across three continents, IDEEL researchers are using their findings to impact health policies so that people sick with a range of tropical infections receive the best possible care.

IDEEL investigators come from a wide breadth of backgrounds including infectious diseases physicians, molecular epidemiologists, geneticists and geographers. IGHID faculty involved in IDEEL include Steven Meshnick, MD, PhD, FASTM; Jonathan J. Juliano, MD, MSPH; Jessica Lin, MD; Natalie Bowman, MD, MPH; and Jonathan B. Parr, MD, MPH. IDEEL has strong collaborations across multiple departments and schools at UNC and beyond.

The work of this collaborative team primarily focuses on malaria, including studies focused on cellular biology, genomics, and translational and spatial epidemiology. However, the investigators embrace other diseases that affect marginalized populations and are conducting a range of projects on other pathogens including Trypanosoma cruzi (the agent of Chagas disease), gastrointestinal pathogens, hepatitis B and C viruses, and illnesses transmitted by ticks (e.g., Rickettsia).

Research projects investigate:
• the epidemiology of malaria across Africa, specifically the epidemiology and appropriate prevention of malaria in pregnant women and a study of malaria transmission in the Kinshasa Province of the Democratic Republic of the Congo (DRC);
• a new salivary diagnostic test in Kinshasa, DRC, where malaria parasites with a genetic mutation allowing them to escape detection are circulating;
• the evolutionary and ecological factors that drive the emergence of malaria drug resistance in the DRC, Tanzania, Kenya, Uganda, Thailand, and Cambodia;
• the burden of hepatitis B and hepatitis C viruses in the DRC;
• the epidemiology of yellow fever virus, Zika virus, and dengue virus in the DRC;
• the implementation of best practices to prevent mother-to-child transmission of hepatitis B virus in the two busiest maternity hospitals in Kinshasa, DRC; and
• the clinical characteristics and pathogenesis of parasitic brain infections, including Toxoplasmosis and American Trypanosomiasis (Chagas disease) in people living with HIV in Bolivia and Peru.
The Division of Infectious Diseases

**HIGHLIGHTS**

- A record **three HIV prevention trials** simultaneously opened for enrollment in 2017.
- The iTech Center received **$31 million** from the NIH to develop apps to target youth at risk for or living with HIV.
- The division **expanded its training opportunities** adding an Immuno-compromised Host Fellowship specializing in transplant infectious diseases as well as antimicrobial stewardship and hospital epidemiology for the immunocompromised host.

*med.unc.edu/infdis*
The IGHID works in collaboration with UNC’s Division of Infectious Diseases, essentially the domestic arm of the Institute housed as one of 11 clinical divisions in UNC’s Department of Medicine.

The Division of Infectious Diseases has a faculty of more than 50 that includes clinicians and researchers working to prevent and treat infectious diseases from influenza to HIV to tropical diseases and emerging infections domestically and internationally. The Division of Infectious Diseases collaborates with hundreds of associates of the IGHID across UNC’s campus and sites worldwide.

› CLINICAL CARE

The UNC Infectious Diseases (ID) Clinic is located in a large and modern facility on the first floor of the North Carolina Memorial Hospital. The ID Clinic provides care to approximately 1,800 people living with HIV as well as offering HIV prevention services, evaluation and treatment of sexually transmitted infections (STIs), hepatitis C treatment, care of patients post-hospitalization and in the outpatient setting with bone and joint infections, post-surgical infections, respiratory infections, and infections in returning travelers.

UNC receives funding through the Ryan White Care Act to provide comprehensive care for persons living with HIV. A multidisciplinary team including pharmacists, social workers and benefits counselors work to engage and retain patients in care to ensure long-term health. Complementarily co-located programs for chronic disease management include subspecialty services in pulmonary disease, cervical and anal dysplasia, and diabetes management.

UNC infectious diseases faculty provides extensive outreach services in other community settings for HIV, STIs, tuberculosis and other communicable diseases. Faculty assist with direct patient care, medical supervision, administration and disease investigation in the community for different programs located in North Carolina:

- Durham County Department of Public Health: Arlene Seña, MD, MPH
- Wake County Human Services HIV/STI Clinics (A and B): Chris Sellers, MD, MPH, and Robert Dodge, PhD, RN, ANP
- North Carolina HIV/STD Prevention and Control Branch: Heidi Swygard, MD, MPH
- North Carolina Department of Public Safety, Division of Prisons: Becky White, MD, MPH
- N.C. Department of Health & Human Services Viral Hepatitis Medical Director: Heidi Swygard, MD, MPH

The Division of Infectious Diseases manages three consult services (two General ID and one Immunocompromised Host) and an inpatient infectious diseases ward service. The Immunocompromised Host ID consult service provides patient-centered outpatient consultation to solid organ transplant recipients and candidates for solid organ transplantation in the UNC Jason Ray Transplant Clinic, and to stem cell transplant recipients and patients with hematologic malignancies in the UNC Lineberger Comprehensive Cancer Center. The Immunocompromised Host Service also delivers care to patients in the NC Jaycee Burn Unit.

› RESEARCH

CURING HIV

David Margolis, MD, and J. Victor Garcia, PhD, lead a team of investigators focused...
on the cure of HIV infection at the newly established UNC HIV Cure Center.

- The Martin Delaney Collaboratory of AIDS Researchers for Eradication (CARE): CARE is a consortium of leading scientific experts in the field of HIV latency from several U.S. and European academic research institutions as well as major pharmaceutical partners (GSK, Merck and others). The investigators are focused on the “target and clear” approach to elimination of HIV-infected cells that persist despite effective therapy. Researchers and collaborators received $2.3 million to extend studies in CARE until 2021.

- QURA Therapeutics: QURA is a unique joint venture public-private partnership that is focused on the cure of HIV infection. Led by Dr. Margolis, investigators from UNC work together with GSK scientists in a shared space on campus. GSK has made an initial investment of $20 million.

- Two novel clinical trials are ongoing at UNC, combining a drug shown to make latently infected cells vulnerable to elimination with novel immunotherapies to recognize and clear persistently infected cells.

Preventing HIV

UNC marked a milestone in 2017 launching, for the first time, three HIV prevention studies. The AMP Study investigates an infusion for the first time, three HIV prevention studies.

Christopher B. Hurt, MD, is the UNC site principal investigator for the Give PrEP a Shot study. He is also involved with two other HIV studies. He is the co-investigator on a National Institute on Drug Abuse-funded study to address the risk of HIV, hepatitis C and sexually transmitted infections among rural opioid users in eight counties of extreme western North Carolina. Dr. Hurt is serving as subproject director for provider outreach and education, in partnership with RTI International and the N.C. Department of Health and Human Services.

He is also the co-investigator and study clinician for ePrEP, an innovative study to assess delivery of PrEP services to young, gay and bisexual men in rural areas of North Carolina using a combination of telemedicine and in-home specimen self-collection.

The ePrEP study is being conducted through the Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN), whose coordinating center and iTech project site are also located at UNC. iTech is co-led by Lisa Hightow-Weidman, MD, MPH, and her Emory colleague Patrick Sullivan. Based at UNC, iTech is the first NIH-funded center to use technology in innovative ways to engage youth living with or at risk for HIV. The NIH awarded iTech $18 million in 2016 to fund six studies. An additional $13 million was awarded in 2017 to support another four trials.

UNC Center for AIDS Research (CFAR)

The UNC CFAR is a consortium of three complementary institutions – UNC, RTI International and FHI 360. The purpose of the UNC CFAR is to provide infrastructure to support investigation of the HIV/AIDS epidemic using clinical research, behavioral research, research into HIV biology and pathogenesis at the molecular level, and educational outreach. The CFAR does this by working closely with the UNC Institute for Global Health & Infectious Diseases, the UNC HIV Cure Center, and the UNC Global HIV Prevention and Treatment Clinical Trials Unit.

The UNC CFAR provides incentive for cross-fertilization within one of the largest groups of scientists in the country, one that covers the entire spectrum of HIV/AIDS-related research. The current UNC CFAR membership includes over 200 active researchers and over three times that many researchers receive news of CFAR events, programs and HIV/AIDS-related funding opportunities. In addition, the CFAR provides developmental awards to young investigators and those new to HIV/AIDS research at our three partnering institutions, and to investigators at NC State and at historically black colleges and universities across the state.

Other Sexually Transmitted Infections

Joseph Alex Duncan, MD, PhD, is an investigator in the Atlantic Coast STI Cooperative Research Center, an NIH-funded multi-institutional research center focused on STI pathogenesis research, including antibiotic resistance and immunity in *N. gonorrhoeae* infection. Marcia Hobbs, PhD, and Dr. Duncan are co-investigators on a $3.5 million grant to conduct studies of potential vaccine and pharmacologic targets in *N. gonorrhoeae* using a unique model of human gonococcal infection. Drs. Hobbs and Duncan recently received pharmaceutical industry funding to conduct a Phase 2 study to determine the potential of a human monoclonal antibody to protect against experimental gonococcal infection. Also, they are preparing for the first-ever vaccine challenge study using the experimental gonococcal infection model.

Arlene Seña, MD, MPH, has been conducting clinical research on STI epidemiology, new diagnostics and therapeutics at the Durham County
Department of Public Health. She serves on the Scientific Review Committee for an NIH-funded STI Clinical Trials Group, and has served as a co-investigator on large, randomized clinical trials involving investigational new drugs for treatment of emerging drug-resistant *N. gonorrhoeae*. She has also received a CDC-funded grant with the N.C. Division of Public Health to investigate the networks of men who have sex with men and transgender women with syphilis in several counties throughout the state.

**Antibiotic Resistance**
The Consortium on resistance against carbapenems in *Klebsiella* and other Enterobacteriaceae (CRACKLE) is led by David van Duin, MD, PhD. Since 2011, he has been conducting this prospective, observational, multi-center study that evaluates carbapenem-resistant Enterobacteriaceae (CRE) in hospitalized patients. CRACKLE is federally funded through the Antibacterial Resistance Leadership Group. After the completion of CRACKLE-1, which focused on the Great Lakes area in the US, CRACKLE-2 was initiated. CRACKLE-2 is an expansion of the CRACKLE-1 study and covers over 80 hospitals in 17 states in the US. In addition, international sites, including China and Colombia, are also enrolling patients into CRACKLE-2.

**TRAINING**
The ID Fellowship program at UNC offers a broad range of clinical and research training, both locally and internationally, that are supported by globally recognized faculty. Michelle Floris-Moore, MD, leads this training program. In 2018, an Immune-compromised Host Fellowship was added, offering training in transplant infectious diseases as well as antimicrobial stewardship and hospital epidemiology for the immunocompromised host.

Dr. Hurt and David Wohl, MD, co-direct the North Carolina AIDS Training and Education Center (NCATEC), a federally-funded program housed at UNC that provides training on topics in HIV treatment and prevention for providers across the state. Dr. Hurt has worked closely with NCATEC since 2014 to help expand the availability of pre-exposure prophylaxis (PrEP) for HIV prevention across North Carolina.

Heidi Swygard, MD, MPH, organizes the largest annual training in the state of providers who treat people living with HIV. May Update is a collaboration between UNC, the North Carolina AIDS Training and Education Center and the Greensboro Area Health Education Center to provide dentists, physicians, nurses, pharmacists and other allied health professionals with the latest clinical information about treating people living with HIV.

Every week, UNC’s Institute for Global Health & Infectious Diseases and Center for AIDS Research (CFAR) host the Friday Infectious Diseases Conference Series. Each Friday morning, investigators from around the world travel to UNC to present their latest research findings. Past talks have focused on hepatitis C virus in North Carolina, tuberculosis in China and antibodies to prevent HIV. The UNC HIV Cure Center has also initiated a monthly seminar series, bringing local and international researchers to campus to discuss their latest work.

- **Beyond Condoms:** New Approaches in HIV Prevention

**Social Worker Michael Williams**

had never considered joining a research study, especially one to prevent HIV. But learning he was at risk prompted him to take control of his health.

“Like a lot of people, I don’t like using condoms,” Williams said. “Then, my partner disclosed that he was living with HIV. He had an appointment at UNC’s Infectious Diseases Clinic the next day. We asked about our options while we were there and that is how we found out about a research study at UNC testing a pill called Truvada to prevent HIV. I’ve been on that now for at least four or five years, and I am still HIV negative.”

While the rate of new HIV infections in the United States has stabilized to around 40,000 annually, African-American gay men remain disproportionately affected. African Americans represented only 12 percent of the U.S. population in 2015, but...
Felton Thomas is part of UNC’s ambassador program, in which he goes out into his community to share information about HIV prevention research trials. Photo by Mary Lide Parker/UNC-Chapel Hill

accounted for 45 percent of new diagnoses, according to the Centers for Disease Control and Prevention (CDC). And even more startling, 82 percent of infections among men occurred in those who identified as gay or bisexual.

For the first time, UNC’s Division of Infectious Diseases launched three prevention studies simultaneously in 2017. The timing is critical as the South, geographically, experienced the most new infections in 2015, according to the CDC.

“When you prevent HIV, you are protecting your personal health. HIV really takes a toll on your body and your immune system,” said Christopher Hurt, MD, an assistant professor of medicine in the UNC Division of Infectious Diseases. “Separately from that, though, HIV still carries a lot of stigma in the United States, especially in the South. Preventing infection helps to also unburden you from all that added stigma that gets attached to a diagnosis.”

Hurt leads one of the three studies aimed at testing different forms of pre-exposure prophylaxis, or PrEP, to prevent HIV. The study he leads, Give PrEP a Shot, tests the safety and effectiveness of a long-acting injection of a new anti-HIV drug called cabotegravir.

A second study, called DISCOVER, is looking at the drug Descovy as an oral alternative to Truvada. The final study is the Antibody Mediated Prevention study, or AMP, which tests a first-of-its-kind infusion of antibodies given every two months.

Williams is now enrolled in the AMP study, his fifth trial at UNC.

“I’m not here to preach, ‘You should come in and do this,’” but I can say it works for me,” he said. “HIV doesn’t have a face. It can happen to anybody at any time. And you cannot help who you fall in love with. Through the research studies, you can still have a healthy relationship and feel protected.”

When you prevent HIV, you are protecting your personal health. HIV really takes a toll on your body and your immune system.” said Christopher Hurt, MD, an assistant professor of medicine in the UNC Division of Infectious Diseases. “Separately from that, though, HIV still carries a lot of stigma in the United States, especially in the South. Preventing infection helps to also unburden you from all that added stigma that gets attached to a diagnosis.”

Luther Bartelt, MD
Assistant Professor, Infectious Diseases, Chapel Hill
SPECIALTY: Research focuses on development of malnutrition during giardiasis

Lameck Chinula, MMED
Research Assistant Professor, OB/GYN, UNC Project-Malawi
SPECIALTY: First Malawian OB/GYN at UNC Project-Malawi

Vivian Go, PhD, MPH
Professor, Health Behavior, Chapel Hill and Vietnam
SPECIALTY: Research focuses on the design, implementation and evaluation of behavioral HIV prevention interventions among marginalized populations, including people who inject drugs

Michael Horce, MD, MPH
Research Assistant Professor, Infectious Diseases, Zambia
SPECIALTY: Research focuses on the effect of implementing new tuberculosis diagnostics on empirical treatment practices

Portia Kamthunzi, MD
Research instructor, Pediatrics, UNC Project-Malawi
SPECIALTY: Research focuses on malaria, pediatric HIV and prevention of mother to child transmission of HIV in Malawi

Cecilia Kanyama, MD
Research instructor, Medicine, UNC Project-Malawi
SPECIALTY: Research focuses on infectious diseases in Malawi, specifically HIV

Kate Muessig, PhD
Assistant Professor, Health Behavior, Chapel Hill and China
SPECIALTY: Research focuses on HIV health issues in China, specifically HIV treatment as prevention and developing eHealth and mHealth interventions for men who have sex with men

Jonathan Parr, MD, MPH
Clinical Assistant Professor, Infectious Diseases, Chapel Hill and Africa
SPECIALTY: Infectious diseases of poverty, with translational projects addressing malaria and viral hepatitis infection in the Democratic Republic of the Congo

Brian Pence, PhD, MPH
Assistant Professor, Epidemiology, Chapel Hill and Africa
SPECIALTY: Research focuses on linkages between mental health and HIV-related behaviors, and health outcomes in the South- eastern US and Africa

Kimberly Powers, PhD
Assistant Professor, Epidemiology, Chapel Hill and Malawi
SPECIALTY: Research focuses on global health and infectious diseases, specifically HIV and sexually transmitted infections in Malawi

Joan Price, MD, MPH
Assistant Professor, OB/GYN, Zambia
SPECIALTY: Research focuses on improving pregnancy outcomes for women living in the world’s poorest countries

Raquel Reyes, MD, MPA
Assistant Professor, Medicine, Chapel Hill and Africa
SPECIALTY: Research focuses on non-communicable diseases, and women and children’s health in resource-poor settings

Nora Rosenberg, PhD, MSPH
Assistant Professor, Health Behavior, UNC Project-Malawi
SPECIALTY: Research focuses on developing, implementing and evaluating multi-level interventions to support HIV testing, prevention, care and treatment in sub-Saharan Africa

Natalia Soriano-Sarabia, PhD
Research Instructor, Medicine, Chapel Hill
SPECIALTY: Research focuses on hepatitis C virus and HIV treatment and eradication

Julia Sung, MD
Clinical Assistant Professor, Medicine, Chapel Hill
SPECIALTY: Research focuses on clearing latent HIV infection

Weiming Tang, PhD, MD, MS
Research Assistant Professor, Medicine, UNC Project-China
SPECIALTY: Research focuses on developing and evaluating interventions to promote HIV testing and linkage to care among key populations, especially among men who have sex with men

Daniel Westreich, PhD
Associate Professor, Epidemiology, Chapel Hill
SPECIALTY: Research focuses on causal inference tools, which help speed the translation of scientific findings into policy interventions, as well as the intersection of infectious diseases, epidemiology, HIV/AIDS and women’s health

New IGHID Recruits
IGHID
Leadership Team

Myron Cohen, MD
Director

Jeff Stringer, MD
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Nazneen Howerton
Dania Munson
Grace Onyebuchi
Rachel Timberlake

Contracts and Grants

Administrative Support

IGHID Advisory Board

Regulatory Affairs
**Fellowship and Training**

<table>
<thead>
<tr>
<th>FELLOWSHIP</th>
<th>DESCRIPTION</th>
<th>ELIGIBILITY</th>
<th>TRAINEEs TO DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNC, Johns Hopkins, Morehouse School of Medicine, Tulane (UJMT) Fogarty Global Health Fellows Program</td>
<td>The program’s primary goal is to train the next generation of U.S. and foreign-national global health research scientists in the fields of HIV, other infectious diseases, and non-communicable diseases.</td>
<td>Pre- and post-doctoral candidates</td>
<td>133</td>
</tr>
<tr>
<td>Doris Duke International Clinical Research Fellowship</td>
<td>The program provides students with the opportunity to participate for 12 months in a mentored, clinical research project in a low- or middle-income country.</td>
<td>Students in their third year of medical school</td>
<td>13</td>
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<tr>
<td>UNC Wits AIDS Implementation Research and Cohort Analyses Training Grant</td>
<td>This is the first implementation science graduate degree program in South Africa, and located in the Department of Epidemiology &amp; Biostatistics at Wits School of Public Health.</td>
<td>Postdoctoral and master's students</td>
<td>30</td>
</tr>
<tr>
<td>Malawi HIV Implementation Research Scientist Training Program (M-HIRST)</td>
<td>This program aims to strengthen implementation research skills through education, research support, and mentorship.</td>
<td>Current and aspiring Malawi College of Medicine junior faculty</td>
<td>46</td>
</tr>
<tr>
<td>Global Infectious Diseases Research Training Program</td>
<td>The program’s focus is to foster the development of skills among Chinese investigators in order to conduct mentored interdisciplinary STD research.</td>
<td>Pre- and postdoctoral Chinese fellows</td>
<td>520*</td>
</tr>
<tr>
<td>Gilead Training Fellowship</td>
<td>The fellowship supports the graduate education of medical professionals from Malawi in South Africa with the standard four-year residency training in internal medicine, pediatrics and OB/GYN. Participating Malawi interns concurrently worked on a Masters of Medicine (MMED) with a focus on HIV.</td>
<td>Malawian medical professionals</td>
<td>11</td>
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</table>

* 512 short-term learners and 8 postdoctoral fellows

**Opportunities**

<table>
<thead>
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<tr>
<td>Training in Infectious Diseases Epidemiology (TIDE)</td>
<td>This program trains infectious diseases epidemiologists to work at the crossroads of lab science and population-based clinical and behavioral research.</td>
<td>Doctoral trainees and postdoctoral fellows</td>
<td>20</td>
</tr>
<tr>
<td>STI Training Grant</td>
<td>This program provides trainees with research opportunities in the broad areas of HIV and STIs.</td>
<td>MD and PhD trainees</td>
<td>88</td>
</tr>
<tr>
<td>Pathogenesis Training Grant</td>
<td>This program provides research training in molecular and epidemiological processes critical to microbial and viral pathogenesis.</td>
<td>Postdoctoral fellows</td>
<td>49</td>
</tr>
<tr>
<td>Explorations in Global Health</td>
<td>These grants are designed to foster the development of research partnerships and projects in global health.</td>
<td>UNC faculty, UNC students can co-apply</td>
<td>70</td>
</tr>
<tr>
<td>Global Women’s Health Fellowship</td>
<td>This is a training for OB/GYNs, who spend two years at UNC-affiliated sites in Malawi, Zambia or South Africa.</td>
<td>Early career OB/GYNs</td>
<td>11</td>
</tr>
<tr>
<td>The UNC-UNZA-Wits Partnership for HIV and Women’s Reproductive Health Research</td>
<td>PhD students train in South Africa and complete their dissertation in Zambia. Postdoctoral trainees complete a mentored research project in Zambia.</td>
<td>African doctoral and postdoctoral trainees</td>
<td>10**</td>
</tr>
<tr>
<td>Nicaraguan Emerging and Endemic Diseases (NEED) Training</td>
<td>This program provides two Nicaraguan researchers with PhD training in epidemiology at UNC, develops a new PhD program in microbiology for five students at UNAN-León and provides short-term learning for 140 trainees.</td>
<td>Nicaraguan researchers Recruiting first cohort</td>
<td></td>
</tr>
</tbody>
</table>

**First cohort of 10 in the works**
The University of North Carolina has one of the largest programs in global health and infectious diseases in the United States. Our projects involve faculty and students from all parts of campus. The work undertaken has made important discoveries, saved lives and offered critical training to thousands of health professionals in the US and in resource-limited settings. The 2018 report conveys the breadth and depth of the Institute for Global Health & Infectious Diseases’ initiatives, and the commitment of UNC to these goals – service, research and education.

If you would like to support us in our mission to improve local and global health, visit our website and choose the “Make Gift” option.
A woman and little girl work together in a field in Vietnam.
Photo by Teerada Sripaipan/UNC Project Vietnam