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OVERVIEW
The University of Chicago Center for Global Health (CGH) is an interdisciplinary program dedicated to improving health and well-being through education, research and training, and service in partnership with communities in the United States and around the world. As so many academic disciplines are needed to address the challenges of global health, CGH leverages the unique institutional strengths of the University of Chicago to bring together faculty and students from different schools and programs on campus.

CGH is excited to announce its annual Summer Fellowship Program. This opportunity will allow promising undergraduate and graduate students to take part in a 10-week internship where they will benefit from first-hand experience working in a research setting in Chicago and one of our partnering sites abroad. Our prestigious partnerships offer a strong local mentoring infrastructure as well as longitudinal and well-defined projects. The objective of this Fellowship is to provide students at different levels and from different backgrounds practical exposure to medical and global health research with a strong foundation in faculty and peer-to-peer mentorship. Students will gain valuable experience in collecting and analyzing data, relating to people of different backgrounds and experiences, collaborating with other researchers and peers, understanding and synthesizing research literature, formulating hypotheses, orally presenting results, thinking and working creatively and independently, and applying knowledge to real-world situations.

STRUCTURE
The University of Chicago Center for Global Health Summer Fellowship program uses faculty mentorship and peer-to-peer partnership to educate scholars on the importance of a collaborative global health team environment and emphasizes factors that are vital to developing medical and global health professionalism. A group of 2 to 3 competitive students, made up of undergraduate and graduate students, will be selected for each of the Fellowship sites. Working as a team, guided by a University of Chicago mentor and a site-based mentor, scholars will learn the nuances of research design, implementation, analysis, and presentation of final products including oral presentation formats, abstract development, and formal academic writing.

FUNDING
Each Fellow will be awarded $5,000 to cover the cost of travel, lodging, and other in-country expenses. This stipend will be distributed in one lump sum through the Office of Career Advancement prior to departure. A completed and signed Mentor-Mentee Commitment form is required in advance of funding distribution. Post Fellowship, students may be eligible for additional CGH funding to present findings at external conferences and/or academic meetings.

REQUIREMENTS
Students selected for the Summer Research Fellowship Program are required to participate in the following components:

- Attend pre-brief and debrief orientations on either end of the fellowship
- Attend CGH Summer Research Fellowship Preparatory Seminars:
  - Seminar One: Introduction to Research (focus on scientific integrity and the process of experimentation)
  - Seminar Two: Research Methods Bootcamp
  - Seminar Three: Preparing Your Written Report
  - Seminar Four: Preparing Your Presentation
- Submit a final report paper detailing research procedures and outcomes
  - Scientific reporting is essential to any research activity. Reports are required to contain an introduction, methods section, and results/discussion. These hopefully will lead to future scholarly work, presentations at conferences, and publication.
- Present a ten-minute oral presentation to peers, mentors, and CGH faculty
- Submit an abstract for the CGH Global Health Day Research Symposium
- Submit an abstract for the annual meeting of the Consortium of Universities for Global Health (CUGH) and/or other professional academic meetings
2018 CALENDAR

Application Timeline

Online Application Available to Students.................................................................January 10, 2018
CGH Summer Research Fellowship Informational Session........................................January 17, 2018
CGH Summer Research Fellowship Informational Session........................................January 26, 2018
Online Application Due.........................................................................................February 9, 2018
Application Review and Student Interviews..........................................................February 19 – March 2, 2018
Notification of Acceptance.....................................................................................March 9, 2018
Mentor-Mentee Commitment Form Due.................................................................March 16, 2018

Summer Research Fellowship Program Schedule

Fellow/Mentor Planning Meeting.............................................................................March 27, 2018
Seminar One: Pre-Departure Orientation & Introduction to Research.....................May 18, 2018
Seminar Two: Research Methods Bootcamp..........................................................June 1, 2018
University of Chicago and Global Site IRB Approval.............................................May 18-June 1, 2018
10-Week In-Country Experience............................................................................June 12 – August 21, 2018
Seminar Three: Preparing Your Written Report.....................................................July 20, 2018
Debrief Orientation.................................................................................................August 28, 2018
Seminar Four: Preparing Your Presentation..........................................................August 17, 2018
Written Report of Summer Research Fellowship Experience Due..........................October 12, 2018
Fall CGH Oral Presentations..................................................................................October 2018
Spring CGH Global Health Day Research Symposium...........................................April/May 2019
2019 CUGH Global Health Conference..................................................................March 2019
The University of Chicago Center for Global Health
Metcalf 2018 Summer Research Fellowship Application

I. Student Information

First Name: ___________________________ Last Name: _____________________________

University of Chicago Email: _____________________________

STUDENT STATUS

☐ Undergraduate (Please list major: ____________________________)
  ☐ 1st Year
  ☐ 2nd Year
  ☐ 3rd Year

☐ Graduate (Master’s) Program: ____________________________
☐ Graduate (PhD) Program: ____________________________
☐ Medical Student

DO YOU INTEND TO PURSUE A CAREER IN GLOBAL HEALTH?

☐ Definitely
☐ Likely
☐ Not Likely
☐ Absolutely Not

HOW EXTENSIVELY DO YOU EXPECT TO BE INVOLVED IN RESEARCH DURING YOUR ACADEMIC CAREER?

☐ Exclusively
☐ Significantly Involved
☐ Somewhat Involved
☐ Involved in a Limited Way
☐ Not Involved

PLEASE INDICATE WHICH CATEGORY BEST DESCRIBES YOUR RESEARCH INTERESTS (RANK TOP 3):

☐ Basic sciences
☐ Clinical research
☐ Community-based research
☐ Public policy
☐ Ethnography/qualitative research
☐ Implementation science
☐ Quality improvement and performance evaluation

PLEASE INDICATE WHICH CATEGORY BEST DESCRIBES YOUR GLOBAL HEALTH AREAS OF INTEREST (RANK TOP 3):

☐ Health and Environment
METHODS:
Please describe any experience you have had with quantitative research and quantitative data analysis (max word count 250)

Please describe any experience you have had with qualitative research and qualitative data analysis (max word count 250).

PLEASE INDICATE IF YOU HAVE USED ANY OF THE FOLLOWING SOFTWARE:

- STATA
- SAS
- SPSS
- R
- Other quantitative data analysis software: ______________________

- MAX QDA
- NVivo
- ATLAS.ti
- Other qualitative data analysis software: ______________________

LANGUAGE PROFICIENCY:
- French
  - Basic
  - Conversational
Please indicate your level of fluency in Spanish:

- Fluent
- Basic
- Conversational
- Fluent

Other (indicate language and level of fluency): ____________________

Please rank your preferred site (select all that apply):

- Bangladesh
- China
- Ghana
- Haiti
- India
- Nigeria
- Panama
- Honduras
- South Africa

Do you anticipate that you will miss any part of the summer research program (including pre and post fellowship meetings)?

- Yes
- No

If yes above, please provide the dates that you will be away:

Start Date ________________  End Date ________________

II. Personal Statement

Please compose a personal statement (maximum 500 words) describing your academic and global health interests. Please describe how this fellowship experience could potentially shape your personal and professional growth.
MENTOR-MENTEE COMMITMENT FORM

The University of Chicago Center for Global Health - Metcalf 2018 Summer Research Fellowship
Mentor-Mentee Commitment Form

DUE March 16TH, 2018

MENTEE: My signature below indicates that I intend to adhere to the Center for Global Health Summer Research Fellowship Program as described in the 2018 Call for Applications and the Mentor-Mentee Commitment Form.

Some of the responsibilities associated with this program include but are not limited to:

- **Maintaining an active relationship with my mentor:** I recognize that it is my responsibility to take initiative and develop the mentor-mentee relationship. I will work with my mentor to set clear expectations and attainable project goals. I will report to my mentor periodically throughout the Fellowship as arranged at the start of the program. I will work closely with my mentor on my final paper, abstract, scientific poster, and presentation.

- **Attending activities identified by the Center for Global Health:** I will spend 8-10 weeks in my global health project site conducting research as determined by myself and my mentor. I will participate in Fellowship travel orientations and seminars sessions as determined by CGH. I will participate in bi-monthly Skype check-ins with CGH administration while in my global health project site. I will orally present my findings to CGH and will submit an abstract to present in the CGH Global Health Research Symposium.

- **Submitting project deliverables:** My Fellowship experience will culminate in a final report, abstract, scientific poster, and PowerPoint presentation. I will work closely with my mentor on all project deliverables and seek final approval for all deliverables prior to submitting any scholarly work to CGH or academic conferences.

MENTOR: My signature below indicates that I agree to take ______________________________________ as my mentee for the 2018 CGH Summer Research Fellowship. I will guide them in their global health research and work to ensure the academic integrity of their work. I will work with the student to set clear expectations for communication through email, phone, Skype, and in person as necessary.

I have read this Mentor-Mentee form and agree to participate in the 2018 CGH Summer Research Fellowship to the best of my ability.

<table>
<thead>
<tr>
<th>Mentee Name (Please Print)</th>
<th>Mentee Signature</th>
<th>Date</th>
</tr>
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<tbody>
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<tr>
<th>Mentor Name (Please Print)</th>
<th>Mentor Signature</th>
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</table>

## Ten Tips for Mentees

1. **Initiate.** In order to sustain the mentoring relationship, take the initiative to ask your mentor a question, to let him or her know your educational and professional interests and objectives, and to ask about his/her own experiences.

2. **Honor your commitment.** Your mentor probably has a very demanding job. He or she has volunteered to take on the added responsibility of mentoring. Please be appreciative of your mentor’s time and investment; respond in a timely manner to your mentor’s questions and comments. If you don't have the time to respond at length, send a short message letting this person know you will be in contact when you have the opportunity.

3. **Help your mentor help you.** Tell your mentor how she/he can be most helpful to you.

4. **Expect support, not miracles.** You can expect a certain level of support and advice from a mentor, but he or she can't solve your problems for you. Perhaps the most valuable quality a mentor can offer is an alternative point of view. A mentor can put the situation in perspective, offer feedback, serve as a sounding board, and identify others whose brain you might pick or activities you can engage in or small ways you can position your work to meet your goals as well as resources that may be helpful to you.

5. **Communicate clearly.** Initiate contact with your mentor if you have questions or would like to discuss something. Identify your needs and communicate them as clearly as possible to your mentor. It may be helpful to put some focused energy into organizing your thoughts and concerns before talking to your mentor, so that the time is spent wisely.

6. **Be teachable.** Be willing to learn new things, obtain another perspective, and be responsive to suggestions and constructive criticism.

7. **Keep up your end.** Work hard at being a good mentee.

8. **Follow through.** When you decide to act on your mentor’s suggestions, act in a timely manner and then report back to him/her.

9. **Look ahead at your calendar.** Are there any days you know that you’ll be offline or ultra-busy? If so...let the other person know, so that if s/he doesn’t hear from you, she knows it’s because you’re away or you’re swamped.

10. **Correct misunderstanding when they happen.** Get in touch with your mentor before a concern becomes a problem.
Reasonable Expectations for Mentors and Mentees

Mentors and mentees typically enter their relationships with assumed expectations of each other. At times, some can experience disappointment because expectations weren’t met or even discussed. To prevent this and help you with your planning, the table below lists some common, reasonable expectations. In many cases, the expectations are similar or the same. A mentoring relationship is a partnership, with both people showing respect and support for each other. Discuss these expectations early in your mentoring partnership. You may want to add other expectations the two of you identify.

<table>
<thead>
<tr>
<th>Mentors</th>
<th>Mentees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet as often as your schedules permit.</td>
<td>Meet as often as your schedules permit.</td>
</tr>
<tr>
<td>Provide help by answering questions. Serve as a learning broker, and be a sounding board for issues relating to the mentee’s career goals and development. Talk about skills mentee could acquire to add value.</td>
<td>Take initiative to drive the relationship and be responsible for your own career development and planning. Ask questions.</td>
</tr>
<tr>
<td>Discuss eliciting getting feedback and help mentee look for information on impact he/she is having.</td>
<td>Focus and be interested in getting feedback and measuring how you are perceived.</td>
</tr>
<tr>
<td>Provide suggestions and advice on goals and activities that lead to effective and rewarding work. Tell stories about how others made their way in the Bank that might be relevant to the mentee.</td>
<td>Ask for suggestions and advice early in the relationship. When advice is given, listen to the mentor, apply at least some of their ideas, and let him or her know the results.</td>
</tr>
<tr>
<td>Be a catalyst for mentee developing his/her own network. Point to others he/she might reach out to and engage.</td>
<td>Elicit Mentor's advice on developing other informal mentoring relationships</td>
</tr>
<tr>
<td>Keep any commitments made.</td>
<td>Keep any commitments made.</td>
</tr>
<tr>
<td>Keep confidences with mentee</td>
<td>Keep confidences with mentor.</td>
</tr>
<tr>
<td>Work out any minor concerns about the relationship.</td>
<td>Work out any minor concerns about the relationship.</td>
</tr>
<tr>
<td>Evaluate the relationship at various Points.</td>
<td>Evaluate the relationship at various Points.</td>
</tr>
</tbody>
</table>
### Unreasonable Expectations Regarding Mentors

There are some common unrealistic expectations of mentors that can cause irritation and disappointment on both sides. As a general guideline, the mentor should not be expected to:

- Provide the mentee with personal introductions to other people unless they’re comfortable doing so.
- Spend more time on the relationship than he or she is able to give.
- Take the lead in the relationship, setting up all meetings and driving the mentee’s career development.
- Continue the relationship beyond the agreed-upon time period.

### Specific Tips for Mentees

These practical strategies can help mentees build a relationship with their mentors:

- Remember that you own your development, your mentor doesn’t. It’s up to you to identify objectives as well as keep the relationship focused and moving forward.
- Use active listening skills in discussions with your mentor.
- Be prepared to ask for specific advice on your skill set, ideas, plans, and goals. The more specific you are, the easier it will be for your mentor to respond.
- Be complete yet succinct in your comments and explanations.
- Make it easy for your mentor to give you honest, specific feedback. Ask for it early in your relationship.
2018 RESEARCH OPPORTUNITIES

AFRICA

Nigeria: Health Systems Capacity Building for Advanced Neuroimaging

University of Chicago Mentor: Steffen Sammet, M.D., Ph.D.
Site Mentor: Godwin Ogbole, M.D.
Project Title: Medical Imaging Research

Project Description: The objective of this research project is to build and expand research and diagnostic capabilities in a West African university hospital. Specifically, capacity building will focus on the expansion of medical imaging post-processing capabilities for a better diagnosis of neurological diseases at the University College Hospital in Ibadan, Nigeria. Fellows will be introduced to medical imaging methods and advanced imaging post-processing techniques, such as computed tomography (CT) and magnetic resonance imaging (MRI) technologies. These, and other quantitative methodologies, will be used for the diagnosis and treatment monitoring of neurological diseases, such as brain tumors, brain/head injuries, or strokes.

Nigeria: Developing Interdisciplinary Research Network for Sickle Cell Studies in Nigeria

University of Chicago Mentor: Paula Jaudes, M.D.
Site Mentor: Obiageli Nnodu, M.D., F.W.A.C.P.
Project Title: Developing Interdisciplinary Research Network for Sickle Cell Studies in Nigeria

Project Description: Sickle cell disease (SCD) was first identified among individuals of African ancestry in 1958, but very little progress has since been made to improve the lives of children born with SCD in Africa or to find faster cures for the disease. The purpose of this project is to build local research capacity for Sickle cell disease by supporting an interdisciplinary, multi-institutional team of basic, clinical, and population scientists at the Universities of Ibadan and Abuja. Fellows will have opportunities to carry out research projects on various aspects of SCD, such as developing educational materials for parents, monitoring a database to identify patients for neonatal screenings, or collecting and screening samples at community-based immunization centers. The long-term objective of this project is to promote health equity by improving research that will prevent and treat SCD, improving the lives of patients already living with SCD, and increasing the capacities of researchers and clinicians in Ibadan, Abuja, and elsewhere in Africa.

CENTRAL AMERICA

Honduras: Understanding the dynamics of Local Health Systems in Honduras

University of Chicago Mentor: Alan Zarychta
Site Mentors: Justa Urbina, Pedro Castillo Milla, Laura and Paul Manship
Project Title: Understanding the Dynamics of Local Health Systems in Honduras

Project Description: This project assesses the effects of health sector decentralization reform and investigates the institutional conditions that shape the performance of local health systems in developing countries. It draws predominantly on administrative, survey, and social network data from the country of Honduras. This research is of immediate practical value as countries around the world struggle to effectively administer health systems and improve community health. Because all in-country research is conducted in Spanish, a minimum of professional working proficiency in Spanish is required. There are three project opportunities in Honduras:

1. Support the implementation of a third wave of health workers across the state of Intibucá, Honduras. This project will draw on research and methodologies from public administration, public health, and political science to understand the attitudes and behaviors of frontline service providers.
2. Support the implementation of a pilot study focusing on the health and sustainability impacts of difference management strategies for community water systems in Intibucá, Honduras. This project will draw on research and methodologies from economics, public health, and sustainability science to understand the institutional conditions that shape local collective action.
3. Support the implementation of interviews and qualitative case studies investigating mechanisms linking health sector reform to community health outcomes in several Honduran municipalities. This project will draw on research and methodologies from sociology, political science, and health policy to understand how administrators, service providers, and community
leaders influence the effectiveness of policy reforms.

Panama: Infectious disease and tropical medicine

**University of Chicago Mentor:** Rima McLeod, MD  
**Site Mentors:** Xavier Saez Llorens, MD  
**Project Title:** Improving Understanding of Toxoplasmosis in Panama

**Project Description:** Compare what is required to establish Toxoplasma Centers in Panama and Morocco, including a project that establishes clinical phenotypes, and genotypes of parasites causing congenital toxoplasmosis in the U.S., Panama, and Morocco. This includes evaluations of families of those with toxoplasmosis and controls. It will include determining whether parasites causing infections in these areas contain epitopes included in a protective vaccine currently being developed in the Toxoplasmosis Center and Research Program at the University of Chicago and whether parasites from these areas are susceptible to standard antimicrobial agents. At the end of the summer, at a minimum language, findings in sero negative and sero positive healthy adults will be compared and the methodology for determining genotypes of parasites and immune function for persons in each region established. The 20 sero positive persons in the U.S. and their controls will be genotyped and tested for response to peptides. This will create the groundwork for similar studies in Panama and Morocco. An understanding of the health infrastructure and how health policy is developed for the three areas will be compared and an understanding of the clinical phenotypes of this disease will be established. The project will involve learning about the following; Clinical evaluation and findings for those with toxoplasmosis and other infectious diseases occurring in these different areas; What is involved in public health policy formulation and development of effective programs to diagnose and treat infections in different areas; Hands-on laboratory techniques: Sero diagnosis; Tissue culture; Biosafety techniques; Parasite isolation; Genotyping; Sequencing; Bioinformatics; Understanding the unique clinical problems and challenges for these processes in each specific area; Methods of language and memory, smell and reward testing; Assessing dopaminergic and connectivity brain functions in healthy persons in a noninvasive manner. The aim is to establish clinical phenotypes and genotypes of parasites causing congenital toxoplasmosis in the U.S., Panama, and Morocco and compare the health infrastructure and policies in the U.S., Panama, and Morocco.

CARIBBEAN

Haiti: Clinical Demographics of Pre-eclamptic and Eclamptic Patients at HUM in Haiti

**University of Chicago Mentor:** Sarosh Rana, MD, MPH, FACOG  
**Site Mentor:** Christophe Millien, MD  
**Project Title:** Clinical Demographics of Preeclamptic and Eclamptic Patients at HUM in Haiti

**Project Description:** Zanmi Lasante (ZL) is the largest nongovernmental health provider in Haiti, serving an area of 1.3 million people with a staff of 5,400 Haitians. In 2013, ZL opened Hôpital Universitaire de Mirebalais (HUM), a 300-bed teaching hospital that provides high-quality education for the next generation of Haitian health care professionals. Dr. Sarosh Rana of the University of Chicago Medical Center is a Perinatologist and section Chief of Maternal Fetal Medicine at UChicago. Dr. Rana’s research is mostly focused on improving prediction of adverse outcomes related to preeclampsia. The purpose of this study will be to help analyze clinical demographics of patients diagnosed with preeclampsia/eclampsia in a tertiary referral center in rural Haiti, and the associated adverse outcomes including eclampsia, placental abruption, acute pulmonary edema, cerebrovascular accident, HELLP syndrome, maternal deaths as well as fetal/neonatal deaths. The results of this research will support the implementation of pregnancy management protocols and treatments that will reduce high rates of maternal and fetal mortality related to preeclampsia.
**AFRICA**

### Ghana: Community development

**University of Chicago Mentor:** Sola Olopade, MD  
**Site Mentor:** Daniel Ansong, MD

**Project Description:** CGH partners with FASUL (Family Support Lifeline), a Ghanaian NGO based in Kumasi to provide essential services to poor rural communities. Over the past ten years, community development efforts have focused on providing basic infrastructure including over 60 wells, dozens of schools, and nutrition programs in rural villages that lack these basic resources. Currently, the project is focused on building depth in two communities to serve as a model for intensive, integrated development schemes that enhance local capacity and improve health outcomes in the communities. Students will actively engage with FASUL and the local communities to contribute to these rural development efforts. Potential projects include developing health education modules for community health workers with particular emphasis on two areas of local need identified in a recently conducted health survey, malaria and hypertension; youth programming to provide safe spaces for youth to develop social and technical skills to prepare them for secondary school or entering the job market; and an assessment of school retention, enrollment and post-graduation performance for students in Abesua who have access to a newly constructed computer lab.

### Ghana: Women’s and children’s health and well-being

**University of Chicago Mentor:** Sola Olopade, MD  
**Site Mentor:** Daniel Ansong, MD

**Project Description:** CGH has conducted research in the Kumasi Maternal and Child Health hospital (MCHH) on outcomes associated with short (<8 hour) post-delivery discharge from the hospital and health outcomes of women and children. Potential projects may include assessment of referral system between MCHH and Komfo Anokye Teaching Hospital; an under-five mortality review; respiratory disease in children and exposure to household air pollution; diabetes treatment and prevention; and exploration of traditional markets and medical practices in Ghana.

### Nigeria: Genomics and chronic non-communicable diseases - Diabetes

**University of Chicago Mentor:** Louis Philipson, MD  
**Site Mentor:** Williams Balogun, MBBS

**Project Description:** Diabetes mellitus is increasing throughout the world in both developed and less well-developed countries at an astounding pace. The economic and health burden is huge and growing, threatening entire economies over the next 10 years. Genetic factors contribute to the development of the various forms of diabetes, but the ones we know the most about are monogenic causes. These together constitute 1-2 of all cases that occur before the age of 35, but the implications for treatment and future generations can be profound. This is because one type of monogenic diabetes, one of the most common causes by mutation in the glucokinase gene (MODY2) has no health consequences and requires no treatment. Other types such as some forms of neonatal diabetes and that causes by mutations in HNF1A can be treated with inexpensive pills. All of these are dominant disorders and so each child will have a 50% of having the same mutation. The diagnosis of monogenic types needs genetic testing for confirmation. However genetic testing is still expensive, and requires careful selection of patients in order to identify those with high chance of having the disease. To do this, one immediate challenge is the overlapping features of phenotypes of diabetes. Classically, patients with monogenic diabetes are young (below 25-35 years), lean and have positive family history of diabetes 2 or 3 generations. However patients with type 1 diabetes may also present with this phenotype. For example, patients with type 1 diabetes are also young and lean like MD, while patients with MD do not have autoantibodies nor require insulin like type 2 patients. To compound the problem, monogenic diabetes is heterogeneous and as such individuals with the condition may not present in the classical form. There is therefore a need for helping physicians to recognize these forms of diabetes, and to have a locally relevant diagnostic algorithm to help physicians arrive at a point they can confidently refer likely patients for genetic testing. Diagnostic decision models have been used successfully in other diseases but have not yet been applied to genetic causes of diabetes in international settings.

Students would help with construction of family pedigrees with diabetes, create a database to understand the incidence and prevalence of inherited forms of diabetes, help local physicians understand the role of genetics in all forms of diabetes, sort out the law and policy that create barriers to genetic testing for diabetes, and help create local technology for medical genetics working with local institutions in partnership with the University of Chicago.
Nigeria: Genomics and chronic non-communicable diseases - Sickle Cell Disease

University of Chicago Mentor: Funmi Olopade, MD, FACP
Site Mentor: Adeyinka Gladys Falusi, PhD
Project Title: Developing an Interdisciplinary Network for Sickle Cell Studies in Nigeria

Project Description: Nigeria has the highest burden of Sickle cell disease (SCD) in the world and contributes 75% of infant SCD in Africa. Over 50% of children with SCD will die before their fifth birthday if undetected and properly managed. SCD is thus a major contributor (8%) to mortality in under-fives. Currently over 90% of affected individuals are diagnosed at manifestation most often after the age of 1 year. This leads to a high severity index of under-5 mortality rate of SCD patients in Nigeria. Early detection of the disorder and prompt commencement of appropriate medical treatment will be tested in primary health care centers. Treatment includes antibiotic prophylaxis (penicillin) for S. pneumonia, which is one of the early life-threatening complications of untreated SCD disease, antimalarial, specific vaccinations such as BCG, DTP, OPV, Measles, etc., folic acid supplementation and continuous medical follow-up for the first 5 years of life of affected children. Identifying newborns with SCD also facilitates the education of parents and caregivers about early treatment of crises, pain relieving measures through palliative care, prevention of complications through adequate nutrition and hydration. These measures will reduce morbidity, reduce complications and improve quality of life. 10,000 neonates from Ibadan and other collaborating centers including Gwagwalada Area Council will be screened. From this population, about 250 SCD-affected neonates are expected to be diagnosed (from an estimated prevalence of 2-3% in Nigeria). These infants will be followed up from 2 months to 5 years at the Pediatric clinics in the respective hospitals.

This project is a multi-disciplinary collaborative project to screen 10,000 newborns and infants attending primary health care centers in Ibadan and Gwagwalada Area Council of the Federal Capital Territory for SCD. A pilot study was conducted by a medical student from the University of Chicago this past summer to assess the willingness of the community to participate in neonatal screening. Results show that 70% of the mothers are willing to have their babies screened. The aims are to develop an education program to increase awareness and education of Sickle Cell Disease in the general population and to provide training for diagnosis and genotyping of SCD at the Institute of Advanced Medical Research & Training, University of Ibadan.

Nigeria: Global mental health

University of Chicago Mentor: Seeba Anam, MD
Site Mentor: Chioma Asuzu, PhD
Project Title: Correlations between measured effects of breast and cervical cancer and mental health at the University College Hospital in Ibadan, Nigeria

Project Description: Studies have been done in various regions of the world to examine predictors of mental illness amongst patients with cervical cancer and have found that modes of treatment of cervical cancer (radiation or surgery) can have differing effects on factors such as mental health, psychosocial distress, and sexual functioning (Frumovitz et al, 2005). It has also been shown that the diagnosis of a gynecologic cancer can induce mental health issues such as anxiety and depression in patients (Suzuki et al, 2011, Drolet et al, 2012). Similar studies have been done with breast cancer. In a study aimed at identifying predictors of clinical distress in breast cancer patients, researchers found that fatigue, lack of muscle strength, experience of a low level of life satisfaction, more frequent cancer, and neuroticism were predictors of clinical distress (Wong et al, 2016). A study of Nigerian women with breast cancer found that low income, absence of previous history of breast cancer, and early stage of breast cancer were significant determinants of anxiety disorders (Fatiregun, 2016). Despite such studies, there is a gap in understanding of what domains of well-being correlate most with mental health and quality of life in Nigerian women with cervical cancer and breast cancer.

The current study aims to identify correlations between several domains of well-being (physical, family/social, emotional, functional) with mental health in Nigerian women with cervical cancer and breast cancer. This study is descriptive, cross-sectional, quantitative study. The study consists of questionnaires that will measure the variables to be correlated (domains of well-being with mental health). The study is being conducted at University College Hospital in Ibadan, Nigeria in oncology departments including gynecologic oncology and radiation oncology. The population for this study is Nigerian adult women diagnosed with breast and cervical cancer.

Nigeria: Environmental health

University of Chicago Mentor: Sola Olopade, MD
Site Mentor: Mary Balogun, MD
Project Title: Exposure to benzene, toluene and xylene and lung function and biomarkers of genotoxicity and oxidative stress in petrol station attendants in Ibadan, Nigeria

This study evaluates Exposure to benzene, toluene and xylene and lung function and biomarkers of genotoxicity and oxidative stress in
petrol station attendants in Ibadan, Nigeria. Petrol filling stations belong to the downstream sector of the oil and gas industry, which is a major driver of many economies, including Nigeria. Millions of automobiles on Nigerian roads run on PMS (Premium Motor Spirit) or diesel fuel with an additional increased use of PMS and diesel in large and small scale-industries scale due to poor and irregular supply of electricity from the National grid thus increasing exposure of Petrol Station attendants (PSAs). Currently there are 26,684 petrol stations in Nigeria with an increasing number of female petrol station attendants. Benzene, toluene and xylene (BTX) are the commercial petroleum aromatics in petrol (gasoline) and could be easily absorbed through the respiratory tract and skin. Petrol station attendants are therefore exposed to BTX. Exposures to BTX are known to cause genotoxicity. Exposure to benzene generates metabolites that induce oxidative stress and damage to DNA Impaired respiratory functions from exposure to PMS have been reported among petrol filling station workers. Recent studies using systematic reviews and meta-analysis suggest exposure to traffic-related air pollutants, Particulate Matter 2.5 micrometers (PM2.5) and Nitrogen dioxide (NO2) are possible risk factors for Type 2 Diabetes and Hypertension. PSAs do not have pre-employment medical examinations or regular medical checkups to detect potential serious effects of the exposures they may have. No study in Nigeria has evaluated blood levels of BTX in PSAs and their genotoxic and oxidative stress effects. This will be the first study to assess diabetic risk among PSAs in order to establish an association between exposure to BTX and diabetes. Almost all studies on PSAs have been among male PSAs. This study will determine frequency of chromosomal aberrations in female PSAs. We hope to generate empiric data to support pre-employment medical examination, regular program for health surveillance of PSAs including biological monitoring and clinical examinations, as well as the possibility of using PPEs, vapor recovery systems and instituting self-service fuel.

The aim of this study is 1. To assess workplace hazards and health problems of petrol station attendants 2. To analyze and compare personal air sample concentrations of BTX and PM2.5 in petrol stations and workplaces of controls. 3. To evaluate and compare urine levels of BTX in petrol station attendants and controls. 4. To evaluate and compare selected biomarkers (urinary 8-oxoDG , superoxide dismutase, malondialdehyde and C-reactive protein) for genotoxic and oxidative stress effects of BTX in petrol station attendants and controls. 5. To assess and compare pulmonary function parameters in petrol station attendants and controls. 6. To assess and compare HbA1c and Fasting plasma glucose (FPG) petrol station attendants and controls. The study is a comparative cross-sectional study. Cluster sampling technique will be used to select three out of the five urban local government areas in Ibadan. A total sampling of all PSAs in these LGAs will be interviewed. For Aims 2,3,4,5 and 6, one LGA will be selected out of the three LGAs. All PSAs in the selected LGA will be recruited. Controls (Tailors) will be matched for age, sex and smoking habits with the study group. Personal exposure monitoring, spirometry, biomarker assays for exposures and breakdown products of exposures, anti oxidants as well as HbA1c assays will be determined and comparisons made between the exposed and control groups.

**Nigeria: Environmental health**

**University of Chicago Mentor:** Sola Olopade, MD  
**Site Mentor:** Pragna Rao, MD, PhD  
**Project Title:** HAP exposure, olfaction and nasal microbiome

Concentrations of household air pollution (HAP) from biomass smoke have been associated with many adverse health consequences in adults including Type 2 diabetes, hypertension, cardio and cerebrovascular changes, impaired olfaction, lung function, cataracts, various cancers, and all-cause mortality. The upper airway is the portal of entry of household air pollution (HAP) and represents an accessible site for evaluation of its effects on respiratory disease. Indeed, increased exposure to air pollution has been linked to elevated nasal and lung symptoms. Components of nasal physiology, such as olfaction, are at high risk from injury due to air pollution. The olfactory nerve, by necessity of its function in chemosensation, is directly exposed to inhaled air and therefore subject to the deleterious effects of pollutants, both directly due to neurotoxicity and indirectly due to inflammation. The olfactory nerve is a pathway for pollutants to the central nervous system, and therefore may also reflect injurious neurologic effects as well. Olfactory loss is an independent risk factor for 5-year mortality and particulate matter exposure is associated with olfactory loss in older adults. Thus, decreased olfaction may represent a relatively unique and sensitive biomarker of exposure to HAP, with major health implications worldwide. Despite the magnitude of the problems associated with exposure to burning biomass, epidemiologic data on the associated olfactory changes is lacking. This study will examine the change in olfaction in adults between the intervention group (ethanol-using women) and control group (firewood/kerosene-using women). We will also examine the question of whether HAP affects microbes in the upper airway.

To evaluate the change in olfactory function due to HAP exposure and compare these changes between two groups of women: intervention group who has been randomized to cook using ethanol, and the control group who will continue using firewood/kerosene as cooking fuel. We will also investigate the impact of HAP exposure on nasal microbiome in the different study groups to test the hypothesis that nasal inflammation from HAP influences airway microbe composition. Olfactory function will be evaluated using commercially available Sniffin’ Sticks smell pens (Burghart Medical Technology, Wendel, Germany). Sniffin’ Sticks reliably deliver the same concentration of n-butanol with each presentation for at least 3 years with correct use and proper storage, including in large field studies across climates. Nasal brushing samples will be obtained using standard methods for large field studies (e.g., the Human Microbiome Project).
Prolonged exposure to naturally occurring high levels of arsenic has been associated with cancers of the skins, lung, bladder, liver and kidney. Arsenic poisoning has also been linked to cardiovascular, endocrine and neurodevelopmental disorders. Hallmarks of chronic arsenic exposure include skin lesions, peripheral neuropathy and anemia. The onset of arsenic exposure in Bangladesh began in the 1970s with the introduction of hand-pumped tube wells. While these sources of clean water helped to reduce the incidence of waterborne illnesses, the tube wells also unwittingly exposed a large portion of the Bangladeshi population to water with naturally occurring high-levels of arsenic. As a result, as many as 70 million Bangladeshis are chronically exposed to arsenic through drinking water. The WHO has called this catastrophe “the largest mass poisoning of a population in history.” In 1999, the Mailman School of Public Health of Columbia University, with funding from the National Institutes of Health (NIH), initiated the “Health Effects of Arsenic Longitudinal Study (HEALS)” study in Araihazar. The purpose of this study was to evaluate the effects of arsenic exposure at different levels on various health outcomes. In 2006, the University of Chicago established a local non-profit affiliate – University of Chicago Research Bangladesh (URB), which joined forces with Government of Bangladesh health authorities to assume responsibility for most aspects of the study. NIH continues to fully fund the arsenic exposure research in Araihazar. URB currently operates a well-equipped research laboratory at Araihazar for processing and storing biological samples as per research protocols. URB also established a primary health care center in Araihazar in 2000. Approximately 100 study participants and their families receive care at the facility each day. URB also supports safe motherhood services in the community to improve maternal and child health outcomes. The overall goal of our work is to improve equity in health, reduce risks, and determine the determinants for health and its appropriate intervention.

In Bangladesh, as in other lower- and middle-income countries, the weak research infrastructure reduces the efficiency of research projects that are undertaken, as many Bangladeshi institutions do not have the complete set of skills (technical, statistical, management, methods, or community engagement skills) to undertake a successful research project and disseminate the results. Morbidity and mortality from non-communicable diseases (NCDs) is growing in these countries, and there is growing evidence that country-specific research is needed to identify risk factors that are unique to the context of LMICs. With the resources of this RCRE grant, we would (1) identify institutions that already have expertise in research practice, and develop a formal framework that encourages the sharing of this expertise across institutions, increasing the efficiency of research by supporting a division of labor (2) increase the robustness of the identified existing expertise by research enhancement activities that allow the collaborators at the partner institutions to hone their skills and disseminate the results of their research and (3) use two pilot projects to engage the newly-formulated RCRE protocol, using the expertise of the RCRE’s shared core facilities and enhancing their research capacity.

Collaborators at the University of Chicago have a long history of collaboration with institutions in Bangladesh, including a 15-year history of collaborating with Bangabandhu Sheikh Mujib Medical University (BSMMU), the only full medical university in Bangladesh. With this local knowledge, the two lead institutions (UC and BSMMU), selected 6 additional regional research institutions to collaborate with. These six additional institutions will make up the shared core facilities of the RCRE, and will implement aspects of a research protocol that are relevant to their expertise. The shared core facilities are National Institute of Cancer Research & Hospital (NCRH), the National Institute of Cardiovascular Diseases (NICVD), University of Chicago Research Bangladesh (URB), Bangladesh Rural Advancement Committee (BRAC), National Institute of Neurological Diseases (NIND), and the Indian Institute of Chemical Biology (IICB). In addition Directorate General of Health Services of Government of Bangladesh will also be a partner in this RCRE. Each of these institutions has a proven ability to excel in one of the five areas of research expertise we identified: clinical and diagnostics; data management, statistics, and
After formally establishing this RCRE, we will implement two pilot research projects whose research topics reflect two key areas of NCD research: the establishment of a pathology-based cancer registry in the capital, Dhaka; and the relationship between the microbiome (which varies greatly between populations) and cardiovascular disease. Each of these pilot projects will be undertaken with the collaboration of the RCRE shared core facilities, and supported by workshops, short courses, and colloquium that have been developed to enhance the existing capacity of the RCRE members. This formal network of collaboration will strengthen the capacity of local researcher to investigate the determinants of NCD in local populations, and lead to better-informed policies and care.

**China: Medical education and training**

**University of Chicago Mentor:** Renslow Sherer, MD  
**Site Mentor:** Jingyi Fan, MD; Jonathan Lio, MD  
**Project Title:** Wuhan University Medical Education Reform (WUMER) Project Evaluation

**Project Description:** Since 2009, the WUMER Project has provided technical assistance for the reform of the Wuhan University Medical School curricula and pedagogy based on a modified version of the Pritzker School of Medicine Pritzker Initiative. Using both general and focused course surveys, we have explored the attitudes, knowledge, and beliefs of students and faculty towards reforms in courses in the basic sciences (Human Body; Cells, Molecules, and Genes; Tissue and Function; Response to Injury; Clinical Pathophysiology and Treatment (CPPT); Clinical Skills and U Early Patient Contact; Clinical Reasoning; and the Clinical Clerkships in Medicine, Surgery, Family Medicine, Pediatrics, Ob-Gyn, Neurology, and Psychiatry). More recently, the WUMER Project has provided technical assistance for the development of Residency Training Programs at the WUMS teaching hospitals. Several adjunctive activities have been initiated by WUMER’s participatory students and faculty, including characterization of mental health care and its medical curricular contents; description of geriatric and palliative care services and its medical curricular contents; and the use of traditional Chinese medicine in community health centers and its relationship to Western Medicine; investigation on the development of interdisciplinary studies such as Clinical Ethics, Communication Skills and Doctor-Patient Relationship.

The aims of this project are to assess faculty and student knowledge, attitudes and beliefs regarding medical school curriculum reforms and graduate medical education reforms and to assess student performance on knowledge assessments in specific disciplines, and to compare performance in reform students compared to standard curriculum students. Following verbal informed consent and an introduction to the survey, students and faculty complete surveys regarding general and course-specific curriculum reforms. Specific questions related to the specific course are included. Students are requested to dedicate 2/3 of their time in Wuhan towards the SRP and WUMER goal of the project, and encouraged to pursue independent interests for the remaining 1/3 of their time.

Interdisciplinary focus areas include medical education policy making, curriculum development; integration of clinical medicine in basic science learning, and reverse learning of basic science in clinical years; relationship between Chinese traditional medicine and western medicine; incorporation of humanistic elements in medicine, ethics, sociology, anthropology, law; transition from learners to practitioners, transition from classroom learning to clinical learning, from hospitals to community medical centers.

**India: Environmental health**

**University of Chicago Mentor:** Jayant Pinto, MD  
**Site Mentor:** Avinash Shetty, MD, PhD  
**Project Title:** Impact of household air pollution on olfaction, pulmonary, and cognitive function in rural Indian women (HAP-India)

**Project Description:** Household air pollution (HAP), resulting from the burning of unclean fuels, is one of the leading environmental causes of death in the world, contributing to over 3.5 million premature deaths annually. However, the cellular impact of these environmental toxins is not appreciated fully at this time. Exposure to HAP could affect the olfactory apparatus and the brain itself. Indeed, the nose houses the olfactory nerve, making it uniquely susceptible to airborne insults and provides a direct pathway for environmental toxicants (and pathogens) to reach the brain and the lungs, where they can trigger oxidative stress and set off local and systemic inflammation. We have recently shown that exposure to fine particulate matter (particles <2.5µm in aerodynamic diameter, [PM2.5], a major component of HAP) is independently associated with impaired olfaction. Furthermore, we have also shown that HAP exposure in low to middle income countries (LMIC) contributes to systemic inflammation and has adverse impacts on pregnancy outcomes, cardiovascular health, and lung function in women and children. Because in many traditional societies, women are responsible for cooking indoors, they face the highest risks from HAP. Understanding how HAP predisposes to olfactory impairment and related cognitive performance would allow critical contributions to the basic understanding of the nervous system, with major implications for downstream neurological, respiratory, cardiovascular, maternal-fetal, social and behavioral outcomes. Such knowledge would have an enormous global impact on women’s health. PM2.5 has been identified in the olfactory bulb (OB), and this may be a route by which air pollution mediates detrimental effects on the central nervous system more broadly. Indeed, inhaled nanoparticles within the PM2.5 fraction translocate to the OB following deposition.
in the olfactory epithelium in animals, and early epidemiologic and pathologic evidence indicates that exposure to air pollution may impair cognition and accelerate cognitive decline via brain deposition. Taken together, these results provide strong support for the intriguing concept that air pollution may exert its negative neurosensory consequences via effects on the chemosensory system. Here, we propose a novel, innovative discovery paradigm that will generate important information on the relationship between exposure to HAP and neurosensory function. We have crafted a unique partnership between The University of Chicago (UChicago) and the Kasturba Medical College (KMC) of Manipal, India, uniting together experts from both nations. We will leverage ongoing studies investigating the pattern of household fuel use and its health effects on women and under-five children in southern part of coastal Karnataka, India by KMC. In this well-characterized cohort of 50,000 people we will randomly select 500 households and quantify the relationship between HAP exposure, objectively measured olfaction, and cognitive function in XX women. In parallel, we will test whether the relationship between HAP and cognition is mediated clinically by detrimental effects on nasal parameters and/or pulmonary function. Specifically, we will determine if HAP is associated with altered nasal microbiota, providing some of the first evidence of a nose-brain axis, or, alternatively, whether HAP exerts its potential adverse effect on cognition via systemic inflammation or oxidative stress generated in the lower airway.

Our hypothesis is that HAP impairs olfaction and cognitive function in rural Indian women, via either local microbial or inflammatory effects in the nose and/or systemic effects related to the lung. To test these hypotheses, we propose to: (1) quantify the relationship between HAP and a) olfaction and b) cognition in XX rural Indian women who live in Karnataka and are enrolled in community health projects led by KMC; and (2) determine the extent to which HAP is associated with a) upper airway inflammation and particular nasal microbiota profiles and/or b) systemic markers of inflammation and oxidative stress mediated by lower airway effects; and c) assess the degree to which these factors explain the relationship between HAP and neurosensory function.

India: Environmental health

University of Chicago Mentor: Sola Olopade, MD & Kristyna Hulland, MSPH
Site Mentor: Sanjay Pattanshetty, MD
Project Title: Environmental hygiene assessment with emphasis on water, sanitation and hygiene (WASH) in health facilities in Udupi Taluk

Project Description: Sustainable development goals, which followed millennium development goals, aim to provide good health, fresh water and sanitation for households, schools and health facilities. It also targets improving maternal and child health. Thirty two per cent of the world’s population – 2.4 billion people – lack improved sanitation facilities and 663 million people still used unimproved drinking water sources according to the latest estimates of the WHO/UNICEF Joint Monitoring Program for Water Supply and Sanitation (JMP), released in early 2015. The provision of WASH in health care facilities helps to prevent infections and spread of various diseases. Water, Sanitation and Hygiene WASH in health facilities is one of the areas that need to be addressed. Globally 38% of healthcare facilities in low and middle-income countries lack access to even rudimentary levels of water and sanitation facilities (UNICEF-WHO 2015). WASH has always been the priority in most of the water and sanitation related programs. A situational analysis of WASH facilities at healthcare facilities could generate an evidence regarding status of WASH at health centers. This evidence could be used as an action document to advocate for WASH facilities in health centers. The project aim is to assess water, sanitation and hygiene situation in healthcare facilities so as to understand strengths and barriers in the management of WASH in health facilities through a mixed methods, cross sectional study.
PRIOR PROJECTS

2017

AFRICA

CHINYE LJELI | The College 2018, Biological Sciences
Abuja, Nigeria
University of Chicago Mentor: Dr. Funmi Olopade
Site Mentor: Atinoke Ibrahim

Chinye Ljeli is a rising fourth year undergraduate in the College majoring in Biological Sciences. This summer, she spent seven weeks working on a sickle cell disease-focused public health project in Abuja, Nigeria. Specifically, she aided the setup of sickle cell screening programs in Abuja schools. She conducted interviews and administered surveys at the University of Abuja Teaching Hospital in order to explore the relationship between gender and psychosocial effects of the disease. After graduation, she hopes to obtain MD and MPH degrees and work as a public health administrator.

SARAH CHUNG | Harris School of Public Policy
Lagos, Nigeria
University of Chicago Mentor: Dr. Sola Olopade
Site Mentor: Dr. Kikelomo Ololade Wright

Sarah Chung is a first-year Master of Public Policy/Graduate Program in Health Administration and Policy (GPHAP) student at the Harris School with a particular interest in environmental health. Before coming to the University of Chicago, she majored in International Development at UCLA, and she hopes to do a Ph.D in either Public Policy or Public Health after obtaining her master’s degree. In the summer of 2017, she spent eight weeks in Nigeria working on the Lagos-based Household Air Pollution (HAP) case study, which is funded by the African Development Bank and National Institute of Health. Within this research study, she was interested in barriers and adoption of clean cooking technology through estimating willingness to pay for the clean cookstoves.

ISABELLA PAN | The College 2018, Comparative Human Development
Ibadan, Nigeria
University of Chicago Mentor: Dr. Sola Olopade, MD, MPH
Site Mentor: Ganiu Arinola, PhD

Isabella Pan is a fourth-year undergraduate in the College who is majoring in Comparative Human Development, with an interest in global health and human rights. This summer, worked on a Household Air Pollution (HAP) project in Ibadan, Nigeria. She sought to characterize the relationship between pollution exposure and loss in olfactory function in order to understand the broader public health implications of HAP. She worked under the direction of Dr. Sola Olapade and the Healthy Life for All Foundation.

WHITNEY GEORGE | The College 2019, History Philosophy and Social Studies of Science and Medicine (HIPS)
Kumasi, Ghana
University of Chicago Mentor: Dr. Nana Fenny
Site Mentor: Dr. Daniel Ansong, MB, ChB

Whitney George is a third-year undergraduate majoring in the History, Philosophy, and Social Studies of Science and Medicine (HIPS). This summer, she traveled to Kumasi, Ghana to study barriers and challenges to immunization under the Expanded Program of Immunization (EPI). She surveyed caregivers and healthcare providers in immunization facilities in both urban and rural settings under the mentorship of Dr. Daniel Ansong. She hopes to continue to engage in global health work in the future and go to medical school after college.
Cindy Du is a fourth-year in the College majoring in biological sciences and minoring in the History, Philosophy, and Social Studies of Medicine (HIPS). This summer, Cindy worked at the University of the Witwatersrand in Johannesburg, South Africa. She worked on two projects on breast cancer in South Africa, and was mentored by Dr. Funmi Olopade, Dr. Sarah Rayne, Dr. Amanda Krause, and Ms. Tasha Wainstein. One project studied genetic counseling, family history, and outcomes at Helen Joseph Breast Care Clinic. The other studied variants of unknown significance in the BRCA2 gene. These two studies both aim to address the growing issue of breast cancer and its treatment in middle income countries like South Africa.

Jenny Kim is a third-year majoring in Biological Sciences who plans to go to medical school after college. This summer she spent ten weeks in Cape Town, South Africa working for the African Organisation for Research and Training in Cancer (AORTIC), a non-profit that promotes improved cancer outcomes in Africa. At AORTIC, she helped formulate and survey a special interest group that brings radiation oncologists together in order to identify research needs, share treatment practices, and address education targets. She also developed a comprehensive resource directory that maps the availability of cancer resources throughout the African continent - information that previously had not been kept up-to-date or otherwise been made readily accessible.

Rashad Crosby is a fourth-year majoring in Public Policy with an interest in Public Health, and with a minor in Cinema and Media Studies. He spent his summer studying the correlations between adolescent health and in-school policies regarding physical activity in Ibadan, Nigeria. The association between behavioral factors (attitude, social support from friends or family, eating patterns, etc.) and the levels of physical activity were assessed. He spent the first two weeks conducting interviews in classrooms from selected schools within different communities around the Oyo state. He then spent the rest of his time conducting a quantitative analysis of the observations and aid in creation of augmented health policies. Rashad's work focused on highlighting the spread of non-communicable diseases within the country among in-school adolescents.

Vivek Sarma is a fourth-year undergraduate in The College and a double major in Economics and South Asian Languages and Civilizations, with a concentration in South Asian language. This summer, Vivek spent eight weeks working on Household Air Pollution research in Lagos, Nigeria. The aim of this comprehensive research study was to stimulate and facilitate the wide-scale, sustainable adoption of safe, clean cooking solutions in underprivileged areas. After graduation, Vivek hopes to continue to pursue his interest in public and global health through either pursuing graduate school in Health Policy and Biostatistics, or through Medical School.
communities in Ghana. Specifically, she surveyed and interviewed healthcare providers and hypertensive patients in order to determine what they believe are the biggest obstacles preventing adequate hypertension care in their communities. After graduation, Gracie hopes to continue to pursue her interest in global health by attending medical school.

**MERCY LOYO | The College 2018, Public Policy Studies**
Johannesburg, South Africa  
University of Chicago Mentor: Dr. Funmi Olopade  
Site Mentor: Dr. Sarah Rayne, MBChB, MMed

Mercy Loyo is a fourth-year in The College and a major in Public Policy Studies, with a concentration in Global Health Policy, along with a minor in Human Rights. This summer, she spent ten weeks at the University of Witwatersrand in Johannesburg South Africa examining the role post-apartheid health policies play in determining the access and provision of genetic counseling services for breast cancer patients. Within this comprehensive research study, she specifically focused her time on the intersection of human rights and health care in implementing and drafting health policy that is aimed at promoting equity and social justice. After graduation, Mercy hopes to attend law school to continue to pursue her interest in international law and global health policy.

**CENTRAL AMERICA**

**DAVINA MOOSAZADEH | The College 2018, Statistics**  
Panama City, Panama  
University of Chicago Mentor: Dr. Rima McLeod  
Site Mentor: Ximena Norero, MD

Davina Moossazadeh is a fourth-year majoring in Statistics and minoring in Spanish. This summer, she studied the epidemiology of toxoplasmosis in Panama City, Panama, where the prevalence of the disease is estimated to be 50-80%. Toxoplasmosis is a parasitic disease that can cause severe birth defects, as well as neural defects in immunocompromised individuals. Davina worked to replicate studies done in other South American countries in order to determine how toxoplasmosis is spread throughout the population of Panama, what the risk factors are, and who is most susceptible to contracting the disease. Additionally, Davina examined the correlation between prevalence of the disease in Panama and other variables such as geography, race, sex, and education. Through this study, Davina hopes to add to the growing body of research aimed at developing proper prevention, diagnosis, and treatment of this disease.

**MARGARITA RAMIREZ | The College 2019, Biology**  
Panama City, Panama  
University of Chicago Mentor: Dr. Rima McLeod  
Site Mentor: Ximena Norero, MD

Margarita Ramirez is a third-year in The College, majoring in Biology and minoring in Human Rights. This summer, Margarita worked in Panama, a country with one of the highest seroprevalences of the zoonotic infection, toxoplasmosis, a disease caused by the parasite toxoplasma gondii. Margarita spent ten weeks analyzing the genetic diversity of toxoplasma gondii isolates in Panamanian wild animals. This study seeks to inform to a better understanding of pathogen-host interactions, dynamics in circles of transmission, and the evolution of the parasite, which can ultimately be applied in the medical field. After graduation, Margarita hopes to pursue her interest in global health through an MD-PhD.

**ASIA**

**STRATTON TOLMIE | The College 2018, Biological Sciences**  
Mumbai, India  
University of Chicago Mentor: Dr. Funmi Olopade

Stratton Tolmie is a fourth-year undergraduate in The College majoring in Biological Sciences. This summer, Stratton worked with the Kapoor Foundation, Tata Memorial Hospital, and other health workers and providers in the Metro Mumbai Area, India. Stratton helped perform a needs assessment with physicians, patients, and other stakeholders for the preventative oncology department of Tata Memorial Hospital. He also developed informational ‘one-pagers’ for waiting rooms at Tata that dispel common cancer myths, discuss available resources, and inform patients on the importance of proper diagnosis and treatment. He also performed econometric research on the efficacy of local programs for women affected by breast cancer. After graduation, Stratton wishes to pursue a career in global health, either through a clinical degree or through further exploring his interests in economic development and health policy.
MEERA MODY | The College 2018, Economics and Mathematics
Mumbai, India
University of Chicago Mentor: Dr. Funmi Olopade, MD, FACP

Meera Mody is a fourth-year in The College, double-majoring in Economics and Mathematics. This summer, she worked with the Kapoor Foundation and Tata Memorial Hospital, under the mentorship of Dr. Funmi Olopade. She helped to conduct a needs assessment in preventative oncology and developed waiting room material for patients. She also worked on a project regarding financial barriers patients face while undergoing cancer treatment. Her projects were informed by data from the Cancer Directory that is compiled by the Kapoor Foundation. In the future, Meera is interested in going to graduate school to pursue health economics and policy.

NORTH AMERICA

BRUNO OSORIO | Harris School of Public Policy
Chicago, Illinois
Site Mentor: Tria Raimundo

Bruno Osorio is a Master in Public Policy Candidate and Co-Executive Director of the Inter-Policy School Summit at The Harris School. He was awarded the Fulbright Scholarship and the Hank Paulson Fellowship for his graduate studies. He previously worked as Chief of Staff of the Directorate General for the Mesoamerican Integration and Development Project at the Mexican Foreign Ministry. This summer, Bruno was a Global Development Fellow at The Chicago Council on Global Affairs, where he worked on issues related to development, food security, sustainable development, and gender equality.

AFRICA

Evan Eschilmann is a Public Policy major, minoring in Biology, who has a special interest in how development and globalization influence policies, perceptions, and treatments concerning mental health. He will be working at University College Hospital in Ibadan, Nigeria, where he will be doing research relating to psycho-oncology. Evan will be studying the systems of care for the mental health of cancer patients and the avenues through which treatment is sought, as well as potential obstacles for treatment program implementation.

ABIOSOLA OSO

Correlations Between Measured Effects of Breast and Cervical Cancer and Mental Health at the University College Hospital in Ibadan, Nigeria
Ibadan, Nigeria
UChicago Mentor: Seeba Anam, MD
Site Mentor: Chioma Asuzu, PhD

Christy Oso is a fourth year in the College majoring in Psychology. She will be working with psycho-oncologist Dr. Chioma Asuzu in Ibadan, Nigeria. Her research project is aimed at determining the effect of the loss of fertility in cervical cancer patients on their mental health and quality of life compared to cervical cancer patients with preserved fertility. She will conduct interviews and questionnaires to measure the effect. There tends to be negative social repercussions for infertile Nigerian women, so the findings of research such as this could provide a better understanding on the care and treatment such patients might require.

ADEOLUWA AYOOLA

Calculations of MODY Risk in Younger Adult Diabetic Patients in Nigeria
Ibadan, Nigeria
UChicago Mentor: Louis Philipson, MD
Ade will be traveling to Nigeria for the Center for Global Health Research Fellowship. Her research will be conducted at the University of Ibadan and the affiliated hospital. She will be studying diabetes among youth and adults of Nigeria. The project will seek to address the lack of information on the number of patients with diabetes in Nigeria, the accuracy of methods of diagnosing diabetes in patients, and the treatment methods undertaken by doctors in response to the diagnosis. She looks forward to exploring this topic with Dr. Williams Balogun, Dr. Philipson of the University of Chicago Medical Center, and Dr. Funmi Olopade. Additionally, Ade will be given the opportunity to work on a breast cancer research project at a lab in Ibadan.

MEESOH BOSSARD

Good Mother, Good Wife: Balancing Family Planning & Societal Roles in Kumasi, Ghana
Kumasi, Ghana
UChicago Mentor: Nana Fenny, MD
Site Mentor: Daniel Ansong, MD

MeeSoh will be conducting research in Kumasi, Ghana alongside Dr. Ansong at Komfo Anokye Teaching Hospital. A recent graduate of the comparative human development department, she is interested in the way socio-cultural factors affect maternal and child health. As an extension of a study conducted in Accra, Ghana concerning factors shaping practices of family planning, she will be exploring driving socio-cultural beliefs that determine female uptake of family planning. MeeSoh is excited to be digging into a qualitative research study that will engage with local women in an ardent attempt to gain insight into their perspectives. She is looking forward to the opportunity to use the knowledge gained to give back to the women and their families.

ZOE LEVINE

Evaluating Parental Knowledge of Bacterial Meningitis
Kumasi, Ghana
UChicago Mentor: Nana Fenny, MD
Site Mentor: Daniel Ansong, MD

Zoe’s project will be conducted in tandem with Dr. Daniel Ansong’s surveillance of pediatric bacterial meningitis at Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana. Once children with suspected bacterial meningitis are enrolled in the surveillance program, she will conduct interviews with patients’ parents. The aim of these interviews will be to determine the prior knowledge parents have about meningitis upon bringing their children to the hospital for care. She hopes to better understand how much parents know about meningitis prior to receiving a diagnosis, how accurate their prior knowledge is, and what they perceive as the best way to address their child’s condition. She aims to compare these findings with outcomes data to determine whether parental prior knowledge affects treatment and outcomes of children with suspected bacterial meningitis.

SEBASTIAN OTERO

Cancer in (South) Africa: The Epidemiological and Anthropological Perspective of a Growing Global Epidemic
Cape Town, South Africa
UChicago Mentor: Funmi Olopade, MD
Site Mentors: Lynn Denny, MD & Belmira Rodrigues

In countries where screening programs have been established and implemented effectively, there has been an effective reduction of the occurrence of cervical cancer in women. Yet, in countries that lack the needed resources to establish a successful screening program, cervical cancer remains prevalent and is the leading cause of cancer morbidity and mortality in many of these countries. Sebastian will be working with Dr. Lynette Denny’s research group in further looking into barriers that restrict women from receiving appropriate preventative care in South Africa. This includes broadening knowledge about screen-and-treat methods of prevention to reduce the existing barriers that exist for South African women. The aim of this research is to contribute to discussion of how to establish effective screening programs for cervical cancer in South African, and more broadly for low- and middle-income countries.

ANDREW BROOK

Cancer in (South) Africa: The Epidemiological and Anthropological Perspective of a Growing Global Epidemic
Cape Town, South Africa
UChicago Mentor: Funmi Olopade, MD
Site Mentors: Lynn Denny, MD & Belmira Rodrigues
Andrew is a second year Public Policy major at the University of Chicago. He will be going to Cape Town, South Africa to work with the African Organization for Research and Training in Cancer (AORTIC) to compile information about radiation therapy centers throughout the African continent. Additionally, he will be working on an independent research project that examines the successful early detection methods that exist in the local areas of Cape Town. He will be looking to determine the most common reasons for early screenings and the barriers to early detection that prevent a diverse community from stopping cancer while it is still early. Cancer is a growing epidemic in Africa and thus, early detection and prevention are of utmost importance.

**ALMA JUAREZ**

*Cost-benefit Analysis of Competing Solutions to the Problem of Arsenic Contamination of Water in Bangladesh*

*Araihazar, Bangladesh*

UChicago Mentor: Habib Ahsan, MD, PhD

Site Mentor: Tariqul Islam, MD

Alma is conducting a cost-benefit analysis of competing solutions for the arsenic pollution problem that is affecting the population’s health in Bangladesh. She aims to contrast the benefits on health and costs of improving heavily polluted water sources (wells) or investing in a distribution system of water from the clean sources, vis-a-vis other less capital intensive solutions that can be done at a local level (e.g. at the health clinics). This would offer a good insight of where money should be invested in order to help tackle the problem in a more efficient manner.

**MAURICIO LOPEZ**

*Cost-benefit Analysis of Competing Solutions to the Problem of Arsenic Contamination of Water in Bangladesh*

*Araihazar, Bangladesh*

UChicago Mentor: Habib Ahsan, MD, PhD

Site Mentor: Tariqul Islam, MD

Mauricio’s project consists of a cost-benefit analysis of competing solutions to the arsenic contamination problem in Bangladesh. He aims to deepen understanding of the health crisis and the relevant factors involved and gather and systematize all the relevant data inputs that will be required to perform the cost-benefit analysis. He will use the data available at UChicago Research Bangladesh to model the costs of treatment for arsenic exposure and their benefit. He will also gather external data to model the cost of the competing solution of investing in water infrastructure and its expected benefit. The final output should provide a useful guideline to policymakers of where money should be invested in order to start tackling the problem rationally.

**WINNIE TONG**

*Implications of New Resident Training Policies for Gender and Occupational Prestige in China*

*Wuhan, China*

UChicago Mentor: Renslow Sherer, MD

Standardized medical residency education may be a key factor to improving healthcare disparities in China. Beginning in 2015, new resident training programs have been implemented nation-wide by the Ministry of Health, and by 2020, all medical graduates are required to receive this mandatory training. Beyond changing healthcare provisions however, this recent policy may inadvertently contribute to gender effects, particularly for females in the medical field. I am interested in examining whether female medical residency students are currently inclined to pursue certain medical specializations for various reasons, and whether their desires to pursue medicine as a career will change given China’s new residency training standards. Furthermore, I will also ask students how they view doctor-patient trust in China and whether specific changes to current medical curriculum may improve this relationship. Thank you to the Center for Global Health, the WUMER team, and Wuhan University for the opportunity and support.

**BRAD LEE**

*Age-Period-Cohort Modeling of Breast and Cervical Cancers in China*

*Beijing, China*

UChicago Mentors: Dezheng Huo, MD, PhD & Shengfeng Wang, MD, PhD
Brad is a second year Biology major at the University of Chicago. This summer, Brad will be placed at the Cancer Institute and Hospital, Chinese Academy of Medical Sciences (CAMS) in Beijing, China. As one of the WHO's Collaborative Centers for Research on Cancer in China, CAMS integrates clinical practice with basic research and field-work and places an emphasis on cancer prevention, diagnosis, and treatment. Under the mentorship of Dr. Huo (Department of Public Health Sciences) and Dr. Wang (Department of Hematology/Oncology), Brad will analyze data collected by CAMS to establish indexes for evaluating young-onset trend of breast cancer occurrence in Chinese women.

CENTRAL AMERICA

REBEKAH SUGARMAN
Postpartum Hypertensive Disorders in Haiti
Artibonite Valley, Haiti
UChicago Mentor: Sarosh Rana, MD, MPH
Site Mentors: Harriott Sannon, MD & Hadi Ramadan

Rebekah Sugarman is a third year majoring in International Studies and minoring in Biology, and she hopes to go to medical school after college. This summer, Rebekah will be traveling to Hôpital Albert Schweitzer in Haiti, which has the world's highest rates of preeclampsia-related maternal and fetal death. Rebekah will spend her summer studying preeclampsia and post eclampsia rates in pregnant women experiencing delivery. Blood pressure, heart rate, and medical history will be recorded in order to examine adverse outcomes in relation to diagnostic criteria. Dr. Sarosh Rana and research specialist Hadi Ramadan will mentor this research.

ELEANOR KANG
Postpartum Hypertensive Disorders in Haiti
Artibonite Valley, Haiti
UChicago Mentor: Sarosh Rana, MD, MPH
Site Mentors: Harriot Sannon, MD & Hadi Ramadan

Preeclampsia is characterized by high blood pressure and protein in the urine. Eclampsia, seizures during or after pregnancy, can follow preeclampsia. Both conditions can cause pregnancy complications such as premature delivery, separation of the placenta, and blood clotting issues. Retrospective research has suggested that some women have elevated blood pressure even after childbirth (postpartum hypertension) and that there might be a link between postpartum hypertension and preeclampsia. Haiti has high rates of eclampsia and preeclampsia. Through taking chart data and measuring blood pressure after childbirth, Eleanor's research in Haiti aims to further investigate the link between postpartum hypertension and preeclampsia.

ALIYA MOREIRA
Investigating Social and Infrastructural Parameters Concerning Toxoplasmosis in Panama
Panama City, Panama
UChicago Mentor: Rima McLeod, MD
Site Mentors: Xavier Saez Llorens, MD & Mariangela Soberon

Aliya will be working on a two-pronged project to address toxoplasmosis prevalence rates and transmission within Panama. The first part of the project will be to transfer a toxoplasmosis pamphlet to an electronic format and use surveying to compare the impact and knowledge transferred from the pamphlet in both formats. The goal is to decrease the high cost of printing multiple pamphlets in the hopes of sharing information on how to avoid toxoplasmosis infection with as many people as possible. The second part of the project will be to use hospital data and surveys to map the demographics of infection in Panama in humans as compared with demographics in cats, dogs, and pigs to better ascertain which methods of transmission impact the largest number of people.

ABHINAV PANDEY
Investigating Social and Infrastructural Parameters Concerning Toxoplasmosis in Panama
Panama City, Panama
UChicago Mentor: Rima McLeod, MD
Site Mentors: Xavier Saez Llorens, MD & Mariangela Soberon

To address high prevalence of infectious disease, one needs to understand the transmission dynamics of the
organism that spreads the disease. Panama faces toxoplasmosis prevalence rates as high as 50%. To address this, Abhinav aims to create a comprehensive prevalence map of toxoplasmosis in Panama using over 3000 serum samples and epidemiological algorithms. This map will be used to identify high prevalence areas, which will be further investigated. He will be examining local feral cat populations (the most important zoonotic source of toxoplasmosis), testing water sources using PCR analysis, and will be surveying the community in these areas to investigate what leads or causes these particularly high prevalence rates. We hope that our findings can be used to inform future large studies seeking to reduce prevalence rates.

2015

AFRICA

ELIZABETH FRANK
Effect of a randomized controlled clean stove intervention study on inflammatory biomarkers in Pregnant Women in Ibadan, Nigeria
Ibadan, Nigeria
UChicago Mentor: Sola Olopade, MD
Site Mentor: Oladosu Ojengbede, MD

Elizabeth Frank is an incoming fourth year undergraduate at the University of Chicago and a double major in Biology, with a concentration in Neuroscience, along with the History, Philosophy, and Social Studies of Science and Medicine (HIPS), with a concentration global health and culture. This summer, she spent 5 weeks working on the Household Air Pollution project in Ibadan, Nigeria. Within this comprehensive research study, she specifically focused her time on the effects that different cook stove types have on the biomarkers of inflammation and oxidative stress in pregnant woman. After graduation, Elizabeth hopes to continue to pursue her interest in global health through either medical school or through international law and global health policy.

JASMINE SOLOLA
Assessing perceptions of genetic risk and breast cancer of women diagnosed and undiagnosed with breast cancer in Ibadan, Nigeria
Ibadan, Nigeria
UChicago Mentor: Funmi Olopade, MD
Site Mentor: Oladosu Ojengbede, MD

Jasmine Solola is a rising fourth year majoring in Biological Sciences at the University of Chicago. This summer she spent her time assessing the structural, social, and cultural factors that influence the perception of genetic risk and how Nigerian women diagnosed with breast cancer and women never diagnosed with breast cancer understand the illness. She is interested in developing culturally-tailored interventions to improve knowledge of genetics and its associations with breast cancer in order to increase the likelihood of successful implementation of genetic risk assessment, early detection, and prevention in this community. She hopes to pursue an MD

KONJE MACHINI
Factors Affecting the Quality of Life for Women of Diagnosed with Breast Cancer in Cameroon
Yaoundé, Cameroon
UChicago Mentor: Dezheng Huo, MD, PhD
Site Mentor: Paul Ndom, MD

Konje Machini is a rising fourth year majoring in Anthropology completing his pre-med requirements. As part of his internship with the Center for Global Health, he spent a month in Cameroon assisting with research on quality of life for people diagnosed with breast cancer. Specifically, he is looking at the relation between quality of life and time since diagnosis, as well as tumor stage. His interests in global health are in global public health NGO work and development.

RACHEL WITTENBERG
The effects of short post-delivery hospital stay on infant health outcomes at a small urban maternal and child health hospital in Kumasi, Ghana
Kumasi, Ghana
UChicago Mentor: Sola Olopade, MD
Site Mentor: Daniel Ansong, MD

Rachel Wittenberg is a rising third year in the College, pursuing a double major in Biological Sciences and Economics. This summer, Rachel worked with Dr. Daniel Ansong at the Maternal and Child Health Hospital in Kumasi, Ghana on a research project examining the effect of short post-delivery hospital stays on infant mortality and other adverse health outcomes. Rachel is passionate about global health with a particular interest in the social and economic determinants of maternal and child health. She hopes to pursue an MD with the goal of contributing to the development of sustainable and equitable systems of healthcare in resource-limited settings.

ANDREW SONG
Breast cancer and genetic risk assessment program implementation
Ibadan, Nigeria
UCHicago Mentor: Funmi Olopade, MD
Site Mentor: Oladosu Ojengbede, MD

ANDREW SONG is a rising 4th year student in the College at the University of Chicago, pursuing a degree in Biological Sciences. This summer, Andrew worked to initiate development of resources and protocols for returning individual genetic testing results to breast cancer research participants at University College Hospital in Ibadan, Nigeria. Recognizing the need for greater infrastructure to provide comprehensive breast cancer genetic counseling, Andrew also helped to coordinate implementation of a clinical database for the surgical oncology department. Currently interviewing for medical schools, Andrew aspires to become a medical oncologist at an academic medical center, combining compassionate clinical practice with global health research efforts focusing on the dynamic interplay between healthcare systems, sociocultural values, and healthcare access.