

## STATEMENT OF GRANT PURPOSE

India, Public Health

Obesity in India: Knowledge, Perceptions and Attitudes of Healthcare Professionals.

**Significance:** Obesity is no longer a public health threat unique to the developed West but a rapidly escalating problem affecting some of the poorest countries of the world. Historically, India has suffered from high rates of malnutrition, but accelerated economic growth combined with urbanization, technological advances and the nutrition transition have led to unprecedented rates of overweight, obesity, and their associated cardio-metabolic diseases. Although multiple nationwide programs are in place for the treatment of malnourishment in India, programs to address overweight and obesity are still in their infancy. The healthcare community is in an ideal position to modify the public's health beliefs, rally schools and businesses to change the nutritional environment, and lobby community leaders and government for policy changes to ensure the optimal health of their people. Therefore, through surveys and interviews, I propose to explore attitudes, perceptions and knowledge of healthcare providers with respect to obesity prevention, treatment and long term consequences.

**Location:** I will focus my research on the state of Tamilnadu which has one of the highest rates of obesity in the country. According to the 2016 National Family Health Survey, rates of overweight and obesity in Tamilnadu have increased by 95% in men and 48% in women in just the past ten years. If this pattern continues, Tamilnadu will soon face an obesity crisis similar to that of the western world. Healthcare providers, in addition to public health officials, will need to take the initiative to reverse this disturbing trend.

**Affiliation:** I plan to affiliate with the PSG College of Arts and Science under the mentorship of Dr. Lalitha Ramaswamy, Head of the Department of Nutrition and Dietetics. I collaborated with the department and Dr. Ramaswamy last year when I collected online data from their students for my Master's thesis on eating behaviors. The college has a recognized history of excellence. It is located in Coimbatore, the second largest city in Tamilnadu, and would be an ideal base from which to conduct my research. Although I did not visit the city for this study, my research indicates that it has two medical colleges, several colleges of nutrition and dietetics, as well as a robust medical community, being home to some of the state's eminent hospitals. Dr. Ramaswamy is well established both in the college and in the community, and as her letter indicates, she will be able to connect me with the appropriate resources to successfully complete my project.

**Methodology and Timeline:** I intend to start my investigation by visiting medical colleges and universities that provide training in nutrition and obesity management in the area. My plan is to meet with curriculum committees to collect information about current and planned courses in obesity prevention and management. The database should be compiled within the first month. I will use this information to prepare for the next step in which I will study the knowledge, perception and attitudes of healthcare providers. This will be done through a combination of surveys and interviews designed under the guidance of Dr. Ramaswamy. The sample will consist of community and academic physicians including primary care physicians, cardiologists and endocrinologists, as well as nutritionists and dieticians. The final size of the sample will be determined after the questionnaires are designed, but I estimate it to consist of 100 providers. I

expect the study design, subject recruitment and data collection to take approximately five months. I will spend the remaining three months analyzing the data, presenting at medical and nutrition colleges, and writing a manuscript with my mentor for future submission to an international public health journal.

Interwoven with my formal research activities, I plan to speak informally with lay persons to also get a sense of their knowledge and beliefs on obesity. Keeping a daily journal reflecting on these conversations and describing my personal observations and experiences will help me gain a deeper understanding of the nutritional environment and the barriers to preventing obesity in this population. This information could lead to articles in the popular press that would reach a wider audience in a more accessible fashion.

**Feasibility and Qualifications:** As a graduate student of Public Health, I developed the skills necessary to perform needs assessments, design studies, conduct interviews, and analyze data. For my Master's thesis, I performed a comprehensive review of the nutritional transition in India, followed by online surveys evaluating the eating behaviors and weight perceptions of over 400 students in three different colleges of Tamilnadu. I conducted this study remotely, starting with making college connections, followed by recruiting and training faculty and research assistants, and finally assisting with electronic data collection. Earlier, as part of an internship, I helped develop a toolkit for a large national multi-site CDC funded obesity prevention trial in vulnerable Latino children of Southern California. I also spent one month this summer in India performing a qualitative study of forty women on eating behaviors and breastfeeding. I designed the study independently and received IRB approval with the help of my adviser, then recruited subjects and conducted interviews. Finally, I learned much about cutting edge research into the pathophysiology and treatment of obesity as part of my specialty training in obesity. Therefore, I believe that I am well qualified and prepared to accomplish the objectives of my proposed study.

**Preparation for Grant Period:** In the months prior to the grant period, I plan to perform an extensive review of the literature of similar studies conducted in the United States. I will also carefully analyze the questionnaires used to collect the data to see if they will be culturally appropriate for India.

**Conclusion:** Several studies in the U.S. have looked at healthcare providers' perception of patients with obesity, their knowledge of diagnosis and treatment of obesity, and how these affect patient care. A few such studies have been done in India on a small scale, but none to my knowledge have been done in Tamilnadu, a large state of almost 78 million people. My study should help fill this crucial gap. Upon completion of the Fulbright grant period, in addition to disseminating my findings in India, I will continue to write academic papers with Dr. Ramaswamy. I also plan to apply the knowledge gained from my experience to help healthcare providers in the United States with online tools to treat Indian-American patients. Indians are at a higher risk for developing cardiac and metabolic diseases at lower weights than Caucasians, but very few ethnic specific resources are available to healthcare providers wanting to provide additional support for these patients, and my tools will hopefully help address this disparity. Finally, I will continue to collaborate with medical schools and hospitals here to expand training in obesity management for both primary care doctors and allied health professionals.

## Statement of Grant Purpose

Mexico, Social Work

From the Eyes of a Woman: Women in Migration and the Realm of Sex Trafficking

**My Project:** To document the correlation between women migrants and sex trafficking. I plan to carry out this project in Mexico City with the support of the local organization Instituto para las Mujeres en la Migración A.C. (IMUMI). Simultaneously I will pursue my Master's Degree in Social Work at the Universidad Nacional Autónoma de México. I am applying in order to obtain a Fulbright Graduate Degree Grant via COMEXUS. My research will consist of the following:

1. Interviewing women who have returned to Mexico City after migrating, have migrated to Mexico City, or are in the process of migration. Document a case study consisting of the following: [a] reasons for migration (economic, violence, forced/trafficked), [b] focus on their cities/towns of origin and the significance of said location (economic standing of the state, market makeup and cartel/violence presence), [c] whether they left behind a spouse, children and/or other family and if they have been reunified with them or are in the process of reunification, [d] family and community response to their return/leave.
2. This population will be reached by working with the local organization IMUMI. I will provide services such as women's health classes, yoga and Zumba. Simultaneously, I plan to help support IMUMI's grass root programs as well by interning with them.
3. My Master's pursuit will complement my research by partnering with UNAM's Programa de Investigación Feminista.

**Mexico:** Mexico City is one of the prime locations in the sex trafficking route. Its proximity to Tenancingo (the largest source of sex slaves to the U.S.), in addition to NGOs such as Asociación para el Desarrollo Integral de Personas Violadas and Centro de Apoyo a la Mujer Margarita Magon make it an ideal location for this research. Sex trafficking used to be the work of traditional family clans until the need of market diversification transferred this work into the hands of cartels. Sex trafficking is now a \$10 billion per year industry, where Mexico ranks second globally, only behind Thailand<sup>1</sup>. This is of huge concern not only to Mexican nationals but also for vulnerable migrant populations from Central and Latin America. In 2010 alone it was reported that 1.2 million people in Mexico fell victims to sex trafficking<sup>2</sup>. Due to migrant vulnerability during migration and government pressure against the drug trade, cartels have flourished in this industry. Therefore, in order to combat sex trafficking in Mexico, bilateral cooperation with the U.S. regarding migration and narcotics policy must be strengthened.

**Significance:** Trafficking continues to be a growing industry, one about which there is either little or incorrect data. State and federal information is often in contradiction and tends to underestimate the real number of victims. Inaccurate statistics, lack of media and social pressure, along with inefficient government practices makes it difficult to convict traffickers. Between the years 2010-13 only 17 pimps were convicted in Mexico, whereas in Tenancingo alone there exist an estimated 3,000-5,000 pimps<sup>3</sup>. In order to influence public policy, sufficient and correct data is necessary. This being why an academic investigation is of the utmost importance.

**Feasibility/Personal Qualifications:** Gretchen Kuhner, Director of Instituto para las Mujeres en la Migración A.C. and Dra. María Elena Jarquín Sánchez, from the Programa de Investigación Feminista at UNAM are the primary sponsors of this research. Dr. Kuhner has collaborated with

institutions such as UNAM, Colegio de la Frontera Norte, the Ford and MacArthur Foundations. Dra. María Elena Jarquín Sánchez is faculty at UNAM in Social and Political Sciences and has published multiple works on women's rights, labor rights and migration.

My preparation for this research lies in the following: [1] I have worked with vulnerable populations in an international setting. In 2014 I worked with Syrian and Iraqi refugees teaching English without a shared common language in Istanbul, Turkey. [2] I have studied Tijuana's Red Light District and the reality of migration in the border city. This experience included taking courses in the city, meeting with institutions such as DIF, la policia municipal, oficinas del PRI, Instituto Nacional de Migracion, and Grupo Beta, as well as organizations that defend women's rights as sex workers (Organizacion vanguardia de mujeres libres Maria Magdalena). [3] I have worked with unaccompanied child migrants in U.S. detention centers for the past three years, many of whom were themselves victims of sex trafficking. [4] I have secured employment for the next year through one of the Office of Refugee Resettlement's programs, housing unaccompanied child migrants. [5] I will enroll in courses to familiarize myself with research methods as well as women's health and yoga courses to provide services to IMUMI.

**Methodology and Timeline:**

August 2016- Arrive in Mexico City, meet with Gretchen Kuhner (IMUMI's Program Director).

August- Sept. 2016- begin working with IMUMI as an intern. Start outreach by commencing classes at UNAM and meeting Program staff.

Sept. 2016- June 2017- Carry out case studies, one per month, while continuing my coursework.

June 2017- Return to U.S. and collaborate with professors to consolidate my findings.

Research setting: I will conduct this research primarily in Mexico City, planning trips south following routes of migration, possibly visiting the southern border.

Data Collection: Women will participate in dance therapy and yoga. My research will make use of these sessions to focus on topics relevant to these women's lives and communities. In-depth interviews will be voluntary and conducted ethically. These interviews can include family and community members whom these women define as important in their lives in order to build their case study. The interviews will discuss the social and political conditions of their past or present experiences, the role of women in today's society, social pressures to migrate and the implications of migrating, whether forced or voluntary.

Data Analysis: Data will be interpreted to reveal patterns. This will expose factors that contribute to women's migration, their vulnerability as a population and the outlets women have to migrate.

**Impacts:** This project is essential to understanding and creating more encompassing policy around sex trafficking at a local, national and global level. Arrests of sex traffickers are extremely rare, prosecutions are rare as well, while victims are all too common. My hope for this research is to better inform and educate the mass population, government leaders and complement work conducted by other academics in order to seek justice for victims and to prevent further victimization. This research will lead to my thesis in my Graduate studies and serve as a launching point to influence policy and relations between the U.S. and Mexico regarding sex trafficking and women in migration.

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<sup>1</sup> CATWLAC (Coalition Against Trafficking in Women and Girls in Latin America and the Caribbean)

<sup>2</sup> InSightCrime.org

<sup>3</sup> FEVIMTRA (Fiscalía Especial para los Delitos de Violencia contra las Mujeres y Trata de Personas)

## STATEMENT OF GRANT PURPOSE FOR STUDY/RESEARCH

### **Air pollution and birth outcomes in Mexico City**

My project will investigate the relationship between air pollution and birth outcomes in the highly populated Mexico City. Aided by the PI on the project, Dr. Felipe Vadillo-Ortega, who is affiliated with La Universidad Nacional Autónoma de Mexico (UNAM) and The University of Michigan, air pollution exposure will be assessed using data (PM<sub>2.5</sub>, PM<sub>10</sub>, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide) from the Mexico City Metropolitan Area (MCMA) air quality monitoring network and biomarkers relevant to inflammation and preterm delivery. Mexico City's Perinatal Cohort, which includes 1,000 women who have completed pregnancy follow-ups since 2009, will be used. Along with the research, outreach regarding prenatal environmental health and birth outcomes will be provided at the hospital by offering classes and educational materials on the health effects of pollutants and tips to avoid exposure.

### **Significance and Scientific Research Goals**

Preterm birth is the leading cause of perinatal mortality and is associated with long-term adverse health consequences for surviving infants. No effective means for prevention of prematurity currently exists, and with preterm birth rates rising in the US and worldwide, investigating possible causal mechanisms is a global public health priority<sup>1</sup>. As the population moves to a more urbanized lifestyle, air pollution has become a major public health concern. A recent Institute of Medicine Report notes that air pollution exposure may be a significant cause of prematurity and intrauterine growth restriction. However, most published studies are based on population birth registries and lack the individual, clinical data needed to elucidate possible biological mechanisms mediating these epidemiological associations.<sup>2</sup> The proposed work presents a unique opportunity to study those mechanisms using clinical information and samples of our repository derived from cohort of 1,000 pregnant women residing in diverse regions of Mexico City, a megacity with high air pollution levels. We will advance understanding of prematurity and intrauterine growth restriction by investigating how air pollution and inflammation may act together to influence the outcomes of pregnancy, and whether certain periods of gestation represent critical time windows and opportunities for preventive interventions, both clinical and environmental.

### **Methods**

Biomarkers relevant to inflammation and preterm delivery (IL-1 $\beta$ , IL-1 $\alpha$ , IL-6, IL-8, IL-10, TNF- $\alpha$ ) in samples of serum provided by participants monthly during their pregnancies, along with information on infections, health history, clinical characteristics, diet and time-activity patterns will be observed. Biomarkers will be measured using a Multiplex assay. Each mother

provided at least 6 samples of serum at different times along their pregnancy. This study is also a National Institute of Health (NIH) funded-project. State-of-the-art exposure assessment techniques will be used to evaluate spatial and temporal variability in air pollution exposure using data from the MCMA air quality monitoring network (PM2.5, PM10, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide) matched to locations of participants' homes. Seasonal variation in exposure will also be observed. Evaluation of whether ambient pollution is associated with preterm birth will be researched, controlling for other risk factors, such as association with cytokines, and which time windows during pregnancy are most relevant. Examination of effect modification by components of the diet such as, intake of antioxidant vitamins (E and C), polycyclic aromatic hydrocarbons (PAH), and other factors will also be observed.

Outreach will involve attending monthly prenatal classes already offered to women at the hospital. The classes inform expecting mothers on proper nutrition and how to care for their children. We will include an environmental health component by supplying mothers with a short presentation and pamphlet regarding environmental prenatal hazards and health effects. A fact-sheet provided by the US EPA and the CHAMACOS program through UC Berkeley will be used as guidance for the presentation and pamphlet.<sup>3,4</sup> The CHAMACOS program offers prenatal environmental health outreach to women in both English and Spanish in Salinas, CA. The program will be modified to fit the needs of participants in Mexico City. The presentation will inform mothers of harmful pollutants, exposure pathways at home and at work, health effects, and tips to avoid and/or minimize exposure. At the end of the presentation, a game will be played to ensure they understand the material.

### **Feasibility and Logistics**

Dr. Vadillo-Ortega and his group will sponsor my research by providing previously collected data, samples, and laboratory space to complete the collaborative project. Data and samples available from "Mexico City's Perinatal Cohort" and MCMA air quality monitoring network will be used to further investigate the relationship between air pollution and birth defects in the area. Funds for the research component will be supplied by the NIH grant. This research will be used as a collaborative effort for manuscript submission.

For the outreach component, contacts from the hospital will be used. Prenatal environmental health pamphlets for women who cannot attend monthly classes will also be made available during scheduled doctor appointments in Spanish. Being of Mexican descent and fluent in Spanish, communicating with the expecting mothers will not be an issue. My studies and courses in public health and experience working on projects involving personal interaction with

large participation of the Hispanic community will enable me to communicate effectively with expecting mothers.

### **Timeline**

Early Aug, 2014- Arrive in Mexico City and meet with Dr. Vadillo-Ortega and hospital staff.

Aug to Sept 2014- Obtain proper laboratory training and certification to work in laboratory and hospital. Begin working on data analysis previously collected. Start outreach by attending classes and meeting staff at the hospital.

Sept 2014 to June 2015- Continue data and laboratory analysis, along with outreach.

June 2015- Return to the U.S. and continue analyzing data. Prepare collaborative manuscript in English for submission and presentations for professional conferences.

### **Further Academic Development**

This multi-disciplinary, global health collaboration will evaluate potential environmental and clinical determinants of preterm delivery, with the goal of developing unique knowledge with far reaching preventative implications. My advisor at San Diego State University, Dr. Quintana, in collaboration with Universidad Autónoma de Baja California, Tijuana, has been studying the relationship between DNA damage in placentas from Tijuana hospitals and exposure to air pollution inside vehicles crossing the US-Mexico border. My research in Mexico City will hopefully lead to collaborative work between UNAM and SDSU. Mexico City being in a tropical latitude is representative of megacities worldwide. Findings in this proposed research could be helpful in elucidating birth outcomes in other megacities. The majority of prenatal outreach involves nutrition and infant care. Most women are unaware of novel findings associating negative birth outcomes to poor air quality. By providing prenatal environmental health outreach, pregnant women can be aware of their surroundings in hopes to minimize and/or avoid exposure. Certain periods represent critical time windows and opportunities for preventative intervention. The goal of these findings will be to support further knowledge to policy-makers who set and enforce health protective air pollution standards, provide further understanding of environmental impacts on infant health, and aid hospitals in hopes to prevent adverse birth outcomes.

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3. EPA. Promoting Good Prenatal Health: Air Pollution and Pregnancy. Office of Children's Health Protection and Environmental Education. EPA-100-F09-020.
4. Center for Environmental Research and Children's Health. The CHAMACOS Study. <http://cerch.org/research-programs/chamacos/>