Center for Collaborative Research in Health Disparities

2016-2017

ZIKA INITIATIVE

Puerto Rico is experiencing an approximate doubling of confirmed Zika virus cases per week and is unique in the total number of cases, the level of local transmission, and the presence of the Zika-carrying vector. In response to this emergency, the Center for Collaborative Research in Health Disparities (RCMI Grant: NIMHD-MD-007600) targeted pilot projects (basic, behavioral, population and community-based) from early stage investigators focusing on ZIKA research. The Center will support the collection of preliminary data that can be used to advance this area. Collaborations with investigators outside Puerto Rico and in other RCMI institutions were encouraged. This approach is consistent with the scope of the RCMI Program, the vision of the National Institute on Minority Health and Health Disparities (NIMHD), and the Strategic Plan to combat the outbreak of Zika virus of the UPR Medical Sciences Campus.

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Pilot Project Awardees 2016-2017

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Other Participants FY 2016-2017

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2016-2017 ZIKA PROJECTS

Pilot Project Awardees 2016-2017

Name	School/Program	Project	E-mail	Telephone
Emilee Colón-Lorenzo, Ph.D. **Adjunct Professor**	Academic Affairs/ Infectious & Global Diseases Program	*The microbiota of the Zika vector Aedes aegypti and its potential role in infection*	emilee.colon@upr.edu	787-758-2525 Ext 1314
Deborah Juarbe-Rey, Ph.D. **Adjunct Professor**	Public Health/ Center for Evaluation and Sociomedical Research	*Risk Communication and Community Engagement to Address Zika Virus Prevention*	deborah.juarbe1@upr.edu	787-522-9034 Ext 1501

Other Participants FY 2016-2017

Name	School/Program	Project	E-mail	Telephone
Maribel Campos-Rivera, MD MSc MBA **Assistant Professor**	Medicine/ Endowed Health Services Research Center	*Prospective Assessment of Intrauterine Zika Exposure, an Integrated Approach*	maribel.campos@upr.edu	787-758-252, Ext 1186 Fax 787-763-4868
Carlos E. Rodríguez-Díaz, PhD, MPHE **Assistant Professor**	Public Health/ Health Promotion& Education	*Assessment of socio-behavioral risks, strengths, and vulnerabilities for Zika Virus*	carlos.rodriguez64@upr.edu	787-758-2525 Ext 4412 or 787-522-9034 Ext 1505

The microbiota of the Zika vector *Aedes aegypti*

Principal Investigator

Emilee Colón, PhD
Adjunct Professor
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Project Description

Zika is an emerging vector-borne disease transmitted by *Aedes aegypti* mosquitoes with active transmission in Puerto Rico. The numbers of Zika infected people are rapidly increasing in Puerto Rico, the first case was reported on December 2015 and up to date there are more than 1,000 confirmed cases in the island. The *Aedes aegypti* mosquito is endemic in PR representing a public threat for Zika and other vector borne viral diseases such as dengue, chikungunya and yellow fever. The major challenge to control the Zika outbreak is to reduce/eliminate the mosquito population. Mosquito control relies on the elimination of mosquito breeding sites, larvicides, and use of insecticides. However, in PR, mosquitoes have developed resistance to almost all commercially available insecticides. Novel strategies to control mosquito's populations are urgently needed. The goal of this project is to investigate the midgut microbiota of field-caught *Aedes aegypti* to explore the bacterial diversity or abundance and its association with Zika virus infection. The specific aims are (1) to collect, identify, and assess viral infection in *Aedes aegypti* mosquitoes from PR and (2) to characterize and investigate the mosquito midgut microbiota in the infected and uninfected mosquitoes. Results from this project will contribute to elucidate the role of the midgut microbiota from wild caught *Aedes aegypti* in Zika infected and uninfected mosquitoes from PR. Most importantly, it will enhance our understanding on the relevance of bacteria potentially associated with Zika transmission. The results generated in this study will yield novel data, which would advance the current knowledge of bacterial microbiota related to Zika infections. We anticipate that this work will contribute to develop strategies for vector control, which will help combat Zika outbreaks.

Keywords: Zika, *Aedes aegypti*, microbiota, vector-borne disease, transmission

Risk Communication and Community Engagement to Address Zika Virus Prevention

Principal Investigator

Deborah Juarbe, PhD
Assistant Professor
Graduate School of Public Health

Project Description

Zika virus infection is a public health challenge in Puerto Rico. Scientific consensus has been reached supporting the conclusion that Zika infection is a cause of Guillain-Barré syndrome and microcephaly. The World Health Organization (WHO) Director-General, Dr. Margaret Chan, described the increase in neurological complications and microcephaly associated with Zika infection as an “extraordinary event” and announced a Public Health Emergency of International Concern. It is expected that Zika virus will extend all over the Island, placing the 3.5 million residents which include about 43,000 pregnant women per year, at risk for Zika virus infection. WHO urges countries affected by the Zika virus to make sure that individuals and communities are informed about how to avoid mosquito bites and precautions to prevent mosquito breeding sites. Effective risk communication and community engagement strategies are essential to enable people to take informed decisions to protect themselves, their family, and communities against the Zika virus. To effectively engage at risk-communities in a meaningful exchange in the context of the Zika virus, the WHO highlights that risk communication needs to be approached from the perspective of shared, multi-directional communications and engagement with affected populations. The proposed community based participatory research initiative will draw on the knowledge and expertise of residents of a public housing project to develop and pilot test culturally sensitive strategies to increase overall understanding about Zika virus infection and to promote community engagement to enhance behavior change for Zika virus prevention and control. The specific aims of this study are: to assess stakeholders' perceptions, beliefs, knowledge, attitudes, and practices about Zika virus and its possible complications; to use community-partnered participatory processes to transform science and expert knowledge into contextualized risk communication strategies that people can relate to, understand, and trust; and assess the feasibility and acceptability of culturally sensitive communication strategies to increase overall understanding about Zika virus infection and to promote engagement to enhance behavior change for Zika virus prevention and control. We propose to use community-based participatory processes to develop strategic partnerships among community and academic groups for planning and pilot testing risk communication and community engagement strategies for Zika response.

Keywords: Zika, community–based participatory research, risk communication, community engagement, prevention

Assessment of socio-behavioral risks, strengths, and vulnerabilities for Zika Virus

Principal Investigator

Carlos Rodriguez, PhD
Assistant Professor
Graduate School of Public Health

Project Description

Zika virus generally causes mild infection in humans, but is associated with severe neurologic complications and adverse fetal outcomes. As of May 18, 2016, 1,380 cases of Zika virus infection in the US and PR have been reported to the CDC. Of these, 544 occurred in continental US, and 806 (58%) in PR. While most of the cases reported within the continental US had been travel related, most (99%) cases reported in PR have been acquired through local transmission. Furthermore, PR is the latest country to report a case of microcephaly associated with Zika virus, and the first US – and so far the only – death tied to Zika virus infection was also reported in PR. Vector control has been a major area of attention for the prevention of Zika virus infections. These measures rely on reducing mosquitoes through source elimination and avoiding contact with mosquito-repellents. The WHO's recommendation to prevent sexual transmission of the virus includes contraceptive measures and safer sexual practices - including condom use. Notwithstanding, in PR, these recommendations seem decontextualized in view of the fact that nearly half (46.2%) of the population live under the poverty level and about two thirds (65%) of pregnancies are unintended. Poor quality sex education, limited access to contraception, and socio-cultural and political barriers (i.e. stigma towards sexuality, limited participation in the allocation of resources for prevention) make prevention of new Zika infections challenging. Considering the imminent epidemic that may affect PR, the best response is to apply rapid assessment and appraisal research methods. The use of a social determinants of health and sexual health promotion framework as well as ethno-epidemiological/mixed-methods research approach, as proposed in this project, represent a great opportunity to understand the practices and conditions that are placing Puerto Rican at risk for Zika virus infection Therefore, In order to assess socio-behavioral risks, strengths, and vulnerabilities for Zika virus infection in PR, we proposed the following aims: 1) To characterize sexual practice and condom use patterns in a sample of young (21-25yo) men and women; and 2) To describe individual, social, and structural conditions that may explain inequities in Zika virus infection. Findings from the proposed study have the potential to inform interventions to address the individual (i.e., sexual practices), social (i.e., access to condoms and contraception), and structural factors (i.e., poverty, stigma) that are shaping and fueling the outbreak in the island into epidemic proportions.

Keywords: Zika, sexual transmission, socio-behavioral risks, stigma, sex education

Prospective Assessment of Intrauterine Zika Exposure, an Integrated Approach

Principal Investigator

Maribel Campos, MD
Assistant Professor
School of Medicine

Project Description

Zika is an emerging arboviral infection that has become a public health emergency. Of the population at risk, the highest burden of disease has been observed among pregnant women and their offspring, based on the association between Zika infection during pregnancy and the increased rate of pregnancy loss, and congenital malformations. The causal relationship between the infection and these serious adverse pregnancy outcomes is currently under scrutiny by the scientific community, particularly because the mechanisms used by the virus to affect fetal development are not known. Furthermore, the effects of intrauterine Zika virus exposure among offspring that do not present apparent congenital anomalies or whose mother were infected during the third trimester is an even bigger mystery. Due to the significant gap in the knowledge regarding the mechanisms related to the effects of the infection, the main goal of this proposal to develop a protocol for the establishment of a data and biological sample repository at a community hospital. The development of this process is expected to have the following effects: 1) at the community level it will allow for the women to be able to continue care with their primary providers through this difficult period of uncertainty and 2) for the academic and public health communities, it will establish a process for standardized collection of data and samples that will serve as platform for future explorations both for research as well as public health purposes. The accomplishment of the main goal of this proposal will address the need to gather reliable information for the evaluation of the effects of Zika virus infection during pregnancy while establishing a communication platform that will enable the effective collaboration among the interdisciplinary research team and stakeholders in the community.

Keywords: Zika, intrauterine, pregnancy, biorepository, healthcare

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