

Background

Texas colonias are residential communities, usually in unincorporated areas of a county, along the Texas-Mexico border. As early as the 1950s developers purchased land that was poor in agricultural value and in areas prone to flooding. They divided this land that was void of infrastructure, and sold it to those with little income in need of housing. Today, according to the Texas Secretary of State, there are about 500,000 Texans living in roughly 2,294 colonias. The average household income is well below the federal poverty level, which often necessitates two to four families living under one roof.

The bateyes are small neighborhoods that were initially settled by seasonal Haitian sugarcane workers traveling to the Dominican Republic (DR) in search of work. These communities were established on the outskirts of sugarcane plantations in the 1960s when the sugar industry was a lucrative business. Today, it is estimated that approximately 500,000 people live in more than 400 bateyes around the country. In San Pedro de Macoris, there are approximately 50 bateyes and the average monthly income is equivalent to about \$80/month.

Although colonias and bateyes vary in population size and infrastructure, many lack basic living necessities such as electricity, running water, paved roads, sewer and drainage systems, and structurally sound houses. These underserved communities may have limited access to schools, healthcare or social services. The living conditions in these communities still remain abysmal due to high unemployment and extreme poverty. The poor infrastructure and environmental hazards in many of these communities can result in injury, infection such as cholera and propagation of vectors that transmit parasites and viruses that may lead to infectious diseases such as malaria, Zika, Chikungunya, and dengue.



References:
1. Last Colonias in the 21st Century: Progress Along the Texas-Mexico Border. April 2005. Federal Reserve Bank of Dallas, Community Development. www.frbatx.com/colonia
2. Texas Border and Mexican Affairs. Texas Secretary of State. Extracted from http://www.sos.state.tx.us/Border/colonia/colonia_china.cfm on February 3, 2017.
3. I. Ramos, L. Baker Davis, Q. He, K. Ramos. (2008). Environmental Risk Factors of Disease in the Cameron Park Colonia, a Hispanic Community Along the Texas-Mexico Border. J. Immigrant Minority Health.
4. The Orphan of the Dominican Batey. Children of the Nations. Extracted February 4, 2017. <http://www.orphanofdominican.com/colonia/2007/11/14/orphanofdominican.com/>

Objectives

- To identify some of the environmental hazards, through video and photographs, that people living in the colonias and bateyes are subject to.
- To provide a platform for critical discussions among medical and epidemiology students about issues defined in photographs and videos.
- To empower community members and leaders to identify sustainable solutions and design programs to improve the health and quality of life of these communities.
- To bring awareness at an international level and influence policymakers to stimulate change.

Environmental Hazard

Colonias



Sanitation

- Lack of proper drainage and sewage collection systems can lead to flooding with contaminated water, increasing the risk of drowning, injury and exposure to infectious agents.

- Unregulated accumulation of garbage can lead to increases in emissions of toxic gases, noxious odors, and may attract animals leading to injury or spread of diseases.

Safety & Structural



- Inability to afford adequate housing and lack of building codes lead to use of precarious building materials, increasing the potential for injury and poisoning.

- Physical hazards such as exposed wood & metal scraps can result in falls, injury, infection, and accidental entrapment. Unenclosed swimming pools increase the risk of drowning.

Water Issues

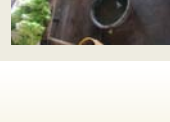
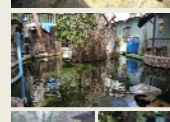


- Areas of standing water: multiple sources such as old tires, uncovered trash cans or buckets for standing water to collect result in mosquito breeding and larval maturation. The bateyes and colonias have the vector that transmits malaria and Dengue, Zika, and Chikungunya viruses.

- Water scarcity or lack of running water may force people to store it without taking appropriate measures resulting in increased risk and incidence of water borne diseases.

- Lack of drinking, bathing, and cooking water source

Bateyes



Method

Phase 1: Photographs and videos

UTRGV physicians and UCE epidemiology students used smart phones and iPads to take photos and videos during their field rotations in the bateyes and colonias in and around the homes and in general recreation areas. Participants were instructed not to include human subjects. Each participant submitted photos to the project coordinator with a short description identifying the hazard, location, and potential solution.

Phase 2: Hazard categories

Photographs are reviewed and categorized into:

- Safety and Structural Hazards – increase risk of falls, injury, burns, poisoning, and drowning
- Water Issues - drinking, bathing, cooking water sources, standing water where mosquitos may breed.
- Sanitation and Hygiene - sewage, garbage

Phase 3: Feedback to participants and community

A PowerPoint presentation will be shared among all study participants via a video conference to discuss similar hazard exposures and sustainable solutions. A written report will be disseminated describing findings, possible solutions, and recommendations to prevent or eliminate the environmental hazards.

Results

The photovoice project provides a comparison between developed and developing countries' environmental hazards. The photos and videos reveal that residents of bateyes and colonias are exposed to almost identical environmental hazards that can profoundly impact the health and well-being of community members. Some of these hazards include solid waste, standing water, and unstable physical structures.

Product Development: Pediatrics faculty at the UTRGV School of Medicine are developing a problem-based service learning course, Environmental Hazards and Health Initiative in the Bateyes and Colonias. Working with faculty at UCE, this course will offer students from UCE and UTRGV Schools of Medicine a cultural experience and opportunity to work with peers, faculty and the community members.

Value Added: Increase knowledge, bring awareness, and decrease exposure to environmental hazards in order to improve human health.

Conclusion

The photovoice project reveals many similarities and opportunities to involve medical and epidemiology students from all three universities to perform environmental hazards assessments in dwellings and neighborhoods and design education programs. They will learn from and provide education to community members about the health effects associated with exposure to the identified and potential environmental hazards and work as a team toward developing sustainable solutions for these hazards.