

Evaluating Community-Based Health Impact Using Social Networks

Ruben Juarez, PhD

Associate Professor and Graduate Chair
Department of Economics and UHERO
University of Hawai'i at Mānoa
2424 Maile Way, Saunders Hall 542
Honolulu, HI 96822
Email: rubenj@hawaii.edu
Ph: 808-956-7143 Fax: 808-956-4347

Alika Maunakea, PhD

Assistant Professor
Department of Native Hawaiian Health
University of Hawai'i at Mānoa
651 Ilalo St, BSB-222K
Honolulu, HI 96813
Email: amaunake@hawaii.edu
Ph: 808-692-1048 Fax: 808-692-1255

PROPOSAL NARRATIVE & SPECIFIC AIMS

The **goal** of this proposal is to identify a social network informed approach to implement and monitor effects of community-based interventions or programs on reducing risk for obesity.

Social networks influence individuals' choices and behaviors that either lead to unhealthy or healthy lifestyles. These networks have been shown to have an effect on a wide range of obesity-related cardiometabolic health conditions afflicting communities, including Type 2 diabetes mellitus (DM), cardiovascular disease (CVD), and metabolic syndrome. Many of these diseases are prevalent in Hawai'i, in particular within communities comprised of Native Hawaiian and Pacific Islanders (NHPI). Results from recent studies suggest a link between social networks and health conditions that are likely mediated by biological mechanisms, influencing glucose homeostasis and gut microbiome composition. Collectively, these studies offer a tentative model by which social networks may impact health behaviors that relate to known risk factors associated with obesity and related diseases. *Thus, establishing a map of the socioeconomic networks in NHPIs may be applied to assess community-based interventions or programs for their potential to reduce risk for obesity-related health conditions.*

In this study, we **hypothesize** that risk for obesity-related health conditions (*i.e.* DM) transmitted through social networks may be modified by community-based programs. With MA'O Organic Farms and their non-profit parent organization, the Wai'anae Community Re-Development Corporation (WCRC), we will test this hypothesis by the following specific aims:

Aim 1: Examine the extent to which social networks and risk for DM interact over time.

As a community-based program, interns enrolled in the MA'O Youth Leadership Training program (YLT) experience improvements in attaining higher-level education, nutrition, physical activity, access to health care, and cultural literacy, altogether potentially reducing risk for obesity-related health conditions, in particular DM, prevalent in the NHPI communities. By partnering with MA'O, we will recruit YLT interns (n=50) and their social network (n=300) as participants for this study to complete surveys that include demographic, health, and socioeconomic information. Using the same assessments, we will follow up on these individuals after 12-months. We will integrate information of social networks with demographic and health-related data using standard statistical techniques and published methods.

Aim 2: Identify the sociocultural/behavioral components of the social network that associate with risk factors for DM. Surveys will be used to collect data on sociocultural and behavioral components of the social network, administered by a NHPI community facilitator trained in clinical psychology. The MA'O YLT program develops leadership in a 2-year peer-to-peer, cohort-based model in which individual and group relationships flourish. Essentially, we would have the trained facilitator gather information to help us predict what type of peer influence exists and how they positively or negatively associate with risk factors for DM.

Aim 3: Explore the mechanism(s) that potentially mediate the interaction between social networks and risk for DM. We will explore a novel mechanism by which social networks and risk for DM may be related and modifiable, the gut microbiome composition, which will be examined from stool biospecimens of each participant (n=350) using a metagenomics approach. As a secondary measure of YLT-mediated health impacts, we will measure the degree of gut microbiome changes after Year 1. Using this data, we may be able to distinguish several factors that could potentially mediate the interactions between social networks and risk for DM to include physical activity, sedentary behavior, and peer network dynamics.