

Enabling Sustainable Health in Our Communities

<http://www.mauliola.net>

Ruben Juarez, PhD

Department of Economics

UHERO

UH-Manoa

Alika Maunakea, PhD

Department of Native

Hawaiian Health

JABSOM



The Problem: Diabetes Disparities

DIABETES STATS

25.8 million

More than 8 percent of the U.S. population has been diagnosed with diabetes.

79 million

Approximately 35 percent of adults, 20 and older, have prediabetes — most have not been diagnosed.

71,382

The number of deaths directly attributed to diabetes annually in the United States. Diabetes also contributes to another 231,404 deaths per year.



2050

The year by which 1 in 3 Americans will have diabetes.



More than **30 MILLION** Americans have diabetes



Health care costs for Americans with diabetes are **2.3X** greater than those without diabetes



Diagnosed diabetes costs America

\$327 BILLION per year



84 MILLION

Americans have prediabetes



\$1 IN \$7

Health care dollars is spent treating diabetes and its complications



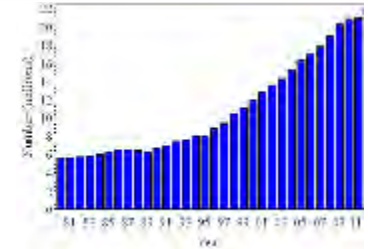
Today, **4,110** Americans will be diagnosed with diabetes. Additionally, diabetes will cause **295** Americans to undergo an amputation and **137** will enter end-stage kidney disease treatment.

Learn how to fight this costly disease at diabetes.org/congress

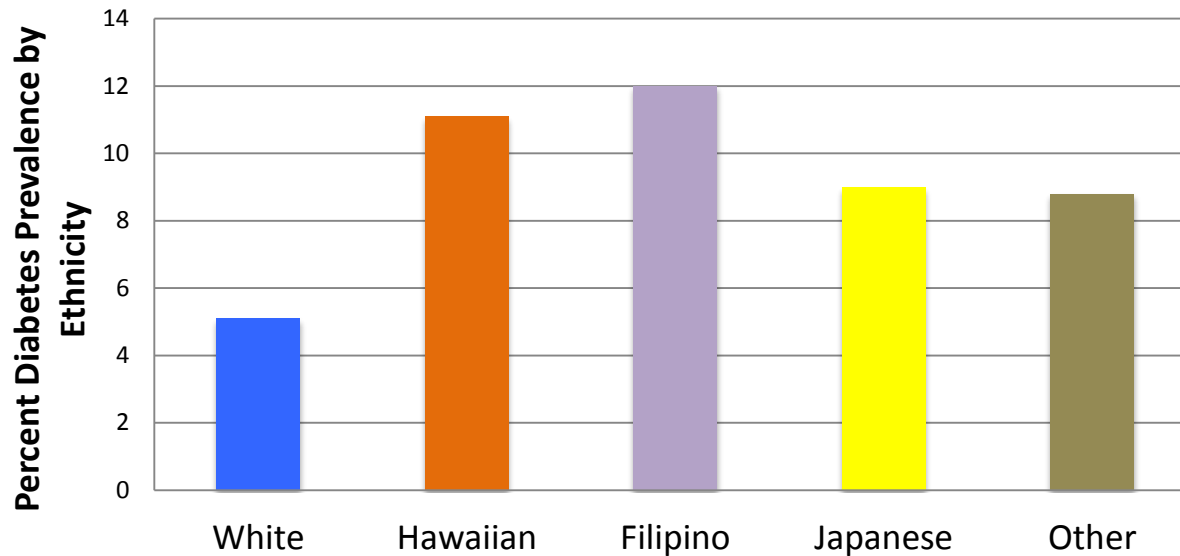


Diabetes Disparity in Hawai'i

- T2DM prevalence tripled in last 30 years [CDC 2011]
- 9.3% prevalence in US [ADA 2012]
- 8.4% prevalence in State of Hawai'i [Hawaii BRFSS 2013]
- 7.9% to 8.4% increase in diabetes prevalence from 2005-2013 [Huakai 2014]

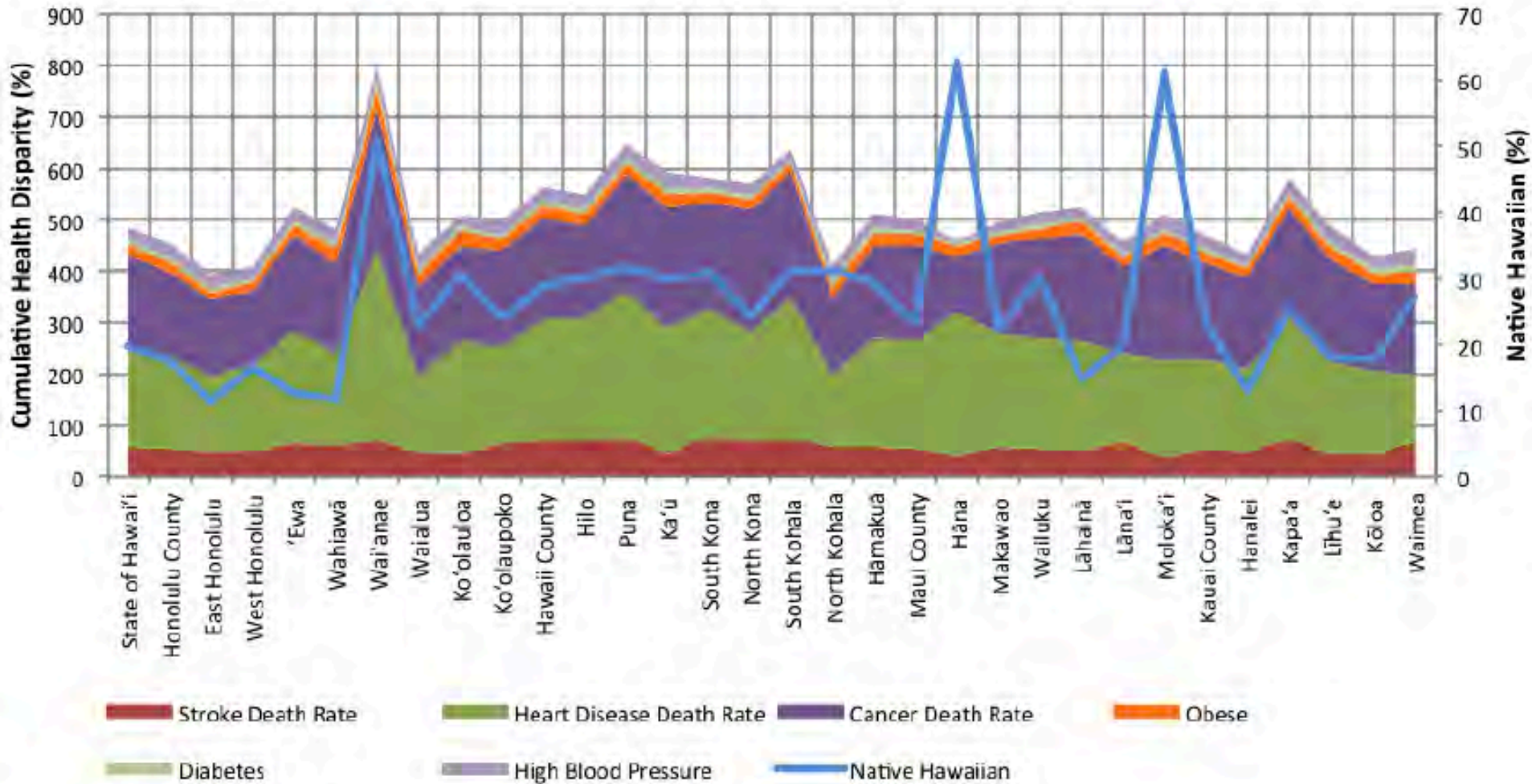


Ethnic Breakdown of Diabetes Prevalence



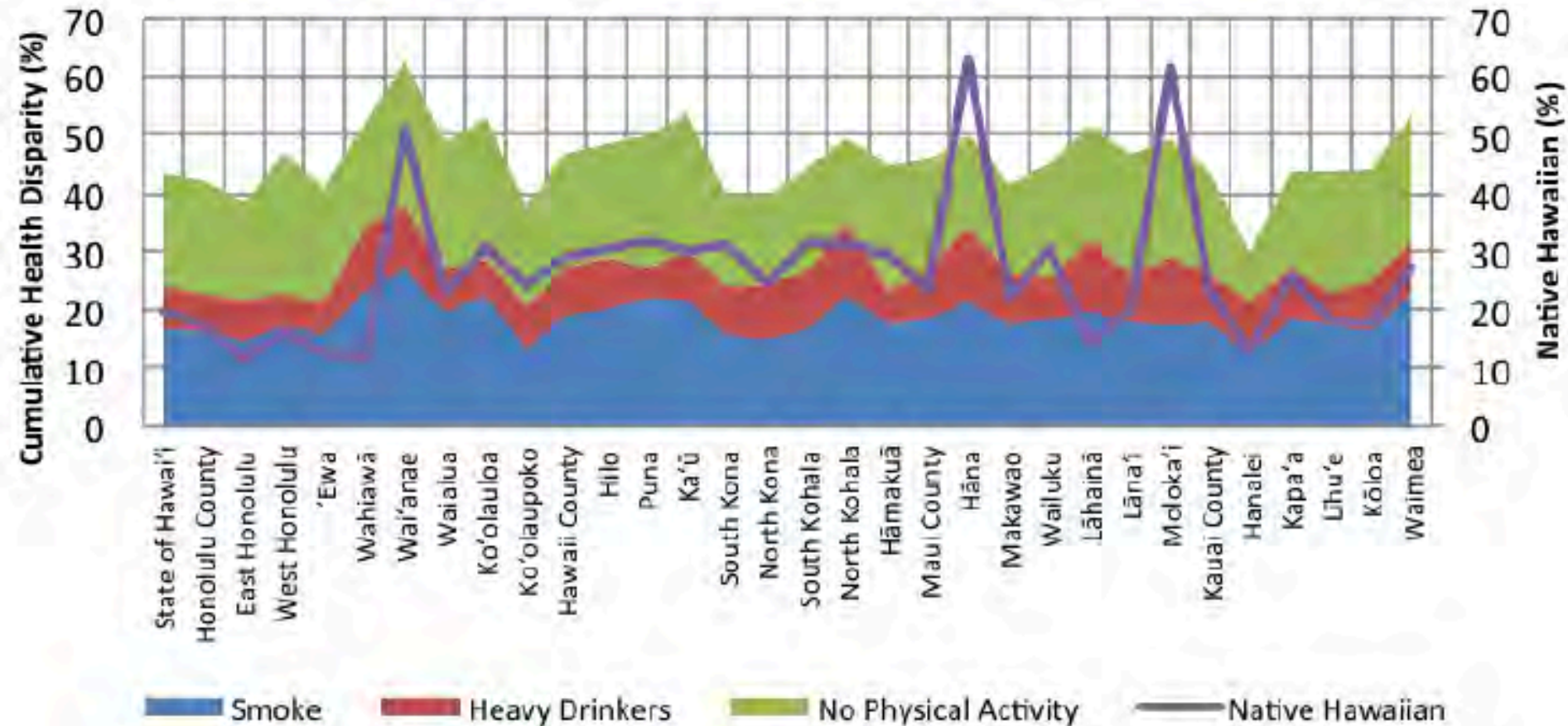
Hawaii Department of Health BRFSS 2013

Regional and Population Health Disparities



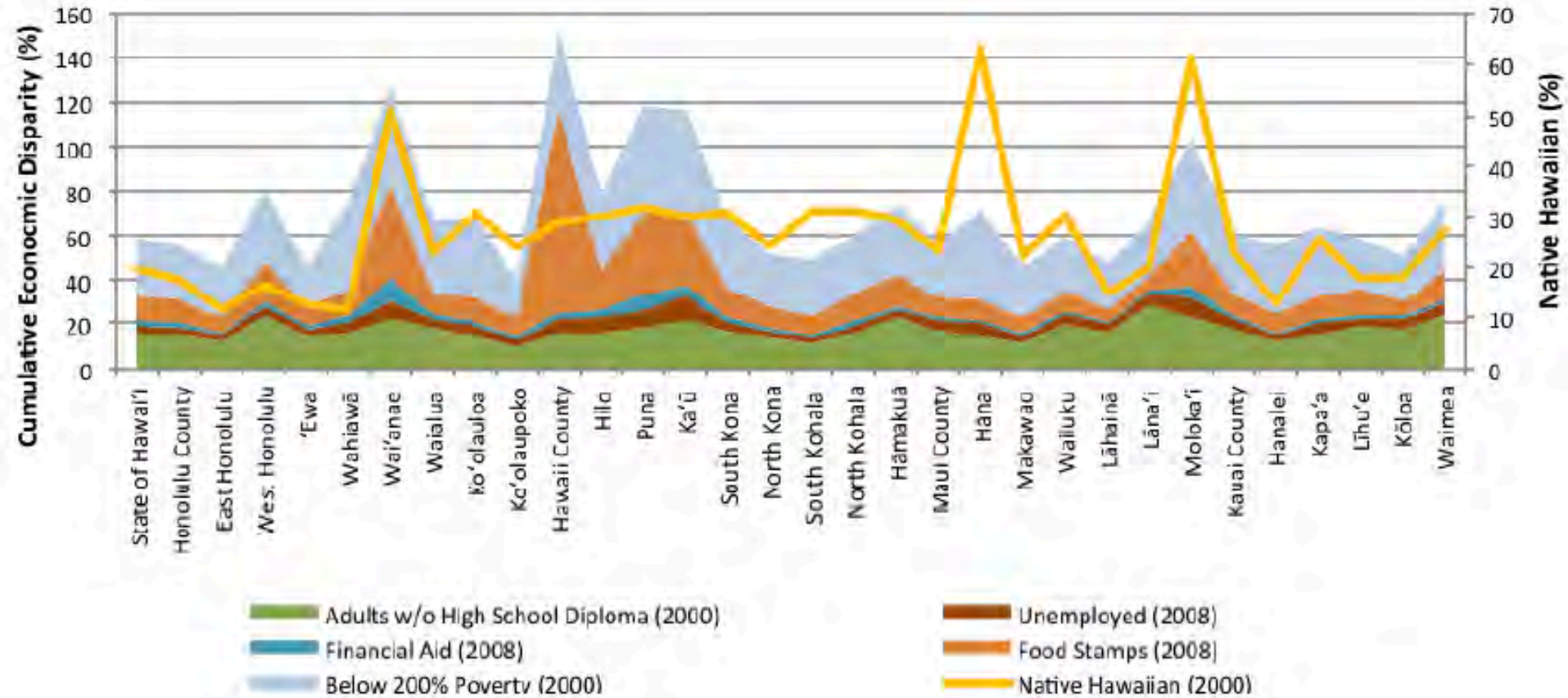
http://www2.jabsom.hawaii.edu/native/comm_ul-

Behavioral Risk Factors



http://www2.jabsom.hawaii.edu/native/comm_ulc-ment.html

Social-Economic & Education Disparity



http://www2.jabsom.hawaii.edu/native/comm_ulun

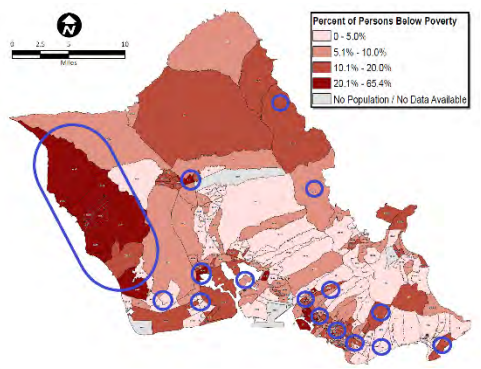
Environment:
Social Status



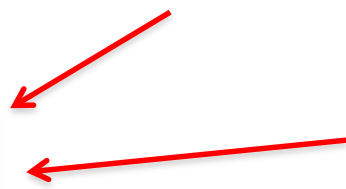
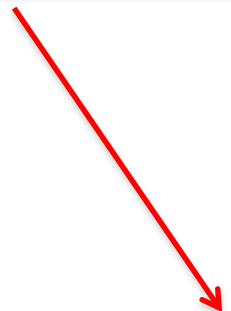
Behavior:
Risk Factors



Health:
Disease Outcomes



Biology:
Epigenetics-Gut
Microbiome-Brain Axis



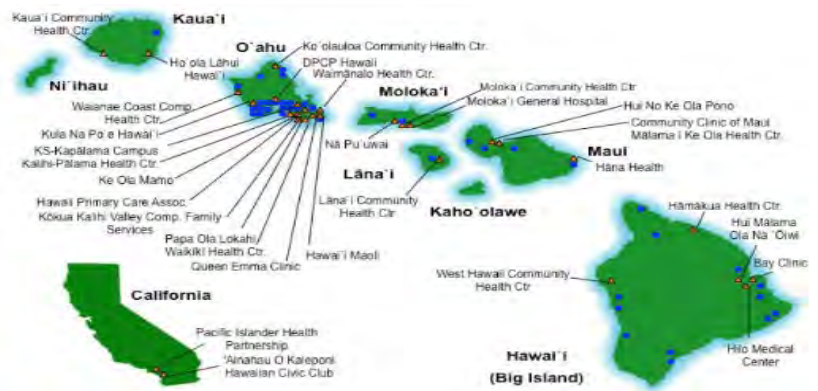
Question:

Can community-based initiatives not designed on health help?

Seeking Solutions:

Measuring health impact of community-based initiatives that incorporate cultural knowledge & practice

Goal: *Prevention-focused health care!*



DNHH-Community Partnerships: 'Ulu network

MA'O: Mala 'ai 'opio (youth food garden)

- Mission: to restore a thriving and resilient community food and education system is based on a successful and progressive 16-year kahua (foundation) of growing organic fruits and vegetables while cultivating youth leadership in Wai'anae.
- 23-acre certified organic farm located in Lualualei valley in Wai'anae. Trains new farmers and community leaders by having them co-manage the social enterprise operations as they produce, process, market and distribute over 2 tons of high quality organic fruits & vegetables.
- Youth Leadership Training (YLT) is a 2-year opportunity for youth 16-24 years old with roots in Wai'anae to participate in a college internship & work program that provides tuition support at Leeward Community College or UH West O'ahu, a monthly stipend, & real-world job experience.



Measuring the Impact of Community-Based Program on Health

Engage & Recruit

MA'O interns
(n=40)

Social network
(n=360)

Year 0

Collect Data

- Diabetes risk (A1C)
- BMI
- Blood pressure
- Mental health
- Gut microbiome composition
- Diet, social economics, etc.
- Health behaviors
- Social network influences

Year 1

Analysis

Health impact

Economic impact

Policy implications?

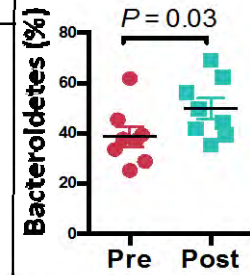
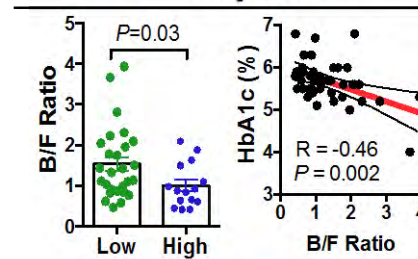
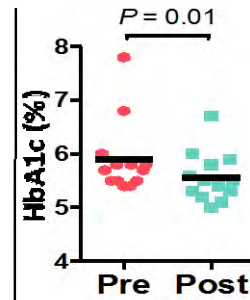
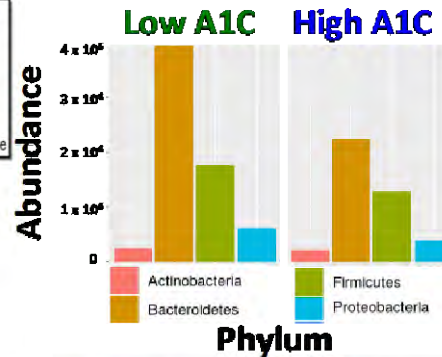
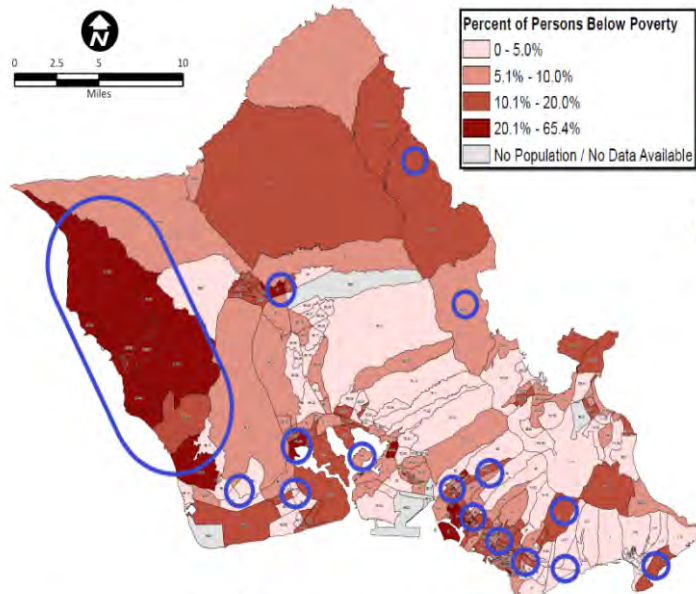
Disseminate

Papers

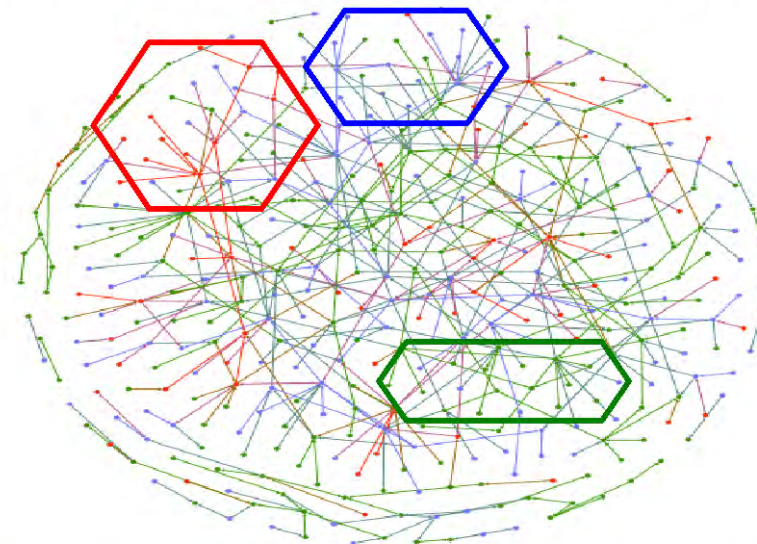
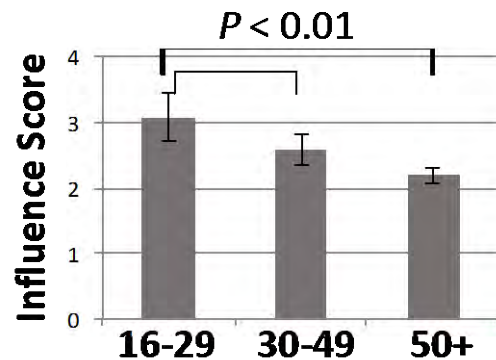
Presentations

Reports

Preliminary Results of Research

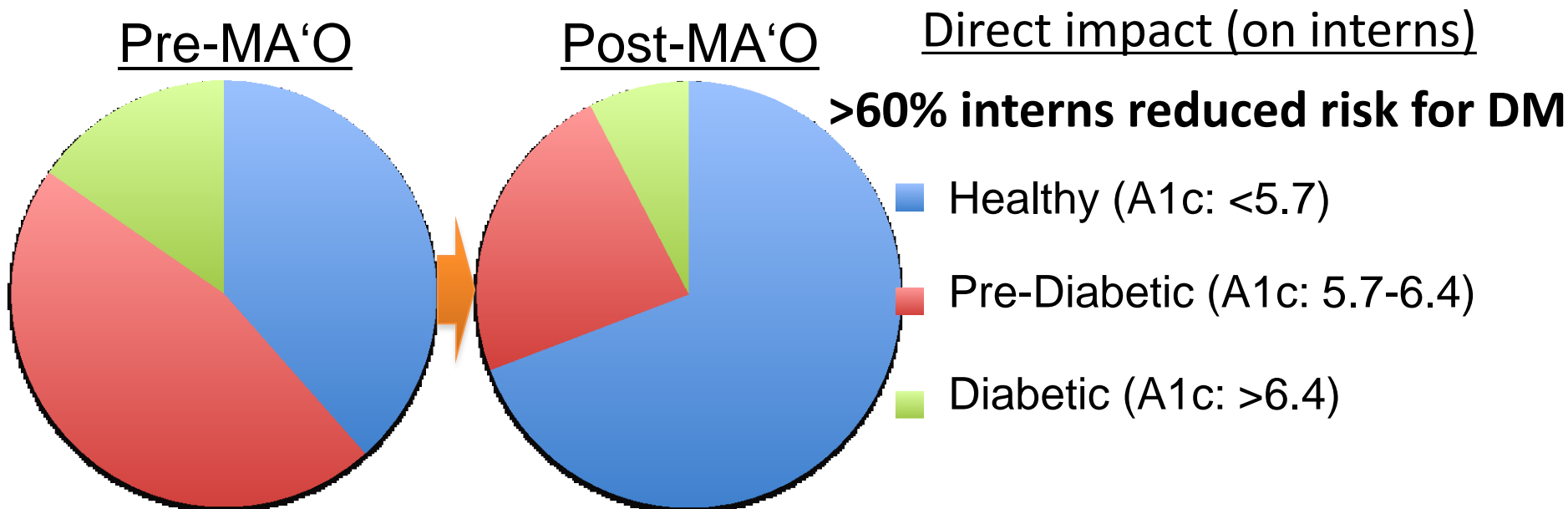


	NHPI	Non-NHPI
Male	145	67
Female	114	66
Total	259	133
Age	35.33 (16-74)	37.77 (16-71)
A1c	5.45 (4-11.7)	5.49 (4-9.9)
BMI	32.52 (17-56.34)	29.41 (16.56-66.05)



■ Normal (<5.7)
 ■ Pre-diabetic (5.7-6.4)
 ■ Diabetic (>6.4)

Health and Economic Impacts



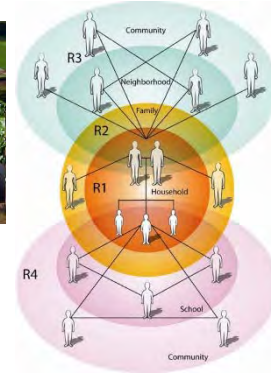
	# Reducton	Direct	Direct + SN
Prediabetics	-32.12	\$ 10,439	\$ 23,124
Diabetes	-8.72	\$ 22,268	\$ 97,088
Total Savings		\$ 32,707	\$ 120,212

When taken into account over the lifetime, the economic impact of MA'O amounts to several millions of dollars in diabetes risk prevention alone (community at-large).

Community-Health-Academic Partnerships

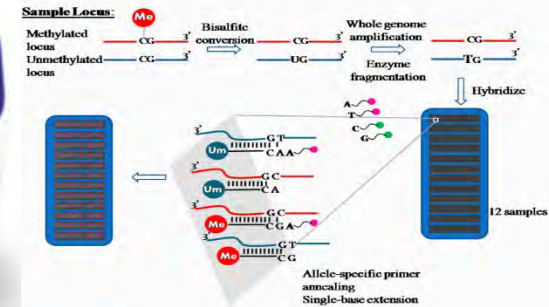
Enable communities to promote healthy lifestyles via evidence-based data of impact to eliminate diseases of health disparities

Engage



Evaluate

- Diabetes risk: A1C, BMI, BP
- Mental health
- Gut microbiome
- Immunoepigenetics
- Nutrition, Socioeconomics, etc.

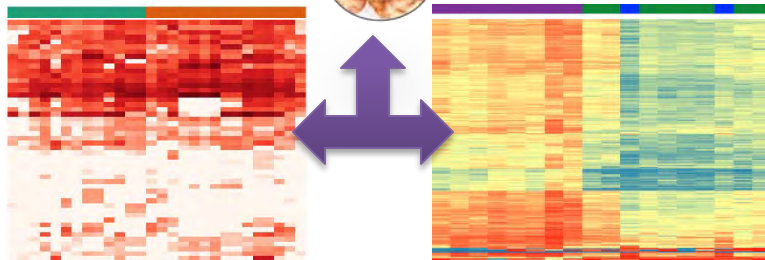


Empower

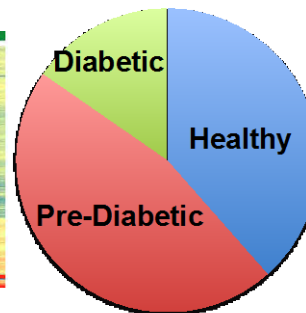
Gut Microbiome



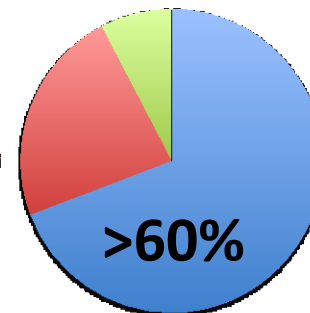
Epigenetics



Pre-MA'O



Post-MA'O



Health Impact

Social Impact

- \$120,000/yr
- Education
- Wellbeing

Conclusion: Health is a Shared Responsibility

- Studies like ours allows communities to be **valuable partners** in the health care system
- Enables sustainable health care by shifting the focus from treatment- to **prevention-oriented** approaches
- Develop new methodologies for communities to assess the impact of their programs in a **rigorous scientific manner**; this enables them to play a vital role in the health care ecosystem

<http://www.mauliola.net>

