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# Randomized Trial of Social Network Lifestyle Intervention for Obesity: *MICROCLINIC* 10-month Intervention and 16-Month Follow up

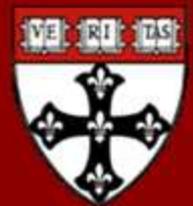
*The Microclinic Social Network  
Behavioral Health Program*

**MICROCLINIC**  
INTERNATIONAL

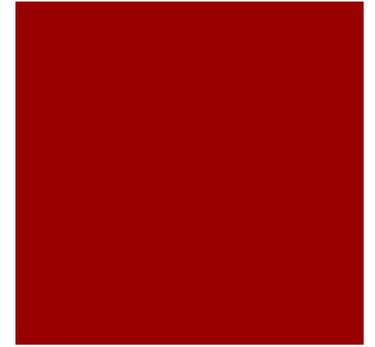
**a 501c(3) non-profit organization**

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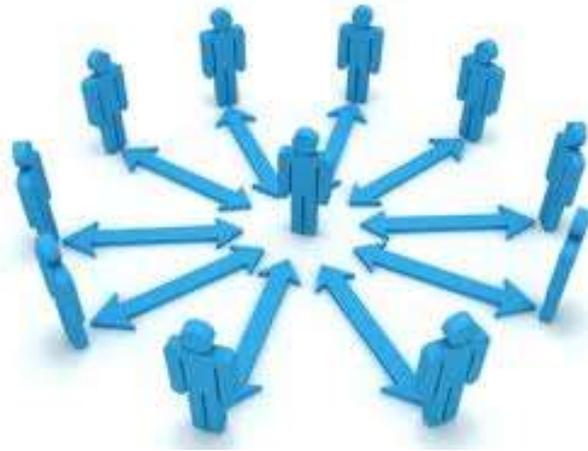
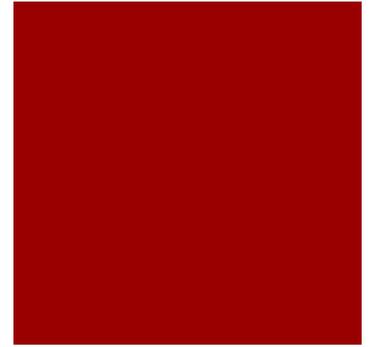


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- Project supported by grants from Humana, the Mulago Foundation, and the Goldsmith Foundation.
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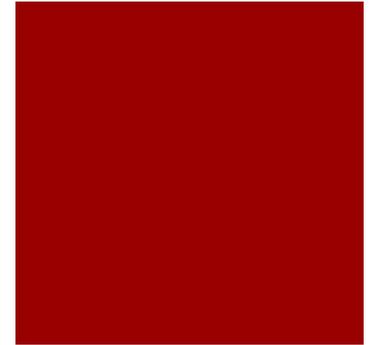
# The Potential of Social Networks



*“If you wish to go fast, go alone.  
But if you wish to go far, go together.”*

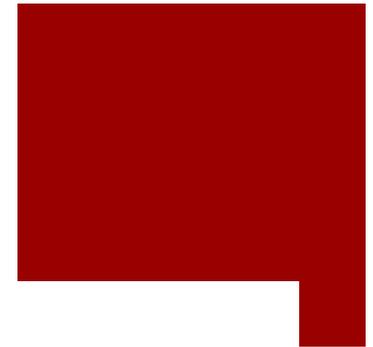
(African proverb)

# Social networks and health



- Social network interactions may play a meaningful role in disease prevention.
- From smoking, to obesity, to alcohol use – such factors are correlated in social networks.
- Thus, if behaviors may naturally aggregate in social networks, then **interventions that leverages social networks, therefore, may hold promise to induce and propagate positive health behaviors**

# Observational studies of Social Network and Obesity/Smoking



The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

## The Spread of Obesity in a Large Social

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

. Fowler, Ph.D.

ARTICLE

**Annals of Internal Medicine**

*Ann Intern Med.* 2010;152:426-433.

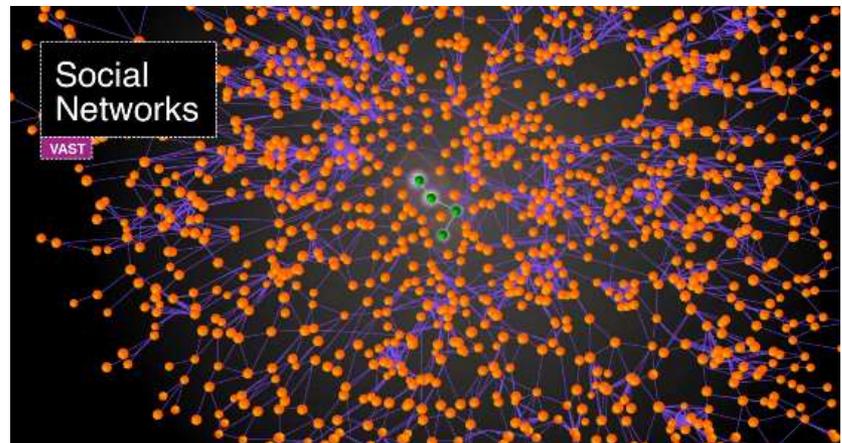
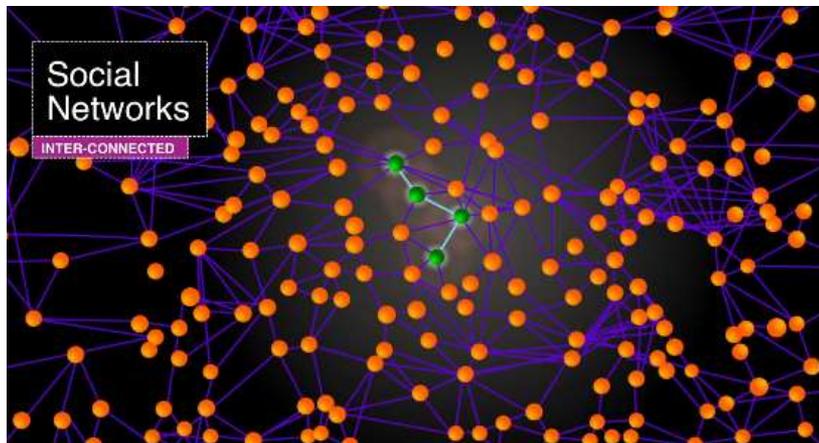
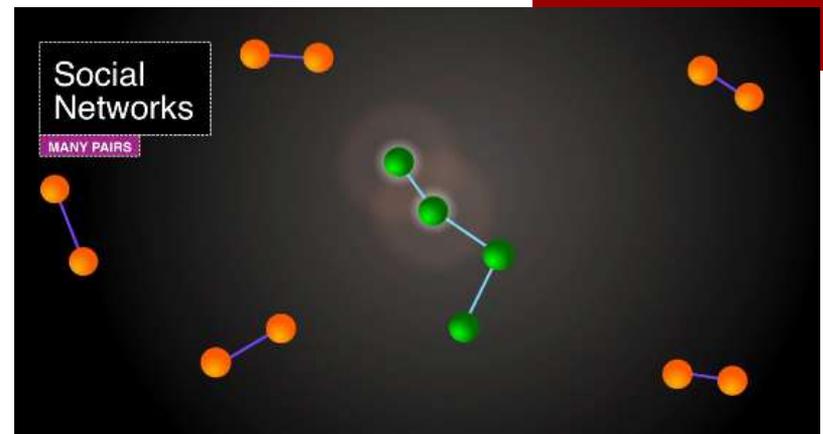
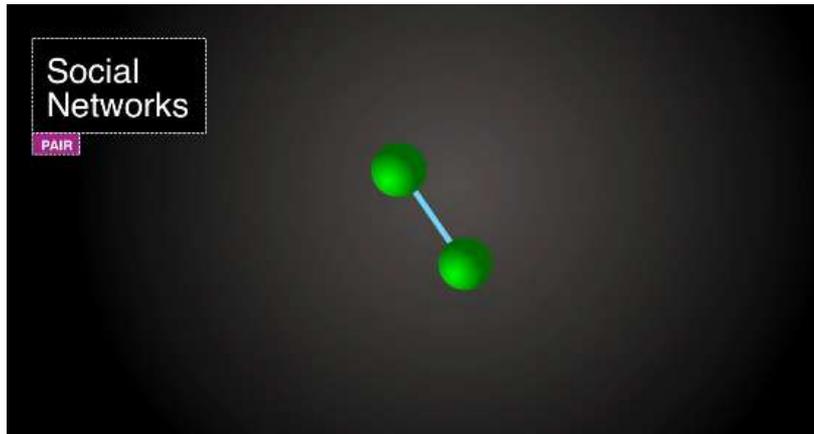
The Colle

in a **The Spread of Alcohol Consumption Behavior in a Large Social Network**

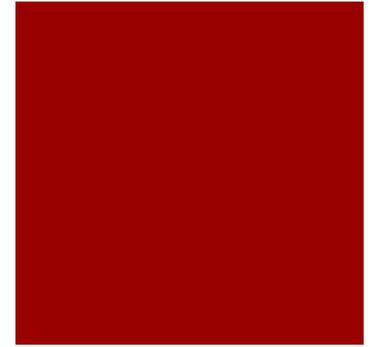
Nicholas A. Christa

J. Niels Rosenquist, MD, PhD; Joanne Murabito, MD; James H. Fowler, PhD; and Nicholas A. Christakis, MD, PhD

# Social Network Paradigm



# Types of Social Network Clustering



## 1. INDUCTION (causation)

- e.g. A friend/spouse makes/nags the other to go to the gym. **Friendship → Weight loss**

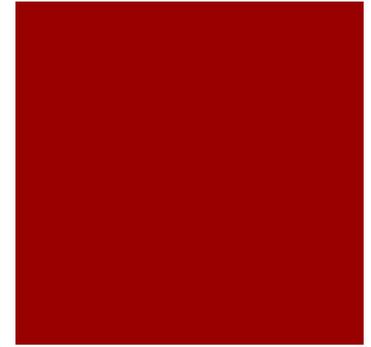
## 2. HOMOPHILY (selection / reverse causation)

- e.g. Jane and Jen form a new friendship because both are skinny and gravitate together as friends. **Body weight → Friendship**

## 3. CONFOUNDING (non-causal correlation)

- e.g. Sheryl and Susan are a pair of lean friends who met from attending the same high income neighborhood gym. **Friendship ← SES → Weight**

# Limitations of past observational studies on social networks

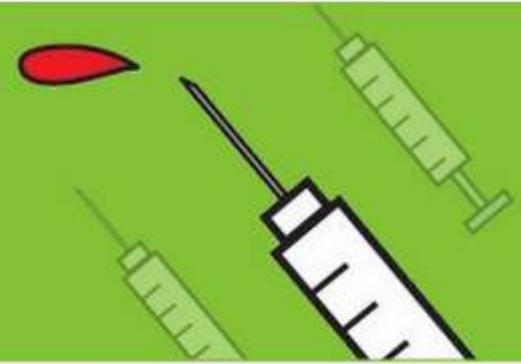


- Cannot prove direct causation
- Cannot disentangle the types of social network clustering
- Cannot answer if interventions can be **PROPAGATED** and **INDUCED** for spreading healthy lifestyles for public health

# Microclinic philosophy



Chronic diseases can be biologically infectious or non-infectious, but epidemics are driven by behaviors spread through social networks.



Unhealthy behaviors are socially contagious.

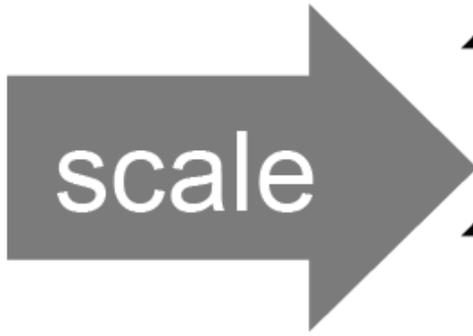
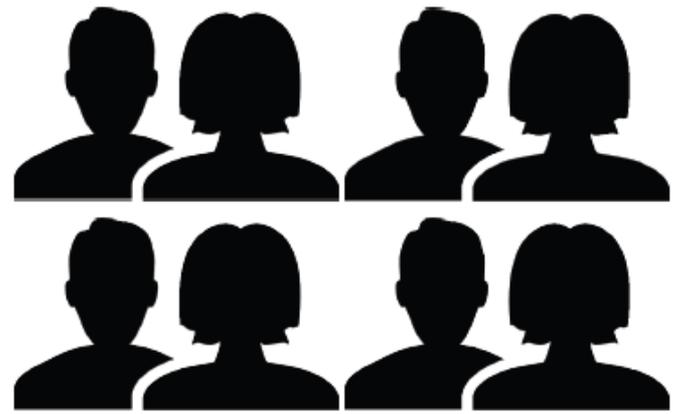
If bad behaviors can be spread, then so can good behaviors.  
Health can be made contagious!



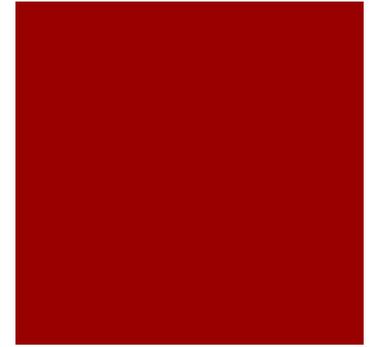
contagious health model



MICROCLINIC INTERNATIONAL



# MICROCLINIC Program



- **‘Microclinics’ are groups of friends and family members who form together into ‘microclinic’ units** for participation together in health program.
- Multiple microclinic units are nested within classes, nested within neighborhood community clusters.
- The MICROCLINIC program works to:
  - strengthen social interaction
  - foster friends and family within microclinic units to share personal health status information
  - Encourage sharing and propagation of health behaviors within and between microclinic units

# Location: Bell County, KY

- Population= 29,000
- Median per capita annual income: \$11,000
- Median household income: \$19,000
- Percent below poverty: 31%

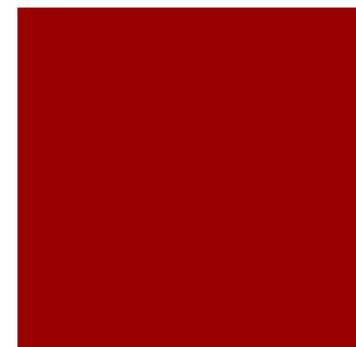


# Methods



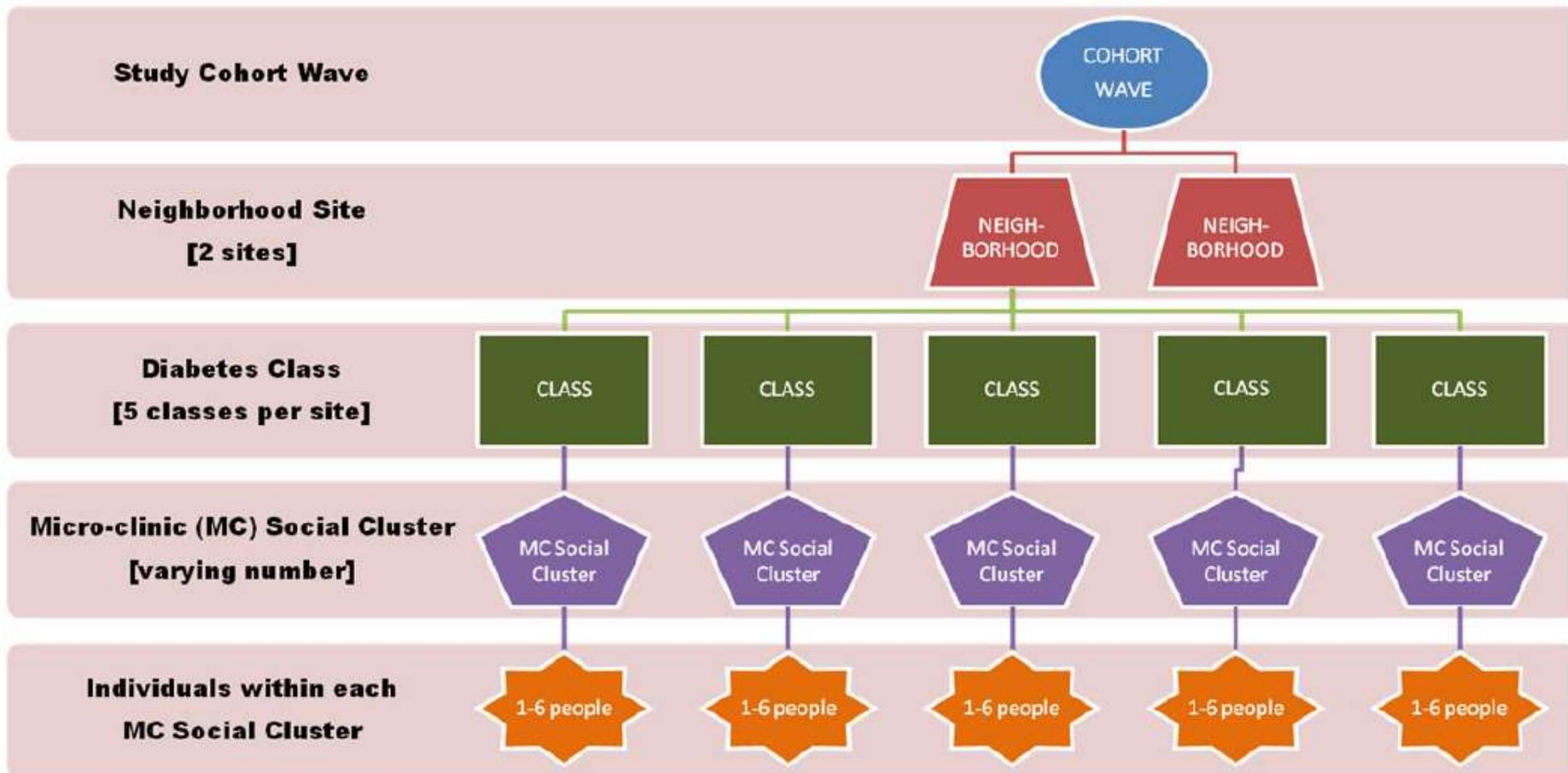
- Randomized trial of 9-10 month intervention, followed by 6-7 months follow up at 16 months.
- Control group received standard health department access and monitoring (in parallel with intervention).
- Recruited participants to enroll as pre-existing network of friends or family members
- Multi-level longitudinal random-effects mixed models
  - Hierarchical levels: temporal cohort → geographic neighborhood community → classroom → microclinic → individual

# Randomization tree



	INTERVENTION	CONTROL
Approached for eligibility		1000
Excluded- not eligible		4
Excluded- declined		125
Entered Randomization		871
Randomized Allocation	581	290
Formally Enrolled in Study	301	193

# Hierarchical Structure of Microclinics within Community



# Social Network Layers in this MICROCLINIC trial

	<b>INTERVENTION</b>	<b>CONTROL</b>
<b>Community cohorts</b>	<b>5</b>	<b>5</b>
<b>Classes</b>	<b>17</b>	<b>18*</b>
<b>Microclinic units</b>	<b>121</b>	<b>93*</b>
<b>Participants</b>	<b>297</b>	<b>192</b>

- \*Among controls, social groups exist and are identified, but are not activated nor leveraged.

# Population

- Participants 91.5% women
- 51.5 (13.5) years mean age
- 36.2 (7.55) mean BMI
- Overweight or at least 1 metabolic risk factor for eligibility
- Average microclinic social cluster size: 4.1 participants
- 494 participants at baseline (80% completed study)



## COHORT PHASE 1 SCHEDULE

**WEEK #**

**TOPIC**

1	Baseline Testing & Survey   <b>SCREENINGS</b>
2	<u>Microclinic</u> Philosophy & Goal Setting
3	Food Pyramid & Portion Sizes
4	Exercise & Stretching   <b>SCREENINGS</b>
6	Grocery Store Field Trip
8	Diabetes Overview
10	Walking Trial & Picnic
12	Nutritionist Speaker & Meal Plans
14	Heart Disease Overview & Survivor Activity   <b>SCREENINGS</b>
16	Glucometers & Under Pressure Team-Building
18	Fitness Class
21*	Extreme Couponing
22*	Healthy Holiday Party
26*	Family Fitness Fair   <b>SCREENINGS</b>
27*	Dancing Away the Pounds
28*	Taste of Health Competition
30*	Cooking Class w/ Chef
31*	Go Green, Get Healthy Gardening
32*	Intro to Canning
34	Review Goals & Sharing Wisdom   <b>SCREENINGS</b>
36	Ophthalmologist Speaker & Stress Team-Building
38	Nutrition & Cooking Class with Chef
40	Endocrinologist & Cardiologist Speakers
42	Health Posters & Follow-up Survey
44	Potluck, Certificates   <b>SCREENINGS</b>

**RED color = Open-community program sessions**

## COHORT PHASE 2 SCHEDULE

### WEEK #

### TOPIC

1	Baseline Testing & Survey   <b>SCREENINGS</b>
2	<del>Microclinic</del> Philosophy, Goal Setting & Survey
3	Exercise & Stretching
4	Walking Trail & Picnic
6	Food Pyramid & Portion Sizes   <b>SCREENINGS</b>
8	Diabetes Overview
10	Grocery Store Field Trip
12	Nutritionist Speaker & Meal Plans
14	Heart Disease Overview & Intro to First Aid Teambuilding   <b>SCREENINGS</b>
16	Gardening Session & Under Pressure Team-Building
18	Fitness Class
21*	<b>SCREENINGS</b>
22*	Healthy Holiday Party
26*	Family Fitness Fair
27*	Taste of Health Competition
28*	Medical Specialist Speakers
30	Review Goals & Sharing Wisdom
31	Stress Team Building   <b>SCREENINGS</b>
32	Nutrition & Cooking Class with Chef
34	Recipe Sharing
36	Health Posters & Survey
38	Potluck & Survey   <b>SCREENINGS</b>

**RED color = Open-  
community  
program sessions**



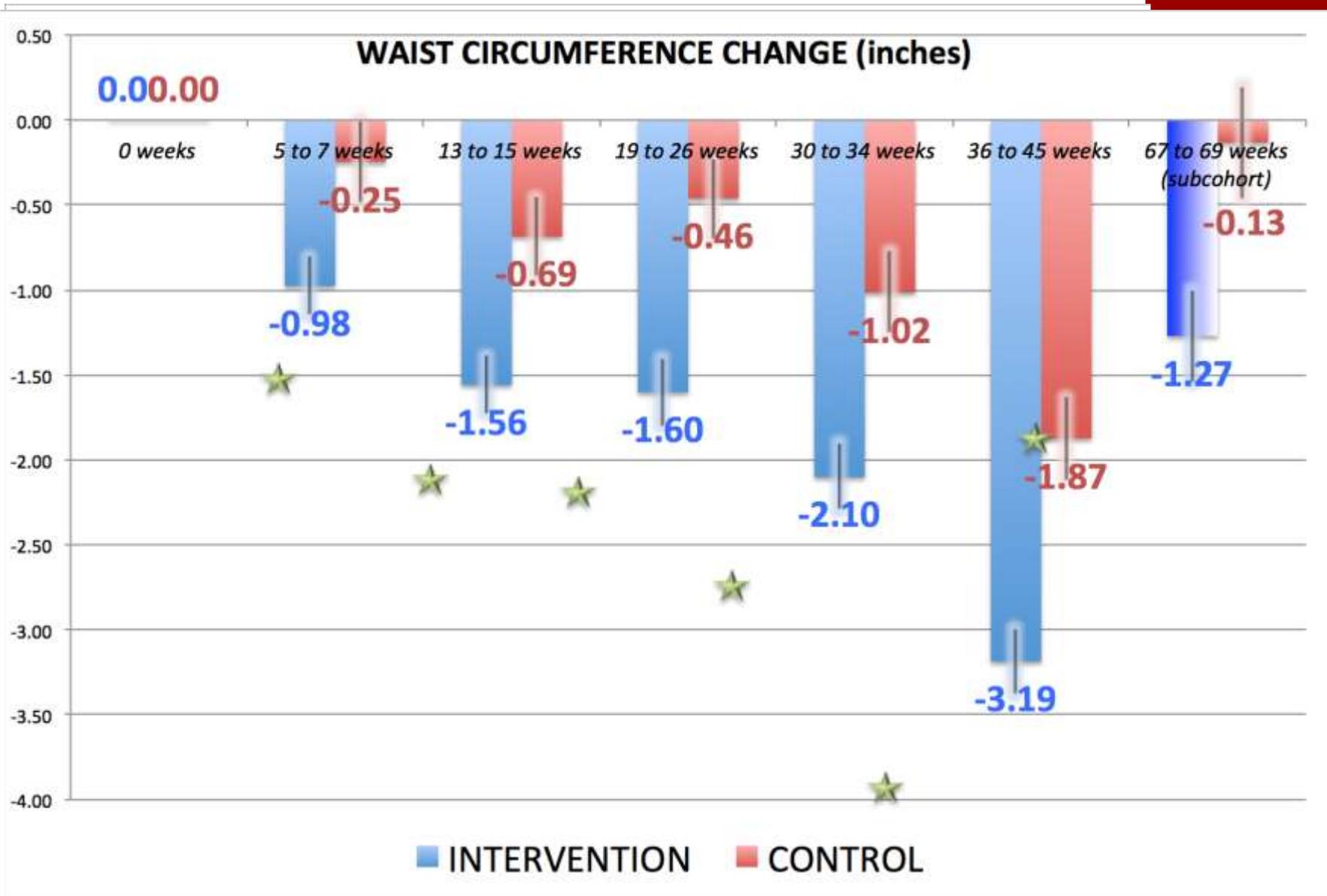
# Results: Weight (10 + 16 mo)

P<0.001



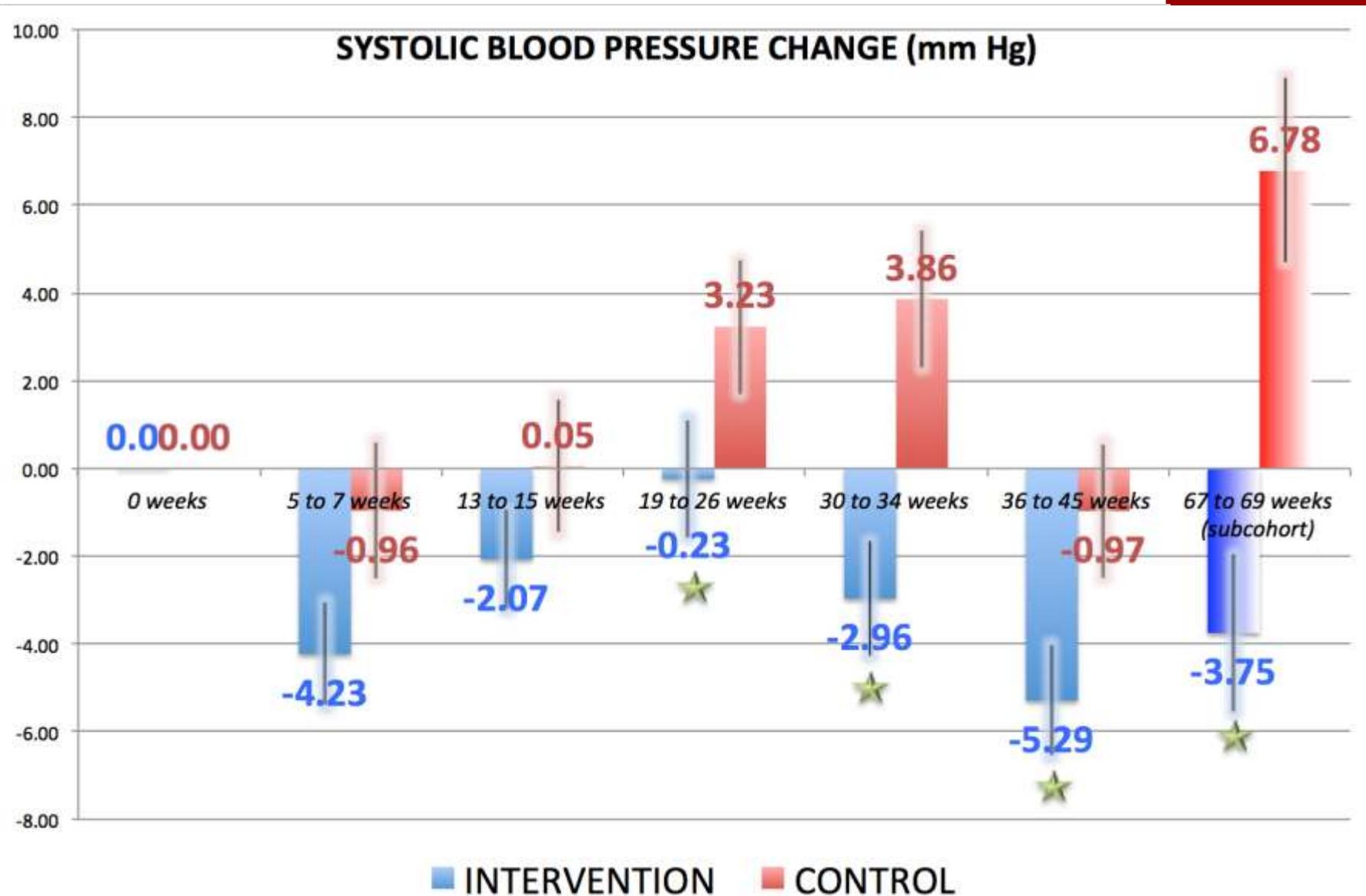
# Results: Waist Circumference

P<0.001

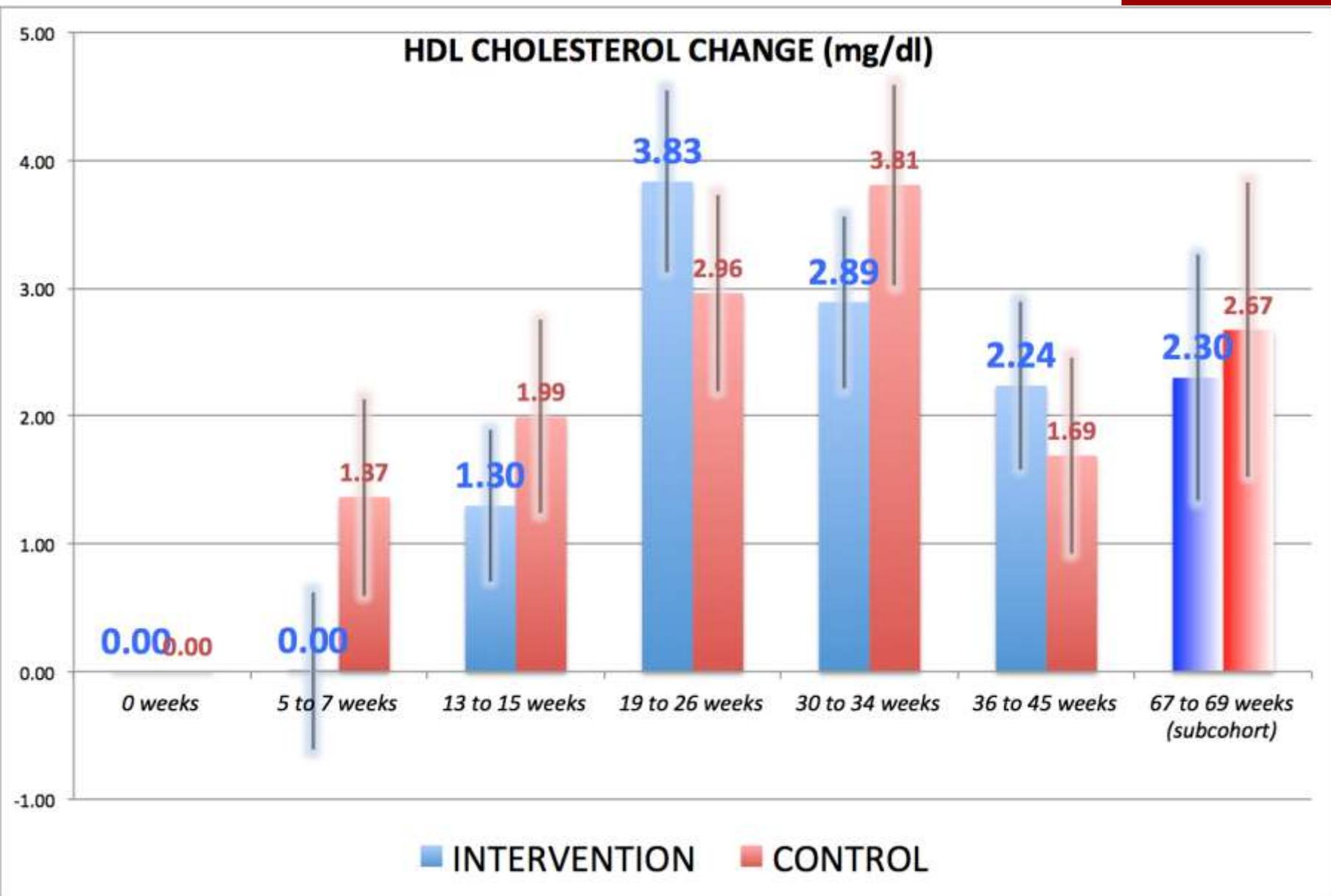


# Results: Systolic Blood Pressure

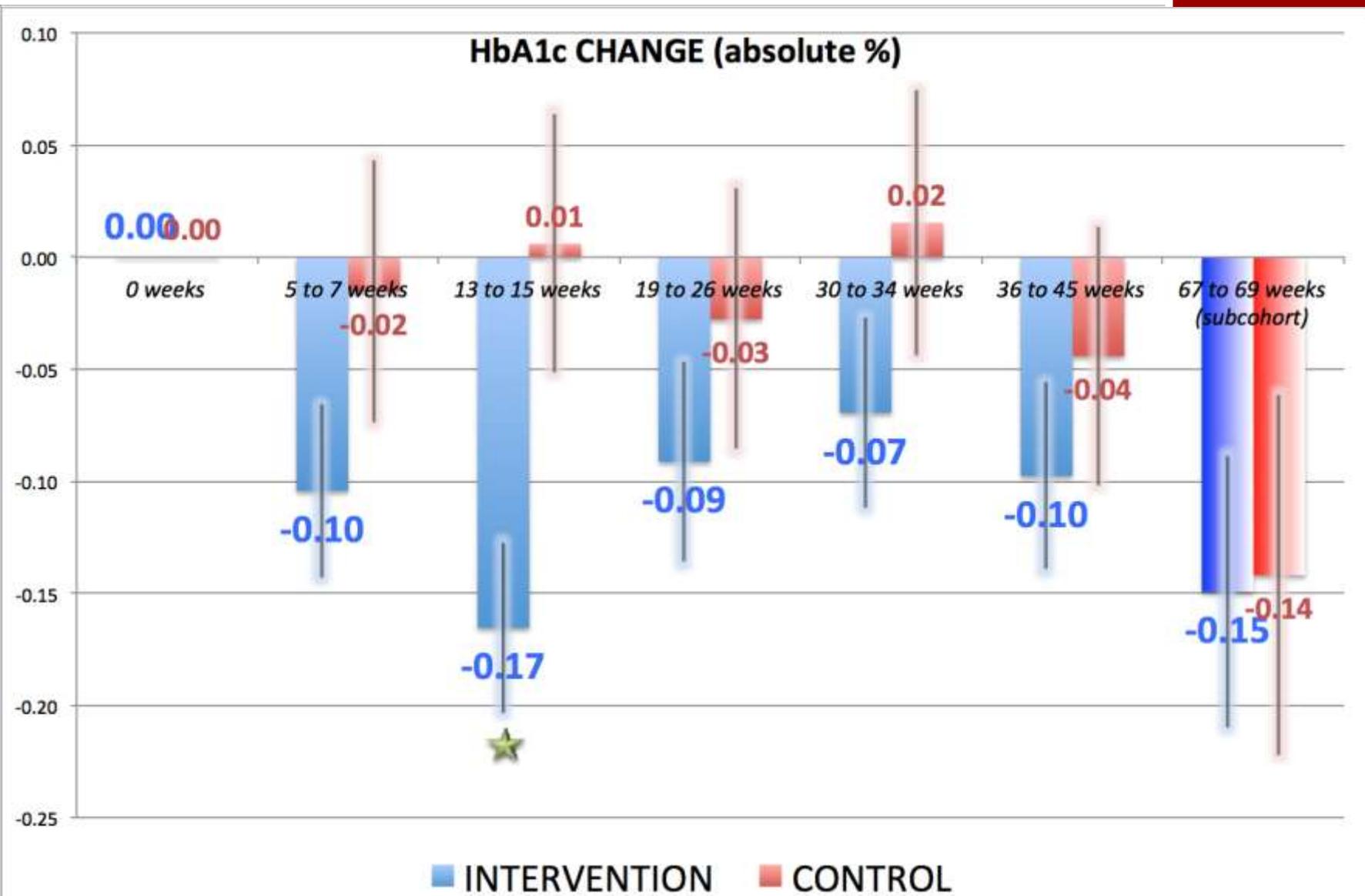
P<0.001



# Results: HDL

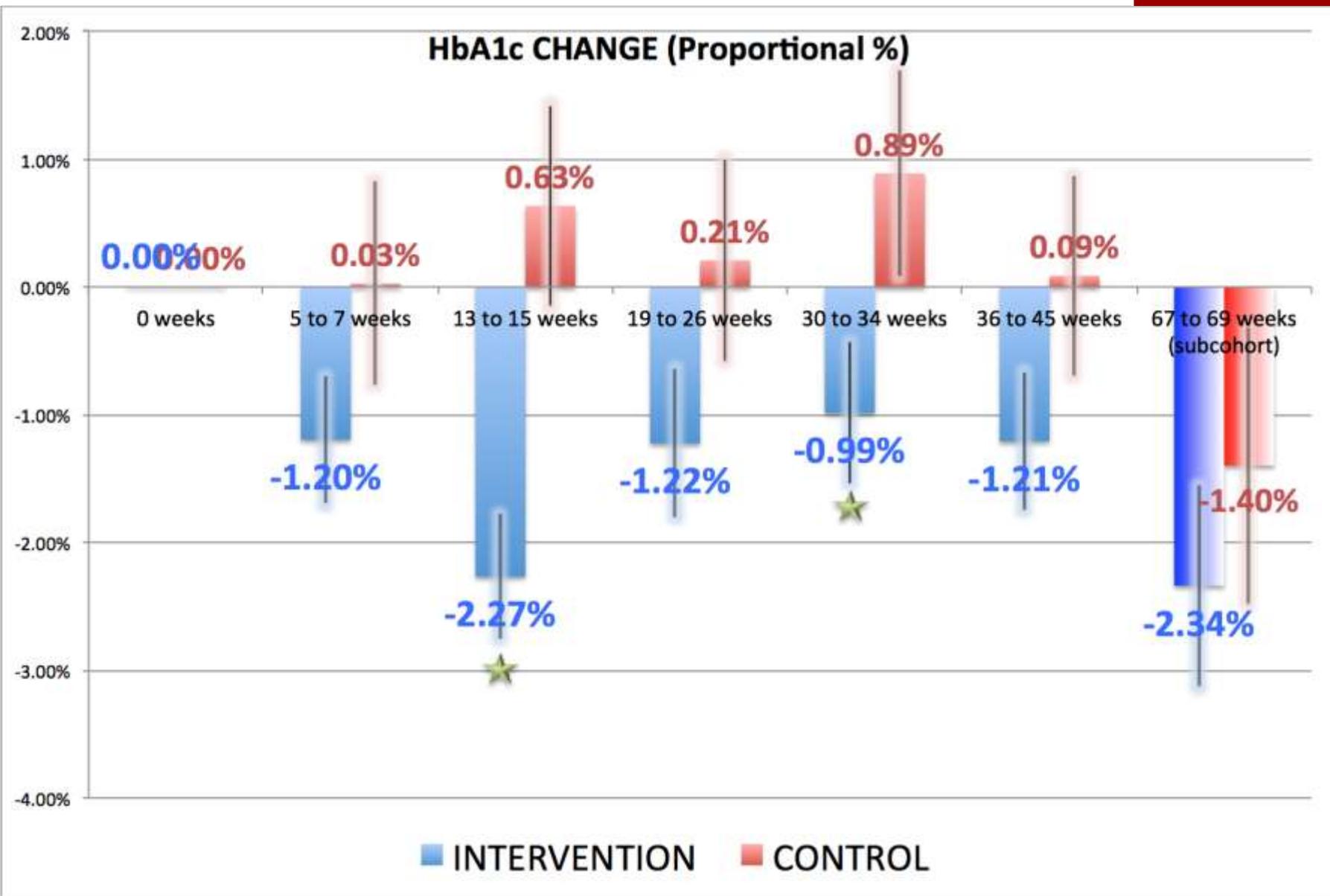


# Results: HbA1c (absolute change)

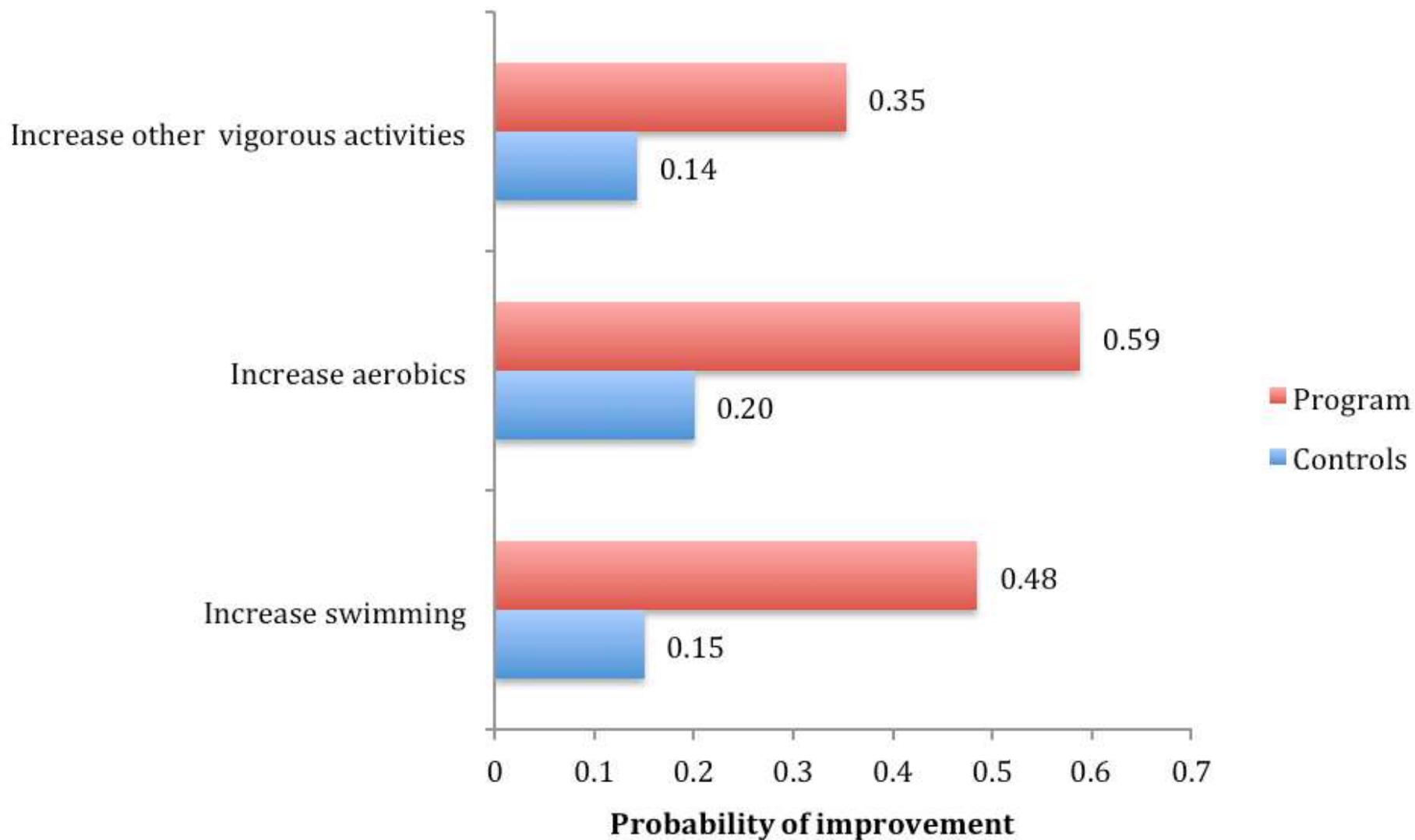


# Results: HbA1c (proportional %)

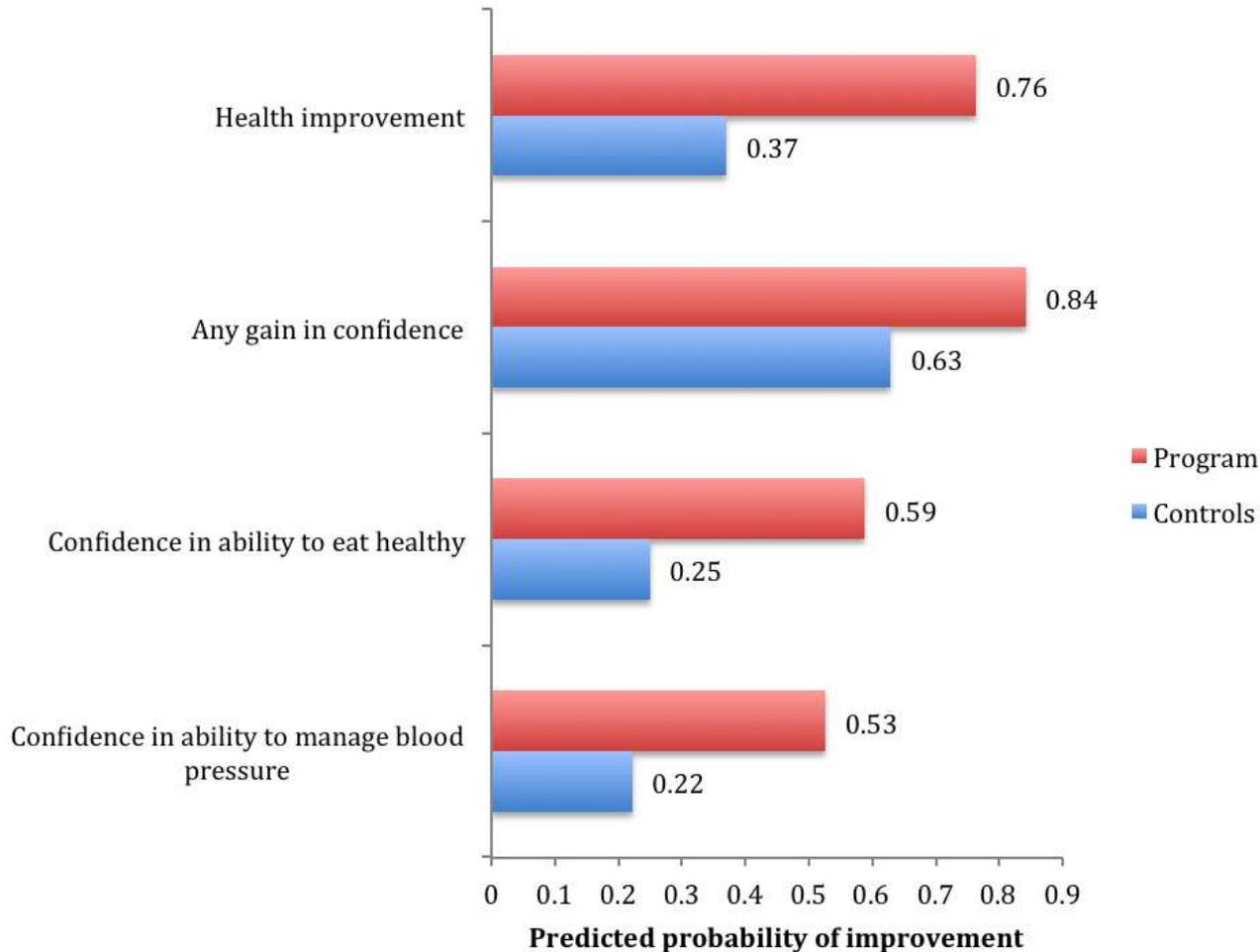
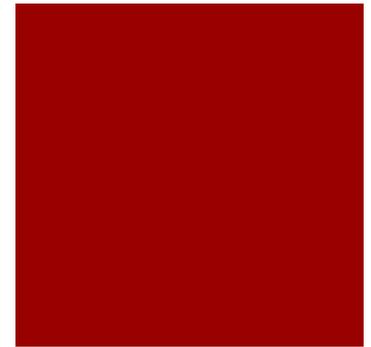
**P=0.03**



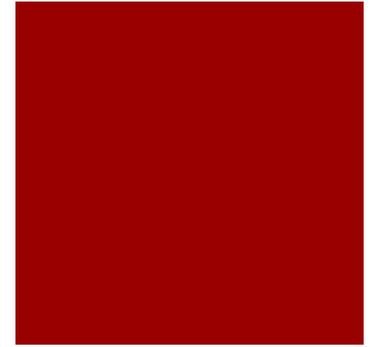
# Results: Exercise



# Results: Self-Confidence in Health



# Summary



- The ***Microclinic Social Network Behavioral Health Program*** lifestyle intervention may be effective for obesity, waist circumference, blood pressure, and glycemic control in resource limited settings.
- As the first randomized trial designed to harness social network effects, results support the promise of **leveraging social networks** to propagate health.
- Results hold promise for **socially engineering and designing interventions around social networks** to propagate healthy lifestyle in future public health programs.



MICROCLINIC  
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[www.microclinics.org](http://www.microclinics.org)



■ a 501c(3) non-profit organization