

**International Conference on Health, Wellness & Society  
UC Berkeley, January 2011**

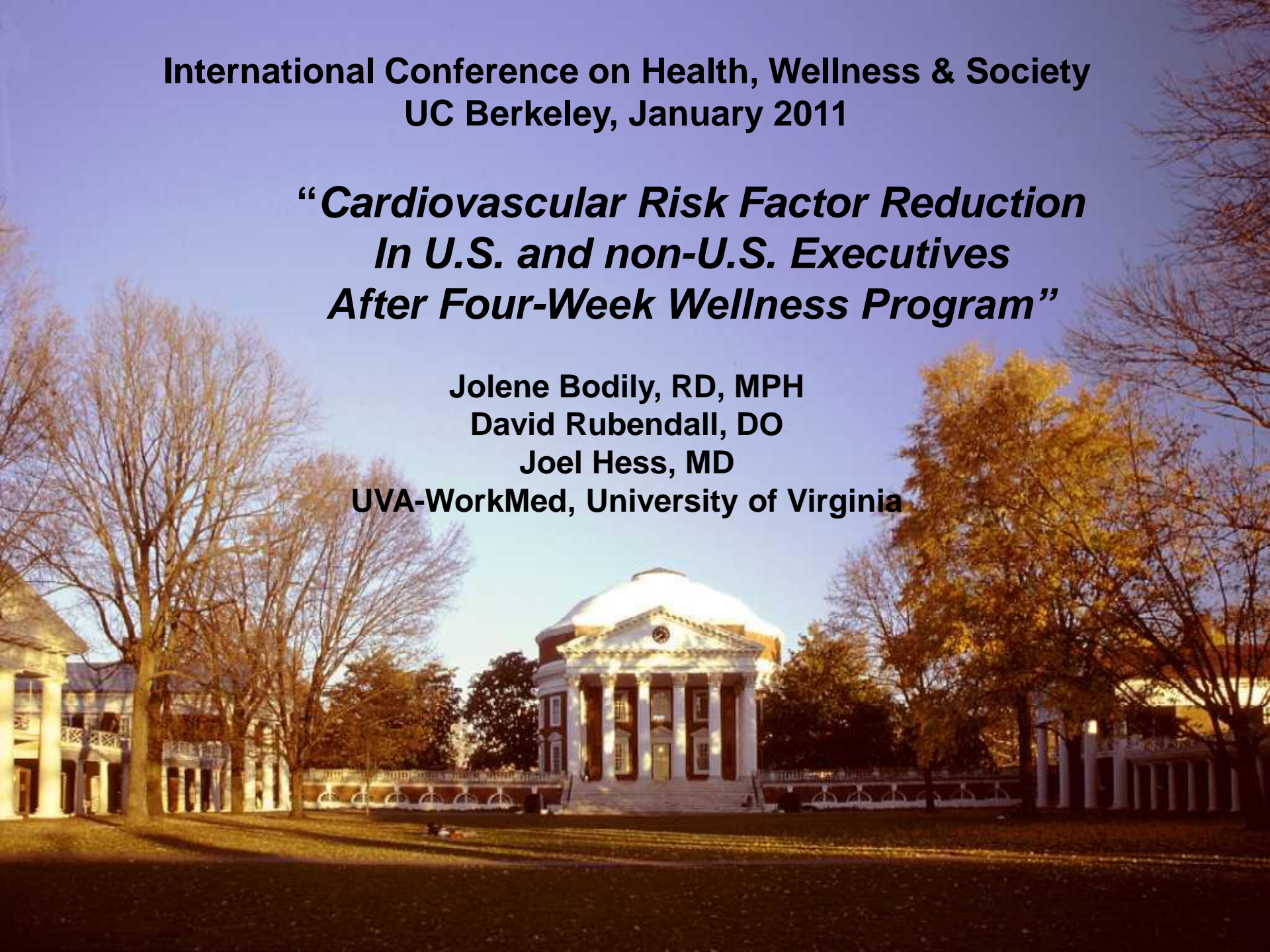
***“Cardiovascular Risk Factor Reduction  
In U.S. and non-U.S. Executives  
After Four-Week Wellness Program”***

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# **Group Characteristics:**

**n=227, seven cohorts, 2003-2009**



<b>Mean Age</b>	<b>44.7 years</b>
<b>Gender</b>	<b>85.8% male</b>
<b>Nationality</b>	<b>72% U.S.</b> <b>28% non-U.S.</b> <b>18% South Africa</b> <b>5% Switzerland</b> <b>13% UK</b> <b>5% Norway</b> <b>8% Australia</b> <b>3% Saudi Arabia</b> <b>5% New Zealand</b> <b>3% Japan</b>
<b>Title</b>	<b>22% Director</b> <b>19% Vice President</b> <b>10% Captain</b> <b>8% Manager</b> <b>7% Senior Vice President</b> <b>6% General Manager</b>

# Wellness Program:



**Initial Health Screening** – cardiovascular biometrics and lipids, personal & family health history, detailed lifestyle questionnaire

**Daily Morning Fitness** – expert-led workouts (endurance, strength, flexibility workouts), blood pressure checks, individual coaching

**Meals** – special requests taken (fruit for dessert, vegetables steamed), nutrient information for entrees

**Individual Health Consults** – on request with Registered Dietitian, Exercise Physiologist, Physician

**Class Sessions** – maximizing energy, health and productivity (sleep, managing stress, enhancing cognition, etc)

**Re-Assessment** – repeat health screening

# Example of menu information



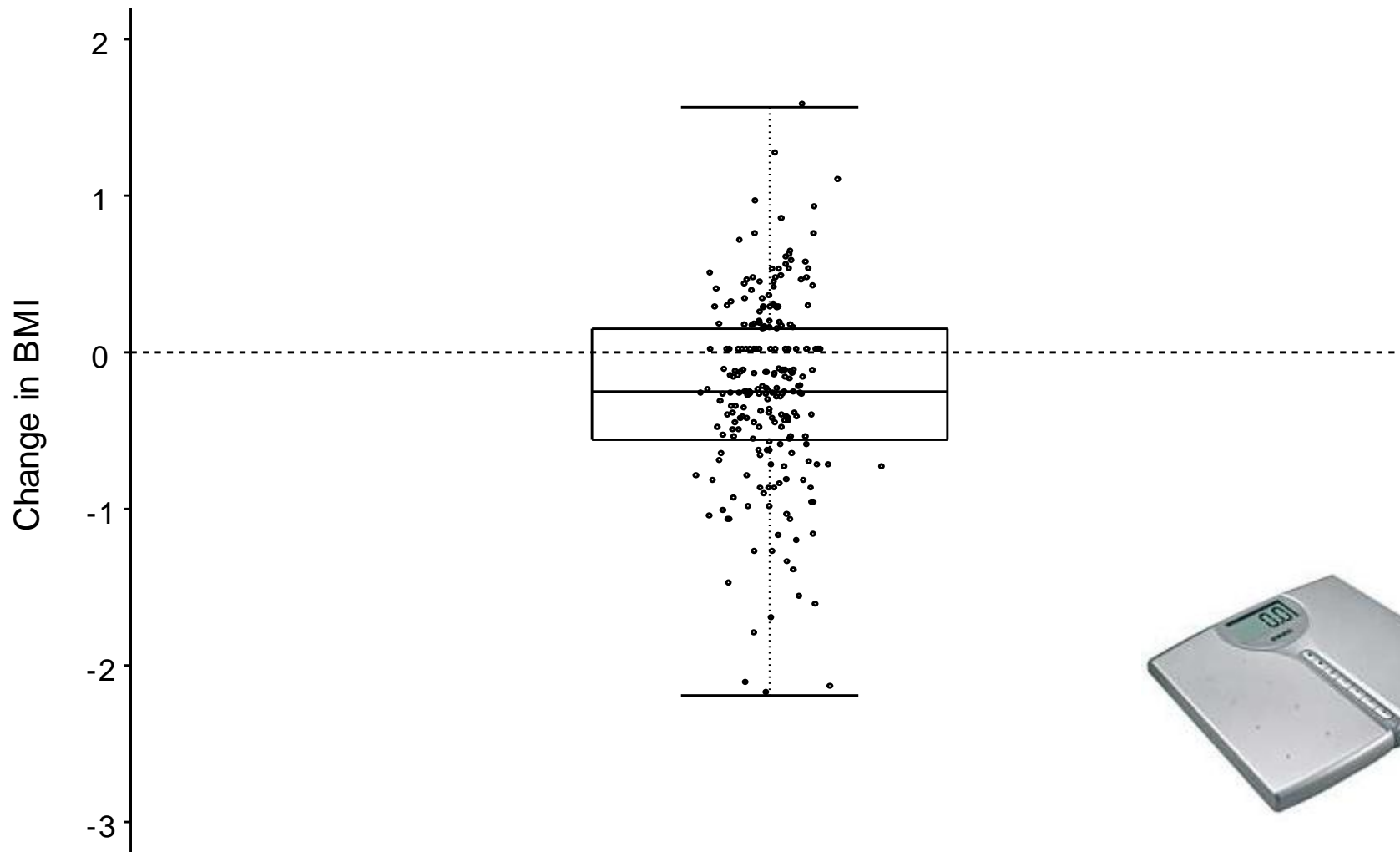
ENTRÉE	PORTION	CALORIES	CARBS	FAT	PROTEIN	SODIUM
Beef Pot Roast	3oz	190	1g	14g	16g	470mg
Potato & Cheese Pierogi	1.5oz(1)	64	11g	1.5g	2g	160mg
Fajita Beef + 1 tortilla	3oz	200	15g	4.5g	18g	240mg
Fajita Chicken + 1 tortilla	3oz	214	16g	7g	20g	265mg
Blackbean Flauta	3 PIECES	360	50g	15g	14g	840mg
Provençal Chicken	4oz chix + veg.	380	11g	23g	31g	330mg
Vegetable Paella	1/4 c rice +veg	405	82g	4g	9g	450mg
Sausage Lasagna	1cup	329	30g	15g	17g	780mg
Tilapia w/ saffron sauce	4oz	156	0	8g	20g	150mg
Beef & Mushrooms	6oz	502	4g	31g	52g	936mg
Shrimp Creole	4oz+1/2c rice	406	83g	3g	12g	310mg
Chicken Roma	1 breast	265	2g	11.5g	35g	245mg
Vegetable Gumbo	8oz	268	36g	12g	7g	886mg

# Anthropometric Measures: n=227, seven cohorts, 2003-2009

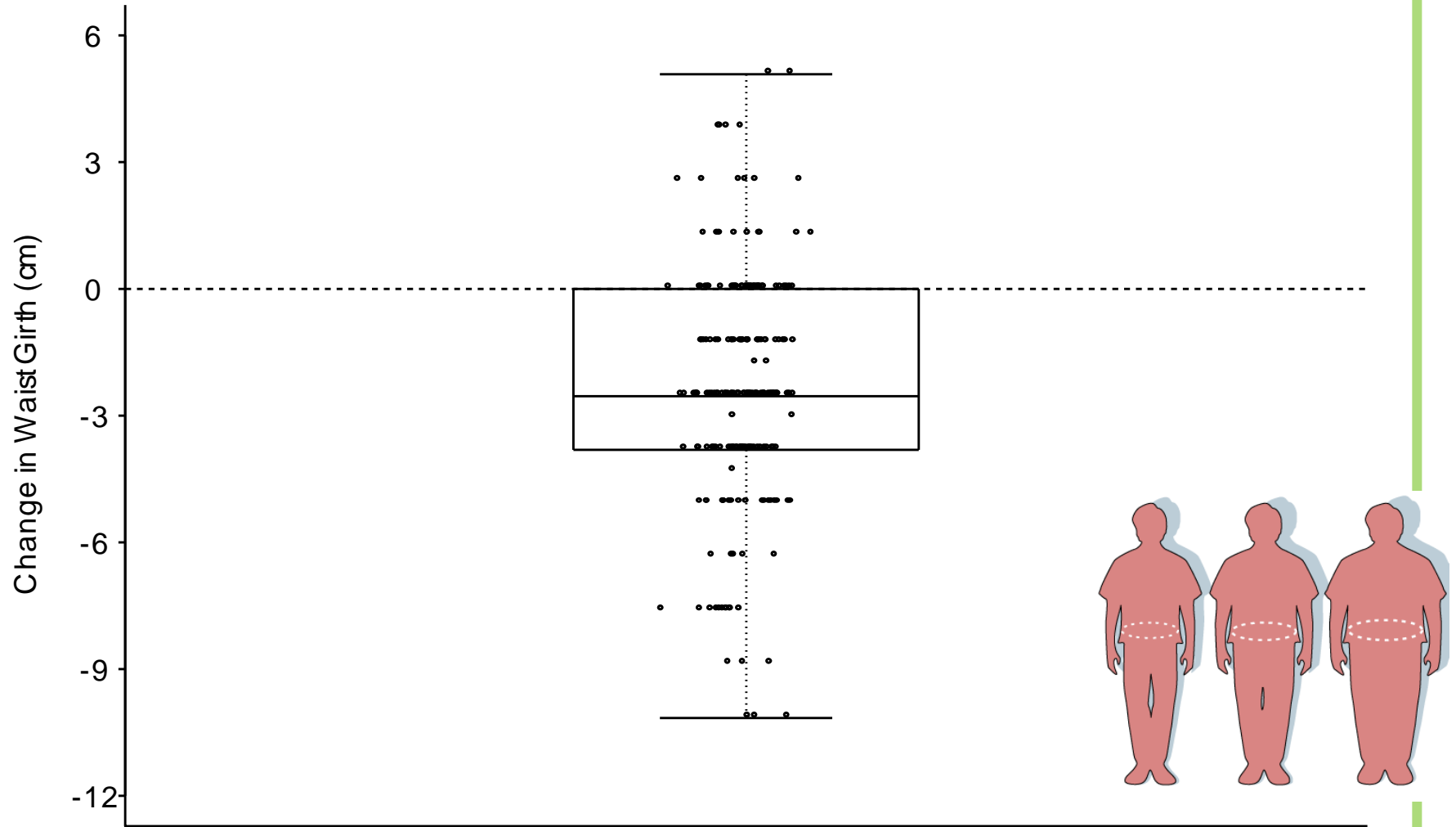


<b><u>OUTCOME</u></b>	<b><u>BASELINE</u> Mean (SD)</b>	<b><u>22 DAYS</u> Mean (SD)</b>	<b><u>Δ</u> Mean (SD)</b>	<b><u>CI</u></b>	<b><u>P-</u> <u>value</u></b>
Weight (kg)	86.0 (15.8)	85.2 (15.4)	-0.8 (1.9)	(-1.02, -0.53)	<0.001
Body Mass Index (kg/m <sup>2</sup> )	27.2 (4.2)	27.0 (4.0)	-0.2 (0.6)	(-0.32, -0.17)	<0.001
Waist (cm)	93.2 (12.2)	90.8 (11.7)	-2.4 (2.7)	(-2.77, -2.05)	<0.001

# BMI



# Waist Girth

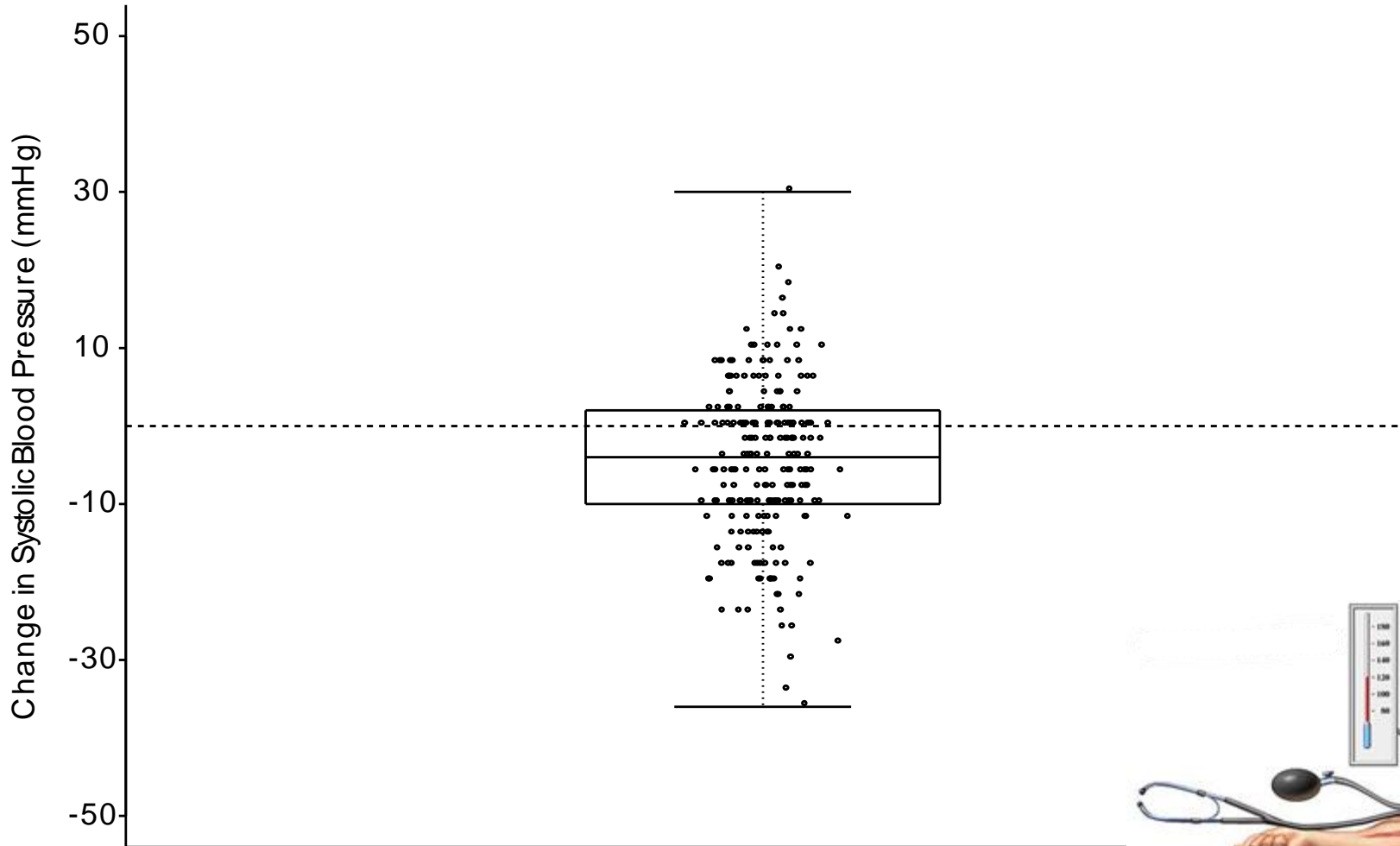


# Cardiovascular Risk Measures: n=227, seven cohorts, 2003-2009

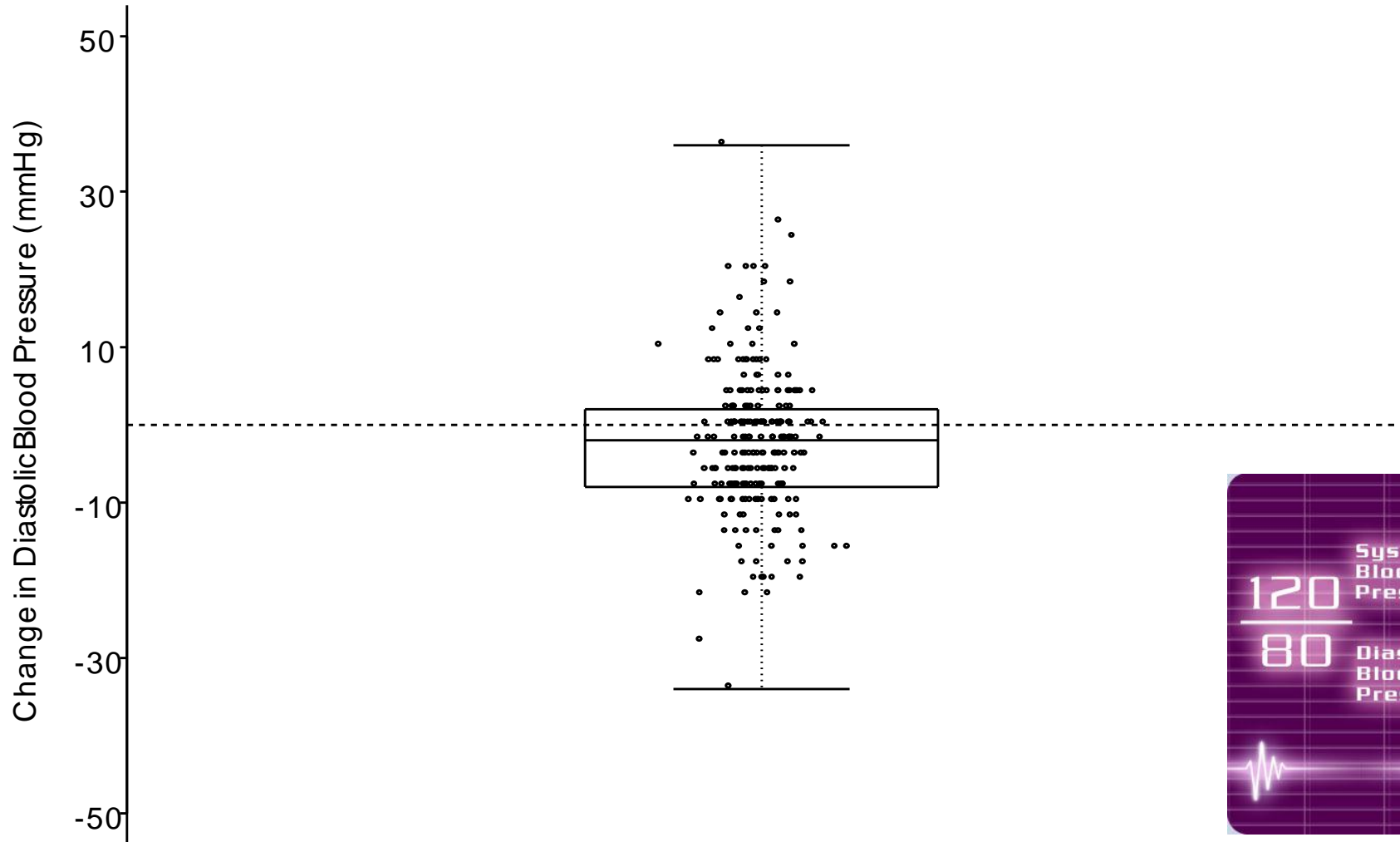


<u>OUTCOME</u>	<u>BASELINE</u> Mean (SD)	<u>22 DAYS</u> Mean (SD)	<u>Δ</u> Mean (SD)	<u>CI</u>	<u>P-value</u>
Systolic blood pressure (mm Hg)	120.5 (12.2)	115.5 (11.3)	-4.9 (10.3)	(-6.29, -3.60)	<0.001
Diastolic blood pressure (mm Hg)	77.6 (10.6)	75.1 (9.6)	-2.6 (9.5)	(-3.80, -1.31)	<0.001
Total cholesterol	191.7 (32.0)	187.4 (34.0)	-4.4 (24.3)	(-7.55, -1.19)	<0.001
HDL-cholesterol	48.7 (12.4)	51.9 (13.5)	3.2 (6.3)	(2.34, 3.99)	<0.001
LDL-cholesterol	121.8 (30.3)	115.0 (30.9)	-6.5 (21.0)	(-9.39, -3.75)	<0.001
Triglycerides	122.7 (70.4)	122.6 (70.8)	-0.1 (63.2)	(-8.42, 8.12)	0.972
Glucose	89.0 (14.2)	87.3 (10.7)	-1.6 (10.5)	(-2.99, -0.26)	0.020

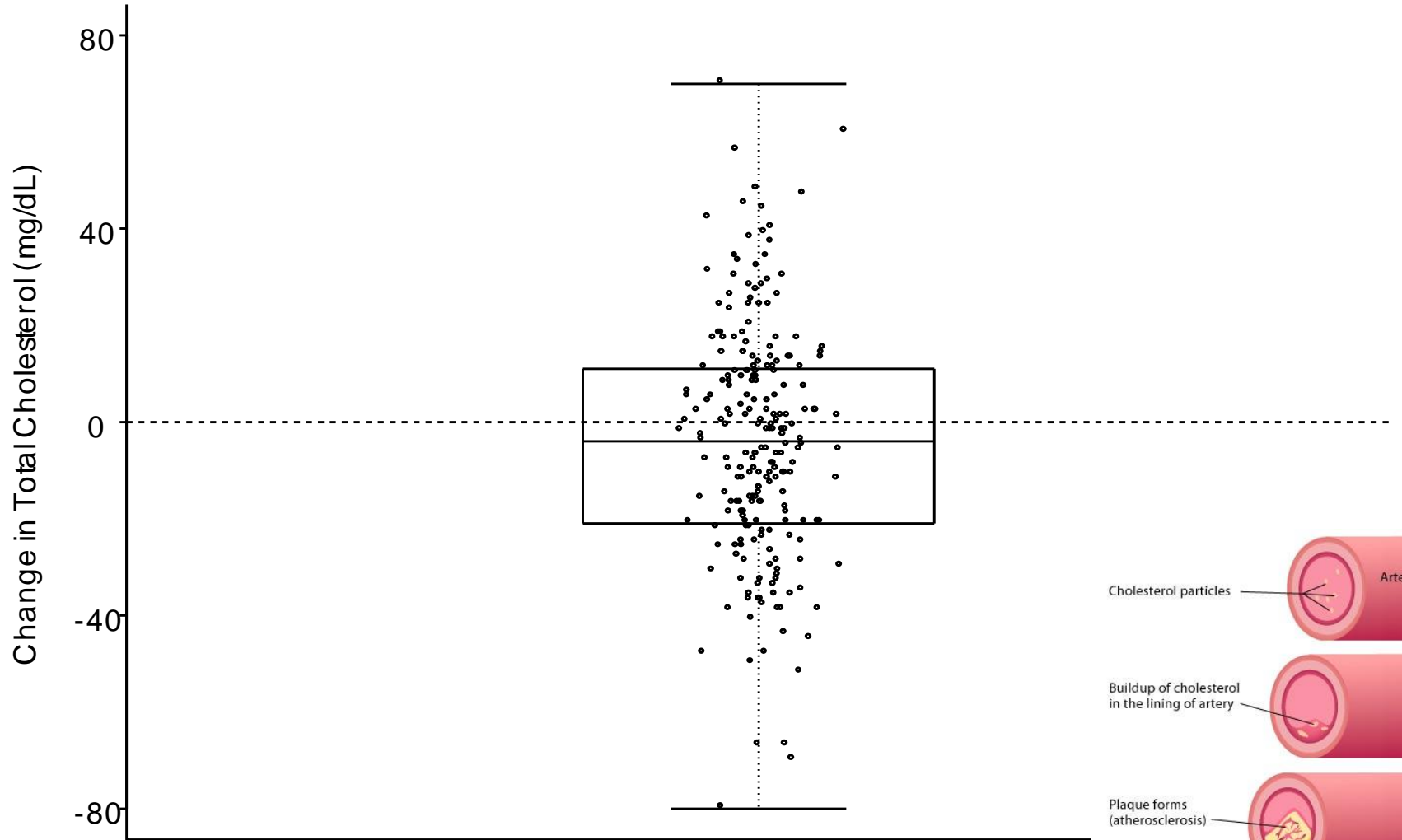
# Systolic Blood Pressure



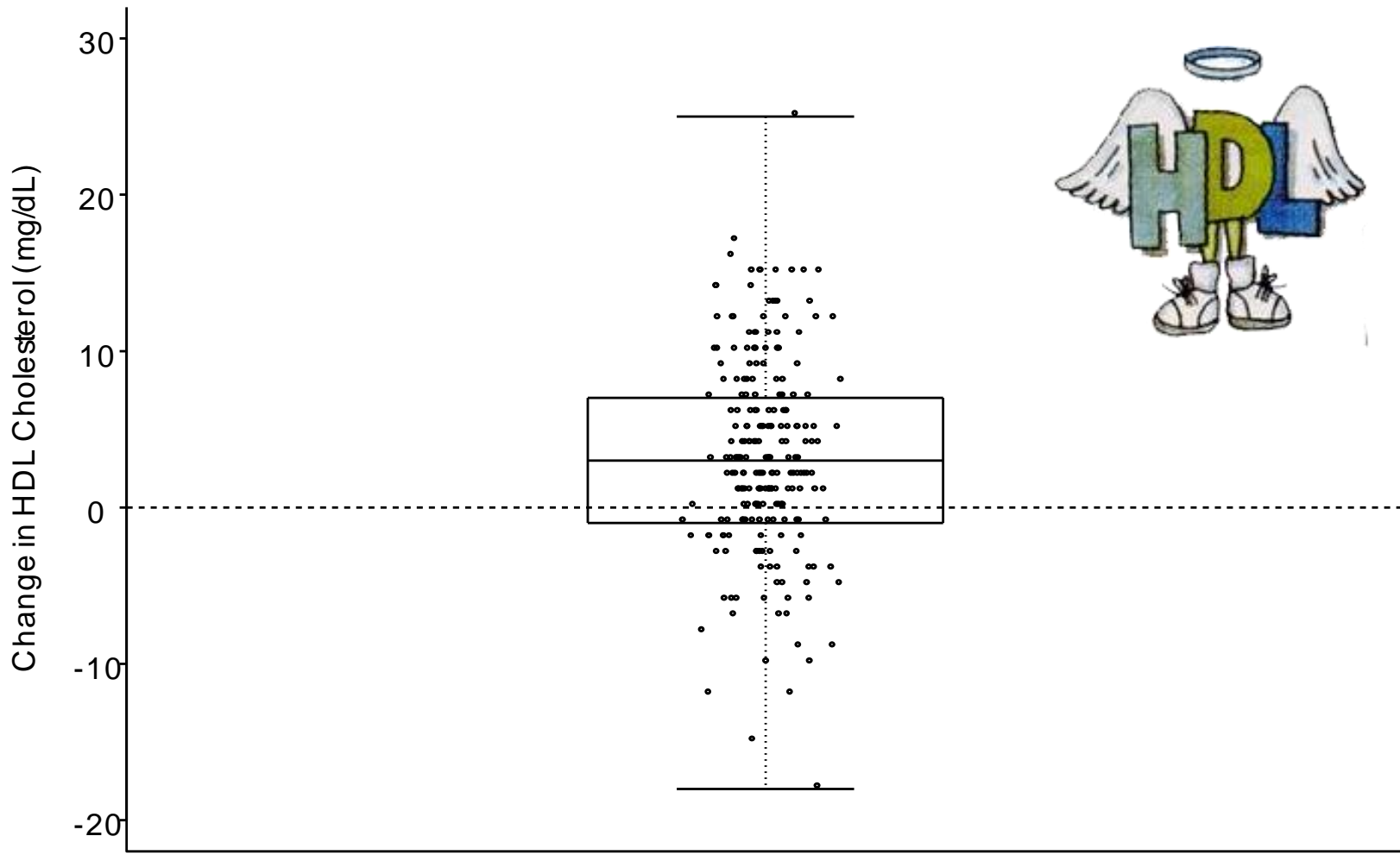
# Diastolic Blood Pressure



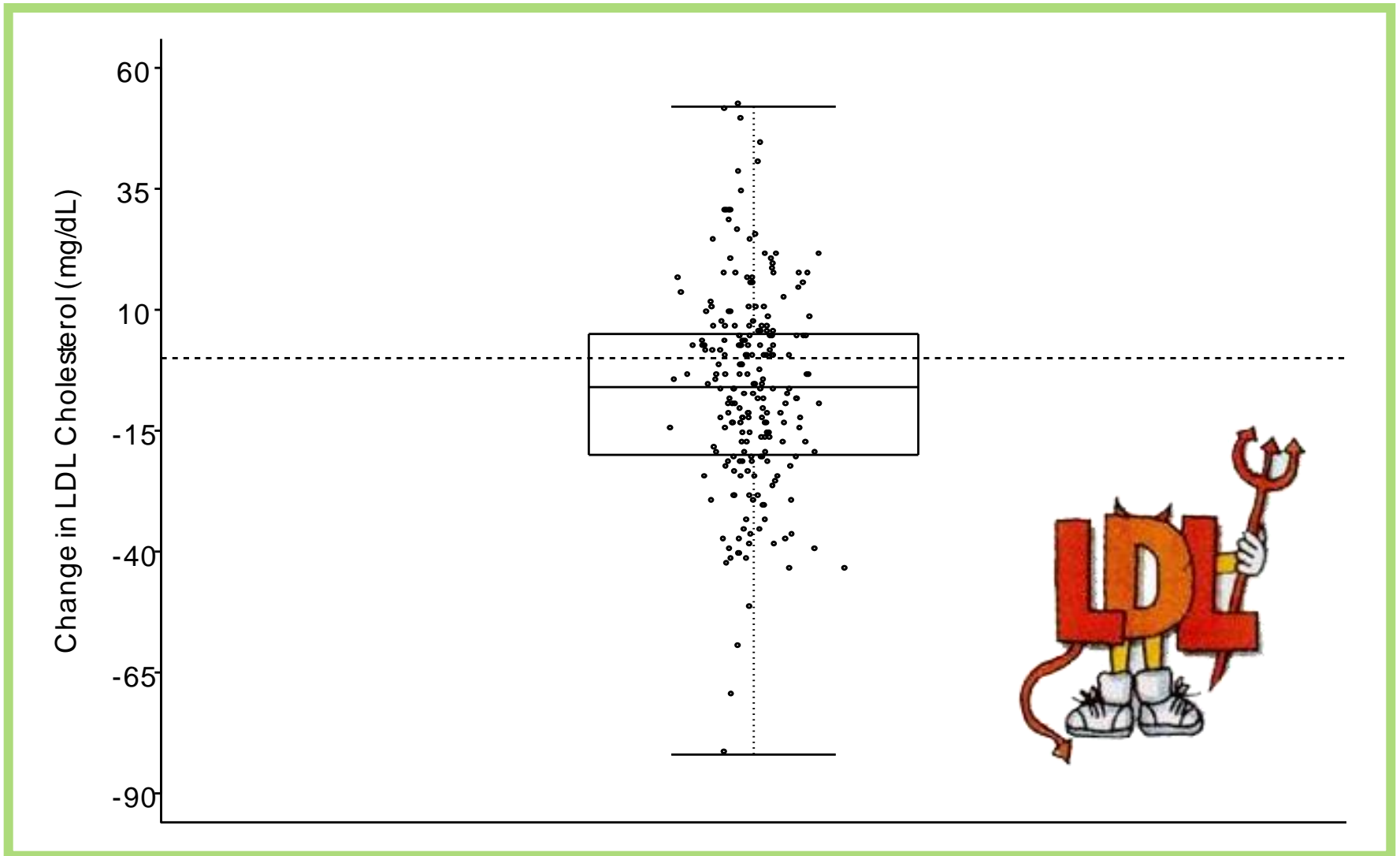
# Total Cholesterol



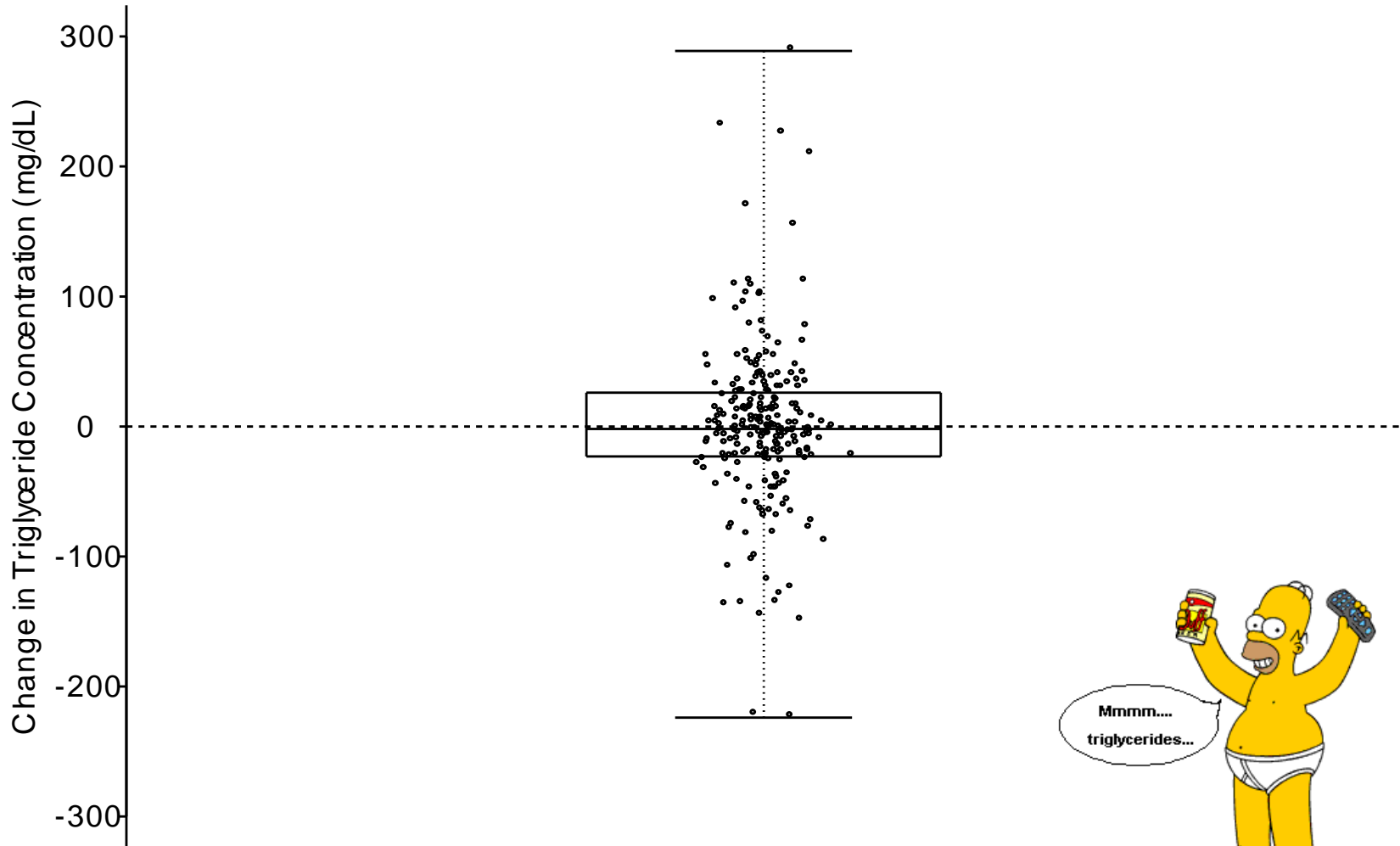
# HDL Cholesterol



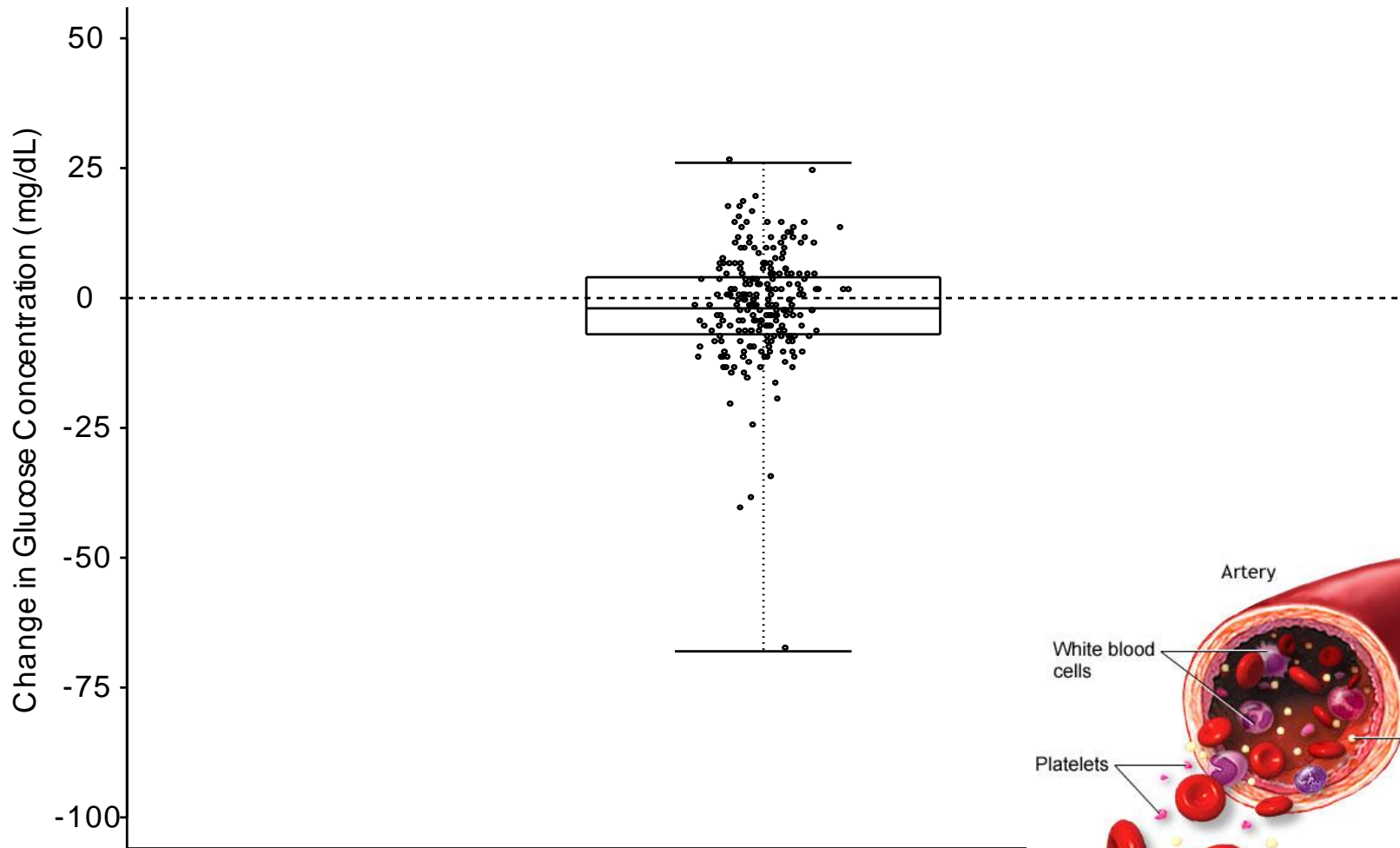
# LDL Cholesterol



# Triglyceride Concentration



# Glucose Concentration



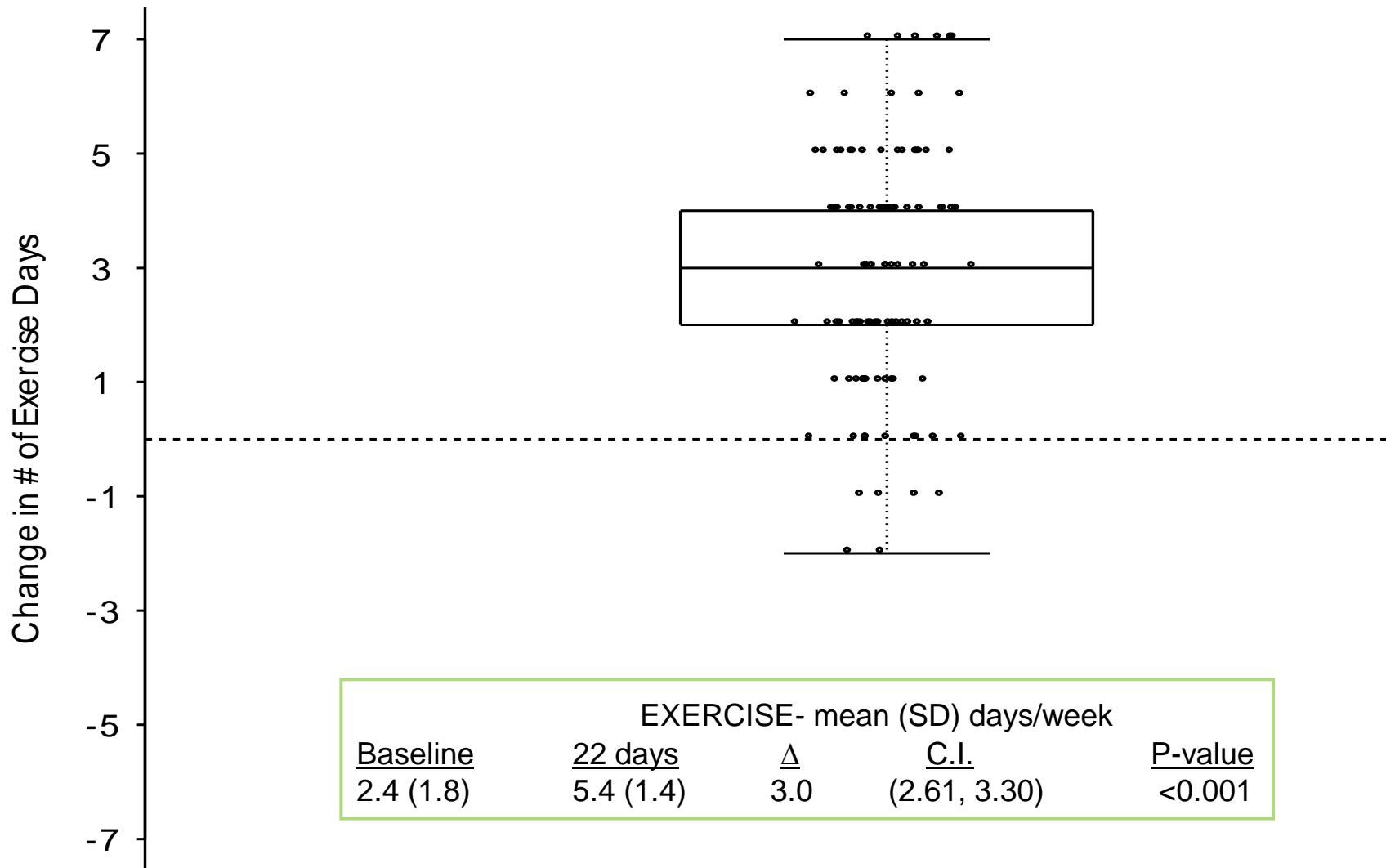
# Personal Health Habits:

**n=111, 4 cohorts, 2006-2009**

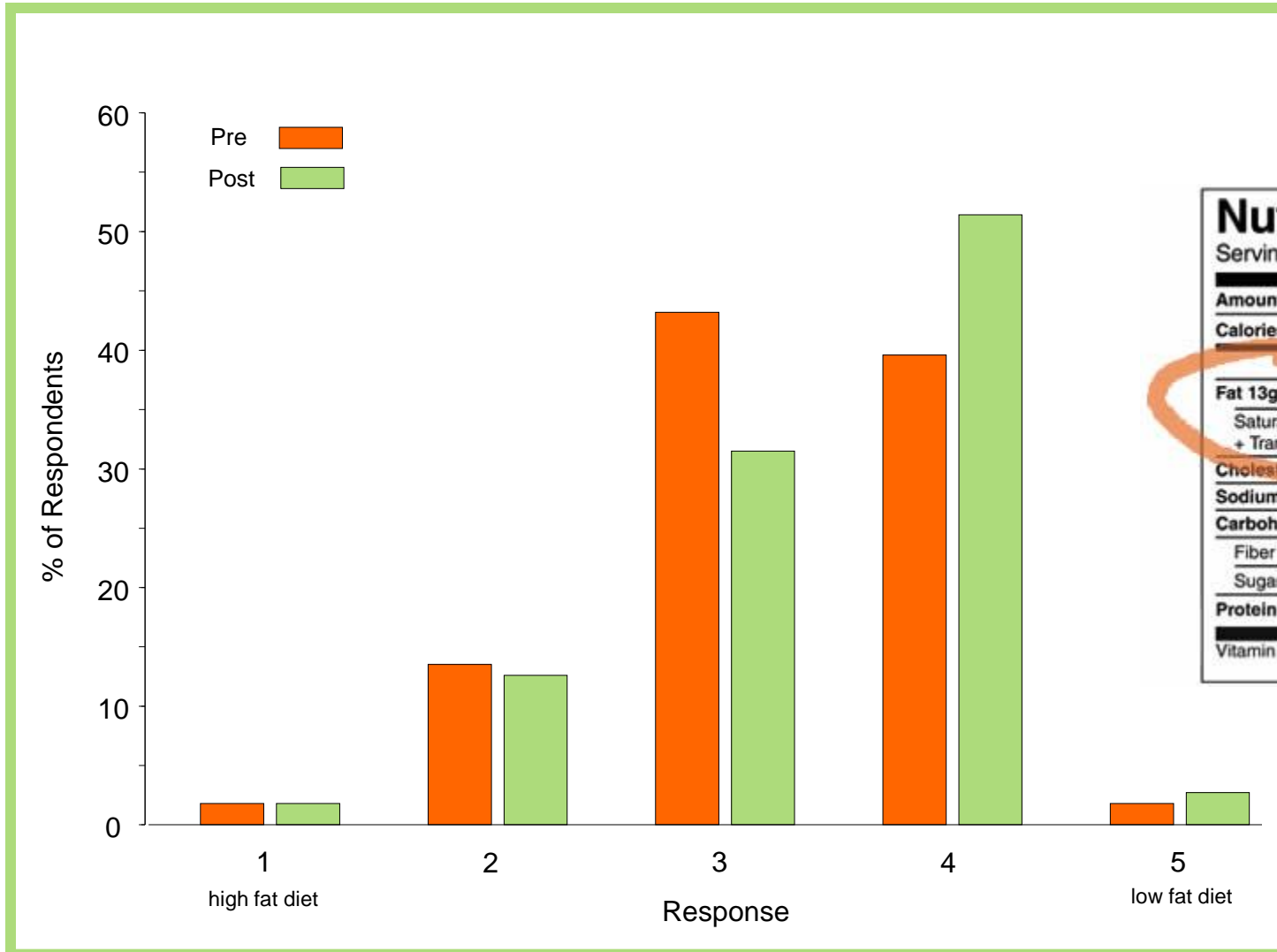


OUTCOME	P-value
Exercise, days/week	<0.001
Dietary Fat, high to low saturated fat	<0.001
Fruits & Vegetables, servings/day	<0.001
Alcohol, servings/week	=0.062
Coping, very well to unable to cope	=0.016
Smoking, never to 10+ cigarettes/day	=0.219
Sleeping, nights/week >7 hours/night	=0.453

# Exercise Days



# Fat Intake



Nutrition Facts	
Serving Size 1 cup (200g)	
Amount Per Serving	
Calories 260	
	% Daily Value
<b>Fat 13g</b>	20%
Saturated Fat 3g + Trans Fat 2g	25%
Cholesterol 30mg	10%
Sodium 660 mg	28%
Carbohydrate 31g	10%
Fiber 0g	0%
Sugars 5g	
<b>Protein 5g</b>	
Vitamin A 4%	Vitamin C 2%

# Fat Intake: Cross-classification

	Post Response Value	
Pre Response Value	≤3 (Higher Fat)	>3 (Lower Fat)
≤3 (Higher Fat)	50	15
>3 (Lower Fat)	1	45

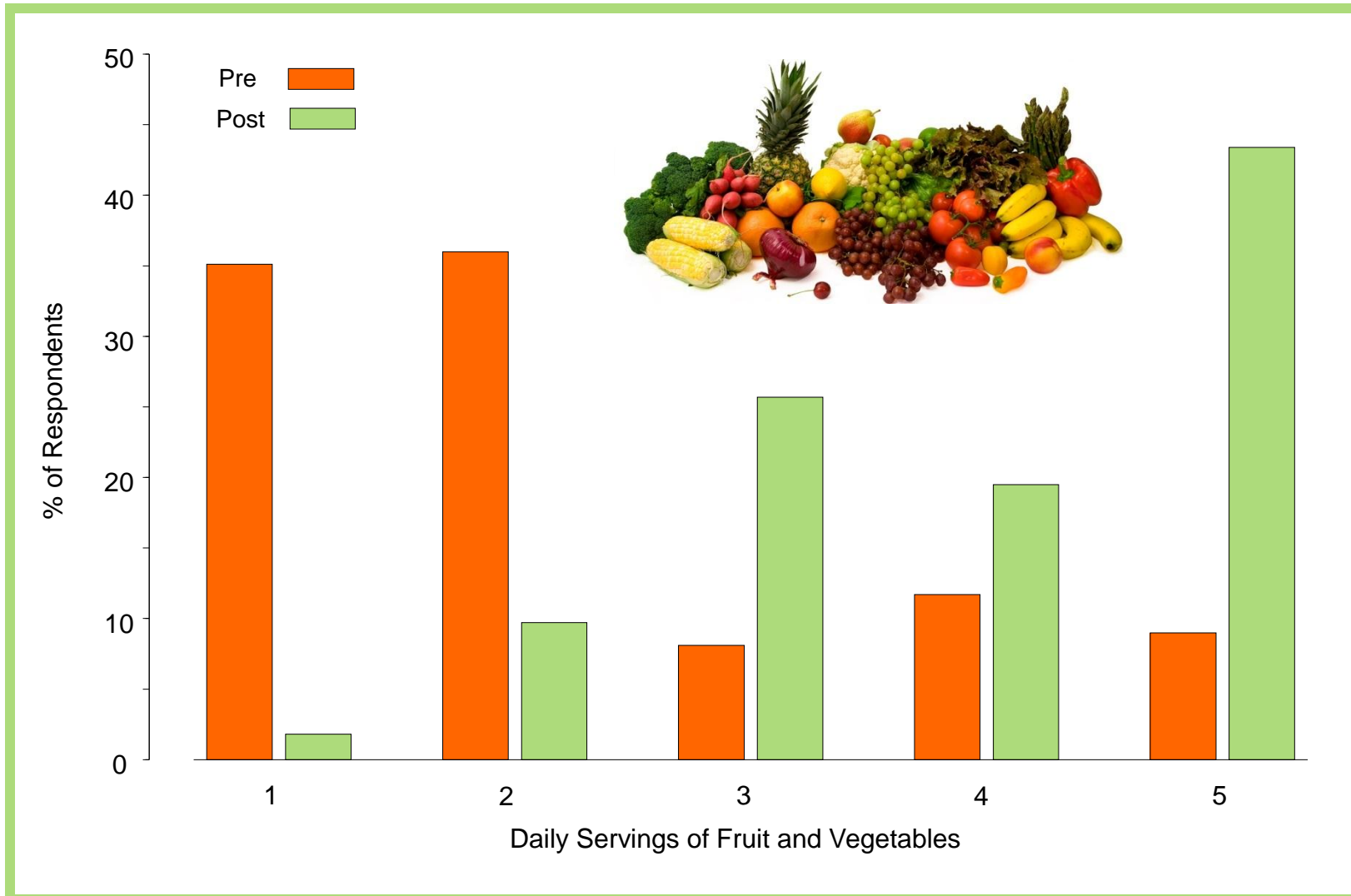
*McNemar's exact test of equal discordance:  $p < 0.001$*

# Fat Intake: US vs Non-US

	Switch to Lower Fat Diet (response values: 4 or 5)	
Group	Yes	No
U.S.	14	32
Non-U.S.	1	18

*Fisher's exact test for equal odds:  $p=0.049$*

# Fruit and Vegetable Intake

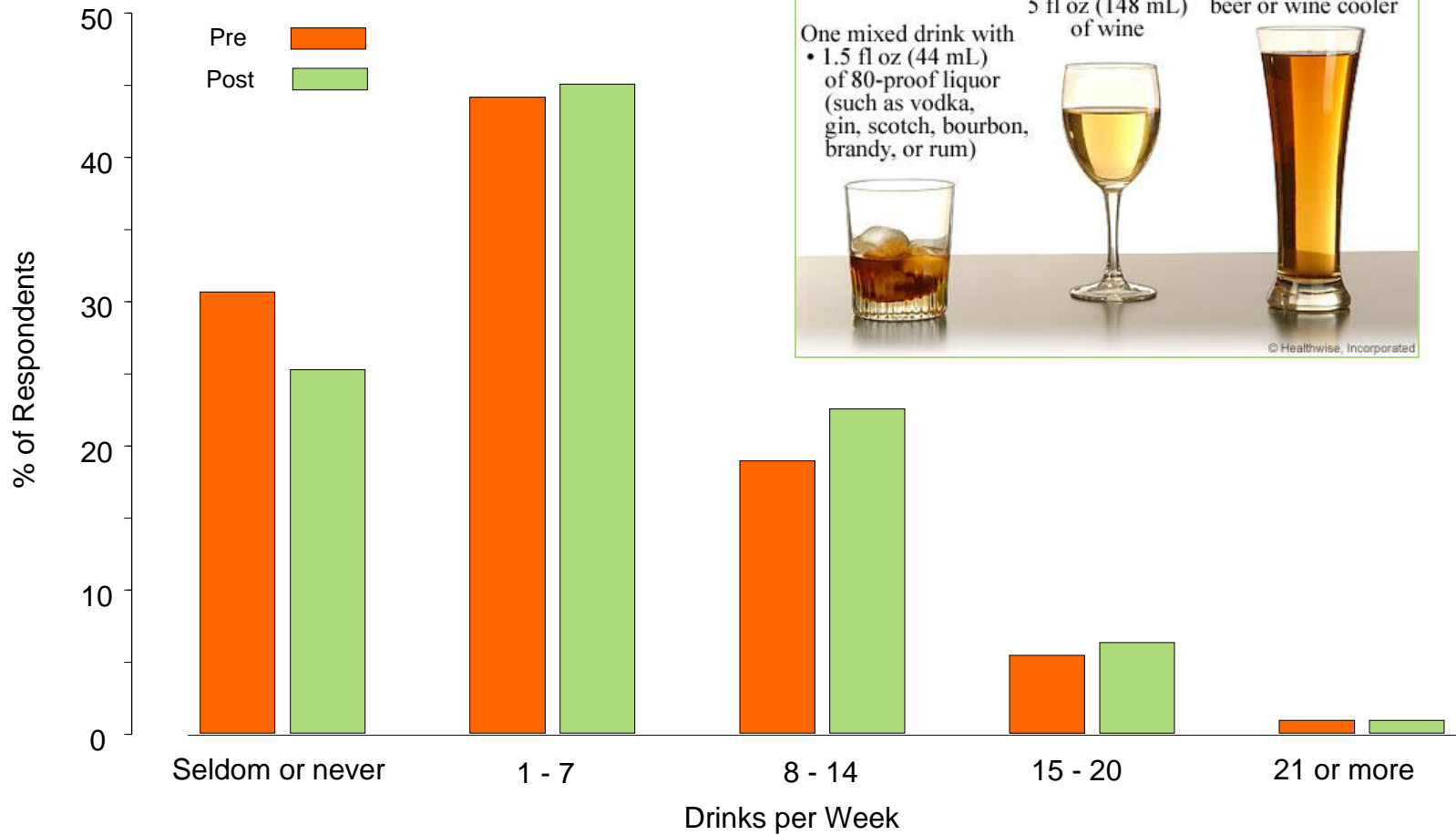


# Fruit & Vegetable Intake: Cross-classification

Pre Response Value	Post Response Value	
	<3 servings	≥3 servings
<3 servings/day	13	66
≥3 servings/day	0	32

*McNemar's exact test of equal discordance:  $p < 0.001$*

# Weekly Alcohol Consumption

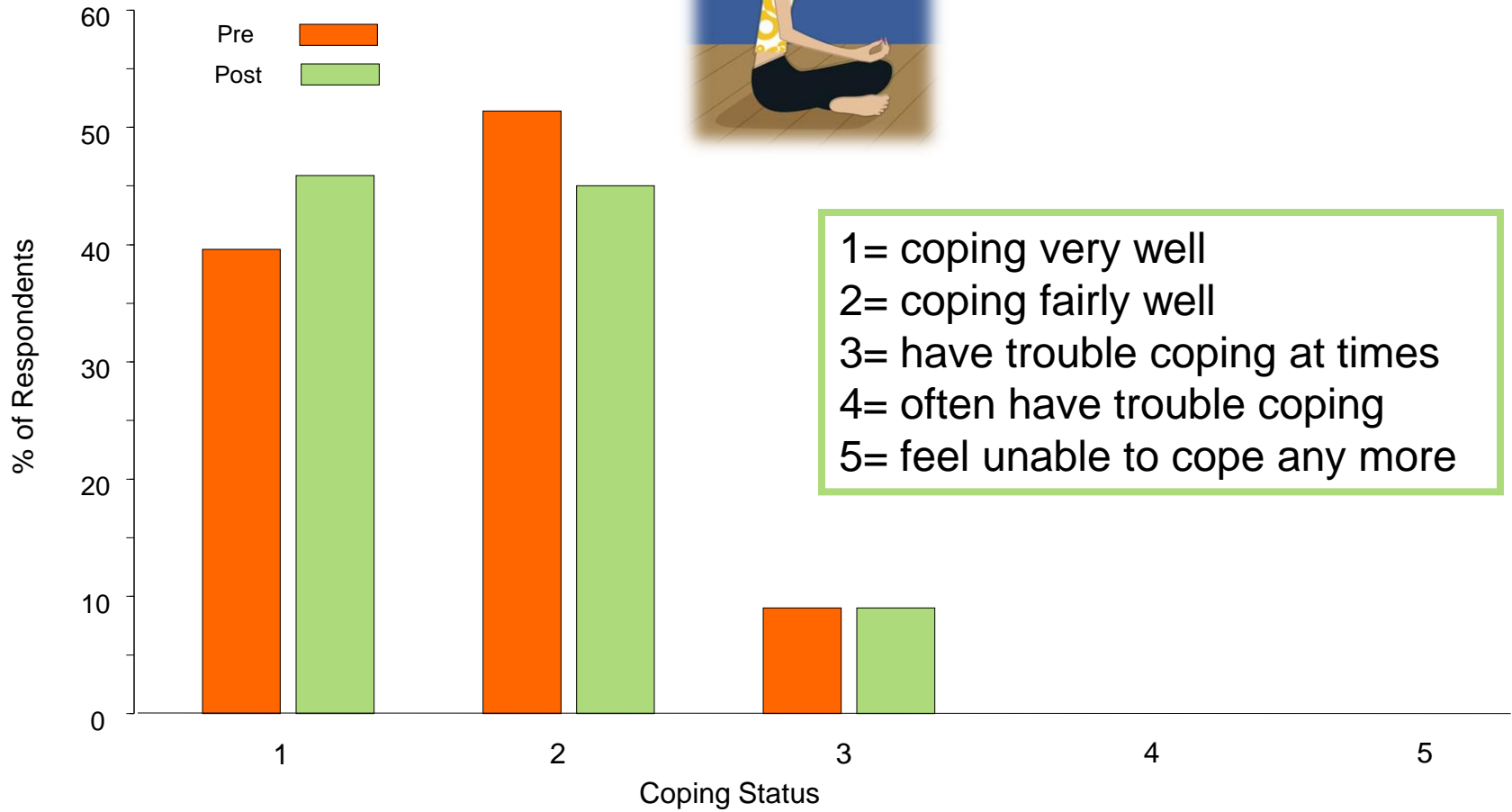


# Alcohol Intake: Cross-classification

	Post Response Value	
Pre Response Value	$\leq 1$ drink/day	$> 1$ drink/day
$\leq 1$ drink/day	78	5
$> 1$ drink/day	0	28

*McNemar's exact test of equal discordance:  $p < 0.062$*

# Coping Status



# Coping Status: Cross-classification

	Post Response Value	
Pre Response Value	>1 (coping less than very well)	1 (coping very well)
> 1 (coping less than very well)	60	7
1 (coping very well)	0	44

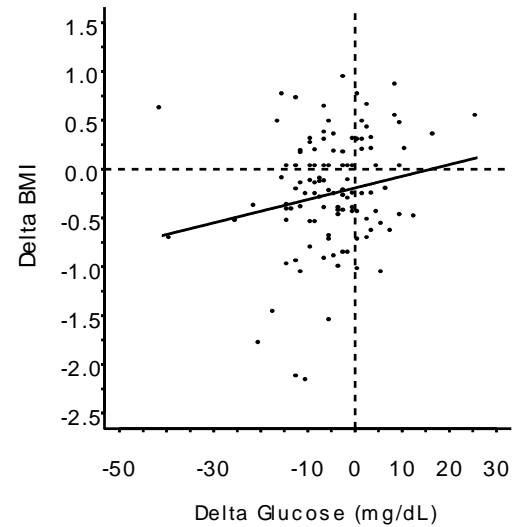
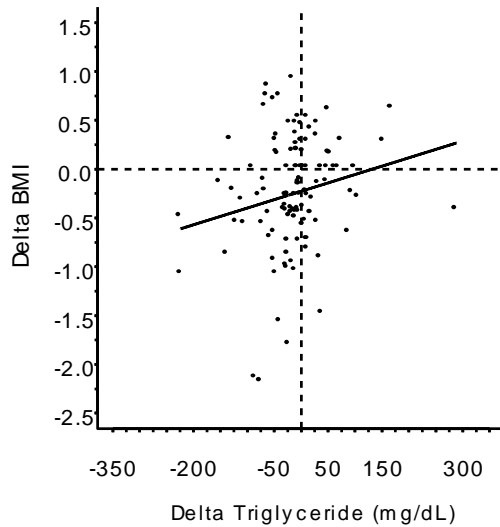
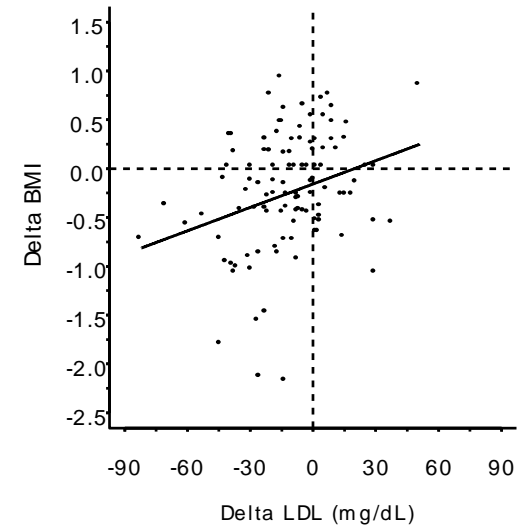
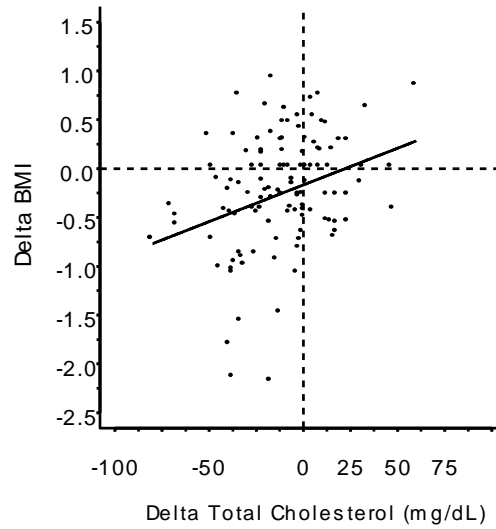
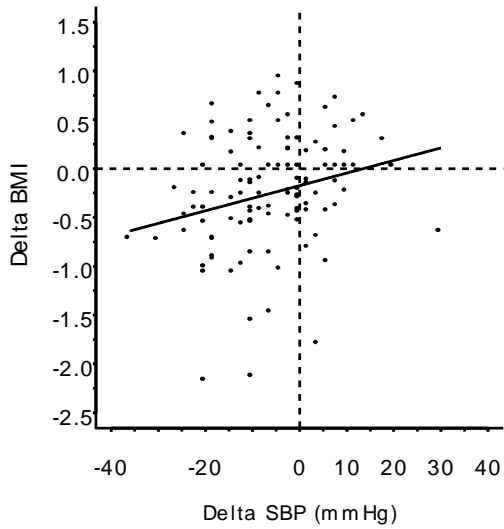
*McNemar's exact test of equal discordance:  $p < 0.016$*

# Correlations:

## $\Delta$ BMI to $\Delta$ blood pressure & lipids

Correlate X	Correlate Y	Spearman Rank Correlation Estimate	Lower 95% CL	Upper 95% CL	P-value
$\Delta$ BMI	$\Delta$ SBP	0.27	0.09	0.44	<b>0.003</b>
$\Delta$ BMI	$\Delta$ DBP	0.11	-0.08	0.29	0.242
$\Delta$ BMI	$\Delta$ Total Chol	0.30	0.12	0.46	<b>0.001</b>
$\Delta$ BMI	$\Delta$ HDL	-0.03	-0.22	0.16	0.767
$\Delta$ BMI	$\Delta$ LDL	0.28	0.09	0.45	<b>0.003</b>
$\Delta$ BMI	$\Delta$ Trigs	0.20	0.02	0.38	<b>0.030</b>
$\Delta$ BMI	$\Delta$ Glucose	0.27	0.09	0.44	<b>0.003</b>

### Change in BMI



# Regression Coefficients: Predicting Change in BMI



Predictor	Estimate	SE
Intercept	4.0868	1.7472
Exercise Pre	-0.0992	0.1065
Exercise Post	-0.1723	0.1342
Fat Intake Pre	-0.9535	0.3971
Fat Intake Post	0.8512	0.3866
Fruit & Vegetables Pre	0.1262	0.1544
Fruit & Vegetables Post	-0.4883	0.1680
Alcohol Consumption Pre	-0.1460	0.0843
Alcohol Consumption Post	0.1221	0.0851
Smoke Status Pre (yes, no)	0.8609	0.7553
Smoke Status Post (yes, no)	-0.3514	0.8690
Coping Status Pre	-0.7561	0.5437
Cope Status Post	0.3770	0.5317
Sleeping Status Pre	-0.2013	0.5040
Sleeping Status Post	0.1725	0.5231

# Regression ANOVA: Predicting Change in BMI



Predictor	d.f.	Partial SS	MS	F	P
Exercise Pre	1	2.549	2.549	0.867	0.354
Exercise Post	1	4.849	4.849	1.650	0.202
Fat Intake Pre	1	16.946	16.946	5.767	0.018
Fat Intake Post	1	14.248	14.248	4.848	0.030
Fruit & Vegetables Pre	1	1.965	1.965	0.669	0.416
Fruit & Vegetables Post	1	24.834	24.834	8.451	0.005
Alcohol Consumption Pre	1	8.816	8.816	3.000	0.086
Alcohol Consumption Post	1	6.048	6.048	2.058	0.155
Smoke Status Pre (yes, no)	1	3.817	3.817	1.299	0.257
Smoke Status Post (yes, no)	1	0.481	0.481	0.164	0.687
Coping Status Pre	1	5.683	5.683	1.934	0.168
Coping Status Post	1	1.478	1.478	0.503	0.480
Sleeping Status Pre	1	0.469	0.469	0.160	0.690
Sleeping Status Post	1	0.320	0.320	0.109	0.742
<b>TOTAL</b>	14	87.208	6.229	2.120	0.017
ERROR	96	282.106	2.939		
Adjusted R <sup>2</sup> = 0.125					

# Summary

1. Significant improvements in CVD risk factors and health habits in business executives can be seen with a four-week wellness program.
2. U.S. and non-U.S. executives respond similarly to this wellness program.
3. Intake of fruits, vegetables and healthy fats is predictive of reduced BMI.