

DSHS Grand Rounds

October 19

Obesity: A Public Health Approach

Presenter:

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Texas A&M University



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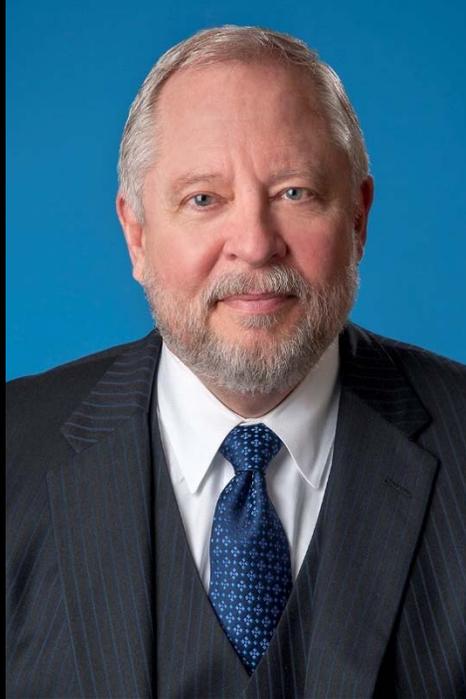
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Peer-reviewed Literature

- Daniels SR, Hassink SG; Committee on Nutrition. The role of the pediatrician in primary prevention of obesity. *Pediatrics*. 2015 Jul;136(1):e275-92.
- English L, Lasschuijt M, Keller KL. Mechanisms of the portion size effect. What is known and where do we go from here? *Appetite*. 2015 May;88:39-49.
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Introductions

John Hellerstedt, MD
DSHS Commissioner is pleased to
introduce our DSHS Grand Rounds speakers

Obesity: A Public Health Approach



Jay Maddock, PhD
Dean and Professor
School of Public Health
Texas A&M University



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Obesity: A Public Health Approach

Jay Maddock, Ph.D., FAAHB
Professor & Dean

Objectives

- Describe the leading contributors to the rise of obesity.
- Synthesize ways that communities can address the obesity problem.
- Discuss individual vs. community approaches to addressing obesity.

Outline

- Epidemiology of Obesity
- Physical activity and the environment
- Nutrition and the environment
- How can we make progress?

Outline

- **Epidemiology of Obesity**

- Physical activity and the environment

- Nutrition and the environment

- How can we make progress?



Body Mass Index

- BMI = weight in KG / (height in meters)(height in meters)
 - 30+ Obese
 - 25.0-29.9 Overweight
 - 18.5-24.9 Normal
 - < 18.5 Underweight



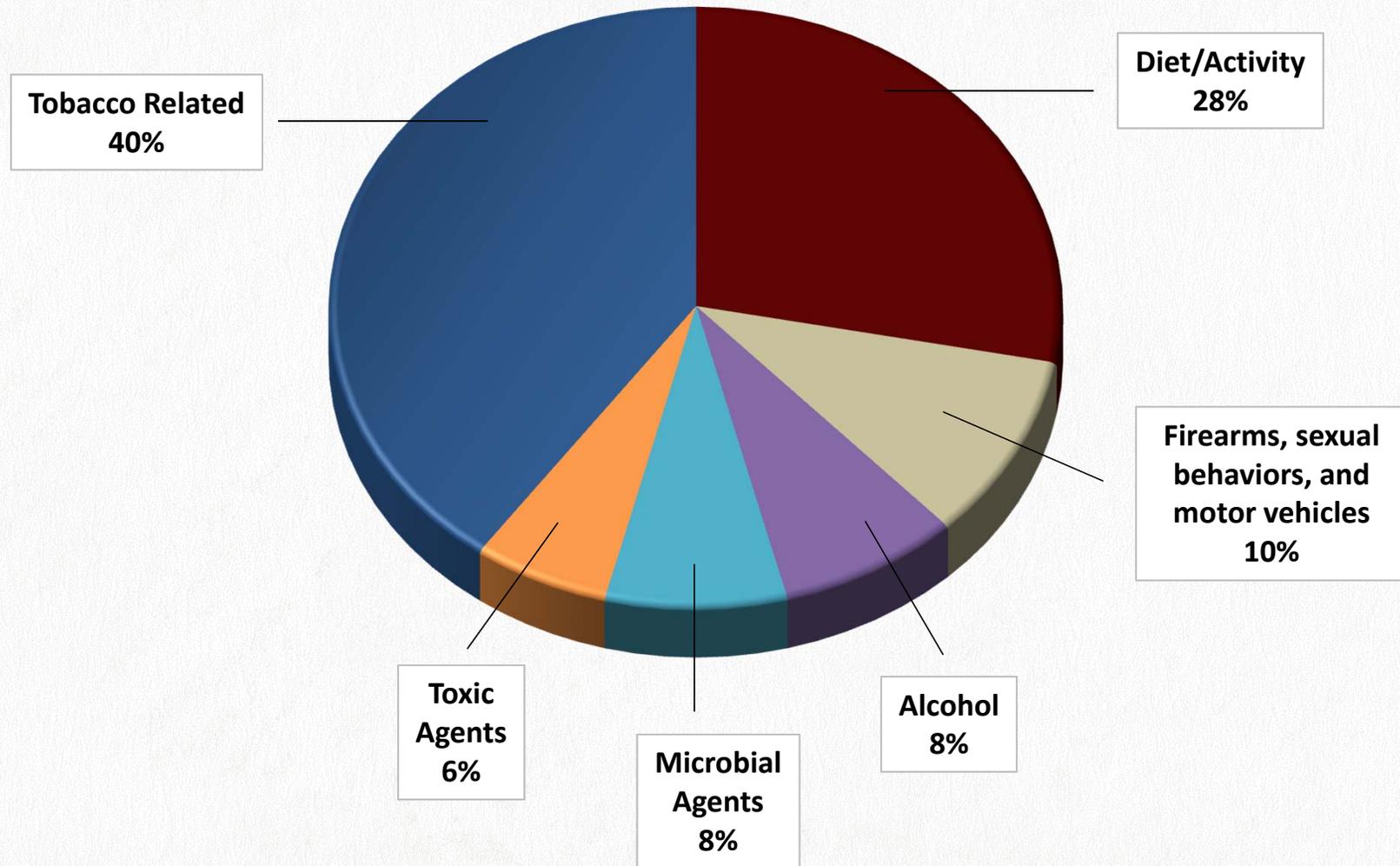
BMI Does Not Measure Body Fat



Obesity Risks

- Hypertension
 - Type 2 diabetes
 - Coronary heart disease
 - Stroke
 - Gallbladder disease
 - Arthritis
 - Sleep apnea
 - Respiratory problems
- Cancers
 - Endometrial
 - Breast
 - Prostate
 - Colon
 - All cause mortality

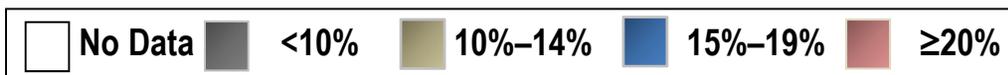
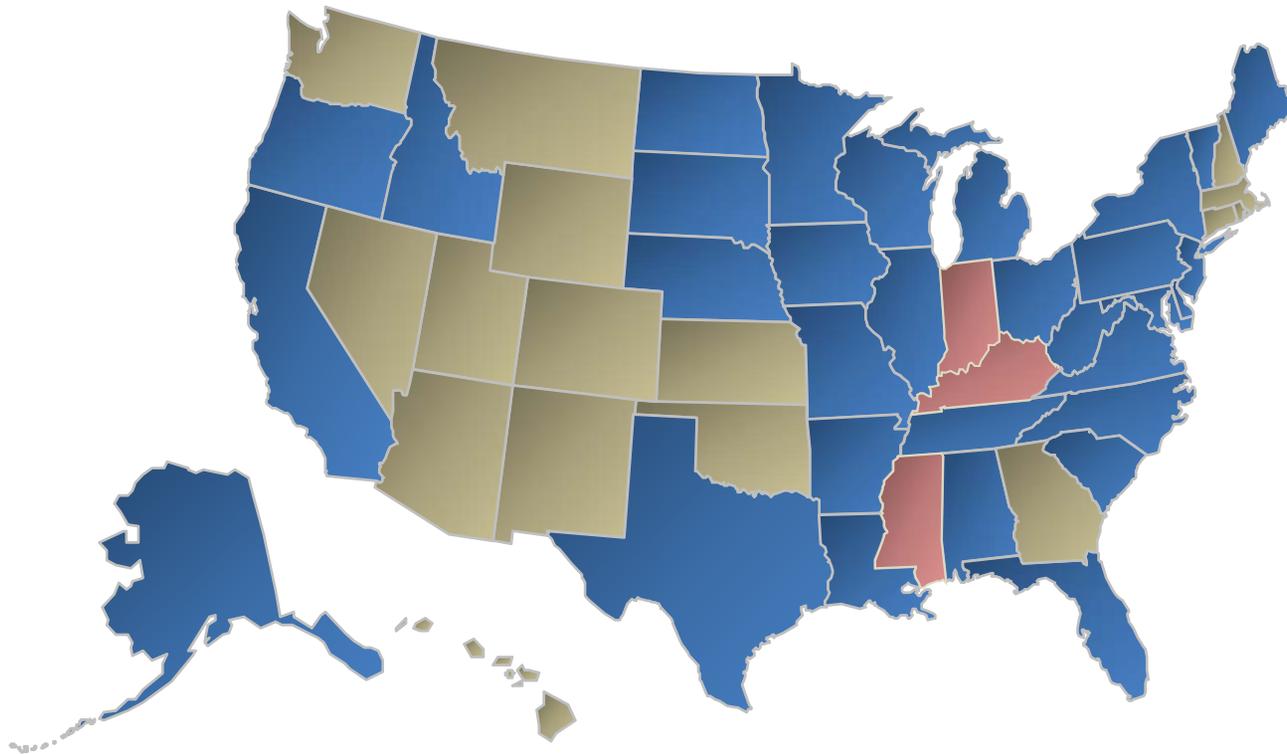
Actual Causes of Premature Death



Obesity Trends* Among U.S. Adults

BRFSS, 1997

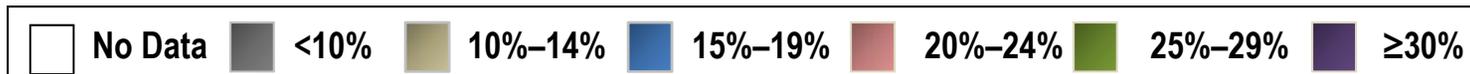
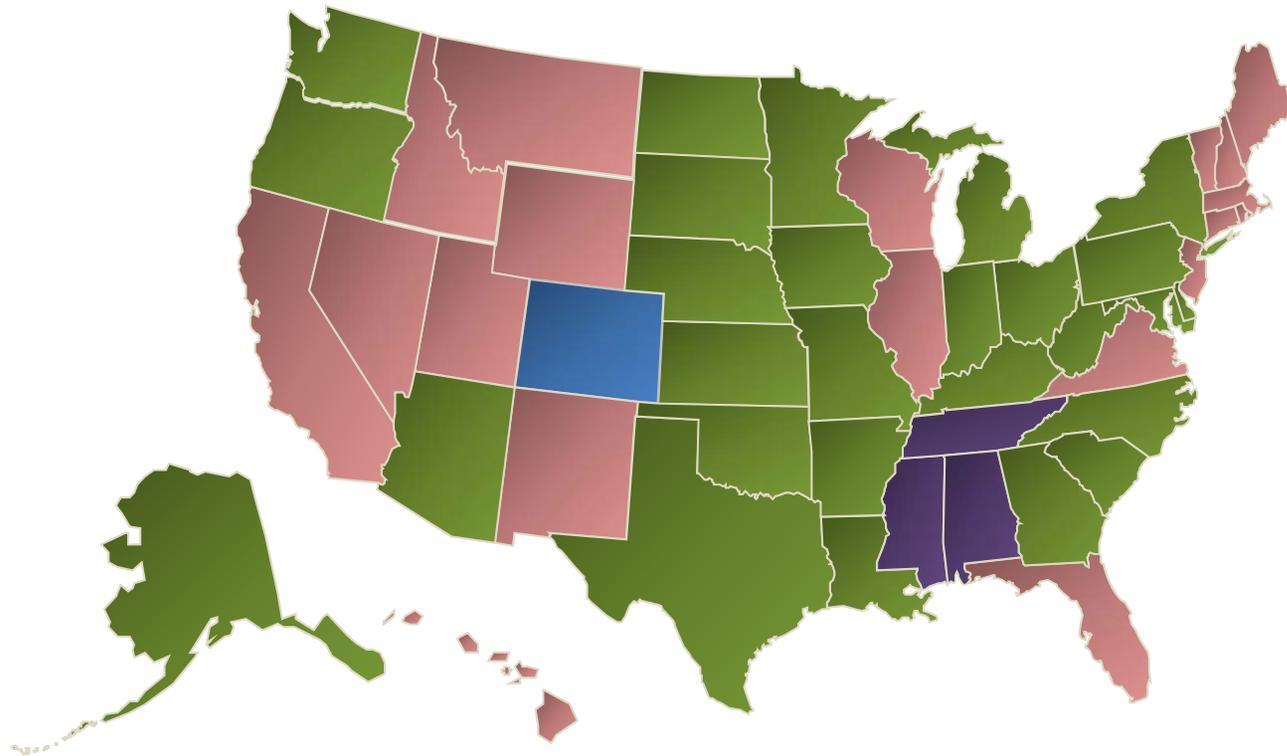
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults

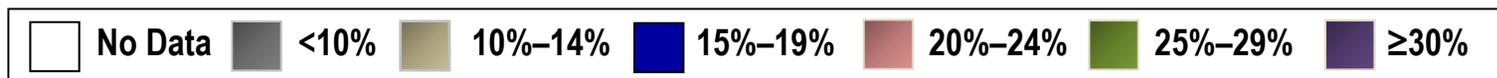
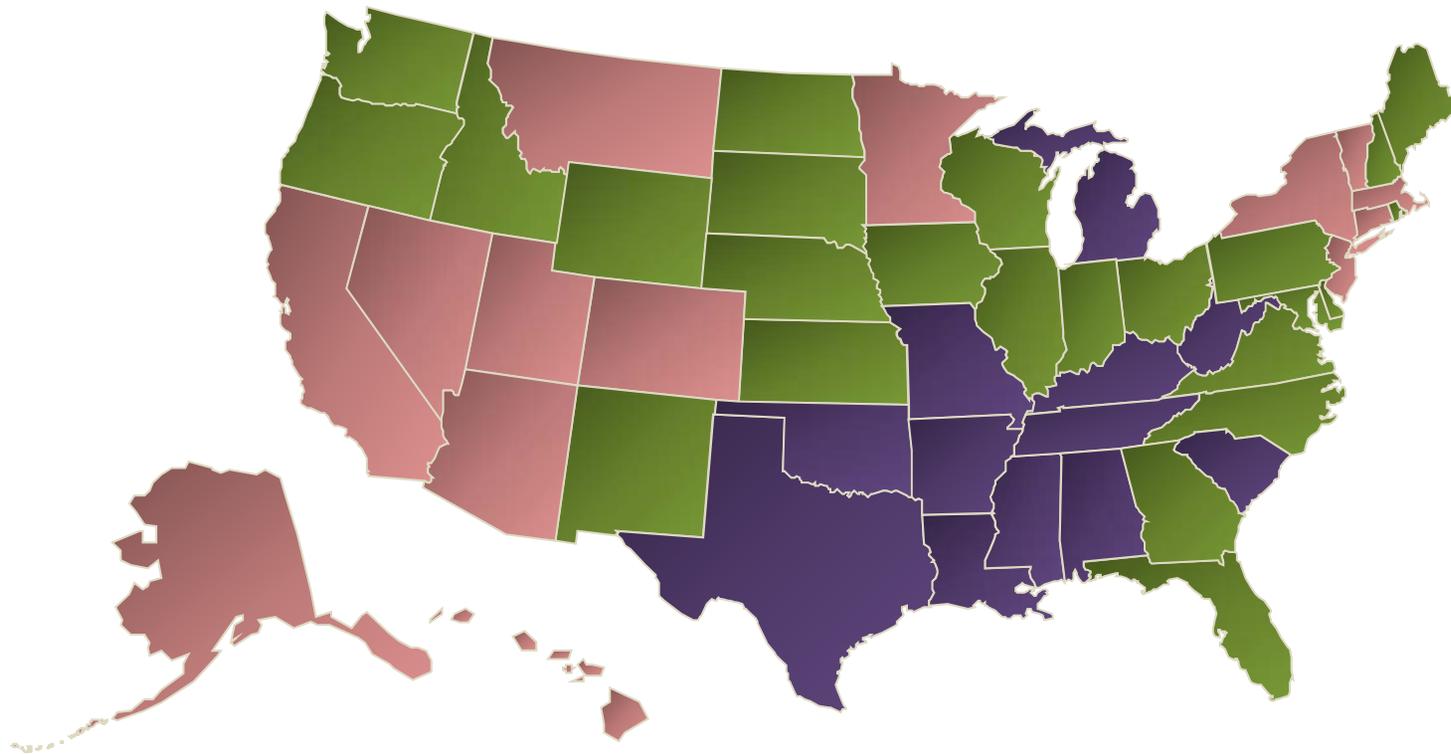
BRFSS, 2007

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)

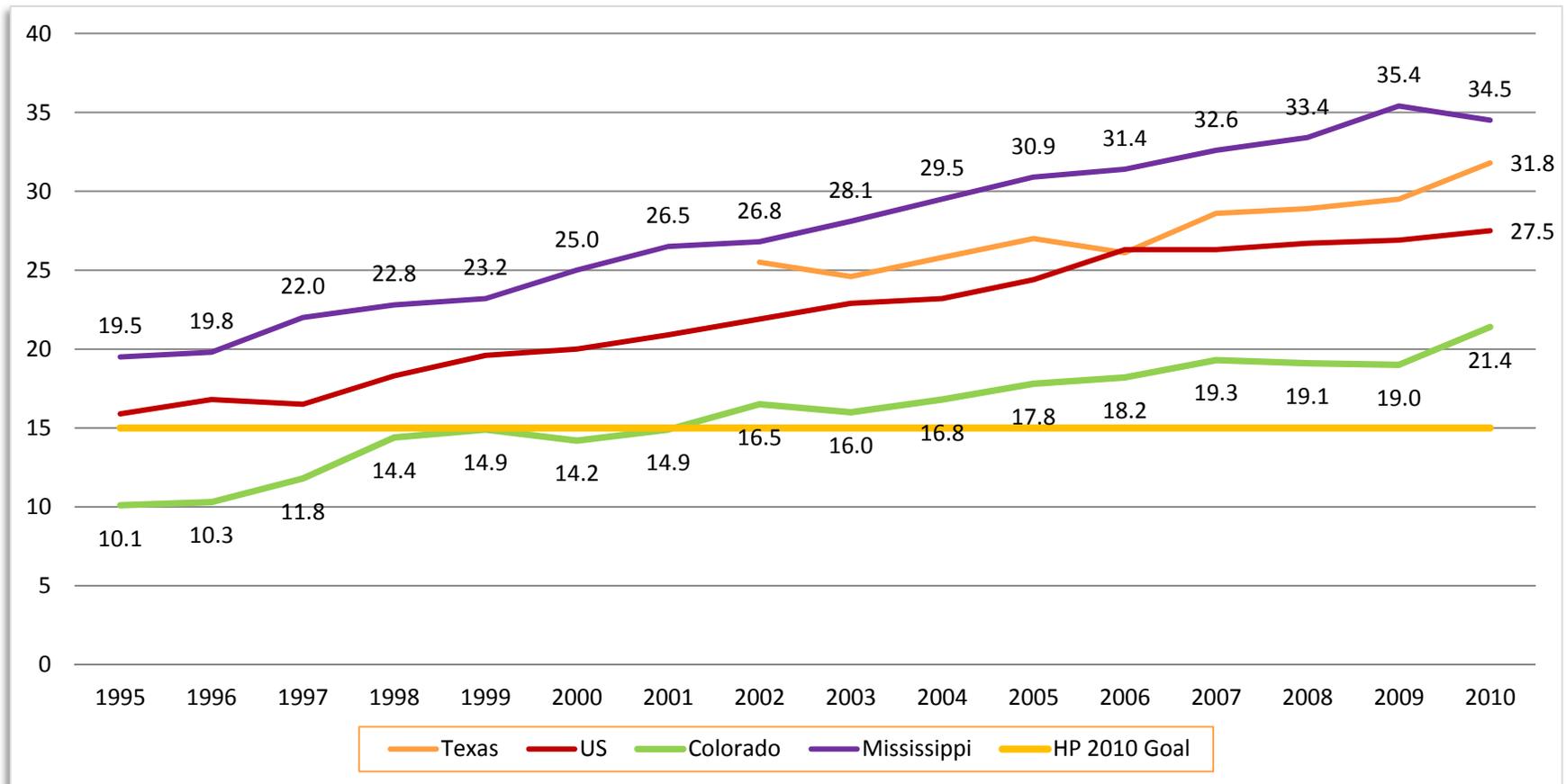


Obesity Trends* Among U.S. Adults BRFSS, 2010

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Adult Obesity Trend Data



Source: CDC Hawaii Behavioral Risk Factor Surveys

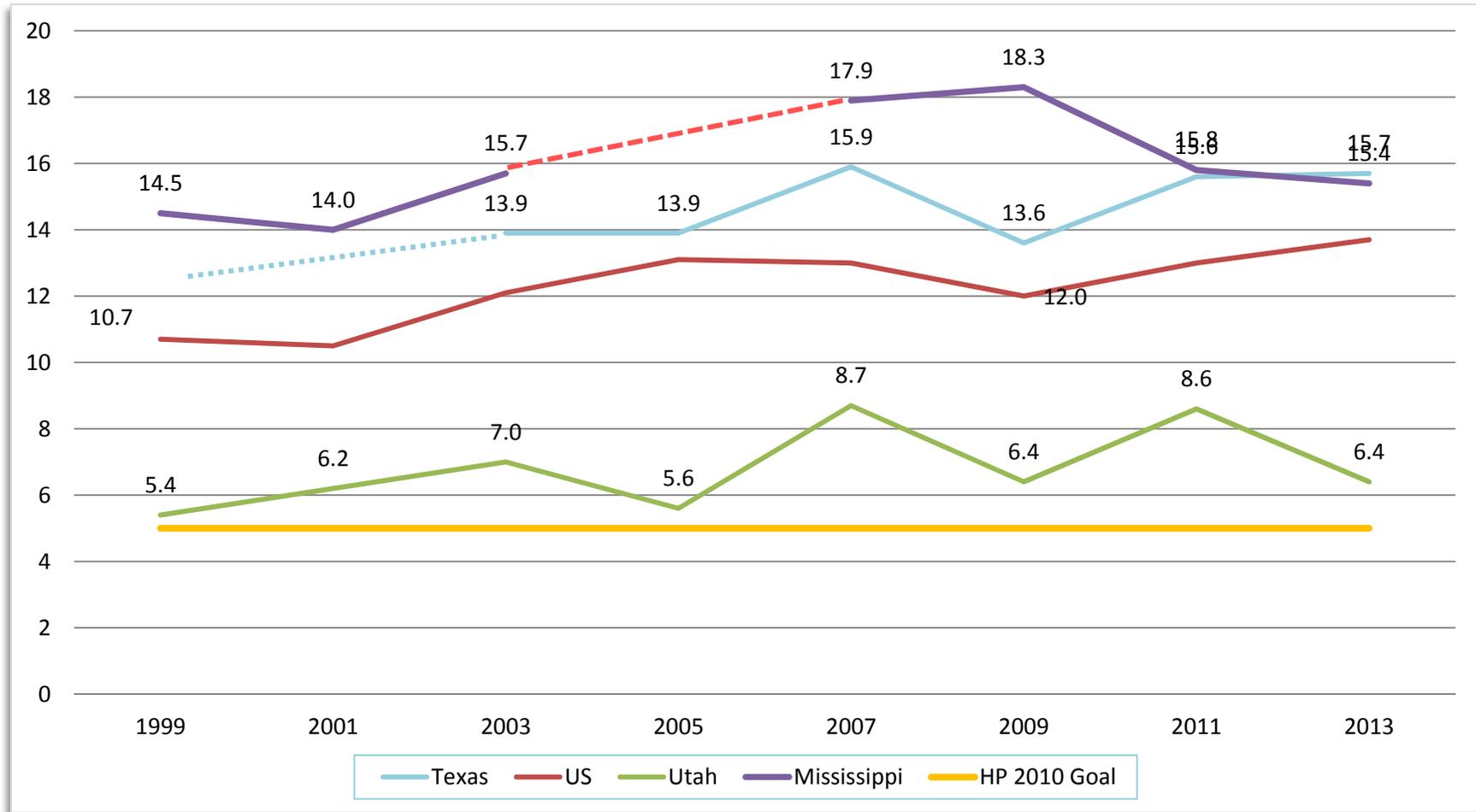


Prevalence of Obesity Among Children Ages 2-19

Age (years)	1963-65 1966-70	1971- 1974	1976- 1980	1988- 1994	1999- 2000	2001- 2002	2003- 2004	2005- 2006	2007- 2008	2009- 2010	2011- 2012
2-5	---	5.0	5.0	7.2	10.3	10.6	13.9	10.7	10.1	12.1	8.4
6-11	4.2	4.0	6.5	11.3	15.1	16.2	18.8	15.1	19.6	18.0	17.7
12-19	4.6	6.1	5.0	10.5	14.8	16.7	17.4	17.8	18.1	18.4	20.5

NHANES

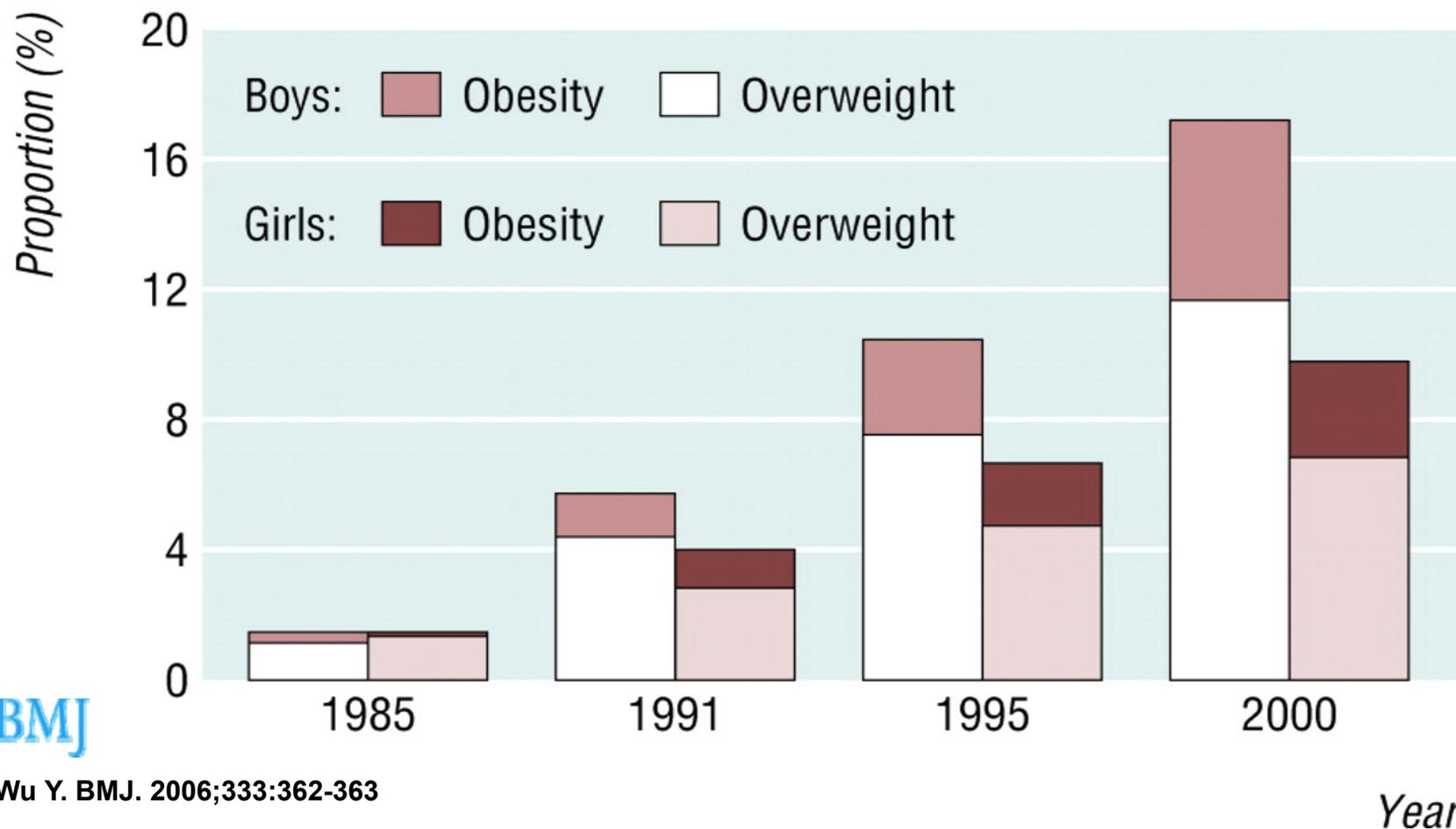
High School Obesity Trend Data



Source: CDC State Youth Risk Behavior Surveys



Overweight and Obesity in Schoolchildren Aged 7-18 in Large Cities in China



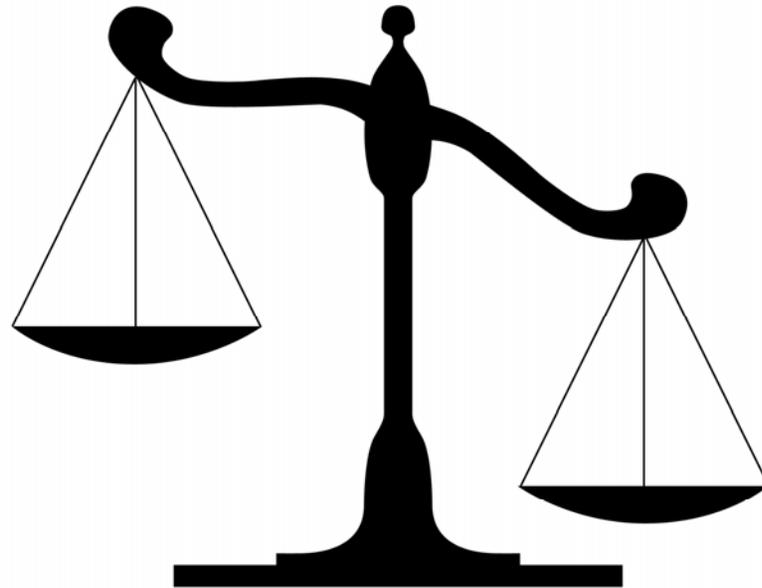
BMJ

Wu Y. *BMJ*. 2006;333:362-363

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*Energy Balance is like a scale.
When calories consumed are greater
than calories used weight gain results.*

We Do Not Have an Obesity Epidemic

WE HAVE DUAL EPIDEMICS

- **Inadequate physical activity**
- **Poor nutrition**



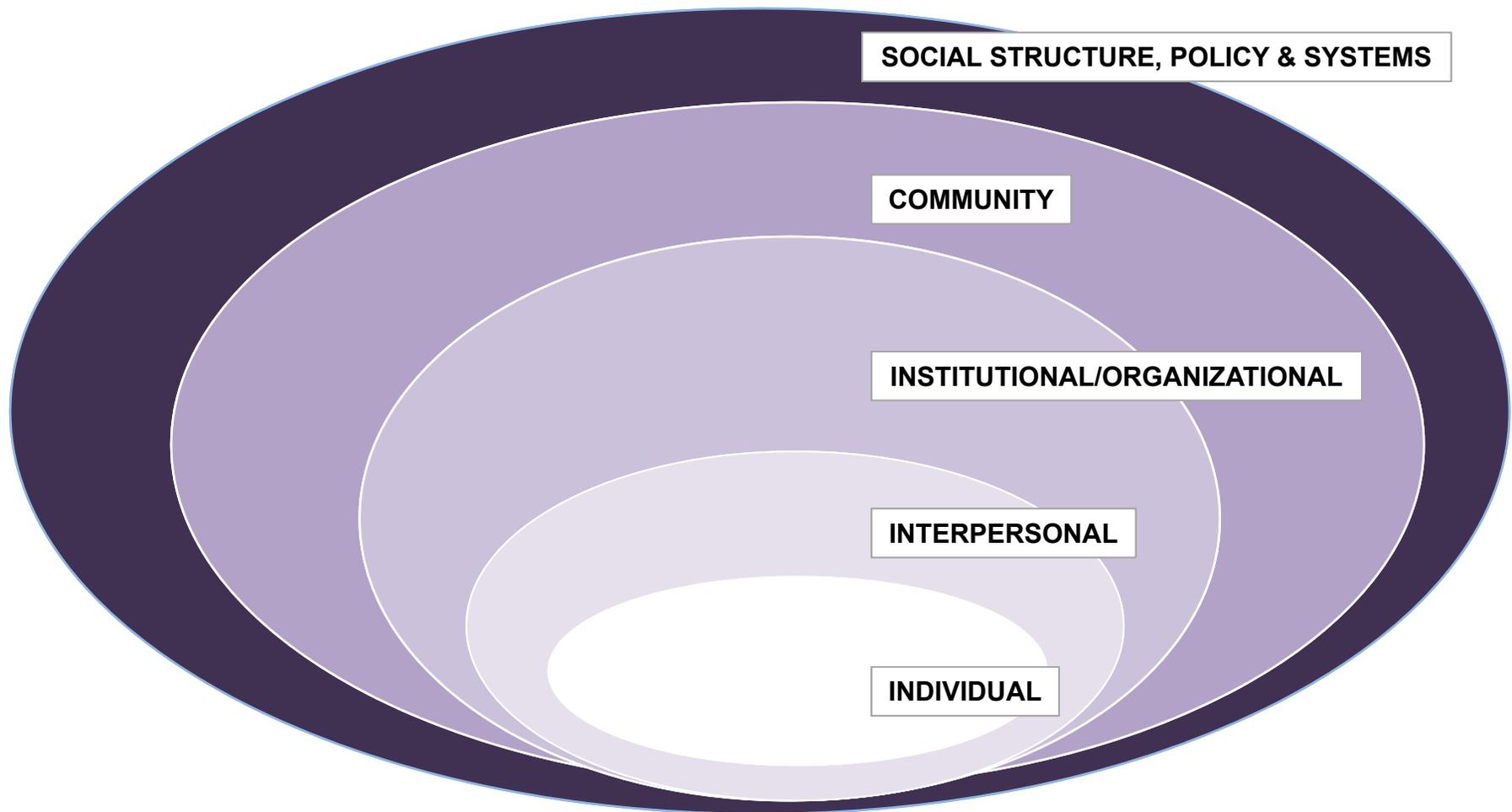
"Despite obesity having strong genetic determinants, the genetic composition of the population does not change rapidly.

Therefore, the large increase in . . . [obesity] must reflect major changes in non-genetic factors."

Hill, James O., and Trowbridge, Frederick L.
Childhood obesity: future directions
and research priorities. *Pediatrics*. 1998; Supplement: 571.



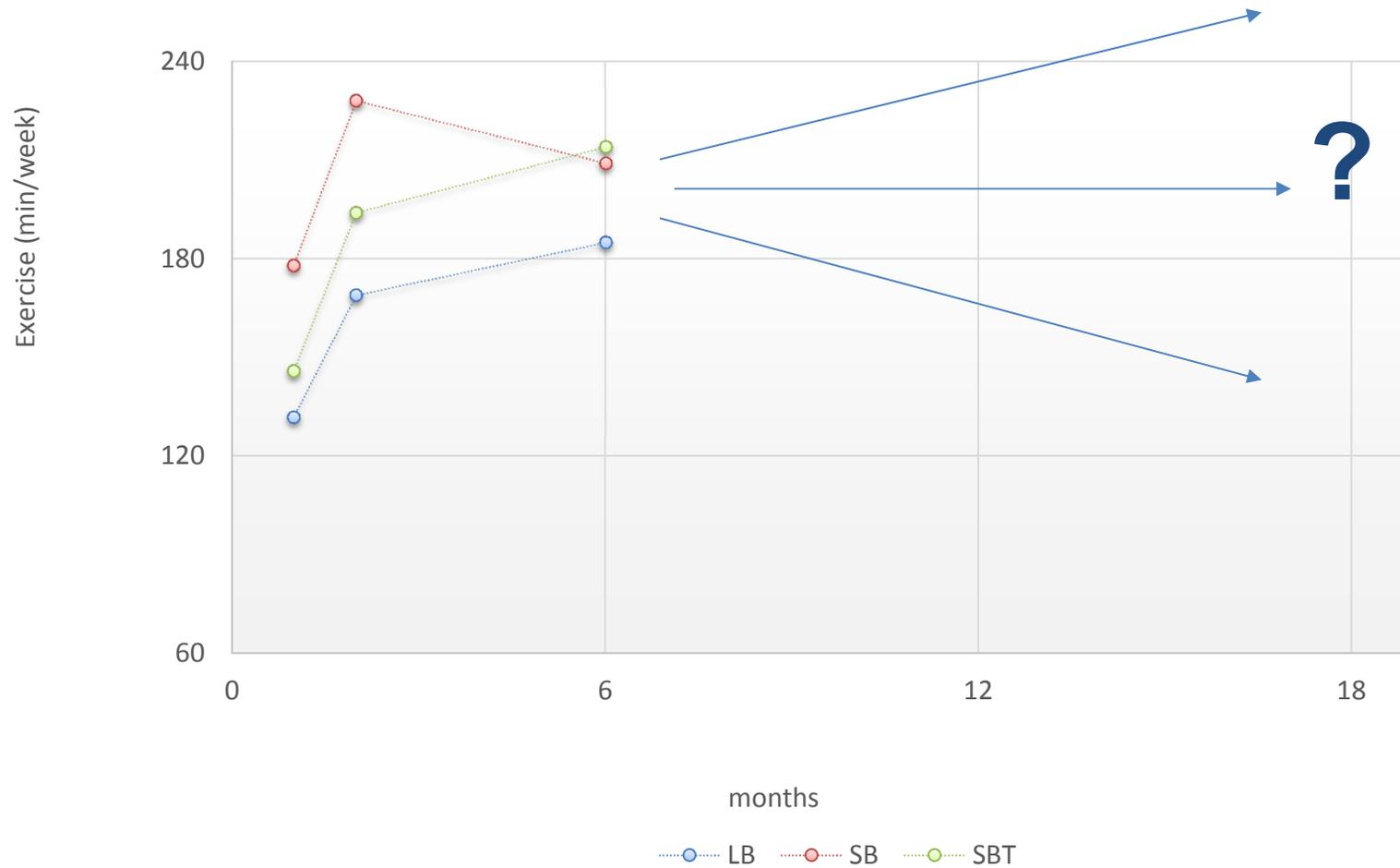
Socio-Ecological Framework



Exercise Participation

Effect of Short Bouts, Home Treadmills

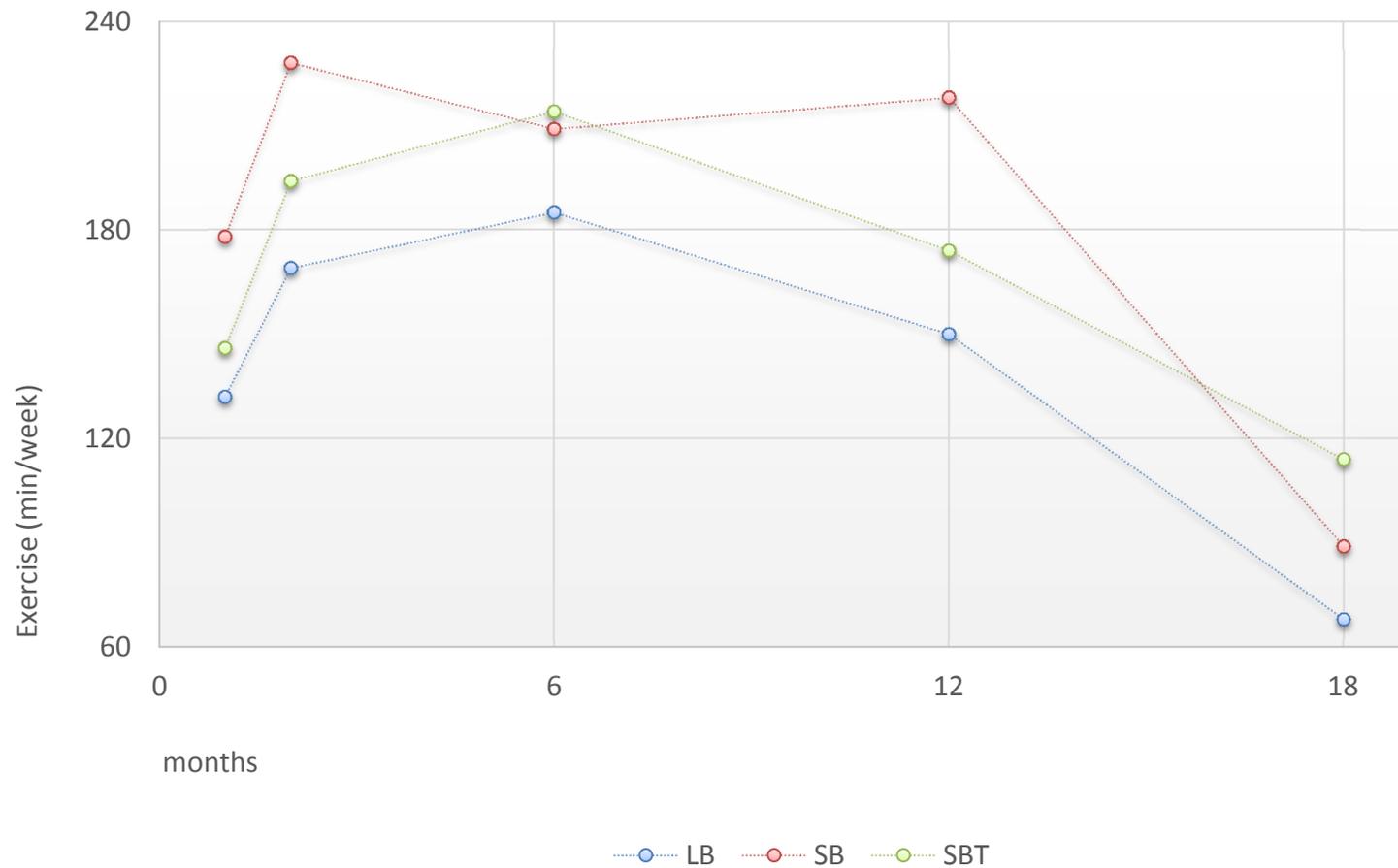
(Jakicic, et al. JAMA. 282(16):1554-60)



Exercise Participation

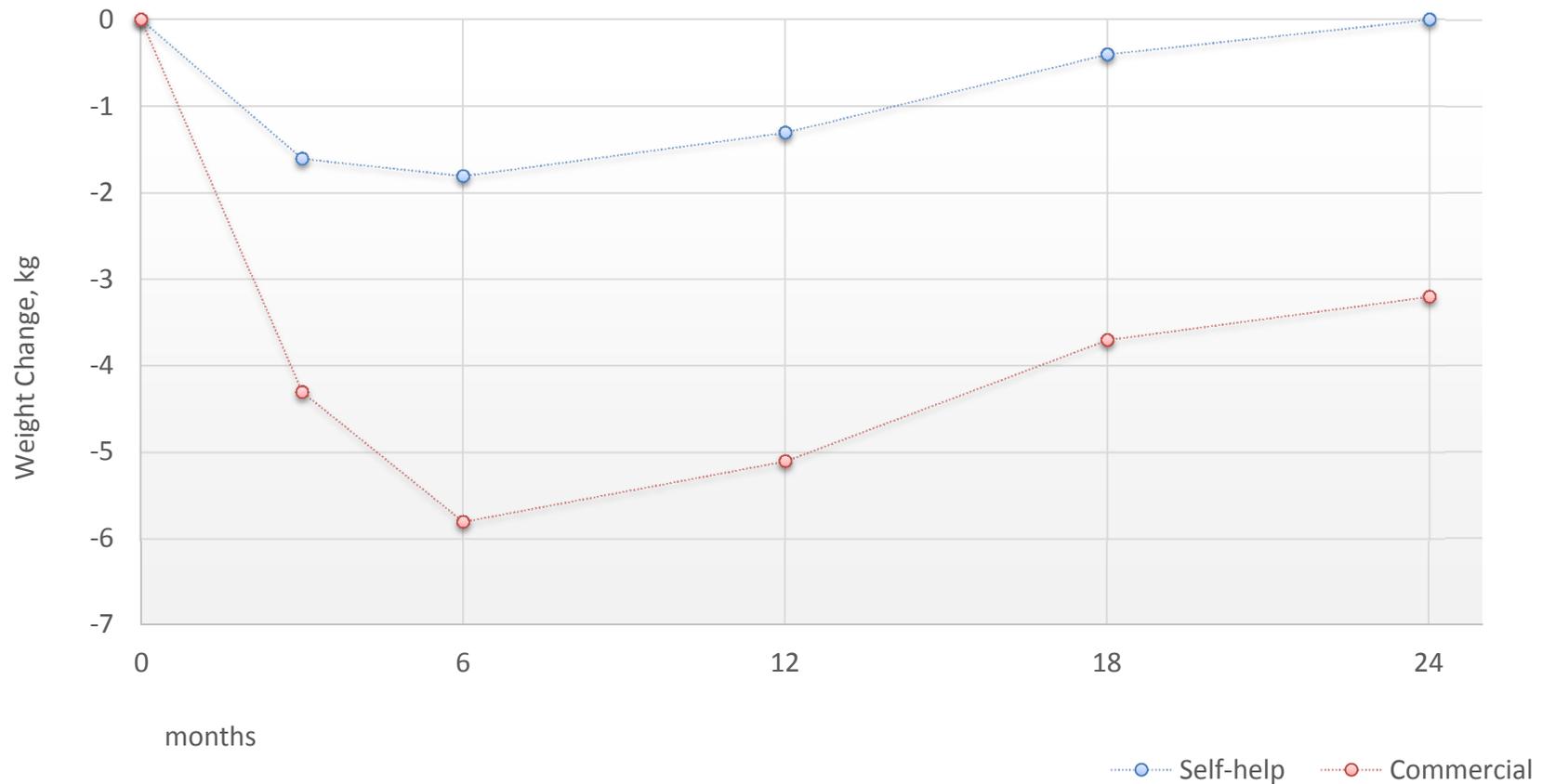
Effect of Short Bouts, Home Treadmills

(Jakicic, et al. JAMA. 282(16):1554-60)



Self-help vs. Commercial Weight Loss Programs

(Heshka, et al. JAMA. 2003 Apr 9;289(14):1792-8)



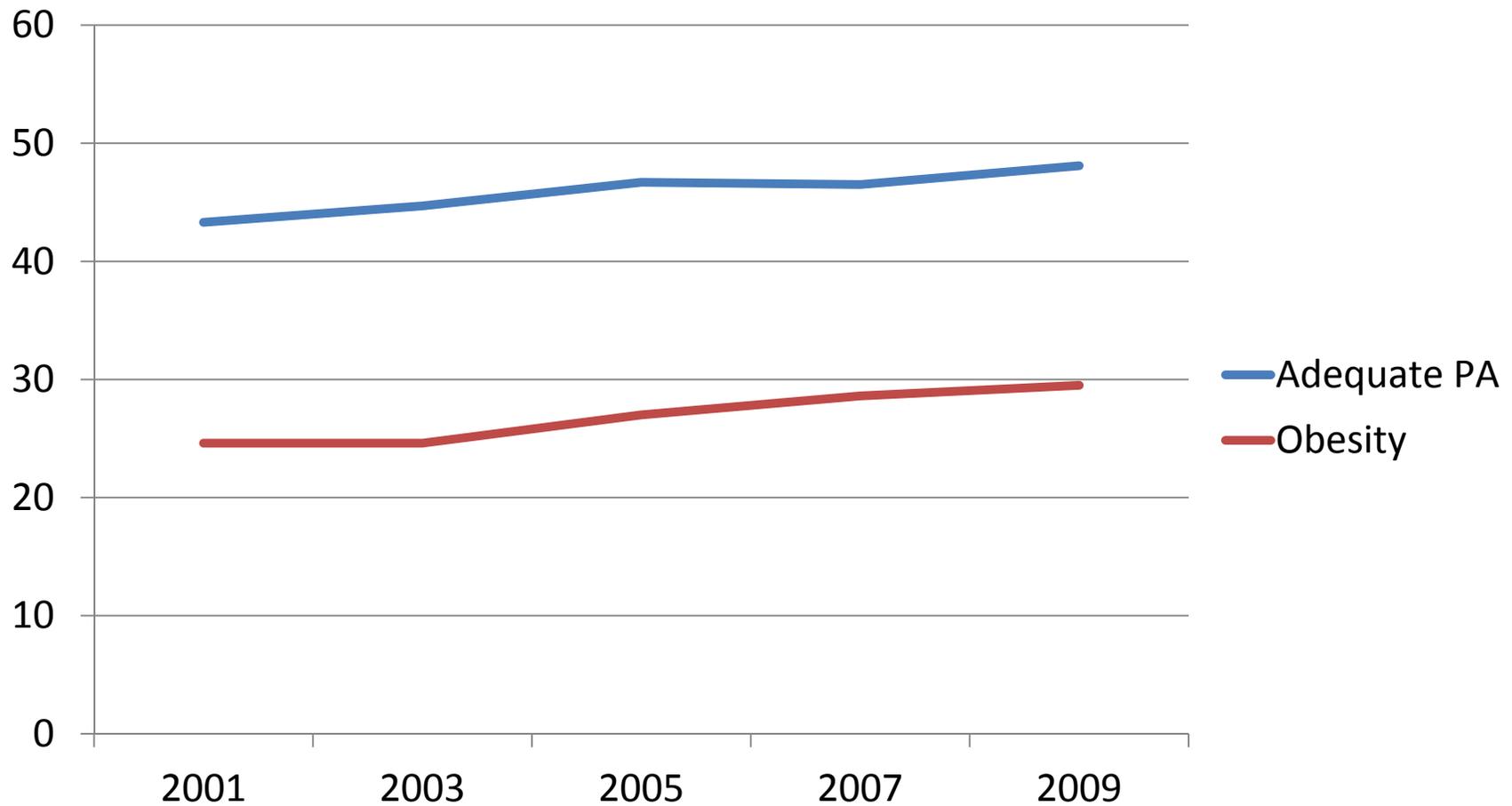
Outline

- Epidemiology of Obesity
- **Physical activity and the environment**
- Nutrition and the environment
- How can we make progress?

US Physical Activity (PA) Recommendation

- 150 minutes a week of moderate intensity physical activity or 75 minutes of vigorous
- 2 days a week of muscle strengthening

Leisure Time PA in Texas



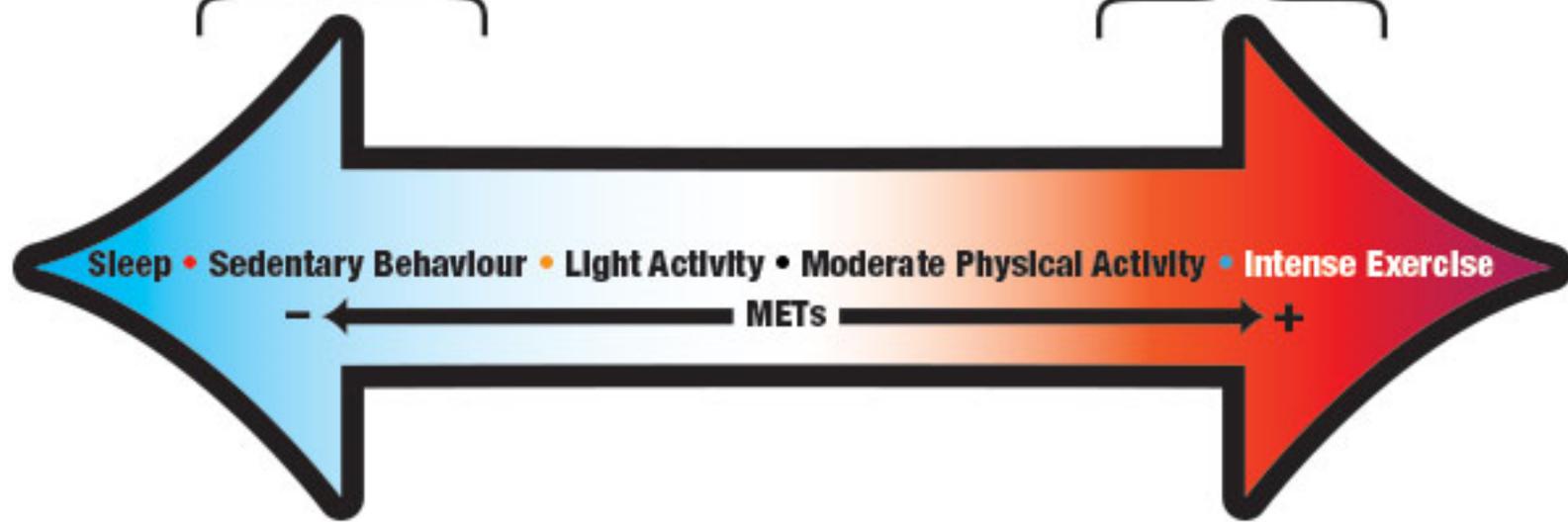
Active but Sedentary

- 6:00 AM Wake-up
- 7:00 AM Drive to School & Work
- 8:00-4:30 PM Work
- 4:30-5:30 PM Drive Home
- 5:30-6:00 PM **Brisk Walk**
- 6:00-7:00 PM Dinner
- 7:00-10:00 PM Watch television/IPAD
- 10:00 PM Sleep



**SEDENTARY
PHYSIOLOGY**

**EXERCISE
PHYSIOLOGY**



Average Time Spent per Day with Major Media by US Adults, 2010-2013

hrs:mins

	2010	2011	2012	2013
Digital	3:14	3:50	4:31	5:09
—Online*	2:22	2:33	2:27	2:19
—Mobile (nonvoice)	0:24	0:49	1:33	2:21
—Other	0:26	0:28	0:31	0:36
TV	4:24	4:34	4:38	4:31
Radio	1:36	1:34	1:32	1:26
Print**	0:50	0:44	0:38	0:32
—Newspapers	0:30	0:26	0:22	0:18
—Magazines	0:20	0:18	0:16	0:14
Other	0:42	0:36	0:20	0:14
Total	10:46	11:18	11:39	11:52

Note: ages 18+; time spent with each medium includes all time spent with that medium, regardless of multitasking; for example, 1 hour of multitasking online while watching TV is counted as 1 hour for TV and 1 hour for online; *includes all internet activities on desktop and laptop computers; **offline reading only

Source: eMarketer, July 2013

160460

www.eMarketer.com



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Place of Residence

Neighborhood characteristics systematically explain variations in the likelihood of involvement in a variety of types of physical activity above and beyond individual-level determinants such as gender, age, income, and education.

(Gauvin, et al., 2008; Yen & Kaplan, 1998)







The Fundamental Problem with Defining “Walkability”



Where would you prefer to shop on foot?

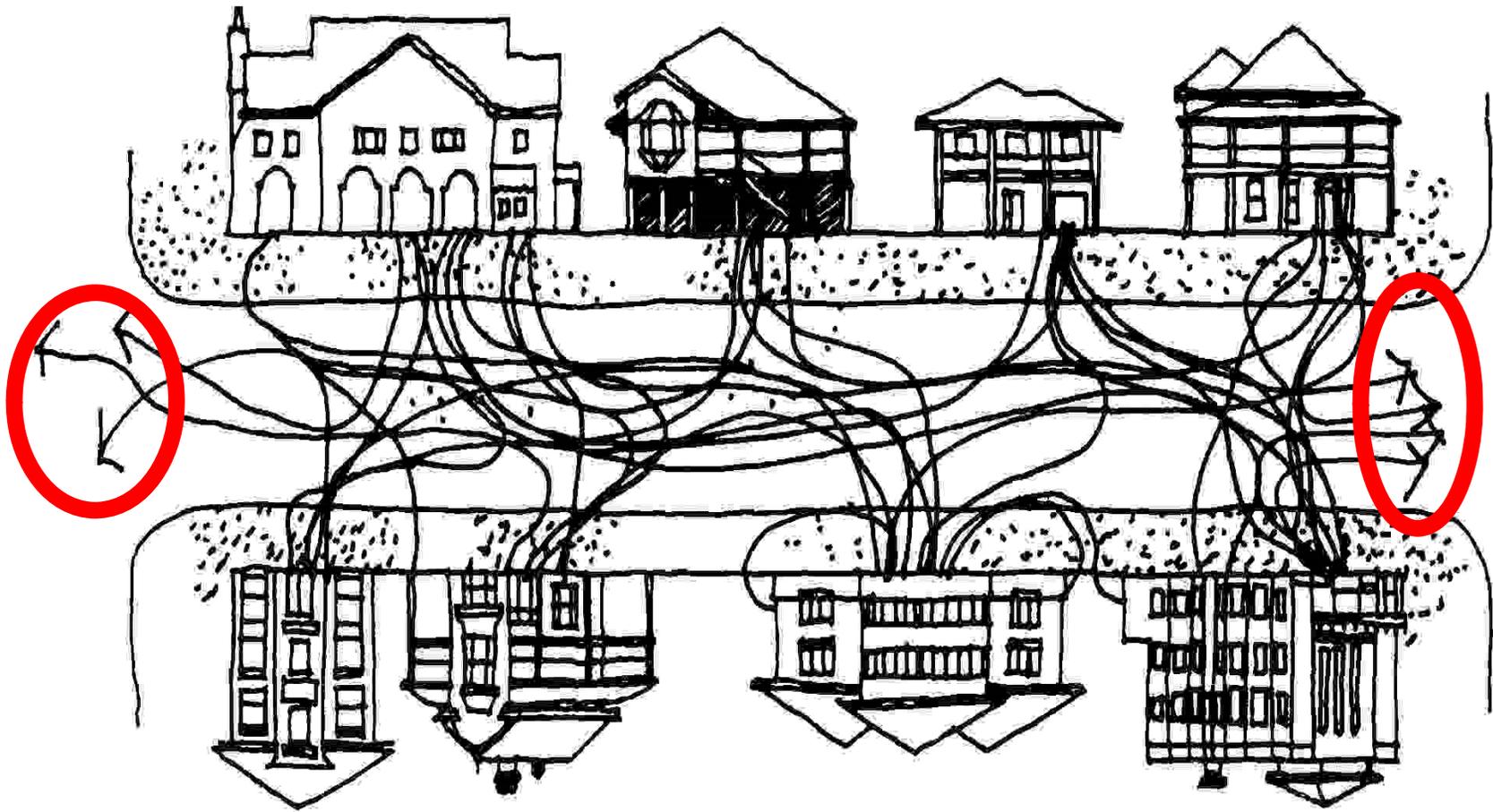
Study by Donald Appleyard

Qualitative (at best) assessment of social interaction and *perhaps* physical activity:

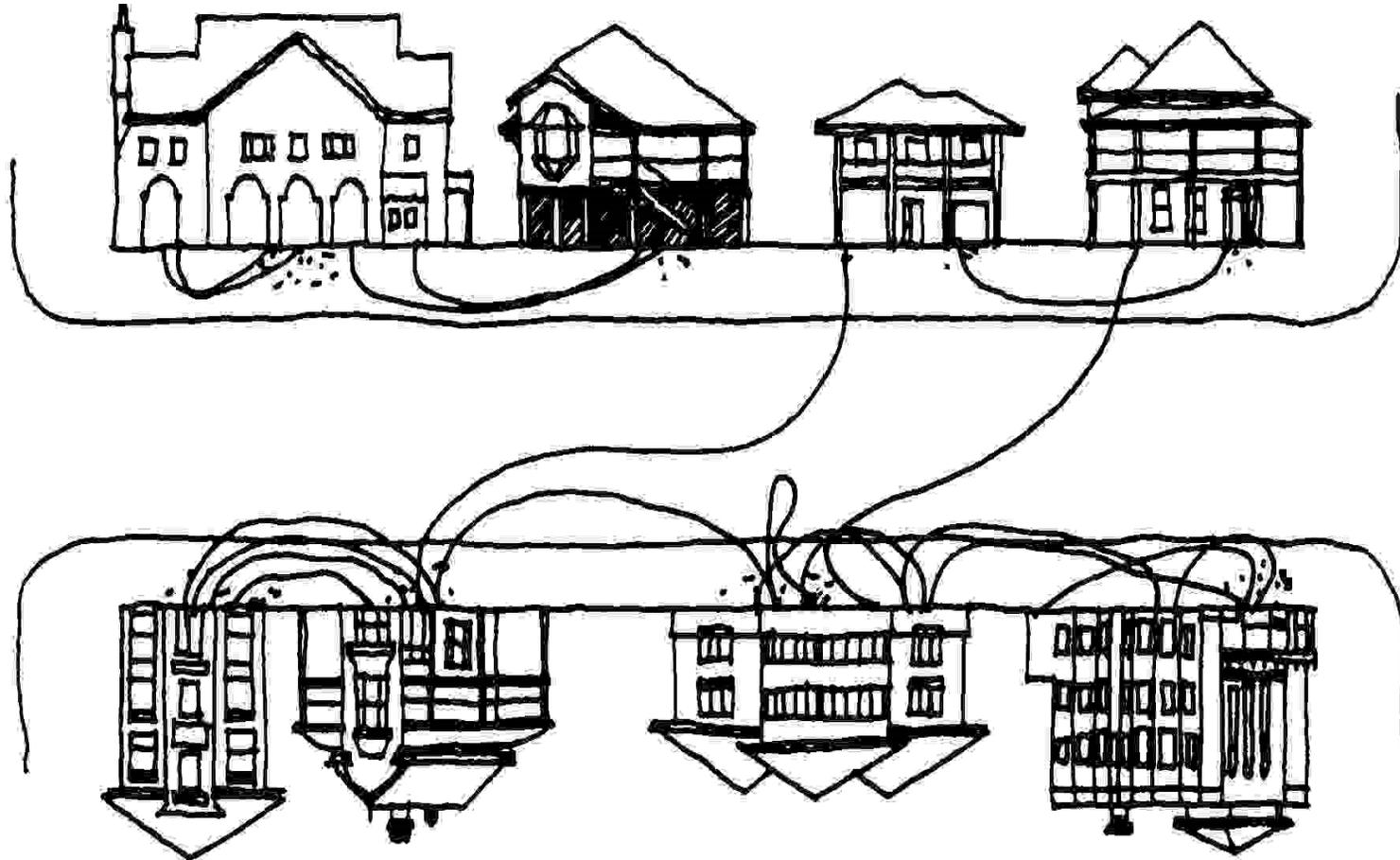
- Two similar streets
 - Light traffic
 - Heavy traffic
- Knocked on doors, asked:
“Draw a line to your friends & acquaintances”



Friends & Acquaintances - Light traffic



Friends & Acquaintances - *Heavy traffic*



Planning & Land Use Perspective

- **Greater sprawl**
= less walking, higher obesity
(Vernez-Moudon; Ewing)
- **Convenient destinations**
= more walking
(King, Frank)



Obesity Risk, Community Design, and Time Spent in Cars

Frank L, et al. Am. J. Prev. Med., June 2004

- 12.2% decrease in risk for each quartile increase in land use mix score.
- 6% increase in risk for each additional hour spent in a motor vehicle.



The Urban Built Environment and Obesity in New York City

Rundle A, et al. Am. J. Health Promot. 21(4S), 2007



Lower BMI among residents living near:

- Mixed residential & commercial areas.
- Proximity to bus & subway stops.
- Higher population density.

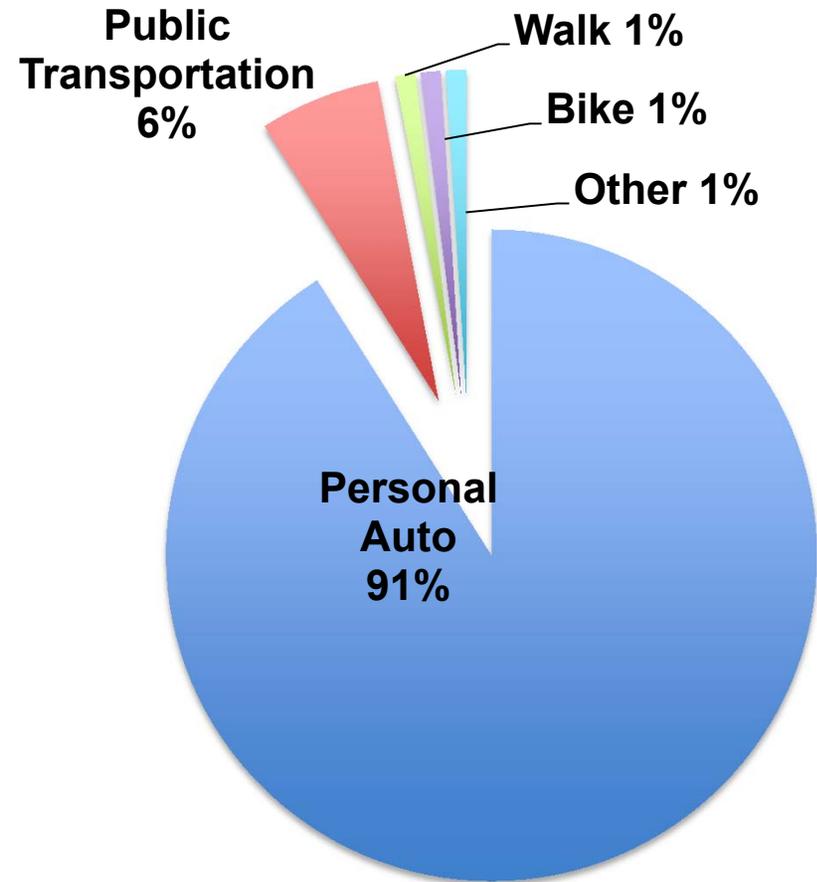
(Controlled for education, income level.)

We need more of this



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How do Texans Travel?



n=4,422

Source: TTI 2014



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How many minutes does it take to walk to work once you...

	n	≤ 5 min	≥ 10 min	≥30 min
Park your car	387	86.2%	11.6%	1.4%
Get off the bus	32	50.3%	43.4%	3.5%
If you walk or bike	26	20.6%	75.1%	11.3%

Source: HHI, 2005



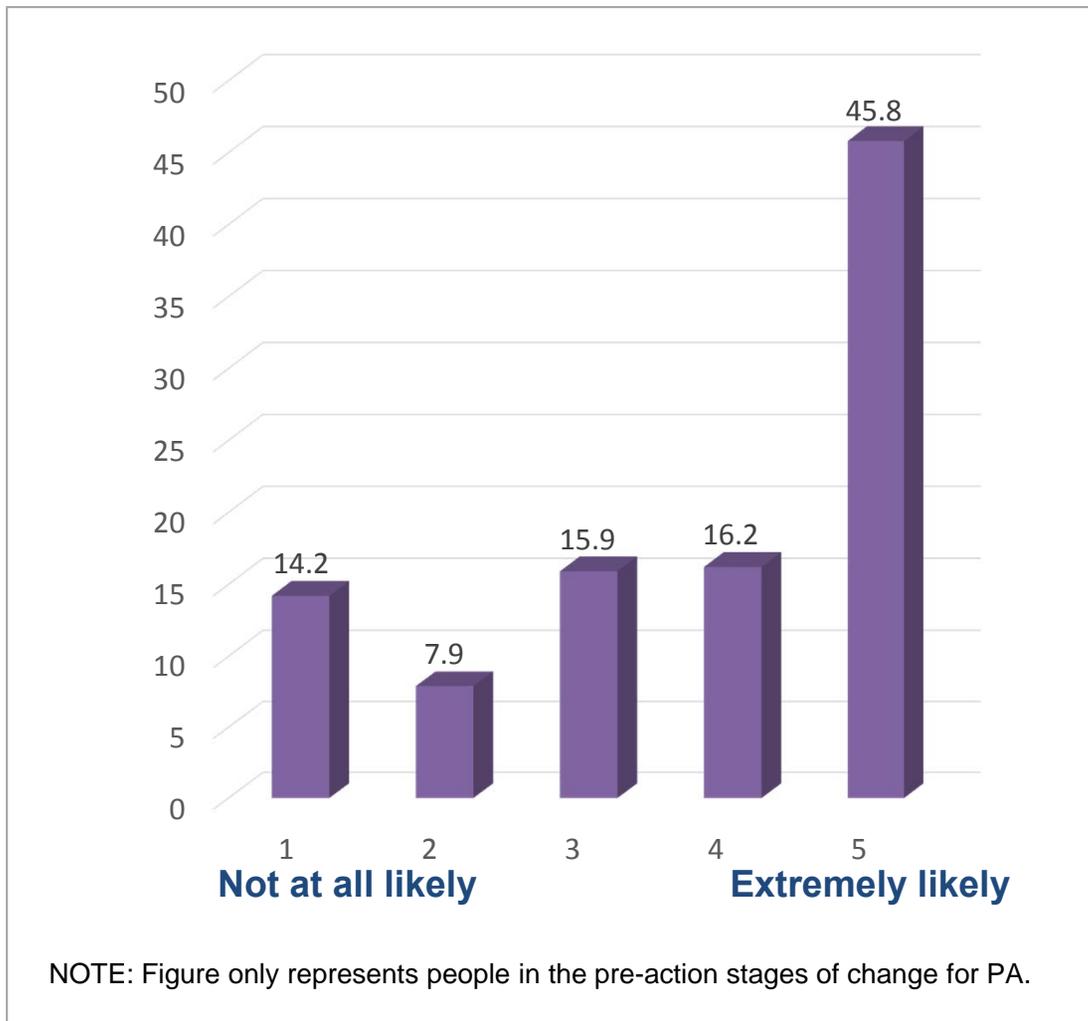
Leisure-time Physical Activity in Public Parks in Diverse Communities



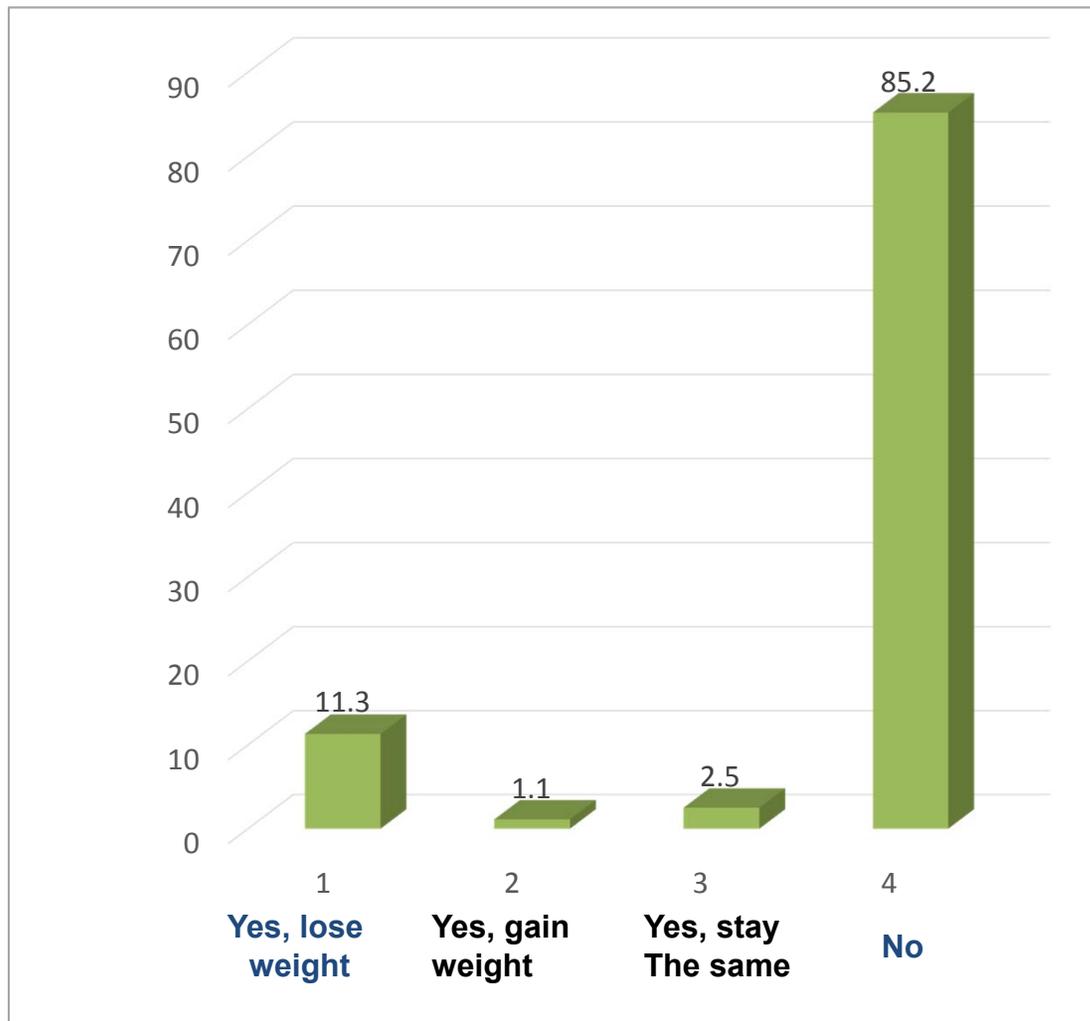
70% Sedentary in Tampa Compared to 51% Sedentary in Chicago



If your Dr. recommended that you walk 30 min., how likely is it that you would try to?



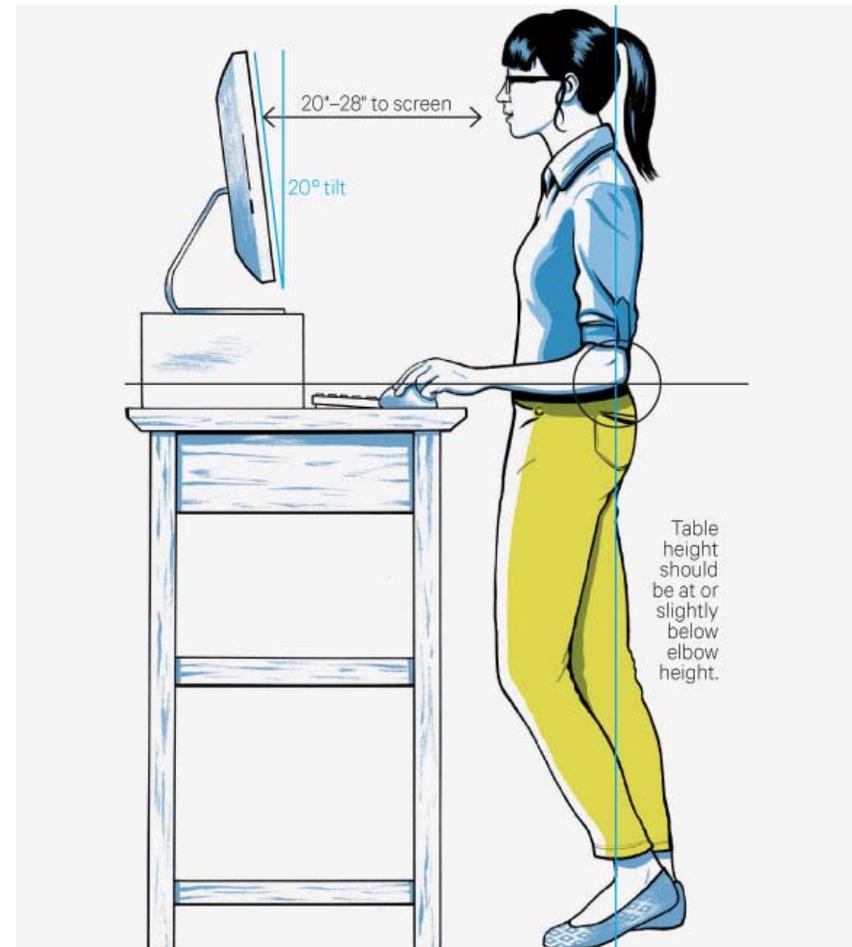
In the past 12 months, has a doctor, nurse or other health professional given you advice about your weight?



Source: BRFSS Hawaii, 2003

Stand-Preferred Desks

- Workers stand about 1.6 hours more per day
- 75 extra calories expended per day
- 46% increase in productivity



Outline

- Epidemiology of Obesity
- Physical activity and the environment
- **Nutrition and the environment**
- How can we make progress?

BAGEL

Calorie Difference: 210 calories

20 Years Ago



140 calories
3-inch diameter

Today



350 calories
6-inch diameter

Source: NHLBI, 2006



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CHEESEBURGER

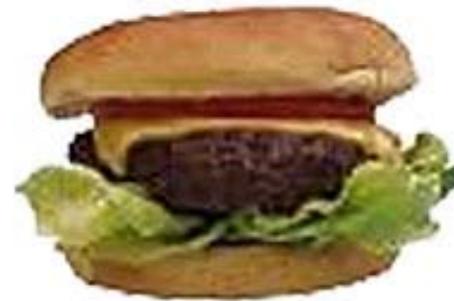
Calorie Difference: 257 calories

20 Years Ago



333 calories

Today



590 calories

Source: NHLBI, 2006



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FRENCH FRIES

Calorie Difference: 400 Calories

20 Years Ago



210 Calories
2.4 ounces

Today



610 Calories
6.9 ounces

Source: NHLBI, 2006



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SODA

Calorie Difference: 165 Calories

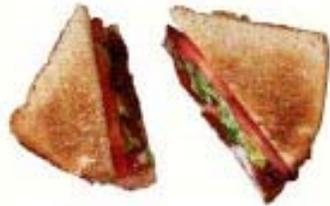


Source: NHLBI, 2006

TURKEY SANDWICH

Calorie Difference: 500 calories

20 Years Ago



320 calories

Today



820 calories

Source: NHLBI, 2006

Why Is This Important?

- In the US, sweetened beverage intake increased 135% between 1977 and 2001 (Nielsen & Popkin, 2004).
But has been dropping recently.
- Meals purchased away from home have increased from 33% of \$ spent in 1970 to 48% in 2010 (USDA, 2011).



Bigger Portions = Increased Intake?



College students ate at a buffet and then the next week were served 100%, 125% or 150% of the food they had consumed the week before.

The larger the portion the more food they consumed.

(Levitsky & Youn, 2004)

Bigger Portions = Increased Intake?

Participants were recruited for a soup testing study.

One group received normal bowls of soup. The second group got self-filling bowls of soup.

Those with the self-filling bowls consumed 73% more soup, yet did not report being more sated than those eating from the normal bowls.

(Wansink, et al., 2005)



Bigger Portions = Increased Intake?

In a 2x2 study, participants received either a large or medium bucket of popcorn that was fresh or stale.

In the fresh condition, those who received the larger bucket ate 45.3% more.

In the stale condition, people ate 33.6% from the large bucket even though the popcorn was 2 weeks old!

(Wansink & Kim, 2005)



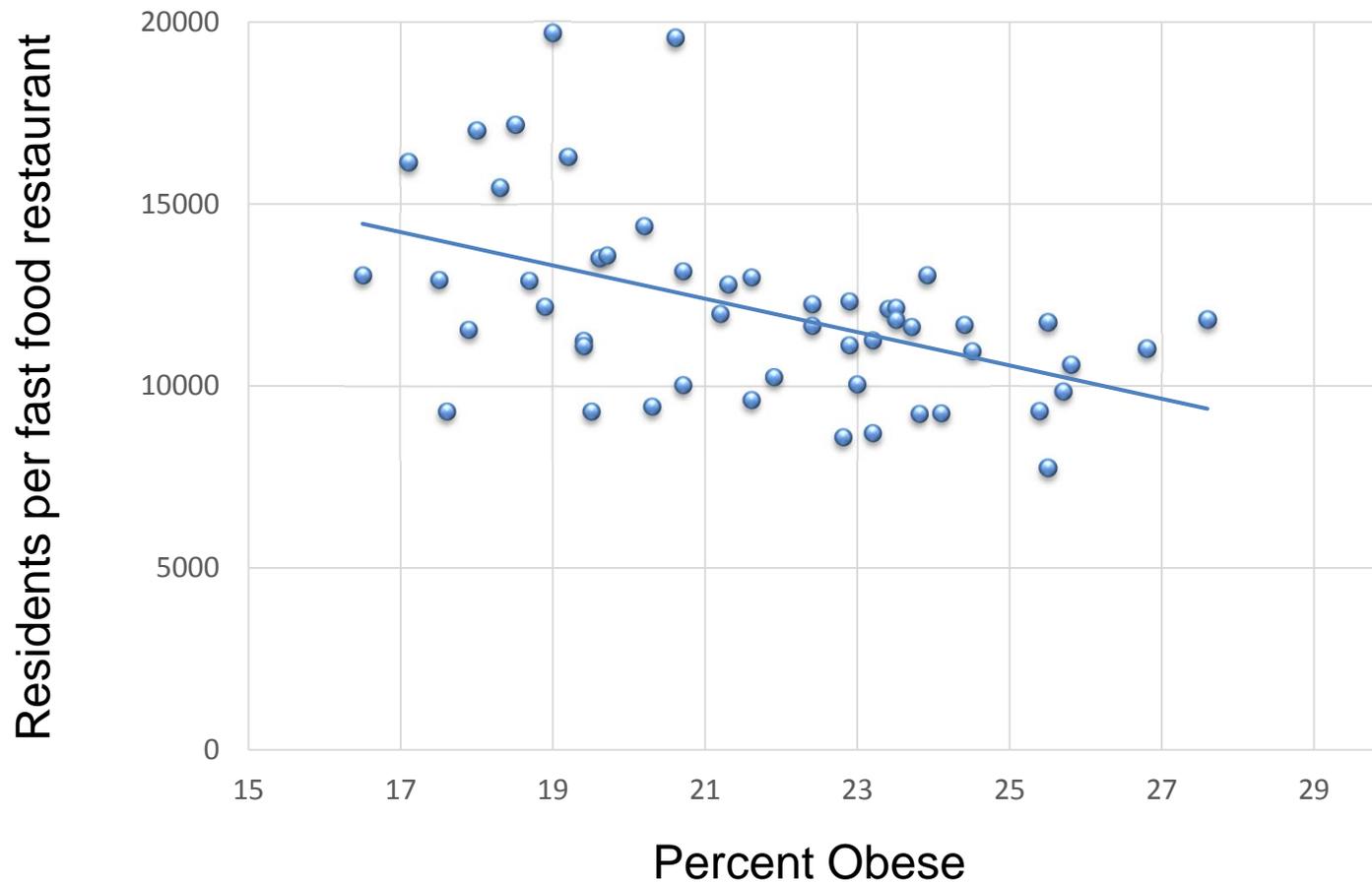
Sugar Sweetened Beverages

- Consistent relationship between body weight and SSB consumption
- SSB and diabetes related
- Study participants who replaced SSBs with diet sodas or water lost 2-5% of their body weight

Review conducted by the Yale Rudd Center



Relationship of Prevalence of Fast Food Restaurants and Obesity by State



Maddock, 2005

What to Do?



- Make the healthy choice the default choice.
- Use strategies to reach large populations.
- Change environments where people live, work, play and learn.
- Use evidence-based science as the framework.

A Healthy City Would Have

- A safe, accessible environment for physical activity
- Good connectivity to encourage active transport
- Accessible, affordable fruits and vegetables
- Well labeled food in appropriate portion sizes
- Support social environment (social norms, physician advice)
- A knowledgeable, motivated population



References

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Questions and Answers



Q & A Moderator

*Janna Zumbrun, MSSW
Associate Commissioner of Disease
Control and Prevention*

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For those in the auditorium, please come to the microphone to ask your question.

October 26

Recent Findings from Epidemiologic Research on Birth Defects in Texas and Beyond

Presenters:

Mark Canfield, PhD and Peter Langlois, PhD
Birth Defects Epidemiology and Surveillance,
DSHS

