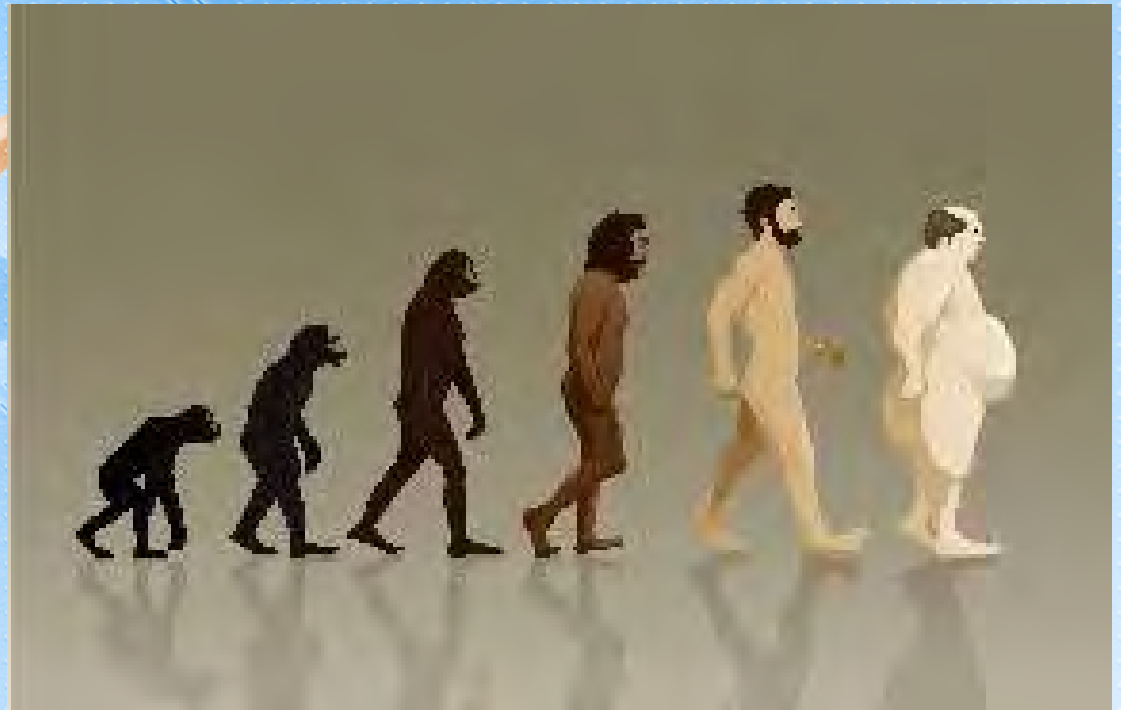


# The U.S. Obesity Epidemic: Causes, Consequences and Health Provider Response



Suzanne Bennett Johnson  
2012 APA President  
[sbjohnson@apa.org](mailto:sbjohnson@apa.org)



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# Presentation Overview

- ⊙ Epidemiology of obesity
- ⊙ Consequences of obesity
- ⊙ Factors underlying the obesity epidemic
- ⊙ The role of health providers in addressing the obesity epidemic



# Categories of Weight

Normal	Overweight	Obese	Severely Obese	Morbidly Obese
BMI 18.5 – 24.9	BMI 25 – 29.9	BMI 30 – 34.9	BMI 35 – 39.9	BMI ≥ 40



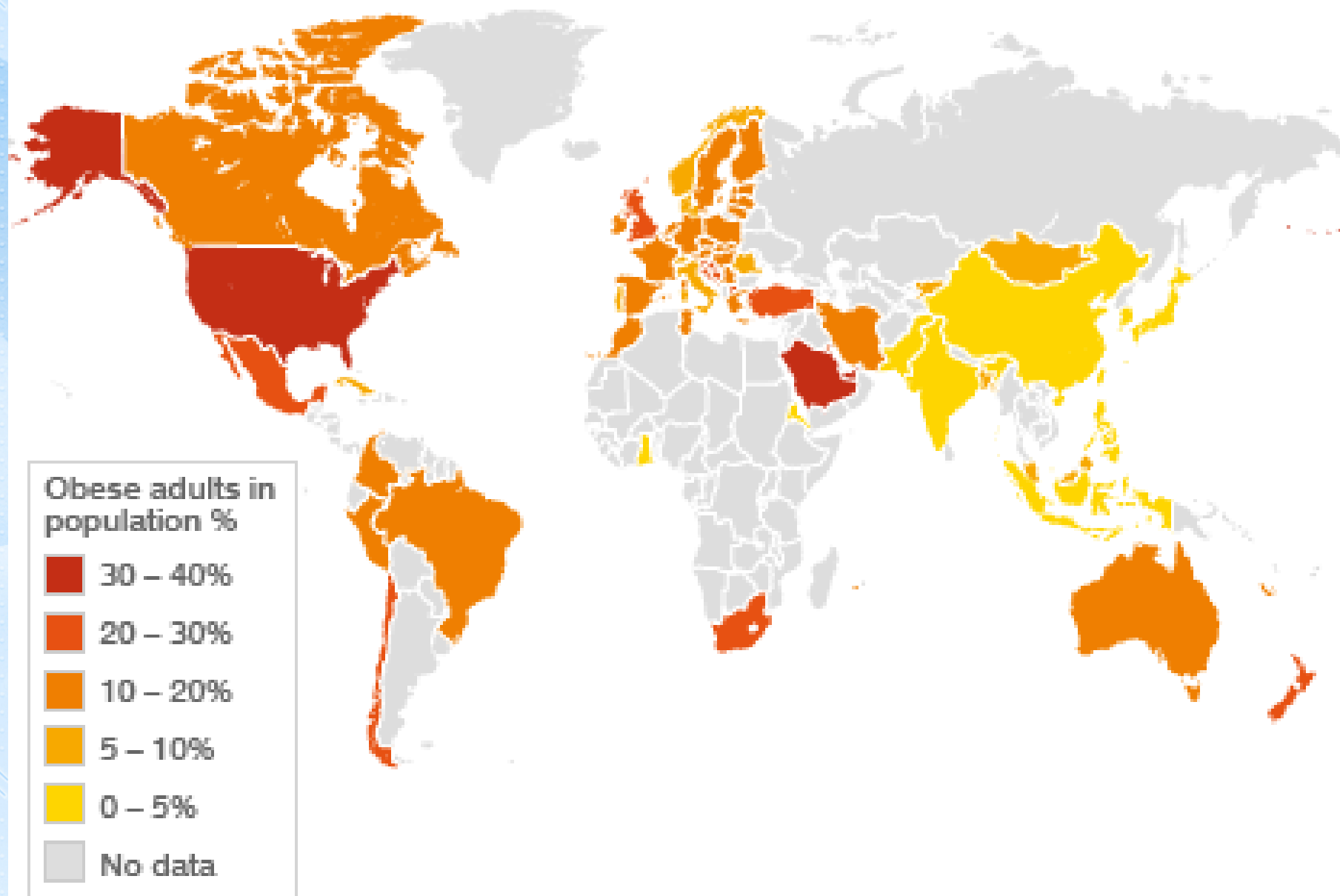


		Weight in Pounds													
		120	130	140	150	160	170	180	190	200	210	220	230	240	250
Height in Feet and Inches	4'6	29	31	34	36	39	41	43	46	48	51	53	56	58	60
	4'8	27	29	31	34	36	38	40	43	45	47	49	52	54	56
	4'10	25	27	29	31	34	36	38	40	42	44	46	48	50	52
	5'0	23	25	27	29	31	33	35	37	39	41	43	45	47	49
	5'2	22	24	26	27	29	31	33	35	37	38	40	42	44	46
	5'4	21	22	24	26	28	29	31	33	34	36	38	40	41	43
	5'6	19	21	23	24	26	27	29	31	32	34	36	37	39	40
	5'8	18	20	21	23	24	26	27	29	30	32	34	35	37	38
	5'10	17	19	20	22	23	24	26	27	29	30	32	33	35	36
	6'0	16	18	19	20	22	23	24	26	27	28	30	31	33	34
	6'2	15	17	18	19	21	22	23	24	26	27	28	30	31	32
	6'4	15	16	17	18	20	21	22	23	24	26	27	28	29	30
	6'6	14	15	16	17	19	20	21	22	23	24	25	27	28	29
	6'8	13	14	15	17	18	19	20	21	22	23	24	25	26	28
		Healthy Weight					Overweight			Obese					





## THE GLOBAL OBESITY PROBLEM



An obese adult is classified as having a Body Mass Index equal to or greater than 30

SOURCE: World Health Organization, 2005

# Obesity: U.S. Leads the World

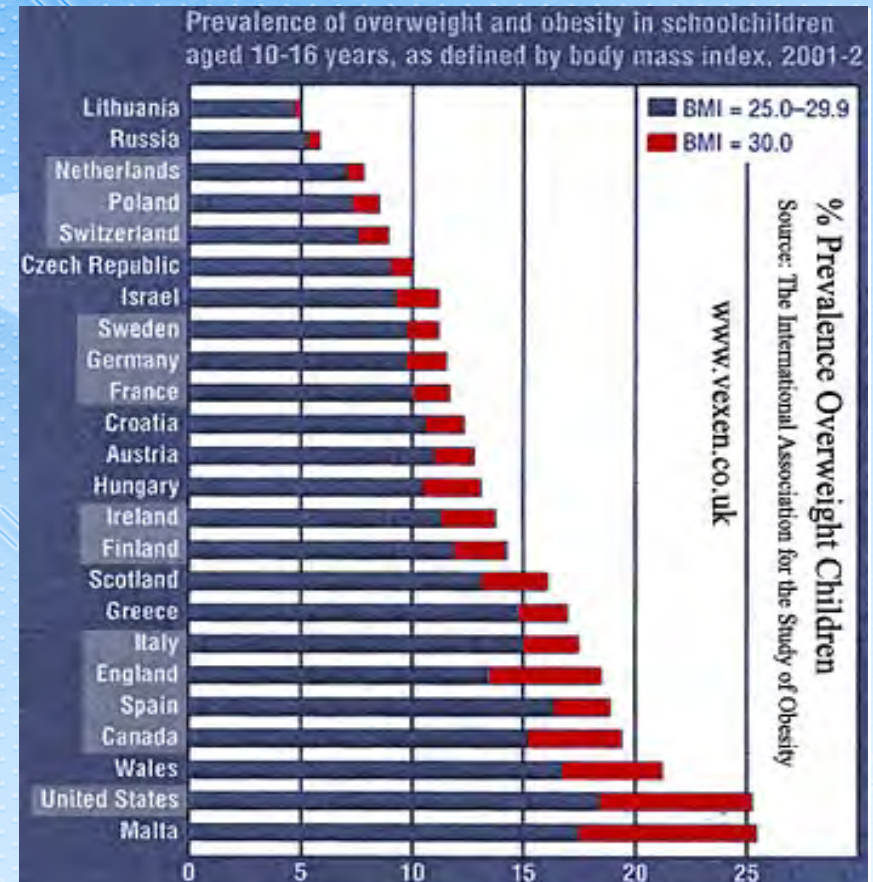
## Adult Obesity



**Figure 1.** Percentage of obese and overweight population by country.

Source: OECD Health Statistics, 2004.

## Childhood Obesity



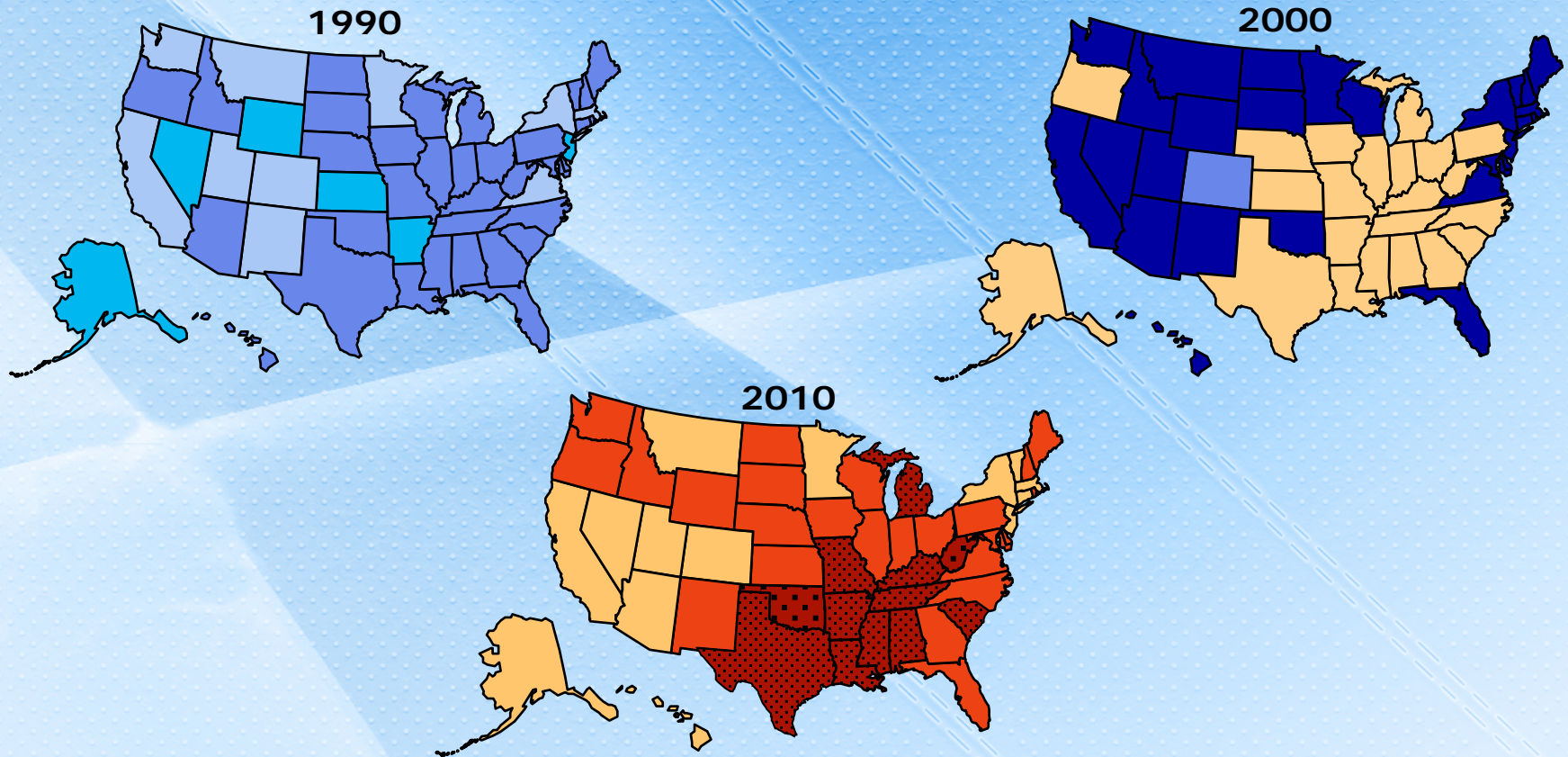
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# Obesity Trends\* Among U.S. Adults

## BRFSS, 1990, 2000, 2010

(\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person)



Source: CDC:

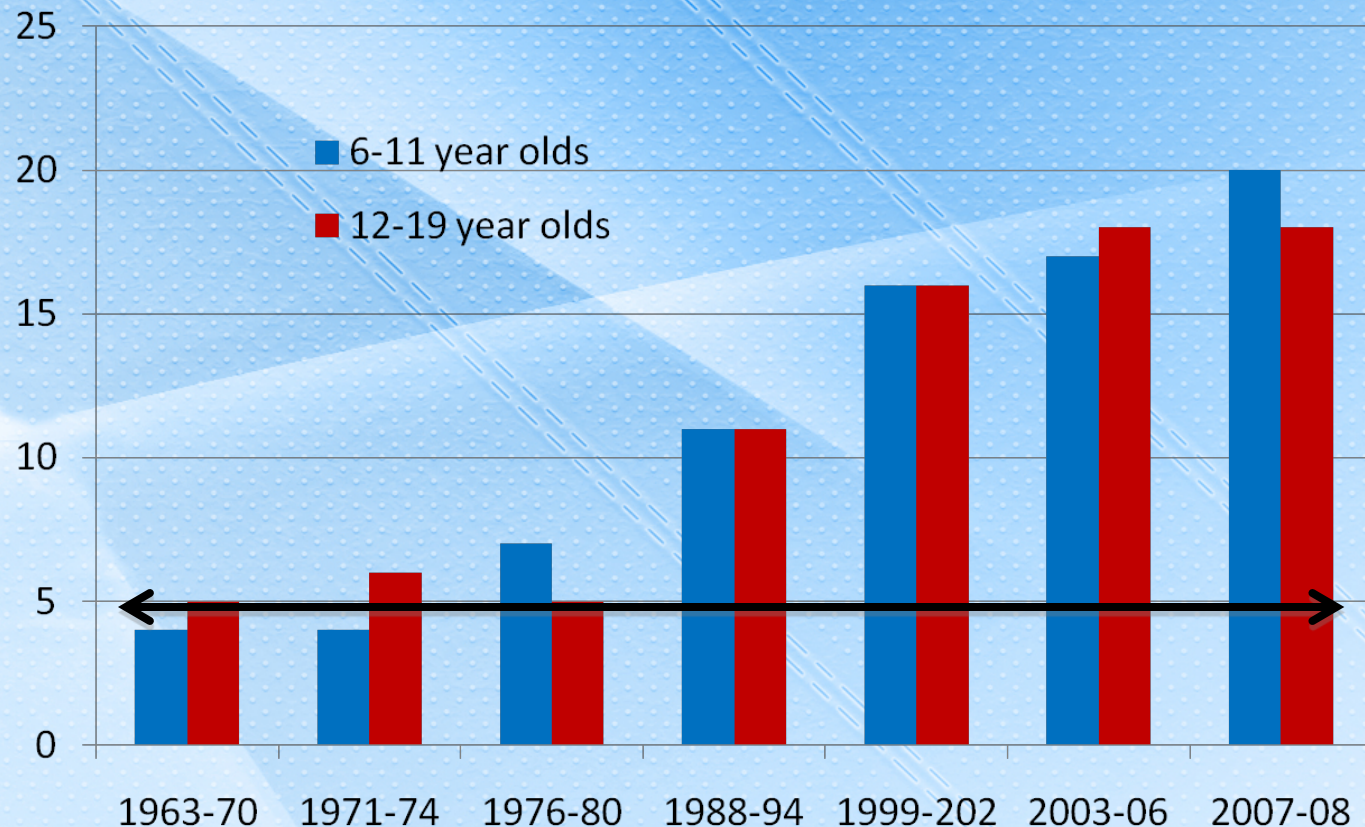
<http://www.cdc.gov/obesity/data/trends.html>



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# Obesity Trends in U.S. Children



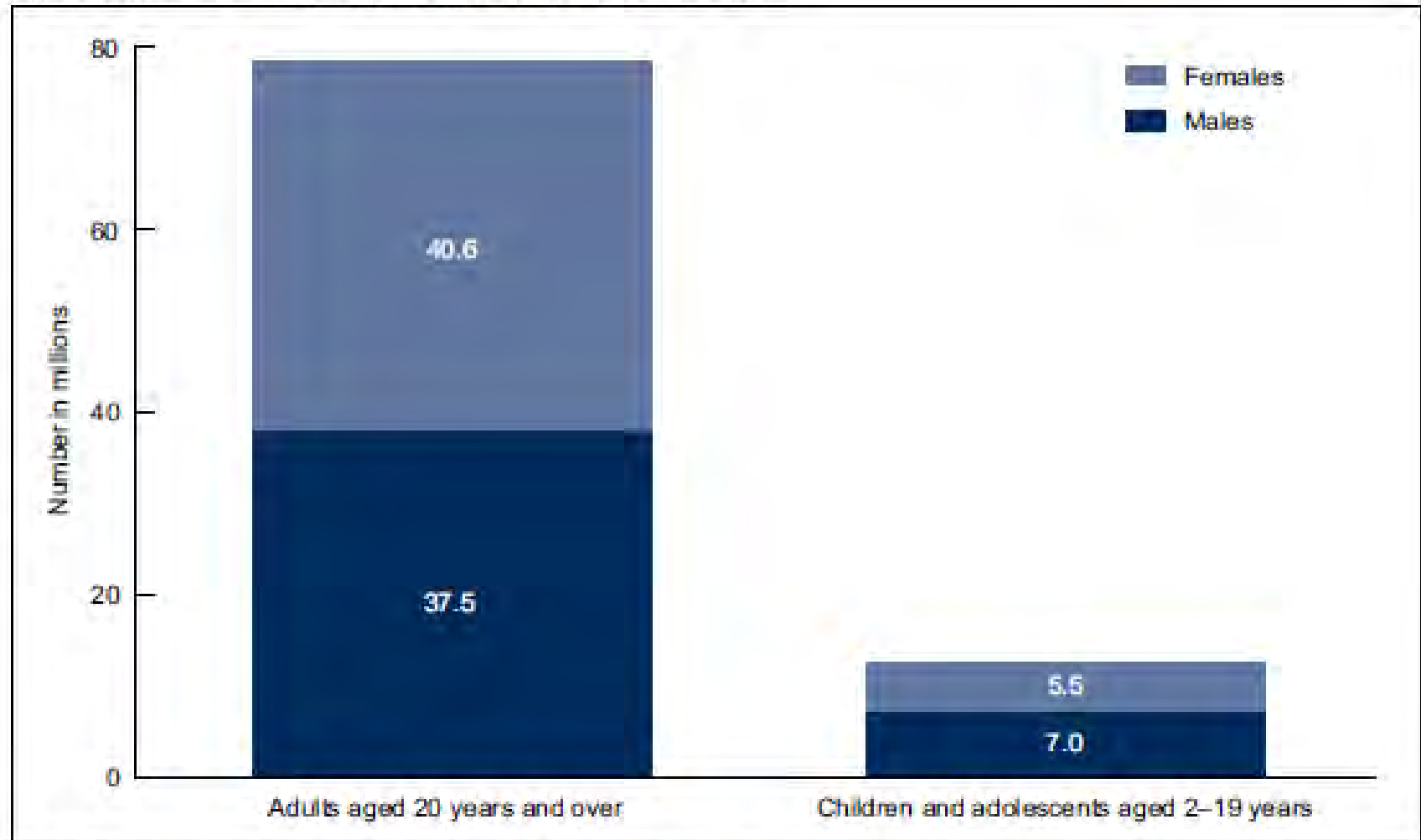
Source: C. Ogden & M. Carroll. (2010). *Prevalence of Obesity Among Children and Adolescents: United States, Trends 1963-1965 Through 2007-2008* [Division of Health and Nutrition Examination Surveys]. CDC:  
[http://www.cdc.gov/nchs/data/hestat/obesity\\_child\\_07\\_08/obesity\\_child\\_07\\_08.htm](http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm)





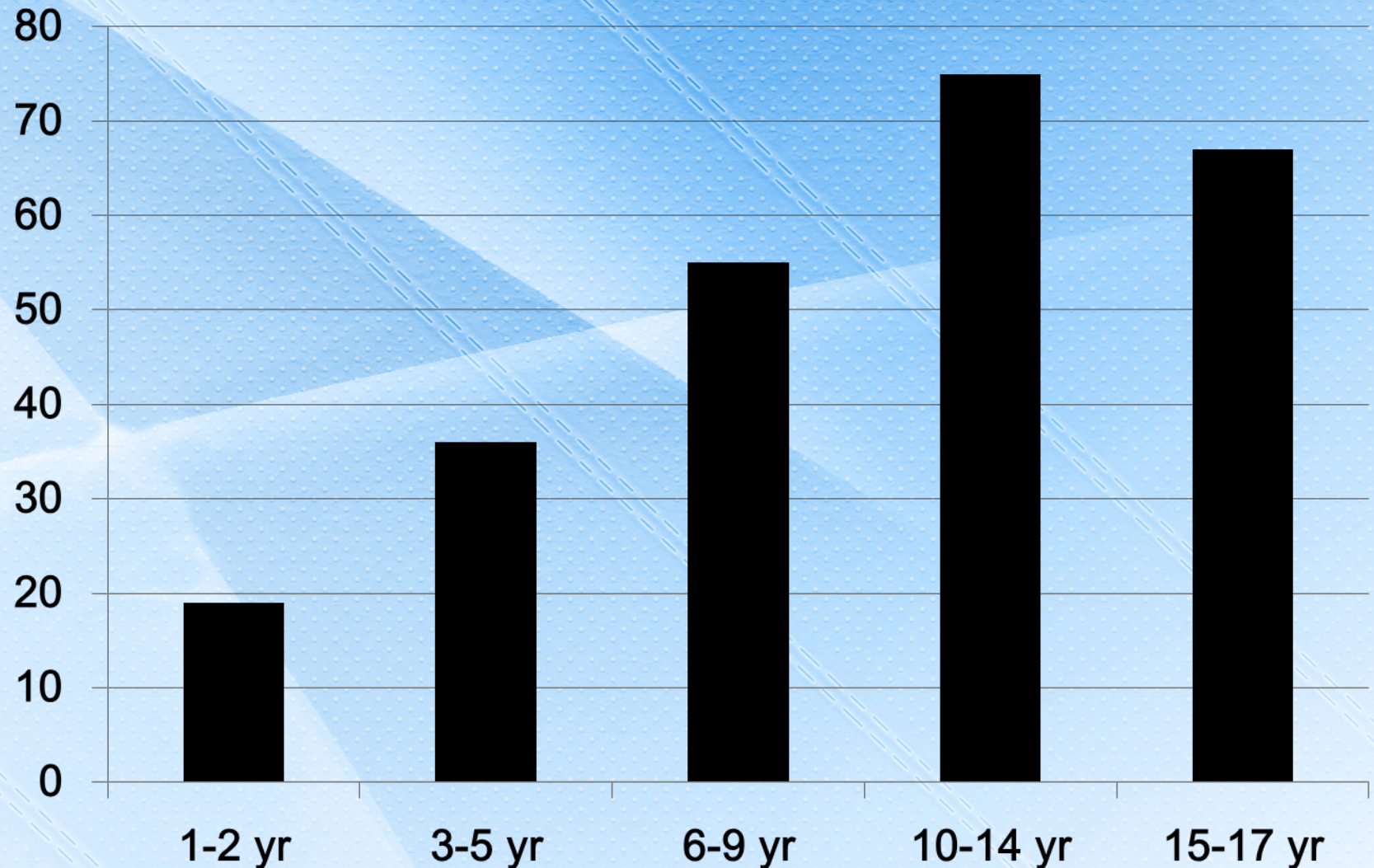
# Over 78 Million Adults and Nearly 13 Million Children are Obese

Figure 3. Number of obese individuals: United States, 2009–2010



SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

# Childhood and Adult Obesity are Linked: Percent of Obese Children Who Become Obese Adults by Age



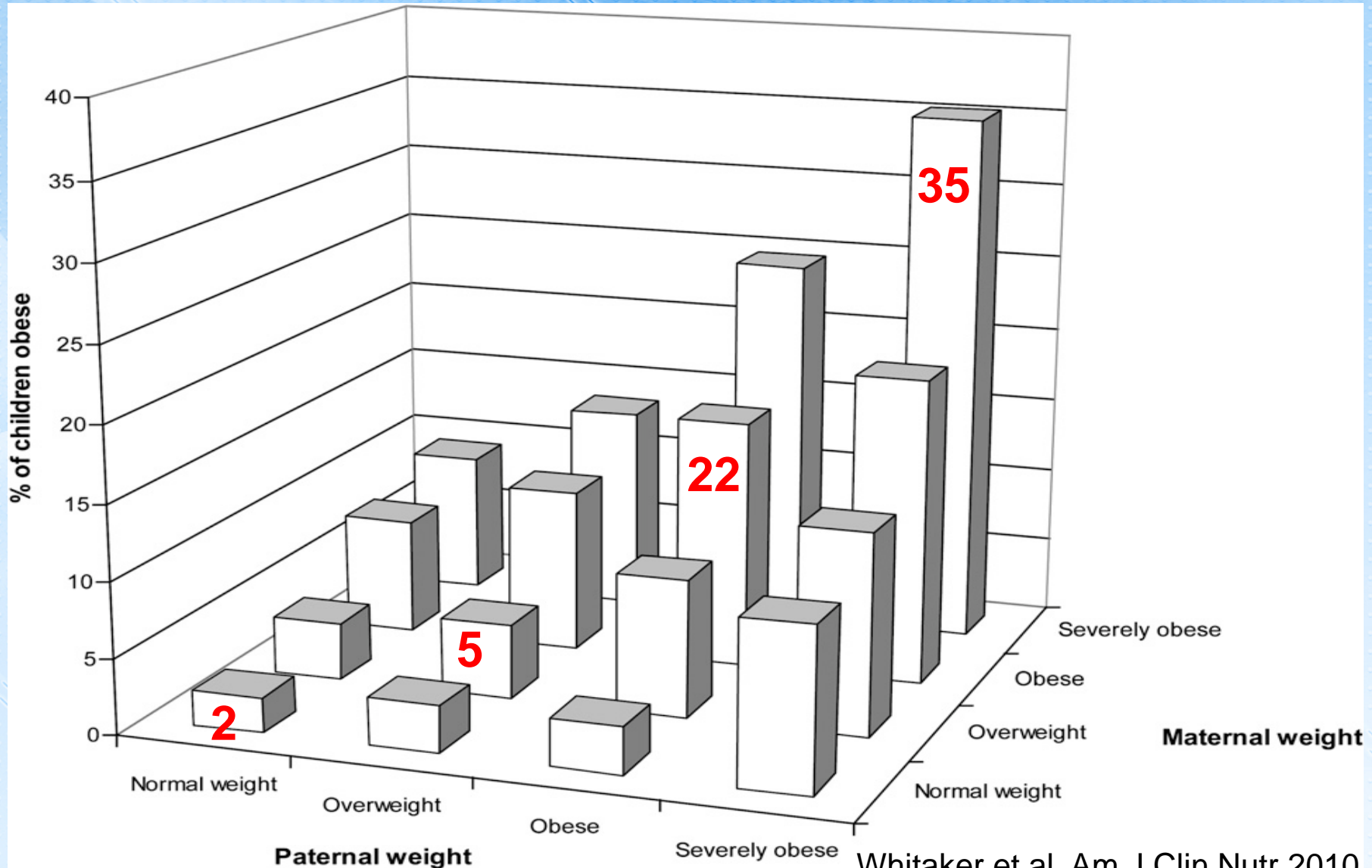
Whitaker et al, NEJM, 1997



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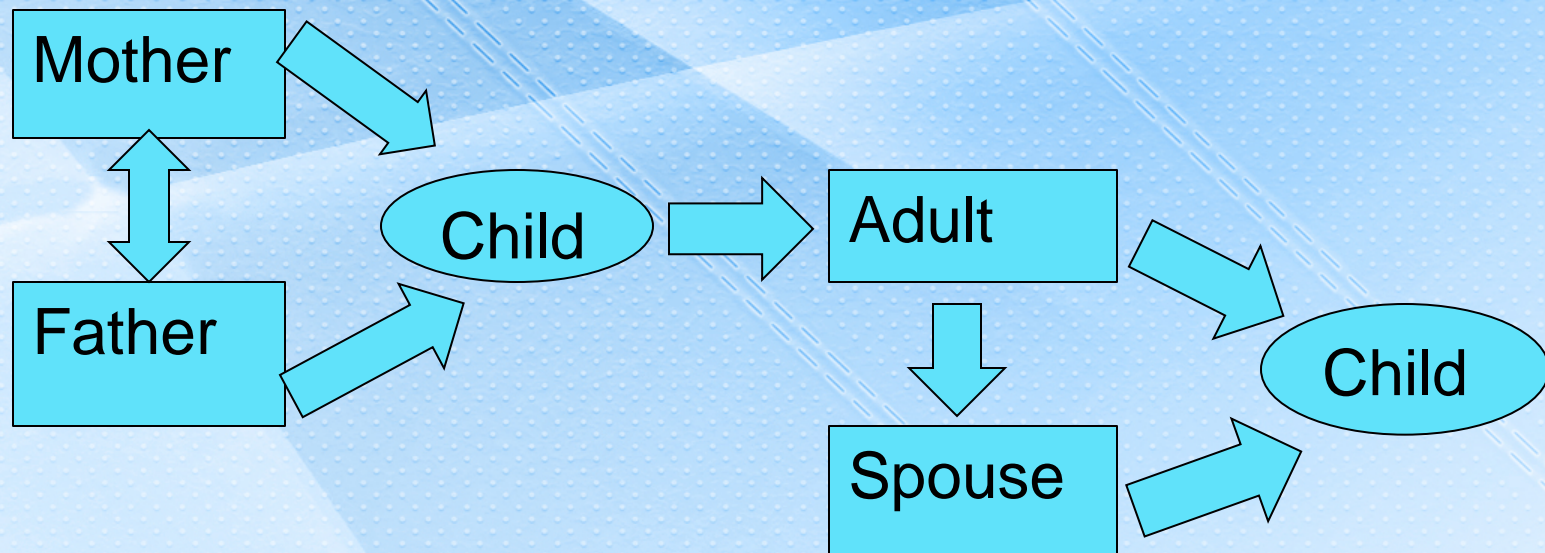


# Childhood and Adult Obesity are Linked: Percent of Obese Children by Parent Weight Status



Whitaker et al, Am J Clin Nutr 2010

# Intergenerational Escalation of Obesity



Whitaker et al NEJM 1997

Whitaker et al Am J Clin Nutrition 2010

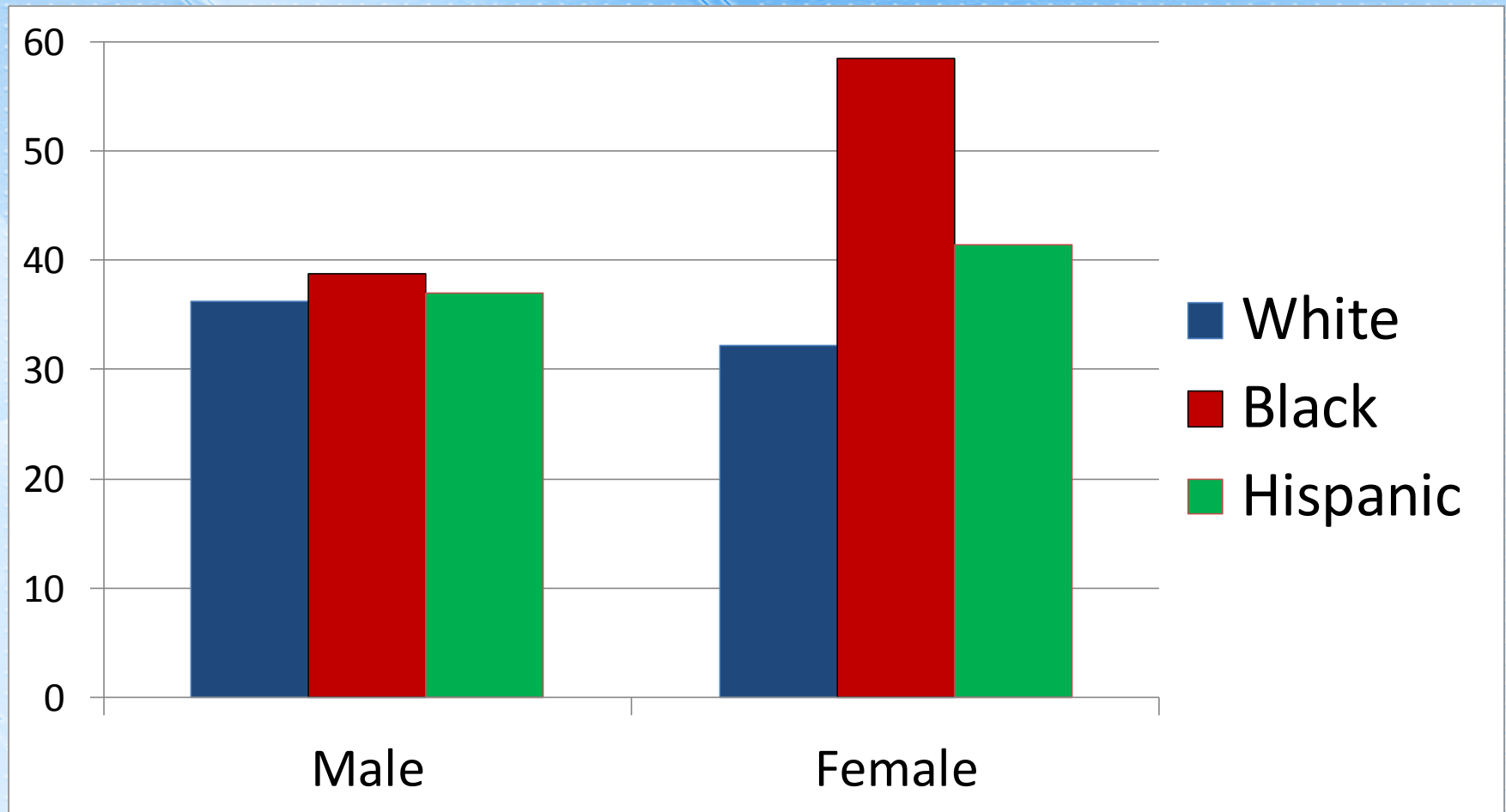
Murrin et al BMC Public Health 2012



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# Adult Obesity: Gender and Ethnicity

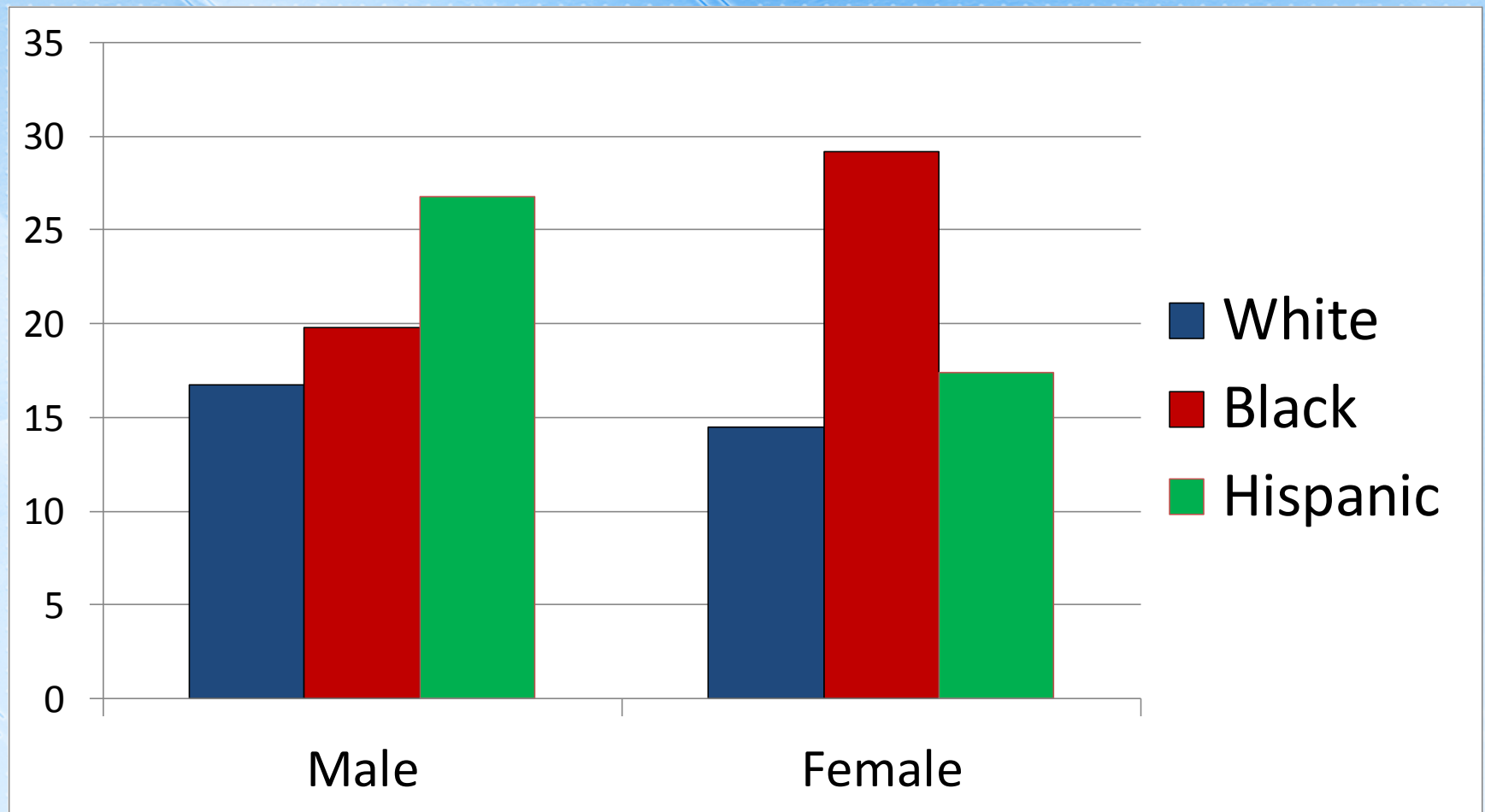


Flegel et al, JAMA 2012



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# U.S. Adolescent Obesity: Gender and Ethnicity



NHANES 2007-2008

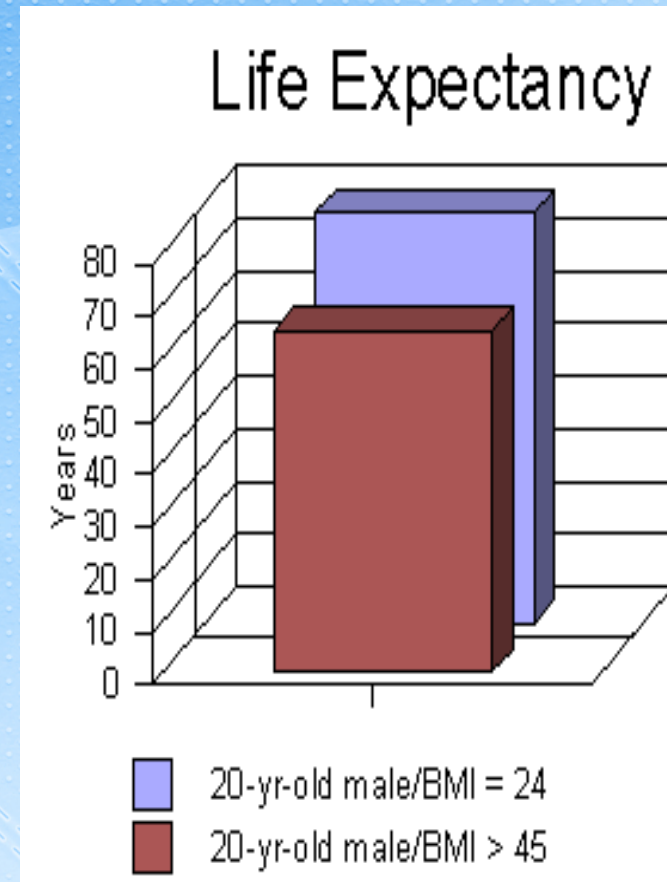
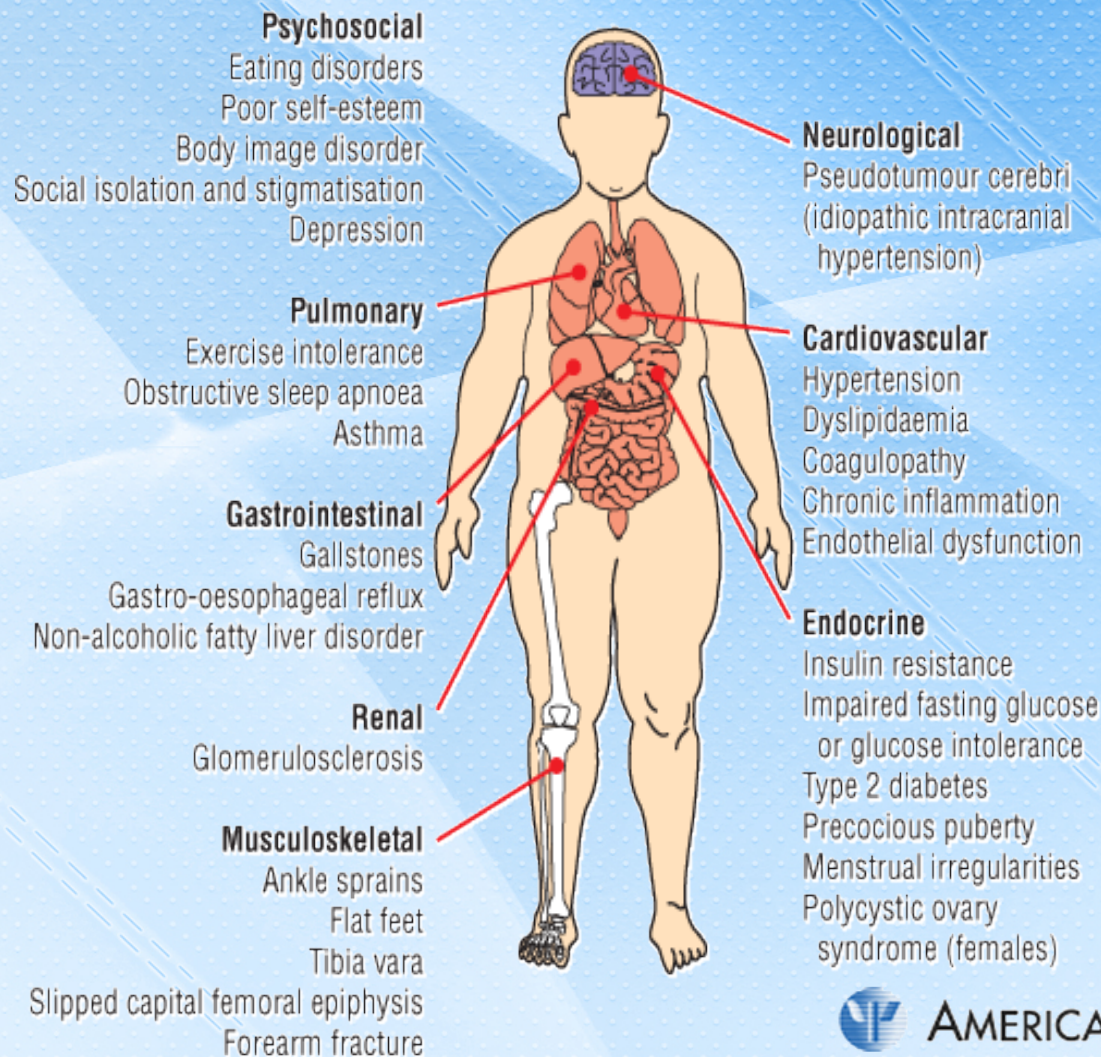


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# Health Consequences of Obesity

Fontaine et al, JAMA 2003



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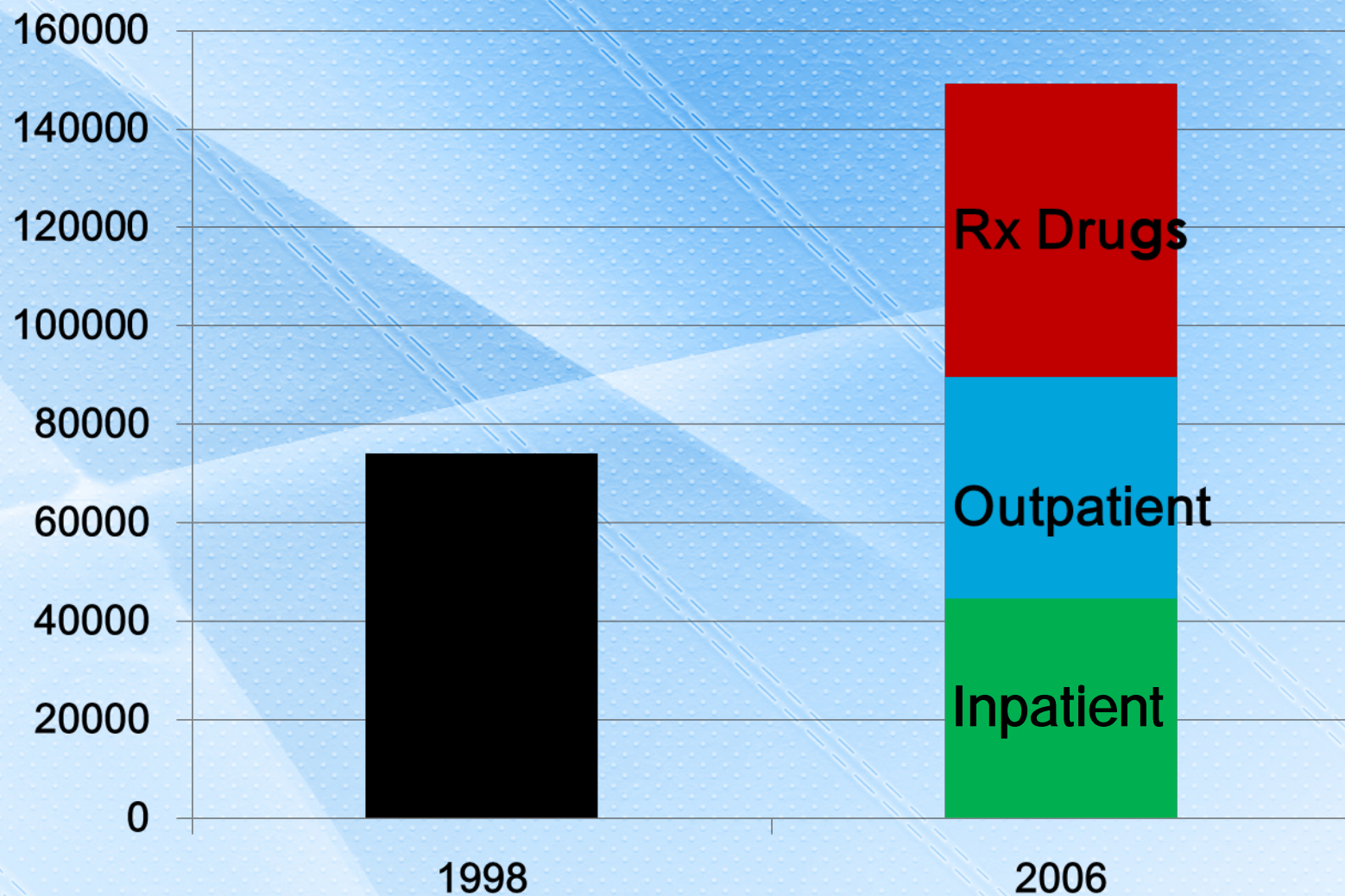
# Percent of Military Retirees and their Dependents with Co-Morbidities by Weight Status

Kress et al Preventive Medicine 2005	Normal	Overweight	Obese BMI 30-35	Obese BMI 35-40	Obese BMI >40
Men					
Arthritis	16.4	26.2	29.2	35.1	40.5
High Cholesterol	42.0	48.6	51.5	58.3	48.3
Diabetes	5.6	10.9	19.4	25.7	34.1
Hypertension	31.2	38.9	52.1	60.7	61.8
Women					
Arthritis	23.4	29.8	35.9	37.8	54.3
High Cholesterol	27.9	39.2	46.2	45.7	45.6
Diabetes	5.3	7.8	15.5	20.3	36.8
Hypertension	24.4	36.5	51.9	58.5	62.5



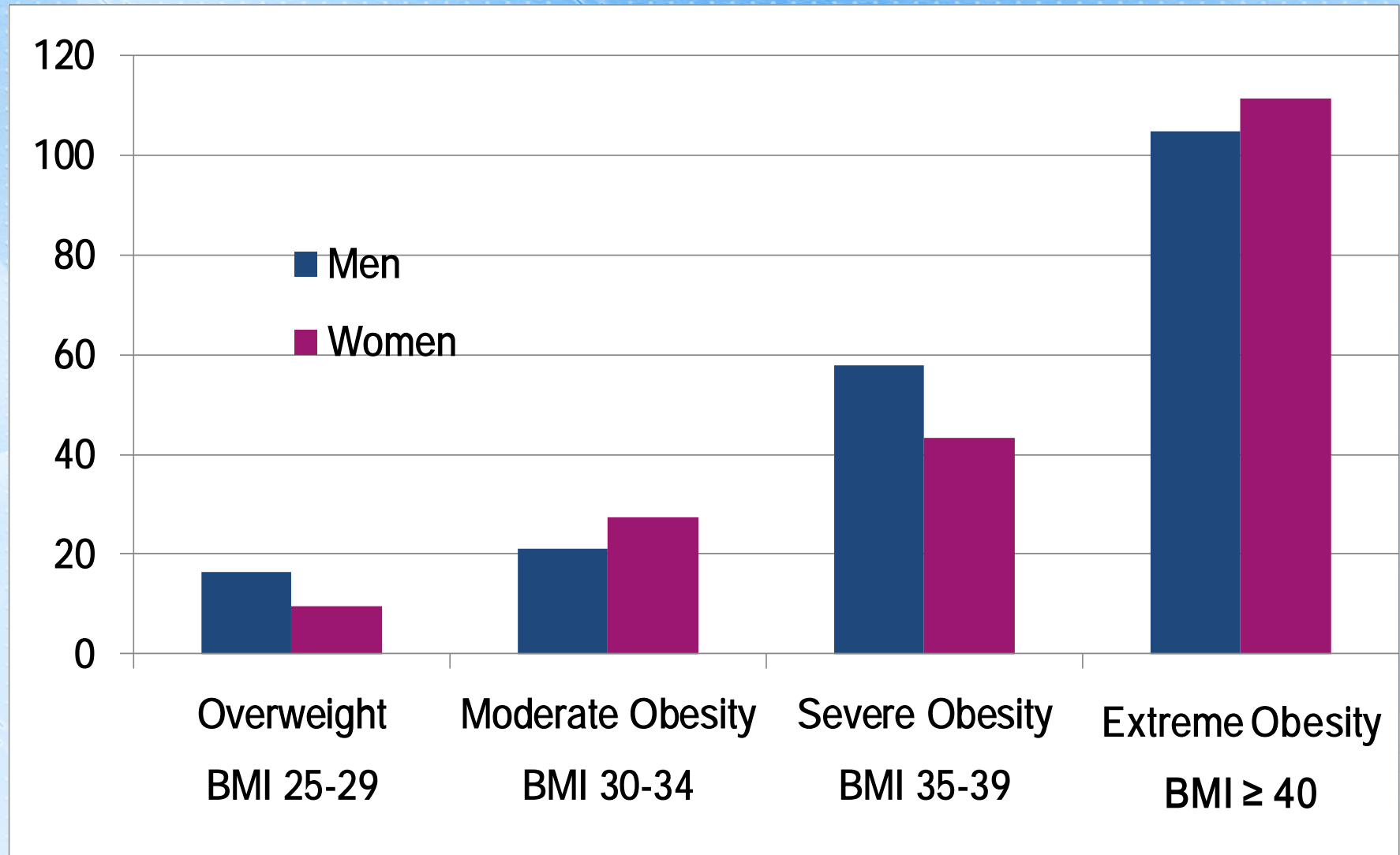


# Medical Spending on Obesity in Millions



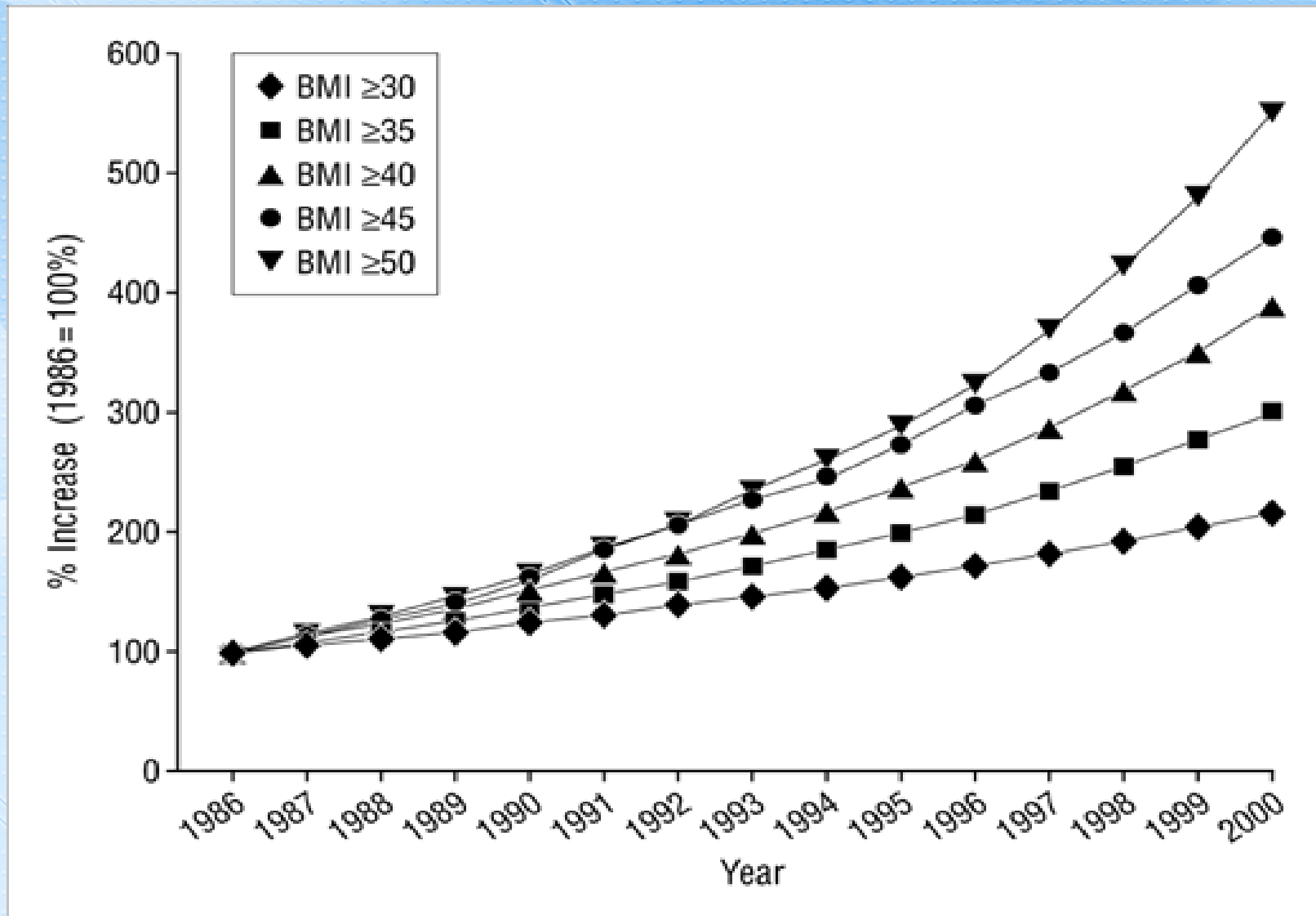


# Percent Above Normal Weight Individuals' Annual Health Care Costs by Obesity Status and Gender





# Severe Obesity is Escalating



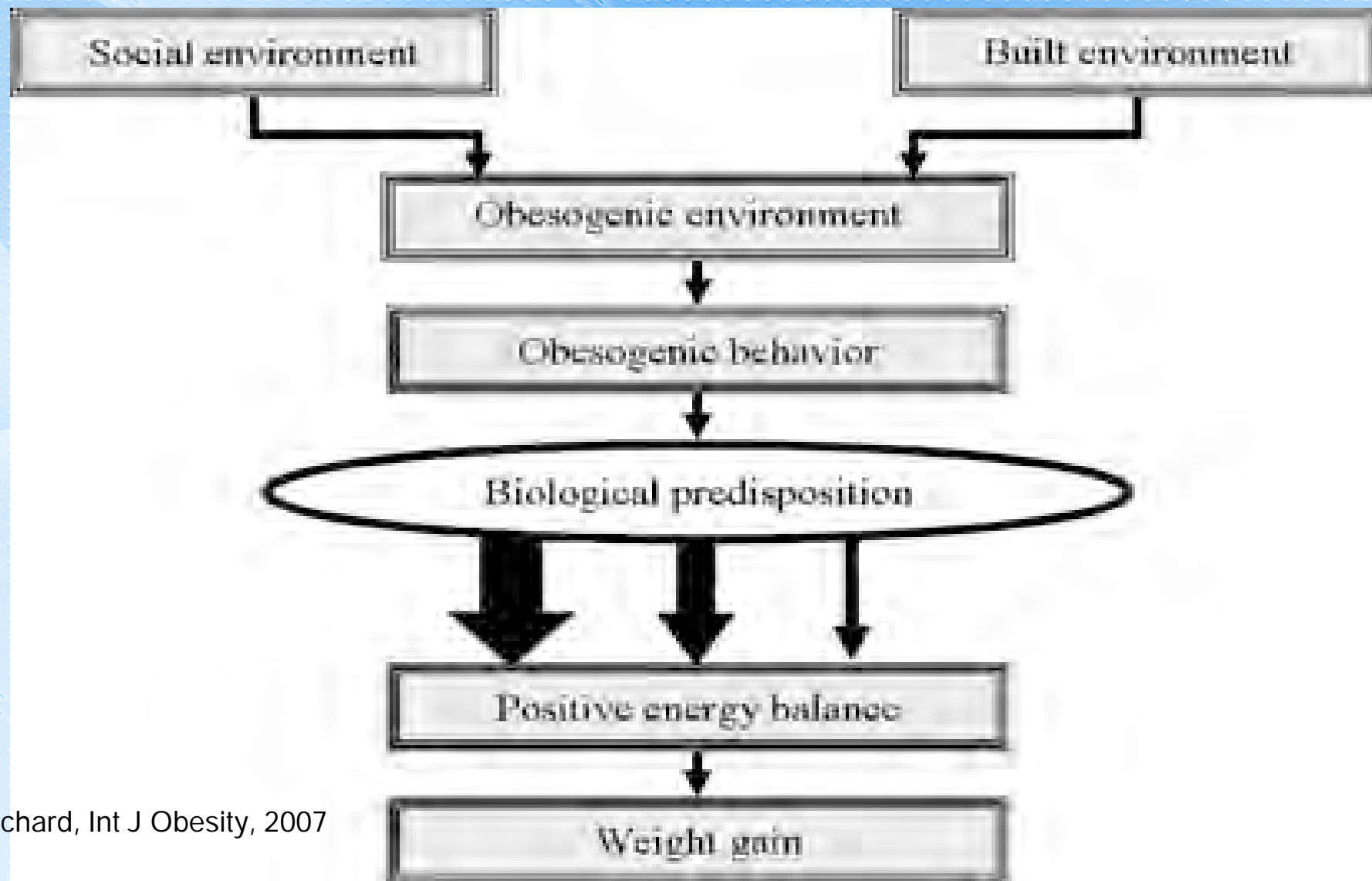


# Obesity in the United States

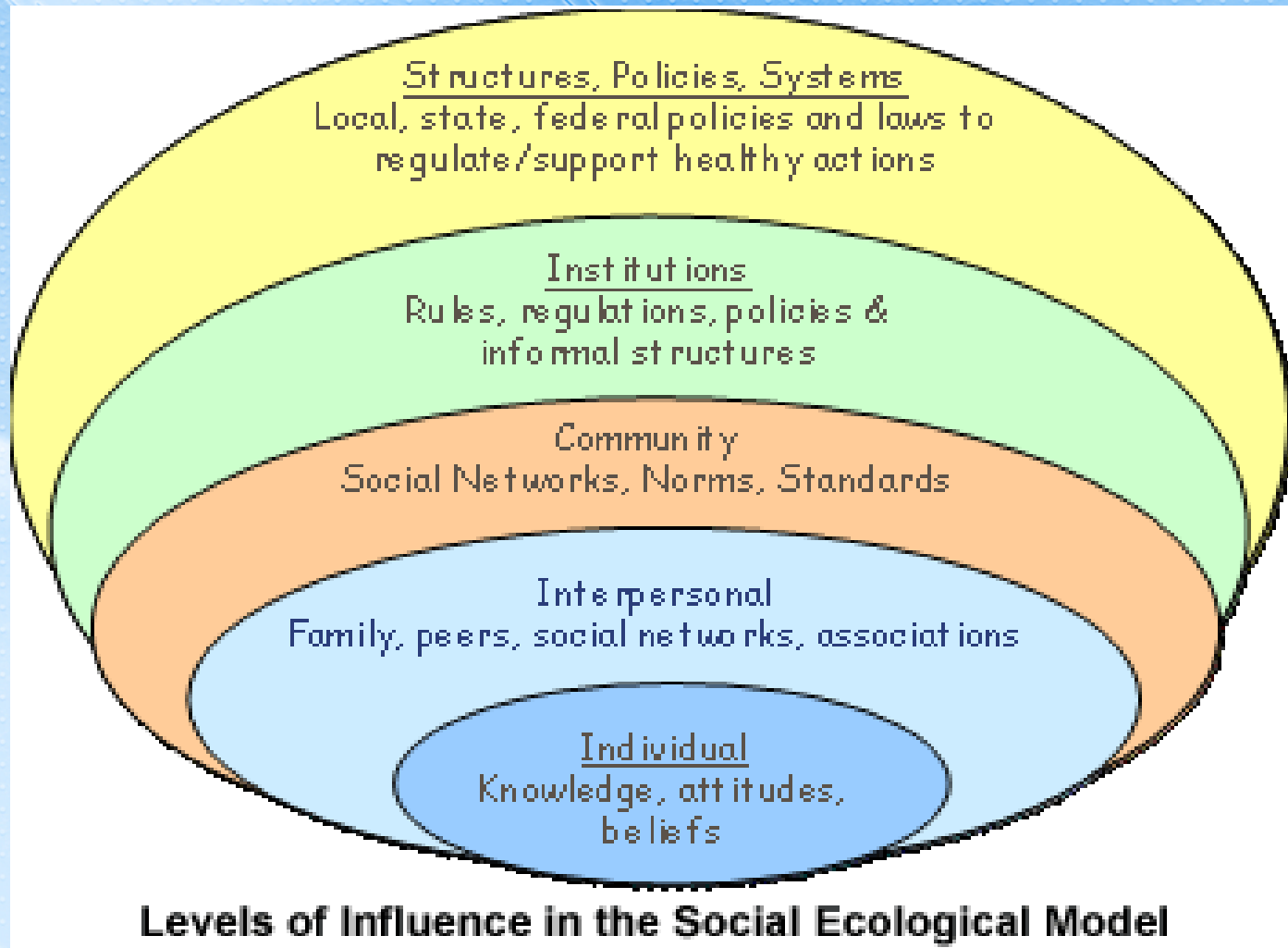
- ⊙ Is the second leading cause of death in U.S. and expected to become the leading cause
- ⊙ Will result in decreased U.S. life expectancy for first time in a century
- ⊙ Is causing a diabetes epidemic
  - ⊙ 33% of boys & 39% of girls born in 2000 will develop diabetes in their lifetime
  - ⊙ 50% of African-American girls born in 2000 will develop diabetes in their lifetime
- ⊙ Is expected to bankrupt the U.S. health care system



# The U.S. Obesity Epidemic: How Did This Happen?



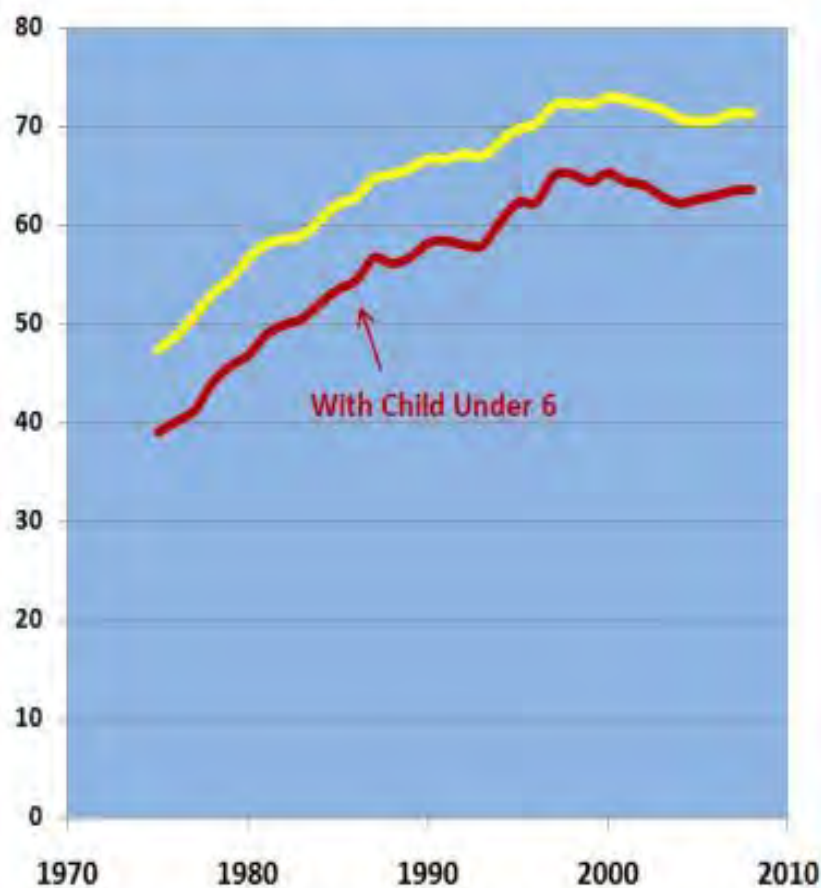
# The Obesogenic Environment: A Socio-Ecological Perspective





# Factors Promoting Increased Calorie Consumption: Increase in US Working Mothers

PERCENT OF WOMEN WITH CHILDREN  
IN THE PAID LABOR FORCE, 1975-2008

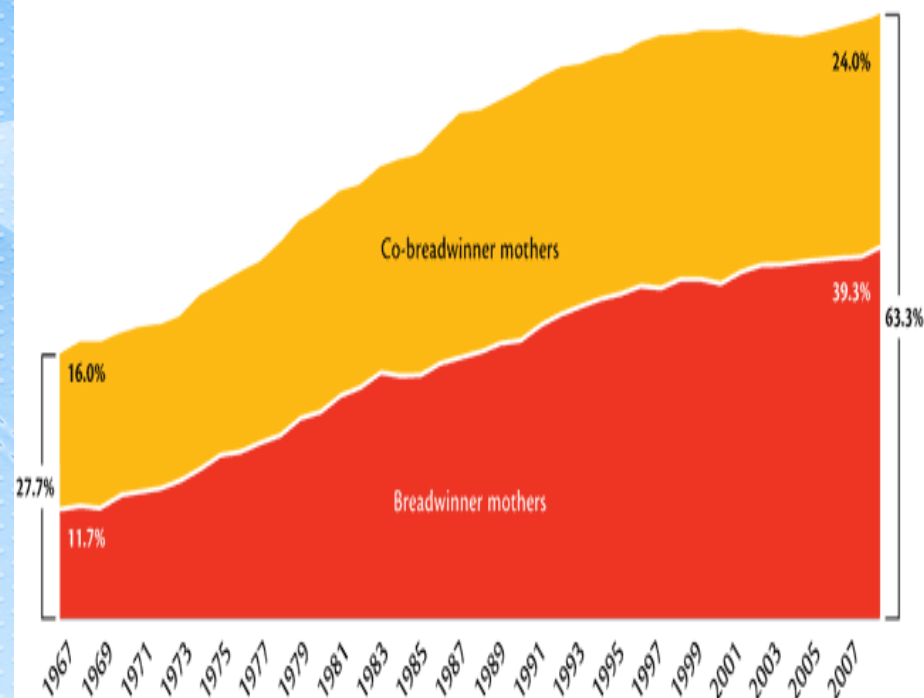


Source: [http://www.bls.gov/opub/ted/2009/ted\\_20091009\\_data.htm#b](http://www.bls.gov/opub/ted/2009/ted_20091009_data.htm#b)

FIGURE 2

## The new workforce

Share of mothers who are breadwinners or co-breadwinners, 1967 to 2008



Source: See Table 1.

Notes: Breadwinner mothers include single mothers who work and married mothers who earn as much as or more than their husbands. Co-breadwinners include all breadwinners as well as wives who bring home at least 25 percent of the couple's earnings. The data only include families with a mother who is between the ages of 18 and 60 and who has children under age 18 living with her.





# Factors Promoting Increased Calorie Consumption: Rise of the US Fast Food Industry

- ⊙ Number of per capita fast food restaurants doubled between 1972 and 1997 in the U.S.
- ⊙ % family's food budget spent on dining out:
  - 1960's: 21%
  - 2008: 42%
- ⊙ > 50% of US adults eat fast food  $\geq 1$  per week
- ⊙ 30% of US children eat fast food every day
- ⊙ Per capita calories in the U.S.
  - 1970: 3250 per day
  - 1997: 3800 per day

<http://www.bls.gov/news.release/cesan.nr0.htm>

<http://www.bls.gov/mlr/1990/03/art3full.pdf>

Chou et al, J of Health Economics, 2004

Bowman et al, Pediatrics, 2003

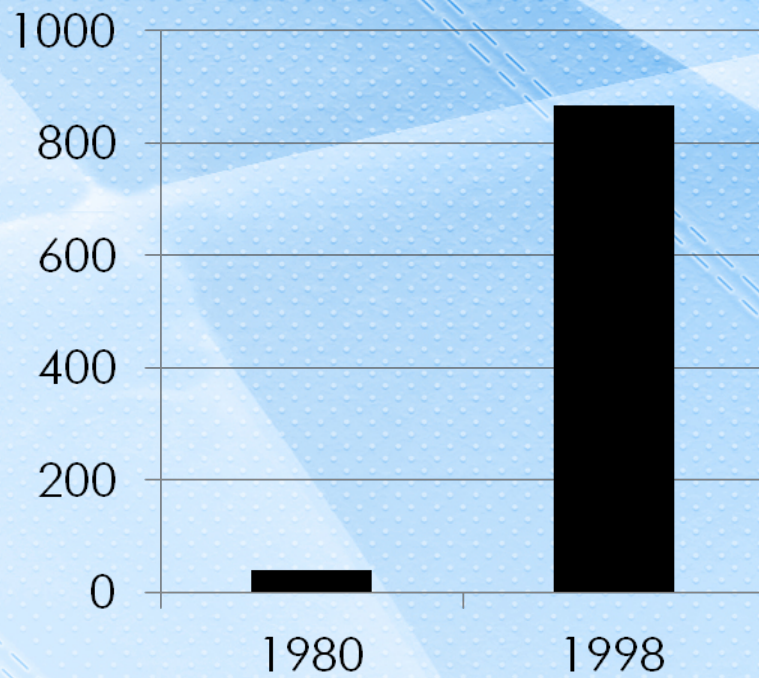
Jeffrey et al. Int J of Behav Nut and Phys Act, 2006



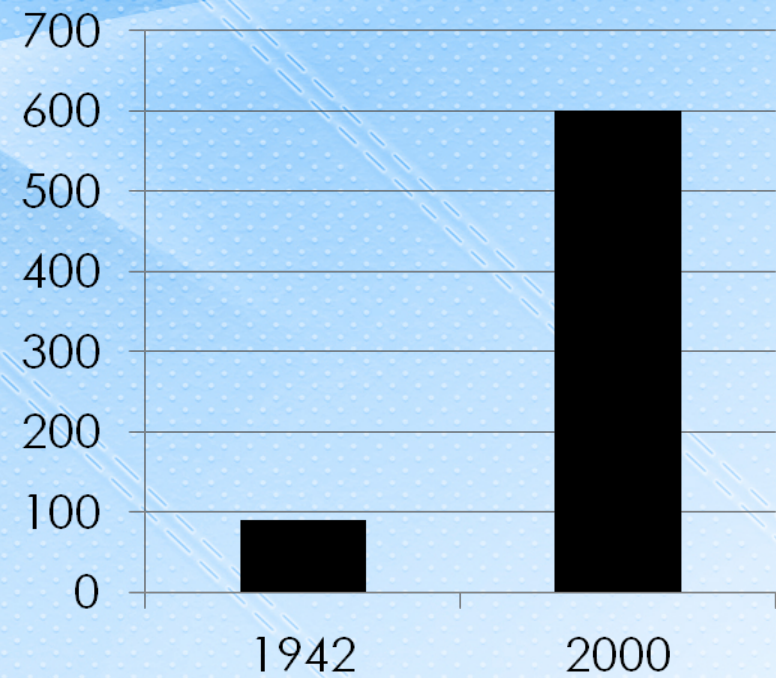


# Factors Promoting Increased Calorie Consumption: Rise of the US Soda Industry

**Per Capita Consumption of High Fructose Corn Syrup (lbs)**

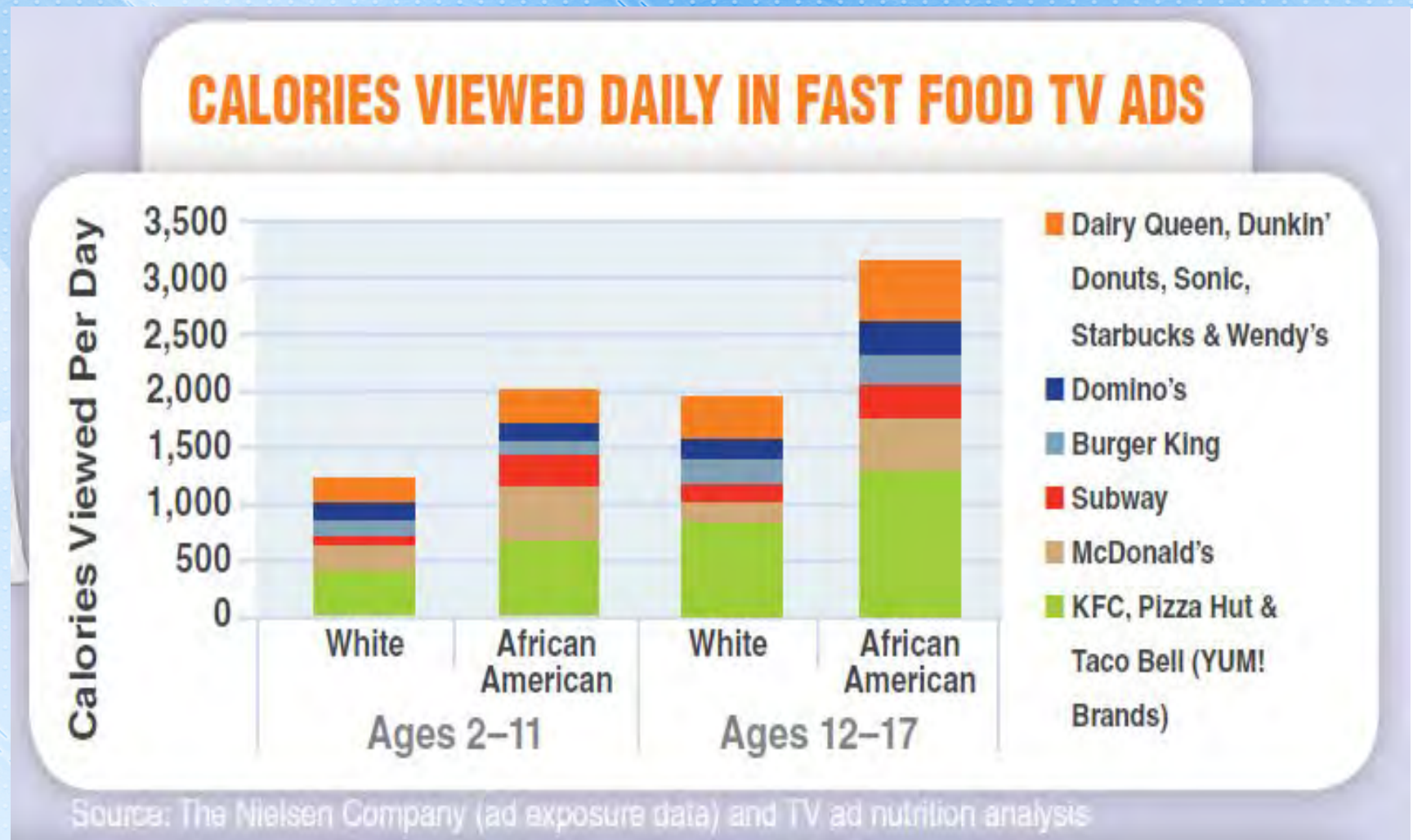


**Annual Per Capita Production of 8 oz Servings of Soft Drinks**





# Factors Promoting Increased Calorie Consumption: Marketing Fast Food to Youth







# Factors Promoting Increased Calorie Consumption: US Farm Subsidies

- ◎ US farm subsidies result in mega farms producing so much corn and soybeans that high fructose corn syrup, hydrogenated fats from soybeans, and corn-based feed is kept artificially low, resulting in low prices for fast food, corn-fed beef and pork, and soda
- ◎ No such subsidies exist for fresh fruits and vegetables which are produced in much lower quantities at higher cost to the public

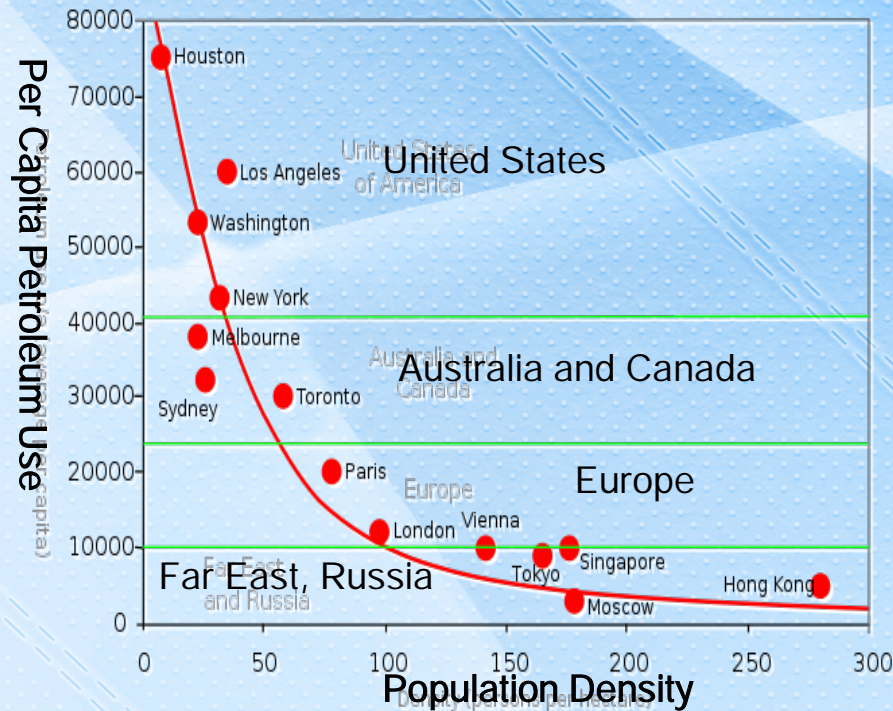




# Factors Associated with Decreased Physical Activity: Suburban Living

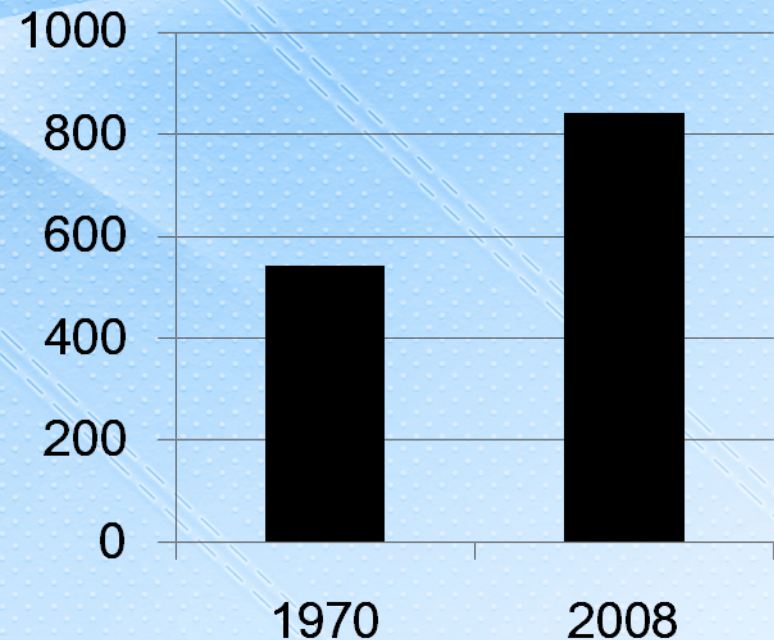
## Relationship between Transport and Land Use

A commonly used study of 32 cities by Newman & Kenworthy in 1989 concluded that there was a strong link between urban development densities and petroleum consumption.



Urban Task Force Partnership: Toward an Urban Renaissance, 1999  
Annual petroleum use per capita adjusted to US \$1 (1990)  
After Andrew Wright Associates, final section taken from 'Towards an Urban Renaissance', 1999

## US Vehicles per 1000 people



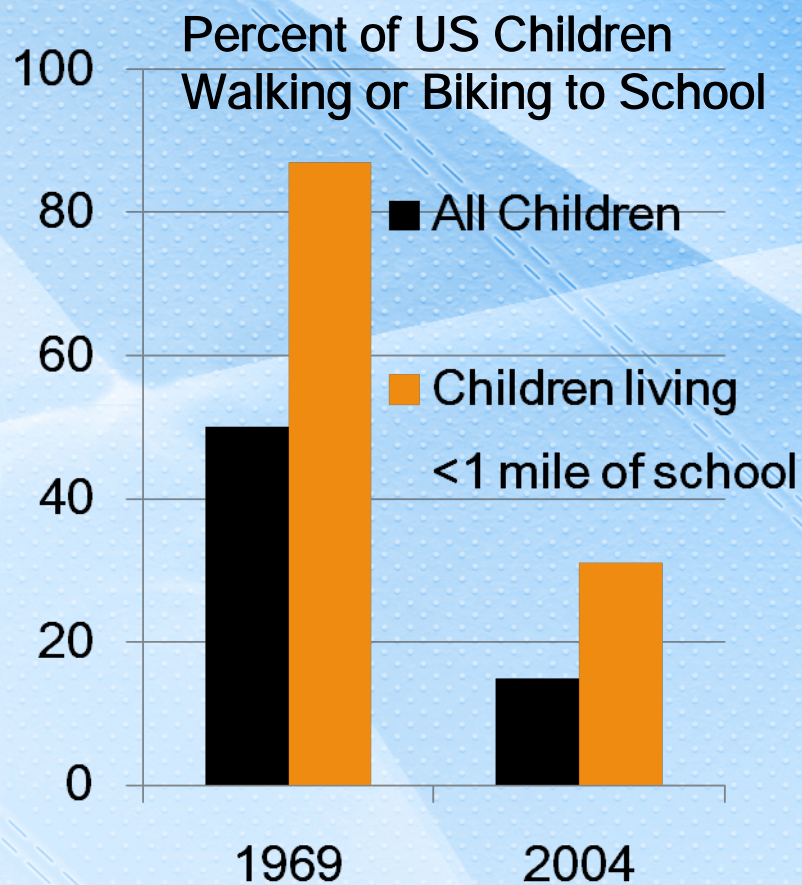
US Dept of Transportation, 2008



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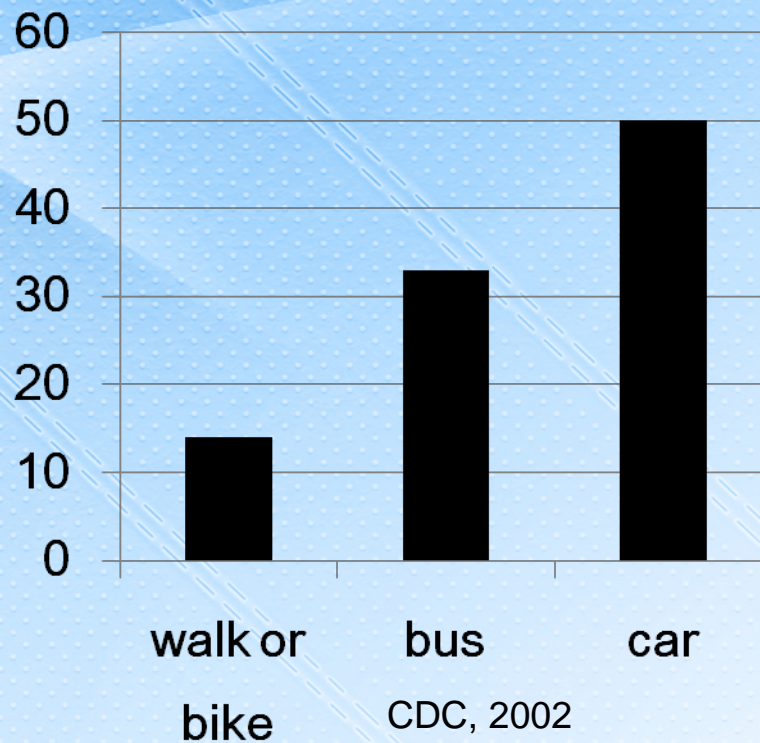


# Factors Associated with Decreased Physical Activity: School Transportation



CDC, 2005

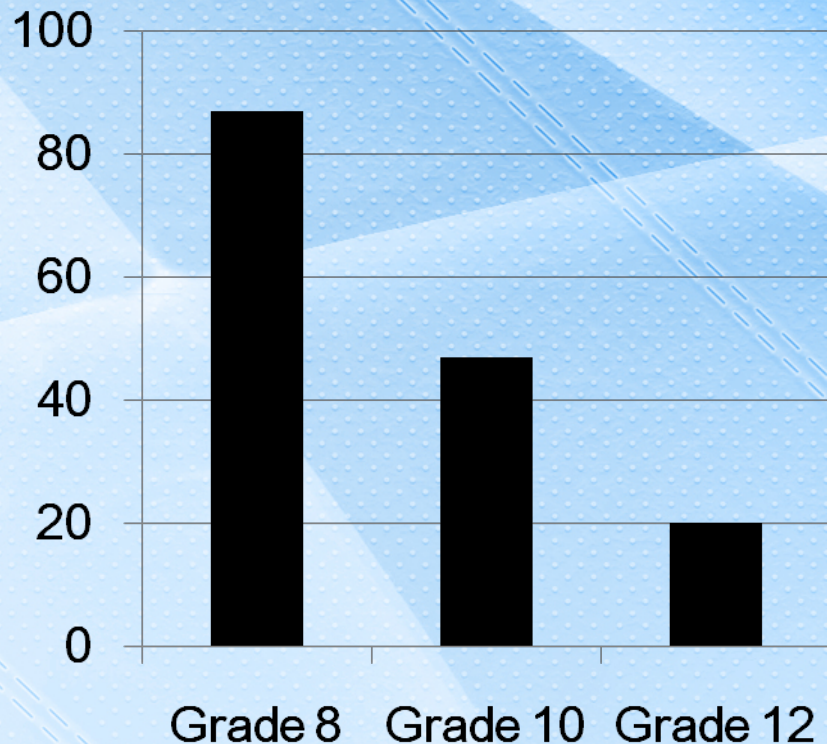
US School Transportation (1999): Percent of Children



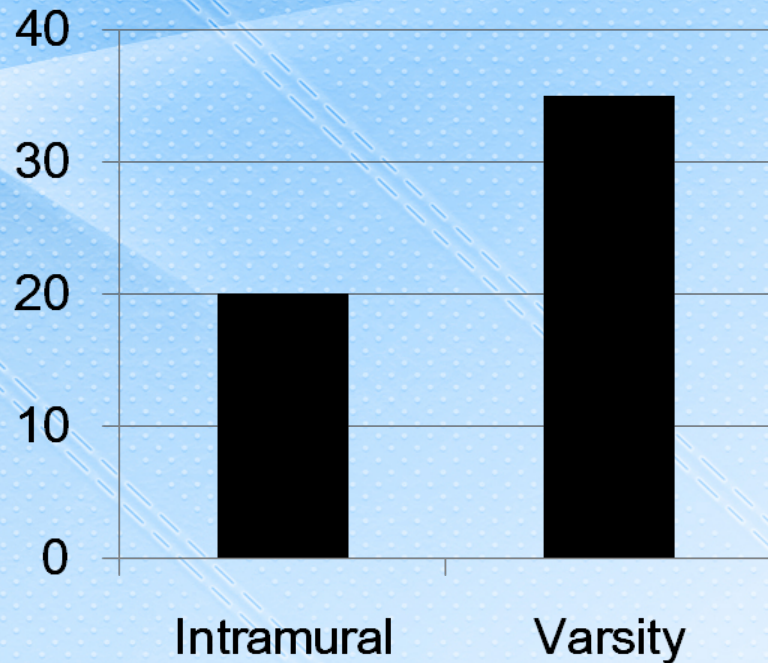


# Decreased Physical Activity at School

**Percent of US Schools  
Requiring Physical  
Education by Grade**



**Percent of US High  
School Students  
Participating in School  
Sports**







# Factors Associated with Decreased Physical Activity: US Policies

- ◎ US Department of Transportation spends most of its money on highways
- ◎ Traffic concerns are one of the primary reasons parents do not allow their children to walk or bike to school
- ◎ No Child Left Behind policy resulted in decreased access to physical education and recess as schools focus on high stakes testing

<http://www.dot.gov/budget/2012/fy2012budgethighlights.pdf>

<http://unstats.un.org/unsd/pocketbook/Pocketbook%202006.pdf>

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5132a1.htm>

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5438a2.htm>

[http://www.bus.lsu.edu/mcmillin/seminars/anderson\\_accountability.pdf](http://www.bus.lsu.edu/mcmillin/seminars/anderson_accountability.pdf)



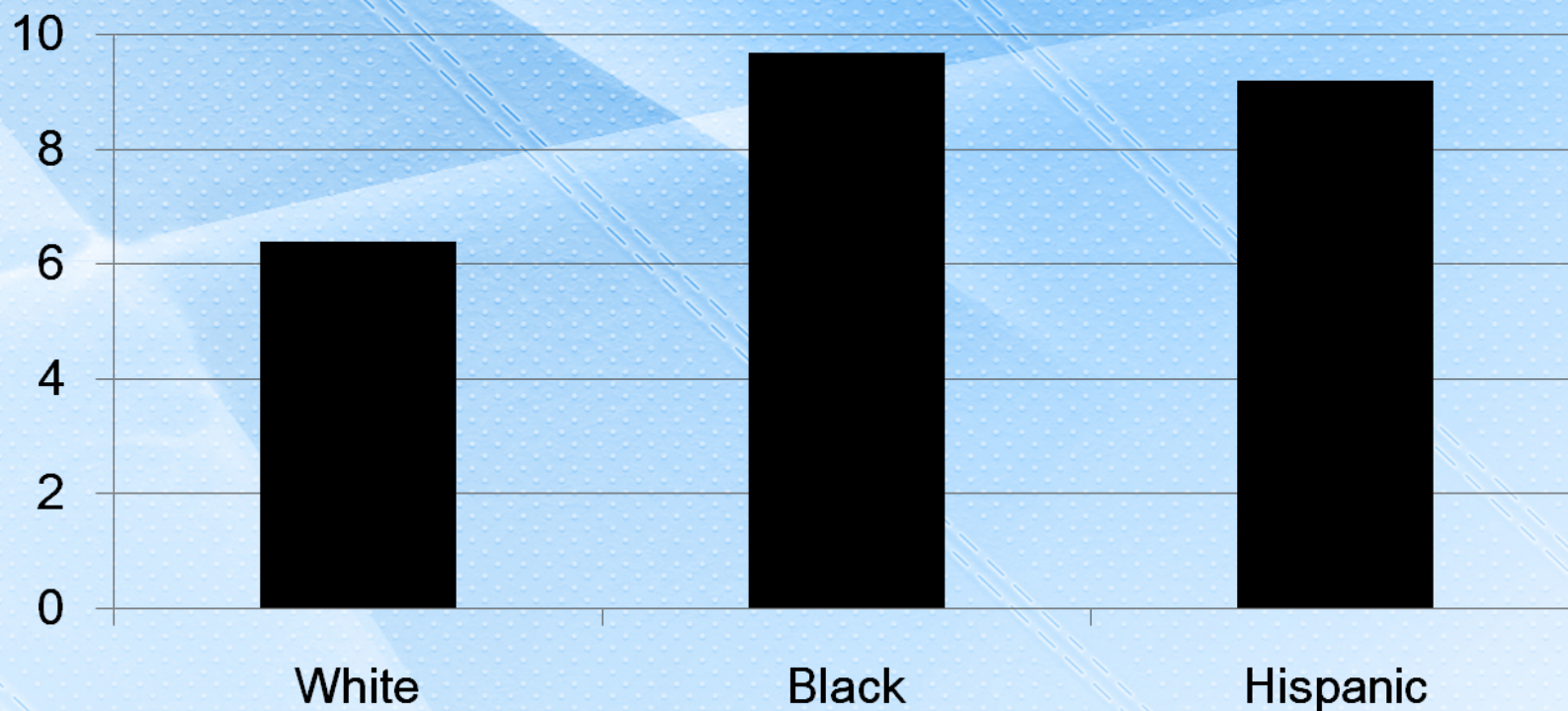
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# Factors Associated with Decreased Physical Activity: Escalating Leisure Time Media Use

Hours Per Day Among 8-18 Year Olds

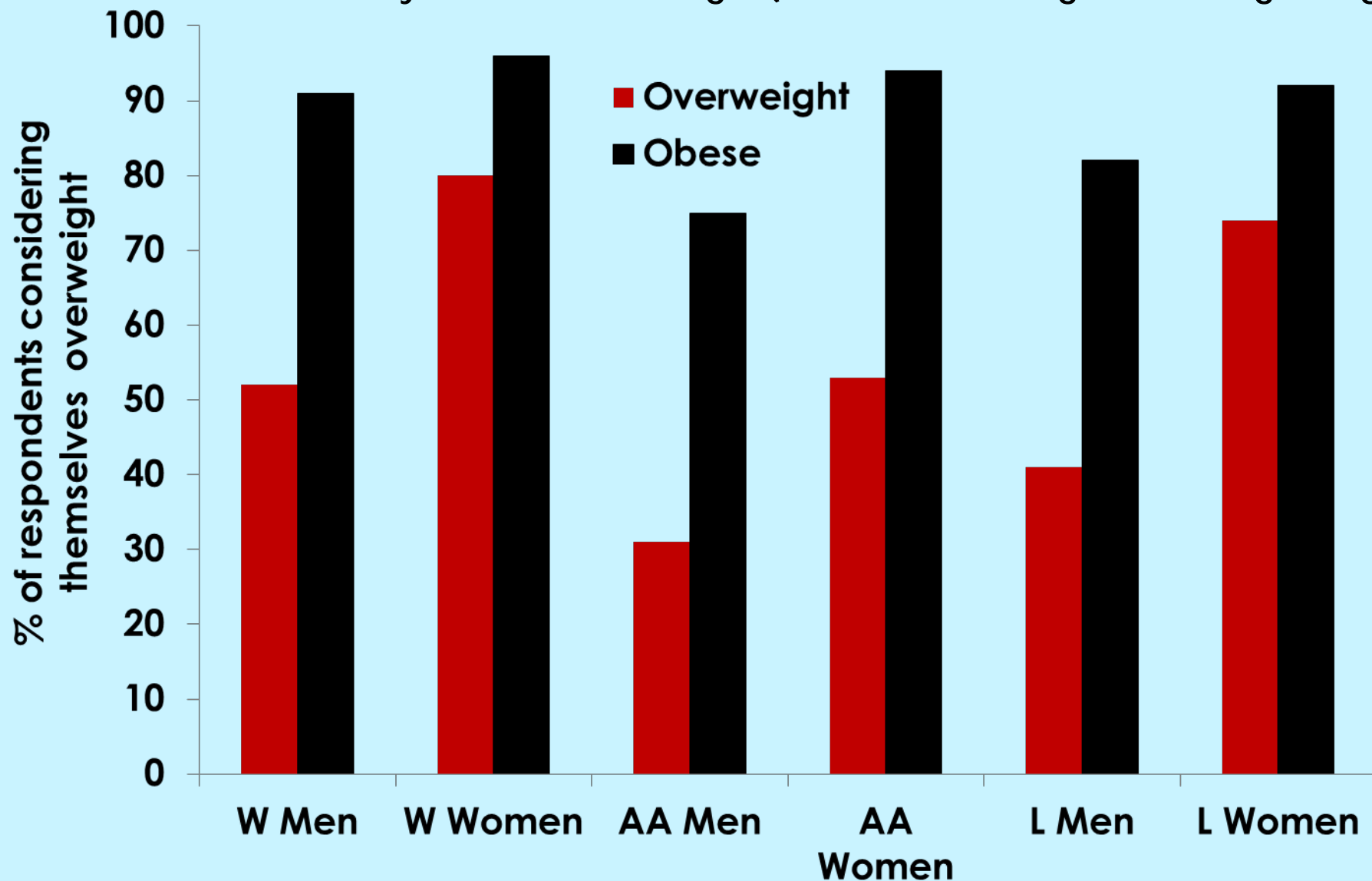






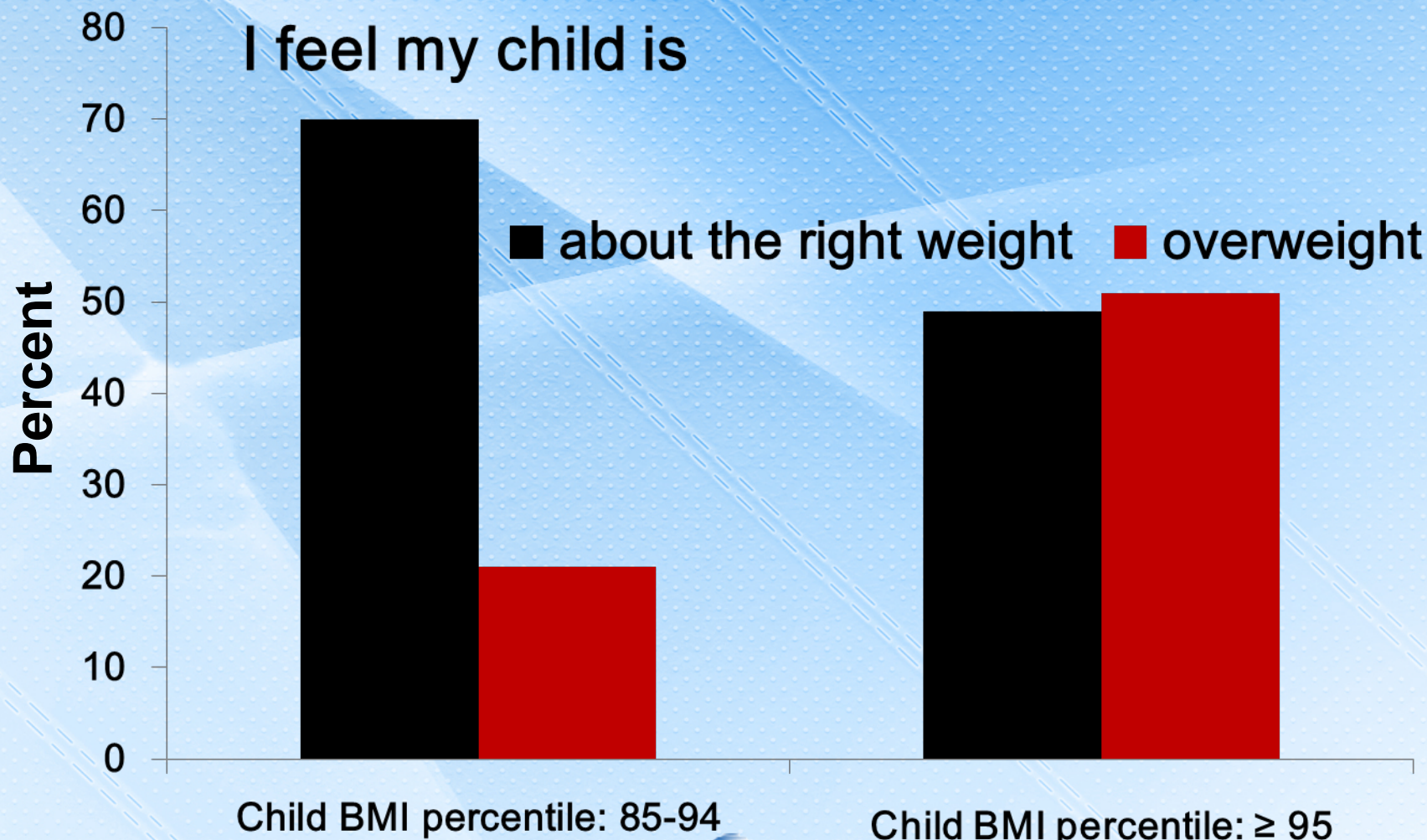
# Adults Often Fail to Recognize They Are Overweight

I consider myself to be overweight (versus underweight or average weight)





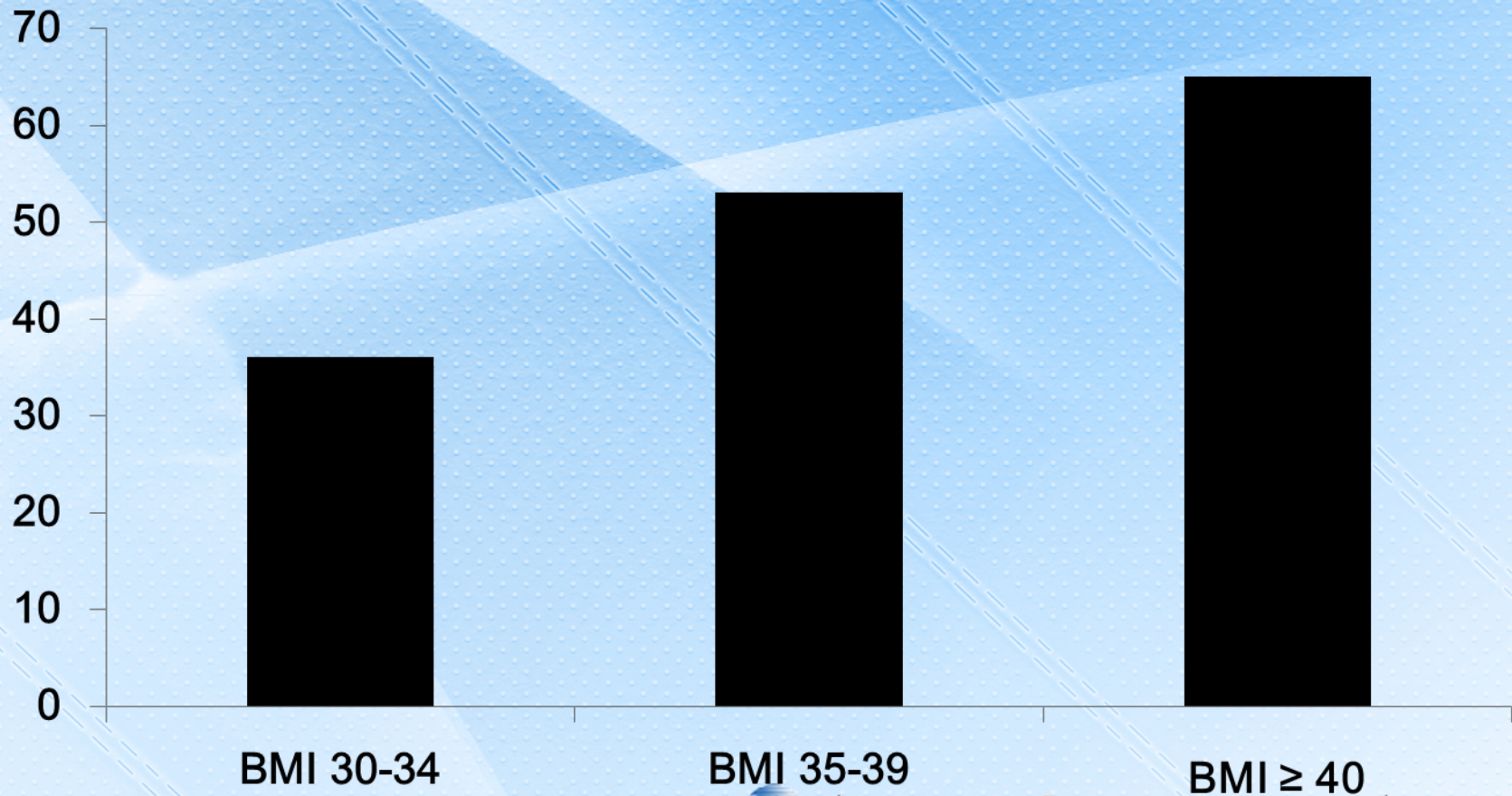
# Many Parents Fail to Recognize Their Child is Overweight





# Many Health Providers Fail to Monitor Adult BMI

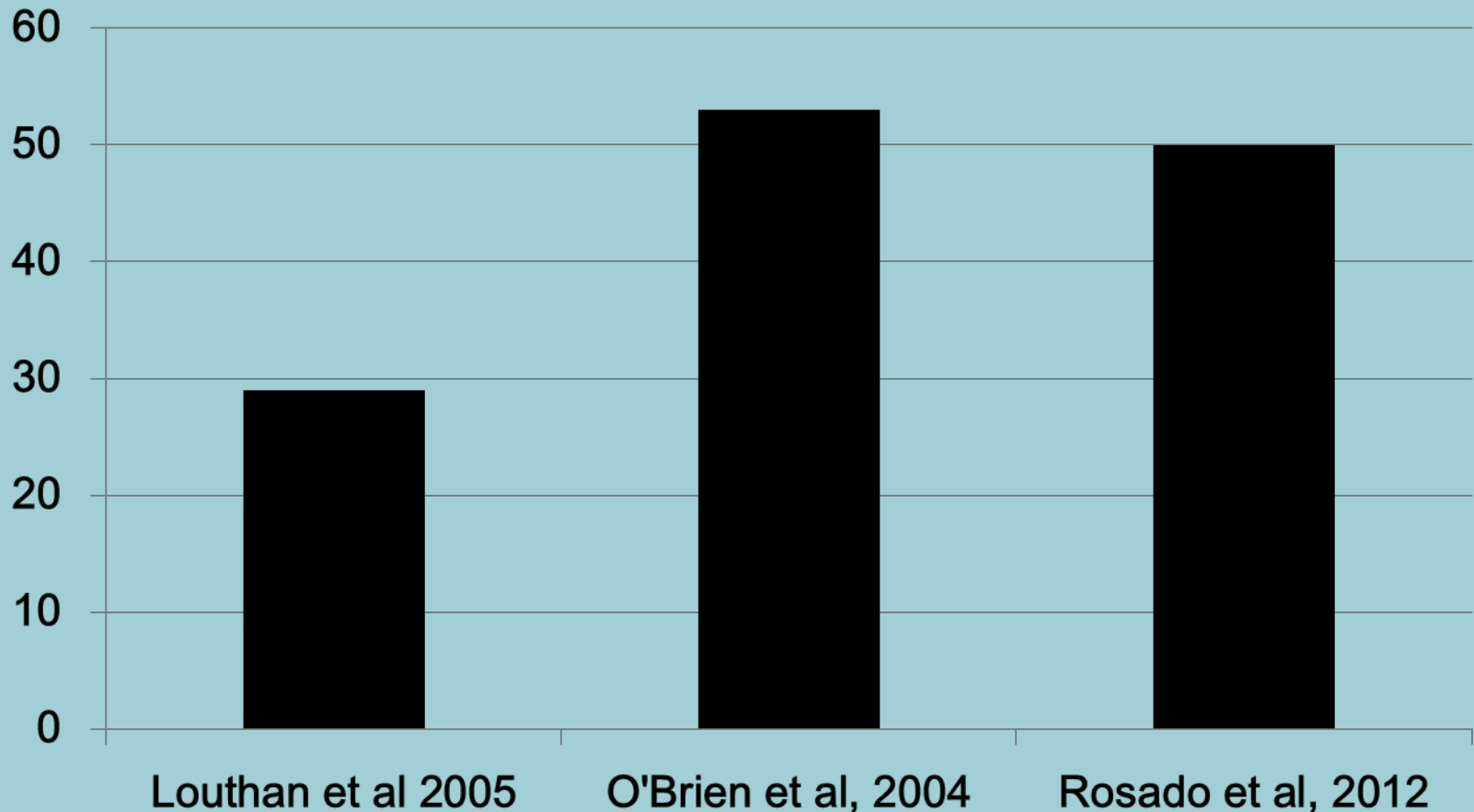
% of obese adults who reported their health care provider advised them to lose weight



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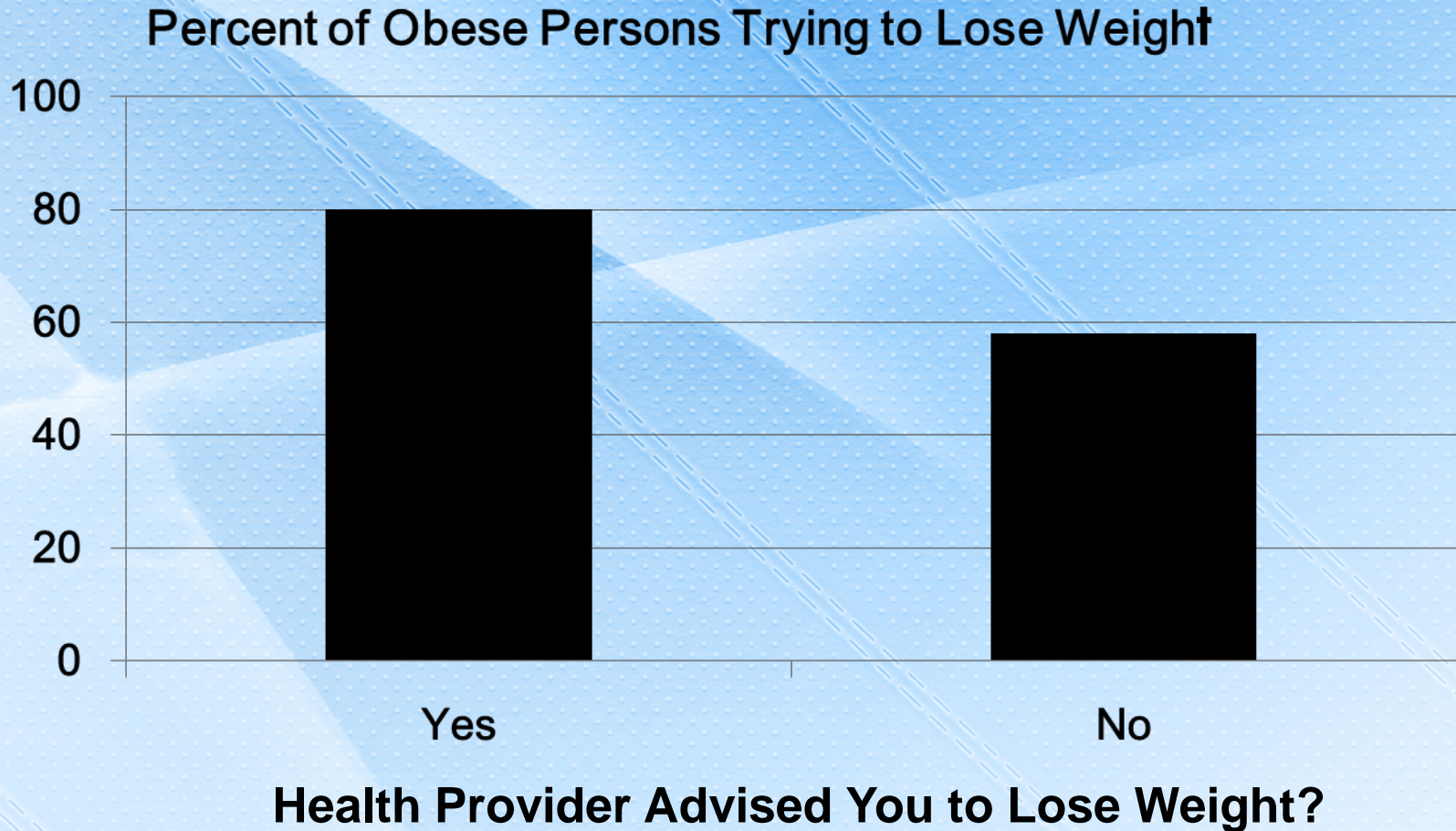
# Many Health Providers Fail to Monitor Child BMI

% of obese children identified by provider in a well-child visit





# Informing Patients of Their Weight May Make a Difference



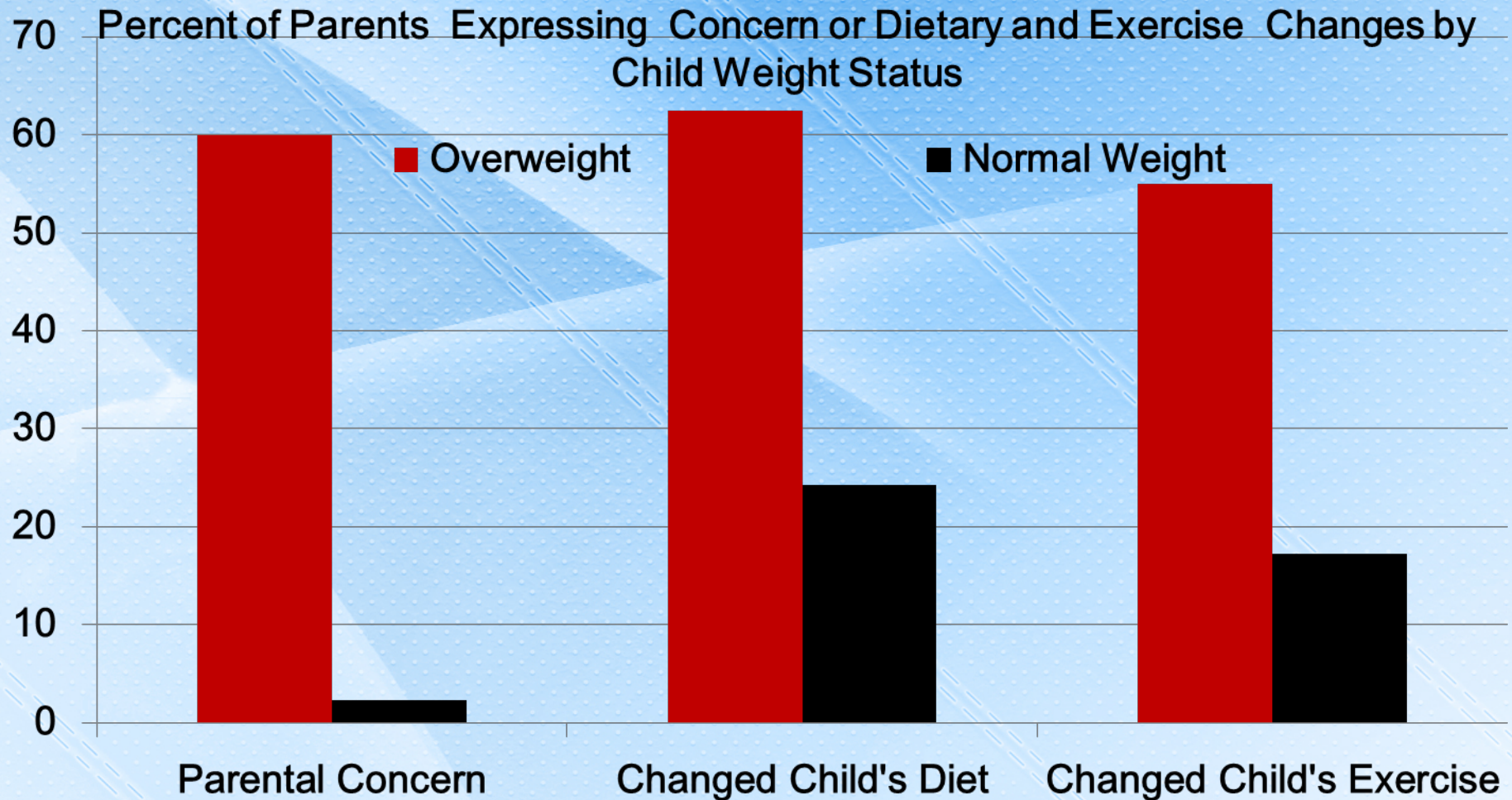
# Informing Parents of Their Child's Overweight May Make a Difference

	Child's Weight Classification			
% of Parents Who Recalled their Child as	Overweight (BMI %: $\geq 85$ )	At-risk for Overweight (BMI %: 85-94)	Normal (BMI %: 5-84)	Underweight (BMI %: $<5$ )
Overweight (Obese)	64.9	28.6	3.7	6.4
At-risk (Overweight)	13.5	40.5	11.1	2.1
Normal	10.8	23.8	74.1	21.3
Underweight	2.7	0	7.4	68.1
Don't know	8.1	7.1	3.7	2.1





# Informing Parents of Their Child's Overweight May Make a Difference





# Informing Parents of Their Child's Overweight May Make a Difference

Predictors of Parent Intent to Take Action		P value
Child age	Older the child, more likely the parent was to take action	0.014
Child weight	When the child was overweight or obese, the parent was more likely to take action	0.001
Parent concern	Parents concerned about the child's weight are more likely to take action	0.001
Provider discussed child's weight	Parents who reported the provider discussed the child's weight were more likely to take action	0.010





# Childhood Obesity Can Be Prevented & Treated

- ◎ 2011 Cochrane Review found “strong evidence to support beneficial effects of child obesity prevention programmes on BMI, particularly for programmes targeted to children six to 12 years”
- ◎ Particularly promising are interventions that:
  - increase physical activity and improve quality of food at school
  - target environments and cultural practices to increase healthier food consumption and daily physical activity
  - support parents to increase activity, decrease screen time, and eat healthier foods





# The Role of Health Care Providers: American Academy of Pediatrics Recommendations

- ◎ Prevention (all patients): promote breastfeeding, family meals, limited screen time, regular physical activity, yearly BMI monitoring
- ◎ Prevention Plus (children with BMI percentiles of 85-94): 5 fruits/vegetable servings, 0 sugary drinks,  $\leq 2$  hours of screen time,  $\geq 1$  hr physical activity, healthy breakfast, home food preparation and limited eating out





# The Role of Health Care Providers: American Academy of Pediatrics Recommendations

- ◎ Structured Weight Management (children with BMI percentiles of 95-98 or children for whom Prevention Plus has not been effective): more frequent follow-up, written diet/exercise plans
- ◎ Comprehensive Multidisciplinary Intervention (if 3-6 months of Structured Weight Management has been ineffective): team based intervention including dietary and behavioral specialists.





# Weight Loss in Obese Adults Has Health Benefits

- ⊙ There is strong - Category A - evidence that weight loss
  - Improves blood pressure
  - Improves lipid levels
  - Improves blood glucose levels in person with diabetes
- ⊙ These benefits occur with weight loss as little as 10% of body weight

NIH guidelines 1998 [http://www.nhlbi.nih.gov/guidelines/obesity/ob\\_home.htm](http://www.nhlbi.nih.gov/guidelines/obesity/ob_home.htm)



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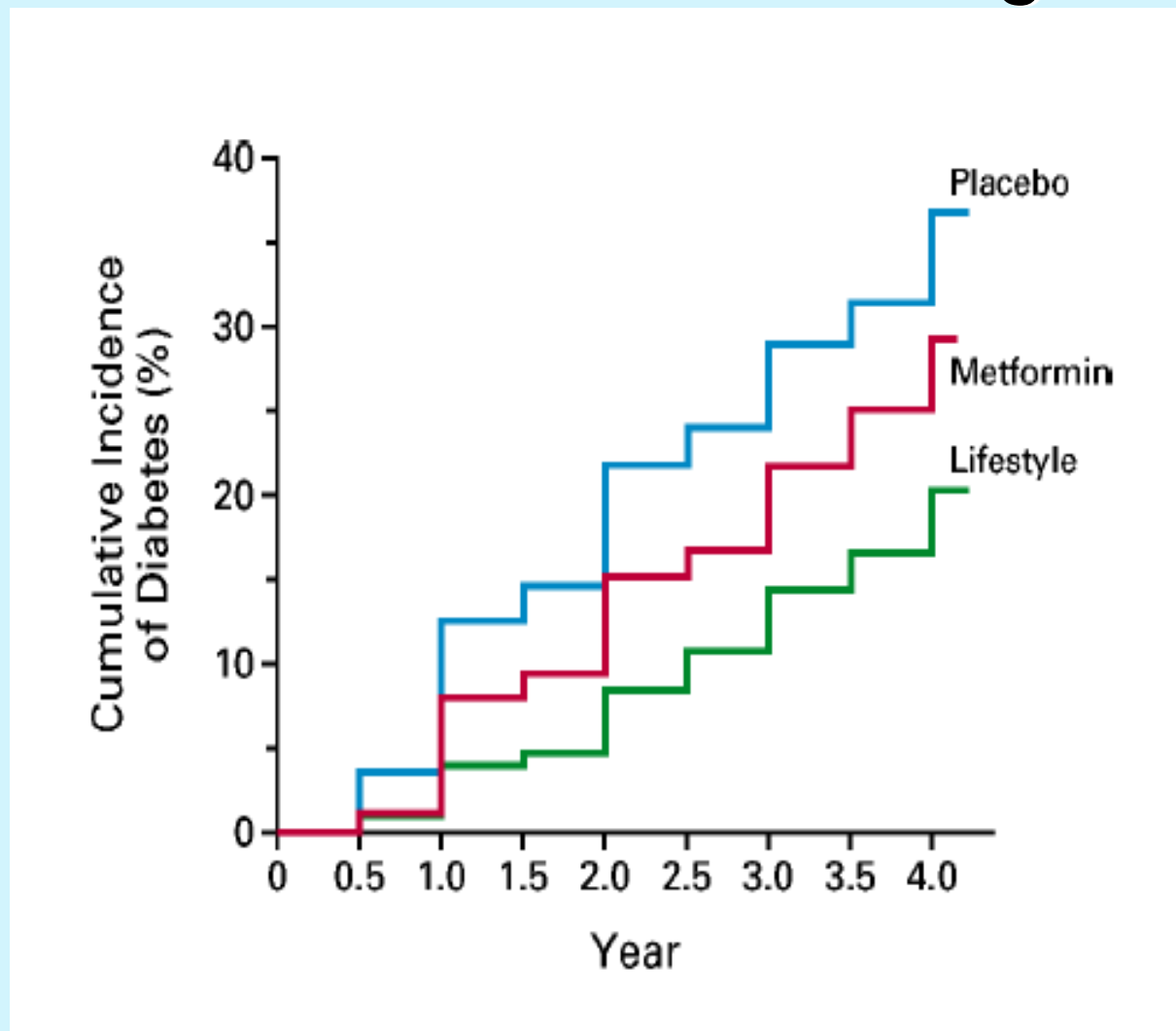


# Obesity Can be Treated

- ⊙ There is strong –Category A –evidence that low calorie diets & increased physical activity with behavior therapy is effective in producing weight loss
- ⊙ The evidence for lifestyle behavior change interventions is stronger than for
  - Pharmacotherapy which is NOT recommended without lifestyle interventions
  - Weight loss surgery which is recommended only in patients with severe obesity who have significant obesity related morbidity and mortality risks



# Lifestyle Interventions Can Prevent Type 2: the Diabetes Prevention Program (DPP)





# The Role of the Health Care Provider: Key Recommendations

- ◎ Emphasize prevention – promote healthy lifestyles from birth and for the whole family
- ◎ Regularly monitor patient BMI
- ◎ Communicate with the patient (or parent )about weight
  - Healthy weight – reinforce weight maintenance
  - Overweight – alert patient of potentially negative health consequences of further weight gain; promote weight maintenance
  - Obese – promote weight loss through lifestyle behavior change





# The Role of the Health Care Provider: Key Recommendations

- ⊙ Avoid patient & parent blaming – acknowledge that this is a systems problem
- ⊙ Work within the health care system to assure that effective lifestyle behavior interventions are available to interested patients & families
- ⊙ Empower patients & families to promote healthy lifestyles within their community
- ⊙ Serve as a role-model and community leader – the obesity epidemic will not be solved solely in the confines of the health provider's office





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[www.apa.org/president](http://www.apa.org/president)**



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