

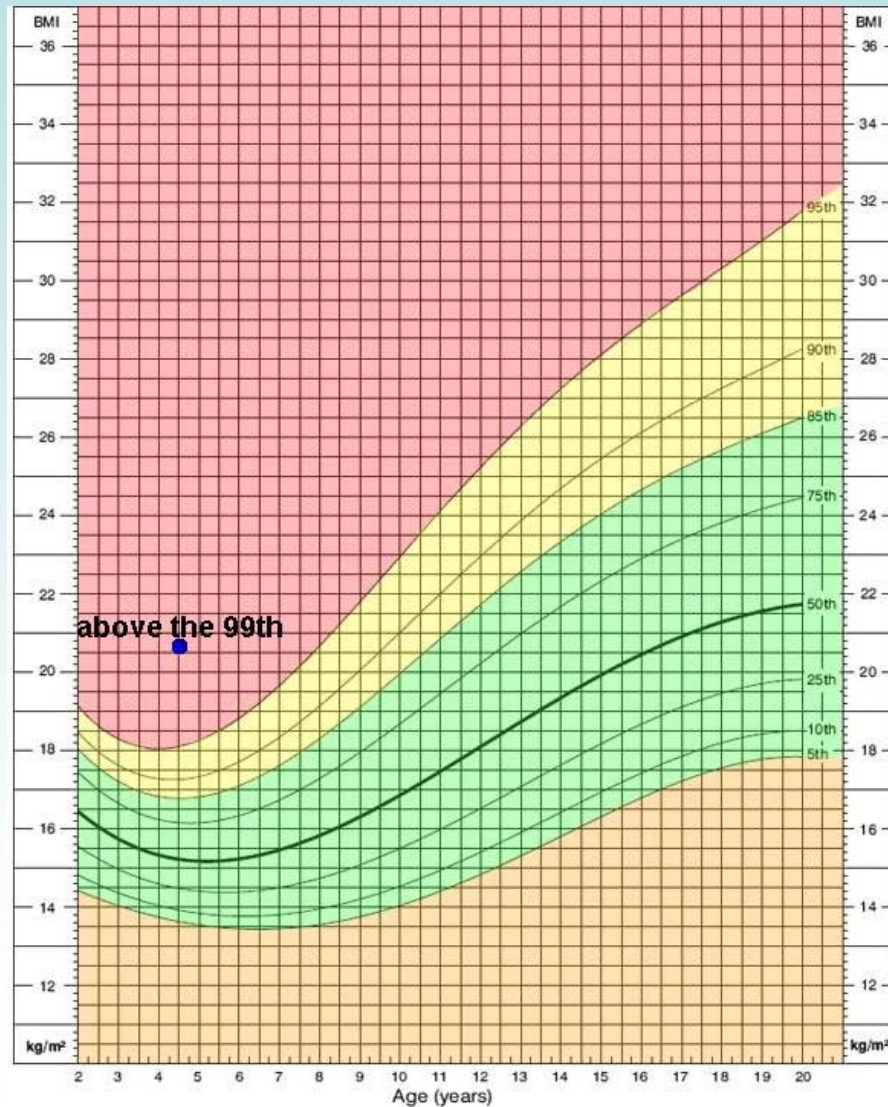
Association of Body Mass Index and  
Prescription Drug Use in Children  
from the Medical Expenditures Panel Survey,  
2003-2006



Yvonne Lin  
MCH Research Festival  
June 10, 2009

# BMI Changes with Age in Children

Growth Curve for Girls, 2 to 20 years



100  
95  
85  
  
  
  
  
  
  
  
  
  
5  
0

**Obese,  $\geq 95^{\text{th}}$  percentile**

**Overweight,**  
85<sup>th</sup> percentile up to 95<sup>th</sup> percentile

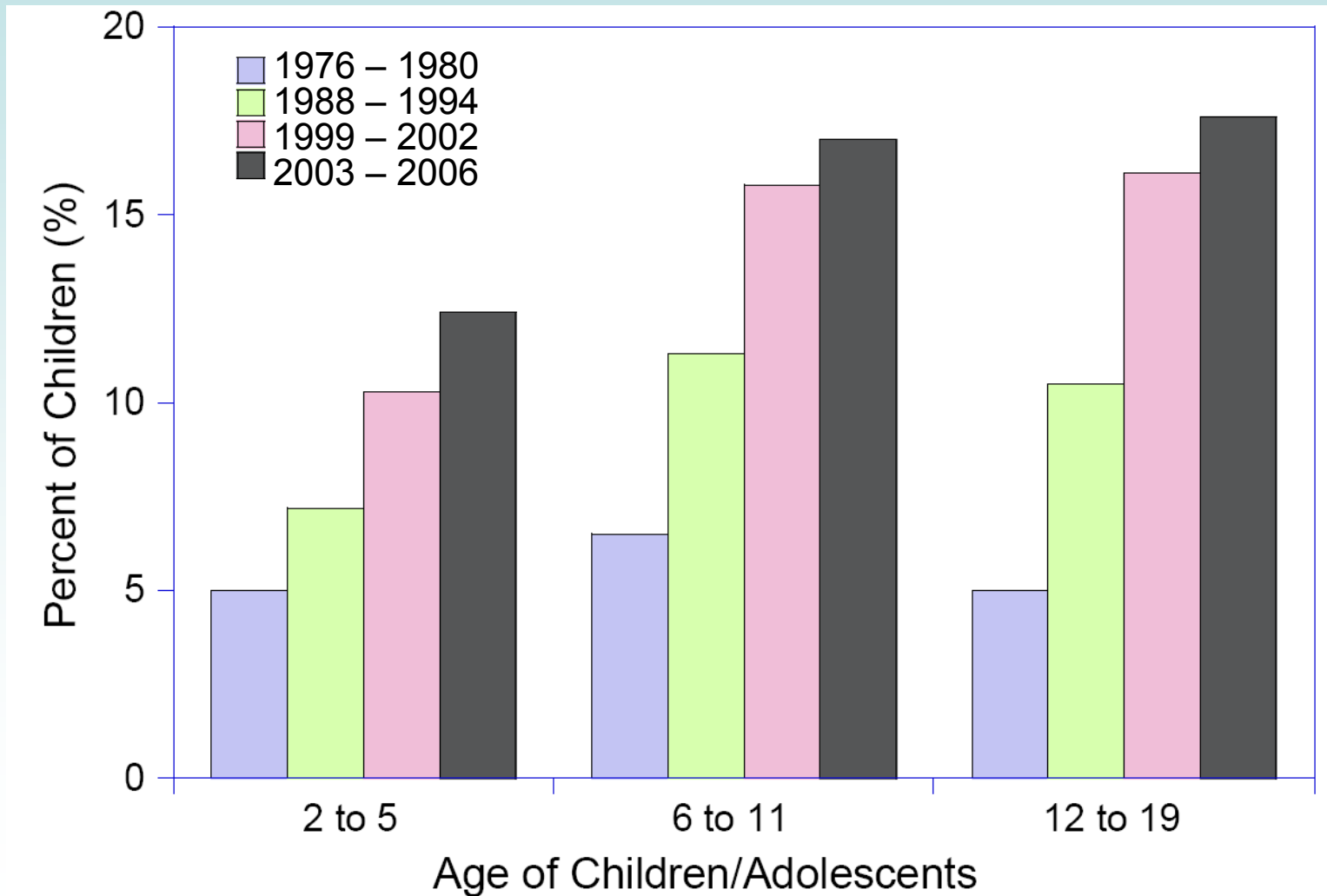
**Normal weight,**  
5<sup>th</sup> percentile up to 85<sup>th</sup> percentile

**Underweight,  $< 5^{\text{th}}$  percentile**

ref: CDC 2007

# Childhood Obesity in the US

- BMI  $\geq 95^{\text{th}}$  percentile based on the CDC sex-and age-specific growth charts



# Health Costs of Obesity

- Obese children and adolescents are more likely to become overweight or obese adults
- More likely to develop chronic diseases:
  - Type 2 diabetes
  - Cardiovascular diseases
  - Hypertension
  - Lipid disorders
  - Sleep apnea
  - Asthma
  - Mental disorders
  - Orthopedic complications
  - Certain cancers

# Economic Costs of Obesity

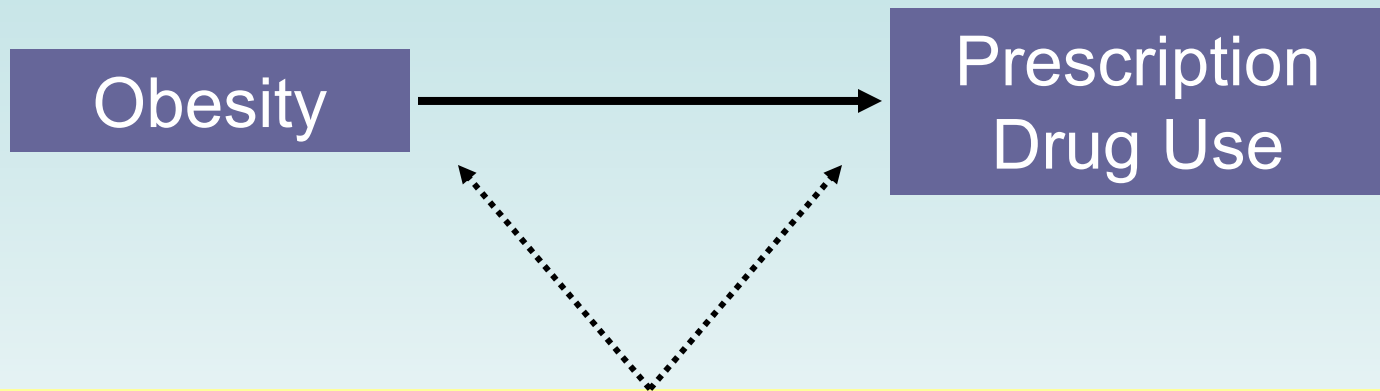
- Hospital costs of treating children for obesity-associated conditions rose from \$35 million to \$127 million between 1980 - 2000
- Number of prescriptions and spending on medications is increasing faster in children than adults
- In 2004, the top five drugs for children (age < 17) totaled \$2.4 billion and represented 24.2% of the \$9.9 billion total drug expenditures
  - ADHD (3 of top 5), asthma (Singulair), antihistamine (Zyrtec)

# Research Question

- To investigate whether overweight and obese children have higher odds of prescription drug use compared with normal weight children
- Personal (and professional) interest in studying drug safety and efficacy in children
  - *Do childrens' bodies handle drugs differently than adults?*
  - *How do diseases (such as obesity) change how drugs work in the body?*

# Empirical Model

- Children who are overweight or obese have poorer health and will receive more prescription drugs



- Age (6-11, 12-17 yrs)
- Sex
- Race/ethnicity (White, Black, Hispanic, Other)
- Family Income
- Region of residence
- Insurance status

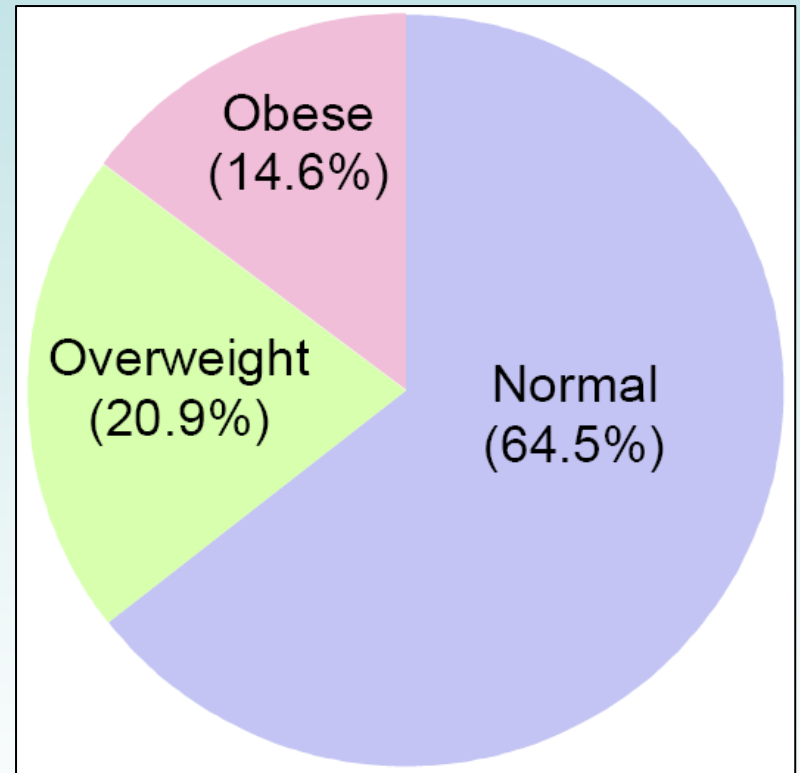
# MEPS: Medical Expenditure Panel Survey

- A nationally representative household survey of families and individuals, their medical providers, and employers across the US
- Data from 2003 through 2006
- Children classified as “using a prescription drug” if they had a purchase of one or more prescribed drugs
- Analysis: multiple logistic regression procedures
- Tested for effect modification by age and adjusted for age, sex, race/ethnicity, family income level, region of residence and insurance status

# Results: Description of the Population

- 11,079 children and adolescents with BMI data
- Age:
  - 6 to 11 years old: 44%
  - 12 to 17 years old: 56%
- Sex:
  - Male: 52%; Female: 48%
- Race/Ethnicity
  - White: 62%; Black: 15%; Hispanic: 16%; Other: 7%

BMI Distribution



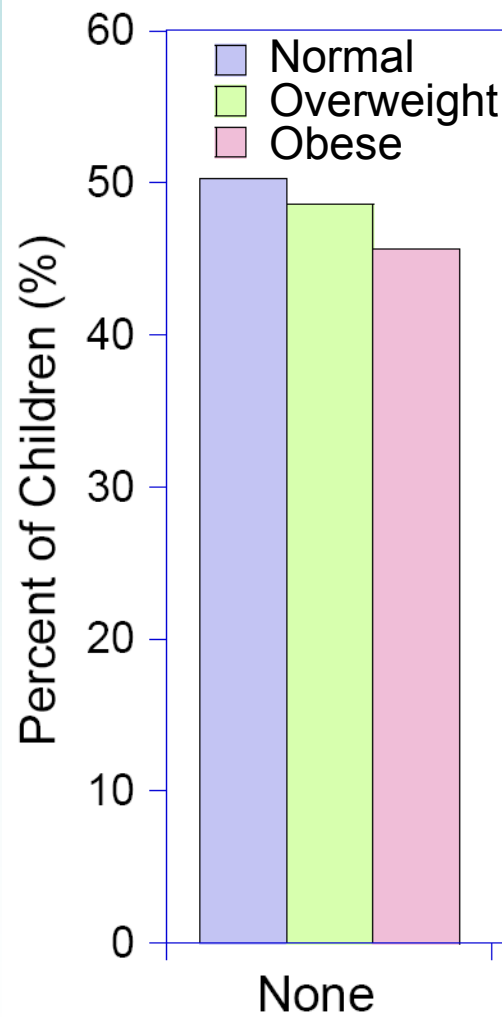
# Results

*Do obese kids use more prescription drugs?*

BMI Category	No Prescriptions (%)	Any Prescription (%)
Normal weight	50.3	49.7
Overweight	48.6	51.4
Obese	45.7	54.3

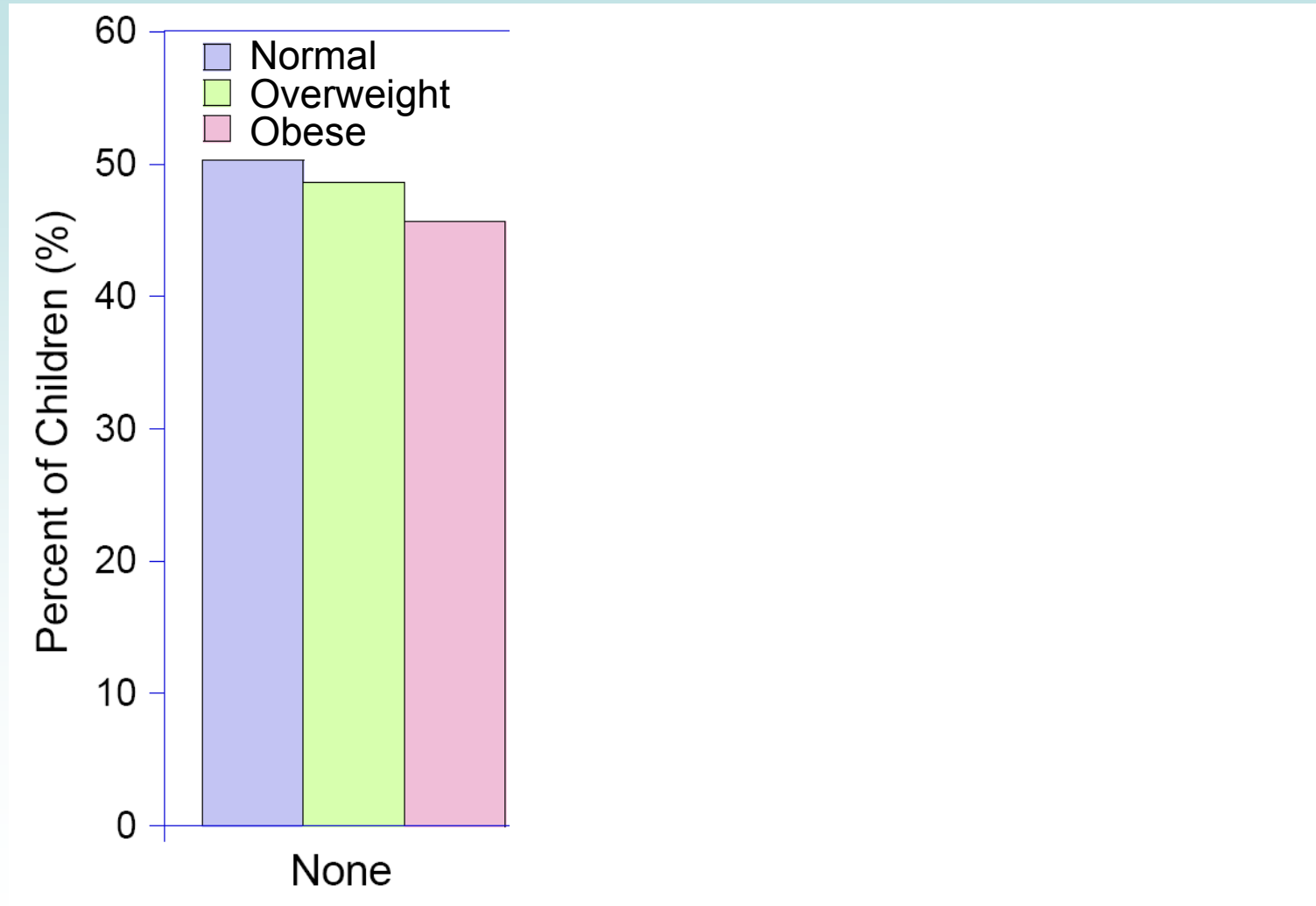
# Results

## *Number of prescriptions by BMI category*



# Results

*Number of different types of drugs by BMI category*



# Results

*What types of drugs are prescribed more frequently to obese kids?*

Type of Drug	Adjusted Odds Ratio	95% Confidence Interval
Antidiabetic agents	4.68	1.92 - 11.4
Antidepressants	2.03	1.33 - 3.11
Antipsychotics	2.02	1.12 - 3.66
Hormones	1.74	1.28 - 2.36
Respiratory agents	1.43	1.21 - 1.69
Anti-infectives	1.26	1.07 - 1.48

# Limitations

- Parental report of weight and height (to calculate BMI)
- Inability to verify if and how long the prescription was taken
- Because of the nature of the MEPS dataset, we cannot answer whether the children were obese before the drug was taken or if the drug might cause weight gain (and obesity)

# Conclusions

- Children and adolescents who are obese are more likely than non-obese children and adolescents to use prescription drugs
- Many of these drugs are used to treat obesity-related diseases
- Appropriate weight management among children may offer a point of intervention to contain some prescription drug expenditures

# Future Directions

- Public Health Importance
  - Childhood obesity
  - Chronic disease/treatment and quality of life
  - Disparities due to differences in social/economic status or insurance coverage
- Studying drug safety and efficacy in children
  - *Does it differ in obese children?*

# Acknowledgements

## Thesis Committee

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Dr. Jane Rees

Dr. Janice Bell

MCH friends

Friends and family



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