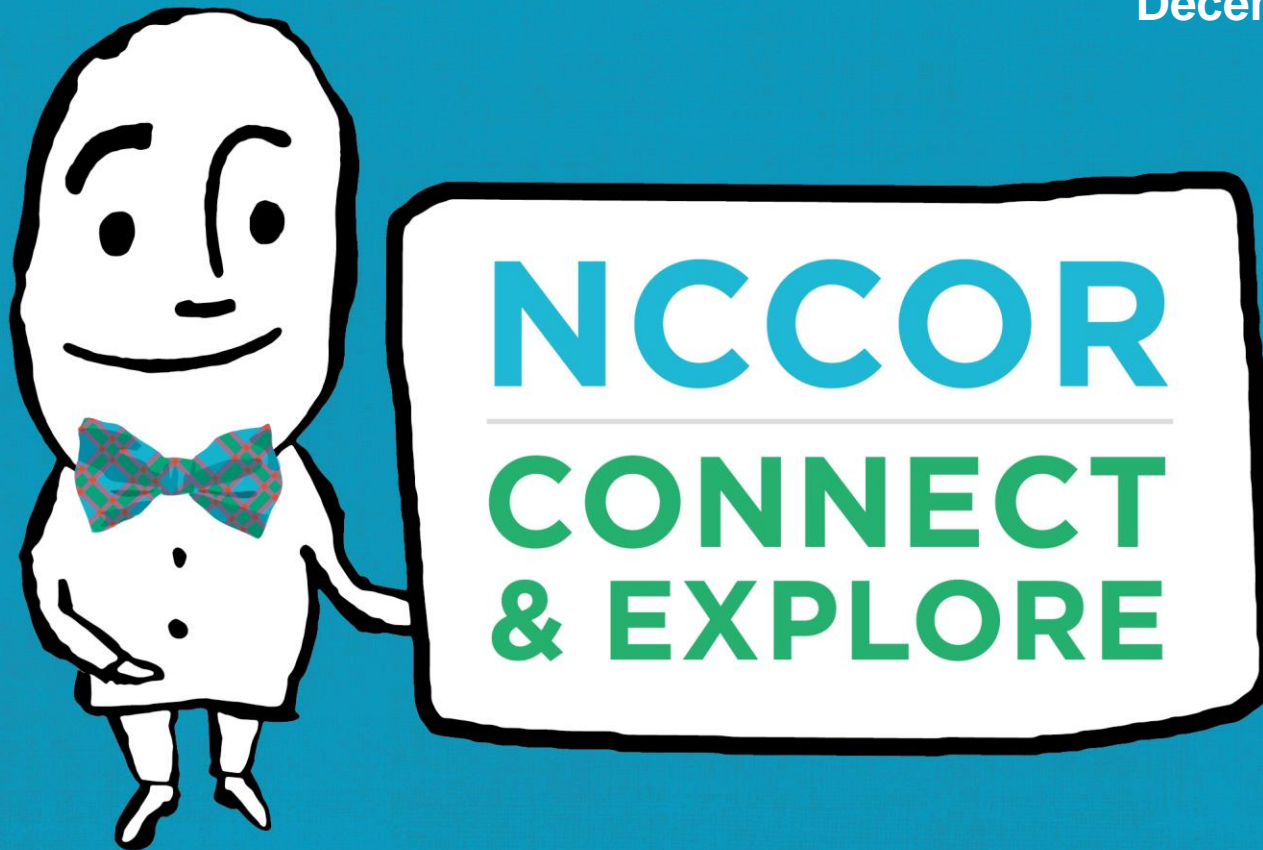


December 5, 2016



Connecting you with experts. Exploring the latest childhood obesity news and research.

We will begin at 3:05 to allow participants time to join the webinar.

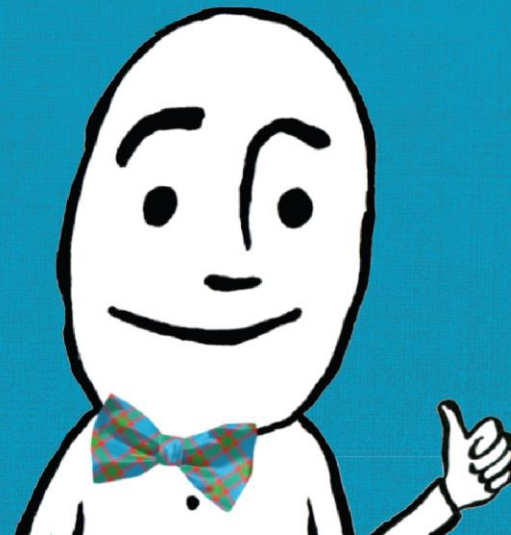
1. Spotlight

- Assessing Prevalence and Trends in Obesity: Navigating the Evidence
- Using NHANES to Demonstrate

2. One on One

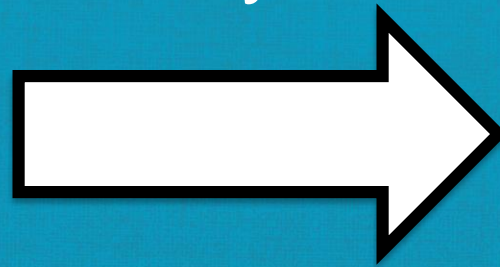
3. NCCOR Announcements

TODAY'S PROGRAM



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Today's Speakers



Elaine Arkin
National Collaborative
on Childhood Obesity
Research



Shari Barkin (Chair)
William K. Warren Foundation
Chair and Professor of
Pediatrics
Director of Pediatric Obesity
Research in the Diabetes
Center
Chief of General Pediatrics at
Vanderbilt University School of
Medicine



Lynn Blewett
Professor, Division of Health
Policy and Management
School of Public Health
Director, State Health Access
Data Assistance Center
(SHADAC)

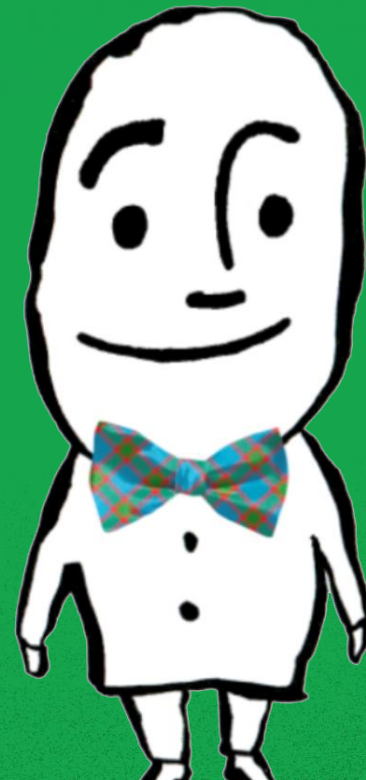


Jackson P. Sekhobo
Director of Evaluation,
Research, and Surveillance in
the Division of Nutrition of the
New York State Department of
Health



Cynthia L. Ogden
NHANES Analysis Branch
Chief/Epidemiologist
National Center for
Health Statistics
Centers for
Disease Control
and Prevention

INTERACTIVE POLL

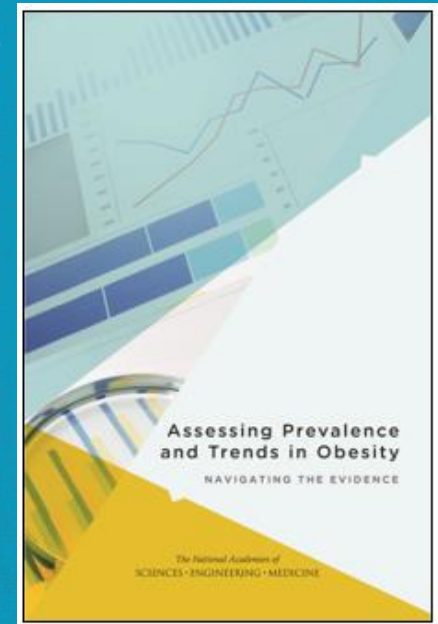




Assessing Prevalence and Trends in Obesity: Navigating the Evidence

Shari Barkin, M.D., M.S.H.S. (Chair)

William K. Warren Foundation Chair and Professor of Pediatrics
Director of Pediatric Obesity Research in the Diabetes Center
Chief of General Pediatrics
Vanderbilt University School of Medicine



This Committee's Task

- **Examine** how obesity prevalence and trend data are collected, analyzed, and interpreted
- **Develop** a framework for assessing studies for policy making and program planning purposes
- **Offer** recommendations for moving the assessment and interpretation of reports forward, improving the collection of data, and filling data gaps

Acknowledgements

- **Study Sponsor**

- Robert Wood Johnson Foundation

- **Consensus Committee Convened by the National Academies of Sciences, Engineering, and Medicine**

- Shari Barkin, MD, MSHS. (Chair)
- Cheryl A. M. Anderson, PhD, MPH
- Lynn A. Blewett, PhD
- Elizabeth Goodman, MD
- Ross Hammond, PhD
- Sandra Hassink, MD, MSc
- Amy H. Herring, ScD
- Giridhar Mallaya, MD, MSHP (*until September 2015*)
- Michael G. Perri, PhD
- Eduardo Sanchez, MD, MPH, FAAFP
- Jackson P. Sekhobo, PhD, MPA
- Shumei S. Sun, PhD (*from July 2015*)
- Donald Hedeker, PhD (consultant)

This Committee's Task

Within the Task

- Assess different methodological and analytical approaches and how that shapes interpretation

Beyond the Task

- Determine current rates, trends, and their significance
- Prescribe how all future studies, assessments should be conducted
- Explore the etiologies of obesity or disparities in obesity

“End Users” of Obesity Reports

- State and local health departments
- Elected officials, state legislatures
- Community-based organizations
- Departments of education, school districts, and schools
- Public agencies (e.g., transportation, planning, parks and recreation)
- Nonprofit and philanthropic organizations
- Advocacy organizations
- Academic researchers and other data generators
- Health care providers
- Health care payers
- Private sector

NOTE: The list is not intended to be exhaustive, but rather illustrative of the range that exists.

Approaches to Data Collection

Key Considerations

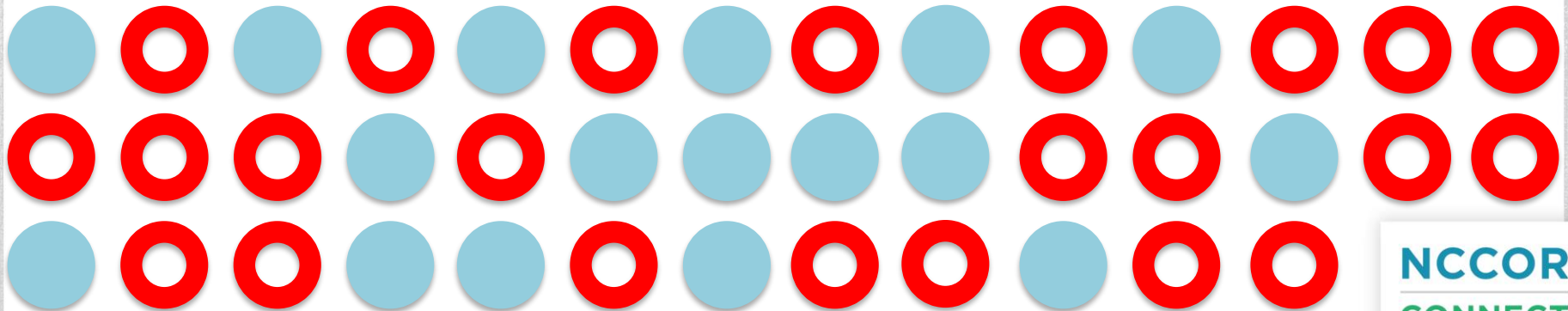
Shari Barkin, M.D., M.S.H.S. (Chair)

Key Considerations

- Sampling
- Assessing weight and height status
- Demographic characteristics

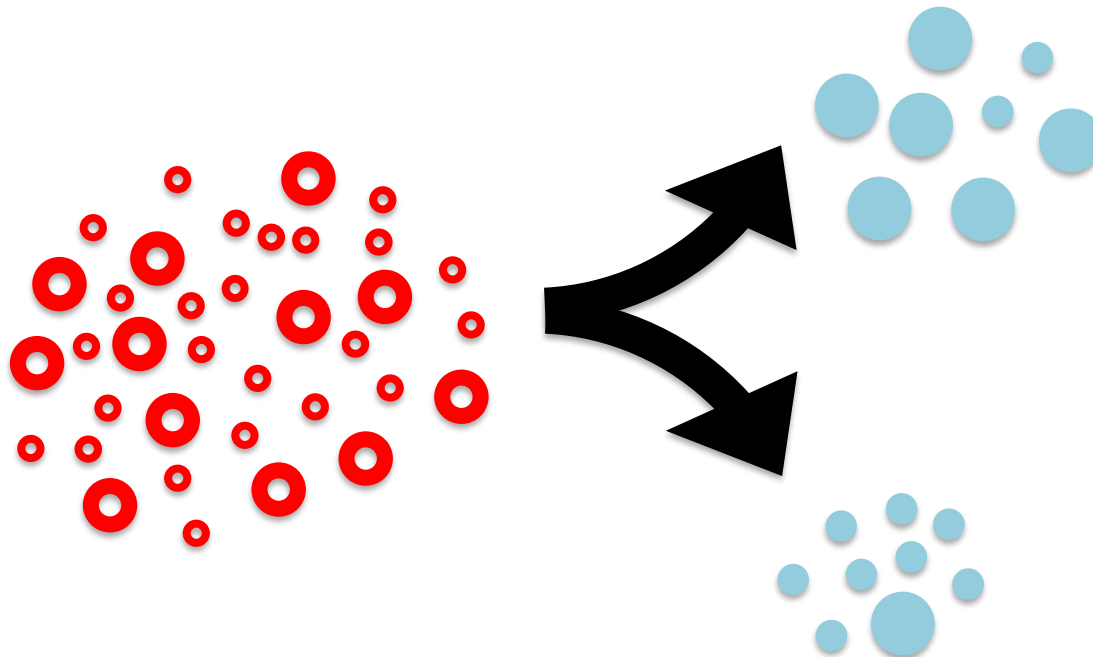
Sampling

- **The individuals who contribute data have implications for:**
 - Representativeness of the data
 - Subgroup analyses



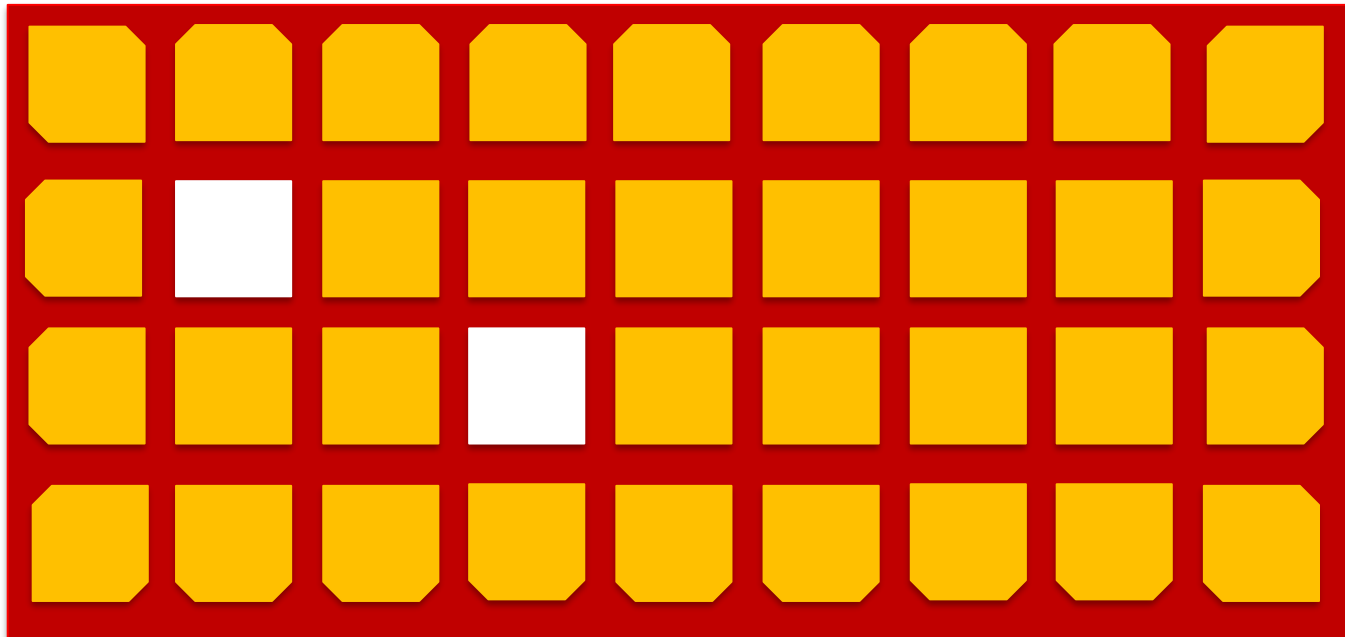
Sampling

- **Obesity prevalence estimates can become compromised if the participants do not reflect the target population**



Sampling

- One sampling challenge is capturing groups that comprise a small portion of the total population



Assessing Weight and Height Status

- **BMI reflects the measures of weight (kg) and height (m²)**
- **Accuracy matters, especially for young children**

Characteristics of the Individual	Height (cm)	Weight (kg)	BMI (kg/m ²)	BMI Status Classification	Difference that Change BMI Status from Normal to Obese
Female, age 2.0 years	86.3	13.4	18.0	Normal	—
	86.3	14.3	19.2	Obese	+0.9 kilograms
	83.7	13.4	19.1	Obese	−2.6 centimeters
Female, age 15.0 years	152.4	55.7	24.0	Normal	—
	152.4	65.3	28.1	Obese	+9.6 kilograms
	140.8	55.7	28.1	Obese	−11.6 centimeters

Direct Measurement

- **Protocols Differ**
 - Equipment used
 - Training and oversight of data collectors
 - Number of repetitions
 - Precision of the recorded measurement
 - Data entry methods

Proxy or Self-Reported Height & Weight Data

Question for Reported Weight	Question for Reported Height
“How much does [sample child] weigh now?”	“How tall is [sample child] now?”
“How much do you weigh?”	“How tall are you?”
“How much do you weigh? __ __ __ pounds”	“How tall are you? __ feet __ __ inches”
“About how much do you weigh without shoes?”	“About how tall are you without shoes?”
“About how much do you (child) weigh without shoes? [IF NEEDED, SAY: ‘Your best guess is fine.’]”	“About how tall are you (child) without shoes? [IF NEEDED, SAY: ‘Your best guess is fine.’]”
“How much do you weigh without your shoes on? Directions: Write your weight in the shaded blank boxes. Fill in the matching oval below each number.”	“How tall are you without your shoes on? Directions: Write your height in the shaded blank boxes. Fill in the matching oval below each number.”
“How much do you weigh without your shoes on? Directions: Write your weight in the blank boxes and fill in the matching circle below each number on your answer sheet.”	“How tall are you without your shoes on? Directions: Write your height in the blank boxes and fill in the matching circle below each number on your answer sheet.”

Assessing Weight and Height Status

- **Proxy-reported vs. Directly Measured**
 - Generally do not lead to equivalent estimates of prevalence of obesity
 - In young children, error in reporting height largely driving the differences
 - Reporting error can vary by the child's age, sex, and weight status

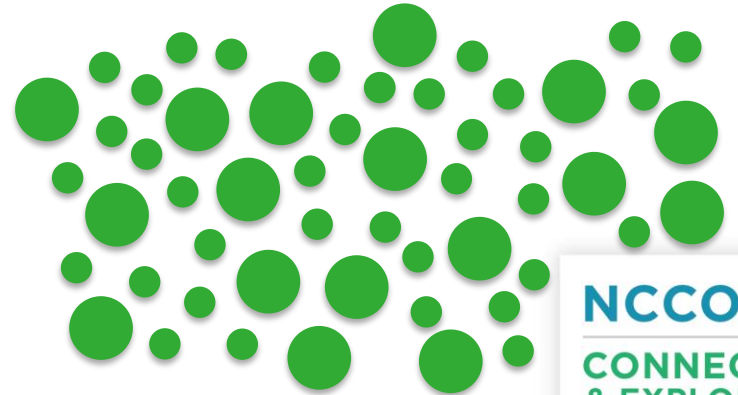
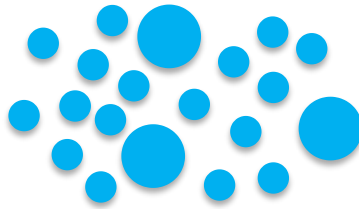
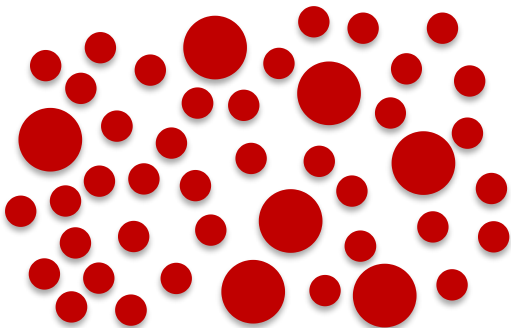
Assessing Weight and Height Status

- **Self-reported vs. Directly Measured**
 - Generally do not lead to equivalent estimates of prevalence

Age (years)	Height	Weight	Effect on obesity prevalence	Reference
~6-11	Underestimate	Underestimate	Overestimate	Beck et al., 2012
10-16	Not Significantly Different	Underestimate	Underestimate	Morrissey et al., 2006
12-18	Overestimate	Underestimate	Underestimate	Himes et al., 2005
~12-18	Not Reported	Underestimate	Underestimate	Goodman et al., 2000
~12-18	Overestimate	Underestimate	Underestimate	Pérez et al., 2015
~14-18	Overestimate	Underestimate	Underestimate	Brener et al, 2003; Jayawardene et al., 2014

Demographic Characteristics

- **Importance of collecting demographic information**
 - Determine representativeness of sample
 - Divide sample into subgroups
 - Assess disparities
 - Consider demographic shifts



Demographic Characteristics

- **Socioeconomic status**

- Variation in measures across reports
 - Individual
 - Household income, highest education of one or both parent or caregiver, insurance type, participation in an income-based program (e.g., WIC, SNAP)
 - Community
 - Mean neighborhood income, percent of students eligible to receive free or reduced price school meals, neighborhood education level

- **Race and ethnicity**

- OMB classification
 - American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White
 - Hispanic or Latino, not Hispanic or Latino
- Some data source provide a long list of ethnic or origin groups for which participants choose

Demographic Characteristics

- **Geography**

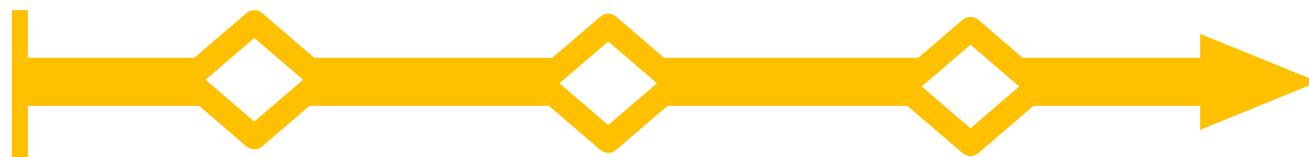
- Can be the basis for how sampling is designed
- Not all samples represent a geographic region

- **Rurality**

- Typically defined by population density

Demographic Shift

- **The U.S. is becoming increasingly more diverse**
 - Within group heterogeneity
 - Implications for the collection of demographic data
- **Stability of the population provides context for interpretation**



Key Messages

- Sampling approaches affect what the data reflect for the target population of interest.
- Directly measured compared to reported height and weight data generally do not lead to equivalent estimates of obesity prevalence, but can result in similar trends reported.
- Demographic variables need to be considered to provide context for population estimates.

Contact Information



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Director of Pediatric Obesity Research in the Diabetes Center

Chief of General Pediatrics

Vanderbilt University School of Medicine

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Data Sources

Key Considerations

Lynn Blewett, Ph.D.

Types of Common Data Sources

- Population surveillance surveys
- School-based assessments
- Clinical, public health administrative data
- Cohort studies

Data Sources

- **Objectives**

- For many data sources, information on height and weight is just one component of a larger surveys whose goals and objectives may or may not be related to your information needs

- **Methods**

- Different combinations of target population, survey design, data collection methodologies
 - Not always feasible to directly measure heights and weights

Geographic Area of Interest

- **National**
 - NHANES has measured weight and height
 - NHIS self-report but conditions/health behaviors, do not collect height and weight data for children <12 years
- **State**
 - BRFSS, YRBSS, other state-based household surveys
- **County**
 - Model-based estimates
- **School District**
- **Clinic/Health System EHR**

Key National & State Data Sources

Survey	Approximate Sample Size	Representativeness	Height & Weight Data
NHANES	5,000 per year	U.S. population	Directly measured
NHIS	35,000 households	U.S. population	Interview (proxy-, self-reported)
MEPS-HC	13,000 households	U.S. population	Interview (proxy-, self-reported)
YRBS, national	14,500 per survey year	U.S. high school students	Paper-based survey (self-reported)
YRBS, state and local	Varies by location	U.S. high school students; locations vary by year	Paper-based survey (self-reported)
WIC PC data	9.3 nationally; varies by location	WIC participants as of April of the assessment year	Directly measured
NSCH (2003, 2007, 2011-2012)	96,000 per cycle (1,800 per state)	U.S. children, 0-17 years All 50 states, Washington DC, U.S., Virgin Islands	Telephone survey (proxy-reported)
Redesigned NSCH/NS-CSHCN	<i>*To be released in 2017</i>	U.S. children, 0-17 years All 50 states, Washington DC, U.S.	Web- and mail-base (proxy-reported)

Administrative Data Example

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

PedNSS

- Discontinued surveillance system
- Included data from low-income children participating in federally funded program
- Data from the entire year
- Not all agencies participated

WIC Participant and Program Characteristics (PC)

- Conducted biennially
- Collects near-census level data on participants enrolled in April

School-Based Assessments

- Variation in grades assessed, data collector, frequency
- Family Educational Rights and Privacy Act (FERPA)
 - Data access consideration

Assessment	Students Assessed	Sample Size	Who Performs Measurement	Collaborators
Arkansas BMI Assessment	All public school students, Pre-K/K, and grades 2, 4, 6, 8, 10	181,000 per year	School staff member	Arkansas Dept. of Education Arkansas Dept. of Health ACHI Schools, Districts
California Annual FitnessGram®	All public school students, grades 5, 7, 9	1.3 million per year	Local education agency or county education office employee	California Dept. of Education Local education agencies
Texas SPAN	Public school students, grades 4, 8, 11 in sampled schools	17,000 per cycle (approximately every 5 years)	Project staff and Dept. of State Health and Services employees	University researchers Texas Dept. of State Health and Services Selected schools, districts

Other Data Sources

- **Innovations in Health Systems and Big Data**
 - Electronic health records
 - Data sharing
 - State-based registries
 - HEDIS, quality measurement strategies
- **Cohort Studies**
 - Provide longitudinal perspective on weight status
 - Used to identify risk factors for obesity
 - Can target populations of interest

Key Messages

- A variety of data sources are being used to assess obesity at the national, state, and local levels.
- Directly measured weight and height data is preferable, but is not always feasible to collect. Knowing the pros and cons of proxy- and self-reported data is critical to effective use of these data.
- Innovations are occurring in the clinical setting both in the collection and use of data through information technology, big data, and electronic health records.

Contact Information



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School of Public Health, University of Minnesota
Director, State Health Access Data Assistance Center
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Analytic Approaches

Key Considerations

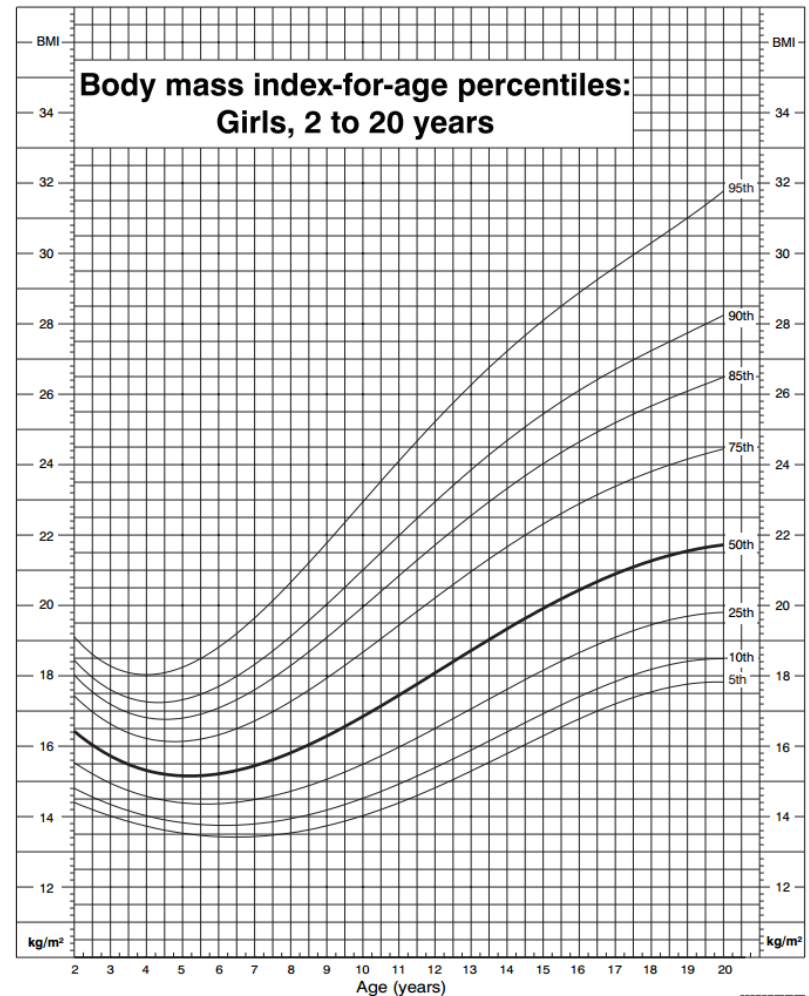
Jackson P. Sekhobo, Ph.D., M.P.A.

Key Considerations

- **Data Preparation**
 - Reference populations
 - Biologically implausible values (BIV)
 - Weighting for complex sampling designs
- **Statistical Analysis**
 - Role of sample size
 - Assessing prevalence & trends over time

Obesity Classification

- **Adults**
 - BMI ≥ 30 kg/m²
- **Children**
 - BMI changes throughout childhood due to growth



Reference Populations

Growth Reference	Source Population	Cut Point to Classify Obesity	Age aligned with adult cut point
2000 CDC BMI-for-age	Nationally representative cross-sectional samples of the U.S. children, adolescents, and young adults	≥95th percentile	Males: 19.3 years Females: 17.5 years
International Obesity Task Force	Representative samples from six international locations	Centile corresponding to a BMI of 30 kg/m ² at age 18 years applied throughout the distribution	18 years
WHO, growth standard	MGRS	+2 standard deviations	N/A – For children 0 to 5 years
WHO, growth reference	1977 National Center for Health Statistics/WHO data, merged with the MGRS data	+2 standard deviations	19 years (approximately)

Biologically Implausible Values (BIV)

- Extreme values in height, weight, BMI data
- Different approaches to identification
- How they are handled also varies
- Not all values flagged as a BIV are errors



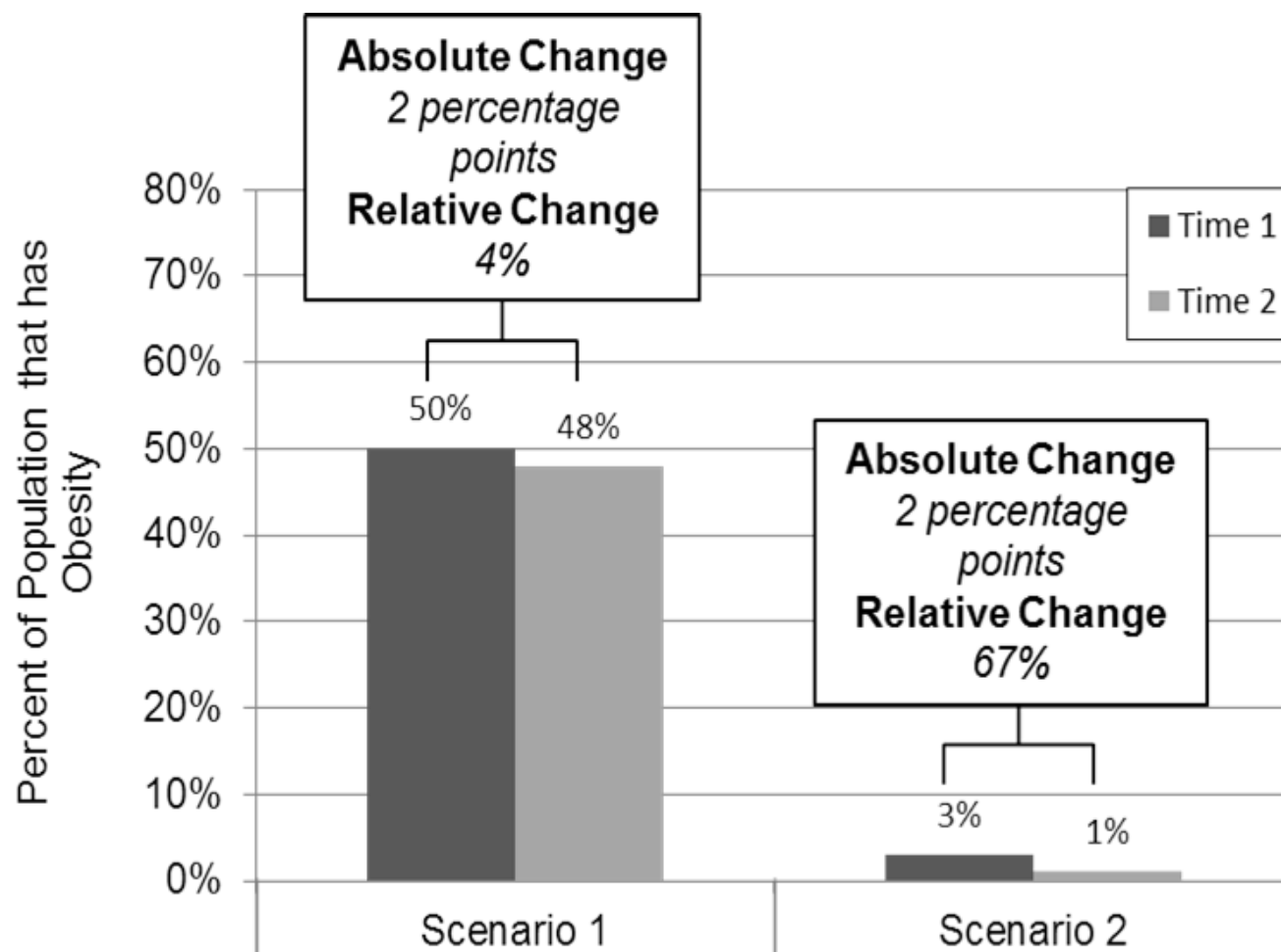
Weighting

- Weighting is an approach used to correct imbalances in sampling and better represent the target population in complex sampling designs
- Not every study will have or need to have sample weights

The Role of Sample Size

- The reliability of an estimate is dependent on sample size
- Sample size also has implications for:
 - Subgroup analyses and the assessment of disparities
 - Small area estimates

Change in Prevalence



Trend Analyses

- **Analytic Approach**
 - Start and end dates
 - Time points
- **Comparing Trends**
 - Person
 - Place
 - Time
 - Analytic Approaches



Key Messages

- Obesity prevalence in children can differ depending on the reference population used.
- Biologically implausible values can affect the prevalence estimates.
- Interpretation of trend estimates includes consideration of the person, place, time, and analytic approach.

Contact Information



Jackson P. Sekhobo, Ph.D., M.P.A.

Director of Evaluation, Research, and Surveillance

Division of Nutrition

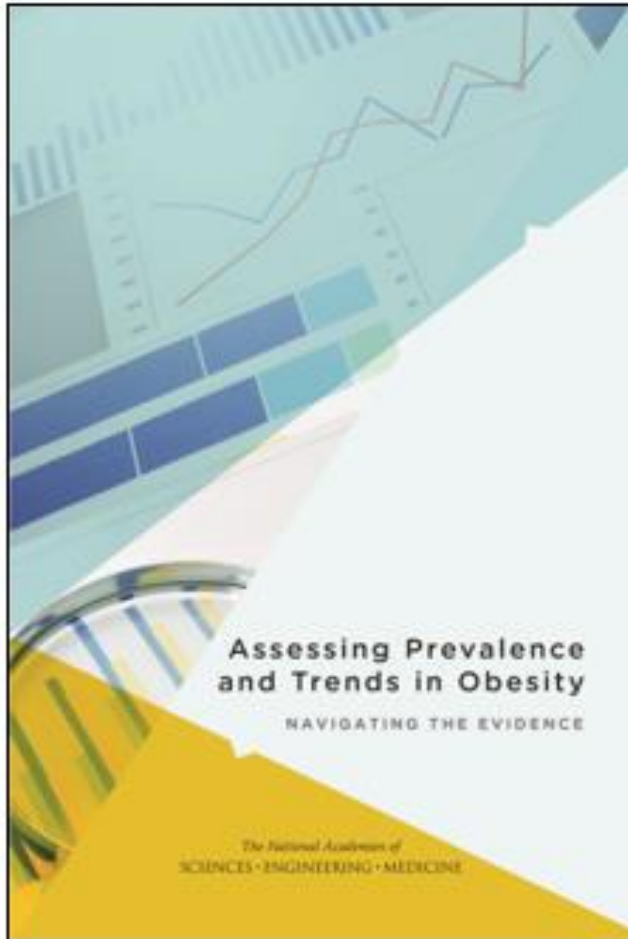
New York State Department of Health

Email: jackson.sekhobo@health.ny.gov

Additional Resources

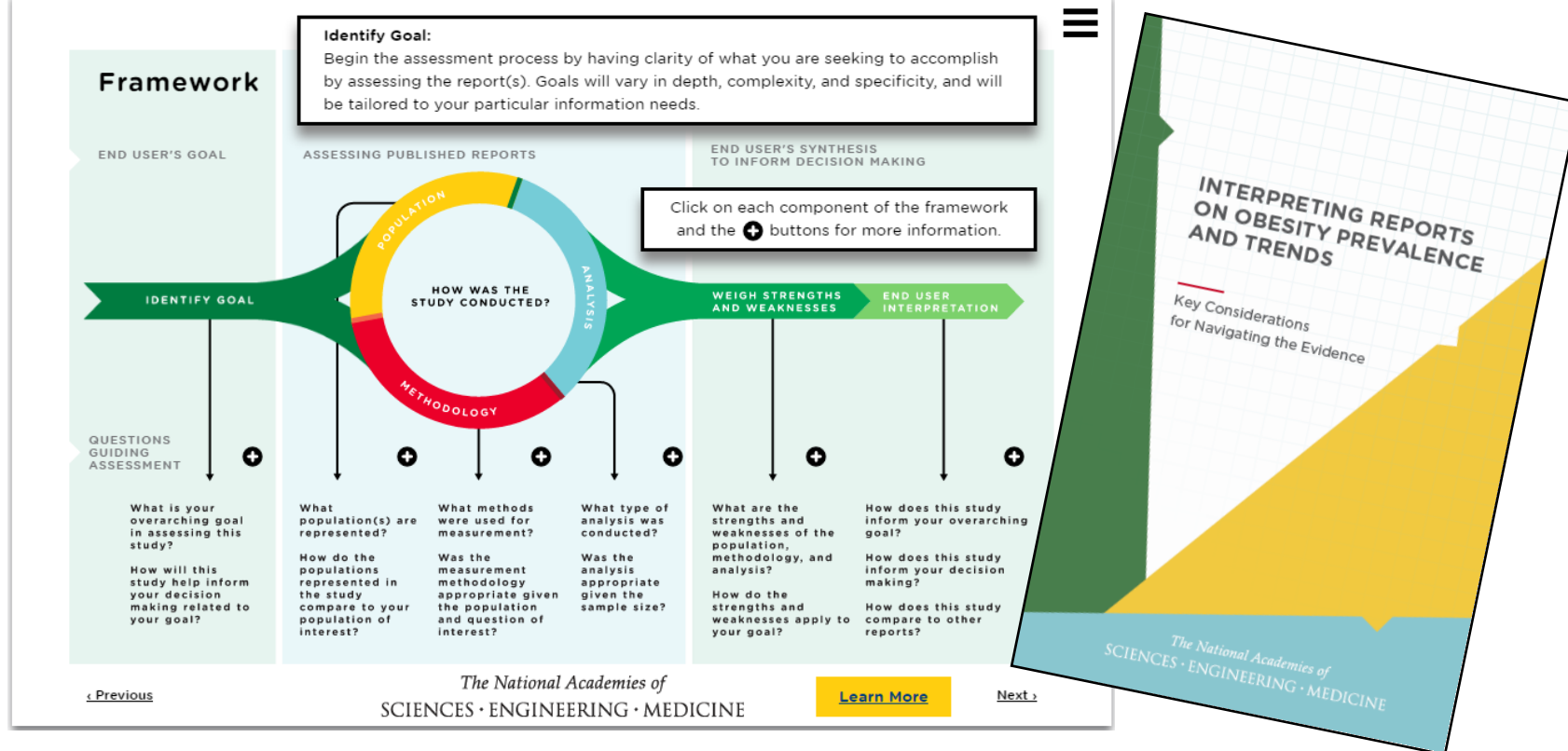
Shari Barkin, M.D., M.S.H.S. (Chair)

Consensus Report



- Available at:
<http://nationalacademies.org/hmd/Reports/2016/Assessing-Prevalence-and-Trends-in-Obesity.aspx>

Interactive Framework & Booklet



Also available at:

<http://nationalacademies.org/hmd/Reports/2016/Assessing-Prevalence-and-Trends-in-Obesity.aspx>

Using NHANES to Demonstrate *Applied Examples*

Cynthia L. Ogden, Ph.D., M.R.P.

NHANES – The Gold Standard

- Approximately 5,000 people surveyed each year



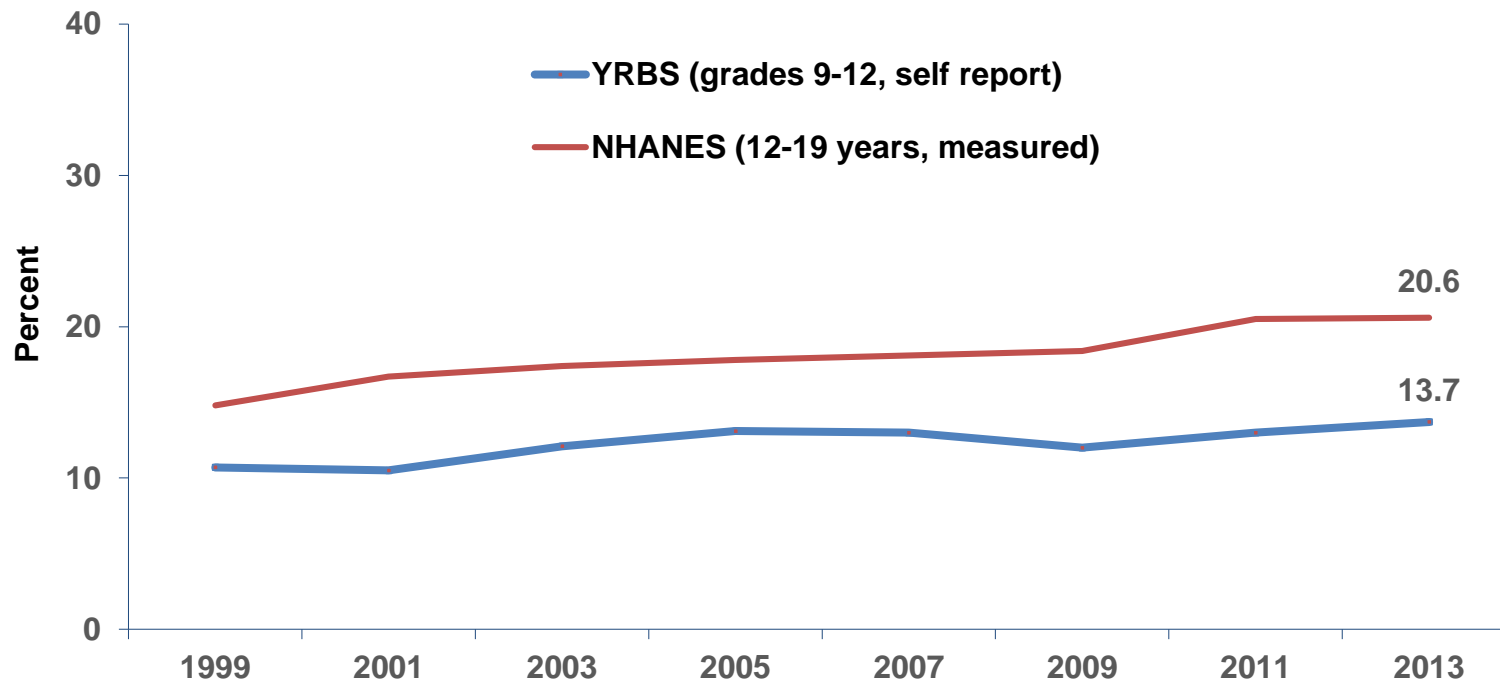
Measured Versus Reported



Measured Versus Reported

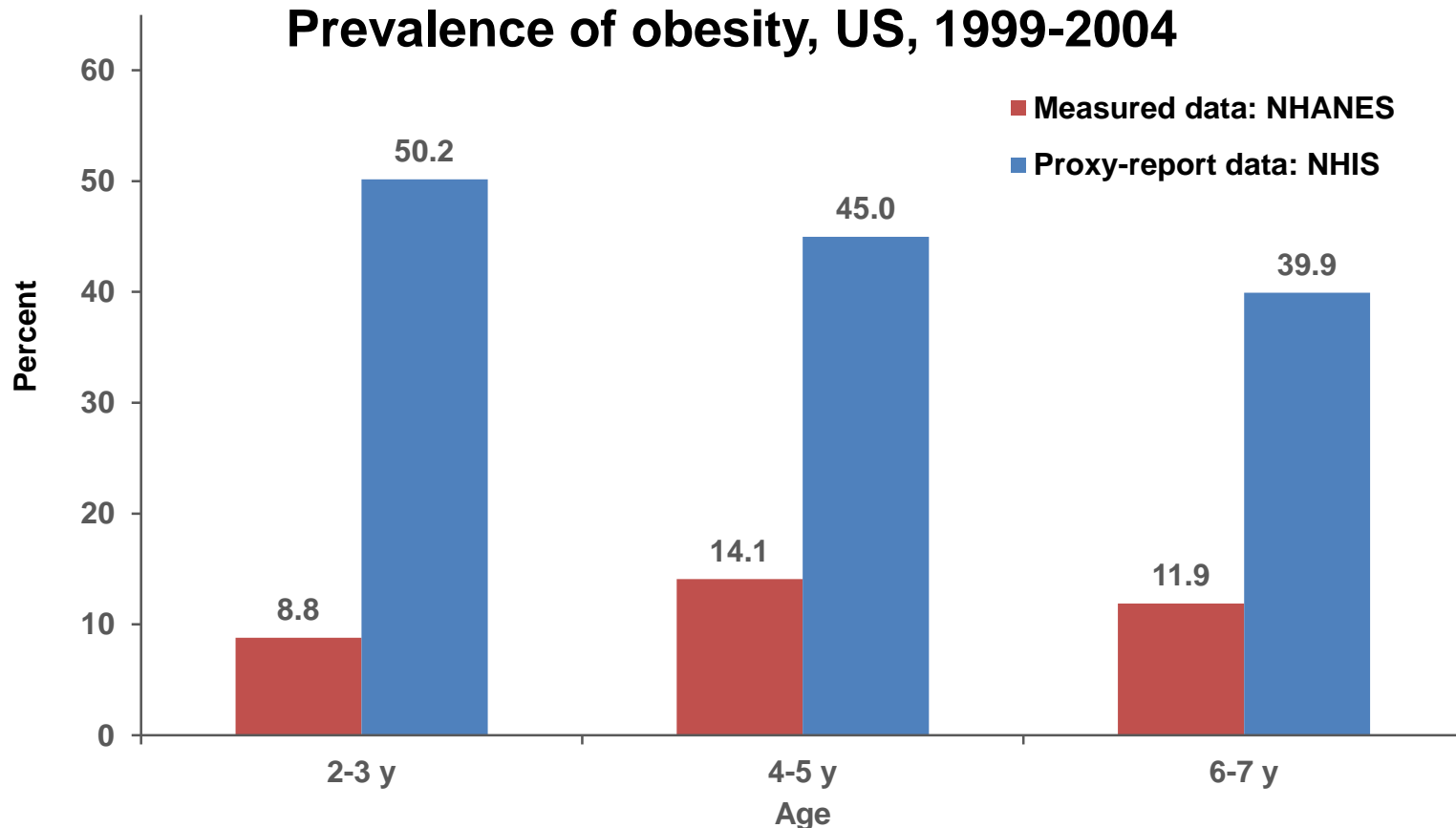
- Prevalence lower based on self report

Prevalence of obesity, US adolescents



Measured Versus Reported

- Higher estimates with parental report

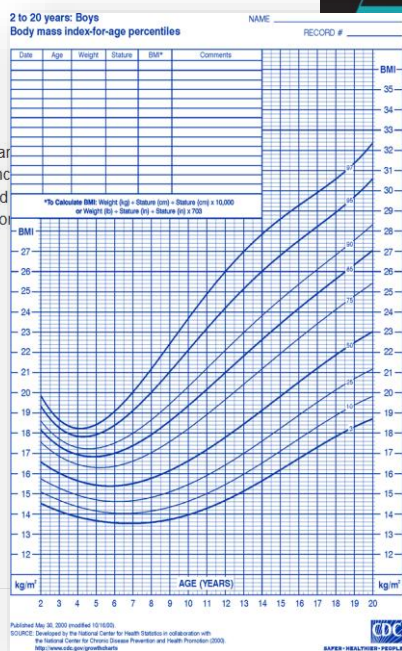
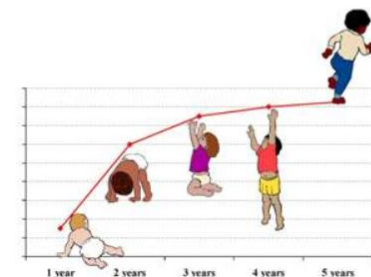


Different Reference Populations

- Which one is used?

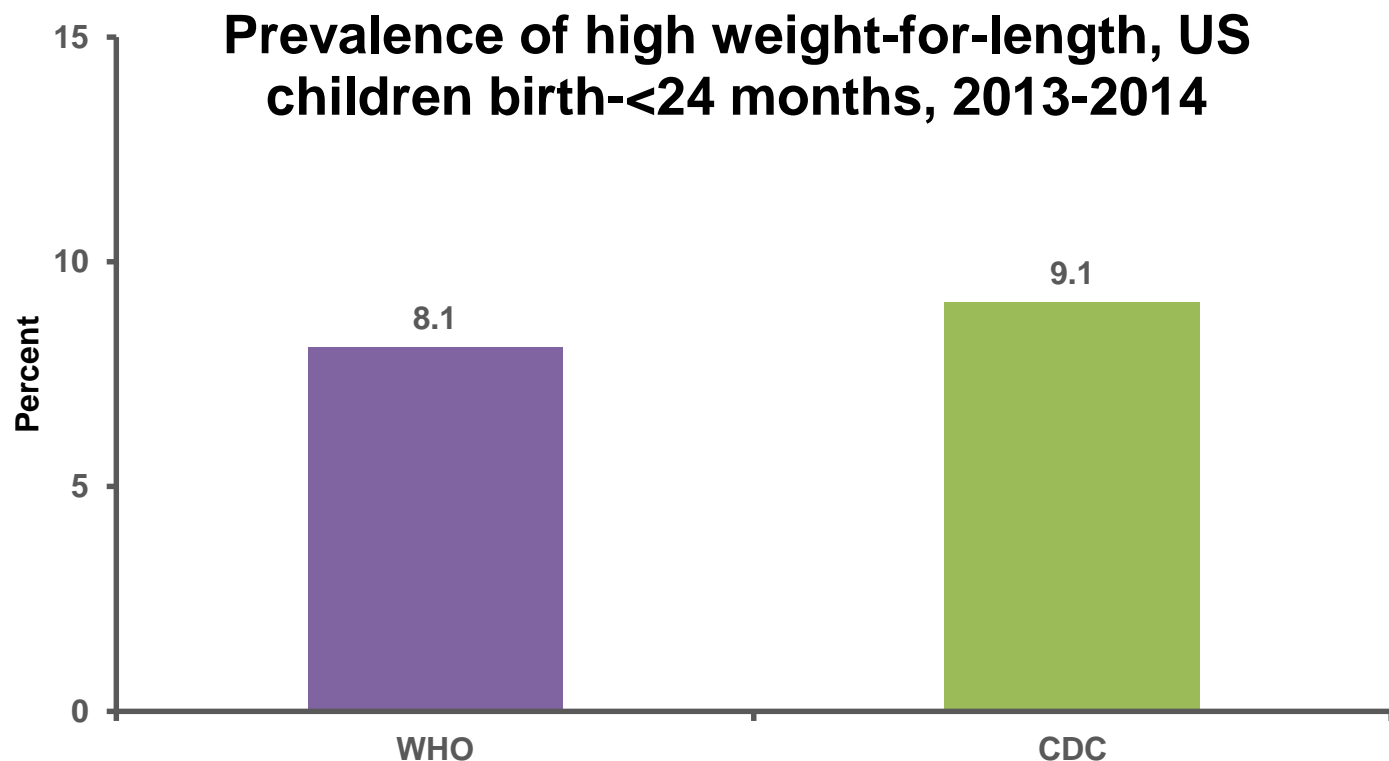
The WHO Child Growth Standards

This web site presents the WHO Child Growth Standards. These standards were developed using data collected in the WHO Multicentre Growth Reference Study. The site presents documentation on how the physical growth curves and milestone windows of achievement were developed as well as application support implementation of the standards.



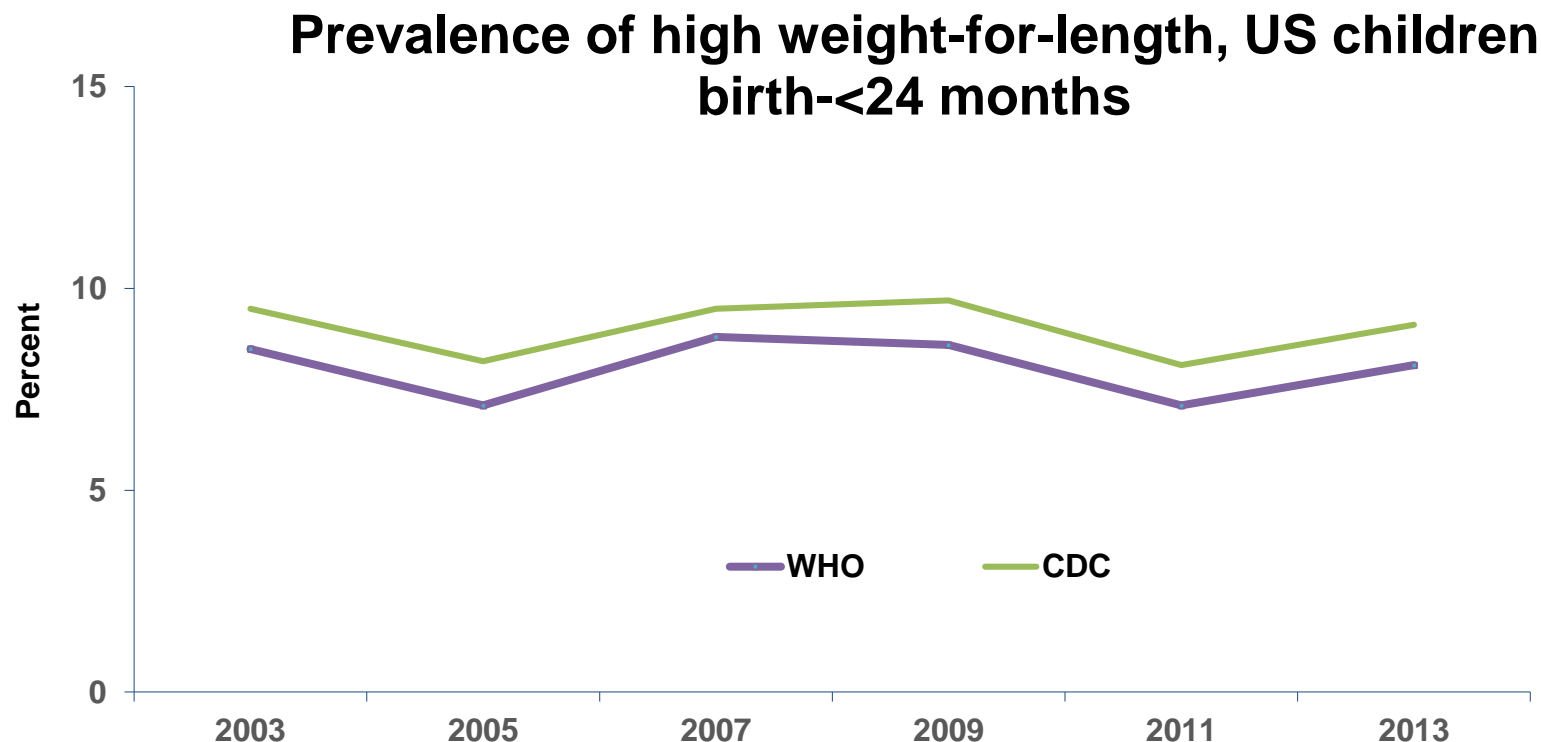
Different Reference Populations

- Give different estimates



Different Reference Populations

- Not different trends if age distribution same

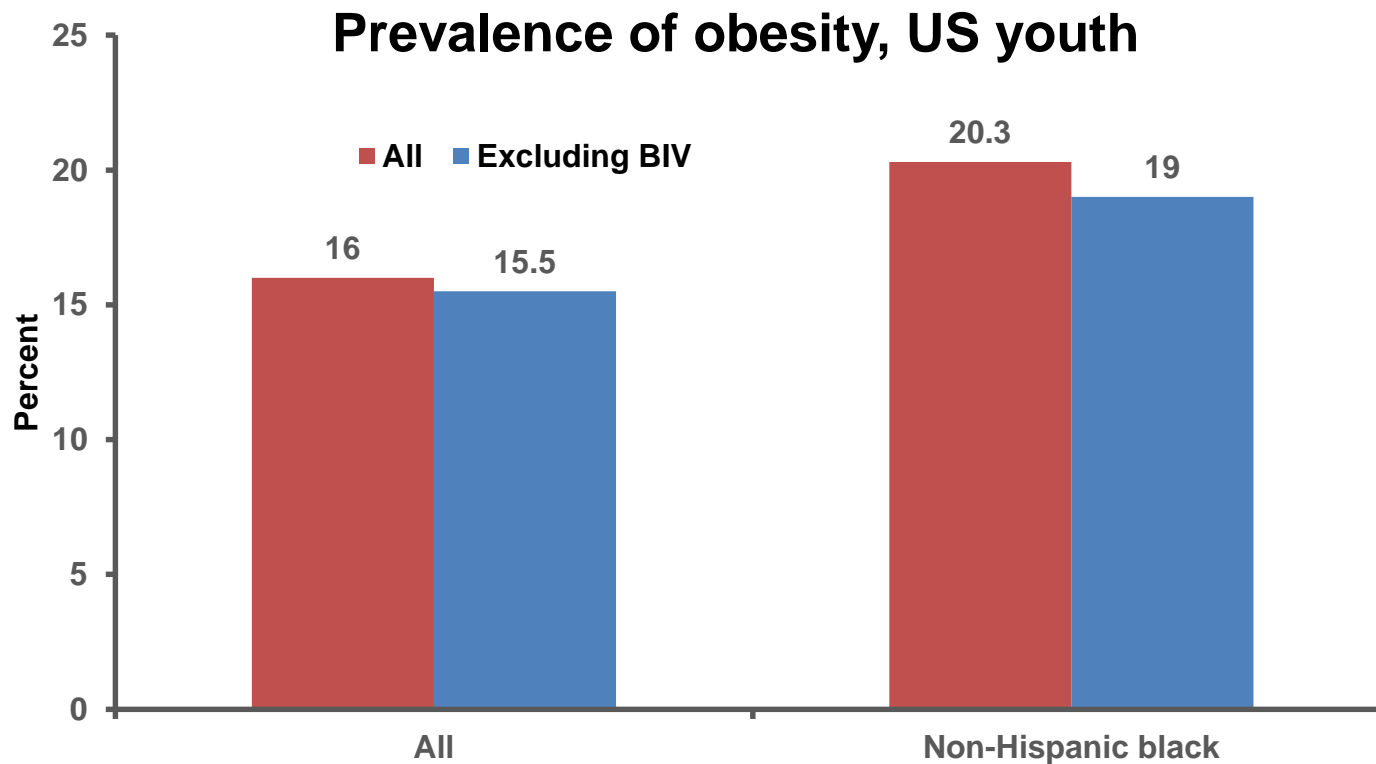


BIVs

- How to define BIV?
- NHANES is relatively clean

BIVs

- Sometimes BIV exclusions are valid



BIVs

- Comparison to maximum NHANES values may provide guidance

Small Sample Sizes

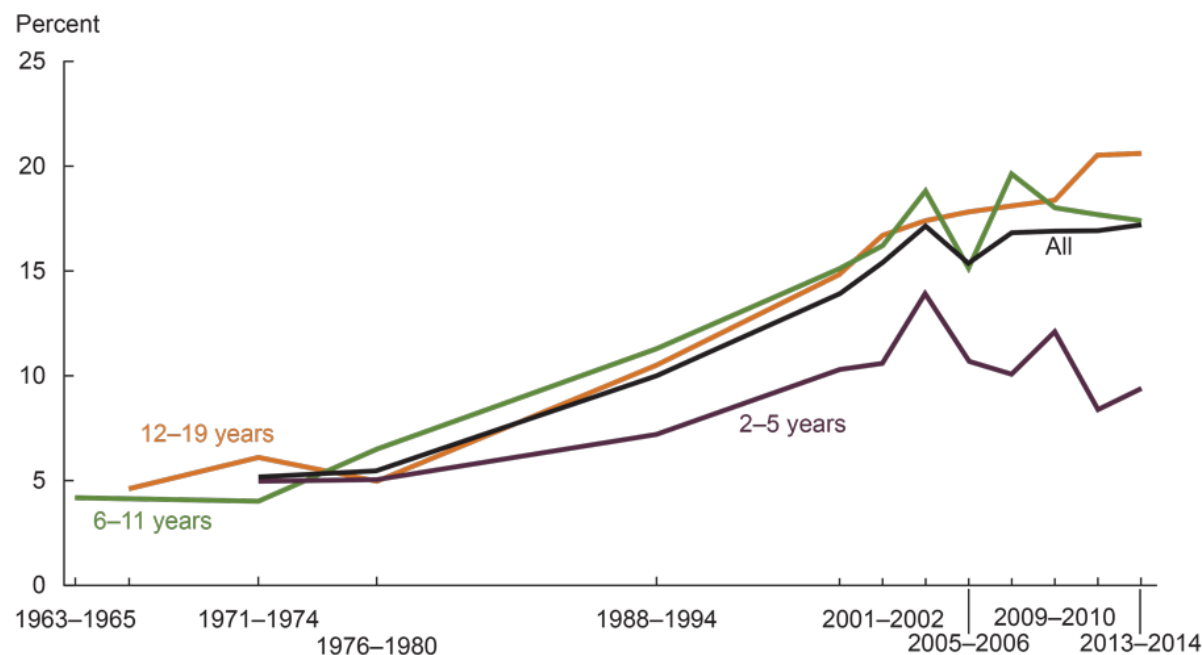
- NHANES subgroups small sample sizes

2011-2012	Total	Obese
Birth-<24 months	584	53
2-5 years	871	91
6-11 years	1268	258
12-19 years	1216	244

Small Sample Sizes

- See less stability, bouncing

Figure. Trends in obesity among children and adolescents aged 2–19 years, by age: United States, 1963–1965 through 2013–2014



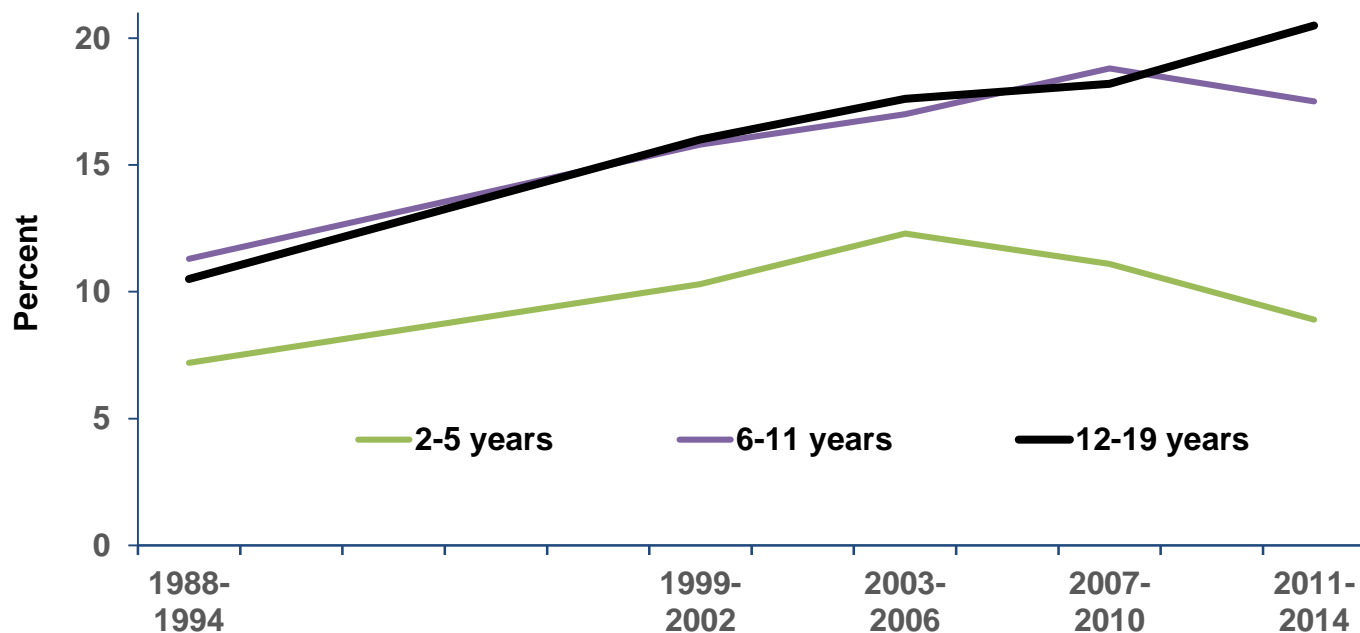
NOTES: Obesity is defined as body mass index (BMI) greater than or equal to the 95th percentile from the sex-specific BMI-for-age 2000 CDC Growth Charts.

SOURCES: NCHS, National Health Examination Surveys II (ages 6–11) and III (ages 12–17); and National Health and Nutrition Examination Surveys (NHANES) I–III, and NHANES 1999–2000, 2001–2002, 2003–2004, 2005–2006, 2007–2008, 2009–2010, 2011–2012, and 2013–2014.

Small Sample Sizes

- Bigger sample (combining years), more stable

Prevalence of obesity, US youth

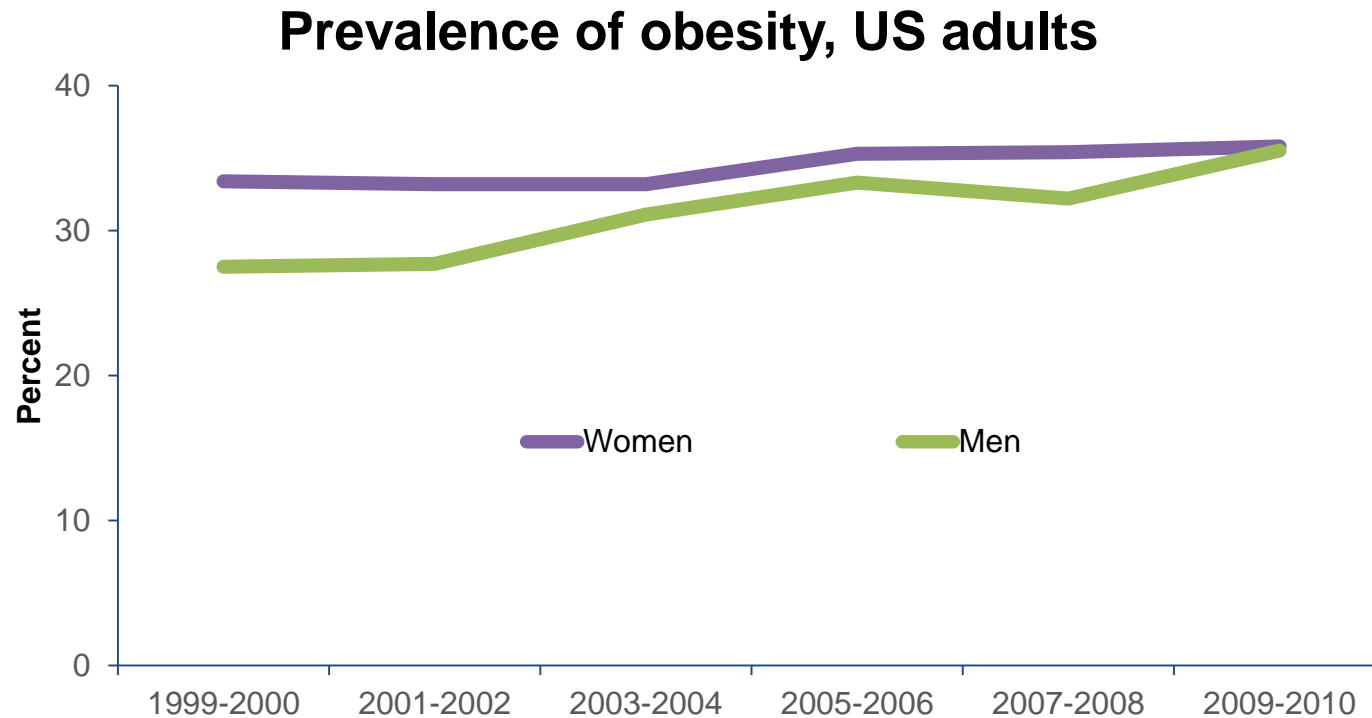


Start and End Points

- Over what time period?

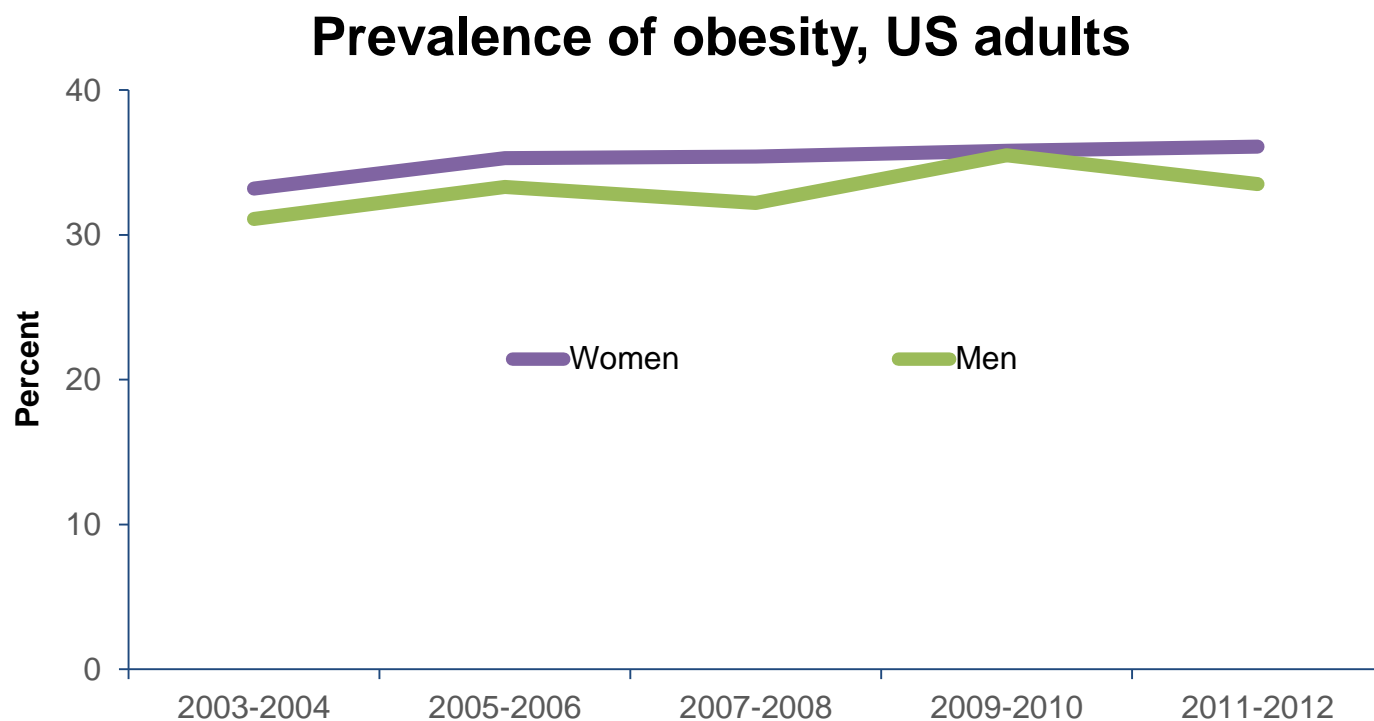
Start and End Points

- 1999-00 to 2009-10: up men, no change women



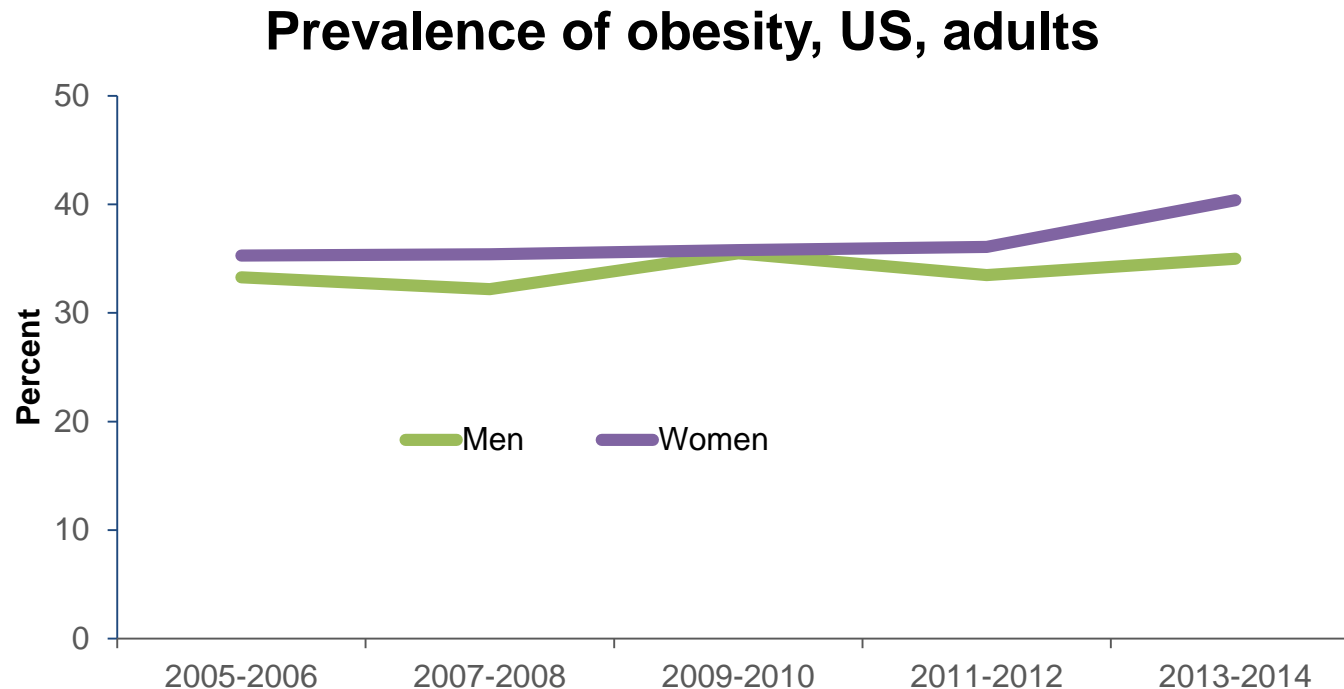
Start and End Points

- 2003-04 to 2011-12: No change



Start and End Points

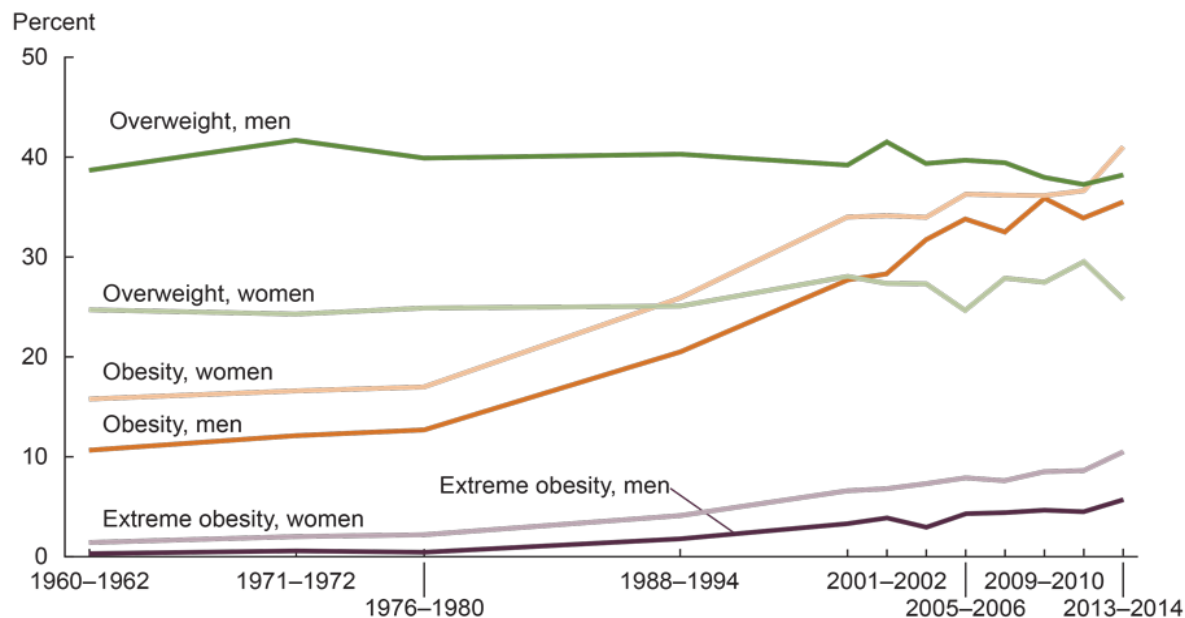
- 2005-06 to 2013-14: no change men, up women



Start and End Points

- All the data

Figure. Trends in adult overweight, obesity, and extreme obesity among men and women aged 20–74: United States, 1960–1962 through 2013–2014



NOTES: Age-adjusted by the direct method to the year 2000 U.S. Census Bureau estimates using age groups 20–39, 40–59, and 60–74. Overweight is body mass index (BMI) of 25 kg/m² or greater but less than 30 kg/m²; obesity is BMI greater than or equal to 30; and extreme obesity is BMI greater than or equal to 40. Pregnant females were excluded from the analysis.
SOURCES: NCHS, National Health Examination Survey and National Health and Nutrition Examination Surveys.

Contact Information



Cynthia L. Ogden, Ph.D., M.R.P.

NHANES Analysis Branch Chief/Epidemiologist

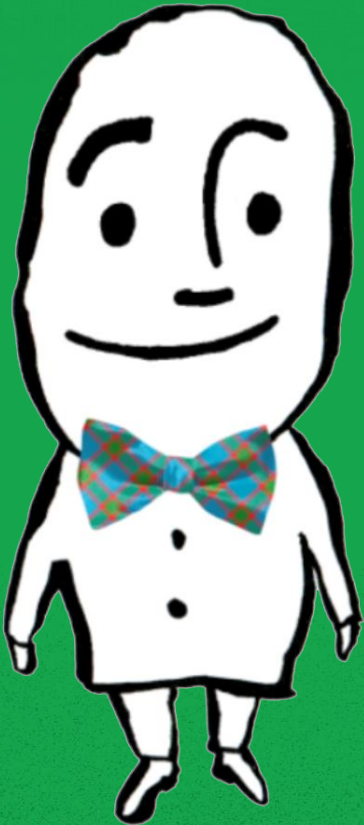
National Center for Health Statistics

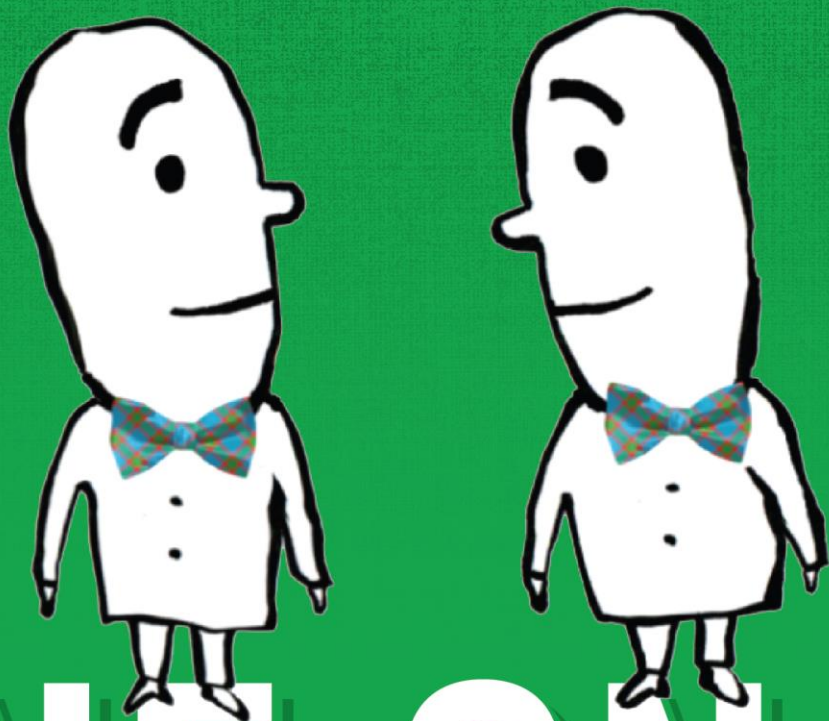
Centers for Disease Control and Prevention

Email: Cogden@cdc.gov

QUESTIONS?

Please type your question(s) in the chat box located on the right.





ONE ON ONE

FURTHER QUESTIONS?

Other questions about NCCOR
or upcoming activities?

Email the NCCOR Coordinating Center
nccor@fhi360.org

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[NCCOR at APHA](#)

[Connect & Explore SNAP-Ed
Evaluation Framework Q&A](#)

[Connect & Explore: Evaluating Health
Care-Community Collaborations:
Hospital-Based Programs](#)

[Three ways NCCOR is accelerating
progress to reduce Childhood Obesity](#)

[NCCOR Childhood Obesity Declines –
New RANF Signs of Progress Data](#)

Connect & Explore



Upcoming Webinars

Mark your calendar for these upcoming Connect & Explore webinars!

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[Evaluating Health Care-Community Collaborations:
Implications and Recommendations for the Field](#)

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[Looking Back and Looking Forward: Nine Years of
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SEP 14

[Evaluating Health Care-Community Collaborations –
A Three-Part Series](#)



THANK YOU!