

HUNGER, FOOD SECURITY & OTHER HOUSEHOLD INSECURITIES: IMPLICATIONS FOR CHILD HEALTH AND DEVELOPMENT

Patrick Casey, M.D.
Harvey and Bernice Jones Professor of
Developmental Pediatrics
Department of Pediatrics
College of Medicine
University of Arkansas for Medical Sciences
Arkansas Children's Hospital



PRESENTATION OVERVIEW

- Brief Primer on Hunger and Food Insecurity
- Brief Intro to Children's Health Watch (formerly C-SNAP)
- Prevalence of Food Insecurity over time
 - National Survey
 - Children's Health Watch Survey
- Association of Food Insecurity with Child Health (including Obesity) and Development
- Influence of WIC Receipt on Food Insecurity and Child
- Other Insecurities: Energy, Housing
- Screening for Food Insecurity

HUNGER

The uneasy or painful sensation caused by a lack of food. The recurrent and involuntary lack of access to food.

FOOD INSECURITY

Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

HOUSEHOLD FOOD SECURITY/INSECURITY QUESTIONS

18 Questions to measure:

ANXIETY that household food budget/supply inadequate

PERCEPTIONS that food eaten was inadequate in
quality/quantity

REPORTED INSTANCES of reduced food intake or its
consequences (sensation of hunger, reported
weight loss), in **ADULTS** of household

REPORTED INSTANCES of reduced food intake or its
consequences for **CHILDREN** in households

COPING ACTIONS taken by household to augment food
budget/supply (e.g. borrow money, get food from
emergency pantries)

FOOD INSECURITY QUESTIONS: EXAMPLES

We could not afford to eat balanced meals

We relied on only a few kinds of low cost food to feed our children because we were running out of money to buy food

In the last 12 months, did you ever cut the size of your meals or skip meals because there was not enough money for food?

In the last 12 months, did your children ever not eat for a whole day because there was not enough money for food?

RESPONSE: Often True – Sometimes True – Never True

CHILDREN'S FOOD SECURITY IN U.S. HOUSEHOLDS

CHILD HUNGER SCALE

USES 8 CHILD REFERENCED OF 18
HOUSEHOLD QUESTIONS

$2/8 =$ CHILD FOOD INSECURITY

CHILD SPECIFIC FOOD SECURITY QUESTIONS

- Relied on few kinds of low-cost food to feed children
- Couldn't feed children balanced meals, couldn't afford
- Children were not eating enough, couldn't afford

CHILD SPECIFIC FOOD SECURITY QUESTIONS (continued)

In the last 12 months:

- Cut size of children's meals because there was not enough money
- Children were hungry
- Children skipped meals

CHILD SPECIFIC FOOD SECURITY QUESTIONS

(continued)

In the last 12 months:

- Children skipped meals in 3 or more months
- Children did not eat for whole day because there was not enough money

USDA HOUSEHOLD FOOD SECURITY MEASURE: FOOD SECURITY SUPPLEMENT (1999-2006) (Current Population Survey)

Four Categories:

Food Secure

Food Insecure without Hunger

Food Insecure with Hunger

Food Insecure with Severe Hunger

**USDA HOUSEHOLD
FOOD SECURITY MEASURE
(2006→)**

Food Secure

Low Food Insecure ≥ 3 positive Responses

Very Low Food Insecure ≥ 6 Positive Responses



CHILDREN'S HealthWatch



CHILDREN'S HEALTH WATCH

A consortium of academic clinicians who focus on infant growth (all have growth clinics), which collects data to influence public policy, and for academic publications

We evaluate the impact of economic conditions and public policy on the health and development of young children in low income households, with particular emphasis on:

- Food Insecurity
- Housing Insecurity
- Energy Insecurity

WHAT WE DO:



Collect data
*in five urban,
safety-net
hospitals*



**Produce
scientific
research**
*that is original
and timely*



**Inform policy
decisions**
*with state and
national partners*

STUDY METHODS

- 5 medical centers
 - 3 emergency departments (ED)
 - 3 hospital based clinics
- August 1998 to present
- Cross-sectional convenience sample
- Children \leq 48 months old

STUDY SITES

CLINICS

Baltimore

Minneapolis

Philadelphia

EMERGENCY DEPARTMENTS

Boston

Little Rock

Baltimore

STUDY METHODS

- Caretaker Survey:
 - Demographics
 - Child health
 - Child development concern: Peds
 - State & federal program participation
 - USDA 18-question food security scale
- Medical Record Audit:
 - Child weight & height
 - Medical diagnosis
 - Admission & dehydration status

FEDERAL ASSISTANCE PROGRAMS— monitored by



- Food Stamps (SNAP)
- Temporary Assistance for Needy Families (TANF)
- Women, Infants and Children (WIC)
- Medicaid
- Federal Housing Subsidies
- Energy Assistance (LIHEAP)

Primary Household
And Child Outcomes

- Food Insecurity
- Hospitalizations
- Child Wellbeing
- Maternal Depression
- Child Growth
- Child Development

STRENGTHS OF CHW DATA

- Close to real time
- Unique focus on under 4 year olds
- High risk population
- Multiple sites, very large sample
- Interaction between program participation, living circumstances, and child status

WEAKNESSES OF CHW DATA

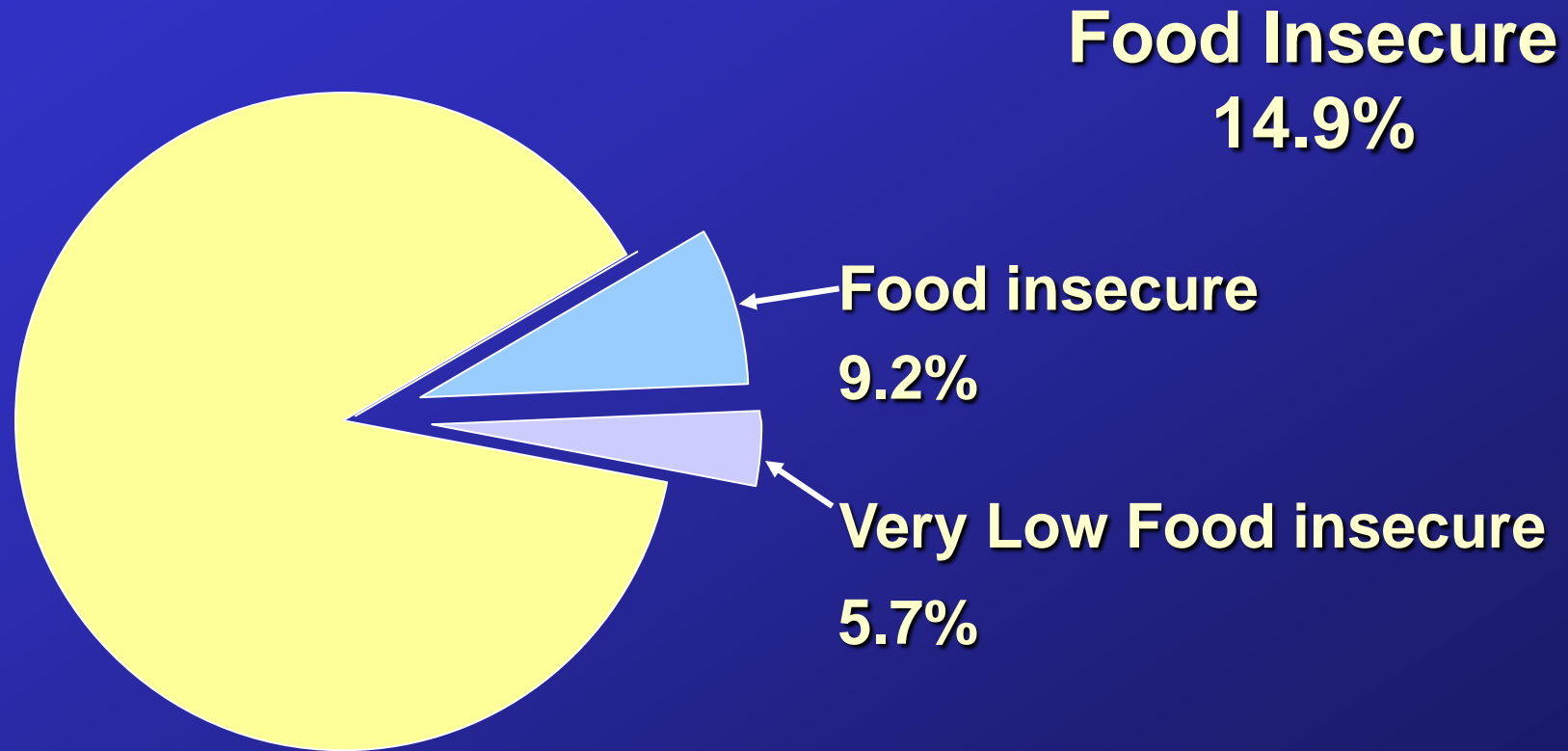
- Non epidemiologic sample
- Potential for biased selection
- Self-reported data

CHW SAMPLE CHARACTERISTICS

(to 12/11)

	<u>All Sites</u>		<u>ACH</u>
	<u>N</u>		<u>N</u>
	44,075		9,957
Race %			
AA	51.9		44.0
White	18.0		47.5
Hispanic (all)	24.8		5.9
Education %			
Some HS	29.5		18.2
HS	38.8		38.7
Beyond HS	31.7		43.1
Child Insurance %			
Private	11.3		22.3
Public	84.1		72
None	4.6		5.7

FOOD SECURITY STATUS OF U.S. HOUSEHOLD 2011

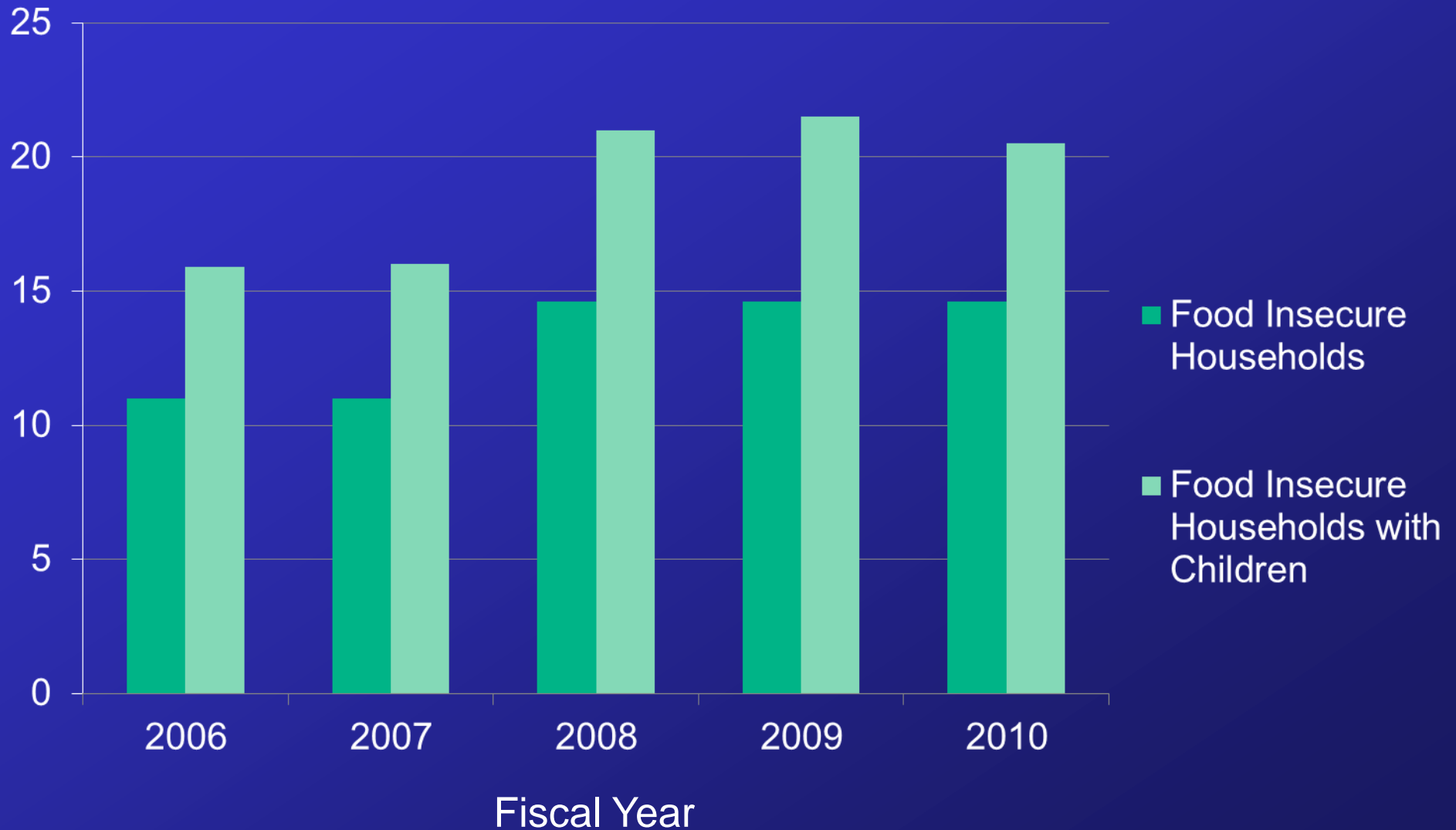


2011

Food Insecurity of all Households:
14.9%

Food Insecurity of Households with Children:
20.6%

FOOD INSECURITY AMONG FAMILIES WITH CHILDREN: RECENT RAPID GROWTH



FOOD SECURITY BY STATE

2007 -- 2009

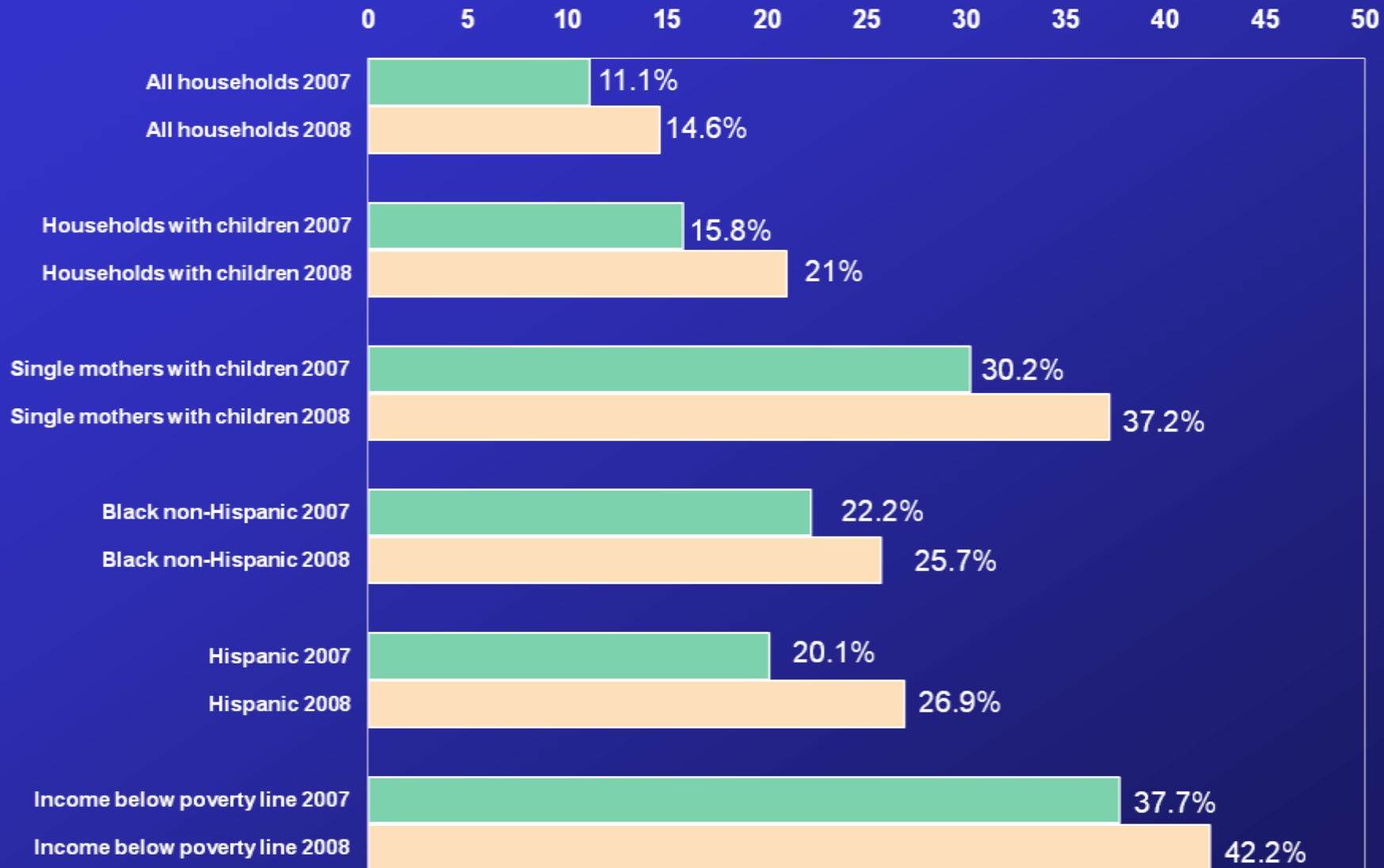
Worst	50:	Arkansas	17.7%
	49:	Texas	17.4%
	48:	Mississippi	17.1%
	47:	Georgia	15.6%
	46:	Oklahoma	15.2%
Best	5:	Wyoming	9.8%
	4:	Delaware	9.5%
	3:	Virginia	9.2%
	2:	New Hampshire	8.9%
	1:	North Dakota	6.7%

FOOD SECURITY BY STATE

2011

Worst	50:	Mississippi	19.2%
	50:	Arkansas	19.2%
	48:	Texas	18.5%
	47:	Alabama	18.2%
	46:	Georgia	17.4%
Best	5:	Wisconsin	11.3%
	4:	Minnesota	10.2%
	3:	New Hampshire	9.6%
	2:	Virginia	9.1%
	1:	North Dakota	7.8%

PREVALENCE OF LOW FOOD INSECURITY BY HOUSEHOLD CHARACTERISTICS, 2007 and 2008



FOOD HARDSHIP 2012

(Food Research and Action Center)

- Gallup – Healthyway Well-Being
- 352,789 people

“Have there been times in the past 12 months when you did not have enough money to buy food that you or your family needed?”

FOOD HARDSHIP 2012

States:

All States: 18.2%

Arkansas #5 @ 22.8%

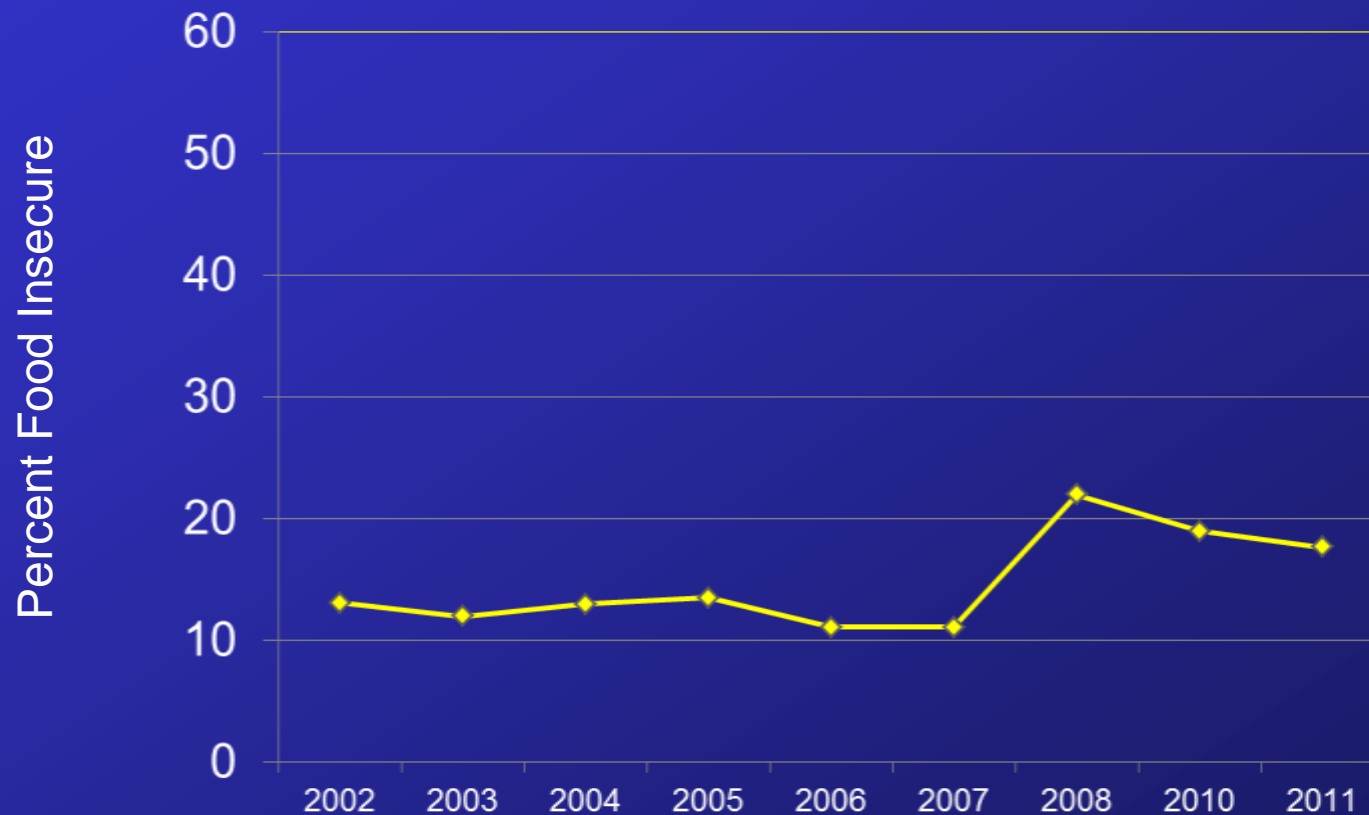
Metropolitan Area:

Little Rock/Conway #18 @ 19.8%

HOUSEHOLD FOOD SECURITY

Children's Health Watch

Little Rock Site



**HAS FOOD INSECURITY
INCREASED DURING THE
2008-2009 U.S. GREAT
RECESSION?**

CHANGES IN HOUSEHOLD AND CHILD INSECURITY

Unadjusted Prevalence
Little Rock

n (%)	2004	2005	2006	2007	2008	Overall p-value
HH Food Insecurity	85 (13.6%)	94 (13.6%)	67 (11.0%)	79 (11.1%)	171 (22.0%)	<.001
Child Food Insecurity	27 (4.3%)	36 (5.2%)	27 (4.4%)	32 (4.5%)	73 (9.4%)	<.001
Total Interviewed	624	689	609	712	779	

ASSOCIATIONS BETWEEN TIME PERIOD AND FOOD SECURITY

Little Rock n=1,492

Outcome	2007 n=712	2008 n=780
Household Food Insecurity	Referent	2.43 (1.79, 3.30) p<.0001
Child Food Insecurity	Referent	2.24 (1.43, 3.49) p<.001

Adjusted for: child's gender, US born mother, marital status,
Caretaker employment, insurance, and mother's age

SUMMARY

In adults, Food Insecurity is associated with poorer diets and poorer general physical and mental health, and obesity in women, independent of demographic confounders

CHILDREN

Food Insecurity is associated with poorer child:

- general health (and more hospitalizations)
- developmental status in pre-school years
- educational achievement
- mental health
- academic problems

while controlling for demographic characteristics

DEVELOPMENTAL FUNCTIONS AT RISK FOLLOWING EARLY UNDERNUTRITION

- Language
 - Short-term Memory
 - Auditory-Visual Equivalence
 - Attention
 - Modulation of Activity and Affect
 - Locomotor Skills
- Young children from food insecure households are **40% more likely to be at developmental risk**

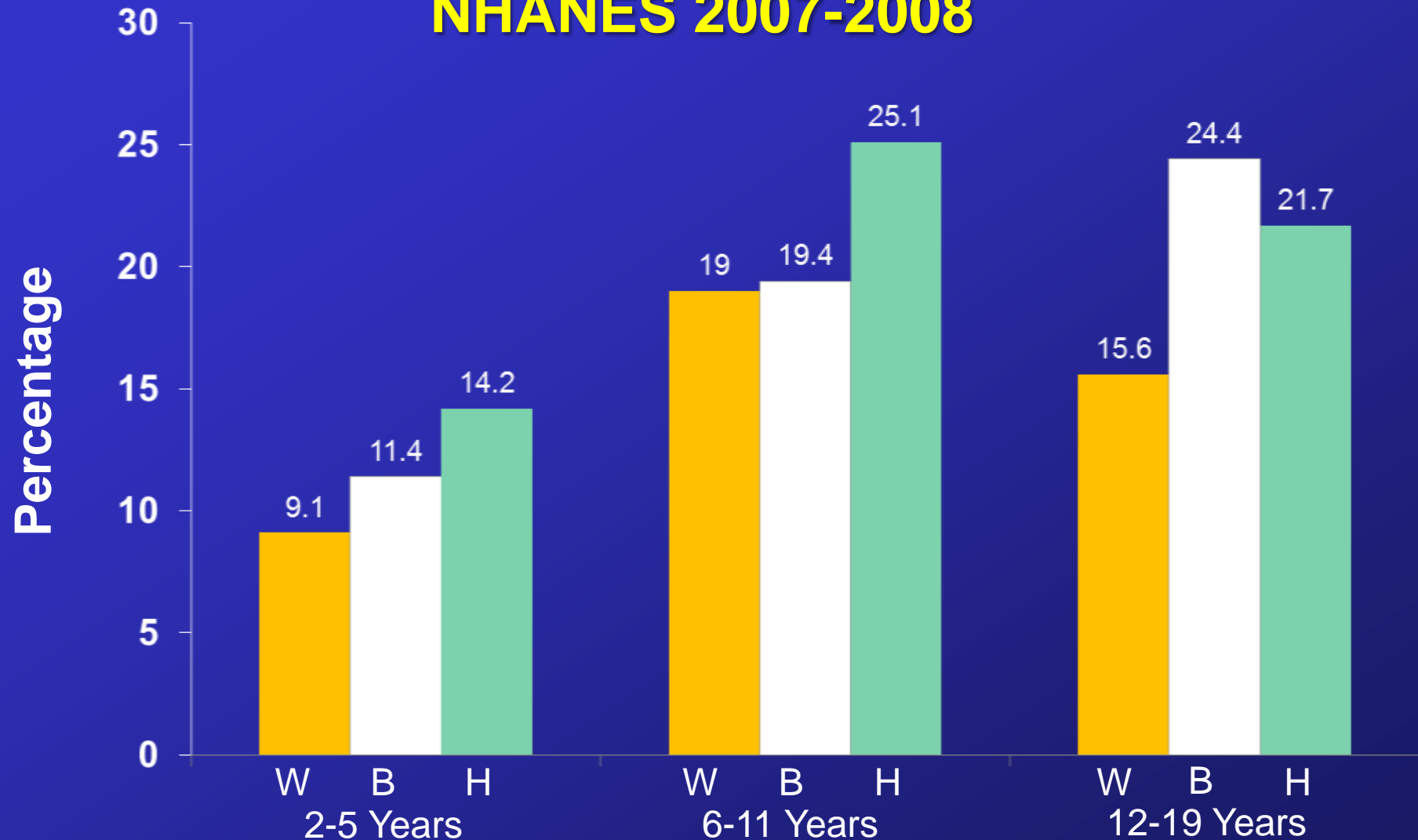
Does Hunger Cause Childhood Obesity?

Dietz, WH

Pediatrics.1995;95:766

OBESITY* BY AGE AND RACE/ETHNICITY

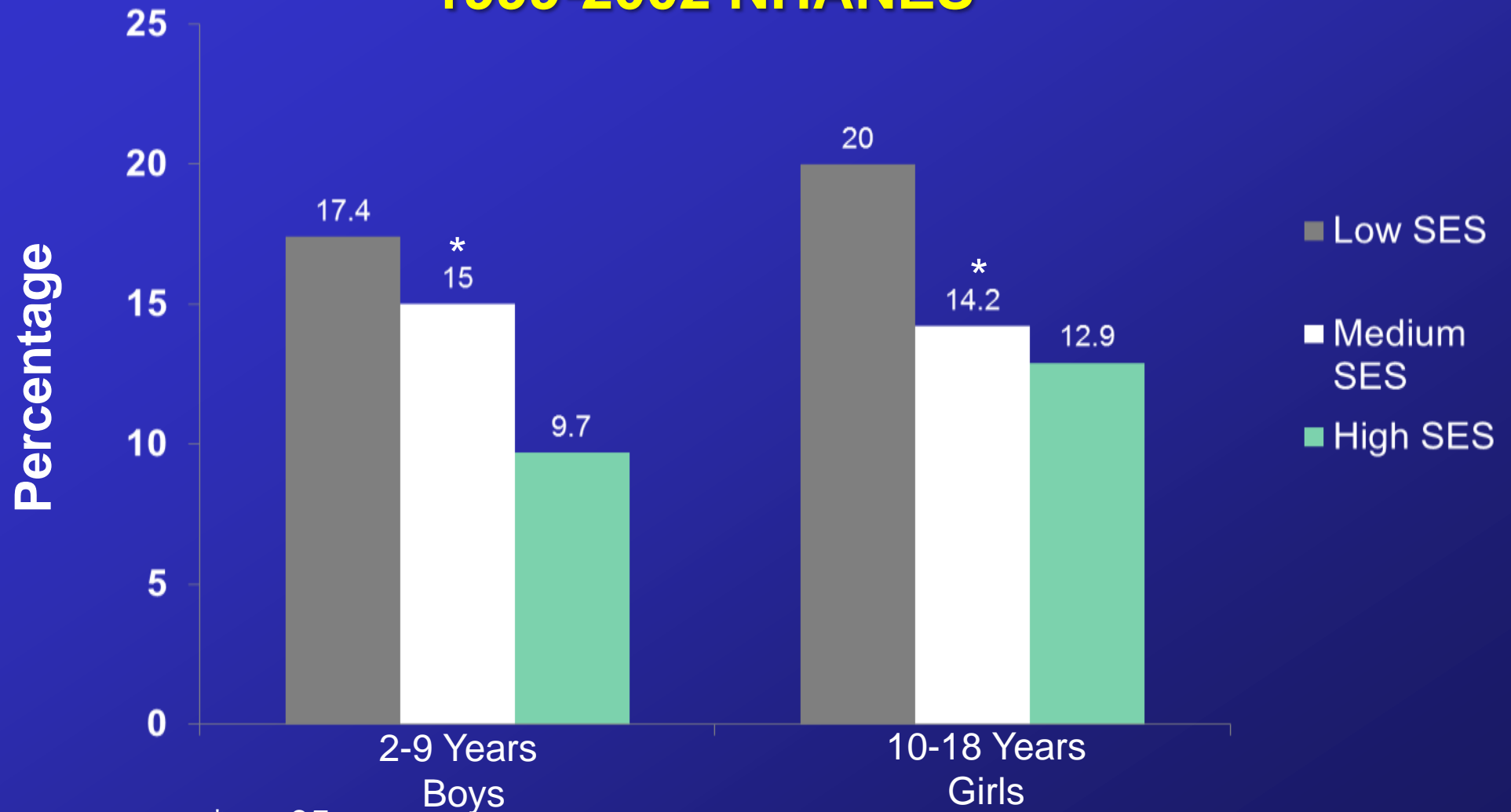
NHANES 2007-2008



*Gender – and age-specific BMI \geq the 95th percentile
Adapted from Ogden et al. *JAMA*. 2010;303:242.

OBESITY BY AGE, SEX, AND SES

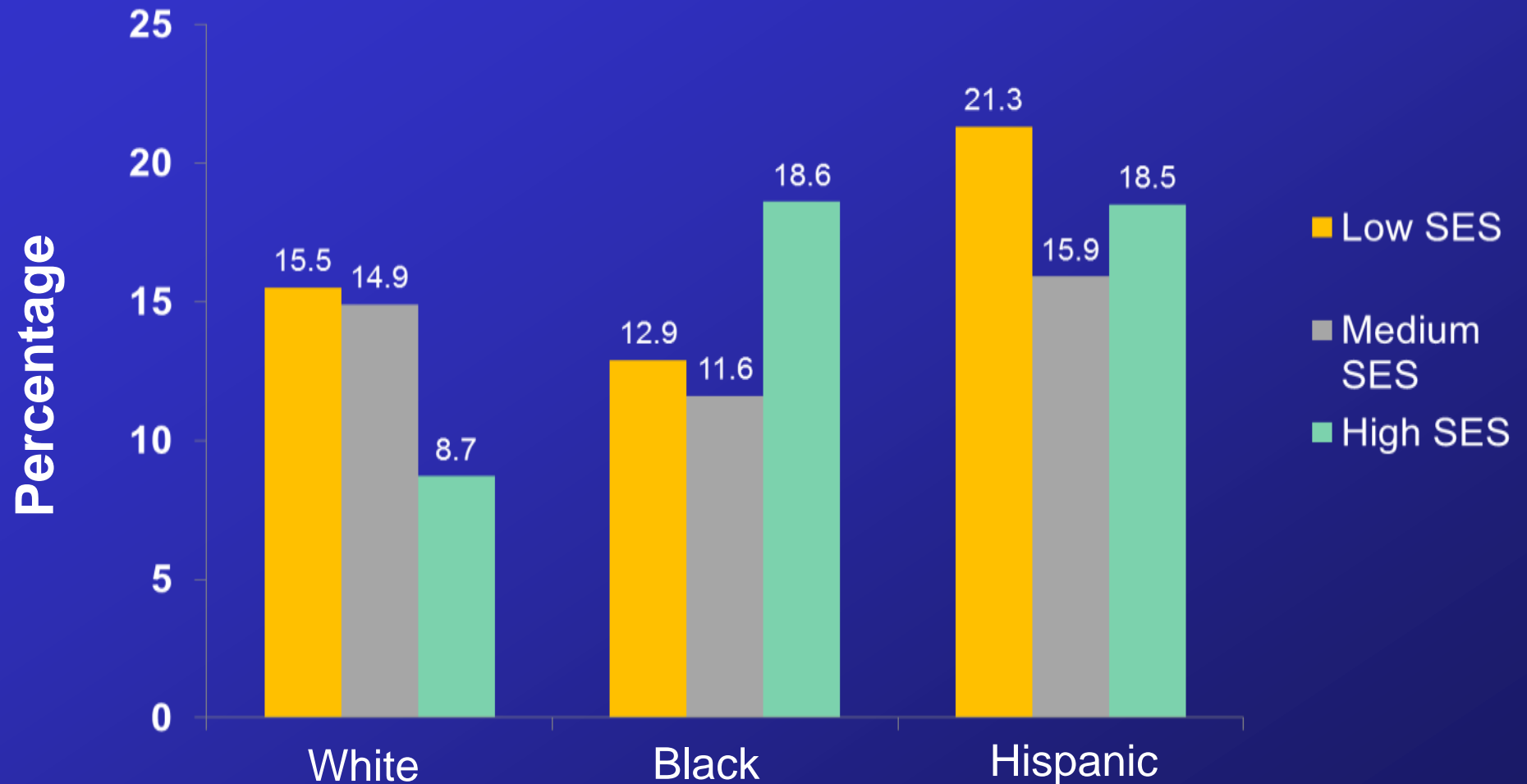
1999-2002 NHANES



* $p < .05$

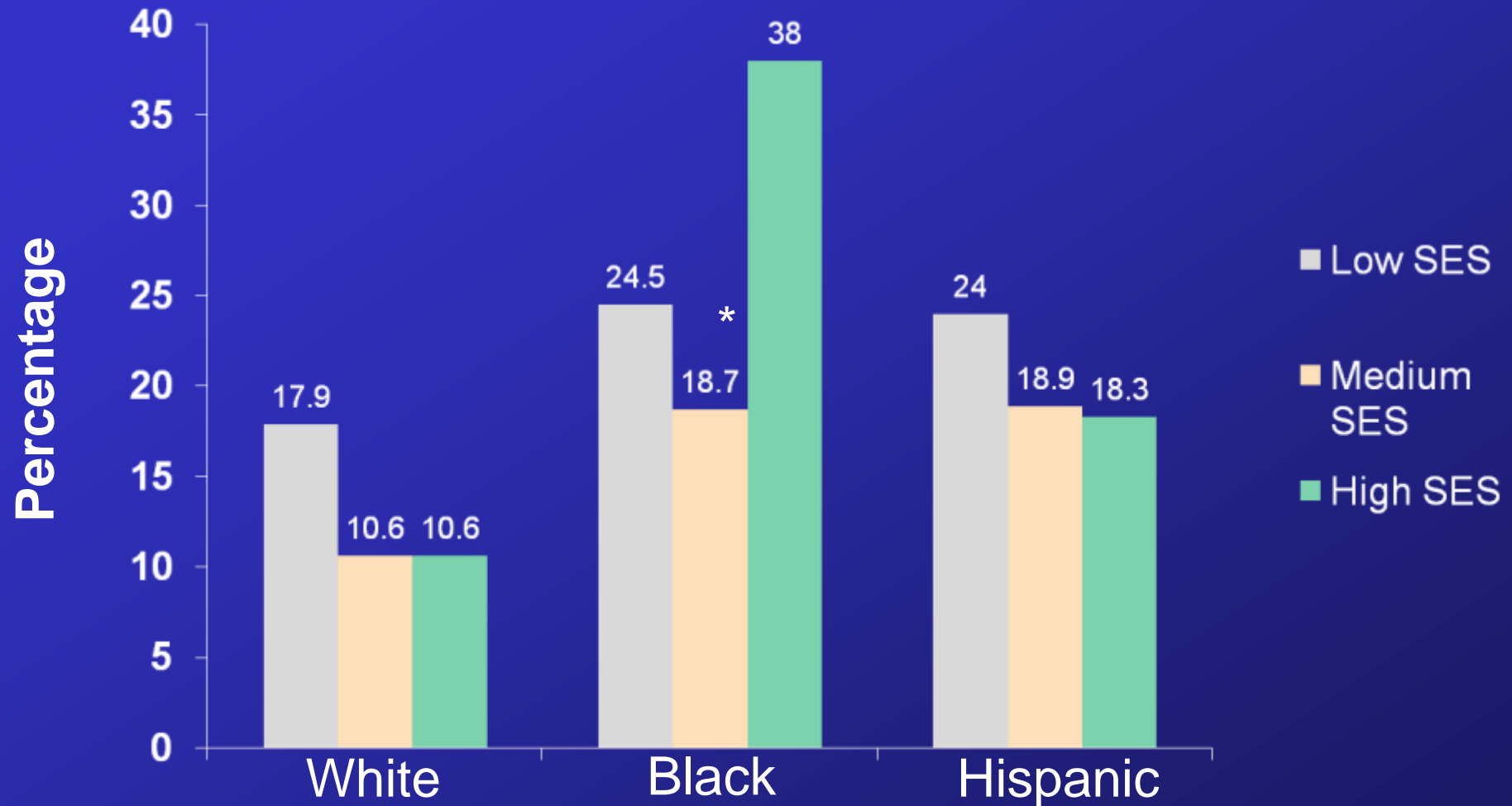
Adapted from Wang and Zhang. *Amer J Clin Nutr.* 2006;84:707

OBESITY FOR 2-9 YEAR OLD GIRLS BY SES AND ETHNICITY 1999-2002 NHANES



Adapted from Wang and Zhang. *Amer J Clin Nutr.* 2006;84:707

OBESITY FOR 10-18 YEAR OLD GIRLS BY SES AND ETHNICITY 1999-2002 NHANES



* $p < .05$

Adapted from Wang and Zhang. *Amer J Clin Nutr.* 2006;84:707

POSSIBLE ETIOLOGIES OF CHILDHOOD OBESITY EPIDEMIC

- Larger servings of food and drinks, fast food and home
- Use of convenience foods, high in calories and fats
- Lower cost of obesogenic diet
- Poor access to affordable health and fresh foods in some regions and neighborhoods
- Access to junk food and liquids at school
- Decreased physical activity at schools
- Reduced walking/biking to and from school
- Less outdoor play, more sedentary time watching TV or playing computer/video games
- Unsafe neighborhoods – can't go outside

**HOUSEHOLD POVERTY IS
ASSOCIATED WITH BOTH FOOD
INSECURITY AND CHILDHOOD
OBESITY**

But:

Does Hunger Cause Childhood Obesity?

Dietz, WH

Pediatrics.1995;95:766

AN INCONSISTENT LITERATURE

Food Insecurity (Insufficiency)

Association with Childhood

Overweight Status

(controlling for demographics)

9.5 Negative Studies

4.5 Positive Studies

CONCLUSION

The association of household food insecurity with childhood overweight obesity, independent of sociodemographic status, is NOT confirmed.

Child food insecurity MAY be associated with overweight obesity in White and Hispanic children, depending on their age.

**The association of food insecurity
and obesity MAY differ for African
American children, with food
secure children having higher
prevalence of obesity**

**More research is required to better
understand these relationships.**

Special Supplemental Nutrition Program for Women, Infants, and Children Participation and Infant's Growth and Health: a Multisite Study

**Black et al. Children's HealthWatch
Pediatrics. 2004;114:169**

UNADJUSTED CHILD OUTCOMES BY WIC PARTICIPATION

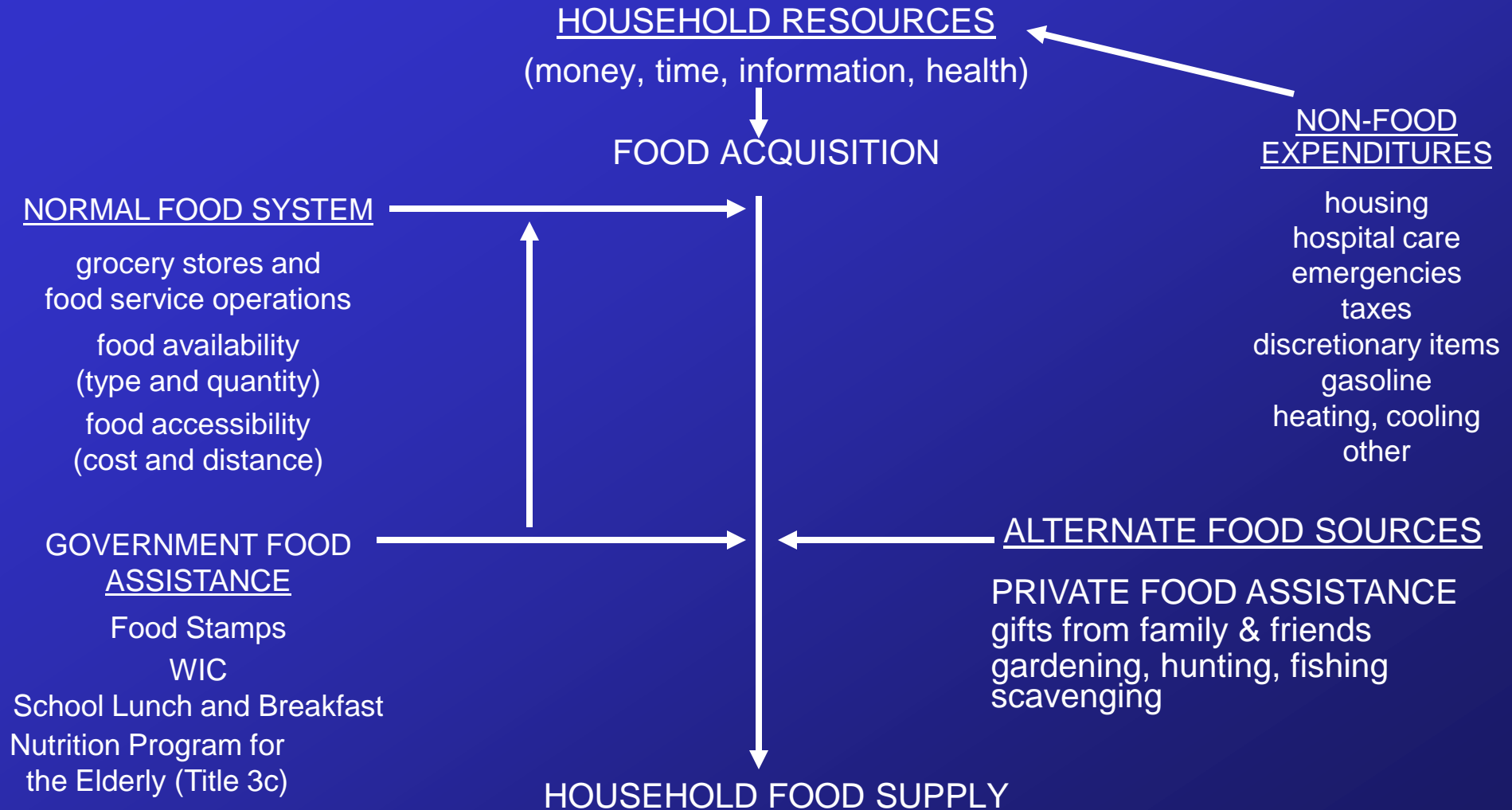
	No WIC (Access Problem) (N=340)	WIC (N=5395)	p value
Weight for Age Z score	-.36 ± 1.28	.0002 ± 1.29	<.0001
Length for Age Z score	-.41 ± .09	-.006 ± .02	<.0001
Overweight (%)	8	9	.65
Odds Ratio	.84 (.50, 1.39)	1	
Perception of Health			
(% Fair/Poor)	16	11	.01
Odds Ratio	1.09, 2.01	1	
Household Food Insecure (%)	28	23	.05
Odds Ratio	1.29 (1.01, 1.64)	1	

ADJUSTED MEANS OF INFANT GROWTH BY WIC PARTICIPATION

	No WIC (N=340)	WIC (N=5395)	P Value
Weight for Age Z Score	-.23	.009	.002
Length for Age Z Score	-.23	.002	.006
Child Health Fair/Poor	1.92 (1.29, 2.87)	1	.001
Overweight			NS
Food Insecurity	1.25 (0.9, 2.87)	1	.18

Adjusted for site, race, birth weight, months breast fed, infant age, caregiver employment status, education, household receipt of housing subsidy, public Insurance TANF, SNAP

FOOD INSECURITY AND RISK FACTORS



Modified from Campbell, CC: Food Insecurity: A Nutritional Outcome or a Predictor Variable? J Nutr. 1991.121:408

FOOD INSECURITY



A Brief Indicator of Household Energy Security: Association with Food Security, Child Health, and Child Development in U.S. Infants and Toddlers

**Cook et al. Children's HealthWatch
*Pediatrics. 2008;122:e867-e875***

ENERGY INSECURITY

In the last 12 months:

- Received letter threatening shut off of electricity or gas for not paying bill
- Ever used a cooking stove to heat house
- Any days house was not heated/cooled because could not pay the bill
- Gas/electric/oil company shut off/refused to deliver for not paying bills

HOUSEHOLD ENERGY INSECURITY AND CHILD OUTCOMES

	Moderate Energy Insecurity (Shut Off Threatened) N=1043 (11%)		Severe Energy Insecurity (Shut Off, Heat with Stove) N=2239 (23%)	
	AOR	p	AOR	p
Household FI	2.37 (1.78-3.16)	<.01	3.06 (2.46-3.81)	<.01
Child FI	1.79 (1.18-2.72)	<.01	3.46 (2.56-4.67)	<.01
Child Health Fair/Poor	1.34 (1.08-1.68)	.01	1.36 (1.15-1.61)	<.01
Significant Developmental Concerns	1.0 (.71-1.41)	.99	1.82 (1.38-2.39)	<.01

Adjusted for site, mother's race, US birth, marital status, employed, education, maternal depressive symptoms, age of child, being breast, receive Food Stamps, TANAF

U.S. HOUSING INSECURITY AND THE HEALTH OF VERY YOUNG CHILDREN

Cutts et al. Children's HealthWatch
American Journal of Public Health.
2011, June 16:e1 – e7

HOUSING INSECURITY

- Crowding: more than 2 people per bedroom, or
- Moved two or more times in the past year

INSECURE HOUSING

	Secure Housing Referent	AOR	Crowding p	AOR	Multiple Moves p
Household Food Insecurity	1	1.3	<.001	1.9	<.001
Child Food Insecurity	1	1.5	<.001	2.6	<.001
Fair/Poor Child Health	1	1.07	.14	1.48	<.001
Child Development Risk	1	1.06	.49	1.71	<.001

Adjusted for multiple family and child characteristics

DEVELOPMENT AND VALIDITY OF A 2-ITEM SCREEN TO IDENTIFY FAMILIES AT RISK FOR FOOD INSECURITY

Black et al. Children's HealthWatch
Pediatrics. 2010;126:e26-e32

TWO SCREENER QUESTIONS

- 1) “Within the past 12 months we worried whether our food would run out before we got money to buy more.”
- 2) “Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more.”

OVERLAP BETWEEN 18-ITEM HFSS AND 2-ITEM FOOD INSECURITY (FI) SCREEN

	Identified By HFSS (%)	Not Identified By HFSS (%)
Identified by FI Screen	97%	17%
Not Identified by FI Screen	3%	83%

RELATION BETWEEN FI STATUS ON HFSS AND 2-ITEM FI SCREEN AND CHILD AND CAREGIVER OUTCOMES

	HFSS		FI Screen	
	Food Secure	Food Insecure	Food Secure	Food Insecure
Child Health Fair/Poor	1	1.73 (p<.001)	1	1.56 (p<.001)
Number of Lifetime Hospitalizations	1	1.19 (p<.001)	1	1.17 (p<.001)
Developmental Risk	1	1.72 (p<.001)	1	1.60 (p<.001)
Caregiver Health Fair/Poor	1	2.29 (p<.001)	1	1.99 (p<.001)
Caregiver Depression	1	3.13 (p<.001)	1	2.76 (p<.001)

SUMMARY

Food Insecurity is a common condition, particularly among poor families, with health consequences that warrants the attention of child health providers, public health leaders, and political officials.

SUMMARY

- Along with food insecurity, other insecurities, such as housing adequacy and household energy, have negative effects on child and caregiver health
- Federal and state support programs, such as WIC, SNAP, LIHEAP, and housing subsidy, can have a positive effect on child and caregiver health
- Loss of federal and state programs, like WIC and SNAP, will likely have adverse effects on child and caregiver health

SUMMARY

Child health providers should be aware of the food, energy, and housing security status of their patients, and facilitate access to appropriate support programs when possible

WIC is an important source of foods for
a large number of mothers and children

Loss of WIC will likely have a negative effect
on child health and household food security

WIC should make every effort to provide access
to eligible families, e.g. presence at hospitals
that serve children

www.ChildrensHealthWatch.org