



Energy Security, Food Security, LIHEAP and Family and Child Health

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Boston Medical Center

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Children's Sentinel Nutrition Assessment Program (C-SNAP)



- A national network of clinicians and public health specialists for research in multiple pediatric settings on the effect of U.S. social policy on young, low-income children's health and nutrition. Research sites in:
 - **Little Rock, AR, Boston, MA, Baltimore, MD, Minneapolis, MN, Philadelphia, PA (Active)**
 - **Los Angeles, CA, Washington, D.C. (Inactive)**

C-SNAP Scientists/Collaborators/Colleagues

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- **Maureen Black, PhD (Baltimore)**
- **John Cook, PhD (Boston)**
- **Mariana Chilton, PhD (Philadelphia)**
- **Carol Berkowitz, MD (Los Angeles)**
- **Patrick Casey, MD, MPH (Little Rock)**
- **Diana Cutts, MD (Minneapolis)**
- **Alan Meyers, MD, MPH (Boston)**
- **Nieves Zaldivar, MD (Washington, DC)**
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- Minneapolis Foundation
- Daniel Pitino Foundation
- Project Bread: The Walk for
Hunger
- Sandpipers Foundation
- M&H Schaffer Foundation
- Sue Schiro & Peter Manus
- Anthony Spinazzola
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- Thomas Wilson Sanitarium for
Children of Baltimore

Presentation Overview



- Household Energy Insecurity
- Household Food Insecurity & Poverty
- Associations Between Energy Security, Food Security and Poverty
- Household Consumption & Expenditure Patterns
- Factors Affecting Family & Child Health
- Policy Issues and Handles
- Alternative Futures

What is Energy Security?

Some Preliminary Considerations

- Users: Individual, *household*, community, state, nation?
- Energy supply: Is needed energy consistently available? Are reserves available? Are production and distribution functional? Are their costs sustainable?
- Energy demand: Can users afford to purchase needed energy? Are income or other resources adequate? **Are energy prices rational?** Is energy use efficient? Are other costs/expenditures an impediment?
- Geography: Location matters a lot.

What is Energy Security?

- ***Energy Security:** Access to enough of the kinds of energy needed for a healthy and safe life in the geographic area where a household is located.*
 - *An energy-secure household's members are able to obtain the energy needed to heat/cool their home, operate lighting, refrigeration and appliances while maintaining expenditures for other necessities (e.g., rent, food, clothing, transportation, child care, medical care, etc.)*

Source: C-SNAP

Energy Insecurity: What is it and how is it measured?

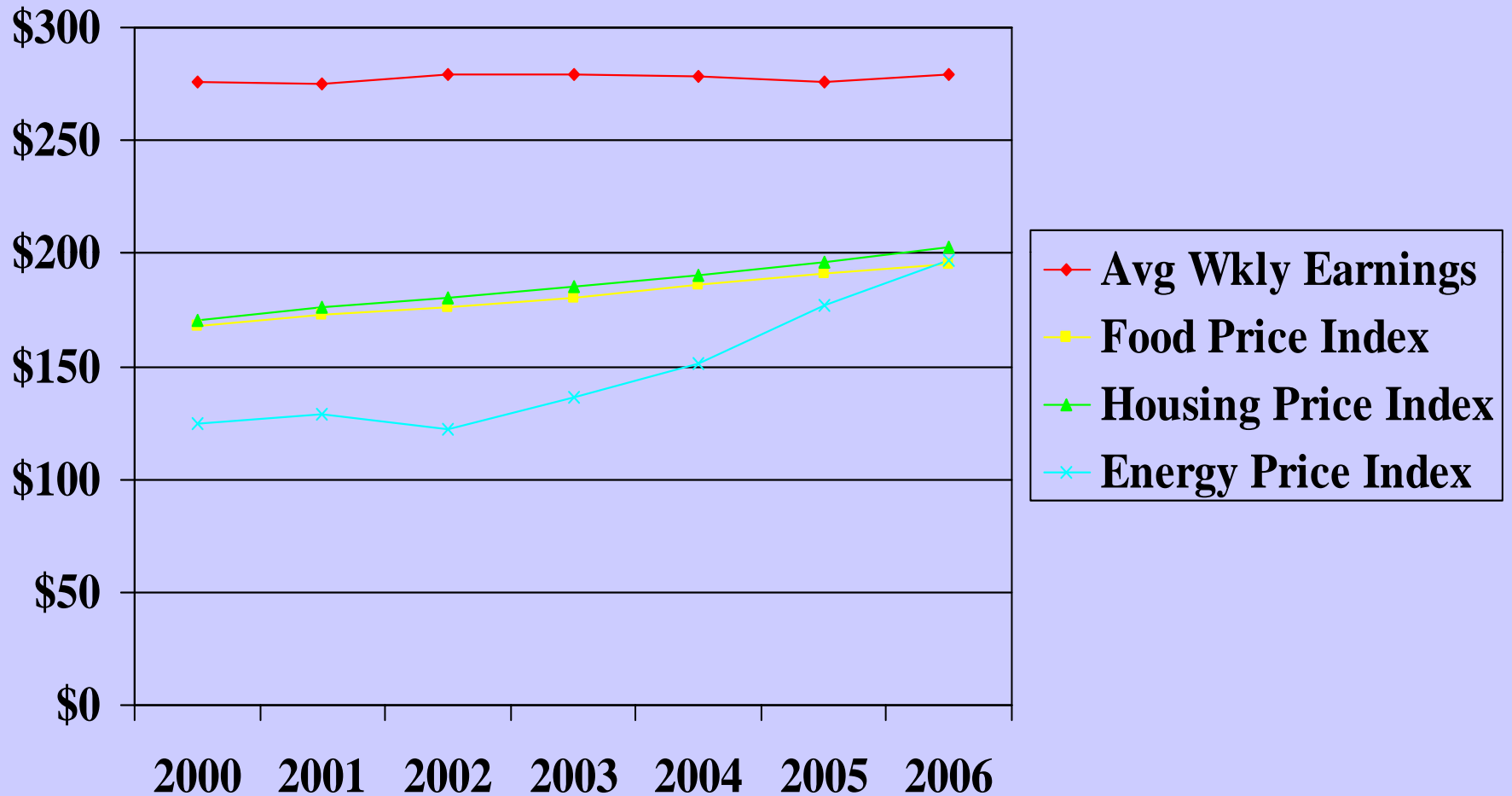
- Energy Insecurity: *Lack of or inconsistent access to sufficient affordable energy of the type and quality necessary for a healthy, safe life.*
 - Home Energy Insecurity Scale
 - HHS/OCS/ACF--LIHEAP “Managing for Results” Committee
 - Roger D. Colton, Fisher, Sheehan & Colton, Public Finance and General Economics, Belmont, MA, June 2003
 - Eleven questions asked in a household survey. Validated, but not yet implemented by HHS?

C-SNAP's Ordinal Energy Security Indicator

- Derived from four questions in the C-SNAP survey interview questionnaire
-

- Low
- Severity
- High
1. In the last year, has the [gas/electricity] company sent you a letter threatening to shut off the [gas/electricity] in the house for not paying bills?
 2. In the last year, has the [gas/electric/oil] company [shut off/refused to deliver] the [gas/electricity/oil] for not paying bills?
 3. In the last year, have you ever used a cooking stove to heat the [house/apartment]?
 4. In the last year, were there days that the home was not [heated/cooled] because you couldn't pay the bills?

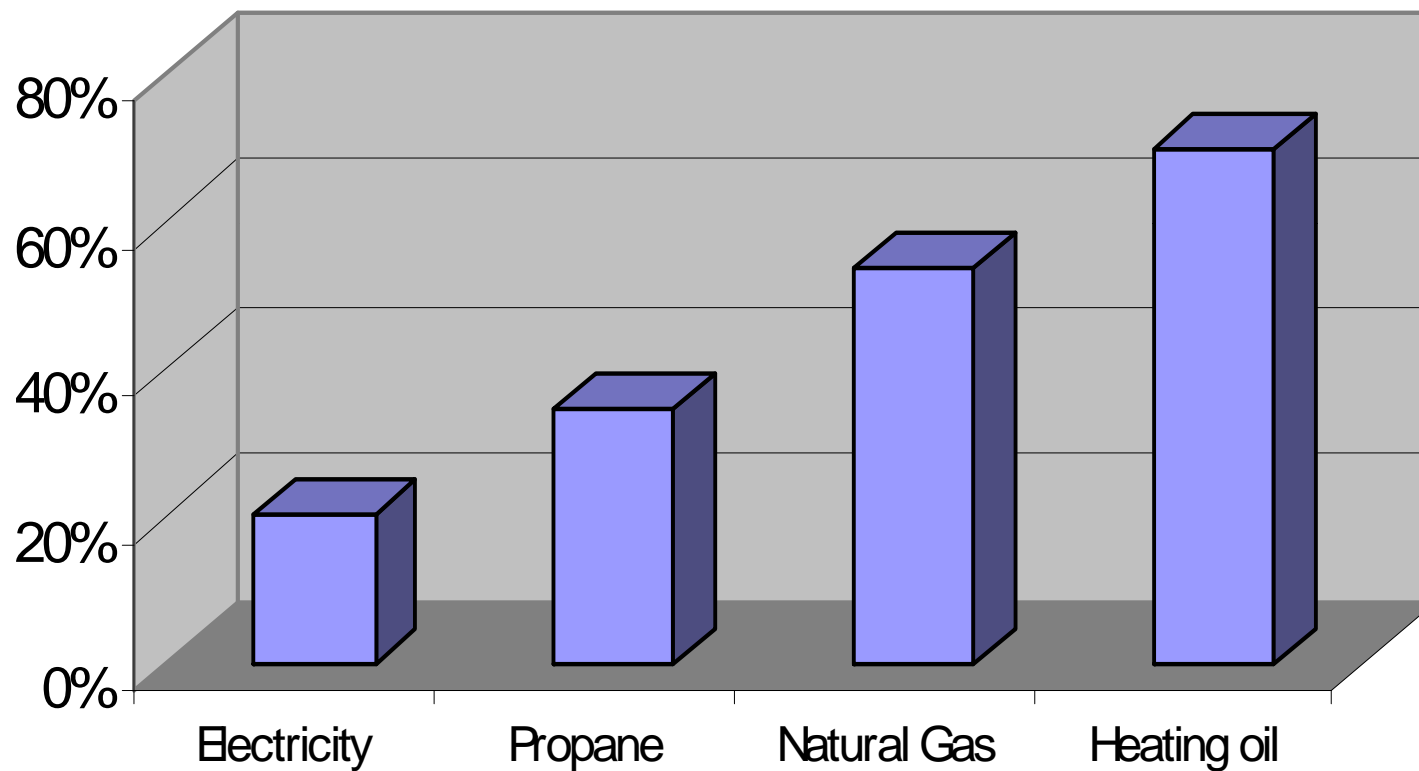
Changes in Inflation-Adjusted Average Weekly Earnings versus Prices of Selected Necessities



Source: US Dept of Labor, Bureau of Labor Statistics

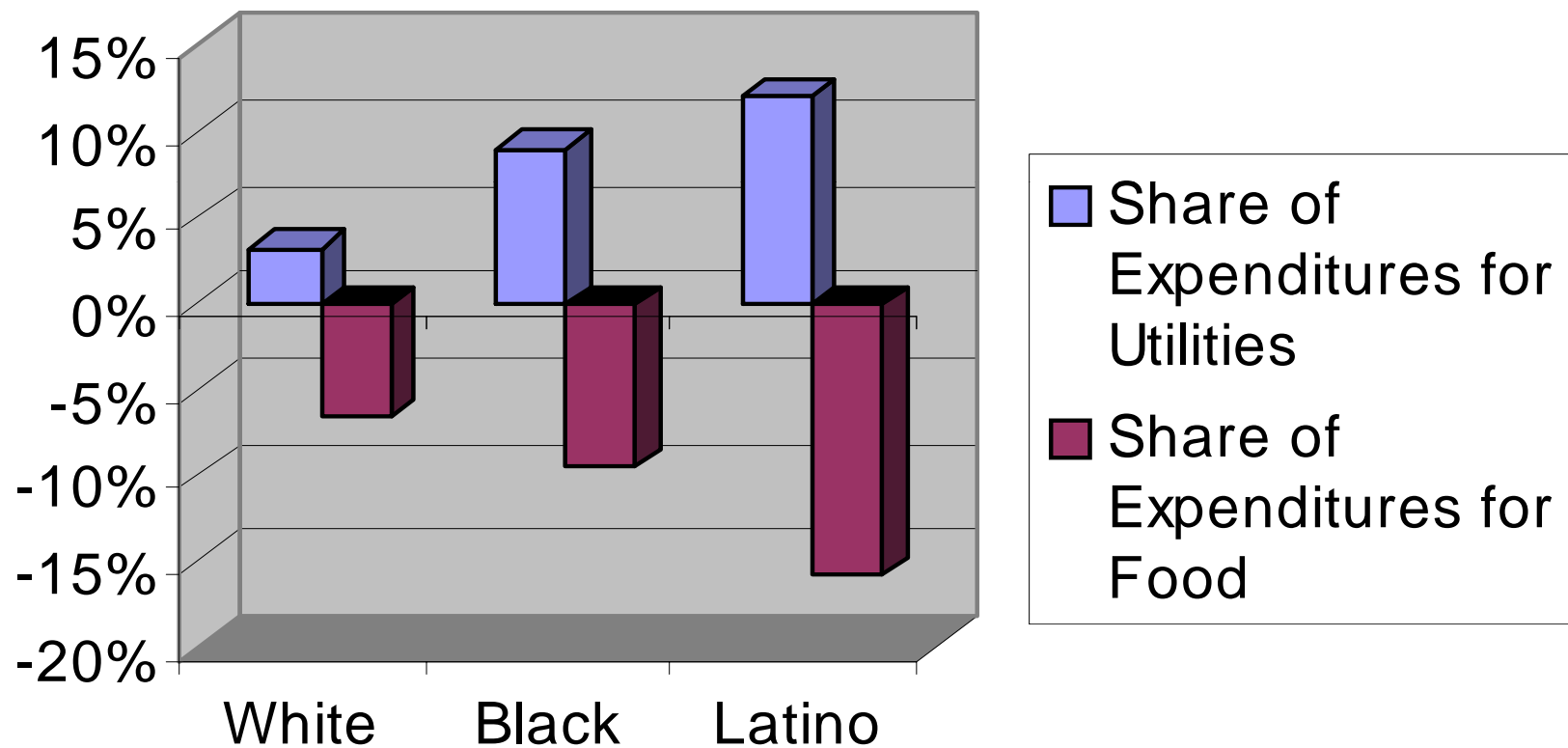
NOTE: Price index represents % change Yr to Yr

% Increase in Heating Fuel Prices by Fuel Type, Winter 2000-01 to Winter 2005-06



Source: US Energy Information Administration Short-Term Energy Outlook.

Shifts in Expenditures for Utilities vs Food By Race/Ethnicity, 2000-2005



Source: US Department of Labor, Bureau of Labor Statistics

Seasonal Variation in Wt/Age in a Pediatric Emergency Room

Exposure	Subjects	Outcome	Results	P Value
Presenting during 3 mos. following the coldest month of the year	Children ages 6-24 months presenting at Boston City Hospital ED	% With Wt/Age Below the 5 th Percentile	A significant increase in prevalence of low Wt/Age followed the coldest month	
July 1989- June 1990	Min Mean Temp=21.7F	Mean =9.6% for next 3 Mos.	Mean =6.6% for Rest of Yr.	P = 0.002
July 1990- June 1991	Min Mean Temp=29.4F	Mean =8.3% for next 3 Mos.	Mean =6.5% for Rest of Yr.	P = 0.049
July 1991- June 1992	Min Mean Temp=31.0F	Mean =8.4% for next 3 Mos.	Mean =6.6% for Rest of Yr.	P = 0.064

Source: Frank DA, et al. Seasonal Variation in Weight-for-Age in a Pediatric Emergency Room. Public Health Reports, July/August 1996, 111:366-371.

Logistic Regression Results: Energy Security as Predictor, Food Security as Outcome, Controlling for Site, Race, US-Born, Low Birthweight, Marital Status, Insurance, Child's Age

Outcome	Energy Secure: No Energy Problems (n=6,418) 67%	Less Severe: Shutoff threatened or heated with cook- stove N=2,443 25%	More Severe: Shutoff occurred or home unheated N=722 8%	P-value
HH Food Insecurity	1.00	3.25 (2.89,3.66) P<0.01	4.67 (3.90,5.58) P<0.01	P<0.01

Source: Preliminary Estimates from C-SNAP data.

Logistic Regression Results: Energy Security as Predictor, Health Indicators as Outcomes, Controlling for Site, Race, US-Born, Low Birthweight, Marital Status, Insurance, Child's Age

Outcomes	Energy Secure: No Energy Problems (n=6,418) 67%	Less Severe: Shutoff threatened or heated with cook- stove N=2,443 25%	More Severe: Shutoff occurred or home unheated N=722 8%	P-value
Child Health Fair/Poor	1.00	1.43 (1.23,1.67) P<0.01	1.38 (1.08,1.77) P<0.01	P<0.01
PEDS –Significant Concerns	1.00	1.31 (0.99,1.974) P=0.06	1.93 (1.33,2.78) P<0.01	P<0.01

Source: Preliminary estimates from C-SNAP data.

Heat or Eat: LIHEAP and Nutritional and Health Risks Among Children Less Than 3 Years of Age

Outcome	Does Not Receive LIHEAP (n=5925)	Receives LIHEAP (n=1149)	P Value
Mean Wt/Age Z-Score	-0.333	0.076	P = 0.01
At Nutritional Risk for Growth Problems	1.23	1.00	P = 0.05
Acute Hospital Admission	1.32	1.00	P = 0.05

Source: Frank, et al. Heat or Eat: The Low Income Energy Assistance Program and Nutritional Risk Among Children Less Than 3 Years of Age. Pediatrics, Nov 2006, 118(5):e1293-e1302.

Seasonal Variation in Food Insecurity is Associated with Heating and Cooling Costs among Low-Income Elderly Americans

- Low-income elderly households experienced substantial seasonal variation in the incidence of food insecurity with hunger in areas with high winter heating costs and high summer cooling costs.
- In high-cooling states: odds of food insecurity with hunger for poor elderly-only households were 27% higher in the summer than in the winter (*cool or eat*).
- In high-heating states: pattern was reversed for such households; the odds of food insecurity with hunger were 43% lower in the summer (*heat or eat*).

Source: Nord M, Kantor LS. Seasonal variation in food insecurity is associated with heating and cooling costs among low-income elderly Americans. J Nutr, November 2006. 136:2939-2944.

How is Energy Security related to Food Security and Child Health?



A Logic Model for Considering Ways
Unaffordable Energy Affects Child Health

**Unhealthy Consequences: Energy Costs and
Child Health**

A Child Health Impact Assessment of
Energy Costs and the Low Income Home Energy
Assistance Program

Prepared by the Child Health Impact Working Group
Boston, Massachusetts
November 2006

Pathways of the Impacts of Unaffordable Energy on Low-Income Households

Mechanism



Short-Term Impacts



Medium & Long-Term Impacts

High energy costs force budget trade-offs that jeopardize child health.

Families spend less on food, medications, and housing in order to pay high energy costs.^{2,3,4}

- "Heat or eat" - food insecurity & other nutritional risk due to trade-offs between energy and food expenditures

- Seasonal food insecurity

- Poor growth
- Malnutrition - infection cycle leading to increased illness
- Cognitive, developmental deficits of malnutrition affecting school performance

Pathways of the Impacts of Unaffordable Energy on Low-Income Households (Contd.)

Mechanism	Short-Term Impacts	Medium & Long-Term Impacts
<ul style="list-style-type: none">- High energy costs result in unpaid bills, arrearages and utility disconnection.- Families make partial rent or mortgage payments or miss an entire payment because of unaffordable energy bills.	<ul style="list-style-type: none">- Potential cold exposure- Increased use of alternative heating sources (see above)- Possible loss of utilities required for basic health and safety: light, refrigeration, cooking, water heating- Increased risk of housing instability due to utility disconnection	<ul style="list-style-type: none">- Adverse physical health impacts, including lack of primary care, untreated or undertreated medical conditions, growth delay- Adverse mental health impacts, including anxiety, depression, behavioral disorders- Adverse behavioral, developmental and educational impacts, including developmental delay, grade repetition

Pathways of the Impacts of Unaffordable Energy on Low-Income Households (Contd.)

Mechanism

Short-Term Impacts

Medium & Long-Term Impacts

- High energy costs combined with unaffordable housing force families to endure unhealthy housing conditions.
- High energy costs contribute to budget constraints limiting families' ability to afford appropriate housing, resulting in exposure to unhealthy housing conditions:
 - > Rodent & cockroach infestation
 - > Water leaks and mold
 - > Peeling paint and lead paint

- Increased incidence & severity of asthma
- Increased incidence of lead poisoning
- Preventable injuries from fires, burns, falls
- Increased rates of infectious diseases, such as diarrhea and respiratory conditions

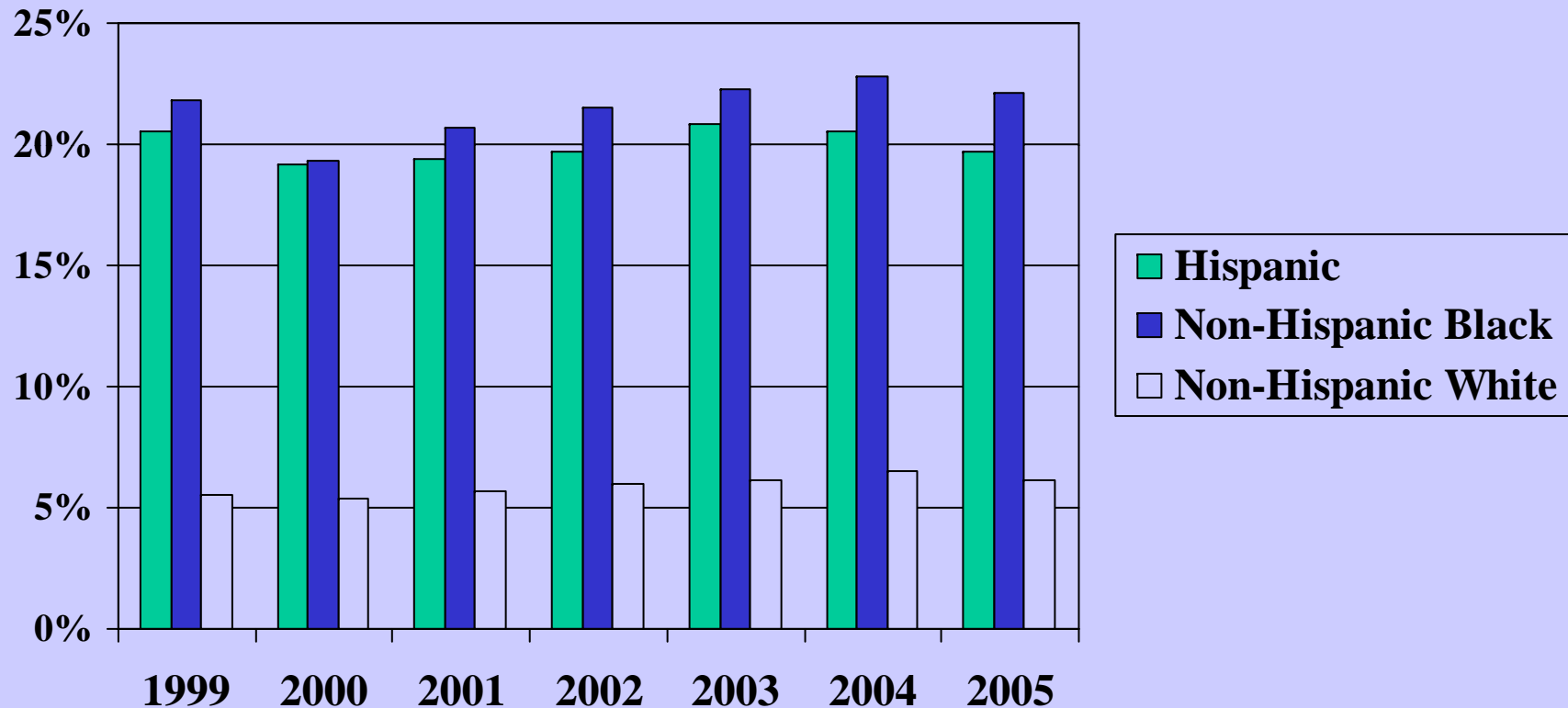
- Increased health care utilization, including emergency department visits and hospitalizations
- Missed school due to illness
- Cognitive and developmental deficits due to lead poisoning

Setting the Context

How bad are things, really?
And how did we get here?



Proportion of U.S. Families with Incomes Below Poverty By Race/Ethnicity, 1999-2005*



*Includes households with and without children.

Source: U.S. Census Bureau, Current Population Survey, various years.

The Current U.S. Poverty Thresholds

Poverty Thresholds for 2005 by Size of Family and Number of Related Children Under 18 Years
(Dollars)

Size of family unit	Weighted average thresholds	Related children under 18 years								
		None	One	Two	Three	Four	Five	Six	Seven	Eight or more
One person (unrelated individual)....	9,973									
Under 65 years.....	10,160	10,160								
65 years and over.....	9,367	9,367								
Two persons.....	12,755									
Householder under 65 years.....	13,145	13,078	13,461							
Householder 65 years and over.....	11,815	11,805	13,410							
Three persons.....	15,577	15,277	15,720	15,735						
Four persons.....	19,971	20,144	20,474	19,806	19,874					
Five persons.....	23,613	24,293	24,646	23,891	23,307	22,951				
Six persons.....	26,683	27,941	28,052	27,474	26,920	26,096	25,608			
Seven persons.....	30,249	32,150	32,350	31,658	31,176	30,277	29,229	28,079		
Eight persons.....	33,610	35,957	36,274	35,621	35,049	34,237	33,207	32,135	31,862	
Nine persons or more.....	40,288	43,254	43,463	42,885	42,400	41,603	40,507	39,515	39,270	37,757

Source: U.S. Census Bureau.

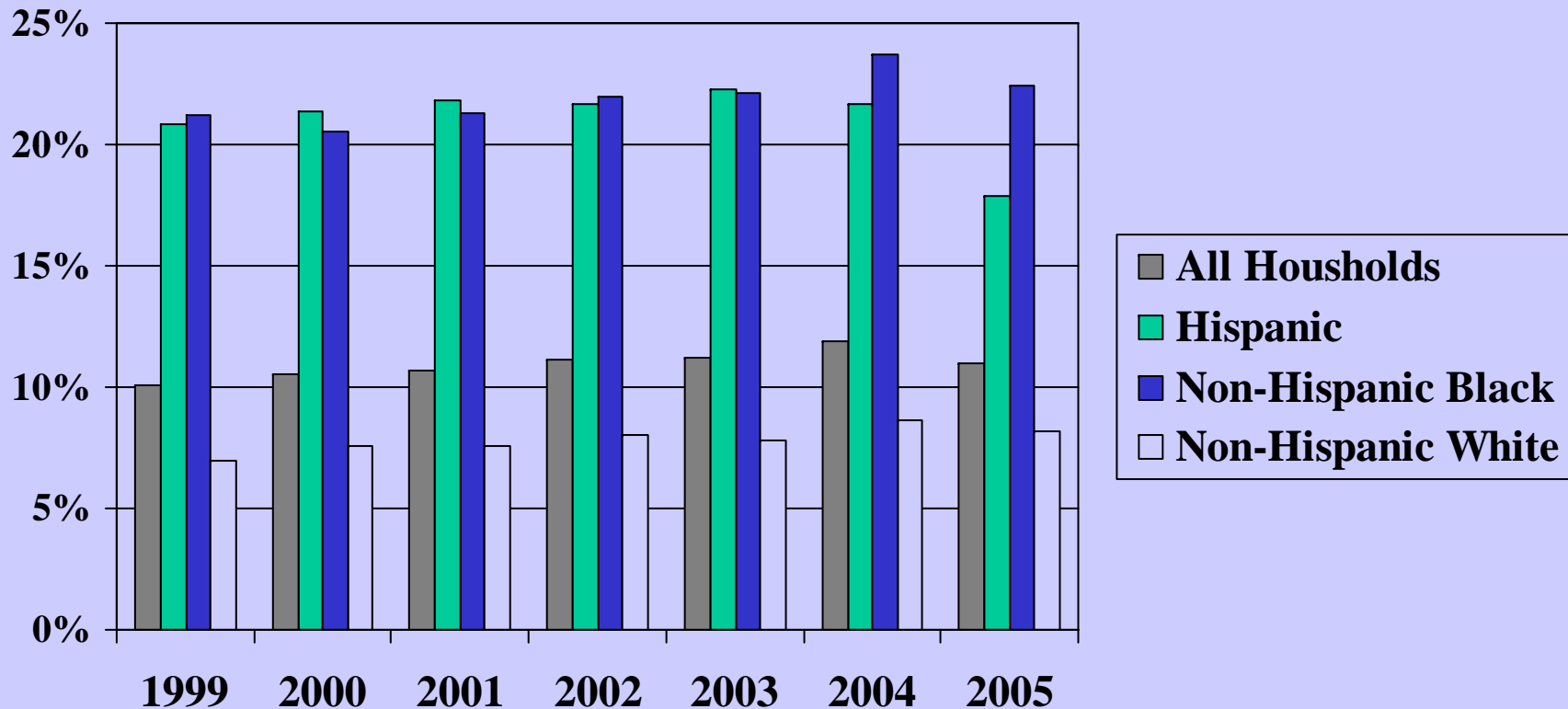
Economic Self-Sufficiency Standard for Family of Four with Two Children, Selected States

- Indiana, 2002: \$36,800/Yr (\$9.20/Hr, 2 adults)
- Kentucky, 2001: \$40,920/Yr (\$10.23/Hr, 2 adults)
- Pennsylvania, 2001: \$40,520/Yr (\$10.13/Hr, 2 adults)
- West Virginia, 2002: \$37,240/Yr (\$9.31/Hr, 2 adults)

Source: Setting the Standard for American Working Families: A Report of the Impact of the Family Economic Self-Sufficiency Project Nationwide. Wider Opportunities for Women, Washington, DC, 2003. Based on work of Diana Pearce.

- Poverty thresholds for family of four with two children:
 - **2001: \$17,960**
 - **2002: \$18,244**
 - **U.S. Federal Minimum Wage: \$5.15/Hr**
 - **In 2005, 36.95 million people in the US were in poverty**

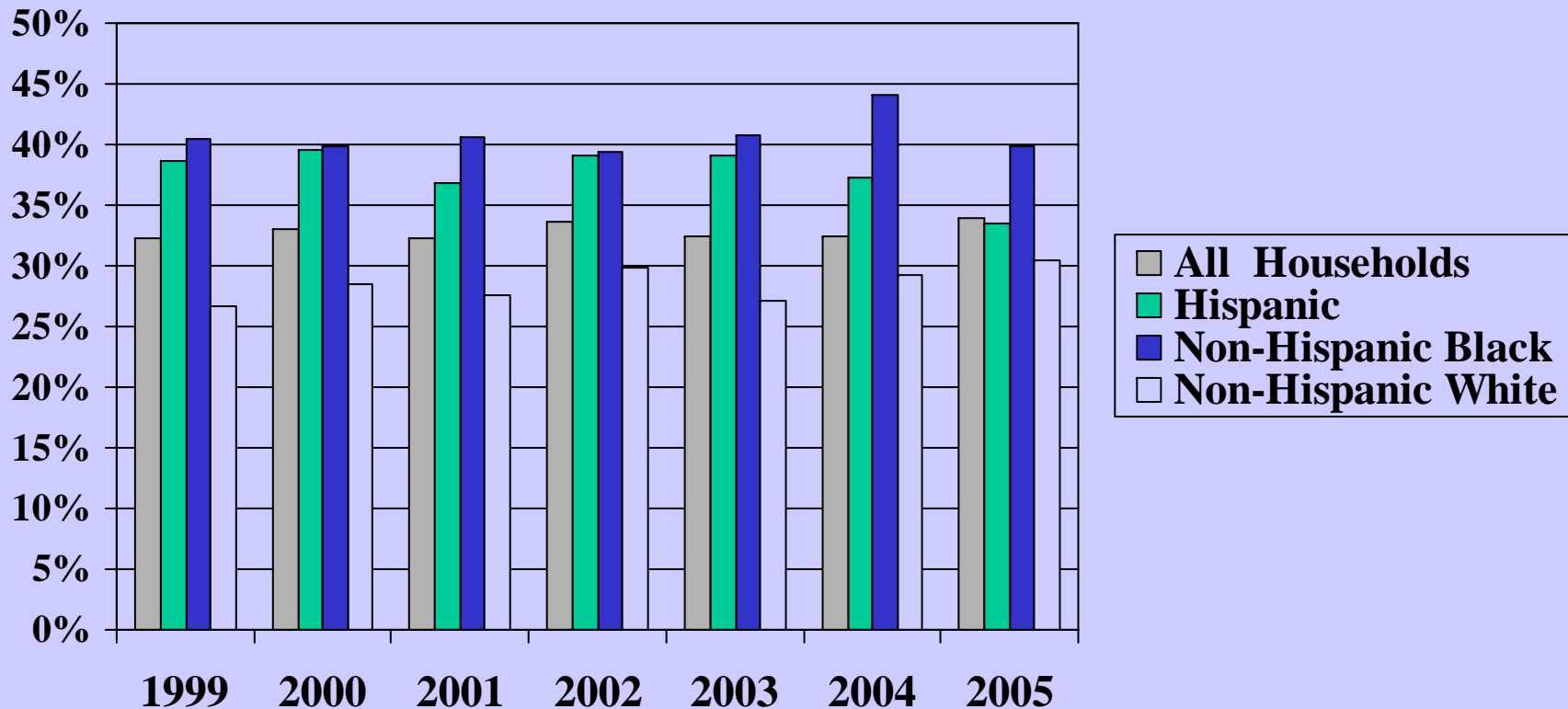
Proportion of U.S. Households that are Food Insecure, By Race/Ethnicity: 1999-2005*



*Includes households with and without children.

Source: USDA\ERS Food Security in the U.S., various years.

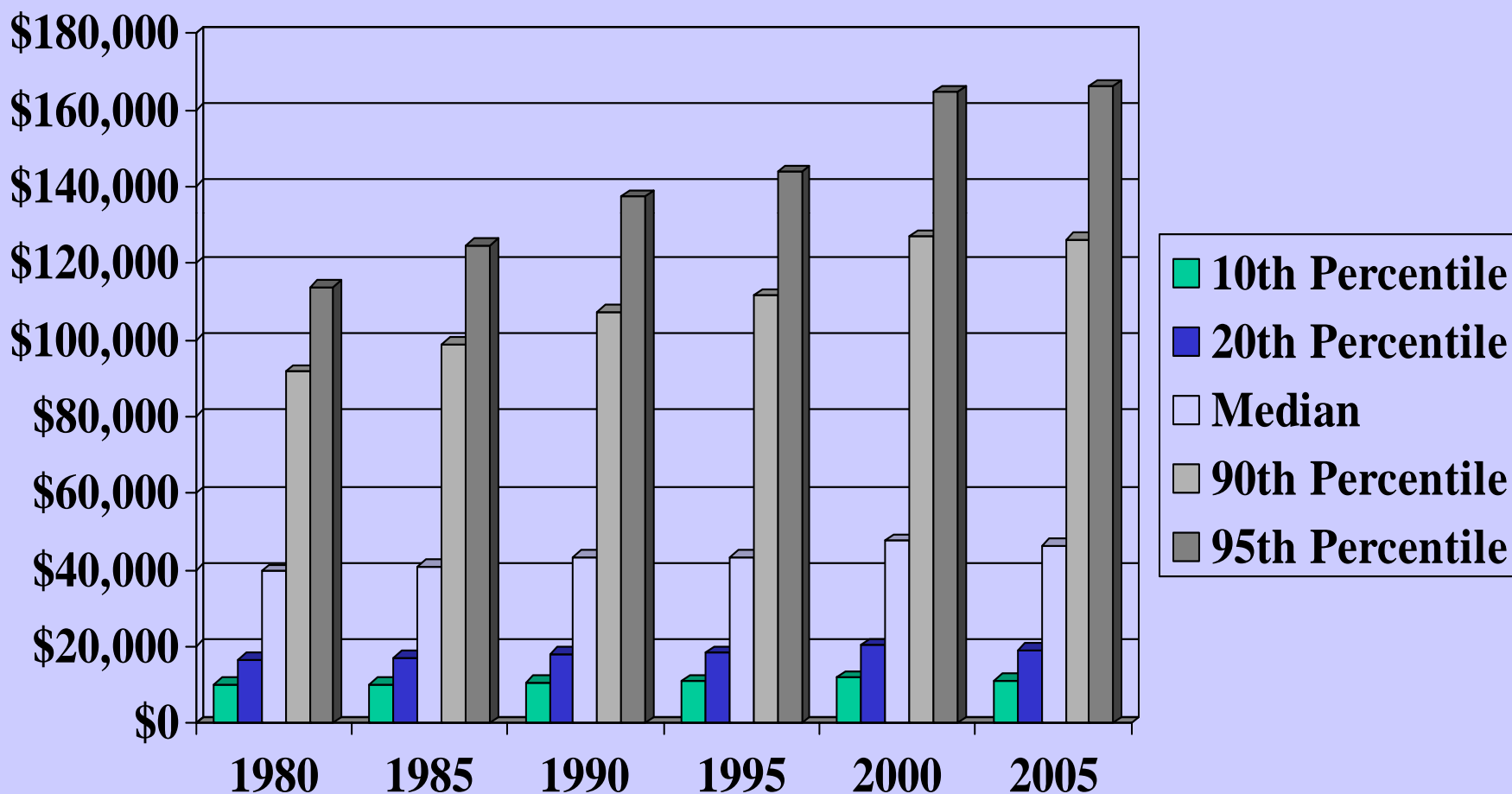
Proportion of U.S. Households with Incomes Below 130 Percent of Poverty that are Food Insecure, By Race/Ethnicity: 1999-2005*



*Includes households with and without children.

Source: USDA\ERS Food Security in the U.S., various years.

Income Limits of Selected Income Percentiles for US Households in Inflation-Adjusted 2005 Dollars



Source: US Census Bureau

NOTE: 10th & 20th percentile values are upper limits, 90th & 95th are lower limits.

What is Food Security?

Ways of Looking at Adequacy of Food Resources

- Definition: “Food security—access by all people at all times to enough food for an active, healthy life—is one of several conditions necessary for a population to be healthy and well nourished.” (*Household Food Security in the United States, 2005 / ERR-29 Economic Research Service/USDA*)
- Scope of reference: Individual, household, community, county, state, nation?
- Dimensions: Quantity, quality, affordability, accessibility, palatability, cultural appropriateness, etc.
- Severity Levels: Low to high. Worry and inconvenience to severe hunger.
- Timeframe and frequency: Occasional, often, chronic, always. Ever, within last year, within last month, last week, today.

What Influences Food Security?



What Influences Food Security?

- **Household Income**

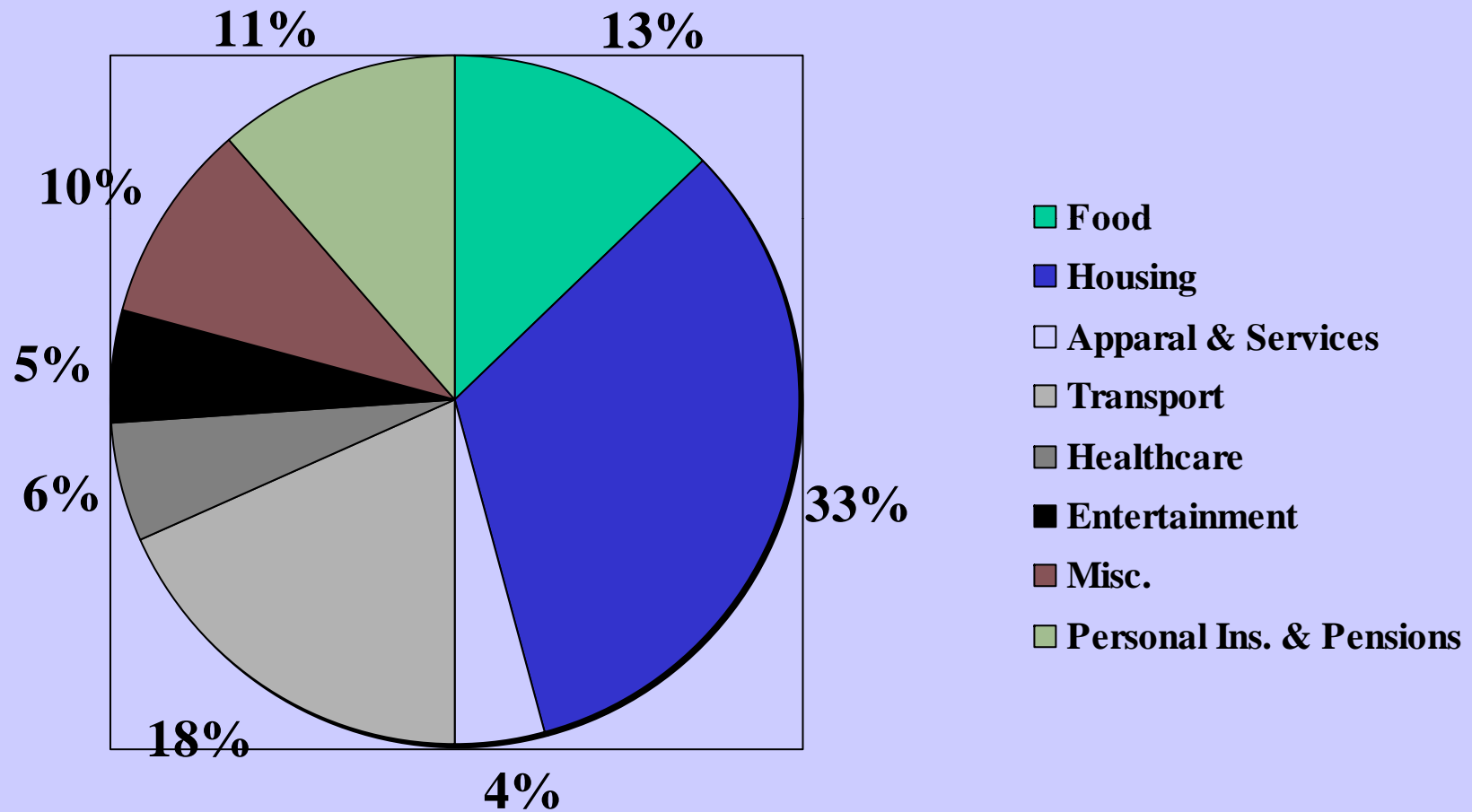
- Human Capital (E.g., education, health)
- Social Capital (E.g., civic engagement, community support)
- Social Policies (E.g., safety-net policies, tax policy, farm bill)

- **Household Costs & Expenditures**

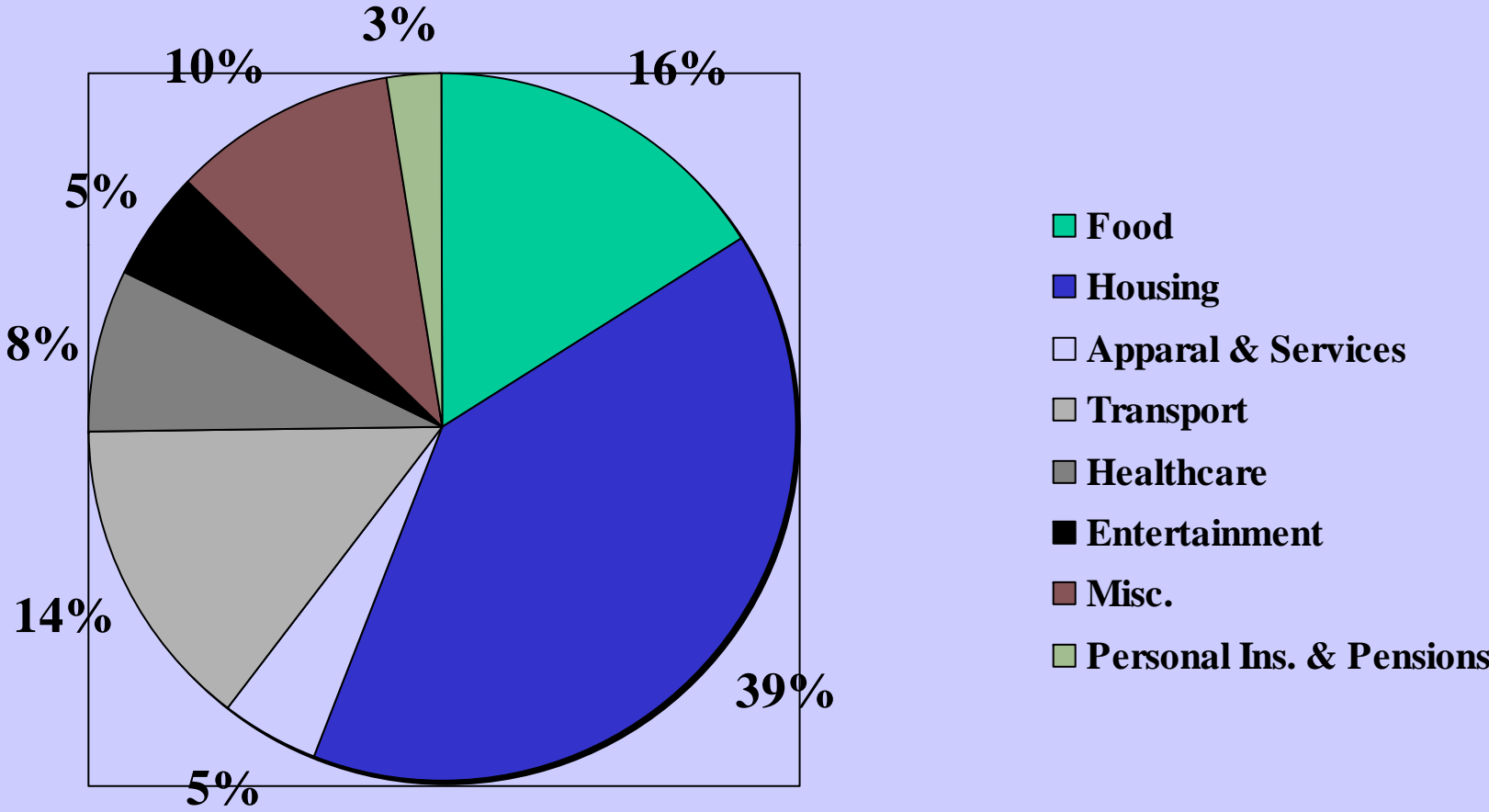
- Type of Household (E.g., marital status, children)
- Living Arrangements (E.g., Rent, own, house, apartment)
- Geography & Climate (E.g., Region, rural-urban, HDD/CDD)

- **Other factors**

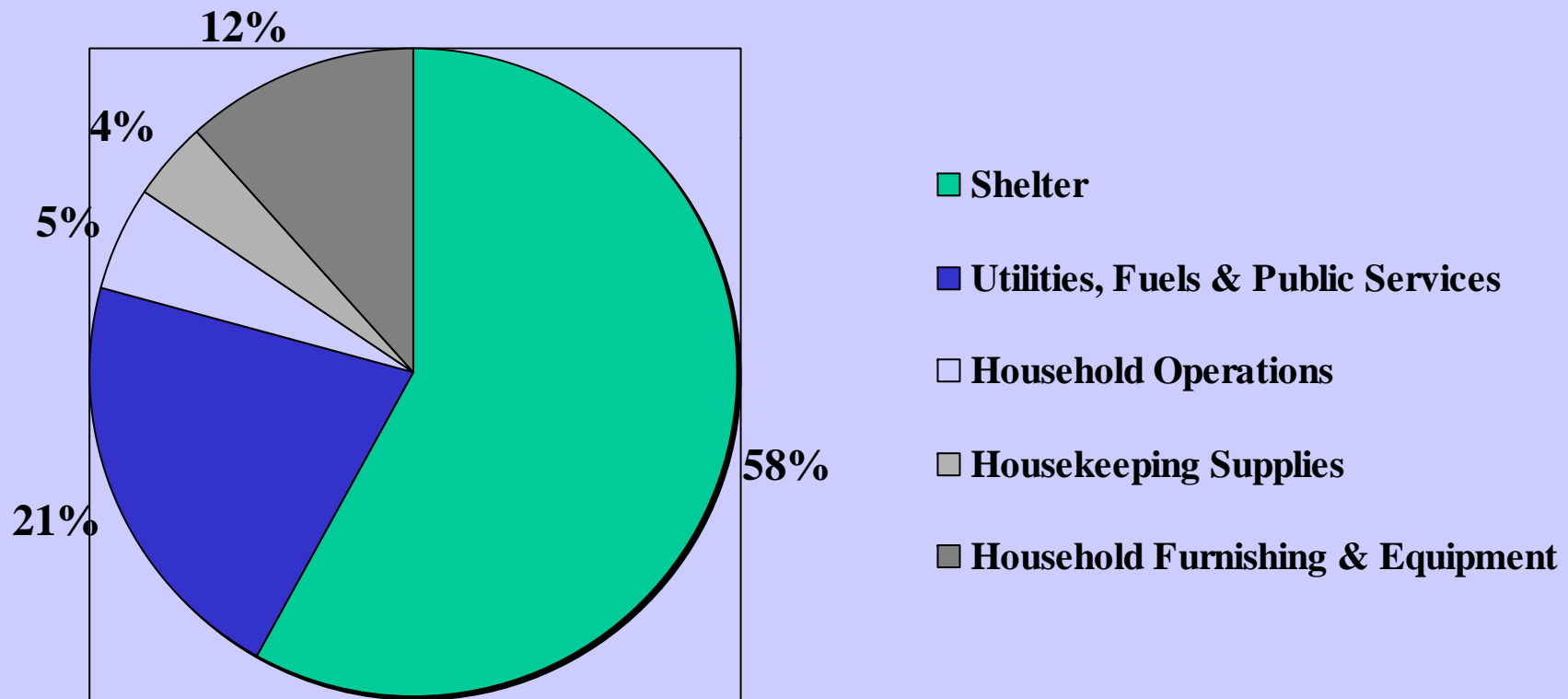
Average Proportions of Expenditures by Major Category, All Income Levels: 2005



Average Proportions of Expenditures by Major Category, Lowest Income Quintile: 2005

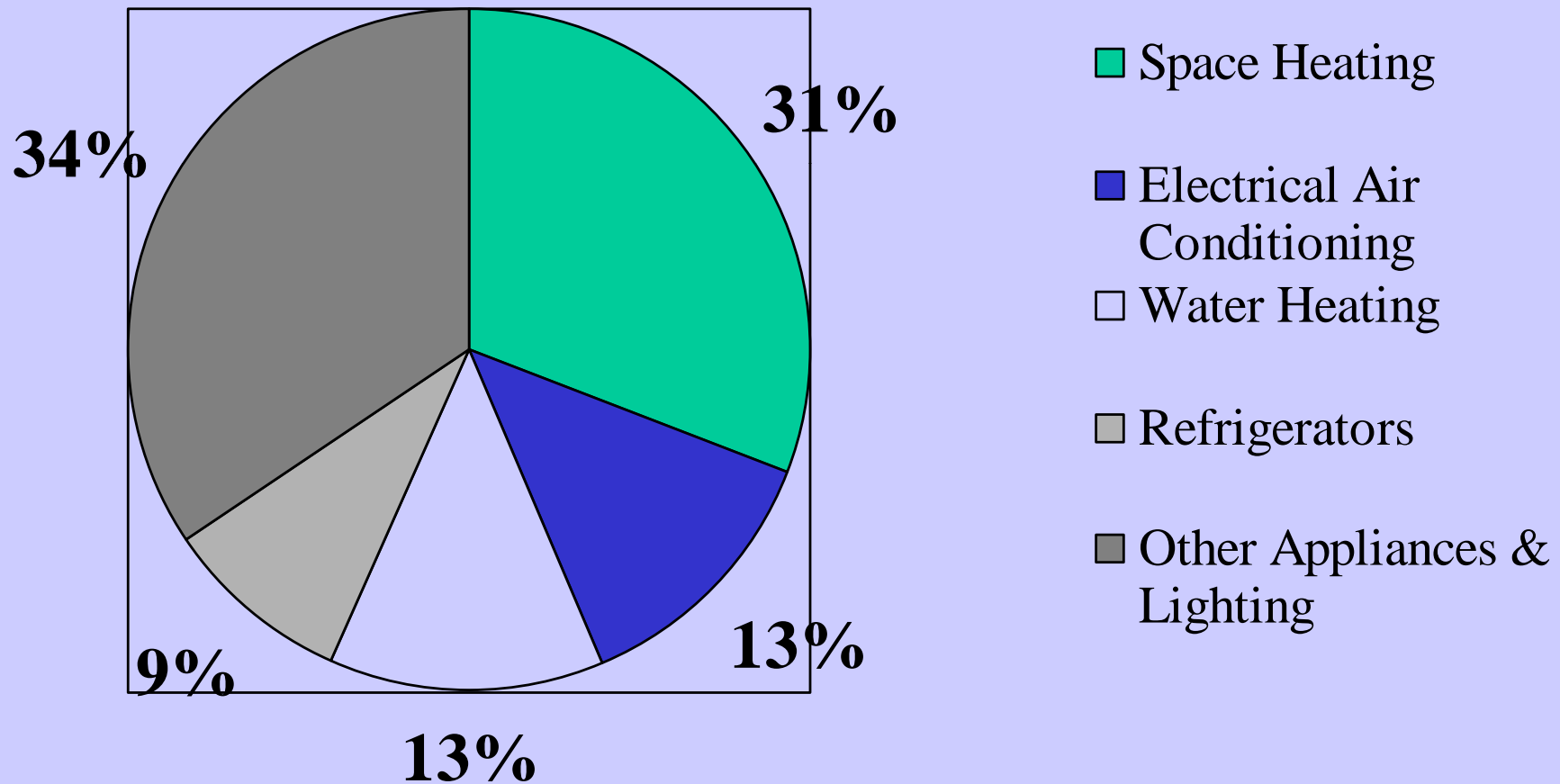


Components of Average Housing Expenditures by Sub-category, All Income Levels: 2005

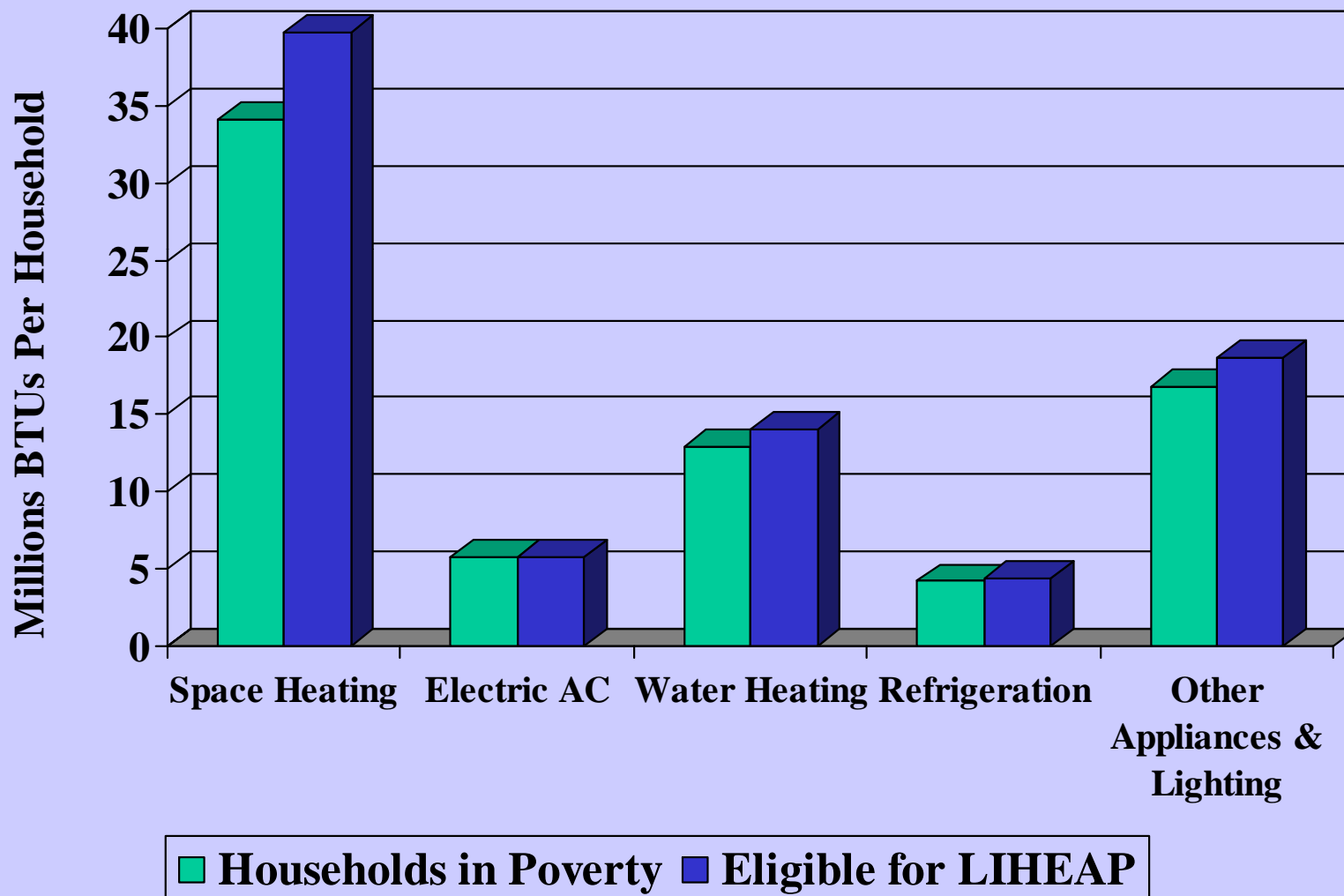


SOURCE: Bureau of Labor Statics, Consumer Expenditure Survey

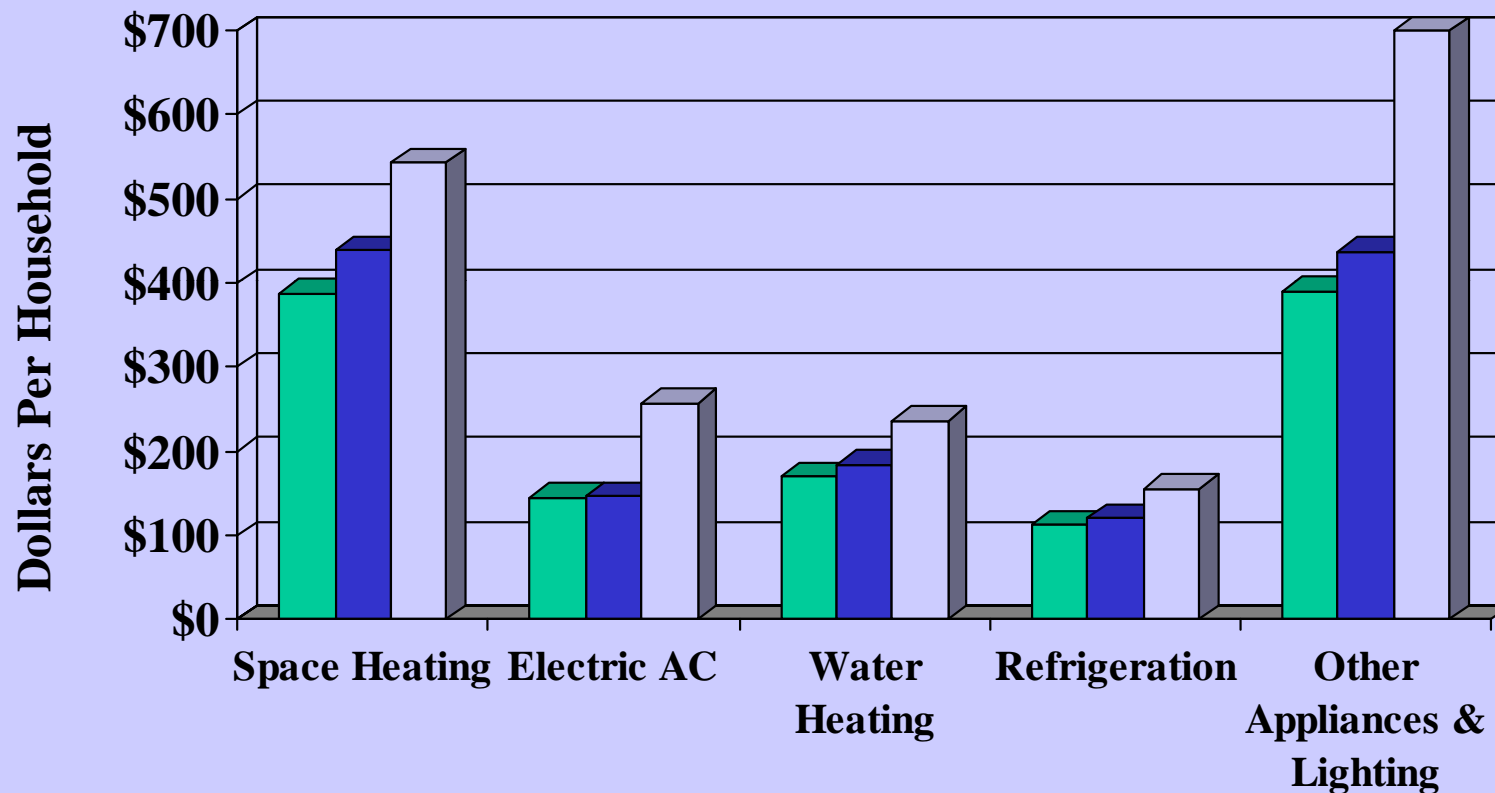
Average Residential Energy Expenditures Per Household By End-Use, All Income Levels: U.S. 2001



Average Energy Consumption By End-Use for US Households in Poverty and Eligible for LIHEAP: 2001



Average Energy Expenditures By End-Use for US Households at Different Income Levels: 2001

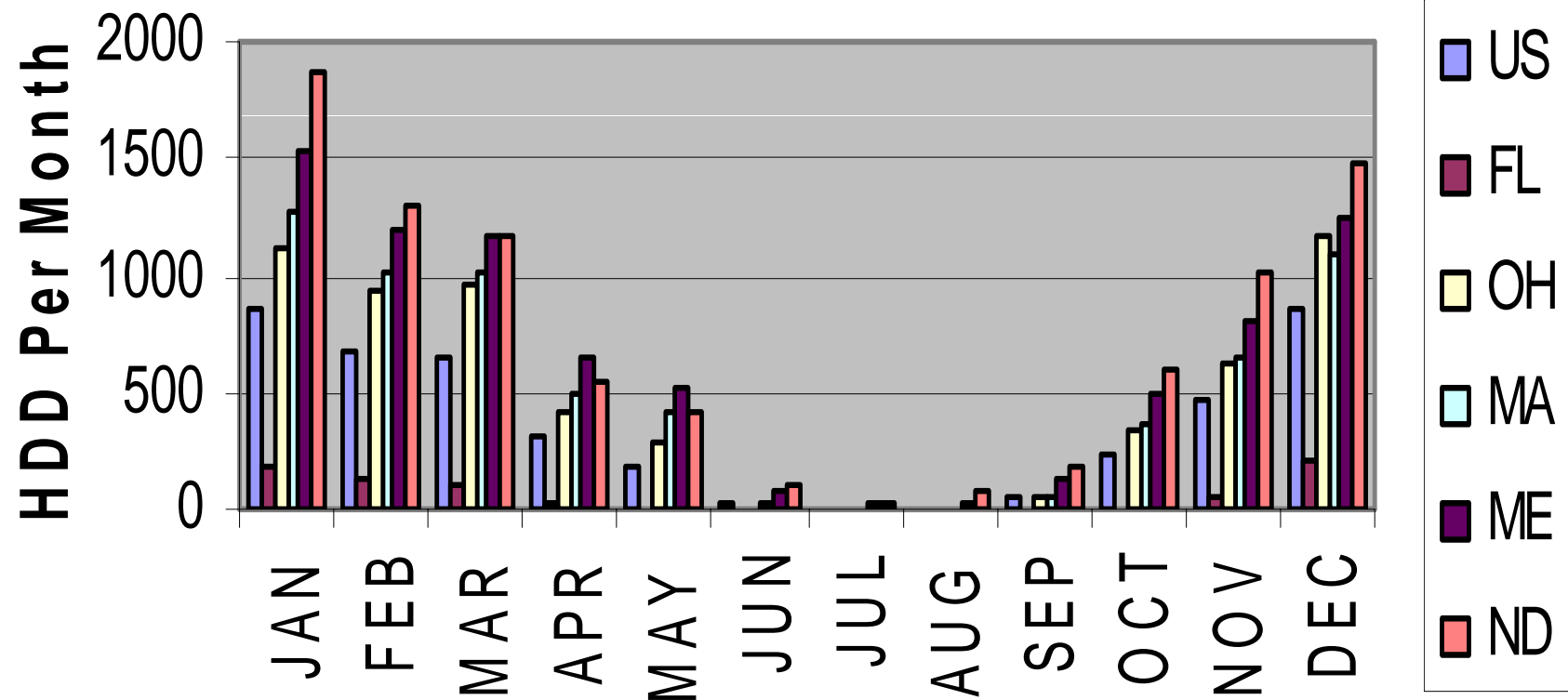


■ Households in Poverty **■ Eligible for LIHEAP**
□ With Incomes of \$50,000 or More

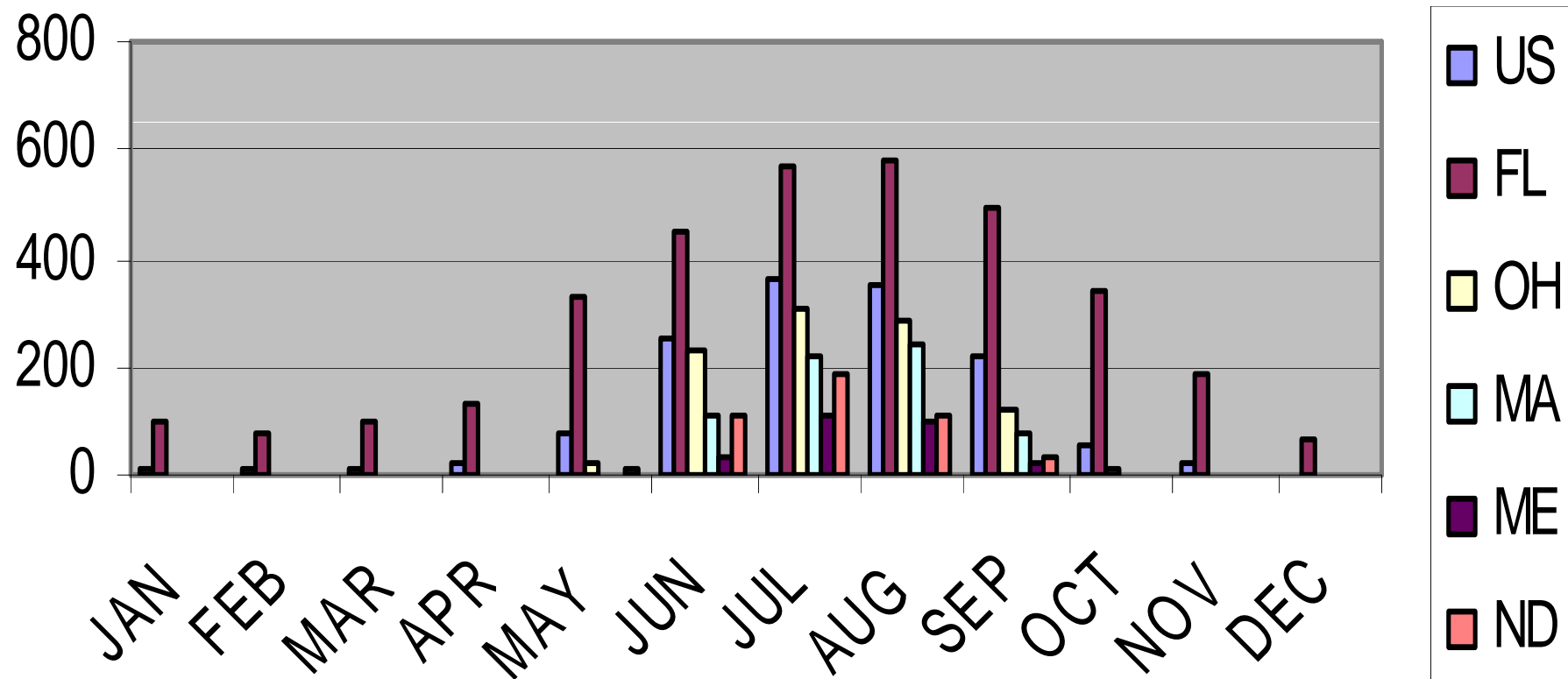
Back to LIHEAP



Number Heating Degree Days Per Month, US and Selected States: 2005



Number Cooling Degree Days Per Month, US and Selected States: 2005

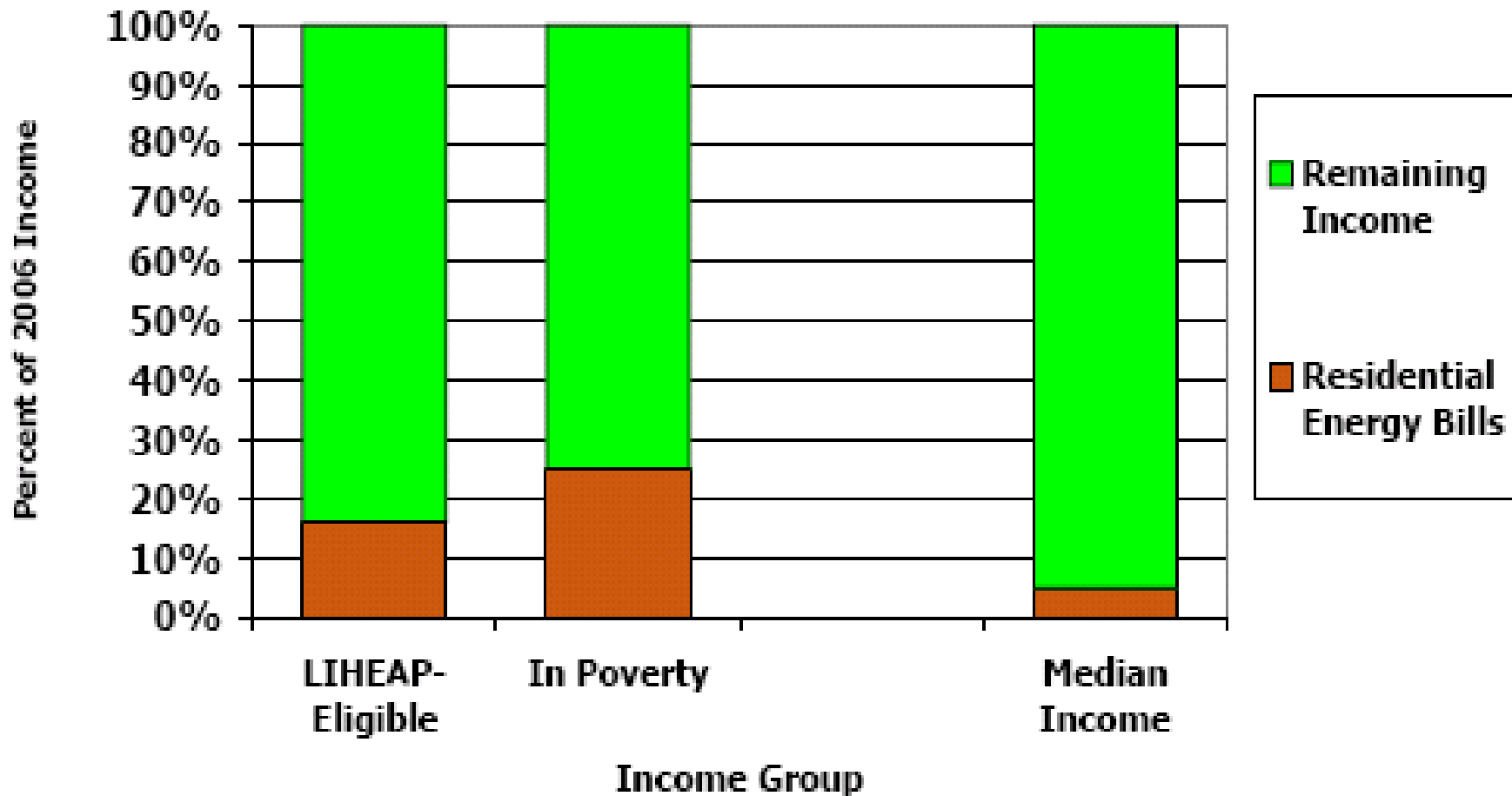


Seasonal Variation in Food Insecurity is Associated with Heating and Cooling Costs among Low-Income Elderly Americans

- In high-cooling states, the odds of food insecurity with hunger for poor elderly-only households were 27% higher in the summer than in the winter (*cool or eat*).
- In high-heating states the pattern was reversed for such households; the odds of food insecurity with hunger were 43% lower in the summer (*heat or eat*).

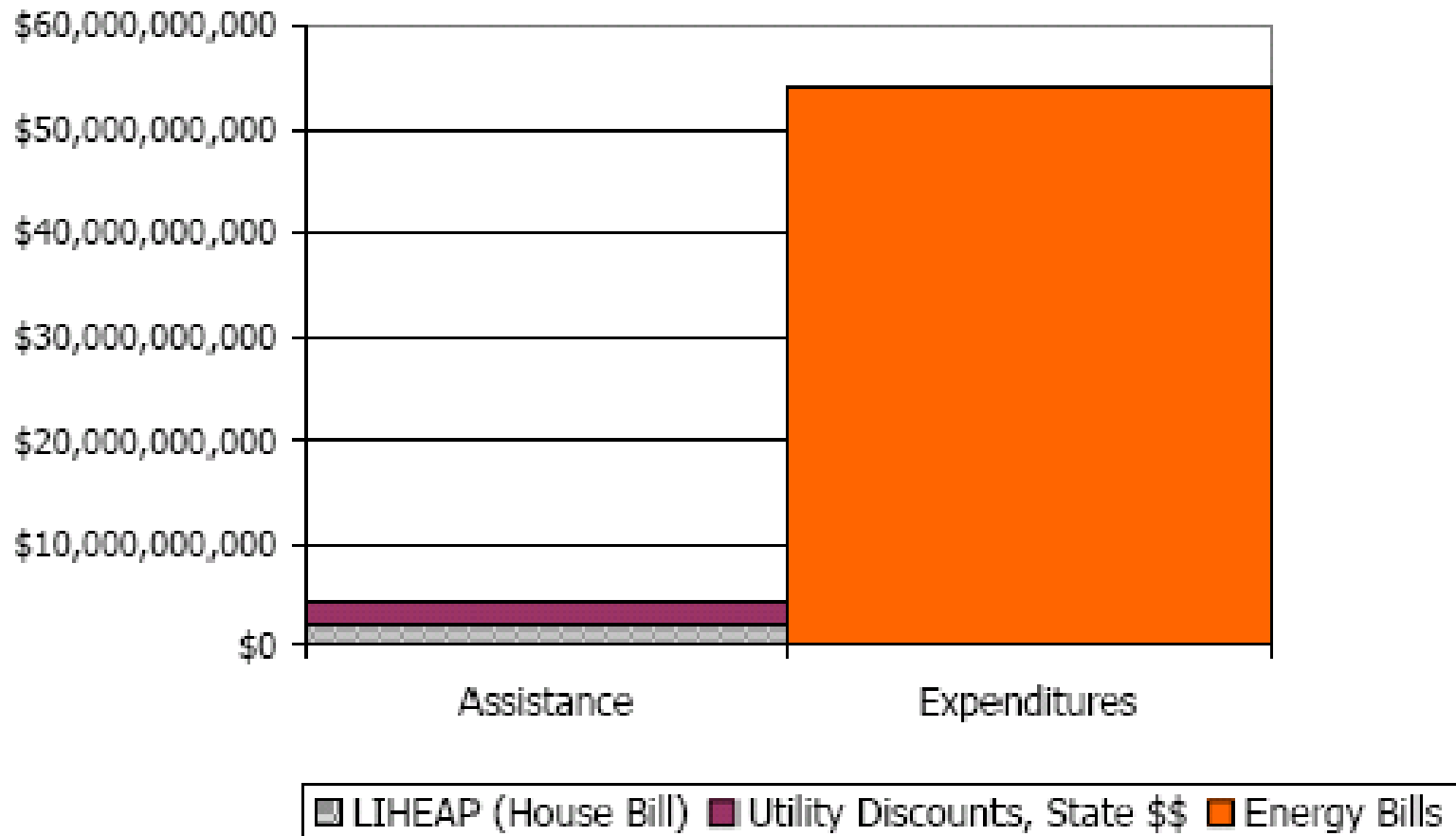
Source: Nord M, Kantor LS. Seasonal variation in food insecurity is associated with heating and cooling costs among low-income elderly Americans. J Nutr, November 2006. 136:2939-2944.

Percent of FY 2006 Household Income Needed to Pay Projected Residential Energy Bills



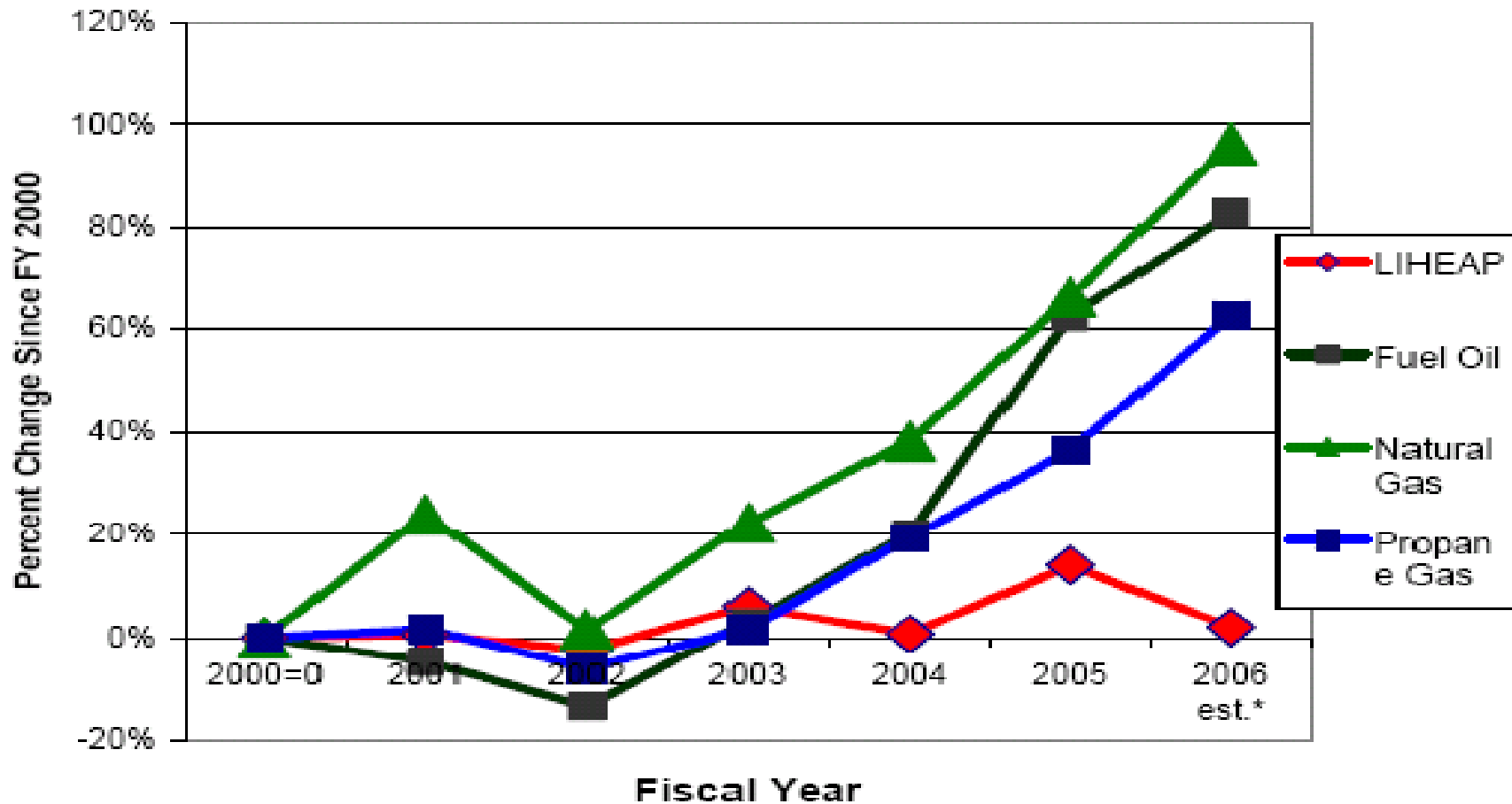
SOURCE: Power M. Lower-Income Consumers' Energy Bills and Their Impact in 2006. Economic Opportunity Studies, Washington, DC, October 25, 2005.

Projected FY 2006 Low-Income Consumer Energy Expenditures v. LIHEAP and Related Resources



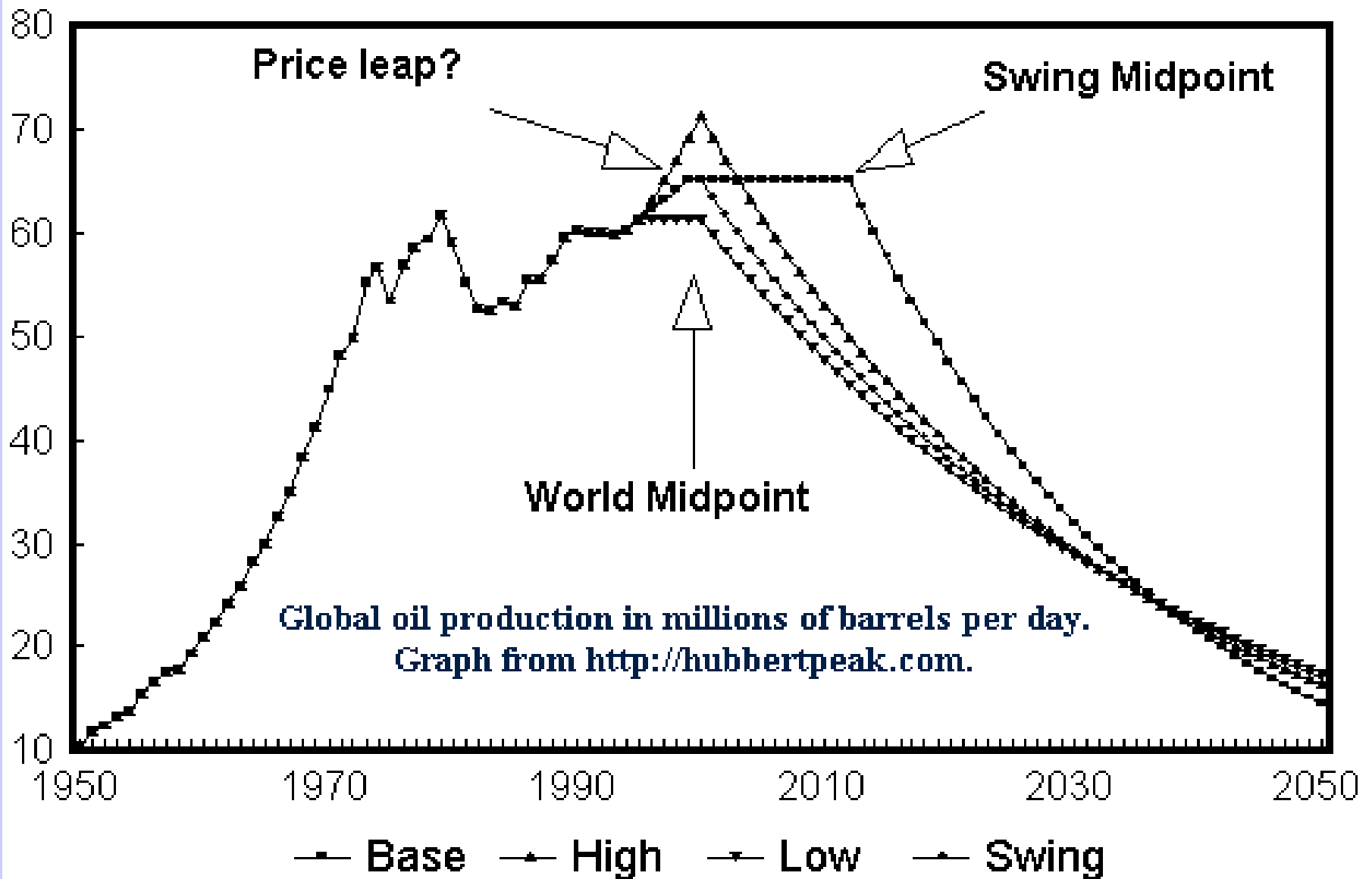
SOURCE: Power M. Lower-Income Consumers' Energy Bills and Their Impact in 2006. Economic Opportunity Studies, Washington, DC, October 25, 2005.

Five Year Index of Change: LIHEAP and Residential Fuel Prices FY 2000=0



*Sources: Price history from DOE/EIA STEO 9/05; Future Prices from DOE/EIA STEO 10/05, LIHEAP at Continuing Resolution Funding

Peak Oil: Global Forecast of World Oil Production: Campbell, 1996



Policy Handles/Leverage Points

- **The Farm Bill**
 - Food Assistance Programs
 - Food Production
 - Energy (Ethanol, inputs, transport, etc.)
- **LIHEAP Funding (State and National)**
- Annual Budget Battles (Go where the \$\$ is)
- “All Politics are Local,” in part: Work from the bottom up AND from the top down
- Build Partnerships and Coalitions
- DON'T MOURN, ORGANIZE!!

Alternative Futures

- What kind of world do we want for our children and grandchildren? (Seven generations?)
 - Status Quo ⇔ Disaster
 - Individual Responsibility Myth ⇔ Disaster
 - Community, Cooperation and Collaboration are our only hope – a Sustainable Community Approach
- **Values of A Sustainable Community Approach:**
 - Community and the “common good” are intrinsically valuable.
 - If you are in need, it diminishes me.
 - Excess is wrong if it requires deprivation among others.
 - Distribution of income matters.
 - Enough is enough.
 - There are limits to what the planet can support.
 - Civic engagement and civil service are necessary and very valuable.
 - Government of, by and for the people is still the model and goal.
 - Government works for the people, not the reverse, and it is not our enemy

THANK YOU
FOR YOUR ATTENTION

