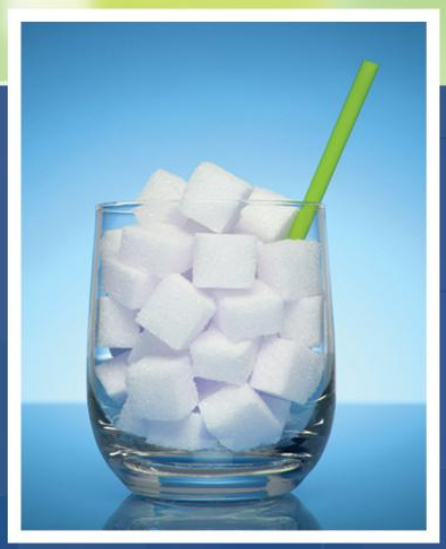


Impacts of Policy and Environment on Consumer Health Behaviors

Lisa M. Powell, PhD

Rethink Your Drink Symposium

April 25, 2012

Illinois Public Health Institute

American Heart Association. Learn and Live

Illinois Alliance to Prevent Obesity

Presenter Disclosure Information

Lisa M. Powell, PhD

Impacts of Policy and Environment on Consumer Health Behaviors

FINANCIAL DISCLOSURE:

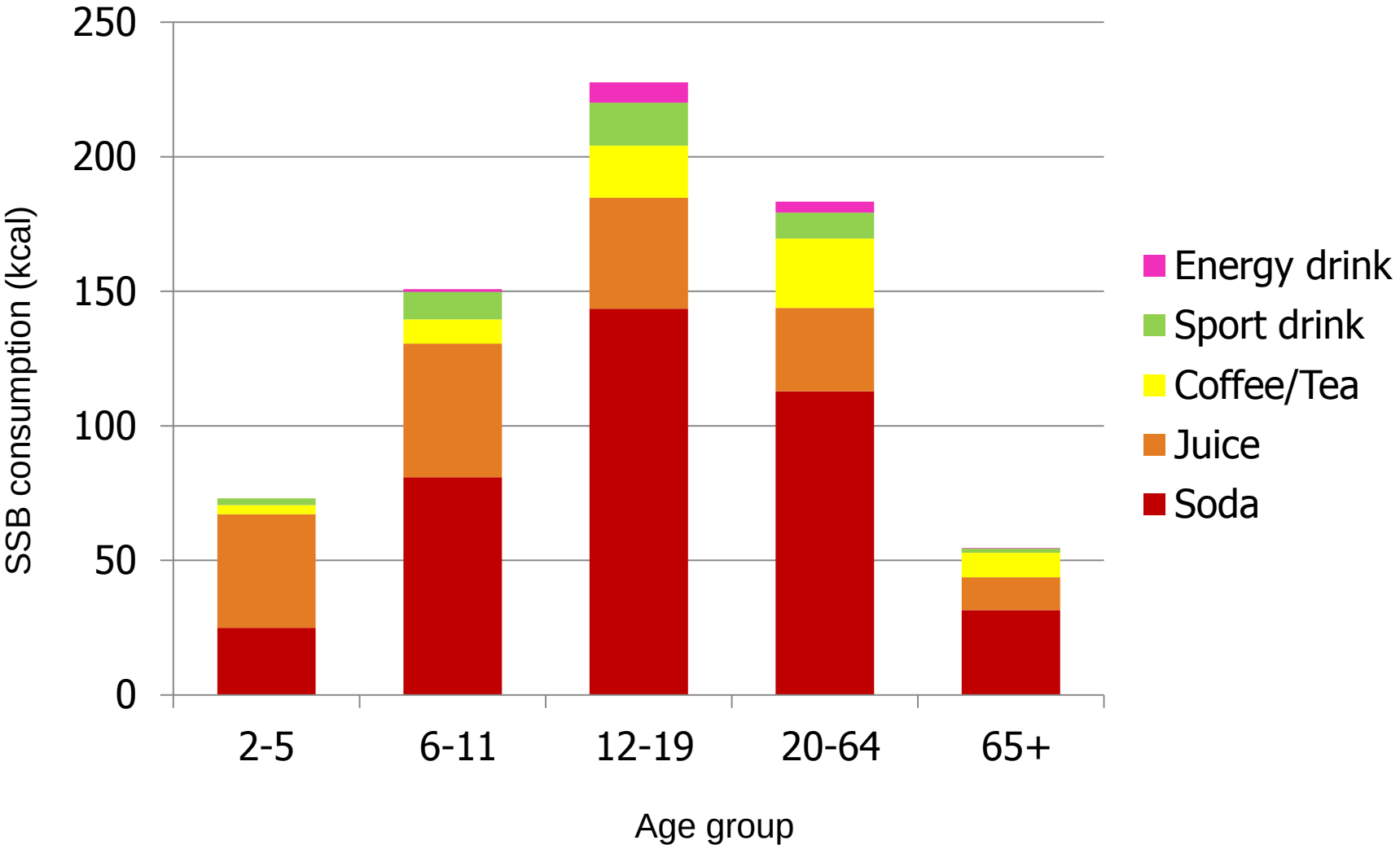
No relevant financial relationship exists

Presentation Overview

- Trends
- Soda Taxes, Consumption and Weight Outcomes
- Policy Implications

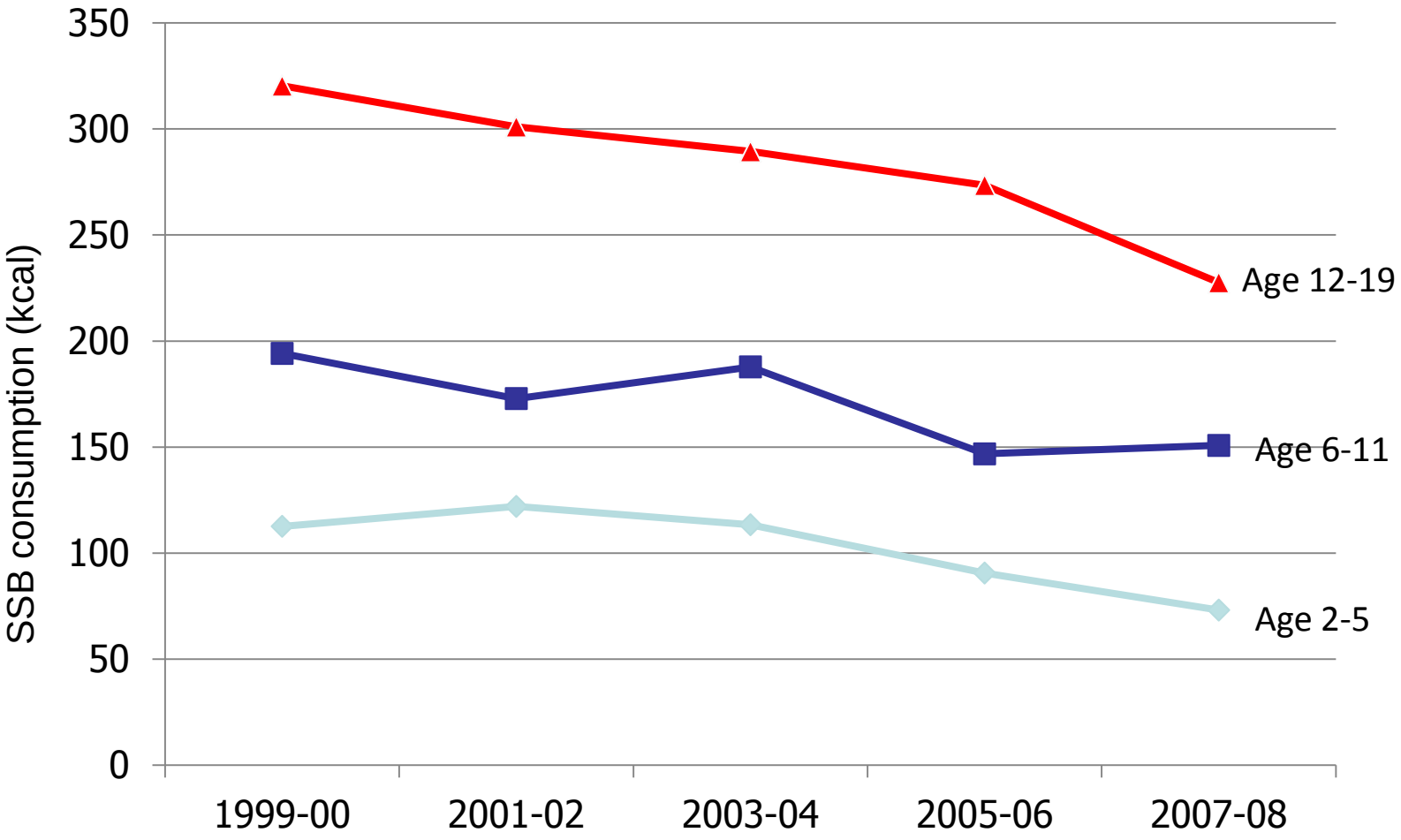
Background: Consumption Patterns

U.S. Sugar-Sweetened Beverage Consumption, by Age 2007-2008



Source: National Health and Nutrition Examination Survey (NHANES) 2007-2008, author's own calculations

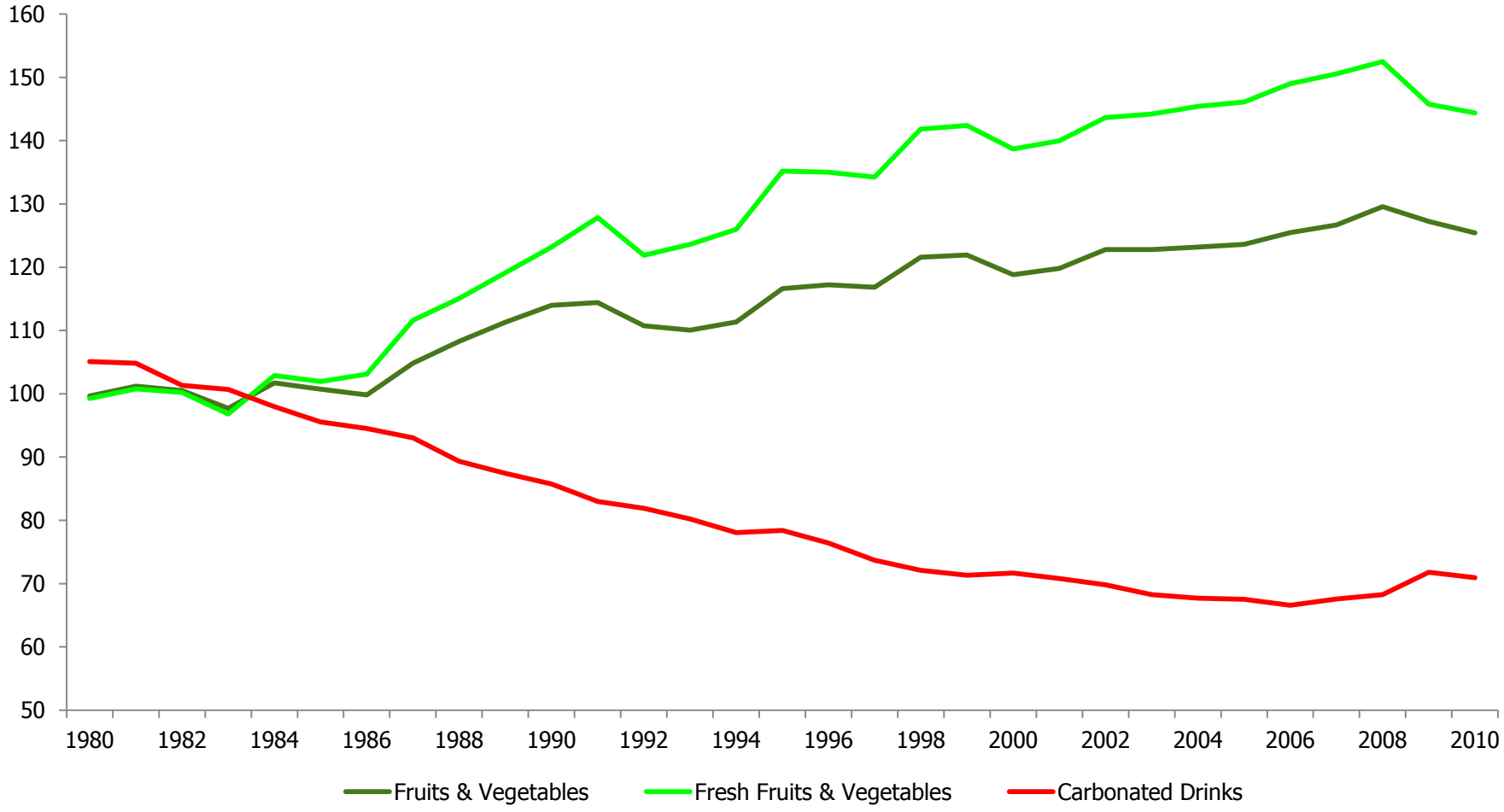
SSB Consumption among Children & Adolescents, 1999-2008



Source: National Health and Nutrition Examination Survey (NHANES) 1999-2008, author's own calculations

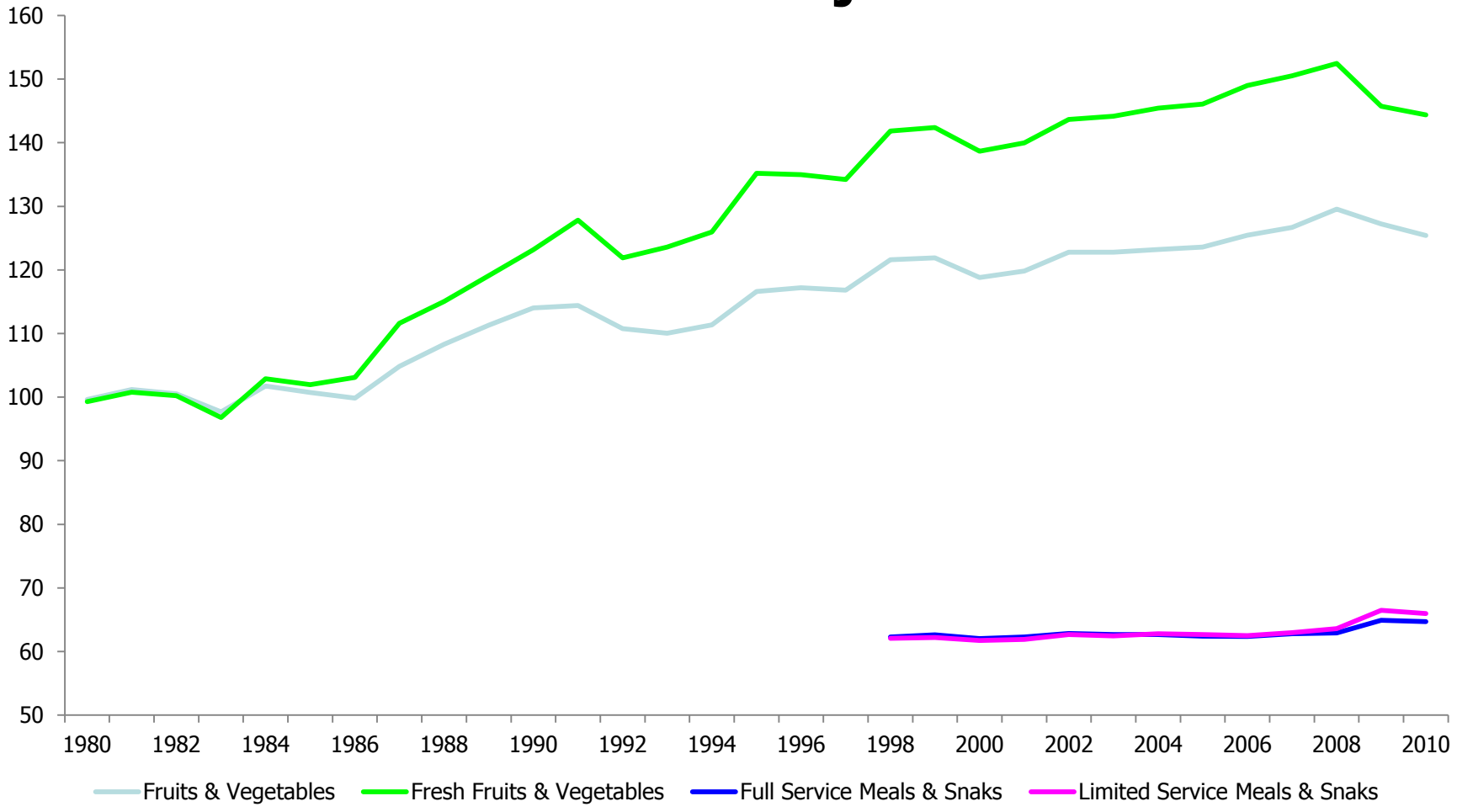
Trends in Food and Beverage Prices

Selected Food Price Trends, 1980-2010
Inflation Adjusted



Source: Bureau of Labor Statistics, 2011

Selected Food Price Trends, 1980-2010
Inflation Adjusted



Source: Bureau of Labor Statistics, 2011

Background: Economic Tool Box

Economic Models

- The economic framework assumes that individuals maximize utility (i.e., happiness) subject to time and budget constraints.

- Prices and wages

- Constraints
  - Budget
  - Time

Economic Models

- Idea is that the policy instrument changes relative costs or benefits which, in turn, affect behavior choices related to diet and activity.

- Equity considerations: i.e., soda taxes - who benefits versus who bears the costs.
  - Health benefits – progressive
  - Tax burden – regressive
  - Subsidies – progressive

Prices and Consumption

Price Effects on Consumption

- A recent review of studies on the impact of food and beverage prices on consumption of various products; estimates suggest 10% own-price increase would reduce:
  - Soft drink consumption by 7.8%
  - Food away from home consumption by 8.1%
- USDA study on SSB and other beverage consumption estimates that a 10% price increase in SSB prices would result in the following changes in consumption :
  - Own-price effect:
    - SSBs: -12.6%

Sources:
• Andreyeva, T, M Long, and K. D. Brownell, "The impact of food prices on consumption: a systematic review of research on price elasticity of demand for food." *American Journal of Public Health.* 100 (2010): 216-222.
• Smith, T. A., B.-H. Lin, and J-Y Lee. Taxing caloric sweetened beverages: Potential effects on beverage consumption, calorie intake, and obesity. Economic Research Report Number 100. 2010. United States Department of Agriculture, Economic Research Service.

Soda Taxes: Consumption & Weight Outcomes

Objectives, Data and Models

Objectives

- To empirically examine the associations of state-level soda taxes with consumption and weight outcomes, using national data sets including:
  - A.C. Nielsen Homescan Data
  - Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K)
  - National Longitudinal Survey of Youth 1997 (NLSY97)

Tax Data

- State level soda taxes from Bridging the Gap (BTG)
- Linked by state FIPS codes and year
- Measures used:
  - State-level soda tax rate
    - Disfavored dichotomous indicator (indicator if disfavored tax rate >0)
    - Disfavored tax rate (soda tax rate – general food tax rate)
  - State-level additional soda taxes/fees (dichotomous indicator)

Soda Taxes and Consumption

A.C. Nielsen Homescan Data

Objective

- To examine the association of soda taxes with household soda purchases

Data Description

- Cross-section of household purchase information based on scanner data from a variety of stores, 2nd Q 2007
- Household demographic data
- Final sample includes 66,211 non-military households
- Outcome variable: soda volume in ounces of carbonated beverages purchased per household over the sample period (m=566 ounces ~ 2 cases of 12 oz cans)
- Control variables: household income, size, race, educational attainment, presence of children/age, female head of household employment status, and census regions

Policy Simulation Example: Household Regular Soda Purchases

- Study results imply very small tax elasticities for purchases of -0.06.

- If all states increased sales taxes to the maximum tax rate of 7% (an increase of 60.6% from the current sample mean of 4.36%), household purchases of regular soda are estimated to be 3.6% lower.

- Consider the imposition of a **new 20% tax** → assuming constant elasticity, household regular soda purchases are estimated to be **27.5% lower**.

  - The extent to which this applies to all regular soda consumption depends on constant elasticity noted above, and whether regular soda consumed away-from-home is similarly price/tax responsive.

Source: Loudermilk, Powell, Chriqui, and Chaloupka, 2011

Soda Taxes, Children's Consumption, and Weight

Early Childhood Longitudinal Study-Kindergarten Cohort

Objective

- To examine association between soda taxes, consumption and weight of children

Data Description

- Nationally representative panel of elementary school students
- Food consumption 5th grade; measured height and weight
- Final sample:7,414 children who reported their food consumption and 7,300 children for which height and weight information exists
- Outcome variables: soda consumption in last week (m=6), soda purchases at school (m=0.4), and weight change 3rd to 5th grade (m=1.9)
- Control variables: age in months, race/ethnicity, family income, mother's education level, physical activity, TV watching, parent-child interactions

Policy Simulation Example: Children's BMI

- Assuming a constant elasticity, an 18% differential soda tax would correspond to a -0.23 BMI units in the change in BMI between 3rd and 5th grade, or a 20% in the excess BMI gain.

Source: Sturm, Powell, Chriqui, and Chaloupka, *Health Affairs*, 2010

Soda Taxes and Adolescents' Weight

National Longitudinal Survey of Youth 97

Objective

- To examine association of soda taxes with youths' BMI using cross-sectional *and* longitudinal models

Data Description

- Nationally representative longitudinal data on youth aged 12 to 17 in 1997; 4 waves of including 1997, 1998, 1999 and 2000
- Estimation sample includes 18,029 person-year observations living at home
- Information on parental characteristics available from parental questionnaire and annual household roster data
- Outcome variable: weight status: BMI and overweight prevalence
- Control variables: age, gender, race, ethnicity, income, mother's education, mother's employment status
- Neighborhood controls: median household income

Longitudinal Regression Estimates of the Determinants of Adolescent BMI

	BMI
Continuous disfavored state soda tax rate	-0.220**
Presence of additional state soda taxes/fees	-0.230***

Source: Powell & Chriqui, in progress, 2011

Summary of Empirical Results

- Generally moderate associations between soda taxes and body weight based on the existing low tax rates which range up to just 7% in the study sample.

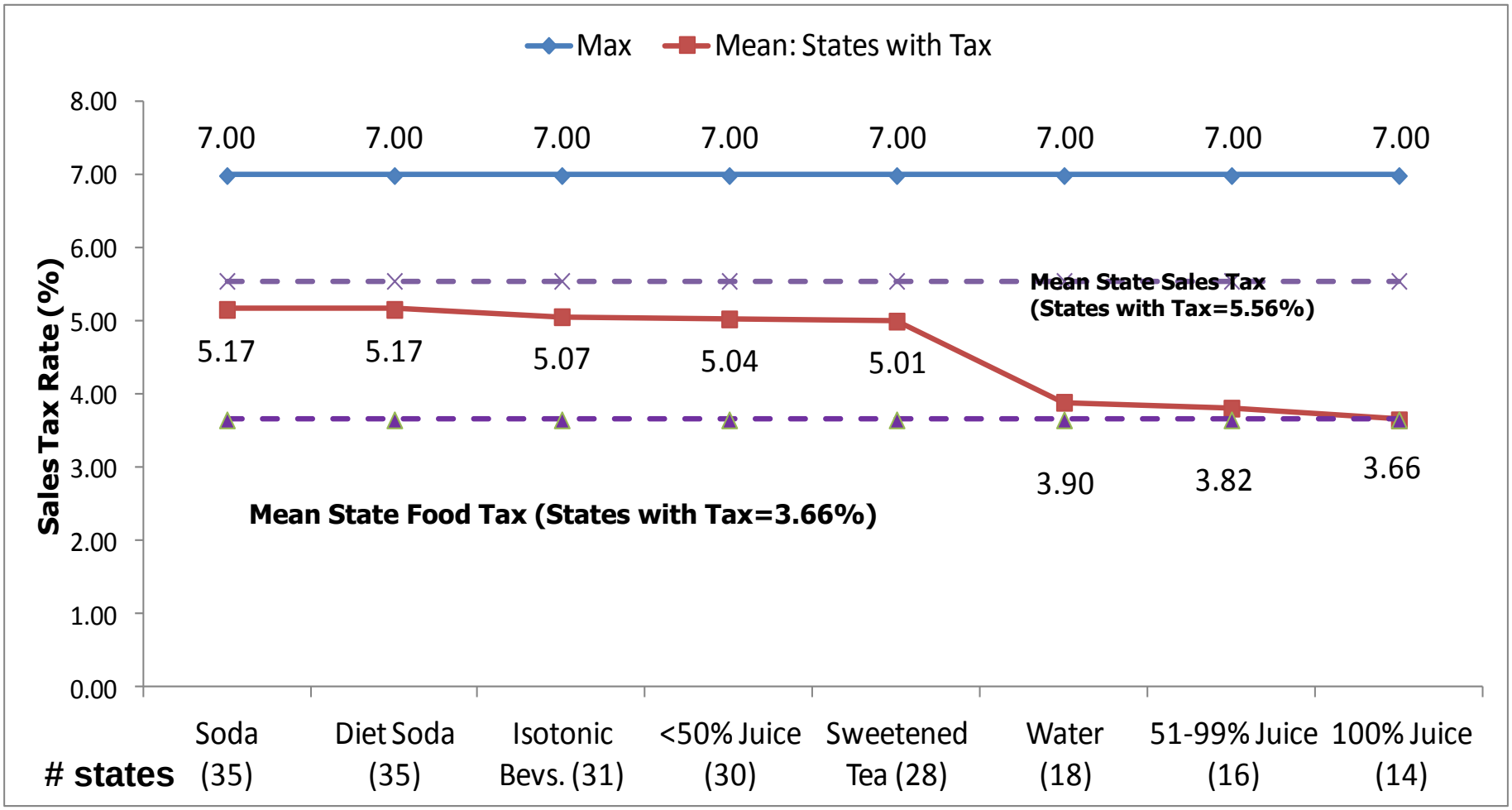
- *Substantial* increases in soda tax rates may have some measureable effects on BMI and even greater effects at the population level.

- Disfavored soda tax elasticity of BMI is estimated to be -0.029.
  - ➢Doubling the disfavored tax rate (~3% to ~6%) is estimated to reduce BMI by 2.9%.

Source: Powell & Chriqui, in progress, 2011

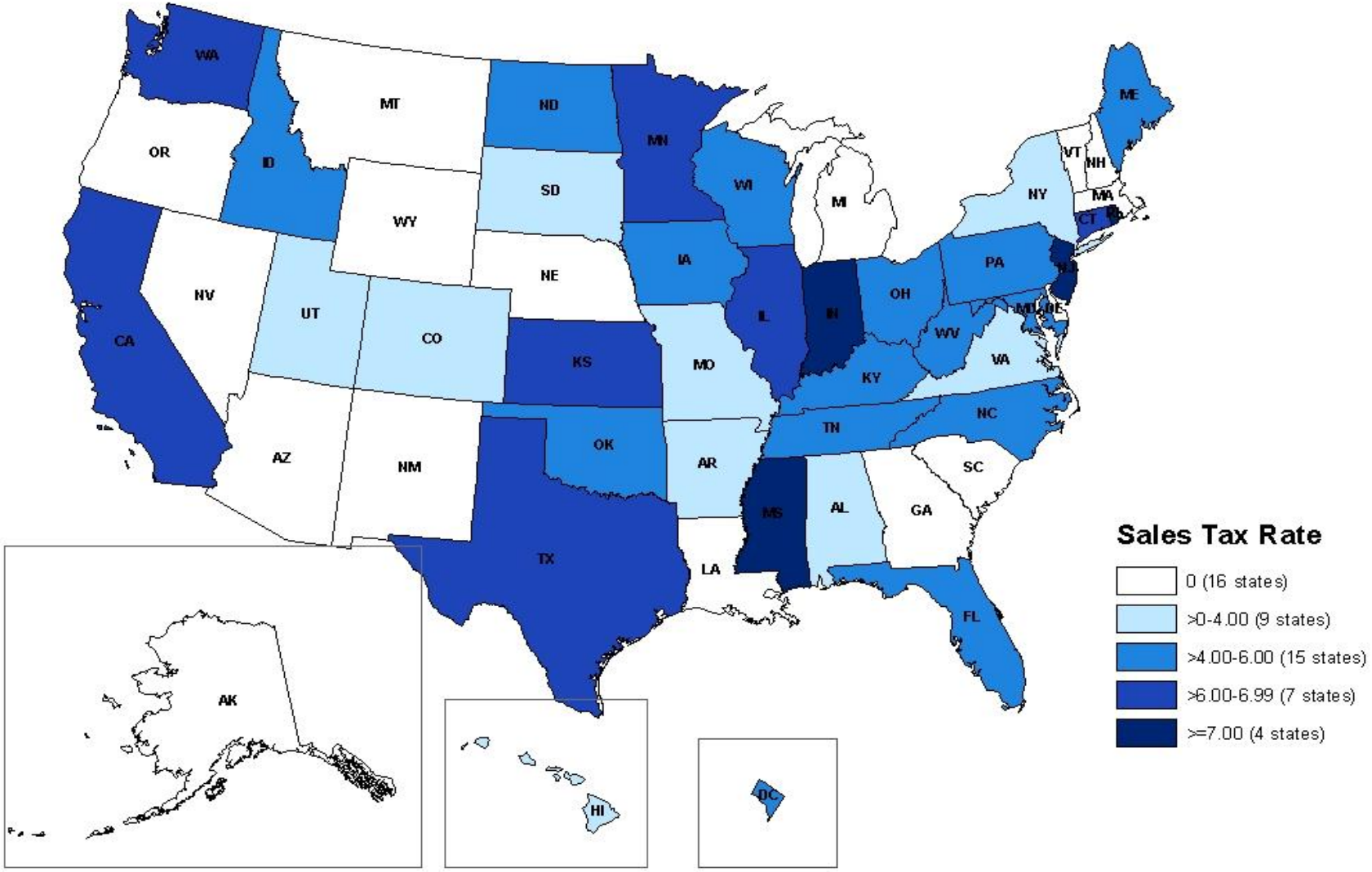
Policy Implications

Sales Taxes on Selected Beverages, **Taxing States** (as of July 1, 2011)



Note: Three states also impose a mandatory statewide local tax that is not reflected in the above data: CA (1%), UT (1.25%), VA (1%).

State Regular, Sugar-Sweetened Soda Sales Tax Rates (as of July 1, 2011)



Note: Does not include 3 states with mandatory, statewide local tax rate (CA-1%, UT-1.25%, VA-1%)

Data Source: Bridging the Gap Program, University of Illinois at Chicago, 2011

Selected Examples of State SSB-related Legislative Activity 2011/12

- **California** ($0.01/ounce tax on tax on distributors of SSBs; revenue to create Children's Health Promotion Fund) – Held (failed to pass) in Committee 9/23/2011
- **California** (to authorize any county or city to propose to voters a $0.01/ounce excise tax on SSBs) – Died in Committee 2/9/2012
- **Hawaii** ($0.01 per teaspoon tax on SSBs; revenue to community health centers and trauma system special funds)
- **Illinois** ($0.01/ounce tax on SSBs; revenue to create Illinois Health Promotion Fund)
- **Nebraska** (sales tax on SSBs; revenue to Obesity Prevention Fund)
- **Rhode Island** ($0.01/ounce, revenue to funds programs to reduce obesity)
- **Tennessee** ($0.01/ounce tax on bottled SSBs in exchange for 1% reduction in state sales tax on food – referred to as 'swap legislation")
- **Vermont** ($0.01/ounce tax on SSBs; revenue to create Vermont oral health improvement fund)
- **West Virginia** (series of taxes on bottled soft drinks, syrups and dry mixtures; revenue for construction, maintenance and improvements of state parks)

Source: Rudd Center for Food Policy & Obesity, Legislation Database

Tax Policy Design Implications

- Implications for Potential Impact on Health Outcomes
  - ❖Issues of applicability to SNAP purchases
  - ❖Excise tax rather than a sales tax
    - ➢ Incorporated at shelf price
    - ➢Applicable regardless of where items are sold
    - ➢Applied on a per unit basis rather than a function of price so that quantity discounts are still taxed. *Issue of zero marginal cost for free refills.*
    - ➢But need to adjust for inflation
  - ❖Dedication of tax revenue to nutrition and physical activity programs

SSB Taxation & Revenues

- Revenue generating potential of tax is considerable
  - SSB Tax calculator at:
  - http://www.yaleruddcenter.org/sodatax.aspx
  - Tax of one cent per ounce could generate:
    - $15.1 billion nationally if on SSBs only
    - $24.4 billion if diet included
  - Tax of one cent per ounce in Illinois
    - $601.7 million, SSBs only
    - $871.0 million if diet included
  - Earmarking tax revenues for obesity prevention efforts would add to impact of tax

Non-tax SSB-related Policies

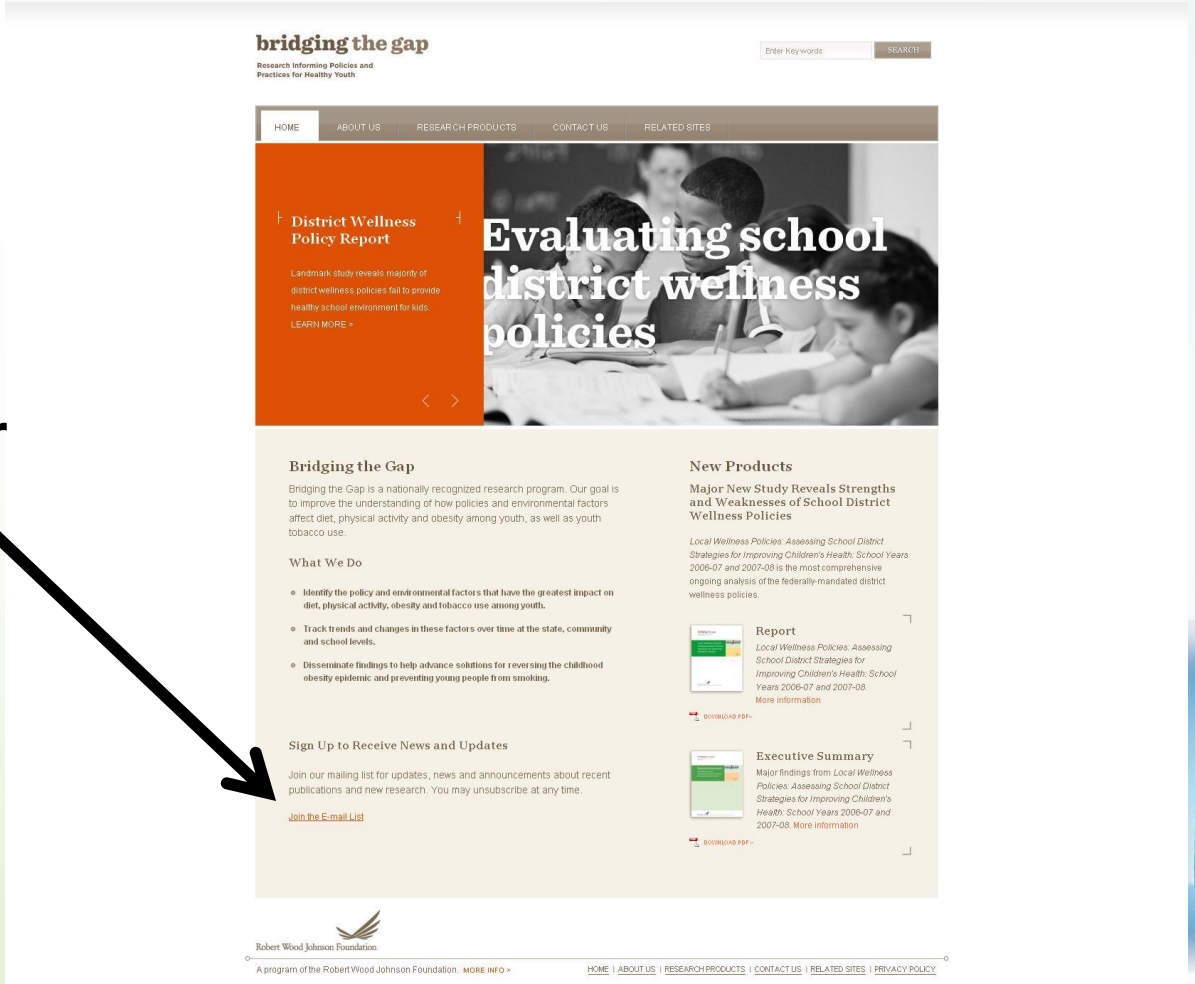
Additional Policies Aimed at Reducing Sugar-Sweetened Beverage Consumption

- School and worksite restrictions on availability
- Other school policies related to standards for competitive foods
- Zoning policies
- Menu labeling
- Advertising restrictions
- Public Service Announcements

Resources and Contacts

For more information: www.bridgingthegapresearch.org

Sign up for our email list!!!



Institute for Health Research and Policy, UIC
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Bridging the Gap
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