

# bridging the gap

Research Informing Policies & Practices  
for Healthy Youth

## Taxes, Advertising and Obesity: Public Policy Implications

Consortium to Lower Obesity in Chicago Children: Quarterly Meeting  
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# Presentation Outline

## 1. Taxation and Obesity

- Objectives
- Individual-level and Tax Data
- Models
- Empirical Results

## 2. Food Advertising and Obesity

- Content Analysis
- Nutritional Analysis
- Trends

## 3. Policy Implications

# Taxation: Overview of Empirical Studies

Objectives, Data and Models

## Objectives

- Empirical findings on association 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)
  - Monitoring the Future (MTF)
  - 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
  - Categorical indicators for state-level soda tax rates:
    - a. Zero tax
    - b.  $0 < \text{soda tax rate} \leq 4\%$
    - c.  $4\% < \text{soda tax rate} \leq 5\%$
    - d.  $5\% < \text{soda tax rate} \leq 6\%$
    - e. Soda tax rate  $> 6\%$
  - Disfavored tax rate (soda tax rate – general food tax rate)
  - Disfavored dichotomous indicator (indicator if disfavored tax rate  $> 0$ )

# Models

## Cross-Sectional Model:

$$\textit{Consumption/Weight}_{ist} = \beta_0 + \beta_1 \textit{Tax}_{st} + \beta_2 \textit{OC}_{st} + \beta_3 \textit{X}_{it} + \beta_4 \textit{D}_{it} + \varepsilon_{ist}$$

## Longitudinal Model:

$$\textit{Consumption/Weight}_{ist} = \beta_0 + \beta_1 \textit{Tax}_{st} + \beta_2 \textit{OC}_{st} + \beta_3 \textit{X}_{it} + \beta_4 \textit{D}_{it} + v_i + w_{ist}$$

❖ Random Effects Models: Assumes  $v_i$  and independent variables are not correlated

❖ Fixed Effects Models: Difference out the constant individual-specific residual  $v_i$  and provide within person effects

# 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, 2<sup>nd</sup> 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



# Preliminary Results

## OLS Regression Results: Soda Volume

|                            | All Households | Households with Children | Households without Children |
|----------------------------|----------------|--------------------------|-----------------------------|
| Disfavored Soda Tax Amount | -9.352**       | -10.983**                | -8.417**                    |
| Disfavored Soda Tax Status | -42.247        | -49.247                  | -38.417                     |

Source: Loudermilk, Powell, Chriqui, and Chaloupka, *in progress*, 2010

# Preliminary Results

## OLS Regression Results: Soda Volume

|  | All Households       | Households with Children | Households without Children |
|--|----------------------|--------------------------|-----------------------------|
| Disfavored Soda Tax Amount<br>(Elasticities) | -9.352**<br>(-0.052) | -10.983**<br>(-0.044)    | -8.417**<br>(-0.052)        |
| Disfavored Soda Tax Status                   | -42.247              | -49.247                  | -38.417                     |

Source: Loudermilk, Powell, Chriqui, and Chaloupka, *in progress*, 2010

## Policy Simulation Example: Household Soda Purchases

- Study results imply very small tax elasticities for purchases of 0.052, 0.044, and 0.052 for all households, households with children, and households without children, respectively.
  - If tax rate went up 1 percentage point from its current average, soda purchases would be expected to fall by about 29 liquid ounces per household per quarter.
- However, if we assume a linear extrapolation for a large tax increase such as the one recently proposed in NY (soda tax of 18%) then rates would increase 14 points from the mean with an implied decrease in soda volume of 406 liquid ounces, 72% of mean purchases, for the average household.

# 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 5<sup>th</sup> 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 3<sup>rd</sup> to 5<sup>th</sup> grade (m=1.9)
- Control variables: age in months, race/ethnicity, family income, mother's education level, physical activity, TV watching, parent-child interactions.

## Associations by Sub-populations

| Outcome Variable      | Total Consumption      |                           | School Consumption     |                           | BMI Change             |                           |
|-----------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|
|                       | Higher Soda Tax Amount | Higher Soda Tax Indicator | Higher Soda Tax Amount | Higher Soda Tax Indicator | Higher Soda Tax Amount | Higher Soda Tax Indicator |
| Full Sample           | -0.004                 | -0.006                    | -0.010                 | -0.064*                   | -0.013*                | -0.085**                  |
| At Risk of Overweight | -0.026                 | -0.078                    | -0.011                 | -0.067                    | -0.033**               | -0.222**                  |
| Low-Income            | -0.142*                | -0.811                    | -0.039**               | -0.239**                  | -0.000                 | -0.005                    |
| African American      | -0.125                 | -0.767                    | -0.103**               | -0.585**                  | 0.029                  | 0.086                     |
| 9+ Hrs TV             | -0.073                 | -0.376                    | -0.029**               | -0.178**                  | -0.014                 | -0.091                    |

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

## Associations by Sub-populations

| Outcome Variable      | Total Consumption      |                           | School Consumption     |                           | BMI Change             |                           |
|-----------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|
|                       | Higher Soda Tax Amount | Higher Soda Tax Indicator | Higher Soda Tax Amount | Higher Soda Tax Indicator | Higher Soda Tax Amount | Higher Soda Tax Indicator |
| Full Sample           | -0.004                 | -0.006                    | -0.010                 | <b>-0.064*</b>            | <b>-0.013*</b>         | <b>-0.085**</b>           |
| At Risk of Overweight | -0.026                 | -0.078                    | -0.011                 | -0.067                    | <b>-0.033**</b>        | <b>-0.222**</b>           |
| Low-Income            | <b>-0.142*</b>         | -0.811                    | <b>-0.039**</b>        | <b>-0.239**</b>           | -0.000                 | -0.005                    |
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Source: Sturm, Powell, Chriqui, and Chaloupka, *Health Affairs*, 2010

## Associations by Sub-populations

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|-----------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|
|                       | Higher Soda Tax Amount | Higher Soda Tax Indicator | Higher Soda Tax Amount | Higher Soda Tax Indicator | Higher Soda Tax Amount | Higher Soda Tax Indicator |
| Full Sample           | -0.004                 | -0.006                    | -0.010                 | -0.064*                   | -0.013*                | -0.085**                  |
| At Risk of Overweight | -0.026                 | -0.078                    | -0.011                 | -0.067                    | <b>-0.033**</b>        | <b>-0.222**</b>           |
| Low-Income            | <b>-0.142*</b>         | -0.811                    | <b>-0.039**</b>        | <b>-0.239**</b>           | -0.000                 | -0.005                    |
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Source: Sturm, Powell, Chriqui, and Chaloupka, *Health Affairs*, 2010



# Policy Simulation Example: Children's BMI

- Assuming a linear extrapolation, an 18% differential soda tax would correspond to a -0.23 BMI units in the change in BMI between 3<sup>rd</sup> and 5<sup>th</sup> grade, or a 20% reduction in the excess BMI gain.

# Soda Taxes and Adolescents' Weight

Monitoring the Future

## Objective

- To examine association of soda taxes with youths' BMI

## Data Description

- Cross-section individual-level data for 8th, 10th, and 12th grade students, 1997-2006
- Estimation sample includes 153,673 observations
- Outcome variable: body mass index (BMI)
- Control variables: gender, age, grade, race, ethnicity, student's hours work and income, parents' education, work, marital status
- Neighborhood controls: Food store and restaurant availability and per capita income

## Associations between Taxes and BMI: Full Sample and by Sub-populations

|                              | Grocery Store Soda Tax Rate | Presence of Grocery Store Tax | Disfavored Grocery Soda Tax Status | Disfavored Grocery Soda Tax Amount | Vending Machine Soda Tax Rate | Presence of Soda Vending Machine Tax |
|------------------------------|-----------------------------|-------------------------------|------------------------------------|------------------------------------|-------------------------------|--------------------------------------|
| <b>Full Model</b>            | <b>0.0131</b>               | <b>0.0638</b>                 | <b>0.0735</b>                      | <b>0.0124</b>                      | <b>0.0110</b>                 | <b>0.0514</b>                        |
| <b>By Weight Status</b>      |                             |                               |                                    |                                    |                               |                                      |
| <b>At Risk of Overweight</b> | <b>-0.0058</b>              | <b>-0.0252</b>                | <b>-0.0337</b>                     | <b>-0.0054</b>                     | <b>-0.0060*</b>               | <b>-0.0210</b>                       |
| <b>Not at Risk</b>           | <b>0.0165</b>               | <b>0.0809</b>                 | <b>0.0993</b>                      | <b>0.0166</b>                      | <b>0.0142</b>                 | <b>0.0665</b>                        |
| <b>By Grade</b>              |                             |                               |                                    |                                    |                               |                                      |
| <b>8<sup>th</sup> Grade</b>  | <b>0.0031</b>               | <b>0.0429</b>                 | <b>0.0373</b>                      | <b>0.0043</b>                      | <b>0.0070</b>                 | <b>0.0590</b>                        |
| <b>10<sup>th</sup> Grade</b> | <b>0.0241</b>               | <b>0.0997</b>                 | <b>0.1117</b>                      | <b>0.0212</b>                      | <b>0.0216</b>                 | <b>0.0873</b>                        |
| <b>12<sup>th</sup> Grade</b> | <b>0.0075</b>               | <b>0.0400</b>                 | <b>0.0342</b>                      | <b>0.0043</b>                      | <b>-0.0101</b>                | <b>-0.0478</b>                       |
| <b>By Parents' Education</b> |                             |                               |                                    |                                    |                               |                                      |
| <b>Some College</b>          | <b>0.0160</b>               | <b>0.0948</b>                 | <b>0.0985</b>                      | <b>0.0156</b>                      | <b>0.0146</b>                 | <b>0.0845</b>                        |
| <b>Less than College</b>     | <b>0.0067</b>               | <b>-0.0134</b>                | <b>0.0003</b>                      | <b>0.0033</b>                      | <b>0.0017</b>                 | <b>-0.0354</b>                       |

Source: Powell, Chiqui, and Chaloupka, *Journal of Adolescent Health*, 2009

## Associations between Taxes and BMI: Full Sample and by Sub-populations

|                              | Grocery Store Soda Tax Rate | Presence of Grocery Store Tax | Disfavored Grocery Soda Tax Status | Disfavored Grocery Soda Tax Amount | Vending Machine Soda Tax Rate | Presence of Soda Vending Machine Tax |
|------------------------------|-----------------------------|-------------------------------|------------------------------------|------------------------------------|-------------------------------|--------------------------------------|
| <b>Full Model</b>            | <b>0.0131</b>               | <b>0.0638</b>                 | <b>0.0735</b>                      | <b>0.0124</b>                      | <b>0.0110</b>                 | <b>0.0514</b>                        |
| <b>By Weight Status</b>      |                             |                               |                                    |                                    |                               |                                      |
| <b>At Risk of Overweight</b> | <b>-0.0058</b>              | <b>-0.0252</b>                | <b>-0.0337</b>                     | <b>-0.0054</b>                     | <b>-0.0060*</b>               | <b>-0.0210</b>                       |
| <b>Not at Risk</b>           | <b>0.0165</b>               | <b>0.0809</b>                 | <b>0.0993</b>                      | <b>0.0166</b>                      | <b>0.0142</b>                 | <b>0.0665</b>                        |
| <b>By Grade</b>              |                             |                               |                                    |                                    |                               |                                      |
| <b>8<sup>th</sup> Grade</b>  | <b>0.0031</b>               | <b>0.0429</b>                 | <b>0.0373</b>                      | <b>0.0043</b>                      | <b>0.0070</b>                 | <b>0.0590</b>                        |
| <b>10<sup>th</sup> Grade</b> | <b>0.0241</b>               | <b>0.0997</b>                 | <b>0.1117</b>                      | <b>0.0212</b>                      | <b>0.0216</b>                 | <b>0.0873</b>                        |
| <b>12<sup>th</sup> Grade</b> | <b>0.0075</b>               | <b>0.0400</b>                 | <b>0.0342</b>                      | <b>0.0043</b>                      | <b>-0.0101</b>                | <b>-0.0478</b>                       |
| <b>By Parents' Education</b> |                             |                               |                                    |                                    |                               |                                      |
| <b>Some College</b>          | <b>0.0160</b>               | <b>0.0948</b>                 | <b>0.0985</b>                      | <b>0.0156</b>                      | <b>0.0146</b>                 | <b>0.0845</b>                        |
| <b>Less than College</b>     | <b>0.0067</b>               | <b>-0.0134</b>                | <b>0.0003</b>                      | <b>0.0033</b>                      | <b>0.0017</b>                 | <b>-0.0354</b>                       |

Source: Powell, Chiqui, and Chaloupka, *Journal of Adolescent Health*, 2009

# 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 11,900 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

## Preliminary Regressions Results-Cross Sectional Analysis

|                    | Female  |            | Male    |            |
|--------------------|---------|------------|---------|------------|
|                    | BMI     | Overweight | BMI     | Overweight |
| <b>Full Sample</b> |         |            |         |            |
| 0<tax≤4%           | 0.0552  | 0.0019     | -0.0337 | -0.0055    |
| 4%<tax≤5%          | 0.1339  | 0.0017     | -0.1457 | -0.0160    |
| 5%<tax≤6%          | -0.0797 | -0.0105    | 0.2203  | 0.1010     |
| tax>6%             | -0.0548 | -0.0053    | 0.5410* | 0.0257     |
| <b>Low Income</b>  |         |            |         |            |
| 0<tax≤4%           | -0.5963 | -0.0371*   | -0.5030 | -0.0556**  |
| 4%<tax≤5%          | 0.2401  | -0.0094    | -0.2245 | -0.0073    |
| 5%<tax≤6%          | -0.3359 | -0.0436**  | -0.1683 | -0.0470**  |
| tax>6%             | -0.4483 | -0.0369*   | -0.4099 | -0.0435**  |



## Preliminary Regressions Results-Cross Sectional Analysis

|             | Female  |            | Male    |            |
|-------------|---------|------------|---------|------------|
|             | BMI     | Overweight | BMI     | Overweight |
| Full Sample |         |            |         |            |
| 0<tax≤4%    | 0.0552  | 0.0019     | -0.0337 | -0.0055    |
| 4%<tax≤5%   | 0.1339  | 0.0017     | -0.1457 | -0.0160    |
| 5%<tax≤6%   | -0.0797 | -0.0105    | 0.2203  | 0.1010     |
| tax>6%      | -0.0548 | -0.0053    | 0.5410* | 0.0257     |
| Low Income  |         |            |         |            |
| 0<tax≤4%    | -0.5963 | -0.0371*   | -0.5030 | -0.0556**  |
| 4%<tax≤5%   | 0.2401  | -0.0094    | -0.2245 | -0.0073    |
| 5%<tax≤6%   | -0.3359 | -0.0436**  | -0.1683 | -0.0470**  |
| tax>6%      | -0.4483 | -0.0369*   | -0.4099 | -0.0435**  |

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## Preliminary Regressions Results-Longitudinal Analysis (FE)

|                    | Female     |            | Male       |            |
|--------------------|------------|------------|------------|------------|
|                    | BMI        | Overweight | BMI        | Overweight |
| <b>Full Sample</b> |            |            |            |            |
| 0<tax≤4%           | -0.7805**  | -0.0078    | -0.4054*** | -0.0503    |
| 4%<tax≤5%          | -0.7938**  | -0.0153    | -0.0942    | -0.0369    |
| 5%<tax≤6%          | -0.2033    | 0.0308*    | -0.2297    | -0.0591    |
| tax>6%             | -0.5647    | 0.0667*    | 0.4693     | -0.0212    |
| <b>Low Income</b>  |            |            |            |            |
| 0<tax≤4%           | -2.1950*** | -0.0628*** | -1.0196*** | -0.0922*** |
| 4%<tax≤5%          | -2.3600*** | -0.0737**  | -0.5907*   | -0.0732*** |
| 5%<tax≤6%          | -1.1818    | -0.0162    | -1.5229*** | -0.0879*** |
| tax>6%             | -0.2139    | 0.0847     | 0.5069     | -0.0969**  |

Source: Powell et al., *in progress*, 2010

## Preliminary Regressions Results-Longitudinal Analysis (FE)

|             | Female     |            | Male       |            |
|-------------|------------|------------|------------|------------|
|             | BMI        | Overweight | BMI        | Overweight |
| Full Sample |            |            |            |            |
| 0<tax≤4%    | -0.7805**  | -0.0078    | -0.4054*** | -0.0503    |
| 4%<tax≤5%   | -0.7938**  | -0.0153    | -0.0942    | -0.0369    |
| 5%<tax≤6%   | -0.2033    | 0.0308*    | -0.2297    | -0.0591    |
| tax>6%      | -0.5647    | 0.0667*    | 0.4693     | -0.0212    |
| Low Income  |            |            |            |            |
| 0<tax≤4%    | -2.1950*** | -0.0628*** | -1.0196*** | -0.0922*** |
| 4%<tax≤5%   | -2.3600*** | -0.0737**  | -0.5907*   | -0.0732*** |
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| tax>6%      | -0.2139    | 0.0847     | 0.5069     | -0.0969**  |

Source: Powell et al., *in progress*, 2010

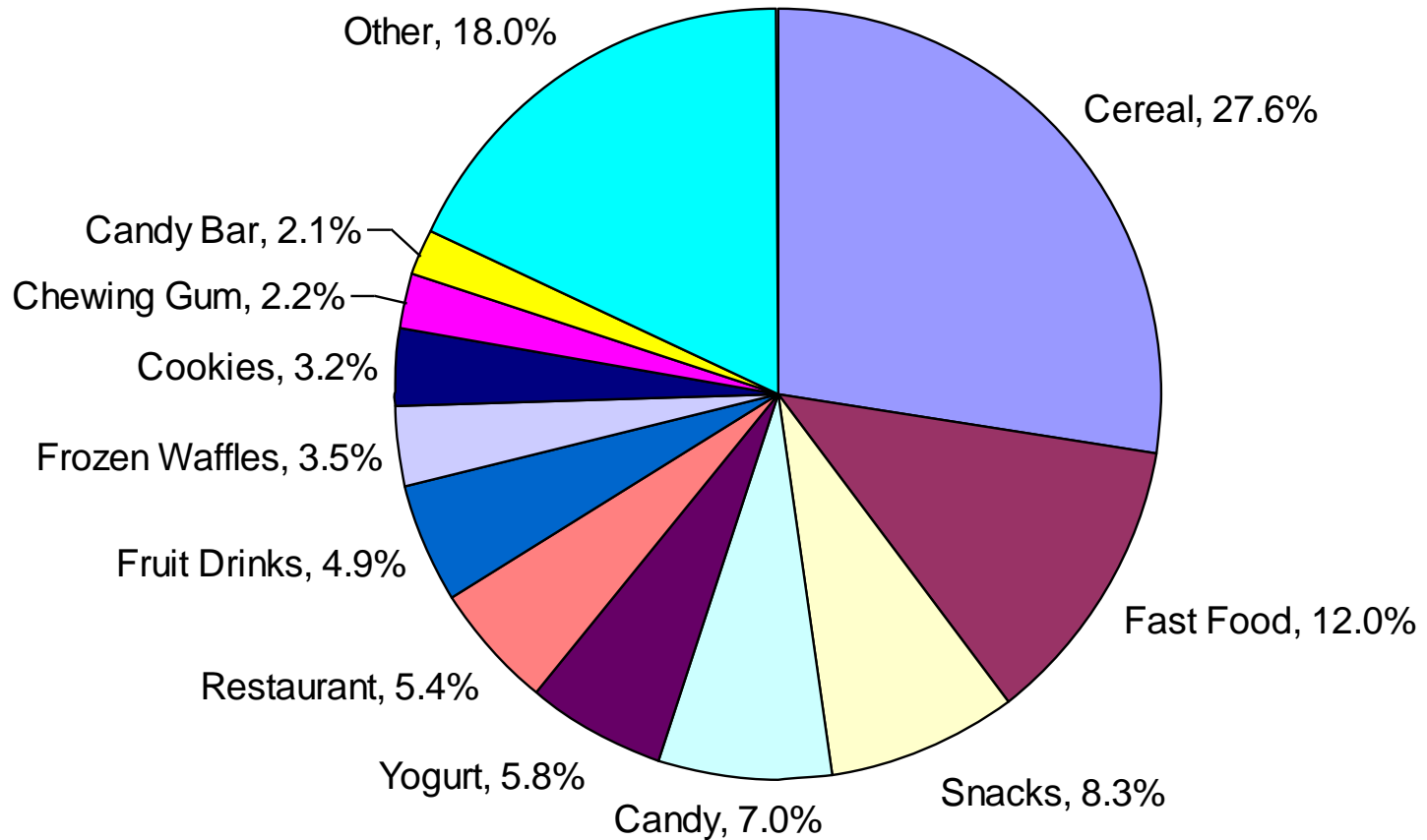
## Summary: Policy Implications of Empirical Results

- Generally very small associations between soda taxes and consumption or weight outcomes based on the existing low tax rates which range up to just 7%. Consistent with previous findings by others researchers such as Fletcher, Frisvold and Tefft.
- Larger associations for populations at greater risk for obesity.
- *Substantial* increases in soda tax rates may have some measureable effects on outcomes and even greater effects at the population level.

# Advertising and Obesity

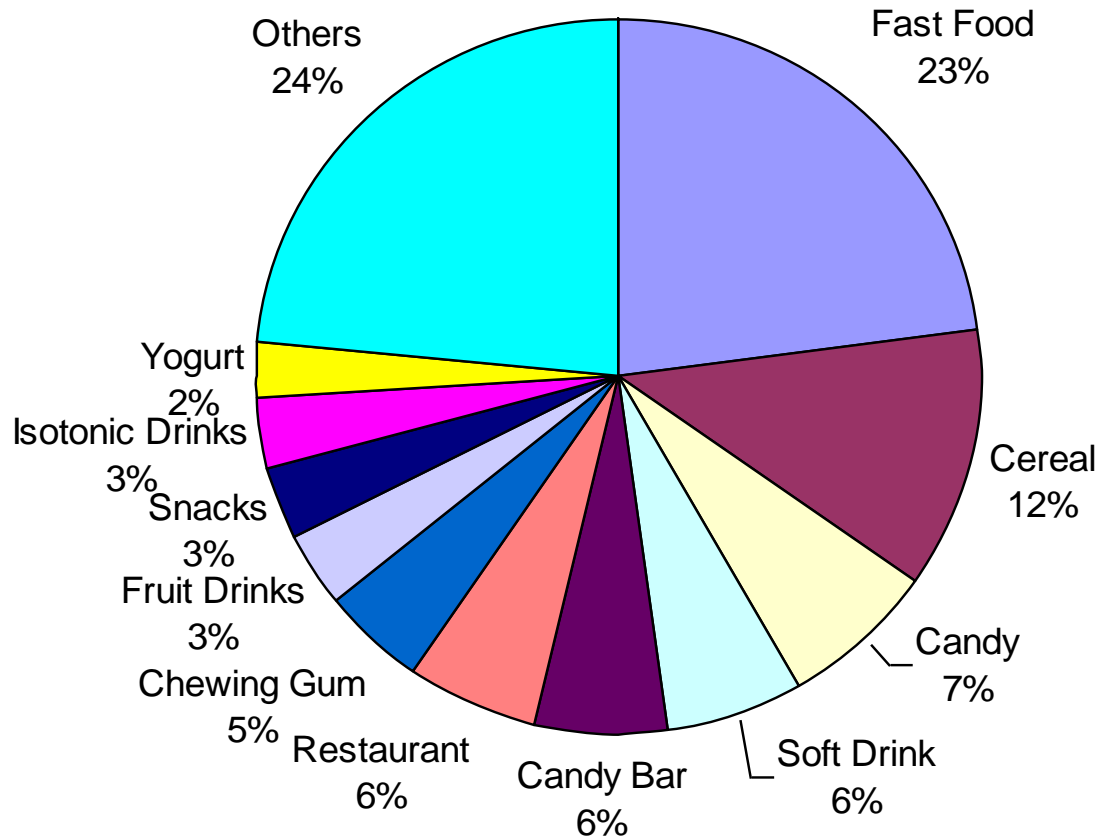
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# Evidence: Food Product Advertising: 2-11



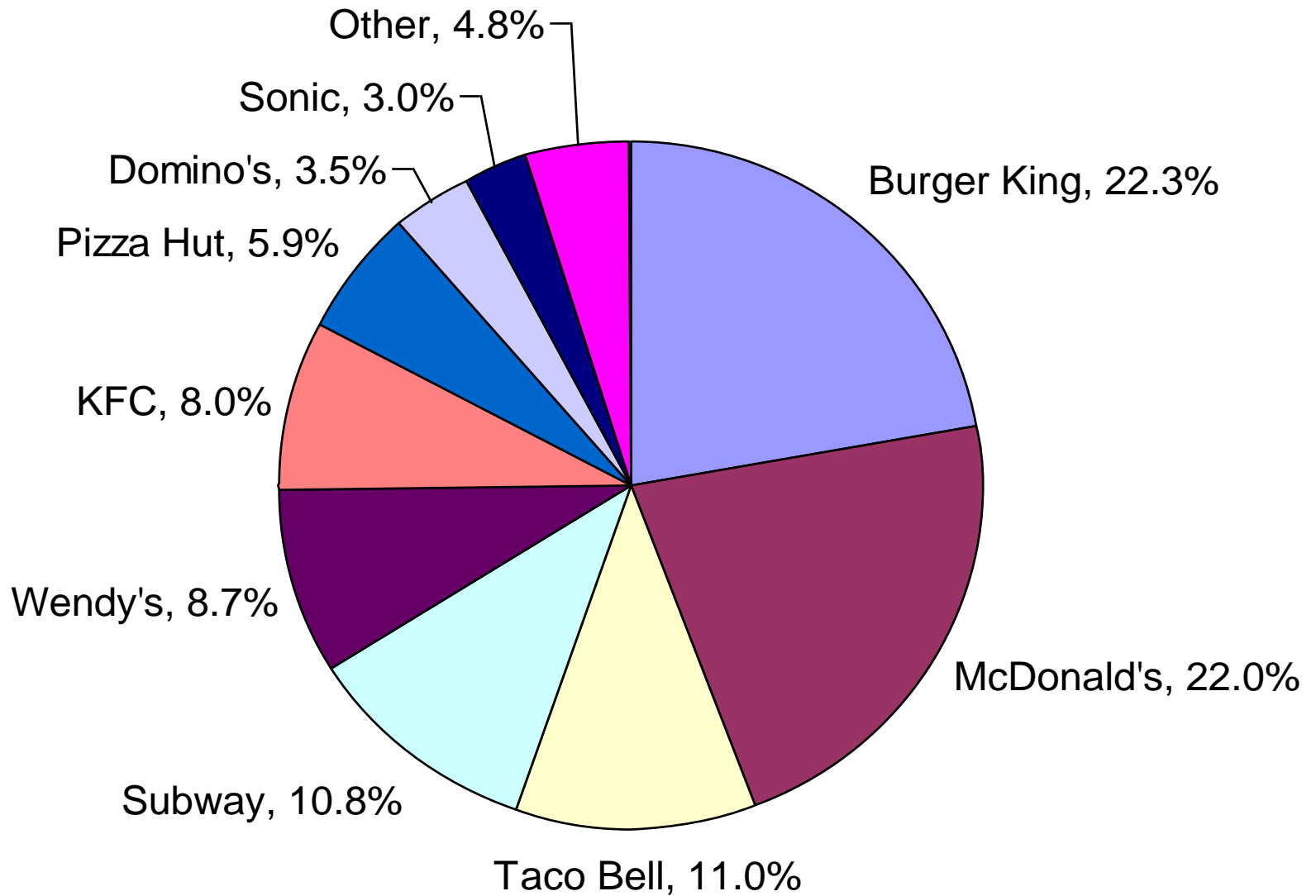
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# Evidence: Food Product Advertising : 12-17



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# Fast Food Advertising: 12-17





# Evidence: Nutritional Content of Food Products Viewed on TV By Children Aged 2-11

|                              | All foods<br>(100%) | Cereal<br>(33.3%) | Sweets<br>(22.7%) | Snacks<br>(13.9%) | Drinks<br>(9.6%) | Other<br>(20.4%) |
|------------------------------|---------------------|-------------------|-------------------|-------------------|------------------|------------------|
| High Fat                     | 17.1%               | 0.0%              | 41.6%             | 36.0%             | 0.0%             | 13.0%            |
| High Sat Fat                 | 21.2%               | 0.0%              | 47.4%             | 25.0%             | 3.2%             | 33.1%            |
| High Sugar                   | 80.7%               | 97.6%             | 88.6%             | 65.4%             | 99.5%            | 44.9%            |
| High Sodium                  | 12.3%               | 2.2%              | 0.0%              | 0.0%              | 0.1%             | 57.8%            |
| Low Fiber                    | 81.6%               | 78.6%             | 82.2%             | 98.0%             | 99.9%            | 65.0%            |
| Either High Fat/Sugar/Sodium | <b>97.8%</b>        | 97.6%             | 96.3%             | 96.7%             | 99.5%            | 99.6%            |

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Source: Powell et al., *Pediatrics*, 2007

# Trends in Exposure to Food Advertisements per Day for Children and Adolescents by Age, 2003 and 2007

|                           | Comp Children Age 2-5 |      |          | Comp Children Age 6-11 |      |          | Comp Teens Age 12-17 |      |          |
|---------------------------|-----------------------|------|----------|------------------------|------|----------|----------------------|------|----------|
|                           | 2003                  | 2007 | % Change | 2003                   | 2007 | % Change | 2003                 | 2007 | % Change |
| # Food Ads/Day            | 13.3                  | 11.5 | -13.7%   | 13.6                   | 13.1 | -3.7%    | 13.1                 | 13.6 | 3.7%     |
| # Food Cat. Ads/Day       |                       |      |          |                        |      |          |                      |      |          |
| <i>Beverage</i>           | 1.5                   | 1.0  | -30.1%   | 1.7                    | 1.2  | -30.1%   | 2.1                  | 1.5  | -26.6%   |
| <i>Cereal</i>             | 2.6                   | 2.0  | -23.1%   | 2.3                    | 2.3  | -2.6%    | 1.3                  | 1.3  | -0.8%    |
| <i>Fast Food Rest.</i>    | 2.3                   | 2.4  | 4.7%     | 2.6                    | 2.9  | 12.2%    | 3.4                  | 4.1  | 20.4%    |
| <i>Full Service Rest.</i> | 0.9                   | 1.2  | 36.5%    | 0.9                    | 1.3  | 37.3%    | 1.0                  | 1.4  | 39.4%    |
| <i>Snacks</i>             | 1.3                   | 1.0  | -21.9%   | 1.3                    | 1.2  | -8.9%    | 0.9                  | 0.8  | -9.9%    |
| <i>Sweets</i>             | 2.3                   | 1.3  | -41.0%   | 2.3                    | 1.6  | -29.3%   | 2.2                  | 1.9  | -12.1%   |
| <i>Other</i>              | 2.5                   | 2.5  | 0.4%     | 2.5                    | 2.7  | 8.2%     | 2.3                  | 2.6  | 14.2%    |

Source: Powell et al., *Archives of Pediatrics and Adolescent Medicine*, in press.

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# Trends in Exposure to Food Advertisements per Day for Children and Adolescents by Age, 2003 and 2007

|                           | Comp Children Age 2-5 |      |          | Comp Children Age 6-11 |      |          | Comp Teens Age 12-17 |      |          |
|---------------------------|-----------------------|------|----------|------------------------|------|----------|----------------------|------|----------|
|                           | 2003                  | 2007 | % Change | 2003                   | 2007 | % Change | 2003                 | 2007 | % Change |
| # Food Ads/Day            | 13.3                  | 11.5 | -13.7%   | 13.6                   | 13.1 | -3.7%    | 13.1                 | 13.6 | 3.7%     |
| # Food Cat. Ads/Day       |                       |      |          |                        |      |          |                      |      |          |
| <i>Beverage</i>           | 1.5                   | 1.0  | -30.1%   | 1.7                    | 1.2  | -30.1%   | 2.1                  | 1.5  | -26.6%   |
| <i>Cereal</i>             | 2.6                   | 2.0  | -23.1%   | 2.3                    | 2.3  | -2.6%    | 1.3                  | 1.3  | -0.8%    |
| <i>Fast Food Rest.</i>    | 2.3                   | 2.4  | 4.7%     | 2.6                    | 2.9  | 12.2%    | 3.4                  | 4.1  | 20.4%    |
| <i>Full Service Rest.</i> | 0.9                   | 1.2  | 36.5%    | 0.9                    | 1.3  | 37.3%    | 1.0                  | 1.4  | 39.4%    |
| <i>Snacks</i>             | 1.3                   | 1.0  | -21.9%   | 1.3                    | 1.2  | -8.9%    | 0.9                  | 0.8  | -9.9%    |
| <i>Sweets</i>             | 2.3                   | 1.3  | -41.0%   | 2.3                    | 1.6  | -29.3%   | 2.2                  | 1.9  | -12.1%   |
| <i>Other</i>              | 2.5                   | 2.5  | 0.4%     | 2.5                    | 2.7  | 8.2%     | 2.3                  | 2.6  | 14.2%    |

Source: Powell et al., *Archives of Pediatrics and Adolescent Medicine*, in press.

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## Beverage Advertising Exposure by Product Category, Children and Adolescents by Age, 2003 and 2007

|                    | Children Age 2-5 | Children Age 6-11 | Teens Age 12-17  |
|--------------------|------------------|-------------------|------------------|
| Beverage Category  | % Change 2003-07 | % Change 2003-07  | % Change 2003-07 |
| Bottled Water      | 375.5%           | 364.0%            | 195.81%          |
| Cocoa Mix          | 10.8%            | -33.6%            | -5.85%           |
| Diet Soft Drink    | 72.0%            | 82.7%             | 106.27%          |
| Drink Mix          | 0.9%             | 31.2%             | 44.10%           |
| Drinks-Isotonic    | -20.0%           | -9.2%             | 7.94%            |
| Fruit Drinks       | -75.0%           | -71.7%            | -61.91%          |
| Fruit Juices       | -1.6%            | -16.6%            | -22.83%          |
| Milk               | -56.2%           | -59.0%            | -38.83%          |
| Regular Soft Drink | -68.2%           | -69.2%            | -66.07%          |
| Yogurt Drink       | 72.8%            | 58.8%             | 31.95%           |
| Other Beverage     | -31.7%           | -35.7%            | -27.43%          |
| <i>Total</i>       | -30.1%           | -30.1%            | -26.6%           |

### bridging the gap

Source: Powell et al., *Archives of Pediatrics and Adolescent Medicine*, in press.

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| Yogurt Drink       | 72.8%            | 58.8%             | 31.95%           |
| Other Beverage     | -31.7%           | -35.7%            | -27.43%          |
| <i>Total</i>       | -30.1%           | -30.1%            | -26.6%           |

### bridging the gap

Source: Powell et al., *Archives of Pediatrics and Adolescent Medicine*, in press.

**Advertising Exposure by Parent Company, Children and Adolescents, 2003 and 2007**

|                                     | <b>Children Age 2-5</b> | <b>Children Age 6-11</b> | <b>Teens Age 12-17</b>  |
|-------------------------------------|-------------------------|--------------------------|-------------------------|
| <b>Parent Company</b>               | <b>% Change 2003-07</b> | <b>% Change 2003-07</b>  | <b>% Change 2003-07</b> |
| <b>Pledges by December 2007:</b>    |                         |                          |                         |
| <b>Campbell Soup Co.</b>            | <b>99%</b>              | <b>113%</b>              | <b>64%</b>              |
| <b>Coca-Cola Co.</b>                | <b>-56%</b>             | <b>-52%</b>              | <b>-48%</b>             |
| <b>Hershey Co.</b>                  | <b>-79%</b>             | <b>-74%</b>              | <b>-64%</b>             |
| <b>Kraft Foods Inc.</b>             | <b>-40%</b>             | <b>-30%</b>              | <b>-22%</b>             |
| <b>Mars Inc.</b>                    | <b>-51%</b>             | <b>-39%</b>              | <b>-16%</b>             |
| <b>Unilever</b>                     | <b>-34%</b>             | <b>-31%</b>              | <b>-12%</b>             |
| <b>Pledges after December 2007:</b> |                         |                          |                         |
| <b>Burger King</b>                  | <b>-4%</b>              | <b>15%</b>               | <b>3%</b>               |
| <b>Cadbury Plc</b>                  | <b>149%</b>             | <b>211%</b>              | <b>167%</b>             |
| <b>Conagra Foods Inc.</b>           | <b>35%</b>              | <b>67%</b>               | <b>51%</b>              |
| <b>General Mills Inc.</b>           | <b>-30%</b>             | <b>-10%</b>              | <b>9%</b>               |
| <b>Kellogg Co.</b>                  | <b>-11%</b>             | <b>7%</b>                | <b>14%</b>              |
| <b>McDonalds Corp.</b>              | <b>-14%</b>             | <b>3%</b>                | <b>-1%</b>              |
| <b>Pepsico Inc.</b>                 | <b>-14%</b>             | <b>-9%</b>               | <b>-13%</b>             |
| <b>Other Parent Companies</b>       | <b>1%</b>               | <b>1%</b>                | <b>11%</b>              |
| <b>Total</b>                        | <b>-14%</b>             | <b>-4%</b>               | <b>4%</b>               |

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# Policy Implications

# Policy Landscape - Taxes

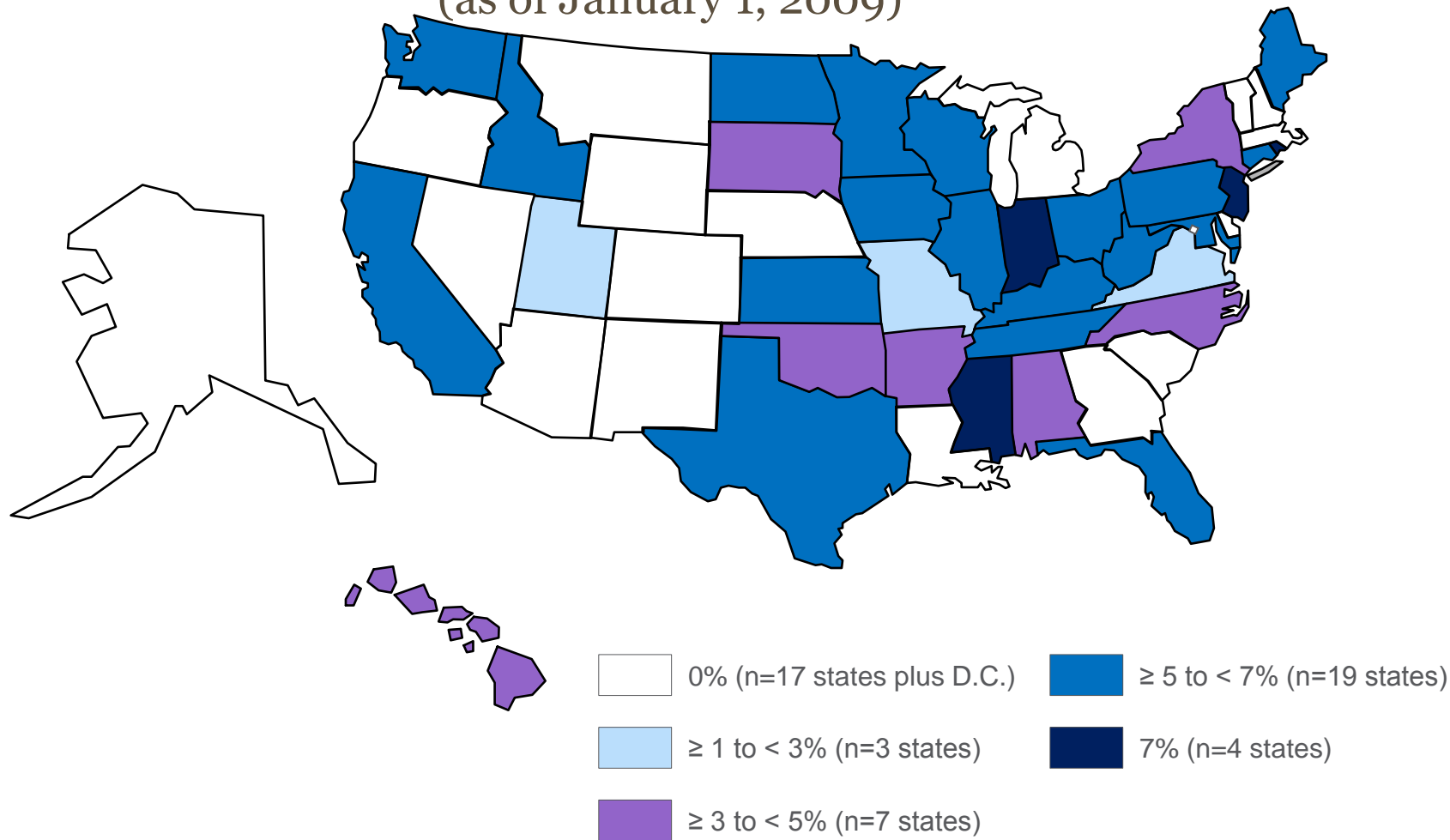
Food taxes have not generally been introduced with the aim of modifying consumption behavior as they have been used in other public health areas such as tobacco.

Food taxes are currently imposed on selected categories of food such as soft drinks, candy and snacks in grocery stores and vending machines but at quite **low tax rates**.



# State Sales Tax Rates on Soda

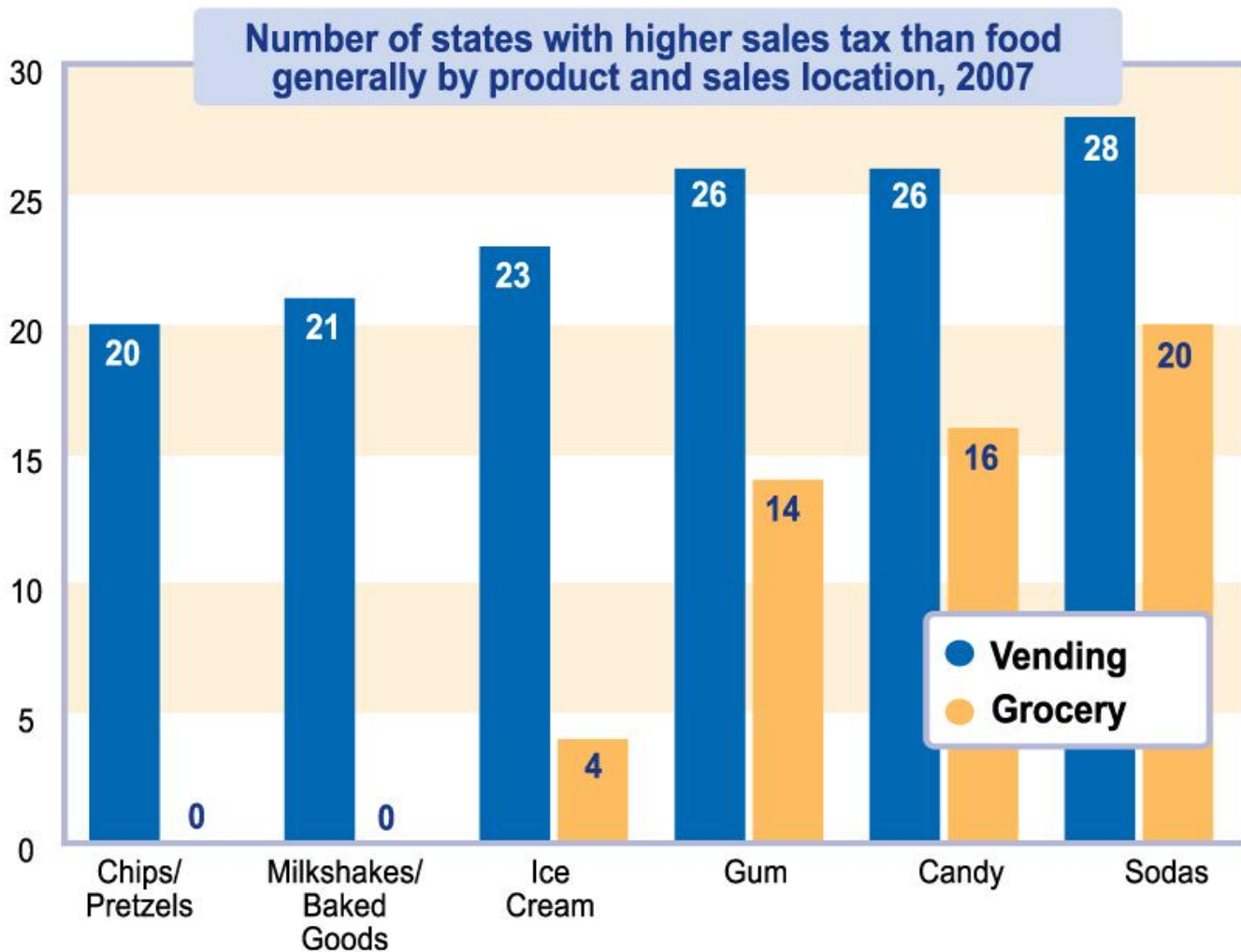
(as of January 1, 2009)



Source: Bridging the Gap Program, Health Policy Center, University of Illinois at Chicago, 2009. Data based on information compiled by The MayaTech Corporation. In addition to sales taxes, the following states currently apply excise taxes to bottles, syrups, and/or powders/mixes at the manufacturer, distributor, or retail level: AL, AR, RI, TN, VA, WA, and WV.

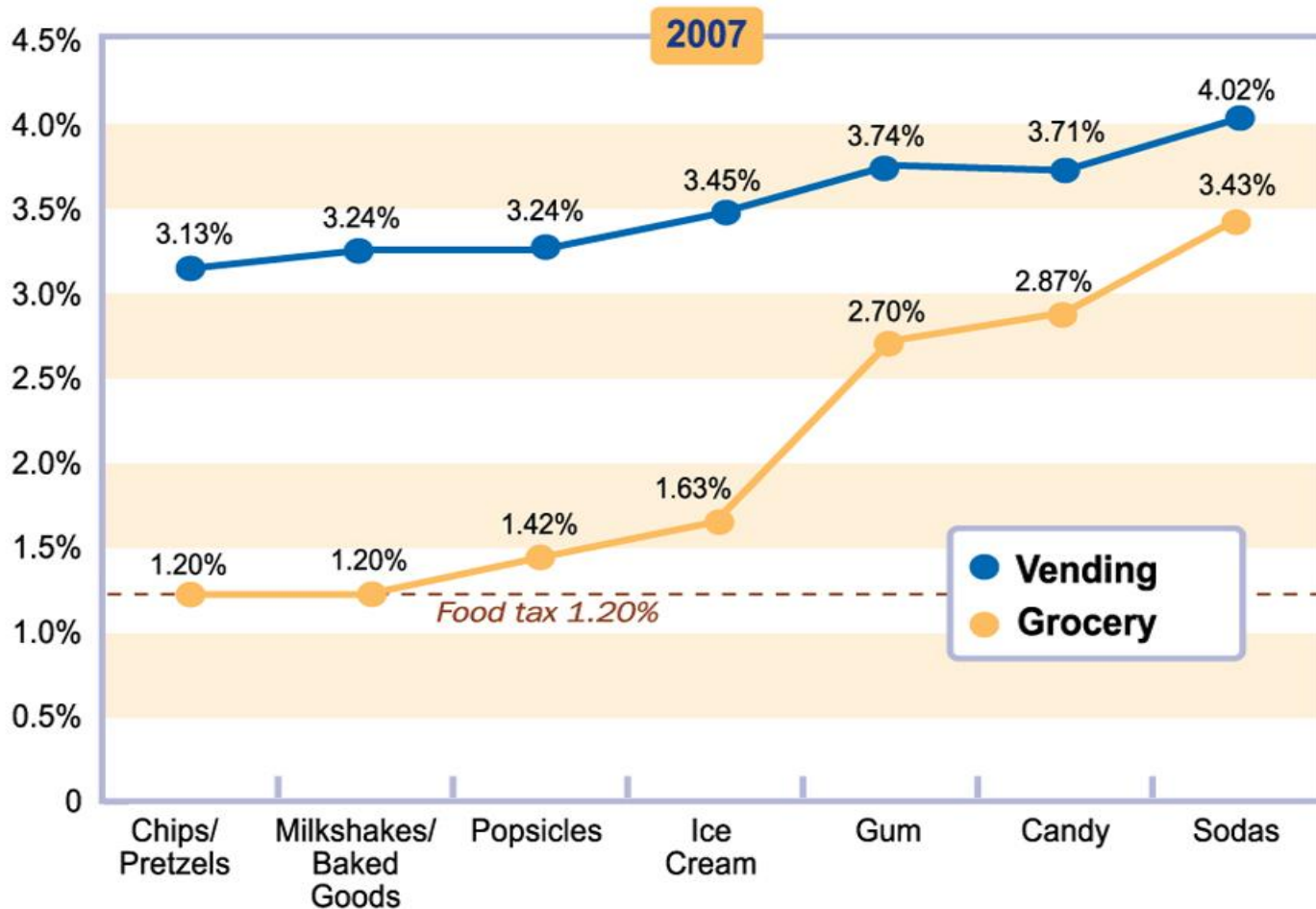
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# States With Sales Taxes on Sodas and Snack Foods



Source: Chriqui, et al., *Journal of Public Health Policy*, 2008

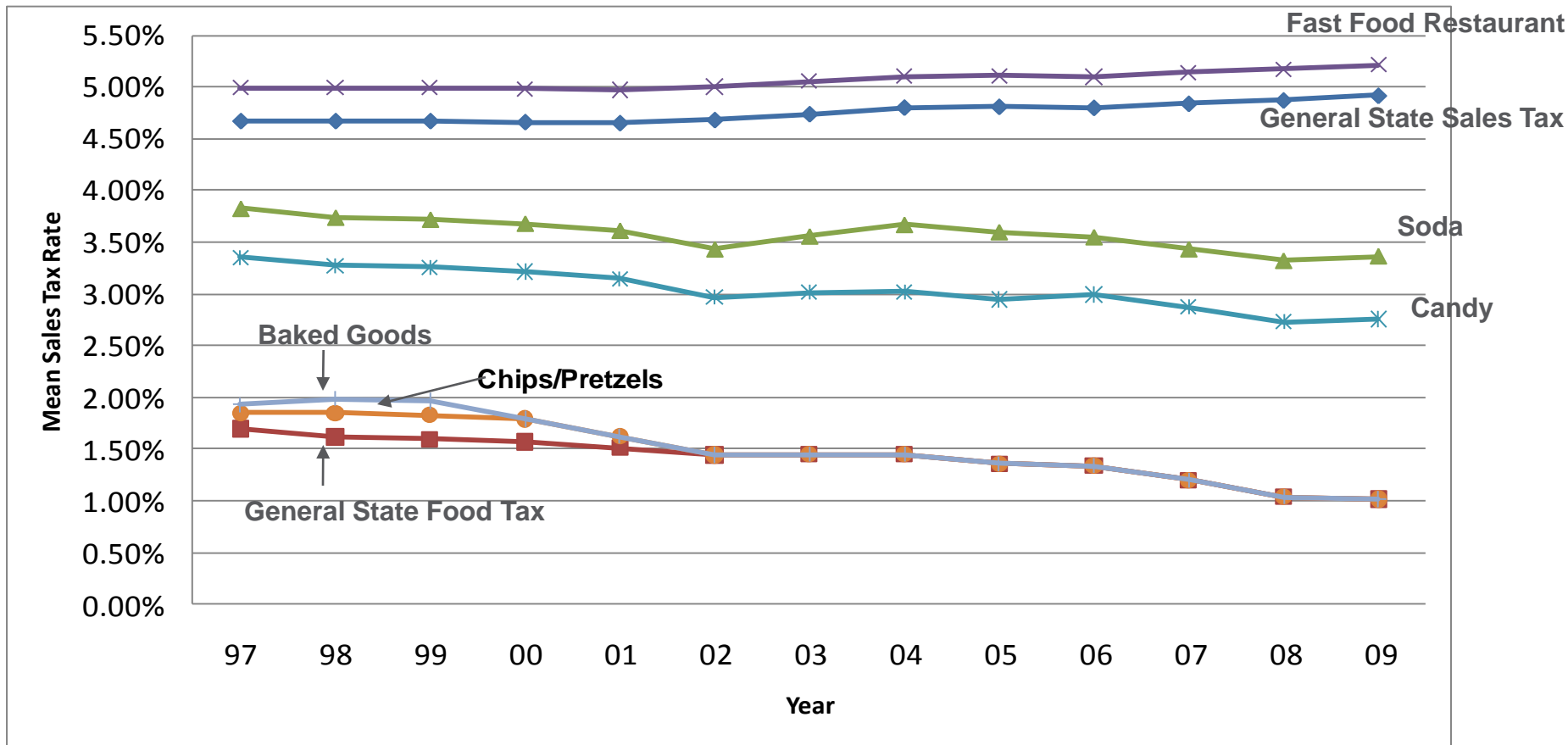
# State Sales Tax Rates for Sodas and Snack Foods



Source: Chriqui, et al., *Journal of Public Health Policy*, 2008

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# Mean state sales tax rates on food products, regular soda, restaurant sales, and snacks, 1997-2009



**Source:** Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago based on data compiled by The MayaTech Corporation. All data reflect tax rates effective as of January 1 of each year and include all 50 states and the District of Columbia.

# Future Research and Tax Policy Design Implications

- Evidence as we go ... jurisdictions that adopt higher taxes on sugar sweetened beverages will provide natural experiments for researchers to examine the effectiveness of these efforts in promoting healthier dietary intake and curbing the obesity epidemic.
- Tax Policy Design: Implications for Potential Impact on Health Outcomes
  - ❖ Issues of applicability to food stamp 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.

# Policy Landscape - Advertising

No formal regulations in place

- CFBAI – self-regulation by the industry
- No uniform nutritional standards
- No uniform definition of child audiences
- Does not apply to children age 12 and over
- By end of 2009, only 16 members, including just 2 fast food companies

**ImpacTeen**

<http://www.impacteen.org>

**Bridging the Gap**

<http://www.bridgingthegapresearch.org>

Contact: powelll@uic.edu

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