The Public Health and Economic Benefits of Taxing SSBs

Roberta R. Friedman, ScM
Yale University
Today

- Rudd Center
- Why target SSBs?
  - public health benefits
  - economic benefits
- Taxes as part of broader public health strategy
  - Other strategies to reduce consumption
- What to expect from industry
www.yaleruddcenter.org

- Strategic science
- Food marketing to kids
- School and pre-school initiatives
- Weight bias
- Legal and economic approaches
- Food and addiction
- Policy resources
Definition: Any beverage with added caloric sweetener
SSB Tax Proposal

• Penny per ounce
  – Any beverage w. added sugar
  or
• Penny per teaspoon added sugar
  – Incentive to reduce sugar

• Revenue for obesity prevention
Impact of price changes

- 10% price increase = 10-12.6% consumption decrease
- Penny per oz = approx 20% increase
- Enough to reduce net caloric intake and obesity

Andreyeva, AJPH, 2010; Smith, USDA ERS, 2010; Chaloupka, CCHSS, 2011
Also looking for

• Decreased diabetes incidence
• Reduced obesity-related health care costs
<table>
<thead>
<tr>
<th>Beverage</th>
<th>Tax of beverage (¢1/oz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SSBs taxed, %</td>
</tr>
<tr>
<td>CSDs, regular varieties</td>
<td>26.7</td>
</tr>
<tr>
<td>CSDs, diet varieties</td>
<td>0</td>
</tr>
<tr>
<td>Fruit drinks, excluding 100%</td>
<td>17.1</td>
</tr>
<tr>
<td>Fruit juice</td>
<td></td>
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<tr>
<td>Sports drinks</td>
<td>24.0</td>
</tr>
<tr>
<td>RTD teas, regular varieties</td>
<td>13.3</td>
</tr>
<tr>
<td>RTD teas, diet varieties</td>
<td>0</td>
</tr>
<tr>
<td>Flavored/enhanced water</td>
<td>21.8</td>
</tr>
<tr>
<td>Energy drinks</td>
<td>6.9</td>
</tr>
<tr>
<td>RTD coffees</td>
<td>6.0</td>
</tr>
<tr>
<td>Total</td>
<td>24.0</td>
</tr>
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</table>
A Penny-Per-Ounce Tax On Sugar-Sweetened Beverages Would Cut Health And Cost Burdens Of Diabetes

ABSTRACT Sugar-sweetened beverages are a major contributor to the US obesity and diabetes epidemics. Using the Disease Policy Model, we examined the health and economic effects of a nationwide 1-cent-per-ounce excise tax on sugar-sweetened beverages. We found that the tax would prevent 2.4 million diabetes and heart disease cases and 8,000 premature deaths, and would reduce health spending by $13 billion annually. To generate approximately $13 billion in annual tax revenue, a modest tax on sugar-sweetened beverages could reduce the adverse health and cost burdens of obesity, diabetes, and cardiovascular diseases.

...would reduce consumption by 15 percent among adults ages 25-64.

Why target SSBs?
Largest source added sugar
Sources of added sugars, 2-19 yr, NHANES 2007-08

- Sodas
- Other foods
- Yogurt
- Dairy desserts
- Breads and muffins
- RTE cereals
- Cakes and cookies
- Candy and gum
- Sugar and syrups
- Alcohol beverages
- Fruitades & sports drinks
- Energy drinks
- Sweetened milk
- Coffee and tea
Why target SSBs?
Science is strong and growing
Since then, more studies…
Child/adult overweight & obesity

- Committee on Nutrition, Council on Sports Med and Fitness, Pediatrics, 2011
- Fiorito et al., Am J Clin Nutr, 2009
- Lim et al., Obesity, 2009
- Sichieri et al., Pub Health Nutr, 2009
- Hu et al., Physiol Behav, 2010
Elevated risk of type 2 Diabetes

• deKoning, AJCN, 2012
• Malik et al., Circulation, 2010
• Malik et al., Diabetes Care, 2010
Prospective Study of Pre-Gravid Sugar-Sweetened Beverage Consumption and the Risk of Gestational Diabetes Mellitus

LIWEI CHEN, MD, PhD1
FRANK B. HU, MD, PhD2,3,4
EDWINA YEUNG, PHD5
WALTER WILLET, MD, DRPH2,3,4
CUILIN ZHANG, MD, PHD5

OBJECTIVE — Consumption of sugar-sweetened beverages (SSBs) was related to an elevated risk of type 2 diabetes and insulin resistance in several recent studies among middle- or older-aged populations. Studies on SSB consumption and glucose intolerance among pregnant women, however, are lacking. We therefore examined the association between regular SSB consumption before pregnancy and the risk of gestational diabetes mellitus (GDM).

RESEARCH DESIGN AND METHODS — This was a prospective study among 13,475 U.S. women who reported at least one singleton pregnancy between 1992 and 2001 in the Nurses’ Health Study II. GDM was self-reported and validated by medical record review in a subsample. Cox proportional hazards models with multivariate adjustments were applied to examine the association of SSB consumption with GDM risk.

RESULTS — During 10 years of follow-up, 860 incident GDM case subjects were identified. After adjustment for age, parity, race, physical activity, smoking, alcohol intake, prepregnancy BMI, and Western dietary pattern, intake of sugar-sweetened cola was positively associated with the risk of GDM, whereas no significant association was found for other SSBs and diet beverages. Compared with women who consumed <1 serving/month, those who consumed ≥5 servings/week of sugar-sweetened cola had a 22% greater GDM risk (relative risk 1.22 [95% CI 1.01–1.47]).

CONCLUSIONS — Findings from this study suggest that prepregnancy higher consumption of sugar-sweetened cola (≥5 servings/week) is associated with an elevated GDM risk, whereas no significant association with GDM risk was observed for other SSBs and diet beverages.

Diabetes Care 32:2236–2241, 2009

Americans’ diets (2). In animal models and human studies, a high-sugar diet reduces insulin sensitivity (3,4) and insulin secretion (5). Higher consumption of SSBs was associated with an elevated risk of type 2 diabetes (6–8) and insulin resistance (9) among middle- or older-aged adults in several recent epidemiological studies. Studies regarding the impact of habitual SSB consumption on glucose intolerance among pregnant women, however, are lacking. We therefore examined the association of pregravid SSB consumption with GDM risk in a large prospective cohort of U.S. women.

RESEARCH DESIGN AND METHODS — The Nurses’ Health Study II (NHS II) is a prospective cohort study of 116,671 female U.S. nurses, originally recruited at age 24–44 years in 1989. This cohort has been, and continues to be, followed with the use of biennial mailed questionnaires to update information on health-related behavior and to determine incident disease outcome. The follow-up rate has been ~90% for every 2-year period. In the present analysis, women were excluded if they did not complete a semi-
CVD in adolescents and adults

- Pollock et al., J Nutr, 2012
- Bernstein et al., AJCN, 2012
- deKoning et al., Circ., 2012
- Aeberli et al., AJCN, 2011
- Brown et al., Hypertension, 2011
- Duffey et al., AJCN, 2010
- Welsh et al., JAMA, 2010
- Fung et al., AJCN, 2009
Dental caries, erosion

- Committee on Nutrition, Council on Sports Med and Fitness, Pediatrics, 2011
- Buyer, J IN Dental Assn, 2009
- Warren et al, Commmty Dent. Oral, 2009
NO association: Industry-funded

Meta-analyses

- Vartanian et al. AJPH, 2007

Industry funding increased the likelihood of a finding favorable to the sponsor by 4- to 8-fold.
Why target SSBs?
Consumption trends
Soda down slightly

Gallons/year per capita

2009

45.45

2010

44.70

Beverage World Data, 2011
Sports drinks up

2009: 3.78 Gallons/year per capita
2010: 4.10 Gallons/year per capita

Beverage World Data, 2011
RTD teas up

2009: 2.94 Gallons/year per capita
2010: 3.28 Gallons/year per capita

Beverage World Data, 2011
Energy drinks up

1.16

2009

1.25

2010

Gallons/year per capita

Beverage World Data, 2011
Why target: Intake
Average US intake = 45 gallons/yr

Figure 6
Per Capita Daily Consumption of Calories from SSBs, by Type, 1999-2004

Figure 1. Mean kilocalories from sugar drinks for ages 2 and over: United States, 2005–2008

1Significantly different from males.
2Significant quadratic trend for both males and females.

Ogden et al., NCHS Data Brief, No. 71, 2011
By Race/Ethnicity

Figure 4. Mean percentage of total daily kilocalories from sugar drinks for ages 2 and over, by race and ethnicity: United States, 2005–2008

- Non-Hispanic white
- Non-Hispanic black
- Mexican American

Ogden et al., NCHS Data Brief, No. 71, 2011
By Income

Figure 5. Mean percentage of total daily kilocalories from sugar drinks for ages 2 and over, by poverty income ratio: United States, 2005–2008

Ogden et al., NCHS Data Brief, No. 71, 2011
The calories are...

- empty
- junk
- detrimental
- nutrition-less

- whatever (bad thing) you want to call them....
Maine is drinking...

<table>
<thead>
<tr>
<th>Drink Type</th>
<th>Gallons</th>
<th>Tax Revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Soft Drinks</td>
<td>25,519,652</td>
<td>$32,665,155</td>
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<tr>
<td>Fruit Beverages</td>
<td>7,670,475</td>
<td>$9,818,208</td>
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<tr>
<td>Sports Drinks</td>
<td>3,786,096</td>
<td>$4,846,203</td>
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<tr>
<td>Ready-to-Drink Tea - Nondiet</td>
<td>3,059,866</td>
<td>$3,916,628</td>
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<tr>
<td>Flavored Water</td>
<td>1,493,721</td>
<td>$1,911,963</td>
</tr>
<tr>
<td>Energy Drinks</td>
<td>1,577,312</td>
<td>$2,018,959</td>
</tr>
<tr>
<td>Ready-to-Drink Coffee</td>
<td>245,500</td>
<td>$314,240</td>
</tr>
<tr>
<td><strong>Total sugar-sweetened beverages</strong></td>
<td><strong>43,352,622</strong></td>
<td><strong>$55,491,356</strong></td>
</tr>
</tbody>
</table>
Why target SSBs: Marketing to Kids
Sugary Drink FACTS

- 644 products, 61 brands, 14 companies
- $29 billion estimated sales

Share of sales in 2010:

- Regular soda 45%
- Energy drinks 21%
- Fruit drinks 16%
- Sports drinks 15%
- Flavored water 8%

Source: Symphony IRI
Evaluating Sugary Drink Nutrition and Marketing to Youth

www.sugarydrinkfacts.org
Higher exposure significantly associated with higher consumption
Voluntary policies not working

- CFBAI
  - Began 2006
  - 17 companies
  - No ads to kids under 12
Industry fighting voluntary stds

Sensible Food Policy Coalition
ENSURING CHOICES IN NUTRITION FOR AMERICA'S FAMILIES

Keep the Government Out of Your Kitchen!
New restrictions proposed by the federal government will limit the information parents have to make decisions about foods our children eat. Lawmakers and bureaucrats will decide what’s best for you and your family.

Tell the FTC

sensiblefoodpolicy.org
Coke’s CEO

“We are laser-focused on targeting the right consumers....To target aging and affluent consumers globally, we are actively exploring new ingredients, new functionality and new occasions. **At the same time, we are creating new strategies that are winning over a massive new generation of teens to drive growth of Trademark Coca-Cola.**”

Businesswire.com, November 16, 2009
Targeting Youth

• Especially Black and Hispanic
• Despite pledges to market fewer SSBs, industry is targeting youth with more
TV ads increased overall

3 companies doubled advertising

<table>
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<th></th>
<th>2008</th>
<th>2010</th>
<th>2008</th>
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<tr>
<td>Children</td>
<td></td>
<td></td>
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<tr>
<td>Coca-Cola</td>
<td>13</td>
<td>24</td>
<td>26</td>
<td>33</td>
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<td>Dr Pepper</td>
<td>17</td>
<td>45</td>
<td>39</td>
<td>60</td>
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<td>Snapple</td>
<td>23</td>
<td>60</td>
<td>61</td>
<td>105</td>
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<td>5-hour Energy</td>
<td>17</td>
<td>24</td>
<td>23</td>
<td>61</td>
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<tr>
<td>5-hour Energy</td>
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<td>5-hour Energy</td>
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<td>24</td>
<td>23</td>
<td>61</td>
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<th>Teen</th>
<th>2008</th>
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<tr>
<td>PepsiCo</td>
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<td>24</td>
<td>26</td>
<td>33</td>
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<tr>
<td>PepsiCo</td>
<td>13</td>
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<td>33</td>
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Coca-Cola
Dr Pepper
Snapple Group
5-hour Energy
PepsiCo
Kraft Foods
Black children/teens view 80-90% more TV ads than whites
Product placements
YouTube

- Coke: 23 million upload views
- Red Bull: 158 million
- Monster: 11 million
Facebook

• 30 million fans, #1 brand on Facebook
Mobile advertising

- Banner ads

- Text messages

From My Coke Rewards, 3/4/11:
Want to boost ur balance? It’s easy to do. Enter 3 codes in the next 10 days and u’ll get 20 Bonus Points on us.
Mobile apps

• Downloaded by 40,000 teens (25-40% of users)
### Company websites

<table>
<thead>
<tr>
<th></th>
<th>Visitors per month</th>
<th></th>
<th>Minutes per month</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-11 years</td>
<td>12-17 years</td>
<td></td>
</tr>
<tr>
<td>MyCokeRewards.com</td>
<td>42,000</td>
<td>128,900</td>
<td>9.2</td>
</tr>
<tr>
<td>Coca-Cola.com</td>
<td>3,800</td>
<td>32,600</td>
<td>1.6</td>
</tr>
<tr>
<td>MyCoke.com</td>
<td>6,200</td>
<td>28,400</td>
<td>1.8</td>
</tr>
</tbody>
</table>
Banner ads on 3rd-party websites

- Wish studying was more fun?
- Use the Crammer Keeper Application
- and turn your notes into catchy tunes
- Put your class notes to music and make studying fun!
Twitter

• 300,000 followers

@CocaCola
10/19/10: Smiles, laughs, bubbles. What else do you associate with Coca-Cola? ^OP
Even Barbie
Why target SSBs: Caffeine
Gratuitous addition of caffeine

- Coupled with calories
- *Supposed* taste enhancer

- AAP: “Rigorous review and analysis of the literature reveal that caffeine and other stimulant substances contained in energy drinks have no place in the diet of children and adolescents.”

Brownell, Griffiths, & Gold 2008; Keast & Riddell 2007; Griffiths & Vernotica, 2000
Economic benefits
### Tax Per Ounce

**Year:** 2013

**Status:** ME

Tax Per Ounce: 1 cent(s) (0.01 - 2.00 cents)

- **Sugar-Sweetened Beverages**
- **Sugar-Sweetened and Diet Beverages**

**Calculate**

<table>
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<td>25,284,640</td>
<td>$32,364,339</td>
</tr>
<tr>
<td>Fruit Beverages</td>
<td>7,443,479</td>
<td>$9,527,653</td>
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<tr>
<td>Sports Drinks</td>
<td>3,763,009</td>
<td>$4,816,652</td>
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<tr>
<td>Ready-to-Drink Tea - Nondiet</td>
<td>3,220,321</td>
<td>$4,122,011</td>
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<tr>
<td>Flavored Water</td>
<td>1,466,857</td>
<td>$1,877,577</td>
</tr>
<tr>
<td>Energy Drinks</td>
<td>1,620,433</td>
<td>$2,074,154</td>
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<tr>
<td>Ready-to-Drink Coffee</td>
<td>257,269</td>
<td>$329,304</td>
</tr>
<tr>
<td><strong>Total sugar-sweetened beverages</strong></td>
<td>43,056,008</td>
<td><strong>$55,111,690</strong></td>
</tr>
</tbody>
</table>
Study: Obesity adds $190b in health costs

• “The startling economic costs of obesity, often borne by the non-obese, could become the epidemic’s second-hand smoke.”
## Estimated adult obesity-attributable percentages and medical expenditures for Maine (2003 dollars)

<table>
<thead>
<tr>
<th>Population Type</th>
<th>Obesity Percentage</th>
<th>Expenditure</th>
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</thead>
<tbody>
<tr>
<td>Total population</td>
<td>5.6%</td>
<td>$357m</td>
</tr>
<tr>
<td>Medicare pop</td>
<td>5.7%</td>
<td>$66m</td>
</tr>
<tr>
<td>Medicaid pop</td>
<td>10.7%</td>
<td>$137m</td>
</tr>
</tbody>
</table>

Finkelstein et al, Obes Res, 2004
Earmarking

• School-based interventions
• Access to real food/subsidize real food
• Public education campaigns
• Community interventions
• Health care
Tax as part of a broader approach
Increasing Population Impact

Counseling and Education

Clinical Interventions

Long-Lasting Protective Interventions

Changing the Context to Make Individuals’ Default Decisions Healthy

Socioeconomic Factors

Increasing Individual Effort Needed
How best to make change?

Educate → Knowledge

Medicate

Operate

Implore → Motivation

The Individual

Less Obesity?
Optimal Defaults

Legislation

Economics

Regulation

Environment

The Individual

Less Obesity?
Change Environment:
Optimal Defaults
SSB “Environment”

Within an Arm’s Reach of Desire
Default: Encourages healthy behavior
Default: supports responsible behavior
Default: normalizes
Obesity Prevention Strategies

Schools: food/p.a.

Marketing

Built environ

Access to real food

Pricing strategies
ARE YOU POURING ON THE POUNDS?

You’re drinking 68 PACKETS OF SUGAR in just 4 sugary drinks a day.

Education: Portland, ME
Education: Youth campaigns

YO! Youth Outlook, California
Education: other

• School curricula
• Health care professionals
  – Discuss with patients
Lead by example: Healthy cities
Lead by example: Hospitals

Sugary drinks out at 4 Chicago-area hospitals

Wednesday, April 25, 2012
Lead by example: Churches

Seattle
Lead by example: no soda
Study Shows Widespread Marketing of Unhealthy Foods and Beverages in Maine High Schools, Despite Statewide Marketing Ban

School Administrators Overwhelmingly Support Law, but Need Help to Implement

Published: Mar 09, 2012
Within an Arm’s Reach of Desire
The Supplemental Nutrition Assistance Program, Soda, and USDA Policy

Who Benefits?

Kelly D. Brownell, PhD
David S. Ludwig, MD, PhD

Opposition to the New York proposal came from some surprising and not so surprising groups. With billions of dollars at stake annually, the beverage industry was predictably opposed. A spokesperson for the American Beverage...
Supermarkets

• no SSBs in checkout aisles
• no SSBs on endcaps
• better beverages at eye-height
• signage:
  – “water is better for you”
  – “water is cheaper”
  – sugar amounts
Other pricing strategies

- Differential pricing
- Minimum pricing
- Discount better bevs
Calls for reducing added sugars, SSB consumption

- American Academy Pediatrics
- American Heart Assn
- American Medical Assn
- CDC
- Institute of Medicine
- USDA
- World Health Organization
What to expect from the industry
Millions spent lobbying by industry

Reuters, April 29, 2012
<table>
<thead>
<tr>
<th>Statement</th>
<th>Truth</th>
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<tbody>
<tr>
<td>Many things drive obesity</td>
<td>True</td>
</tr>
<tr>
<td>It won’t solve obesity</td>
<td>True</td>
</tr>
<tr>
<td>Consumption is down, obesity is up</td>
<td>False</td>
</tr>
<tr>
<td>Sugar isn’t special – all calories are equal</td>
<td>False</td>
</tr>
<tr>
<td>It’s about physical activity</td>
<td>False</td>
</tr>
<tr>
<td>The science isn’t clear</td>
<td>False</td>
</tr>
<tr>
<td>People will lose jobs</td>
<td>False</td>
</tr>
<tr>
<td>Tax would hurt the poor</td>
<td>False</td>
</tr>
</tbody>
</table>
“We’re part of the solution”

My Coke Rewards
School Donations

Donate points to your school, so it can get rewards like art supplies and sports equipment, and support all the ways kids play. Even the smallest point contribution can lead to great things for students in your community.

- Find a school and donate points
- Register your school and become a school coordinator
How Sugar Daddy Lobbyists Killed the War on Obesity

By DUFF WILSON, JANET ROBERTS, Reuters April 29, 2012
Clear on Calories
Think Smart. Be Smart. Act Smart.

Now, more than ever, Americans must think smarter and act smarter. Especially when it comes to improving health care in America, an admirable goal we support. But we also know we can’t tax our way to healthier lifestyles, and we need to make that clear to our members of Congress. After all, we do have an obligation to our children—and to ourselves—to promote healthy lifestyles through balanced diet and exercise. More

Make your voice heard!

84,519 signups
www.yaleruddcenter.org/ssbtax

- Issue overview and fact sheets
- Tax information
- Revenue calculator
- Legislation
- Public opinion data
- Study synopses
- Supporting statements of nat’l orgs
- Additional resources
Thank you!

Roberta.friedman@yale.edu

203-432-4717

www.yaleruddcenter.org