The sugar pandemic: policy vs. politics

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Healthy Kids Forum, Santa Clara, May 11, 2015
• no disclosures
If a researcher isn’t willing to follow his data into the policy arena, who will?

— Dr. Jeremiah Stamler,
“Father” of Cardiovascular Epidemiology
Non-communicable disease is now a bigger problem than acute infectious diseases worldwide.

Plan to target tobacco, alcohol, and diet.

But exactly what about diet?
- Total calories?
- Fat?
- Red meat?
- Dairy?
- Carbohydrate?
Non-communicable disease is now a bigger problem than acute infectious diseases worldwide.

Plan to target, tobacco, alcohol, and diet.

“Beating obesity will take action by all of us, based on one simple *common sense* fact: *All calories count*, no matter where they come from, including Coca-Cola and everything else with calories…”

- The Coca Cola Company, “Coming Together”, 2013
The Science

- Some Calories Cause Disease More than Others
- Different Calories are Metabolized Differently
- A Calorie is Not A Calorie
Addictive and hazardous to your health

![Marlboro cigarettes with warning labels]
Addictive and hazardous to your health
Sugar is 'addictive and the most dangerous drug of the times'

Soft drinks should carry tobacco-style warnings that sugar is highly addictive and dangerous, a senior Dutch health official has warned.

Paul van der Velpen, the head of Amsterdam's health service, the Dutch capital city where the sale of cannabis is legalised, wants to see sugar tightly regulated.

"Just like alcohol and tobacco, sugar is actually a drug. There is an important role for government. The use of sugar should be discouraged. And users should be made aware of the dangers," he wrote on an official public health website.
BACON ‘WANTED TO BE LIKE SCARFACE’
Surrey Six witness says Red Scorpions leader sought power and control

The Province

3'6"
3'0"
2'6"
2'0"

SUGAR: PUBLIC ENEMY #1

Dietitians recommend 12-step program to help manage your sugar consumption

FINAL EDITION
$1.52 minimum in outlet areas
$1.94 minimum in突出问题

TUESDAY, MARCH 11, 2014
VANCOUVER, BRITISH COLUMBIA

A DIVISION OF POSTMEDIA NETWORK INC.

CANUCKS SUCCUMB IN WILD ONE TO ISLES
SPORTS A28-30
The toxic truth about sugar

Added sweeteners pose dangers to health that justify controlling them like alcohol, argue Robert H. Lustig, Laura A. Schmidt and Claire D. Brindis.
Criteria for societal intervention for substance control

• Unavoidability
• Toxicity
• Abuse
• Externalities-negative impact on society

Unavoidability
Total Caloric Intake

↑ 275 kcal in teen boys

Children 2-17 yrs, CSFII (USDA) 1989-91 vs. 1994-95
http://www.usda.gov/cnpp/FENR%20V11N3/fenrv11n3p44.PDF
Fat Intake: Grams

Children 2-17 yrs, CSFII (USDA) 1989-91 vs. 1994-95

↑ 5 g (45 cal) in teen boys
Secular trends in specific food intake 1989-1996

Secular trends in specific food intake 1989-1996

Prevalence of Obesity Compared to Percent Calories from Fat Among US Adults

Year

Percent

Calories from fat

Obesity prevalence


Courtesy D.S. Ludwig
Carbohydrate Intake: Grams

↑ 57 g (228 cal) in teen boys

Children 2-17 yrs, CSFII (USDA) 1989-91 vs. 1994-95
Secular trends in specific food intake 1989-1996

Beverage Intake

Children 2-17 yrs, CSFII (USDA) 1989-91 vs. 1994-95

↑41% soft drinks

↑35% fruit drinks
High Fructose Corn Syrup

Current US annual consumption:

• 63 pounds per person

Current users:
U.S.
Canada
Japan
Parts of Europe (limited use)
High Fructose Corn Syrup is 42-55% Fructose; Sucrose is 50% Fructose

Glucose

Fructose

Sucrose
US Sugar Consumption, 1822-2005

Grams per day

**Growth of Sugar Industry**

**Stabilization**

**WWII**

**HFCS + Sugar for Fat**

U.S. Commerce Service 1822-1910, combined with Economic Research Service, USDA 1910-2010
US Sugar Consumption, 1822-2005

Grams per day

Theoretical threshold based on EtOH

Stabilization

HECS + Sugar for Fat

AHA threshold for CVD

Growth of Sugar Industry

1820 1840 1860 1880 1900 1920 1940 1960 1980 2000

U.S. Commerce Service 1822-1910, combined with Economic Research Service, USDA 1910-2010
Grams per day

Diabetes rise In NYC 1924

Theoretical threshold based on EtOH

AHA threshold for CVD

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Theoretical threshold based on EtOH

Sugar for Fat

HFCS +

U.S. Commerce Service 1822-1910, combined with Economic Research Service, USDA 1910-2010
Growth of Sugar Industry

Stabilization

Emergence of Adolescent T2DM as health issue 1988

HFCS + Sugar for Fat

Theoretical threshold based on EtOH

AHA threshold for CVD

Diabetes rise in NYC 1924

Emergence of CVD as health issue 1931

WWII

U.S. Commerce Service 1822-1910, combined with Economic Research Service, USDA 1910-2010
Worldwide per capita sugar supply, 2007

FAOStat, 2007
The early history of the sugar pandemic
The perfect storm from five political winds
The perfect storm from five political winds

1. Fall of Bautista and rise of Castro in Cuba (1959) altered sugar imports
The perfect storm from five political winds

1. Fall of Bautista and rise of Castro in Cuba (1959) altered sugar imports

2. Richard Nixon and USDA Secretary Earl Butz (1973)
   - food should never be an issue in a presidential election
Percent of Gross National Product spent on food, by country

Time Magazine, Feb 28, 2011
The perfect storm from five political winds

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3. The advent of High Fructose Corn Syrup (1966)
   • introduced to the American market in 1975
Influence of corn sweeteners on the price of sugar

U.S. Producer Price Index

International price of refined sugar

U.S. Retail Price

- raw cane sugar
- refined beet sugar
- corn sweeteners
- London price
- U.S. price
- refined sugar
- HFCS-42

U.S. Department of Agriculture
ANNUAL PER CAPITA AVAILABILITY OF SUGAR AND HFCS ADJUSTED FOR LOSS

USDA FOOD DISAPPEARANCE DATA

TOTAL HFCS & SUGAR

SUGAR*

HFCS**

Source: USDA, Economic Research Service, Sweetener Yearbook, Tables 51 and 52
*Estimated annual per capita sugar consumption calculated by adjusting sugar deliveries for domestic food and beverage use for food losses.
**Estimated annual per capita HFCS consumption calculated by adjusting HFCS deliveries for domestic food and beverage use for food losses.
ANNUAL PER CAPITA AVAILABILITY OF SUGAR AND HFCS ADJUSTED FOR LOSS

USDA FOOD DISAPPEARANCE DATA

YEAR

POUNDS PER YEAR
0 10 20 30 40 50 60 70 80 90 100

TOTAL HFCS & SUGAR
SUGAR*
HFCS**
JUICE

MOST FRUCTOSE ITEMS

Source: USDA, Economic Research Service, Sweetener Yearbook, Tables 51 and 52
*Estimated annual per capita sugar consumption calculated by adjusting sugar deliveries for domestic food and beverage use for food losses.
**Estimated annual per capita HFCS consumption calculated by adjusting HFCS deliveries for domestic food and beverage use for food losses.
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4. The USDA, AMA, and AHA call for dietary fat reduction (1977)
   • Early 1970’s: discovery of LDL
   • Mid 1970’s: Dietary fat raises LDL (A → B)
   • Late 1970’s: LDL correlated with CVD (B ≈ C)
   • 1980: If A → B, and B ≈ C, then A → C, therefore no A, no C
The macronutrient wars 1970-1980

SEVEN COUNTRIES
Ancel Keys
with
Christ Aravanis
Henry Blackburn
Ratko Bozina
B. S. Djordjević
A. S. Duntas
Flaminio Fidanza
Martti J. Karvonen
Noboru Kimura
Alessandro Menotti
Ivan Mohaček
S. Nedeljković
Vittorio Puddu
Sten Puskar
Henry L. Taylor
F. S. P. van Buchem

A Multivariate Analysis of Death and Coronary Heart Disease

A Commonwealth Fund Book

Harvard University Press
Cambridge, Massachusetts
and London, England
1980

John Yudkin
Pure, White and Deadly
Viking
1972, 1986
The Original Case Against Fat

Ancel Keys “7-Country Study” in fact listed 6, studied 22
Started in 1958, continued for 15 yr

Figure 1A. Correlation between the total fat consumption as a percent of total calorie consumption, and mortality from coronary heart disease in six countries. Data from Keys.
The Original Case Against Fat

Ancel Keys “7-Country Study” in fact listed 6, studied 22
Started in 1958, continued for 15 yr
Add in the Maasai, Inuit, Rendille, and Tokelau indigenous tribes
Seven Countries
Correlation of CHD with dietary fat
The fact that the incidence rate of coronary heart disease was significantly correlated with the average percentage of calories from sucrose in the diets is explained by the intercorrelation of sucrose with saturated fat. Partial correlation analysis shows that with saturated fat constant there was no significant correlation between dietary sucrose and the incidence of coronary heart disease.

Comparisons of coronary death rates with estimates of national diets in international statistics indicate a strong linear relationship with saturated fat.
The low-fat craze

The content of low-fat home-cooked food can be controlled

But low-fat processed food means substitution with carbohydrate

Which carbohydrate?

Either

• High fructose corn syrup (55% fructose)
• Sucrose (50% fructose)

e.g. Nabisco Snackwells® Oreos
   —2g fat, +13g CHO (+4g sugars)
The SFUSD School Milk Program

Courtesy of M. Lustig
The SFUSD School Milk Program

Courtesy of M. Lustig
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   • Late 1970’s: LDL correlated with CVD (B $\approx$ C)
   • 1980: If A $\rightarrow$ B, and B $\approx$ C, then A $\rightarrow$ C,
     therefore no A, no C

5. Hurricane Allen (1980) destroyed the Caribbean sugar crop
New Coke (1985)
Adulteration of our food supply

Addition of fructose
- palatability (esp. with decreased fat)
- browning agent (Maillard Reaction)

Removal of fiber
- shelf life
- freezing

Substitution of trans-fats
- hardening agent, shelf life
- now being removed due to CVD risk
Toxicity
Obesity is not the problem
People don’t die of obesity
Obesity is not the problem

People don’t die of obesity

Metabolic syndrome is the problem

In particular, diabetes:

because that’s where the money goes
“Exclusive” view of obesity and metabolic dysfunction

240 million adults in U.S.

- 72 million Obese (30%)
- 168 million Normal weight (70%)
“Exclusive” view of obesity and metabolic dysfunction

240 million adults in U.S.

72 million Obese (30%)

Obese and sick (80% of 30%)

Total: 57 million sick

168 million Normal weight (70%)

“Exclusive” view of obesity and metabolic dysfunction

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Obese and sick (80% of 30%)

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240 million adults in U.S.

- Obese (30%): 72 million
- Normal weight (70%): 168 million
“Inclusive” view of obesity and metabolic dysfunction

240 million adults in U.S.

- 72 million Obese (30%)
- 67 million Normal weight, Metabolic dysfunction (40% of 70%)
- 57 million Obese and sick (80% of 30%)
- 168 million Normal weight (70%)

Total: 124 million sick adults
**Toxicity:**

The degree to which a substance can damage an organism

- Does not distinguish acute vs. chronic toxicity

**Caveats:**

- Exclusive of calories
- Exclusive of obesity
- Human data only
- In doses routinely consumed
Prevalence of diabetes, 2010
Hazard ratio for CV disease based on percent calories as sugar for US adult population, 1988-2006

Figure 1. Adjusted Hazard Ratio of the Usual Percent of Calories from Added Sugar for CVD Mortality Among US Adults Aged ≥20 Years – NHANES Linked Mortality Files, 1988-2006

Histogram is the distribution of usual percent of calories from added sugar in population. Lines show the adjusted HRs from Cox models. Mid-value of quintile 1 (7.5%) was the reference standard. Model was adjusted for age, sex, race/ethnicity, educational attainment, smoking status, alcohol consumption, physical activity level, family history of CVD, antihypertensive medication use, health eating index score, body mass index, systolic blood pressure, total serum cholesterol and total calories. Solid line indicates point estimates; dashed lines indicate 95% CIs. CVD indicates cardiovascular disease; HR, hazard ratio; NHANES, National Health and Nutrition Examination Survey.
### Table 2  HRs (and 95% CIs) for type 2 diabetes according to type and amount of sweet beverage consumption in the EPIC-InterAct study

<table>
<thead>
<tr>
<th>Variable and model</th>
<th>&lt;1 glass(^a)/ month HR (95% CI)</th>
<th>1–4 glasses(^a)/ month HR(^b) (95% CI)</th>
<th>&gt;1–6 glasses(^a)/ week HR(^b) (95% CI)</th>
<th>≥1 glass(^a)/ day HR(^b) (95% CI)</th>
<th>p for trend</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Juices and nectars (median intake, g/day)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. cases</td>
<td>(0.0)</td>
<td>(10.0)</td>
<td>(14.0)</td>
<td>(38.0)</td>
<td></td>
</tr>
<tr>
<td>Crude model</td>
<td>1.00 (ref)</td>
<td>0.88 (0.80, 0.98)</td>
<td>0.89 (0.83, 0.94)</td>
<td>0.97 (0.85, 1.11)</td>
<td>0.64</td>
</tr>
<tr>
<td>Adjusted model</td>
<td>1.00 (ref)</td>
<td>0.91 (0.80, 1.02)</td>
<td>0.96 (0.88, 1.04)</td>
<td>1.00 (0.87, 1.15)</td>
<td>0.63</td>
</tr>
<tr>
<td>Adjusted model+EI</td>
<td>1.00 (ref)</td>
<td>0.91 (0.81, 1.02)</td>
<td>0.96 (0.88, 1.04)</td>
<td>0.99 (0.86, 1.14)</td>
<td>0.84</td>
</tr>
<tr>
<td>Adjusted model+EI+BMI</td>
<td>1.00 (ref)</td>
<td>0.97 (0.86, 1.10)</td>
<td>1.04 (0.96, 1.13)</td>
<td>1.06 (0.90, 1.25)</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Total soft drinks(^c) (median intake, g/day)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. cases</td>
<td>(0.0)</td>
<td>(20.0)</td>
<td>(95.1)</td>
<td>(413.1)</td>
<td></td>
</tr>
<tr>
<td>Crude model</td>
<td>1.00 (ref)</td>
<td>1.21 (1.07, 1.36)</td>
<td>1.30 (1.18, 1.43)</td>
<td>1.78 (1.55, 2.04)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model</td>
<td>1.00 (ref)</td>
<td>1.21 (1.07, 1.37)</td>
<td>1.26 (1.13, 1.42)</td>
<td>1.58 (1.35, 1.84)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model+EI</td>
<td>1.00 (ref)</td>
<td>1.21 (1.07, 1.37)</td>
<td>1.27 (1.12, 1.43)</td>
<td>1.59 (1.35, 1.88)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model+EI+BMI</td>
<td>1.00 (ref)</td>
<td>1.17 (0.97, 1.42)</td>
<td>1.11 (0.98, 1.26)</td>
<td>1.21 (1.05, 1.41)</td>
<td>0.0005</td>
</tr>
<tr>
<td><strong>Sugar-sweetened soft drinks(^d) (median intake, g/day)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. cases</td>
<td>(0.0)</td>
<td>(19.3)</td>
<td>(94.3)</td>
<td>(425.7)</td>
<td></td>
</tr>
<tr>
<td>Crude model</td>
<td>1.00 (ref)</td>
<td>1.14 (0.97, 1.35)</td>
<td>1.16 (1.05, 1.28)</td>
<td>1.68 (1.40, 2.02)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model</td>
<td>1.00 (ref)</td>
<td>1.13 (0.97, 1.31)</td>
<td>1.04 (0.94, 1.15)</td>
<td>1.39 (1.16, 1.67)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model+EI</td>
<td>1.00 (ref)</td>
<td>1.12 (0.96, 1.31)</td>
<td>1.04 (0.94, 1.15)</td>
<td>1.39 (1.15, 1.69)</td>
<td>0.001</td>
</tr>
<tr>
<td>Adjusted model+EI+BMI</td>
<td>1.00 (ref)</td>
<td>1.19 (0.91, 1.56)</td>
<td>1.07 (0.94, 1.21)</td>
<td>1.29 (1.02, 1.63)</td>
<td>0.013</td>
</tr>
<tr>
<td><strong>Artificially sweetened soft drinks(^e) (median intake, g/day)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. cases</td>
<td>(0.0)</td>
<td>(18.3)</td>
<td>(89.0)</td>
<td>(500.0)</td>
<td></td>
</tr>
<tr>
<td>Crude model</td>
<td>1.00 (ref)</td>
<td>1.09 (0.97, 1.23)</td>
<td>1.52 (1.36, 1.69)</td>
<td>1.84 (1.52, 2.23)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model</td>
<td>1.00 (ref)</td>
<td>1.10 (0.93, 1.29)</td>
<td>1.46 (1.29, 1.65)</td>
<td>1.93 (1.47, 2.54)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model+EI</td>
<td>1.00 (ref)</td>
<td>1.08 (0.93, 1.26)</td>
<td>1.46 (1.29, 1.65)</td>
<td>1.88 (1.44, 2.45)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adjusted model+EI+BMI</td>
<td>1.00 (ref)</td>
<td>1.05 (0.81, 1.35)</td>
<td>1.18 (1.03, 1.35)</td>
<td>1.13 (0.85, 1.52)</td>
<td>0.24</td>
</tr>
</tbody>
</table>
An international econometric analysis of diet and diabetes

**Food and Agriculture Organization (FAO); FAOSTAT**

Food Supply data in kcal/capita/day calculation:

Food Supply\(=\sum\text{Supply Elements} - \sum\text{Utilization Elements}\) =
\[(\text{Production} + \text{Import Quantity} + \text{Stock Variation} - \text{Export Quantity}) - (\text{Feed} + \text{Seed} + \text{Processing} + \text{Waste}).\]

Only industrial waste factored in.

Extracted Food Supply data for 2000 and 2007:

- **Total Calories**
  - Roots & Tubers, Pulses, Nuts, Vegetables
  - Fruits-Excluding Wine
  - Meat
  - Oils
  - Cereals
  - Sugar, Sugarcrops & Sweeteners

**International Diabetes Federation (IDF)**

2000 (1st ed) and 2010 (3rd ed)

**The World Bank World Development Indicators Database**

GDP expressed in purchasing power parity in 2005 US dollars for comparability among countries

An international econometric analysis of diet and diabetes

Diabetes prevalence rose from 5.5% to 7.0% for 175 countries 2000-2010

<table>
<thead>
<tr>
<th>Model</th>
<th># countries</th>
<th>Effect (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>175</td>
<td>1.02 (0.82, 1.23)</td>
</tr>
<tr>
<td>Sugar+controls</td>
<td>137</td>
<td>0.63 (0.24, 1.02)</td>
</tr>
<tr>
<td>Sugar+controls+period</td>
<td>137</td>
<td>0.72 (0.34, 1.11)</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>0.90 (0.73, 1.06)</td>
</tr>
</tbody>
</table>

% change in diabetes for each 100kcal sugar/person/day

An international econometric analysis of diet and diabetes

Adjusted Association of Sugar with Diabetes Prevalence

coefficient = 0.00717465, (robust) standard error = 0.00228186, t = 3.14

An international econometric analysis of diet and diabetes

Only changes in sugar availability predicted changes in diabetes prevalence

Every extra 150 calories increased diabetes prevalence by 0.1%

But if those 150 calories were a can of soda, diabetes prevalence increased 11-fold, by 1.1% (95% CI 0.03 — 1.71%, p <0.001)

This study meets the Bradford Hill criteria for Causal Medical Inference:
—dose —duration —directionality —precedence

We estimate that 25% of diabetes worldwide is explained by sugar

Abuse
Obesity and reward
Dopamine binding correlates with glucose metabolism both in drug addiction and obesity.

Is there really such a thing as sugar addiction?

Need to look for similarities to drugs of dependence

- nicotine
- morphine
- amphetamine
- cocaine
- alcohol
Criteria for addiction

- Bingeing
- Tolerance
- Withdrawal
- Anticipation
- Craving
- Enhanced locomotion
- Cross-sensitization
- Increased consumption

Avena et al. Neurosci Biobehav Rev 32:20, 2008 (Courtesy Dr. B. Hoebel)
How about humans?
The DSM-V criteria for addiction

2 of the 11 following criteria within a 12-month period:

1. Tolerance
2. Withdrawal
3. Craving or a strong desire to use
4. Use resulting in a failure to fulfill major role obligations (work, school, home);
5. Recurrent use in physically hazardous situations (e.g. driving);
6. Use despite social or interpersonal problems caused or exacerbated by use;
7. Taking the substance in larger amounts or over a longer period than intended;
8. Attempt to quit or cut down;
9. Time spent seeking or recovering from use;
10. Interference with life activities;
11. Use despite negative consequences.

Physiologic

Psychologic
( Dependence)
Externalities-
Negative impact on society
Societal intervention requires “externalities”
Societal intervention requires “externalities”

If you smoke, drink, or take drugs, it’s bad for me

- second hand smoke
- car accidents
- declining housing prices
- altered work productivity and absenteeism
Societal intervention requires “externalities”

If you smoke, drink, or take drugs, it’s bad for me
  • second hand smoke
  • car accidents
  • declining housing prices
  • altered work productivity and absenteeism

How does your obesity/diabetes affect me?
  • $274 million extra for jet fuel (?)
  • discomfort on the subway (?)
  • sinking of boats due to the weight (?)
Societal intervention requires “externalities”

If you smoke, drink, or take drugs, it’s bad for me
- second hand smoke
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- altered work productivity and absenteeism

How does your obesity/diabetes affect me?
- $274 million extra for jet fuel (?)
- discomfort on the subway (?)
- sinking of boats due to the weight (?)
- $65B reduction in work productivity
- 50% increase in absenteeism
- 50% increase in health insurance premiums
- $245B for diabetes, $200B for dementia
- $192B waste of health care resources
- Obesity is a “threat to national security”
- The Government pays “twice”
Toxic substances that are not abused
(The dose determines the poison)

- Iron
- Vitamin D
- Oxygen
- Pseudoephedrine (not turned into meth)
- Water
Toxic substances that are not abused
(The dose determines the poison)

- Iron
- Vitamin D
- Oxygen
- Pseudoephedrine (not turned into meth)
- Water

Abused substances that are not toxic

- caffeine
- nicotine (but the tars in the cigarettes are)
A vicious cycle: Addiction medicine—Toxic substances that are abused

- morphine
- heroin
- amphetamine
- cocaine
- ethanol
- sugar
Recognition at the American Heart Association

Dietary Sugars Intake and Cardiovascular Health
A Scientific Statement From the American Heart Association

Rachel K. Johnson, PhD, MPH, RD, Chair; Lawrence J. Appel, MD, MPH, FAHA;
Michael Brands, PhD, FAHA; Barbara V. Howard, PhD, FAHA;
Michael Lefevre, PhD, FAHA; Robert H. Lustig, MD; Frank Sacks, MD, FAHA;
Lyn M. Steffen, PhD, MPH, RD, FAHA; Judith Wylie-Rosett, EdD, RD;
on behalf of the American Heart Association Nutrition Committee of the Council on Nutrition,
Physical Activity, and Metabolism and the Council on Epidemiology and Prevention

Recommends reduction in sugar intake from 22 tsp/day to 9 tsp/day (males) and 6 tsp/day (females)

Circulation 120:1011, 2009
How our food dollars have been reallocated
Who’s winning the war?

- Despite the economic downturn of 2008, McDonald’s revenues and stock price continues to rise; and Coke and Pepsi still fared better than the S&P 500.
Who’s winning the war?

Stock prices of various food companies compared to the S&P500 2007-2011
Conflicts of Interest

And Now a Word From Our Sponsors

Are America’s Nutrition Professionals in the Pocket of Big Food?

Michele Simon

JANUARY 2013
Conflicts of Interest

October 17, 2009
American Academy of Pediatrics (Washington, DC)
Welcome Reception Sponsored by Coca-Cola
American Academy of Family Physicians Launches Consumer Alliance With First Partner: The Coca-Cola Company
Which substance do you think is most harmful to your health?

- 50%: Tobacco
- 40%: Alcohol
- 30%: Sugar
- 20%: Marijuana
- 10%: None of the above
### Old medicine: infections microbes

### New medicine: chronic disease multinational corporations

Proven and pandemics: prevention of harmful effects of tobacco, alcohol, and ultra-processed food and drink industries

Rob Moodie, David Stuckler, Carlos Monteiro, Nick Sheron, Bruce Neal, Thaksaphon Thamarangsi, Paul Lincoln, Sally Casswell, on behalf of The Lancet NCD Action Group

Lancet 381:670, 2013
Personal responsibility vs. public health

- Syphilis
- Cholera
- Lead poisoning
- TB
- Food-borne illnesses
- Vitamin deficiencies
- AIDS
- Pollution
- Guns?
Personal responsibility vs. public health

- Syphilis
- Cholera
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- TB
- Food-borne illnesses
- Vitamin deficiencies
- AIDS
- Pollution
- Guns?
- Sugar?
Question 1:

Can our “toxic food environment” be changed without government/societal intervention? Especially when there are potentially addictive substances involved?
Question 2:
Can we afford to wait to enact public health measures when health care will be bankrupt due to chronic metabolic disease?
Research Institute
Thought leadership from Credit Suisse Research and the world's foremost experts

Sugar Consumption at a crossroads
We believe higher taxation on “sugary” food and drinks would be the best option to reduce sugar intake and help fund the fast-growing healthcare costs associated with diabetes type II and obesity.
The obesity and diabetes epidemic poses threat to future economic growth

The chart shows real GDP growth in the OECD area under simulations which adjust long-term OECD forecasts for different productivity levels of normal-weight, obese and diabetic individuals, and assume different levels of sugar consumption per capita in the high- and low-sugar scenarios.

Source: Morgan Stanley Research
Further reading

FAT Chance
Beating the Odds Against SUGAR, PROCESSED FOOD, OBESITY and DISEASE
Robert H. Lustig M.D.
Hudson Street Press (Penguin USA)

Sugar Has 56 Names: A Shopper’s Guide
Robert H. Lustig, MD
NEW YORK TIMES bestselling author of FAT CHANCE
E-book Hudson Street Press
Sept 3, 2013

The FAT Chance Cookbook
Author of the NEW YORK TIMES bestseller FAT CHANCE
Robert H. Lustig, MD, MSL
More Than 100 Recipes Ready in Under 30 Minutes to Help You Lose the Sugar and the Weight
Recipes by CINDY GERSHEN
with Heather Millar
Hudson Street Press
Jan 1, 2014
Fed Up blows the lid off everything we thought we knew about food and weight loss, revealing a 30-year campaign by the food industry, aided by the U.S. government, to mislead and confuse the American public, resulting in one of the largest health epidemics in history.
2015 Hot Docs Film Festival, Toronto
Hidden sugar is like a ticking time bomb.
SWEET REVENGE
TURNING THE TABLES ON PROCESSED FOOD

Featuring New York Times Bestselling Author
Robert H. Lustig, MD, MSL
Professor of Pediatrics,
Division of Endocrinology
University of California, San Francisco
President, Institute for Responsible Nutrition

AS SEEN ON PUBLIC TELEVISION

Public Television
Special, USA
We have started a non-profit to provide medical, nutritional and legal analysis and consultation to promote personal and public health vs. Big Food

responsiblefoods.org
acalorieisnotacalorie.com