



Raising revenue, cutting costs, saving lives:

The benefits of sugary drink taxes in America's major cities

Executive summary

As of November, 2016, six U.S. cities and one urban county have adopted soda taxes as a way to raise revenue for important community priorities while encouraging residents to shift away from sugary drinks that contribute to diabetes, heart disease and other chronic health issues. In the process they are saving tens of millions in health care costs.

But how great an impact can a city-by-city approach have on the nation's health? Substantial, as this report will show. Healthy Food America (HFA) asked researchers at Harvard University's T.H. Chan School of Public Health to use their evidence-based, peer-reviewed computer model to evaluate the impact should 15 more of the nation's largest cities (with legal authority to do so) adopt a sugary drinks tax of one cent per ounce. Here's what they found (see their full brief here):

- With a population of 15.3 million people in the 15 cities, the tax would cut diabetes rates by an average 6 percent and prevent nearly 115,000 of cases of obesity;
- As a result, the nation would avoid \$759 million in health care costs over ten years, 2,349 premature deaths would be averted and tens of thousands of people would live longer lives with less illness;
- All while raising \$600 million a year for community priorities, from initiatives to prevent chronic disease to promoting access to healthy food to providing universal pre-kindergarten and improving schools and recreation centers.

ASSESSING THE BENEFITS OF SUGARY DRINK TAXES IN 21 LOCALES



BAY AREA SODA TAXES



Adopted soda taxes in 2016
 San Francisco, Oakland, Albany, Philadelphia, Boulder, Cook County-Chicago.

Possible future tax Baltimore, Charlotte, Columbus, Denver, Detroit, Indianapolis, Jacksonville, Las Vegas, Los Angeles, Louisville, Oklahoma City, Phoenix, San Diego, San Jose and Seattle.

The Harvard researchers also modelled the potential benefits from sugary drink taxes in the six jurisdictions that adopted them this year – San Francisco, Oakland and Albany, CA; Boulder, CO; Cook County, IL; and Philadelphia, PA. Adding the projected health gains for these six places with a combined population of 8.2 million to those of the 15 cities above, we would see:

- 23.5 million people benefit.
- Health care savings of well over \$1.2 billion over ten years,
- Nearly \$1 billion a year in revenue to help prevent disease and improve life chances for people of all backgrounds,
- 3,683 premature deaths averted,
- Declining diabetes rates, 173,220 fewer cases of obesity, and longer lives, unburdened by preventable disease, for tens of thousands of Americans.

Introduction

This has been a watershed year for communities seeking to tax soda and other health-harming, sugary drinks in the way tobacco is taxed. At the start of 2016, Berkeley, CA, was the only jurisdiction in the U.S. with a tax, adopted by referendum in 2014 after several previous efforts had failed elsewhere. Philadelphia became the second in June, when the mayor proposed, and City Council passed, a 1.5-cent tax on sweetened drinks.

On Nov. 8, voters overwhelmingly approved all four measures to impose a one cent per ounce tax on sugary drinks that were on the ballot – in the California cities of San Francisco, Oakland and Albany, and Boulder, CO. Two days later, the Chicago region joined them when the Cook County, IL, Board of Commissioners approved a 1.5-cent tax on sweetened beverages. In adopting these measures, the six communities overcame more than \$42 million in opposition spending by the American Beverage Association, the trade association for Coca-Cola, Pepsi and Dr Pepper Snapple.

The benefits to those communities will be significant, according to a sophisticated computer model developed by the Childhood Obesity Intervention Cost-Effectiveness Study (CHOICES) at the Harvard T.H. Chan School of Public Health. Not only will the taxes in the Bay Area, Philadelphia, Boulder and Cook County raise millions for important community needs, but they will avert hundreds of millions in health care costs, according to the model. (For a full tally of these benefits, see Table 2.)

Philadelphia will use the revenue to make pre-kindergarten universal and meet other needs, while Boulder and the Bay Area cities will invest in programs to improve the health of kids and other vulnerable communities. Berkeley has raised \$1.4 million for grants to community-based organizations to promote healthy eating and food, primarily in low-income communities.

These communities' success is sure to inspire others to reach for the same health and fiscal benefits – and indeed, Healthy Food America already has heard from a number of them. This led us to wonder what the potential impacts would be if other major cities that have statutory authority to implement a sugary beverage tax did so. HFA asked the Harvard CHOICES researchers to answer this question.

The 15 cities chosen for analysis are: Baltimore, Charlotte, Columbus, Denver, Detroit, Indianapolis, Jacksonville, Las Vegas, Los Angeles, Louisville, Oklahoma City, Phoenix, San Diego, San Jose and Seattle.

Addressing the health effects of excessive sugar

There are many compelling reasons for cities to take bold action to reduce sugar in the American diet, such as taxing sugary drinks, to save and extend their residents' lives. Obesity remains epidemic. Diabetes is rampant and now is striking children as well as adults. Heart, liver, and dental diseases afflict millions and cost billions. One key contributor to these chronic health issues: There is too much sugar in our food and beverage products. It's not just the calories in the sugar that causes these diseases, but also the direct metabolic effects of sugar on lipids, blood pressure, insulin resistance and inflammation.

And it's not just a matter of telling people not to consume sugar. Food makers add it in many forms to 68 percent of packaged foods—and most of us are unaware of it all. Soda companies alone spend a billion dollars a year marketing sugary soda, sports, energy, and fruit-flavored drinks to children, youth, and other vulnerable populations. (For sources and more information, look [here](#).)

Sugary drinks: A special problem

Sugary drinks are the number one source of added sugars in our diet, representing almost half of all added sugars we consume. Added sugars are a major culprit in the obesity and diabetes epidemics.

Sugary drinks are uniquely harmful. They have little to no nutritional value. Just one 20-oz. Coca-Cola has approximately 120 percent of the daily maximum recommended sugar under federal guidelines for a healthy diet. Yet we continue to drink too much, driven by the big beverage companies' lavish spending on marketing, especially to young and poor people. And that spending pays off: Every day half of U.S. adults and two thirds of youth consume sugary drinks—adding up to approximately 50 gallons per person each year.

When sugar is delivered in a liquid form it bypasses the body's defense against consuming too many calories: Sugary drinks don't make you feel full. They also have been found to displace healthier foods in the diet.

Taxing sugary drinks like we tax harmful substances like tobacco

As communities seek to address rising rates of heart disease, type 2 diabetes, and obesity, many are looking to sugary drink taxes. Communities around the country, facing funding challenges, are considering these taxes as a way to raise money for important community priorities and to improve health while calling attention to the health risks from sugary drinks.

A tax on sugary drinks can help:

- **Raise revenue for important initiatives** like healthier food in schools, taking actions to prevent diabetes and other chronic diseases, education campaigns about sugary drinks and healthy eating, and universal pre-k.
- **Target investment of revenues in low-income communities disproportionately affected** by health conditions caused by sugary drinks.
- **Reduce the rates of, and curb rising costs** from, preventable chronic diseases by investing to prevent their occurrence.
- **Increase awareness** about the harmful effects of sugary drinks and shift sales to healthier products.
- **Discourage consumption** of sugary drinks by raising their prices.
- **Encourage industry** to produce and promote healthier beverage options.

Addressing health inequities

It is well documented that lower income households and some racial/ethnic minority suffer higher rates of chronic diseases, such as diabetes, that have been associated with sugar consumption. Black and Mexican-American adults are twice as likely to have diabetes as white counterparts (21% versus 10%) and low-income people are twice as likely to suffer from this disease as high-income individuals (18% versus 8%). The model shows that an excise tax of one cent per ounce will lead to reduced consumption of sugary drinks, with greater reduction among those who drank more to begin with. All population groups would spend less on sugary drinks than they did before the tax.

In 2015, the CHOICES researchers modeled the effects of a one-cent tax for the nation as a whole. They found that the resulting reduction in sugar consumption would prevent 630,000 cases of childhood obesity. But the effect on obesity rates among kids would be 35 percent greater for black children, and 32 percent greater for Hispanic kids, relative to white children. Because local data on consumption patterns by race/ethnicity and income is limited or non-existent in most places, the model could not produce estimates at the city level. Similarly greater reductions among black and Hispanic people would be expected for diabetes, though the model did not examine diabetes disparities per se.

In addition, revenue raised from a tax can be reinvested in low-income communities. For instance, in Berkeley revenue has been allocated for spending on school and community programs, most with a focus on low-income or minority populations, to promote healthy eating, diabetes and obesity prevention. Philadelphia prioritized early learning for low-income families, and investing in recreation centers and community schools in low-income communities, all aimed at supporting a path out of poverty, and the health issues that are often associated with it.

About the researchers and methodology

The Childhood Obesity Intervention Cost-Effectiveness Study (CHOICES) at the Harvard T.H. Chan School of Public Health uses cost-effectiveness analysis to compare the costs and outcomes of policies and programs aimed at promoting improved nutrition or increased physical activity over ten years. CHOICES uses a computer micro-simulation model that creates a virtual population of people based on big data (including the U.S. Census, National Health and Nutrition Examination Survey, Behavioral Risk Factor Surveillance System, and multiple longitudinal studies).

CHOICES analysis relies on reviews of published findings of the effectiveness of changes in sugar-sweetened beverage intake on changes in relative body weight in children and adults. CHOICES takes into account the costs necessary to carry out the implementation of a policy or program intervention and any health care cost savings.

The CHOICES cost-effectiveness analysis examines: How many and what types of people would be affected by the policy/program? What would be the effect of the policy/ program on health? What are the likely implementation costs of an intervention, and what might the potential health care cost savings be?

The project is led by Dr. Steven Gortmaker, professor of the practice of health sociology at Harvard. (See the full team here.)

CHOICES' methods include:

- Working with researchers and key stakeholders to identify the most promising programs and policies for evaluation: Stakeholder consultation
- Building a computer model of the US population and projecting body mass index (BMI) changes, obesity rates, and health outcomes over time: US population model
- Synthesizing scientific literature to estimate the likely effects of promising obesity prevention interventions on BMI and physical activity: Systematic reviews and meta-analyses
- Integrating information on the economic costs and health effects of interventions, utilizing a structured, transparent process: Cost-effectiveness analysis

Modeling how the soda tax works

For each city, CHOICES modeled a tax of one cent per ounce on “sugar-sweetened beverages”, including all drinks with caloric sweeteners from added sugars. Like those that have been adopted to date, the modeled tax is assumed to be an excise tax collected at the distributor level (as opposed to a sales tax that is applied at the register). As all adopted and proposed taxes do, the modeled tax excludes 100% fruit juice and milk products. The model also excludes “diet” drinks with artificial, non-caloric sweeteners because of the scientific uncertainty of their health effects, although two recently passed taxes – Philadelphia and Cook County – include them.

The researchers assume that distributors will pass on the full amount of the tax to consumers, rather than absorb it themselves. Empirical studies of taxes in Mexico and France indicate that roughly the full amount of the excise tax is passed on to consumers. Preliminary evaluations of the local tax in Berkeley indicate less than complete pass-through. The price per ounce of sugary beverages purchased in stores was calculated using weighted averages of two-liter bottles, 12-can cases, and single-serve bottles or cans based on the distribution of package sizes estimated from 2010 Nielsen Homescan data. The \$0.01/ounce excise tax resulted in an average 16.3% price increase.

Findings

The researchers set out to tally the benefits from applying a tax on sugary drinks in the 15 largest U.S. cities with authority to levy such an excise tax. (Some states – which have the power to define the scope of the cities' authority – have laws limiting what they can do in terms of such taxes.)

Table 1 shows the results for each city in terms of dollars raised, health care costs saved, and reduction in diabetes and obesity. Should all 15 adopt a soda tax of one cent per ounce, the

total benefits would be significant:

- With a population of 15.3 million people in the 15 cities, the tax would **cut diabetes rates by an average 6 percent**, depending on region, and prevent nearly 115,000 of cases of obesity;
- As a result, the nation would avoid **\$759 million in health care costs** over ten years, 2,349 premature deaths would be averted and tens of thousands of people would live longer lives with less illness;
- All while **raising \$600 million** a year for community priorities, from initiatives to prevent chronic disease to promoting access to healthy food to providing universal pre-kindergarten and improving schools and recreation centers.

15 Largest American cities with authority to levy sweetened drinks tax

PROJECTED REVENUE AND HEALTH IMPACTS

	Est. annual revenue (millions)**	Diabetes rate*	Obesity cases prevented	Healthcare savings (millions)	Population Reach
Baltimore	\$25.60	-6%	4,950	\$31.60	627,445
Charlotte	\$38.90	-8%	7,140	\$33.60	755,674
Columbus	\$40.80	-8%	7,960	\$46.30	811,882
Denver	\$28.60	-7%	5,120	\$35.30	614,708
Detroit	\$33.50	-7%	7,200	\$33.60	721,507
Indianapolis	\$41.00	-8%	7,710	\$43.30	837,391
Jacksonville	\$38.90	-7%	7,300	\$39.60	834,543
Las Vegas	\$25.20	-6%	4,678	\$23.10	594,712
Los Angeles	\$115.00	-4%	21,700	\$177.00	3,869,243
Louisville	\$29.90	-9%	6,793	\$41.30	600,188
Oklahoma City	\$25.90	-6%	4,590	\$20.00	593,385
Phoenix	\$68.50	-7%	13,510	\$79.80	1,498,089
San Diego	\$39.90	-4%	7,100	\$58.30	1,329,060
San Jose	\$29.30	-4%	5,200	\$43.40	971,402
Seattle	\$19.00	-4%	3,985	\$52.80	611,902
Total	\$600	-6%	114,936	\$759	15,271,131

TABLE 1

Benefits from adopted taxes

The researchers also have run simulation models on the six jurisdictions that have adopted taxes this year. The levies in San Francisco, Oakland and Albany, CA are all taxes of one cent per ounce on sugary drinks, including soda, sports drinks, fruit-flavored drinks, sweetened teas, etc. Philadelphia and Cook County both adopted 1.5-cent taxes that cover all sweetened beverages, whether they contain sugar or artificial sweeteners. Boulder's tax on sugary drinks only is two centers per ounce. Table 2 below shows the results for each city in terms of dollars raised, health care costs saved, and reduction in diabetes and obesity. (See the briefs for each city here.)

Combined, the Bay Area, Philadelphia, Boulder, and Cook County taxes will cover:

- Cover a population of 8.2 million and bring in estimated revenues of more than \$342 million per year,
- Over ten years, extend thousands of lives and avert 1,334 premature deaths,
- Cut diabetes rates by 6 percent and prevent 58,220 cases of obesity,
- And save more than \$360 million in healthcare costs over the next decade.

Meanwhile, Philadelphia will use the revenue to make pre-kindergarten universal and meet other needs, while Boulder and the Bay Area cities will invest in programs to improve the health of kids and other vulnerable communities.

TABLE 2

Six sugary drinks taxes passed in 2016

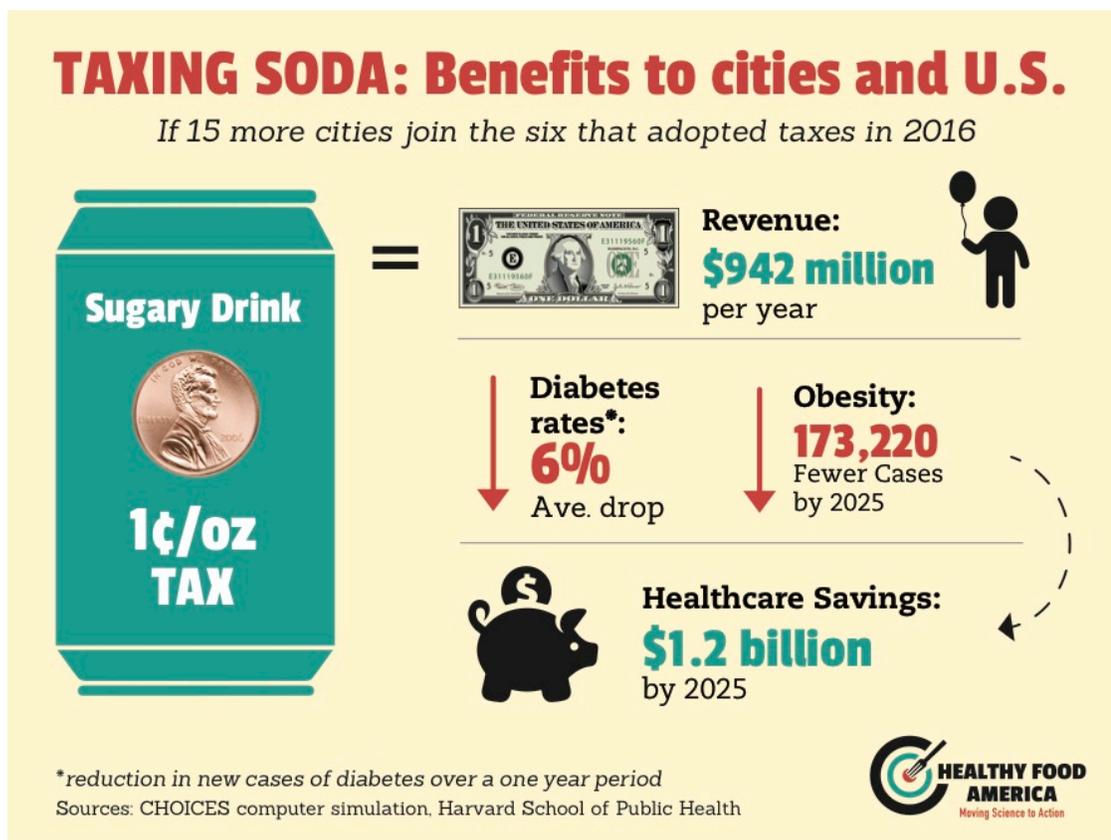
PROJECTED REVENUE AND HEALTH IMPACTS

	Est. annual revenue (millions)	Diabetes rate*	Obesity cases prevented	Healthcare savings (millions)	Population Reach
Philadelphia, PA Council	\$91.0	-7%	14,300	\$76.80	1,567,442
Albany, CA Measure O1	\$0.2	-3%	92	\$0.80	19,735
Oakland, CA Measure HH	\$7.0	-4%	2,140	\$18.10	419,267
San Francisco, CA Measure V	\$15.0	-4%	3,750	\$36.00	864,816
Boulder, CO Measure 2H	\$3.8	-10%	938	\$6.41	107,349
Cook County, IL Commission	\$223.8	-7%	37,000	\$223.80	5,238,216
Total	\$340.8	-6%	58,220	\$361.91	8,216,825

Adding it all up

Adding the projected health gains for the six places with existing taxes to those of the 15 cities above, we would see:

- 23.5 million people benefit;
- Health care savings of well over \$1.2 billion over ten years;
- Nearly \$1 billion a year in revenue to help prevent disease and improve life chances for people of all backgrounds;
- 3,683 premature deaths averted;
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About Healthy Food America

Healthy Food America acts on science to drive change in policy and industry practice so that all people can live in places where nutritious food is easy to obtain and exposure to unhealthy products is limited. We are coordinating with other advocates to energize a national movement to roll back added sugars in food and beverages, while providing technical assistance to communities across the country looking to craft a sugary drink tax to meet their local goals.