



# Public Policies to Reduce Sugary Drink Consumption in Children and Adolescents

Natalie D. Muth, MD, MPH, RDN, FAAP,<sup>a,b</sup> William H. Dietz, MD, PhD, FAAP,<sup>c</sup> Sheela N. Magge, MD, MSCE, FAAP,<sup>d</sup> Rachel K. Johnson, PhD, MPH, RD, FAHA,<sup>e</sup> AMERICAN ACADEMY OF PEDIATRICS, SECTION ON OBESITY, COMMITTEE ON NUTRITION, AMERICAN HEART ASSOCIATION

Excess consumption of added sugars, especially from sugary drinks, poses a grave health threat to children and adolescents, disproportionately affecting children of minority and low-income communities. Public policies, such as those detailed in this statement, are needed to decrease child and adolescent consumption of added sugars and improve health.

## STATEMENT OF THE PROBLEM

Excess consumption of added sugars, especially from sugary drinks, contributes to the high prevalence of childhood and adolescent obesity,<sup>1–3</sup> especially among children and adolescents who are socioeconomically vulnerable.<sup>4</sup> It also increases the risk for dental decay,<sup>5</sup> cardiovascular disease,<sup>6</sup> hypertension,<sup>7,8</sup> dyslipidemia,<sup>9,10</sup> insulin resistance,<sup>11,12</sup> type 2 diabetes mellitus,<sup>13</sup> fatty liver disease,<sup>14</sup> and all-cause mortality.<sup>15</sup> The 2015–2020 Dietary Guidelines for Americans recommend that added sugars contribute less than 10% of total calories consumed, yet US children and adolescents report consuming 17% of their calories from added sugars, nearly half of which are from sugary drinks.<sup>16,17</sup> Decreasing sugary drink consumption is of particular importance because sugary drinks are the leading source of added sugars in the US diet,<sup>18</sup> provide little to no nutritional value, are high in energy density, and do little to increase feelings of satiety.<sup>19,20</sup> To protect child and adolescent health, broad implementation of policy strategies to reduce sugary drink consumption in children and adolescents is urgently needed.

## DEFINITIONS

- Added sugars: sugars added to foods and beverages during processing or at the table, including, but not limited to, sucrose, glucose, high-fructose corn syrup, and processed, refined fruit juice added to

## abstract

<sup>a</sup>Children's Primary Care Medical Group, Carlsbad, California; <sup>b</sup>Department of Community Health Sciences, Fielding School of Public Health, University of California, Los Angeles, Los Angeles, California; <sup>c</sup>Sumner M. Redstone Global Center for Prevention and Wellness, Milken Institute School of Public Health, The George Washington University, Washington, District of Columbia; <sup>d</sup>Division of Pediatric Endocrinology and Diabetes, School of Medicine, Johns Hopkins University, Baltimore, Maryland; and <sup>e</sup>Department of Nutrition and Food Sciences, University of Vermont, Burlington, Vermont

Dr Muth conceptualized the report; and all authors wrote and revised this statement, are jointly responsible for its content, and approved the final manuscript as submitted.

This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.

Policy statements from the American Academy of Pediatrics benefit from expertise and resources of liaisons and internal (AAP) and external reviewers. However, policy statements from the American Academy of Pediatrics may not reflect the views of the liaisons or the organizations or government agencies that they represent.

The guidance in this statement does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

**To cite:** Muth ND, Dietz WH, Magge SN, et al. AAP AMERICAN ACADEMY OF PEDIATRICS, AAP SECTION ON OBESITY, AAP COMMITTEE ON NUTRITION, AAP AMERICAN HEART ASSOCIATION. Public Policies to Reduce Sugary Drink Consumption in Children and Adolescents. *Pediatrics*. 2019;143(4):e20190282

beverages and foods as a sweetener. Added sugars do not include fructose and lactose when present naturally in fruits, vegetables, and unsweetened milk.

- Sugary drink, sugar-sweetened beverage, sugar drink: all terms that refer to beverages containing added sugars. Such beverages include, but are not limited to, regular soda, fruit drinks, sports and energy drinks, and sweetened coffees and teas. In most studies, diet drinks (defined as <40 kcal per 8 oz), 100% fruit juice, and flavored milks are not considered to be sugary drinks.
- Excise tax: tax imposed on product manufacturers or distributors (which often is passed down to retailers and ultimately consumers) that increases prices of products at the shelf or for distributors, in contrast to a sales tax in which the tax is added at the register.

## BACKGROUND

In its scientific statement on the role of added sugars and cardiovascular disease risk in children, the American Heart Association (AHA) concluded that strong evidence supports the association of added sugars with increased cardiovascular disease risk through increased caloric intake, increased adiposity, and dyslipidemia.<sup>6</sup> The 2015 Dietary Guidelines Advisory Committee drew similar conclusions and advised that public health strategies are needed to reduce consumption of sugary drinks, the leading source of added sugars in the diets of US children and adolescents.<sup>21</sup> Highlighting the global problem of excess sugar intake and the international urgency to act, the European Society for Paediatric Gastroenterology, Hepatology and Nutrition called on national authorities to adopt policies aimed at reducing free sugar intake in infants, children, and adolescents.<sup>22</sup>

The World Health Organization recommends limiting added sugars

intake to less than 10% of total calories, with increased benefits of reducing intake to less than 5% of calories.<sup>23</sup> The 2015–2020 Dietary Guidelines for Americans also recommends that less than 10% of calories consumed be from added sugars.<sup>16</sup> The AHA recommends that children 2 years and older consume ≤25 g (6.25 teaspoons) of added sugars per day and no more than 8 oz of sugary drinks per week. Added sugars should not be in the habitual diet of children younger than 2 years.<sup>6</sup> Despite these recommendations, US children and adolescents report consuming 17% of their calories from added sugars, nearly half of which are from sugary drinks. Those at the highest quintile report consuming 620 kcal daily from added sugars, of which nearly 300 kcal (equivalent to 75 g or 18.75 teaspoons) are from sugary drinks.<sup>17</sup> Many of these high consumers are adolescent boys, who report drinking, on average, 278 kcal of added sugars per day.<sup>24</sup>

Previous American Academy of Pediatrics (AAP) publications have stressed the important role that pediatricians play in the early identification, prevention, and treatment of obesity.<sup>25</sup> The AAP also recommends that pediatric health care providers become more involved in schools, advocating for healthier foods and activities.<sup>26</sup> In its 2017 statement, “Fruit Juice in Infants, Children, and Adolescents: Current Recommendations,” the AAP advised pediatricians to support policies that seek to limit the consumption of fruit juice (ie, no juice in children younger than 1 year; no more than 4 oz per day in children ages 1–3 years; no more than 4–6 oz per day in children ages 4–6 years; and no more than 8 oz per day in children ages 7–18 years), including children participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).<sup>27</sup> In its 2011 statement on

sports and energy drinks, the AAP recommended that children and adolescents avoid all energy drinks and the routine consumption of carbohydrate-containing sports drinks and instead drink water.<sup>28</sup>

On the basis of lessons learned from tobacco-control efforts (1 of the greatest public health successes of the United States) the AAP and AHA offer additional policy recommendations targeted at federal, state, and local policy makers to improve child nutrition through reduced sugary drink intake. These policies are best implemented in conjunction with local pediatrician support to respond to the urgent need to reduce added sugars consumption in children and adolescents.

## PUBLIC POLICY RECOMMENDATIONS

**1. Local, state, and/or national policies intended to reduce consumption of added sugars should include the consideration of approaches that increase the price of sugary drinks, such as an excise tax. Such taxes should be accompanied by education of all stakeholders on the rationale and benefits of the tax before implementation. Tax revenues should be allocated, at least in part, to reducing health and socioeconomic disparities.**

Price increases are associated with a decrease in consumption. For example, as tobacco prices increased, cigarette consumption dropped precipitously, particularly among youth and people of lower socioeconomic status.<sup>29</sup> Strong evidence indicates that alcohol excise taxes reduce excessive alcohol consumption and its associated harmful consequences, such as motor vehicle collisions.<sup>30</sup> In the case of sugary drinks, a systematic review revealed that each 10% increase in price, such as a tax, reduced sugary drink consumption by 7%.<sup>31</sup> The World Health Organization suggests

that a higher tax of 20% would most likely have the greatest effect on reducing consumption.<sup>32</sup> The Childhood Obesity Intervention Cost-Effectiveness Study (CHOICES), a modeling study aimed at identifying the most cost-effective interventions to reduce childhood obesity, found implementation of a sugary drink tax to be the most cost-effective strategy to address childhood obesity, leading to prevention of 575 000 cases of childhood obesity and a health care savings of \$30.78 per dollar spent over 10 years.<sup>33</sup> Such taxes are most effective when accompanied by a broad education campaign to help stakeholders understand the risks of sugary drink consumption and the rationale and benefits of the tax.<sup>34</sup>

Several countries have implemented these types of taxes. In 2014, Chile raised the tax on drinks containing more than 6.25 g of added sugars per 100 mL from 13% to 18% and lowered the tax on drinks with under 6.25 g of added sugars per 100 mL from 13% to 10%. Researchers found that sugary drink purchases decreased 21% in the year after the tax took effect.<sup>35</sup> The most rigorously evaluated sugary drink tax is Mexico's 2014 implementation of a nationwide 10% excise tax (1 peso per liter) on sugary drinks. The successful passage and implementation of the tax resulted from a broad education campaign organized by tax proponents that included coalition building, lobbying, media advocacy, public demonstrations, multiple forums, drafting of a legislative proposal, and public opinion polling.<sup>36</sup> As a result of the tax, the average volume of taxed beverages purchased was 5.5% lower in 2014 than expected without the tax, with a 9% decrease in sales to lower-income households.<sup>37</sup> A follow-up study of the second year of the tax (2015) revealed that consumption decreased 9.7% from baseline. Thus, over the 2 years after the tax was implemented, the net decrease in

sugary drinks was 7.6%. Purchases of untaxed beverages, such as water, increased 2.1%.<sup>38</sup> This tax alone is projected to prevent nearly 200 000 cases of obesity and save \$980 million in direct health care costs from 2013 to 2022, with the majority of benefits afforded to young adults.<sup>39</sup>

Berkeley, California, was the first US city to levy a relatively large tax (\$0.01 per oz) on sugary drinks, effective March 2015. A study of the impact of the tax (comparing pre- and 1-year posttax beverage prices at 26 Berkeley stores; point-of-sale scanner data on 15.5 million checkouts for beverage prices, sales, and store revenue for 2 supermarket chains in 3 Berkeley and 6 nearby control non-Berkeley large supermarkets; and a representative telephone survey of 957 adult Berkeley residents) revealed that approximately 67% of the tax was passed on to consumers. Sales of sugary drinks fell 9.6%, whereas sales of untaxed beverages, such as water and milk, increased 3.5%. There was no increase in grocery bills for consumers or loss of revenue or decrease in beverage sales for stores.<sup>40</sup> Other studies of the Berkeley tax have found similar results,<sup>41,42</sup> although 1 study<sup>43</sup> found that the tax had minimal impact. The authors of that study cited a low pass-through rate and, thus, limited sugary drink price increase to the consumer. However, results may have been skewed because in the evaluation, national chains that were covered by the law in the first year were combined with small stores that were only covered by the law in the second year.

Other US locales, including San Francisco, Oakland, and Albany, California; Philadelphia, Pennsylvania; Boulder, Colorado; and Seattle, Washington, have implemented an excise tax on sugary drinks. Cook County, Illinois (Chicago), which did not have a high degree of buy-in from stakeholders before implementation and was

associated with substantial industry resistance, briefly implemented a sales tax on sugary drinks but then repealed it.<sup>44</sup> Some states have passed preemption laws that prohibit local municipalities from implementing a tax on sugary drinks. In June 2018, California lawmakers passed a law prohibiting any new local sugary drink taxes until 2031 in response to threats from the American Beverage Association, which funded a likely-to-pass ballot measure that would require a two-thirds majority of voters to approve any local tax increase. In exchange, the American Beverage Association dropped the ballot measure. These laws stifle local innovation to meet the health and fiscal needs of constituents and are counter to a 2011 report from the Institute of Medicine (now the National Academy of Medicine), in which federal and state legislators were urged to "avoid framing preemptive legislation in a way that hinders public action."<sup>45</sup>

Although people of lower socioeconomic status bear a greater burden from taxation, they also disproportionately benefit from the health and economic benefits from prevention of cardiovascular disease and type 2 diabetes mellitus.<sup>39</sup> Moreover, if the tax revenue is allocated to decrease health disparities or provide other services that promote health in these specific groups, the tax ultimately may be progressive.<sup>46,47</sup> For example, the Philadelphia tax has been used to fund prekindergarten programs that are of direct benefit to underserved communities.

Given the success of tobacco and alcohol taxes in reducing adolescent use and consumption of these products, policy makers should consider enacting policies that raise the price of sugary drinks. A portion of tax revenues could be used to subsidize healthier options, such as water, milk, fruits, and vegetables,

and/or child health or obesity and diabetes prevention programs.

## **2. The federal and state governments should support efforts to decrease sugary drink marketing to children and adolescents.**

Similar to tobacco companies, sugary drink manufacturers aim to appeal to children and adolescents by associating their product with celebrity, glamour, and coolness. Despite the existence of the Children's Food and Beverage Advertising Initiative, an industry-initiated, self-regulatory body designed to limit marketing of unhealthy food and beverage products to children younger than 12 years, children and adolescents are frequently exposed to sugary drink advertisements. In 2009, carbonated beverage companies reported \$395 million in youth-directed expenditures, approximately 97% of which were directed at teenagers.<sup>48</sup> According to recent Nielsen data reported by the University of Connecticut Rudd Center, children's exposure to advertisements for carbonated beverages increased 19% and their exposure to advertisements for juice, fruit drinks, and sports drinks increased 38% from 2015 to 2016. Overall, advertisements for sugary drinks have increased substantially since 2007.<sup>49</sup> Beverages are more heavily promoted to adolescents than to younger children,<sup>48</sup> who may only see 1 beverage advertisement per day on children's programs.<sup>50</sup> An online survey of US adolescents ages 12 to 17 years ( $n = 847$ ) revealed that almost half of the adolescents reported daily sugary drink advertising exposure.<sup>51</sup> Among survey respondents, 14- to 15-year-old, African American male adolescents whose parents had a high school education or less (factors associated with increased sugary drink consumption<sup>52</sup>) reported the highest exposure to advertising of soda, fruit drinks, sports drinks, and energy drinks.<sup>51</sup> Because children

tend to consume the beverages promoted on television and because African American children are exposed to the most sugary drink advertisements, the disparity in sugary drink advertising exposure may contribute to the disproportionate rates of obesity among African American children.

Stronger measures are needed to curtail advertising of sugary drinks to children and adolescents on television, on the Internet, and in places frequented by children, such as movie theaters, concerts, and sporting events. Although companies are protected by commercial free speech rights and may not be mandated to stop advertising to children and adolescents, other methods to reduce advertising of unhealthy food and beverages to children and adolescents could be used. For example, businesses are permitted to deduct costs of advertising as a business expense. Modeling by the CHOICES study suggests that eliminating the advertising subsidy for nutritionally poor foods and beverages marketed to children would prevent approximately 129 000 cases of obesity over a decade at a cost \$0.66 for each unit of BMI reduced. The additional benefit of this approach is that it would generate approximately \$80 million annually in tax revenue.<sup>33</sup> The US Congress should consider this and other allowable measures to reduce advertising of sugary drinks to children and adolescents.

State governments should implement the US Department of Agriculture's (USDA) local school wellness policy final rule under the Healthy, Hunger-Free Kids Act of 2010, which requires that only foods and beverages meeting the Smart Snacks standards may be marketed on school campuses during the school day.<sup>53</sup> State governments should also consider additional strategies to reduce sugary drink marketing and advertising to children and adolescents through

measures such as prohibitions on coupons, sales, and advertising in and around schools and on school buses as well as sugary drink-branded sponsorship of youth sporting events.

## **3. Federal nutrition assistance programs should aim to ensure access to healthful food and beverages and discourage consumption of sugary drinks.**

Several federal nutrition programs direct taxpayer dollars toward reducing food insecurity and supporting healthful nutrition for children and families of low income.

### *WIC*

WIC provided nutritious foods to nearly 1.9 million infants and 4 million children ages 1 to 5 years in fiscal year 2016. WIC provides a supplemental package of healthful foods and beverages and offers a robust nutrition education program. Although 100% juice is allowed, sugary drinks are not included in the WIC package.

### *Child and Adult Food Care Program*

More than 3 million children are served by the Child and Adult Care Food Program (CACFP) (a program administered by the USDA), which provides cash assistance to states to provide healthful food to children and adults in child and adult care institutions. Sugary drinks are noncreditable items in the CACFP (ie, they may be served but do not count toward meeting the meal pattern requirements for a meal to be reimbursed). Flavored milks are not creditable for children ages 2 to 5 years but are creditable for children and adults older than 6 years if they contain no more than 22 g of total sugars per 8 oz. The CACFP best practices advise early care and education centers to avoid serving noncreditable sugary drinks in their facilities.<sup>54</sup> However, few states currently have any provisions prohibiting access to sugary drinks in these settings. Because most early

care and education centers are regulated at the state, rather than federal, level, states should adopt policies that restrict early care and education centers from serving children sugary drinks.

#### *School Breakfast Program, School Lunch Program, and Competitive Foods*

The Healthy, Hunger-Free Kids Act of 2010 required the USDA to establish national nutrition standards for all foods sold in schools at any time, including foods sold for school breakfast and school lunch and competitive foods sold outside meal programs (Smart Snacks standards). The adopted standards do not allow sugary drinks in elementary or middle school and only allow drinks other than 100% fruit juice, milk, or approved milk alternatives if they contain less than 40 kcal per 8 oz or less than 60 kcal per 12 oz for high schools. A 2018 final rule allows states flexibility to include flavored low-fat milk, in addition to flavored nonfat milk, as long as school meals stay within calorie requirements.<sup>55</sup> The CHOICES modeling study predicts that nutrition standards for all school meals will likely prevent 1.8 million cases of childhood obesity from 2015 to 2025 and save \$0.42 per dollar spent and that including nutrition standards for all competitive foods and beverages will prevent 345 000 cases of childhood obesity and save \$4.56 per dollar spent.<sup>33</sup> Additional evidence indicates that adolescents drink fewer sugary drinks when standards such as these are implemented.<sup>56–59</sup> Ultimately, the Healthy, Hunger-Free Kids Act and Smart Snacks standards improved children's nutrition and reduced intake of added sugars,<sup>60–62</sup> although additional technical assistance and supports are needed to increase compliance.<sup>61,63,64</sup> These policies should be implemented, enforced, and enhanced to further promote a healthy school environment. The policies also should be accompanied by a robust nutrition education

program to help children and adolescents understand how to make healthy food and beverage choices, including information on how to identify and respond to marketing messages and how to read nutrition labels.

#### *Supplemental Nutrition Assistance Program*

The Supplemental Nutrition Assistance Program (SNAP), a vital safety net program that provides food for 45 million families, including 23 million children, is the nation's largest child nutrition program, serving approximately 1 in 4 US children.<sup>65</sup> Although SNAP has proven successful at addressing undernutrition and food insecurity, it is the only government feeding program that does not have nutrition standards to address diet quality. In the 2015 Dietary Guidelines Advisory Committee report, it was advised that changes be made to align WIC and SNAP with the Dietary Guidelines for Americans, including encouraging the purchase of healthful foods and discouraging the purchase and consumption of sugary drinks.<sup>21</sup> Additionally, the Dietary Guidelines Advisory Committee suggested that efforts are necessary to reduce access to sugary drinks in community settings and that they should be seamlessly integrated with food assistance programs, including SNAP.<sup>21</sup> Each day, SNAP dollars pay for 20 million servings of sugary drinks at an annual cost of \$4 billion.<sup>66</sup> If sugary drinks were not included as a SNAP benefit, estimates suggest that 510 000 type 2 diabetes mellitus person-years and 52 000 deaths could be averted, with a savings of \$2900 per quality-adjusted life-years saved.<sup>67</sup> Quality-adjusted life-years is an economic measure of the state of health of a person that combines quality of life and longevity.

The public and SNAP participants support both improved access to

healthful foods within SNAP and removal of SNAP benefits for sugary drinks.<sup>68,69</sup> States cannot make changes to SNAP benefits without a waiver from the USDA. Nonetheless, the USDA has repeatedly rejected states' requests for waivers and pilot studies that would eliminate sugary drinks from SNAP. The USDA has cited concerns related to retailer implementation as well as the need for a robust evaluation framework. Moreover, the USDA and antihunger organizations have raised many concerns about the consequences of such a restriction, leading to a clear need to evaluate such a policy and gain public support before its implementation.<sup>70</sup> There is concern that a restriction might increase stigma and embarrassment and subsequently deter SNAP participation if a SNAP participant attempts to purchase a sugary drink with SNAP benefits and is denied at the counter. A robust information campaign detailing the benefits of change might counter, but would not eliminate, this risk, and policies should be sensitive to this issue. Some have also questioned the restriction of sugary drinks from SNAP whereas other highly processed, nonnutritious foods containing substantial amounts of added sugars (eg, snack cakes, cookies, etc) are still allowed. There is also concern that any change to SNAP may prompt cuts to the food benefits that participants receive.<sup>71</sup> Because the current SNAP benefit amounts to an average of \$1.40 per person per meal, it is imperative that SNAP benefits and eligibility not only remain intact but also increase to provide families with the resources they need to obtain an adequate, healthful diet throughout the month.

The Healthy Incentives Pilot offers a model to evaluate the effects of making a change to SNAP. In 2008, Congress directed \$20 million to fund a pilot project to subsidize fruit and vegetable purchases within SNAP. The Healthy Incentives Pilot

demonstrated that providing a 30-cent incentive for every SNAP dollar spent on fruits and vegetables increased purchases of fruits and vegetables by 26%.<sup>72</sup> A randomized controlled trial conducted in Minnesota revealed that a food benefit program that paired incentives to eat healthful foods, such as fruits and vegetables, with restrictions on sweet baked goods, candies, and sugary drinks decreased caloric intake and improved the nutritional quality of participants' diets, compared with no change, incentive only, or restriction only.<sup>73</sup> A survey of SNAP participants and SNAP-eligible nonparticipants revealed support for policies that provided an incentive to purchase healthful foods and imposed restrictions on sugary drinks.<sup>74</sup> Congress could authorize the USDA to conduct a study to evaluate a fruit and vegetable incentive combined with restriction of sugary drinks. Such a study may help clarify the effects on consumer purchasing and SNAP participant perspectives, including real or perceived stigma, dietary quality, and retailer implementation. In addition, SNAP Education, the nutrition education component of the program, provides a mechanism to develop and test policy, system, and environmental changes to promote fruit and vegetable consumption and reduce sugary drink intake.<sup>75</sup> SNAP Education should be expanded and further developed so as to further emphasize the health benefits of fruits and vegetables and the health risks of sugary drinks and added sugars. Retailer incentives and new retail stocking standards could be used to reduce purchase of sugary drinks and increase purchase of healthier foods. It is critical that any change to SNAP preserves and enhances access to healthful foods and the integrity of this vital nutrition program with no decrease in the benefits to participants.

#### **4. Children, adolescents, and their families should have ready access to credible nutrition information, including on nutrition labels, restaurant menus, and advertisements.**

Whether nutrition labels help improve health is unclear.<sup>76</sup> However, just as consumers are advised of the health risks of nicotine and carcinogens when purchasing tobacco products, they also should be advised of nutritional risks when making purchases of sugary drinks, giving them the opportunity to use this information to make healthier choices. Encouraging policy changes include implementation of the regulations that require added sugars content to be included on the nutrition facts panel and on restaurant menus. Consumers support such measures. In 1 survey, 84% of adults believed "the government should require nutrition information labels on all packaged food sold in grocery stores," and 64% wanted similar requirements for restaurants.<sup>77</sup> Consumer education on how to read and use nutrition labels may help increase label effectiveness in changing behavior. For example, a study of 34 adolescents revealed that students significantly increased their ability to read and understand a nutrition label after a brief school-based educational intervention.<sup>78</sup> Additionally, a systematic review of 16 studies found that increased nutrition knowledge and education was associated with nutrition label use in college students.<sup>79</sup>

Front-of-package labels, including warning labels of the health harms of consumption of added sugars, could serve to further empower families to make healthier choices. For example, a randomized trial of 2000 adolescents revealed that those who were exposed to a health warning label chose fewer sugary drinks and believed that sugary drinks were less likely to help them lead a healthy

life.<sup>80</sup> When parents were exposed to a warning label, they chose significantly fewer sugary drinks, believed that sugary drinks were less healthful for their children, and were less likely to intend to purchase sugary drinks.<sup>81</sup> The constitutionality of warning labels has been challenged by industry.<sup>82</sup> The controversy was prompted by a 2015 San Francisco ordinance that required advertisements for sugary drinks to include a disclaimer that says "WARNING: Drinking beverages with added sugar(s) contributes to obesity, type 2 diabetes, and tooth decay." In 2019, the Ninth Circuit Court of Appeals blocked the law, ruling that it "unduly burdens and chills protected commercial speech" and is not purely factual because the US Food and Drug Administration has stated that added sugars are "generally recognized as safe" and "can be part of a healthy dietary pattern when not consumed in excess amounts."<sup>83</sup>

#### **5. Policies that make healthy beverages the default should be widely adopted and followed.**

Policies and incentives should support decreased consumption of sugary drinks through environmental changes, such as promoting healthier options (like water and milk) and decreasing access to and portion sizes of sugary drinks in all locations where children and adolescents are present. For example, current standard beverage policy for federal agencies requires that 50% of beverages contain  $\leq 40$  kcal per 8 oz except for 100% juice or unsweetened fat-free or 1% milk.<sup>84</sup> For all vending machines contracted by New York City agencies, policy prohibits advertisements, limits high-calorie beverages to 12 oz and a maximum of 2 slots in the vending machine, requires the provision of water in 2 slots at eye level, and requires that all other beverages other than milk contain  $\leq 25$  kcal per 8 oz.<sup>85</sup> Several cities, states, and state parks have implemented food service

guidelines, including the provision of healthful beverages.<sup>86-88</sup> In August 2018, California became the first state to pass a law requiring restaurants to serve water or milk as the default beverage in kids' meals. Hawaii, Vermont, Connecticut, Rhode Island, and New York City are considering similar bills, and several cities in California; Baltimore, Maryland; Louisville, Kentucky; and Lafayette, Colorado have already passed "healthy-by-default" city ordinances.<sup>89</sup> Some restaurants have voluntarily changed the default beverage choice on the children's menu from soda and other sugary drinks to water or milk, although more than 75% of the 50 largest chain restaurants have not.<sup>89</sup> A few restaurants have gone further and eliminated sugary drinks from children's menus altogether.<sup>90</sup> Although data on the effects of these types of changes are limited, some evidence suggests when the healthier choice is the easier or default choice, people are more likely to make it.<sup>91-93</sup>

## **6. Hospitals should serve as a model and implement policies to limit or disincentivize purchase of sugary drinks.**

One of the less recognized contributors to the reduction in cigarette smoking is the role that physicians and hospitals played in changing social norms regarding tobacco use. Before the 1950s, physicians and their choice of cigarette brands featured prominently in cigarette advertising.<sup>94</sup> In the 1960s, hospital grand rounds were conducted in smoke-filled rooms, and doctors who smoked were less likely to counsel regarding the adverse health effects of smoking. However, as awareness of the medical consequences of tobacco use grew, physicians stopped smoking, and hospitals eliminated cigarette vending machines and the sale of cigarettes in hospital gift shops.<sup>94-96</sup> Although tobacco use remains a pressing threat to public health, the ongoing obesity

epidemic and high consumption of added sugars has led to epidemics of type 2 diabetes mellitus and metabolic disease that require increased action by physicians and other health care providers, hospitals, and many other members of civil society.<sup>6,97,98</sup>

As with the ban on tobacco, leadership by hospitals and health plans to eliminate the sale of sugary drinks can improve the health of their employees, increase public awareness about the contribution of sugary drinks to obesity, and thereby change social norms regarding sugary drinks. For example, the Boston Public Health Commission engaged with 10 medical centers in Boston to reduce sugary drink consumption using a variety of strategies. Massachusetts General Hospital labeled drinks with red, yellow, or green stickers to indicate their calorie content and made the high-calorie drinks less accessible. Over 2 years, consumption of healthier products increased, consumption of high-calorie beverages decreased, and there was a modest increase in revenue from beverage sales.<sup>99</sup> A second hospital found that increased prices of high-calorie beverages reduced their sales.<sup>100</sup> Many hospitals have stopped selling sugary drinks entirely. In 2010, the Cleveland Clinic eliminated the sale of sugary drinks, extending previous efforts to improve community health through hospital practices by banning smoking on campus and eliminating the use of trans fats.<sup>101</sup> In 2011, Nationwide Children's Hospital eliminated all sugary drinks in all food establishments within the hospital, with no loss of revenue.<sup>102</sup> In 2018, Geisinger eliminated sales of sugary drinks from all campuses.<sup>103</sup> More than 30 health systems comprising more than 250 hospitals are participating in the Healthier Hospital Initiative, which includes a pledge to increase healthful beverages to 80% of total beverage purchases in patient care, retail, vending, and catering.<sup>104</sup> In 2017, the American Medical Association passed

a resolution that "encourages hospitals and medical facilities to offer healthier beverages, such as water, unflavored milk, coffee, and unsweetened tea, for purchase in place of SSBs [sugar-sweetened beverages]."<sup>97</sup> A useful guide for the development of healthful beverage programs has been published by the Public Health Law Center and the Centers for Disease Control and Prevention.<sup>105,106</sup>

Decisions to reduce promotion and sale of sugary drinks in hospitals may appear to be a distraction from hospitals' core efforts to provide medical care or appear to be ineffective given that most sugary drink consumption does not occur in hospitals. The same arguments could have been made about hospitals' efforts to reduce the promotion and sale of tobacco. A well-publicized effort to reduce sugary drink consumption among hospital patients, visitors, and staff could help build public awareness of the links between sugary drink consumption, obesity, and diabetes. These efforts could also signal to employers and leaders in other settings that reducing sugary drink sales and promotion in worksites and public spaces is an important and feasible approach to improving population health.

## **CONCLUSIONS**

Consumption of added sugars, particularly those in sugary drinks, pose a significant health risk to children and adolescents. Pediatricians are encouraged to routinely counsel children and families to decrease sugary drink consumption and increase water consumption. Pediatricians can also advocate for policy change through school boards, school health councils, hospital and medical group boards and committees, outreach to elected representatives, and public comment opportunities. Policy targets, such as those discussed in this report and summarized below, are needed to

reduce sugary drink consumption in children and adolescents and subsequently improve child health.

1. Local, state, and/or national policies to reduce added sugars consumption should include policies that raise the price of sugary drinks, such as an excise tax. Such taxes should be accompanied by an education campaign on the risks of sugary drinks and on the rationale and benefits of the tax and should be supported by stakeholders. Tax revenues should be allocated, at least in part, to reducing health and socioeconomic disparities. Metrics should be established to evaluate the impact of such a tax.
2. The federal and state governments should support efforts to decrease sugary drink marketing to children and adolescents.
3. Federal nutrition assistance programs should ensure access to healthful foods and beverages and discourage consumption of sugary drinks.
4. Children, adolescents, and their families should have ready access to credible nutrition information, including on the nutrition facts panel, restaurant menus, and advertisements.
5. Policies that make healthful beverages the default choice should be widely adopted and followed.
6. Hospitals should serve as a model and implement policies to limit or disincentivize the purchase of sugary drinks.

Although the strength and availability of evidence supporting the policy recommendations addressed in this report vary and although there may be significant barriers or considerations in implementation of some or all of these recommendations, pediatricians may tailor their advocacy efforts to approaches that are most likely to lead to decreased access to and consumption of sugary drinks in the children and families they serve, whether on a local, state, or federal level.

#### LEAD AUTHORS

Natalie D. Muth, MD, MPH, RDN, FAAP  
William H. Dietz, MD, PhD, FAAP  
Sheela N. Magge, MD, MSCE, FAAP  
Rachel K. Johnson, PhD, MPH, RD, FAHA

#### AAP SECTION ON OBESITY EXECUTIVE COMMITTEE, 2017–2018

Christopher F. Bolling, MD, FAAP, Chairperson  
Sarah C. Armstrong, MD, FAAP  
Matthew Allen Haemer, MD, MPH, FAAP  
Natalie D. Muth, MD, MPH, RDN, FAAP  
John Conrad Rausch, MD, MPH, FAAP  
Victoria Weeks Rogers, MD, FAAP

#### LIAISONS

Marc Michalsky, MD, FACS, FAAP – *American Academy of Pediatrics Section on Surgery*

#### CONSULTANT

Stephanie Walsh, MD, FAAP

#### STAFF

Mala Thapar, MPH

#### AAP COMMITTEE ON NUTRITION, 2017–2018

Steven A. Abrams, MD, FAAP, Chairperson

Jae Hong Kim, MD, PhD, FAAP  
Sarah Jane Schwarzenberg, MD, FAAP  
George Joseph Fuchs III, MD, FAAP  
Sheela N. Magge, MD, MSCE, FAAP  
C. Wesley Lindsey, MD, FAAP  
Ellen S. Rome, MD, MPH, FAAP

#### LIAISONS

Cria G. Perrine, PhD – *Centers for Disease Control and Prevention*  
Andrea Lotze, MD, FAAP – *US Food and Drug Administration*  
Janet M. de Jesus, MS, RD – *National Institutes of Health*  
Valery Soto, MS, RD, LD – *US Department of Agriculture*

#### STAFF

Debra L. Burrowes, MHA  
Tamar Haro

#### AHA STAFF

Laurie Whitsel, PhD, FAHA

#### ABBREVIATIONS

AAP: American Academy of Pediatrics  
AHA: American Heart Association  
CACFP: Child and Adult Care Food Program  
CHOICES: Childhood Obesity Intervention Cost-Effectiveness Study  
SNAP: Supplemental Nutrition Assistance Program  
USDA: US Department of Agriculture  
WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

**DOI:** <https://doi.org/10.1542/peds.2019-0282>

Address correspondence to Natalie D. Muth, MD, MPH, RDN, FAAP. E-mail: nmuth@rchsd.org

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2019 by the American Academy of Pediatrics

**FINANCIAL DISCLOSURE:** The authors have indicated they have no financial relationships relevant to this article to disclose.

**FUNDING:** No external funding.

**POTENTIAL CONFLICT OF INTEREST:** The authors have indicated they have no potential conflicts of interest to disclose.

## REFERENCES

1. de Ruyter JC, Olthof MR, Seidell JC, Katan MB. A trial of sugar-free or sugar-sweetened beverages and body weight in children. *N Engl J Med.* 2012; 367(15):1397–1406
2. Ebbeling CB, Feldman HA, Chomitz VR, et al. A randomized trial of sugar-sweetened beverages and adolescent body weight. *N Engl J Med.* 2012; 367(15):1407–1416
3. Luger M, Lafontan M, Bes-Rastrollo M, Winzer E, Yumuk V, Farpour-Lambert N. Sugar-sweetened beverages and weight gain in children and adults: a systematic review from 2013 to 2015 and a comparison with previous studies. *Obes Facts.* 2017;10(6): 674–693
4. Ogden CL, Carroll MD, Lawman HG, et al. Trends in obesity prevalence among children and adolescents in the United States, 1988-1994 through 2013-2014. *JAMA.* 2016;315(21): 2292–2299
5. Moynihan P, Petersen PE. Diet, nutrition and the prevention of dental diseases. *Public Health Nutr.* 2004;7 (1A):201–226
6. Vos MB, Kaar JL, Welsh JA, et al; American Heart Association Nutrition Committee of the Council on Lifestyle and Cardiometabolic Health; Council on Clinical Cardiology; Council on Cardiovascular Disease in the Young; Council on Cardiovascular and Stroke Nursing; Council on Epidemiology and Prevention; Council on Functional Genomics and Translational Biology; Council on Hypertension. Added sugars and cardiovascular disease risk in children: a scientific statement from the American Heart Association. *Circulation.* 2017;135(19):e1017–e1034
7. Chen L, Caballero B, Mitchell DC, et al. Reducing consumption of sugar-sweetened beverages is associated with reduced blood pressure: a prospective study among United States adults [published correction appears in *Circulation.* 2010;122(4): e408]. *Circulation.* 2010;121(22): 2398–2406
8. Perez-Pozo SE, Schold J, Nakagawa T, Sánchez-Lozada LG, Johnson RJ, Lillo JL. Excessive fructose intake induces the features of metabolic syndrome in healthy adult men: role of uric acid in the hypertensive response. *Int J Obes (Lond).* 2010;34(3):454–461
9. Lee AK, Binongo JN, Chowdhury R, et al. Consumption of less than 10% of total energy from added sugars is associated with increasing HDL in females during adolescence: a longitudinal analysis. *J Am Heart Assoc.* 2014;3(1):e000615
10. Lustig RH, Mulligan K, Noworolski SM, et al. Isocaloric fructose restriction and metabolic improvement in children with obesity and metabolic syndrome. *Obesity (Silver Spring).* 2016;24(2): 453–460
11. Wang JW, Mark S, Henderson M, et al. Adiposity and glucose intolerance exacerbate components of metabolic syndrome in children consuming sugar-sweetened beverages: QUALITY cohort study. *Pediatr Obes.* 2013;8(4):284–293
12. Welsh JA, Sharma A, Cunningham SA, Vos MB. Consumption of added sugars and indicators of cardiovascular disease risk among US adolescents. *Circulation.* 2011;123(3):249–257
13. Malik VS, Popkin BM, Bray GA, Després JP, Willett WC, Hu FB. Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis. *Diabetes Care.* 2010;33(11): 2477–2483
14. O’Sullivan TA, Oddy WH, Bremner AP, et al. Lower fructose intake may help protect against development of nonalcoholic fatty liver in adolescents with obesity. *J Pediatr Gastroenterol Nutr.* 2014;58(5):624–631
15. Shah NS, Leonard D, Finley CE, et al. Dietary patterns and long-term survival: a retrospective study of healthy primary care patients. *Am J Med.* 2018; 131(1):48–55
16. US Department of Health and Human Services; US Department of Agriculture. 2015–2020 dietary guidelines for Americans. 2015. Available at: <http://health.gov/dietaryguidelines/2015/guidelines/>. Accessed September 17, 2017
17. Powell ES, Smith-Taillie LP, Popkin BM. Added sugars intake across the distribution of US children and adult consumers: 1977-2012. *J Acad Nutr Diet.* 2016;116(10):1543–1550.e1
18. Drewnowski A, Rehm CD. Consumption of added sugars among US children and adults by food purchase location and food source. *Am J Clin Nutr.* 2014; 100(3):901–907
19. Pan A, Hu FB. Effects of carbohydrates on satiety: differences between liquid and solid food. *Curr Opin Clin Nutr Metab Care.* 2011;14(4):385–390
20. Shearrer GE, O’Reilly GA, Belcher BR, et al. The impact of sugar sweetened beverage intake on hunger and satiety in minority adolescents [published correction appears in *Appetite.* 2016; 100:272]. *Appetite.* 2016;97:43–48
21. Dietary Guidelines Advisory Committee. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture.* Washington, DC: US Department of Agriculture, Agricultural Research Service; 2015
22. Fidler Mis N, Braegger C, Bronsky J, et al; ESPGHAN Committee on Nutrition. Sugar in infants, children and adolescents: a position paper of the European Society for Paediatric Gastroenterology, Hepatology and Nutrition Committee on Nutrition. *J Pediatr Gastroenterol Nutr.* 2017; 65(6):681–696
23. World Health Organization. Sugar intake for adults and children. 2015. Available at: [www.who.int/nutrition/publications/guidelines/sugars\\_intake/en/](http://www.who.int/nutrition/publications/guidelines/sugars_intake/en/). Accessed September 17, 2017
24. Kit BK, Fakhouri TH, Park S, Nielsen SJ, Ogden CL. Trends in sugar-sweetened beverage consumption among youth and adults in the United States: 1999–

2010. *Am J Clin Nutr*. 2013;98(1):180–188
25. Daniels SR, Hassink SG; Committee on Nutrition. The role of the pediatrician in primary prevention of obesity. *Pediatrics*. 2015;136(1). Available at: [www.pediatrics.org/cgi/content/full/136/1/e275](http://www.pediatrics.org/cgi/content/full/136/1/e275)
  26. Council on School Health; Committee on Nutrition. Snacks, sweetened beverages, added sugars, and schools. *Pediatrics*. 2015;135(3):575–583
  27. Heyman MB, Abrams SA; Section on Gastroenterology, Hepatology, and Nutrition; Committee on Nutrition. Fruit juice in infants, children, and adolescents: current recommendations. *Pediatrics*. 2017;139(6):e20170967
  28. Committee on Nutrition; Council on Sports Medicine and Fitness. Sports drinks and energy drinks for children and adolescents: are they appropriate? *Pediatrics*. 2011;127(6):1182–1189
  29. Bader P, Boisclair D, Ferrence R. Effects of tobacco taxation and pricing on smoking behavior in high risk populations: a knowledge synthesis. *Int J Environ Res Public Health*. 2011;8(11):4118–4139
  30. Elder RW, Lawrence B, Ferguson A, et al; Task Force on Community Preventive Services. The effectiveness of tax policy interventions for reducing excessive alcohol consumption and related harms. *Am J Prev Med*. 2010;38(2):217–229
  31. Afshin A, Peñalvo JL, Del Gobbo L, et al. The prospective impact of food pricing on improving dietary consumption: a systematic review and meta-analysis. *PLoS One*. 2017;12(3):e0172277
  32. World Health Organization. Fiscal policies for diet and the prevention of noncommunicable diseases. 2016. Available at: [www.who.int/dietphysicalactivity/publications/fiscal-policies-diet-prevention/en/](http://www.who.int/dietphysicalactivity/publications/fiscal-policies-diet-prevention/en/). Accessed October 10, 2017
  33. Gortmaker SL, Wang YC, Long MW, et al. Three interventions that reduce childhood obesity are projected to save more than they cost to implement. *Health Aff (Millwood)*. 2015;34(11):1932–1939
  34. Action for Healthy Food. *A Roadmap for Successful Sugary Drink Tax Campaigns*. Seattle WA: Action for Healthy Food; 2015
  35. Nakamura R, Mirelman AJ, Cuadrado C, Silva-Illanes N, Dunstan J, Suhrcke M. Evaluating the 2014 sugar-sweetened beverage tax in Chile: an observational study in urban areas. *PLoS Med*. 2018;15(7):e1002596
  36. Donaldson E. *Advocating for Sugar-Sweetened Beverage Taxation: A Case Study of Mexico*. Baltimore, MD: Johns Hopkins Bloomberg School of Public Health; 2015
  37. Colchero MA, Popkin BM, Rivera JA, Ng SW. Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. *BMJ*. 2016;352:h6704
  38. Colchero MA, Rivera-Dommarco J, Popkin BM, Ng SW. In Mexico, evidence of sustained consumer response two years after implementing a sugar-sweetened beverage tax. *Health Aff (Millwood)*. 2017;36(3):564–571
  39. Sánchez-Romero LM, Penko J, Coxson PG, et al. Projected impact of Mexico's sugar-sweetened beverage tax policy on diabetes and cardiovascular disease: a modeling study. *PLoS Med*. 2016;13(11):e1002158
  40. Silver LD, Ng SW, Ryan-Ibarra S, et al. Changes in prices, sales, consumer spending, and beverage consumption one year after a tax on sugar-sweetened beverages in Berkeley, California, US: a before-and-after study. *PLoS Med*. 2017;14(4):e1002283
  41. Falbe J, Rojas N, Grummon AH, Madsen KA. Higher retail prices of sugar-sweetened beverages 3 months after implementation of an excise tax in Berkeley, California. *Am J Public Health*. 2015;105(11):2194–2201
  42. Cawley J, Frisvold DE. The pass-through of taxes on sugar-sweetened beverages to retail prices: the case of Berkeley, California. *J Policy Anal Manage*. 2017;36(2):303–326
  43. Bollinger B, Sexton SE. Local excise taxes, sticky prices, and spillovers: evidence from Berkeley's soda tax. 2018. Available at: <https://ssrn.com/abstract=3087966>. Accessed February 1, 2019
  44. Dewey C. Why Chicago's soda tax fizzled after two months – and what it means for the anti-soda movement. *The Washington Post*. October 10, 2017. Available at: [https://www.washingtonpost.com/news/wonk/wp/2017/10/10/why-chicagos-soda-tax-fizzled-after-two-months-and-what-it-means-for-the-anti-soda-movement/?noredirect=on&utm\\_term=.a5285122edcb](https://www.washingtonpost.com/news/wonk/wp/2017/10/10/why-chicagos-soda-tax-fizzled-after-two-months-and-what-it-means-for-the-anti-soda-movement/?noredirect=on&utm_term=.a5285122edcb). Accessed February 1, 2019
  45. Institute of Medicine. *For the Public's Health: Revitalizing Law and Policy to Meet New Challenges*. Washington, DC: The National Academies Press; 2011
  46. Langellier BA, Lê-Scherban F, Purtle J. Funding quality pre-kindergarten slots with Philadelphia's new 'sugary drink tax': simulating effects of using an excise tax to address a social determinant of health. *Public Health Nutr*. 2017;20(13):2450–2458
  47. Hashem K, Rosborough J. Why tax sugar sweetened beverages? *J Pediatr Gastroenterol Nutr*. 2017;65(4):358–359
  48. Federal Trade Commission. A review of food marketing to children and adolescents: follow-up report. 2012. Available at: <https://www.ftc.gov/sites/default/files/documents/reports/review-food-marketing-children-and-adolescents-follow-report/121221foodmarketingreport.pdf>. Accessed July 25, 2017
  49. Frazier WC III, Harris JL. Trends in television food advertising to young people: 2016 update. 2017. Available at: <http://uconnruddcenter.org/files/TVAdTrends2017.pdf>. Accessed October 1, 2017
  50. Powell LM, Schermbeck RM, Chaloupka FJ. Nutritional content of food and beverage products in television advertisements seen on children's programming. *Child Obes*. 2013;9(6):524–531
  51. Kumar G, Onufrak S, Zytneck D, Kingsley B, Park S. Self-reported advertising exposure to sugar-sweetened beverages among US youth. *Public Health Nutr*. 2015;18(7):1173–1179
  52. Han E, Powell LM. Consumption patterns of sugar-sweetened beverages in the United States. *J Acad Nutr Diet*. 2013;113(1):43–53
  53. Food and Nutrition Service, United States Department of Agriculture. Final

- rule: local school wellness policy implementation under the Healthy, Hunger-Free Kids Act of 2010. 2016. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2016-07-29/pdf/2016-17230.pdf>. Accessed July 30, 2018
54. Food and Nutrition Service, USDA. Child and Adult Care Food Program: meal pattern revisions related to the Healthy, Hunger-Free Kids Act of 2010. Final rule. *Fed Regist*. 2016;81(79):24347–24383
  55. United States Department of Agriculture. *Interim Final Rule: Child Nutrition Program Flexibilities for Milk, Whole Grains, and Sodium Requirements*. Washington, DC: United States Department of Agriculture; 2017
  56. Craddock AL, McHugh A, Mont-Ferguson H, et al. Effect of school district policy change on consumption of sugar-sweetened beverages among high school students, Boston, Massachusetts, 2004-2006. *Prev Chronic Dis*. 2011;8(4):A74
  57. Chriqui JF, Pickel M, Story M. Influence of school competitive food and beverage policies on obesity, consumption, and availability: a systematic review. *JAMA Pediatr*. 2014;168(3):279–286
  58. Hood NE, Colabianchi N, Terry-McElrath YM, O'Malley PM, Johnston LD. School wellness policies and foods and beverages available in schools. *Am J Prev Med*. 2013;45(2):143–149
  59. Foster GD, Linder B, Baranowski T, et al; HEALTHY Study Group. A school-based intervention for diabetes risk reduction. *N Engl J Med*. 2010;363(5):443–453
  60. Wang YC, Hsiao A, Chamberlin P, et al. Nutrition quality of US school snack foods: a first look at 2011-2014 bid records in 8 school districts. *J Sch Health*. 2017;87(1):29–35
  61. Johnson DB, Podrabsky M, Rocha A, Otten JJ. Effect of the Healthy Hunger-Free Kids Act on the nutritional quality of meals selected by students and school lunch participation rates. *JAMA Pediatr*. 2016;170(1):e153918
  62. Micha R, Karageorgou D, Bakogianni I, et al. Effectiveness of school food environment policies on children's dietary behaviors: a systematic review and meta-analysis. *PLoS One*. 2018; 13(3):e0194555
  63. Chriqui JF, Piekarz E, Chaloupka FJ. USDA snack food and beverage standards: how big of a stretch for the states? *Child Obes*. 2014;10(3):234–240
  64. Asada Y, Chriqui J, Chavez N, Odoms-Young A, Handler A. USDA snack policy implementation: best practices from the front lines, United States, 2013-2014. *Prev Chronic Dis*. 2016;13:E79
  65. Gray KF, Fisher S, Lauffer S. *Characteristics of Supplemental Nutrition Assistance Program Households: Fiscal Year 2015*. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service, Office of Policy Support; 2016
  66. Shenkin JD, Jacobson MF. Using the Food Stamp Program and other methods to promote healthy diets for low-income consumers. *Am J Public Health*. 2010;100(9):1562–1564
  67. Basu S, Seligman H, Bhattacharya J. Nutritional policy changes in the supplemental nutrition assistance program: a microsimulation and cost-effectiveness analysis. *Med Decis Making*. 2013;33(7):937–948
  68. Blumenthal SJ, Hoffnagle EE, Leung CW, et al. Strategies to improve the dietary quality of Supplemental Nutrition Assistance Program (SNAP) beneficiaries: an assessment of stakeholder opinions. *Public Health Nutr*. 2014;17(12):2824–2833
  69. Long MW, Leung CW, Cheung LW, Blumenthal SJ, Willett WC. Public support for policies to improve the nutritional impact of the Supplemental Nutrition Assistance Program (SNAP). *Public Health Nutr*. 2014;17(1):219–224
  70. Schwartz MB. Moving beyond the debate over restricting sugary drinks in the Supplemental Nutrition Assistance Program. *Am J Prev Med*. 2017;52(2S2):S199–S205
  71. Pomeranz JL, Chriqui JF. The Supplemental Nutrition Assistance Program: analysis of program administration and food law definitions. *Am J Prev Med*. 2015;49(3):428–436
  72. United States Department of Agriculture. Healthy incentives pilot final evaluation report. 2014. Available at: <https://www.fns.usda.gov/snap/healthy-incentives-pilot-final-evaluation-report>. Accessed October 7, 2017
  73. Harnack L, Oakes JM, Elbel B, Beatty T, Rydell S, French S. Effects of subsidies and prohibitions on nutrition in a food benefit program: a randomized clinical trial [published correction appears in *JAMA Intern Med*. 2017;177(1):144]. *JAMA Intern Med*. 2016;176(11): 1610–1618
  74. Leung CW, Musicus AA, Willett WC, Rimm EB. Improving the nutritional impact of the Supplemental Nutrition Assistance Program: perspectives from the participants. *Am J Prev Med*. 2017;52 (2S2):S193–S198
  75. United States Department of Agriculture. FY 2019 SNAP-Ed plan guidance. 2018. Available at: <https://snaped.fns.usda.gov/snap/Guidance/FY2019SNAPEdPlanGuidanceFULL.pdf>. Accessed February 1, 2019
  76. Afshin A, Penalvo J, Del Gobbo L, et al. CVD prevention through policy: a review of mass media, food/menu labeling, taxation/subsidies, built environment, school procurement, worksite wellness, and marketing standards to improve diet. *Curr Cardiol Rep*. 2015;17(11):98
  77. Prentice C, Kahn C. Americans want required food labels even if they don't read them. *Reuters*. October 2, 2017. Available at: <https://www.reuters.com/article/us-usa-foodlabels-poll/americans-want-required-food-labels-even-if-they-dont-read-them-idUSKCN1071F5>. Accessed February 1, 2019
  78. Hawthorne KM, Moreland K, Griffin IJ, Abrams SA. An educational program enhances food label understanding of young adolescents. *J Am Diet Assoc*. 2006;106(6):913–916
  79. Christoph MJ, An R, Ellison B. Correlates of nutrition label use among college students and young adults: a review. *Public Health Nutr*. 2016;19(12): 2135–2148
  80. VanEpps EM, Roberto CA. The influence of sugar-sweetened beverage warnings: a randomized trial of adolescents' choices and beliefs. *Am J Prev Med*. 2016;51(5):664–672
  81. Roberto CA, Wong D, Musicus A, Hammond D. The influence of sugar-sweetened beverage health warning labels on parents' choices. *Pediatrics*. 2016;137(2):e20153185

82. Pomeranz JL, Mozaffarian D, Micha R. Can the government require health warnings on sugar-sweetened beverage advertisements? *JAMA*. 2018;319(3):227–228
83. *American Beverage Association v City and County of San Francisco*, No 16-16072 D.C. No. 3:15-cv-03415-EMC (9th Cir 2019). Available at: [https://cspinet.org/sites/default/files/attachment/SF%20Warning\\_Ninth%20Circuit%20En%20Banc.pdf](https://cspinet.org/sites/default/files/attachment/SF%20Warning_Ninth%20Circuit%20En%20Banc.pdf). Accessed February 1, 2019
84. Food Service Guidelines Federal Workgroup. Food service guidelines for federal facilities. 2017. Available at: [https://www.cdc.gov/obesity/downloads/guidelines\\_for\\_federal\\_concessions\\_and\\_vending\\_operations.pdf](https://www.cdc.gov/obesity/downloads/guidelines_for_federal_concessions_and_vending_operations.pdf). Accessed July 29, 2017
85. City of New York. New York city food standards: beverage vending machines. Available at: <https://www1.nyc.gov/assets/doh/downloads/pdf/cardio/cardio-vending-machines-bev-standards.pdf>. Accessed October 7, 2017
86. Centers for Disease Control and Prevention. Food service guidelines: case studies from states and communities. 2015. Available at: [https://www.cdc.gov/obesity/downloads/fs\\_g\\_cases\\_studies\\_508.pdf](https://www.cdc.gov/obesity/downloads/fs_g_cases_studies_508.pdf). Accessed August 1, 2017
87. City of New York. Procurement: standards for meals and snacks. Available at: <http://www1.nyc.gov/site/foodpolicy/initiatives/procurement.page>. Accessed October 7, 2017
88. Cradock AL, Kenney EL, McHugh A, et al. Evaluating the impact of the healthy beverage executive order for city agencies in Boston, Massachusetts, 2011-2013. *Prev Chronic Dis*. 2015;12:E147
89. Wootan, MG. California becomes first state to pass healthy restaurant kids' meal bill. 2018. Available at: <https://cspinet.org/news/california-becomes-first-state-pass-healthy-restaurant-kids%E2%80%99-meal-bill-20180822>. Accessed August 26, 2018
90. Ribakove S, Almy J, Wootan, MG. Soda on the menu: improvements seen but more change needed for beverages on restaurant children's menus. 2017. Available at: <https://cspinet.org/kidsbeveragestudy>. Accessed October 10, 2017
91. Hanks AS, Just DR, Smith LE, Wansink B. Healthy convenience: nudging students toward healthier choices in the lunchroom. *J Public Health (Oxf)*. 2012;34(3):370–376
92. Loeb KL, Radnitz C, Keller K, et al. The application of defaults to optimize parents' health-based choices for children. *Appetite*. 2017;113:368–375
93. Peters J, Beck J, Lande J, et al. Using healthy defaults in Walt Disney World restaurants to improve nutritional choices. *J Assoc Consum Res*. 2016;1(1):92–103
94. Gardner MN, Brandt AM. "The doctors' choice is America's choice": the physician in US cigarette advertisements, 1930-1953. *Am J Public Health*. 2006;96(2):222–232
95. New York Times. Hospitals act to curb cigarette sales, smoking. *New York Times*. February 9, 1964. Available at: <https://www.nytimes.com/1964/02/09/archives/hospitals-act-to-curb-cigarette-sales-smoking.html>. Accessed August 27, 2018
96. Smith DR, Leggat PA. The historical decline of tobacco smoking among Australian physicians: 1964-1997. *Tob Induc Dis*. 2008;4:13
97. American Medical Association. *AMA Adopts Policy to Reduce Consumption of Sugar-Sweetened Beverages*. Chicago, IL: American Medical Association; 2017
98. Yang Q, Zhang Z, Gregg EW, Flanders WD, Merritt R, Hu FB. Added sugar intake and cardiovascular diseases mortality among US adults. *JAMA Intern Med*. 2014;174(4):516–524
99. Thorndike AN, Sonnenberg L, Riis J, Barraclough S, Levy DE. A 2-phase labeling and choice architecture intervention to improve healthy food and beverage choices [published correction appears in *Am J Public Health*. 2012;102(4):584]. *Am J Public Health*. 2012;102(3):527–533
100. Block JP, Chandra A, McManus KD, Willett WC. Point-of-purchase price and education intervention to reduce consumption of sugary soft drinks. *Am J Public Health*. 2010;100(8):1427–1433
101. Spector K. Sugar-sweetened food, beverages will no longer be sold at the Cleveland Clinic. 2010. Available at: [https://www.cleveland.com/healthfit/index.ssf/2010/07/sugar-sweetened\\_food\\_beverages.html](https://www.cleveland.com/healthfit/index.ssf/2010/07/sugar-sweetened_food_beverages.html). Accessed August 26, 2018
102. Eneli IU, Oza-Frank R, Grover K, Miller R, Kelleher K. Instituting a sugar-sweetened beverage ban: experience from a children's hospital. *Am J Public Health*. 2014;104(10):1822–1825
103. Geisinger. *Geisinger Eliminates Sugar-Sweetened Beverages*. Danville, PA: Geisinger; 2018
104. Public Health Law Center. Food and beverage pledges for hospitals and healthcare systems. Available at: [www.publichealthlawcenter.org/sites/default/files/resources/KS%20Beverage%20Pledge%20Chart%204.28.14.pdf](http://www.publichealthlawcenter.org/sites/default/files/resources/KS%20Beverage%20Pledge%20Chart%204.28.14.pdf). Accessed July 31, 2017
105. Public Health Law Center. Building blocks for success: a guide for developing healthy beverage programs. Available at: [www.publichealthlawcenter.org/sites/default/files/resources/phlc-fs-building-blocks-healthy-beverages-2013.pdf](http://www.publichealthlawcenter.org/sites/default/files/resources/phlc-fs-building-blocks-healthy-beverages-2013.pdf). Accessed July 31, 2017
106. Centers for Disease Control and Prevention. Creating healthier hospital food, beverage, and physical activity environments: forming teams, engaging stakeholders, conducting assessments and evaluations. Available at: <https://www.cdc.gov/obesity/hospital-toolkit/pdf/creating-healthier-hospital-food-beverage-pa.pdf>. Accessed July 31, 2017

## Public Policies to Reduce Sugary Drink Consumption in Children and Adolescents

Natalie D. Muth, William H. Dietz, Sheela N. Magge, Rachel K. Johnson,  
AMERICAN ACADEMY OF PEDIATRICS, SECTION ON OBESITY,  
COMMITTEE ON NUTRITION and AMERICAN HEART ASSOCIATION  
*Pediatrics* originally published online March 25, 2019;

<b>Updated Information &amp; Services</b>	including high resolution figures, can be found at: <a href="http://pediatrics.aappublications.org/content/early/2019/03/21/peds.2019-0282">http://pediatrics.aappublications.org/content/early/2019/03/21/peds.2019-0282</a>
<b>References</b>	This article cites 75 articles, 15 of which you can access for free at: <a href="http://pediatrics.aappublications.org/content/early/2019/03/21/peds.2019-0282#BIBL">http://pediatrics.aappublications.org/content/early/2019/03/21/peds.2019-0282#BIBL</a>
<b>Subspecialty Collections</b>	This article, along with others on similar topics, appears in the following collection(s): <b>Nutrition</b> <a href="http://www.aappublications.org/cgi/collection/nutrition_sub">http://www.aappublications.org/cgi/collection/nutrition_sub</a> <b>Obesity</b> <a href="http://www.aappublications.org/cgi/collection/obesity_new_sub">http://www.aappublications.org/cgi/collection/obesity_new_sub</a>
<b>Permissions &amp; Licensing</b>	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: <a href="http://www.aappublications.org/site/misc/Permissions.xhtml">http://www.aappublications.org/site/misc/Permissions.xhtml</a>
<b>Reprints</b>	Information about ordering reprints can be found online: <a href="http://www.aappublications.org/site/misc/reprints.xhtml">http://www.aappublications.org/site/misc/reprints.xhtml</a>

# American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **Public Policies to Reduce Sugary Drink Consumption in Children and Adolescents**

Natalie D. Muth, William H. Dietz, Sheela N. Magge, Rachel K. Johnson,  
AMERICAN ACADEMY OF PEDIATRICS, SECTION ON OBESITY,  
COMMITTEE ON NUTRITION and AMERICAN HEART ASSOCIATION  
*Pediatrics* originally published online March 25, 2019;

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/early/2019/03/21/peds.2019-0282>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2019 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

