

# African American Collaborative Obesity Research Network

Envisioning healthy weight, freedom from obesity-related health problems and high quality of life for African American youth, adults and elders.

## Impact of Sugar-Sweetened Beverage Consumption on Black Americans' Health

A Research Brief  
January 2011

### Introduction

Health experts and policy makers are increasingly concerned about Americans' consumption of sugar-sweetened beverages (SSBs), which have become the main source of added sugar for many adults and youth.<sup>1-4</sup> Consumption of regular soft drinks and fruit drinks has received the most attention. The definition of SSBs also includes a variety of other beverages with added sugar, such as sport drinks and sweetened teas.<sup>5</sup> Research shows that frequent SSB consumption can be harmful because of its contribution to weight gain, obesity, diabetes, dental decay, and other health problems in adults and youth.<sup>5-7</sup> The potential harm from frequent SSB consumption is of special concern for black Americans, who are more likely to be regular SSB drinkers and are at a higher risk (compared with whites) for obesity and related chronic diseases.<sup>8-10</sup>

This research brief, authored by members of the African American Collaborative Obesity Research Network (AACORN), summarizes trends in SSB consumption among black adults and youth, outlines related health consequences, and identifies research needs and priorities that could help inform policies to reduce SSB consumption among black Americans.\* To emphasize areas of disparity, the brief provides comparison data for white Americans where available and also includes some data for Hispanic Americans, another ethnic minority population potentially affected by the same types of SSB issues.

\* Data sources identified black populations as "black American," "African American," or "non-Hispanic black." For simplicity, AACORN used the term "black" or "black American" throughout this research brief. Similarly, for whites, we used "white" when data referred to Caucasians or non-Hispanic whites and used "Hispanic" when data referred to Hispanics or Latinos. When data were specific to a particular population, such as Mexican-Americans, the name of the specific group was used.

For quick reference when considering SSB consumption data, Box A—which is taken from a Centers for Disease Control and Prevention (CDC) publication about SSB consumption—shows the calorie content of SSBs and other beverages, including several that are lower-calorie alternatives.

<b>Box A. Caloric Content of Commonly Consumed Beverages</b>		
Type of Beverage	Calories in 12 oz	Calories in 20 oz
Chocolate milk (whole)	312	520
Fruit punch	192	320
100% apple juice	180	300
100% orange juice	168	280
Lemonade	168	280
Regular lemon/lime soda	148	247
Regular cola	136	227
Sweetened lemon iced tea (bottled, not homemade)	135	225
Tonic water	124	207
Regular ginger ale	124	207
Sports drink	99	165
Fitness water	18	36
Unsweetened iced tea	2	3
Diet soda (with aspartame)	0*	0*
Carbonated water (unsweetened)	0	0
Water	0	0
Type of Milk	Calories in 8 oz (1 cup)	
Chocolate milk (whole)	208	
Chocolate milk (2%—reduced fat)	190	
Chocolate milk (1%—low fat)	158	
Whole milk (unflavored)	150	
2% reduced fat milk (unflavored)	120	
1% low fat milk (unflavored)	105	
Fat-free milk (unflavored)	90	
<i>Source: Centers for Disease Control and Prevention<sup>11</sup></i>		
<i>*some may contain a small number of calories</i>		

## Key Research Findings

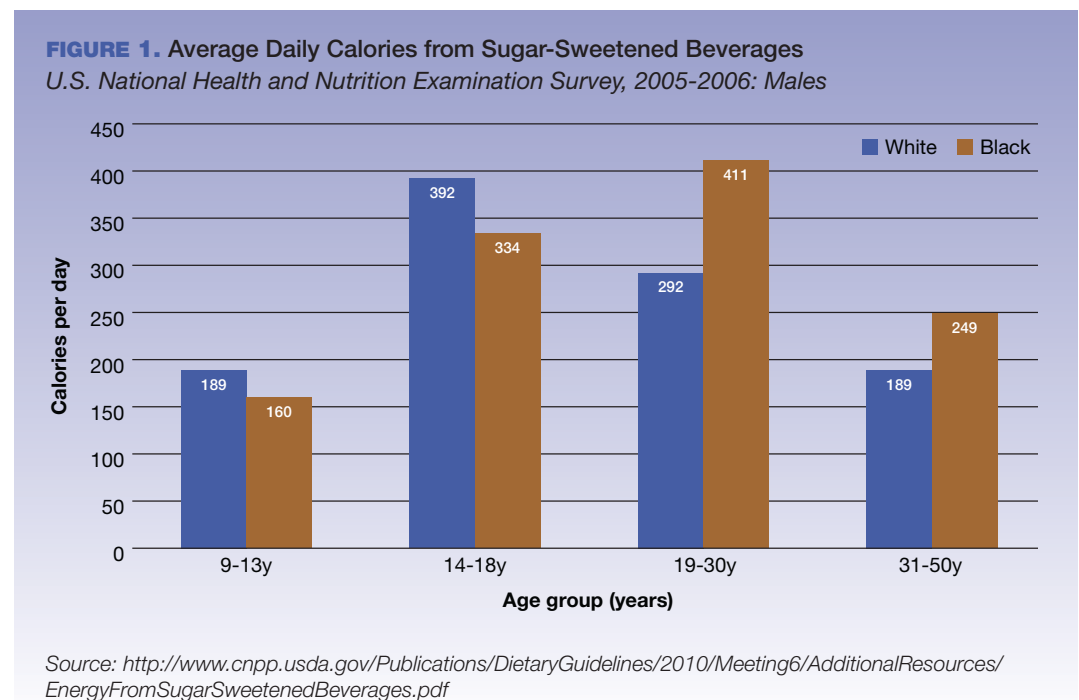
- ▶ U.S. national survey data from 2005-2006, the most recent available for SSB consumption, indicate that black Americans of both sexes, across a wide age range, consume more calories from SSBs per day compared with whites of the same ages.<sup>12</sup> In black females ages 31 to 50 years, average daily consumption of calories from SSBs is double that in white females in this age range.<sup>12</sup>
- ▶ Current consumption levels in black adolescents reflect significant increases since the 1990s. Trend analyses of U.S. national survey data for 1988-1994 and 1999-2004 showed significant consumption increases in blacks—from levels that were lower than in white adolescents during 1988-1994 to levels similar to those of white adolescents during 1999-2004. Meanwhile, SSB consumption levels in white adolescents remained stable between these periods.<sup>13</sup>
- ▶ Several studies suggest that SSB marketing targets black Americans disproportionately relative to whites,<sup>14-16</sup> which may encourage higher levels of SSB consumption among blacks.
- ▶ Reducing SSB consumption can help to prevent or curb excess weight gain<sup>5</sup> and obesity,<sup>17</sup> development of type 2 diabetes,<sup>17-18</sup> and dental decay.<sup>7, 19</sup> Reducing SSB consumption is especially important for black Americans because these medical conditions occur more often in black than in white Americans<sup>9</sup> and have been linked to SSB consumption in several studies that involved black Americans.<sup>20-23</sup>



## Patterns and Trends in SSB Consumption Among Black Adults and Youth

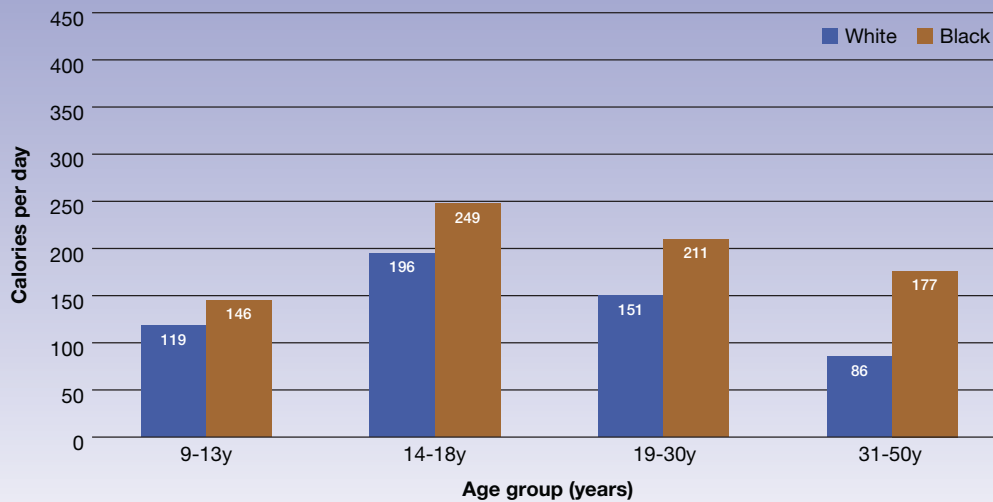
The most recent national survey data available on SSB\* consumption levels by race/ethnicity are from a United States Department of Agriculture analysis of National Health and Nutrition Examination Survey (NHANES) data for 2005-2006.<sup>12</sup> Figures 1 and 2 compare average SSB calories per person for black and white males and females by age group. Males consume more SSB calories than females. Consumption is highest in adolescents and young adults compared to other age groups. Blacks consume more calories from SSBs than whites in both sexes and over all ages, except in boys ages 9 to 18. Black and white children ages 1 to 3 consume, respectively, 78 and 45 calories per day from SSBs; those ages 4 to 8 consume, respectively, 118 and 93 calories per day from SSBs (reported with males and females combined; not shown in the figures).<sup>12</sup>

The same pattern of ethnic differences (higher consumption in blacks) was evident when SSB calories were tabulated as a percentage of total calories. This accounts for possible black-white differences in the total amount of calories consumed daily. For example, in adults ages 31 to 50, black women consumed 9.2 percent of their calories from SSBs on a typical day, compared with white women, who consumed 4.6 percent of calories from SSBs. SSBs contribute 7 percent to 14 percent of total calories consumed by black males ages 9 to 70 years (5 percent to 13 percent in white males) and from 7 percent to 13 percent in black females (3 percent to 10 percent in white females) in these age groups.



\*SSBs included: regular soft drinks, fruit juice drinks, fruit punch, fruit flavored drinks, energy drinks, and sports drinks that contain caloric sweeteners. Beverages excluded from this tabulation were water, 100% fruit juice, milk, milk-based beverages, soy-based beverages, tea, coffee, alcoholic beverages, and drinks with non-caloric sweeteners. Consumption data were obtained from a 24-hour recall interview.

**FIGURE 2. Average Daily Calories from Sugar-Sweetened Beverages**  
U.S. National Health and Nutrition Examination Survey, 2005-2006: Females



Source: <http://www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/Meeting6/AdditionalResources/EnergyFromSugarSweetenedBeverages.pdf>

Based on trend data from NHANES surveys conducted in 1988-1994 and 1999-2004, current SSB\* consumption levels reflect increased consumption in the population at large, including black adults and children.<sup>10, 13</sup>

**Adults.** The percent of adults who reported consuming at least one SSB serving during the previous day increased over time (Table 1).<sup>10</sup> In both surveys and for all ages, a higher percentage of black than white adults reported consuming at least one SSB per day. More than four in five blacks ages 20 to 44 reported consuming at least one SSB serving per day in 1999-2004.

**TABLE 1. Prevalence (%) of daily SSB consumption in black and white adults in the 1988-1994 and 1999-2004 National Health and Nutrition Examination Surveys<sup>10</sup>**

Age Group	Black		White	
	1988-1994	1999-2004	1988-1994	1999-2004
20 years and over	73	76	56	60
20 to 44 years	78	82	67	70
45 to 64 years	68	71	48	55
65 years and over	58	63	34	41

- ▶ Among adults who consumed SSBs, the amount per day increased from 22 ounces to 29 ounces for blacks and 25 ounces to 31 ounces for whites across the two survey periods. The associated increases in calories per day were from 247 to 311 in blacks and from 262

\*SSBs included sports drinks, fruit drinks, soda, and others such as sweetened tea. Low-calorie versions of SSBs were in a separate category.

to 316 in whites. An additional 64 calories, the increase in blacks, is equivalent to adding roughly six sugar packets to the diet each day.

**Youth.** NHANES data indicate that 80 percent of U.S. youth (ages 2 to 19) consume SSBs daily, and that the amount of SSB calories consumed increases with age.<sup>13</sup> From 1988-1994 and 1999-2004, black teens increased their daily SSB consumption from 268 calories to 297 calories (Table 2). Over the same period, SSB consumption among white teens remained virtually unchanged (from 297 calories to 302 calories).

**TABLE 2. Calories from SSBs in black and white children in the 1988-1994 and 1999-2004 National Health and Nutrition Examination Surveys<sup>13</sup>**

Age Group	Black		White	
	1988-1994	1999-2004	1988-1994	1999-2004
2 to 5 years	122	139	102	120
6 to 11 years	161	190	154	184
12 to 19 years	268	297	297	302

*\*per capita consumption as an average based on the entire population group, not just those who reported SSB consumption on the 24-hour-recall day. Caregivers provided recall data for children under age 5 and assisted with interviews for children ages 6 to 11.*

Several other studies reviewed show the same pattern of higher SSB consumption for blacks. Of eight studies identified (three in adults<sup>24-26</sup> and five in youth<sup>13, 23, 27-30</sup>), all except one<sup>29</sup> found higher SSB consumption for blacks compared with whites. Several of the studies that reported differences are highlighted below.

- ▶ The National Heart, Lung, and Blood Institute (NHLBI) Growth and Health Study tracked changes in beverage consumption between 1987 and 1997 for 2,371 black and white girls ages 9 or 10 at the start of the study (Table 3).<sup>23</sup> Soda consumption was similar in black and white girls, with relatively similar increases over time. However, black girls consumed more fruit drinks and increased their fruit drink consumption more than white girls, resulting in higher overall SSB consumption. Consumption of milk decreased in both white and black girls (Table 3).

**TABLE 3. Longitudinal changes in average daily consumption of regular soda, fruit drinks and milk over 10 years in the NHLBI Growth and Health Study (ounces\*)<sup>23</sup>**

	Black girls (n=1261)		White girls (n=1161)	
	1987 to 1997	difference	1987 to 1997	difference
Regular soda	4.8 to 11.9	+ 7.1	4.8 to 13.3	+ 8.5
Sweetened fruit drinks	4.8 to 7.2	+ 2.4	2.8 to 3.1	+ 0.3
Milk	8.6 to 5.1	- 3.5	12.4 to 8.5	- 3.9

*Mean age was 9.5 years in 1987 and 18.6 years in 1997*

*\*grams reported in source were converted to ounces*

- ▶ A study of high-school students found that, although soda consumption was similar among racial/ethnic groups, black students were almost three times more likely to consume sports drinks once or more per week and other SSBs (fruit drinks, lemonade, or energy drinks) three or more times per week. When intakes of soda and other types of SSBs were combined, overall SSB consumption was higher in the black students.<sup>26</sup>
- ▶ Taveras and colleagues reported that SSB intake (regular soda, flavored milks, and fruit drinks) was among several childhood obesity risk factors found to be more common in black and Hispanic/Latino children in Project Viva, a longitudinal study of 1,826 children from before birth through age four.<sup>27</sup> When mothers were asked about their two-year-olds' SSB consumption, 82 percent of black mothers and 74 percent of Hispanic mothers reported that their child consumed some type of SSB, compared to 45 percent of white mothers. A high proportion of black and Hispanic children (12.4 percent and 18.5 percent, respectively) were obese by age three, compared with 8.5 percent of white children. Even after adjustment for socioeconomic status, black children were 4.6 times more likely and Hispanic/Latino children 2.7 times more likely to consume SSBs by age two compared with white children.

## SSBs and Weight Gain

Longitudinal studies show that SSBs contribute to obesity by promoting weight gain.<sup>5</sup> Below are highlights of studies that establish this link in black adults as well as one relevant study in black children.

- ▶ The Black Women's Health Study, a large longitudinal study of 59,000 black women, examined the association of SSB consumption at the start of the study with weight gain over the ensuing six years (1995 to 2001).<sup>22</sup> Data were analyzed for 43,960 women who did not have diabetes at the time of study enrollment and provided complete dietary intake and weight change data. SSB categories were "sugar-sweetened soft drinks" (i.e., regular soda), "orange juice and grapefruit juice" and "other fruit juices, fortified fruit drinks, and Kool-Aid." Daily consumption of at least one glass of soft drinks, fruit drinks, and orange/grapefruit juice at the start of the study was 17 percent, 32 percent, and 22 percent, respectively.

The greatest weight gain, 6.8 kg (~15 lbs), was reported by women who changed from one or fewer soft drinks per week to one or more soft drinks per day. Women whose consumption of soft drinks remained stable at one or more per day reported a weight gain of 5.8 kg (~12.2 lbs). Women who maintained their intake of soft drinks at one or less per week or who reduced their intakes from one or more per day to less than one per week gained the least weight: 4.9 kg (~11 lbs) and 4.1 kg (~9 lbs), respectively. A somewhat similar, but weaker, association was observed for other sweetened fruit drinks.



- ▶ Among black and white girls in the NHLBI Growth and Health study analysis, an increase of 3.5 ounces of regular soda per day was associated with a small but statistically significant increase of 0.01 BMI units ( $p \leq 0.05$ ), controlling for intakes of other beverages and after taking changes in overall caloric intake into account. Other changes in beverage intake were unrelated to BMI change.<sup>23</sup>
- ▶ In the Detroit Dental Health Project, a two-year study of African American children from low-income families enrolled at ages 3 to 5 years in 2002-2003, the prevalence of obesity doubled—from 10.3 percent to 20.4 percent.<sup>21</sup> Consumption of SSBs (regular soda and sweetened fruit drinks) increased over the two years, from an average of 19.2 ounces to 21.6 ounces per day, due to an increase in consumption of fruit drinks. The odds of becoming overweight or obese increased by 4 percent for every additional ounce of soda or fruit drink consumption per day at the start of the study.

In addition to these data on SSBs and weight gain, data from another study, called PREMIER, link higher SSB consumption with lesser success in weight loss. PREMIER was an 18-month study in which combinations of dietary, exercise, and weight-loss counseling were provided as behavioral interventions to lower blood pressure in men and women ages 25 to 79 at the start of the study.<sup>31</sup> For this secondary analysis, intervention and control groups were evaluated together. SSB consumption was assessed through two 24-hour dietary recalls at three time points (the beginning of the study and after six and 18 months). SSBs were defined as regular soft drinks, fruit drinks, fruit punch, or any other high-calorie beverage sweetened with sugar. Results showed SSB consumption decreased over time. In analyses that took into account the intervention group assignment as well as other participant characteristics that might have differed in association with SSB consumption or weight change, a one-serving-per-day decrease in SSB intake was associated with a 0.5 kg (1.1 lb) and 0.7 kg (1.5 lb) weight loss at six and 18 months, respectively.

Further analysis indicated that this effect was similar in the black and white study participants, regardless of gender, age (below versus at or above 50), and BMI level (below versus at or above 30). The effect of change in liquid calories on weight gain was greater than the effect of changes in calories from solid foods; SSBs were the only source of liquid calories for which change in intake was associated with weight loss.

## Racial and Ethnic Disparities in Obesity Rates

The obesity epidemic cuts across all categories of race, ethnicity, income, and locale, but some populations are at higher risk than others. Lower-income individuals in some population groups, blacks, Hispanics/Latinos, American Indians, Pacific Islanders, and populations in the southern part of the United States are more likely to be obese than comparison populations (i.e., higher income, white or non-Hispanic, or in other regions).<sup>32</sup> For example, the most recent NHANES data on population weight levels, from 2007-2008,<sup>8</sup>



indicate that 78 percent of black women had a body mass index (BMI) that classified them as overweight or obese (Table 4). Nearly 50 percent were obese (defined as a BMI  $\geq$  30 kg/m<sup>2</sup>), and 14 percent were extremely obese (defined as a BMI  $\geq$  40 kg/m<sup>2</sup>). These levels are higher than obesity rates in white women and Hispanic women.<sup>8</sup> Black men also have high obesity rates, but are not significantly different from white or Hispanic men.

**TABLE 4. Prevalence (%) of overweight and obesity in U.S. adults in three race/ethnic groups<sup>8</sup>**

	<b>Women ages 20 years and older</b>		
	<b>Either overweight or obese BMI 25 or more</b>	<b>Obese BMI 30 or more</b>	<b>Extreme obesity BMI 40 or more</b>
	Black women	78.2	49.6
White women	61.2	33.0	6.4
Hispanic women	76.1	43.0	7.0
	<b>Men ages 20 years and older</b>		
Black men	68.5	37.3	7.0
White men	72.6	31.9	4.0
Hispanic men	79.3	34.3	3.8

*BMI=body mass index, calculated as weight in kilograms over the square of height in meters*

In children and adolescents, the definitions of overweight and obesity are based on percentiles from the CDC BMI reference standard. Children with a BMI at or above the 85th percentile for their age and gender are considered overweight or obese; those with BMI at or above the 95th percentile are obese; and those with BMI at or above the 97th percentile are very obese. Based on these criteria, the 2007-2008 NHANES data also revealed a high prevalence of overweight and obesity in black girls compared with white and Hispanic girls, and compared with black boys (Table 5). Black boys had obesity rates similar to white boys and lower than Hispanic boys.<sup>33</sup>

**TABLE 5. Prevalence (%) of overweight and obesity in children<sup>33</sup>**

	<b>Girls ages 6 to 19 years and older</b>		
	<b>Either overweight or obese 85th percentile or more</b>	<b>Obese 95th percentile or more</b>	<b>Very obese 97th percentile or more</b>
	Black girls	43.3	25.9
White girls	31.6	15.6	9.6
Hispanic girls	40.5	19.5	14.3
	<b>Boys ages 6 to 19 years and older</b>		
Black boys	34.4	18.9	15.7
White boys	33.4	18.2	14.0
Hispanic boys	43.1	26.7	19.6

In addition to the overall high rates of obesity among black girls, a trend analysis of NHANES data for 1971-1974 through 1999-2002 indicated that obesity levels increased more steeply in 6- to 11- and 12- to 17-year-old black and Mexican-American children compared with white children in these age groups.<sup>34</sup> In black children, obesity rates increased from 4 percent to 20 percent and from 8 percent to 22 percent, respectively, for 6- to 11- and 12- to 17-year-olds compared with respective increases of 4 percent to 13 percent and 6 percent to 13 percent for white children and teens. Increases in Mexican-American children were similar to those of the black children: from 6 percent to 22 percent in 6- to 11-year-olds and 9 percent to 25 percent in 12- to 17-year-olds.

### Box B. Data Highlights Related to Obesity and SSBs in Black Americans

In 2007-08, obesity prevalence was 50 percent in black women aged 20 and over, and 26 percent in black girls ages 6 to 19.<sup>8,33</sup> Obesity prevalence among white women and girls in these age groups is 33 percent and 15 percent, respectively (as shown in Table 1).

An analysis of obesity prevalence trends between 1971-1974 and 1999-2002 indicated a five-fold increase in black children ages 6 to 11 (from 4 percent to 20 percent), compared with about a three-fold increase (from 4 percent to 13 percent) in white 6- to 11-year-olds.<sup>34</sup>

Among women followed from 1995 to 2001 in the Black Women's Health Study, those who reported increasing soft drink consumption from less than one serving per week to at least one serving daily gained the most weight, an average of 15 pounds. Among women who were free of diabetes at the start of the study, women who drank more than two soft drinks per day had a 24 percent increased risk of being diagnosed with diabetes during the follow-up period.<sup>22</sup>

A content analysis of more than 500 advertisements that aired on prime-time television during two months in the fall of 2003 found that soft drink advertisements comprised 10.6 percent of food advertisements on shows with predominantly black viewers, compared with 2 percent of the food advertisements on shows with a primarily white audience.<sup>14</sup>

## Prevalent Chronic Diseases Among Black Americans Related to SSB Consumption

Obesity is a major risk factor for diabetes and cardiovascular diseases and a major factor in chronic disease disparities between blacks and whites.<sup>35-36</sup> The prevalence of cardiovascular diseases is 44.6 percent and 46.9 percent in black men and women respectively, compared with 38.1 percent in white men and 34.4 percent in white women. More than twice as many black men (12.8 percent) and women (13.0 percent) have diabetes compared with white men (6.4 percent) and white women (6.4 percent).<sup>37</sup> Rates of premature death due to cardiovascular diseases and diabetes are much higher in blacks than in whites. Premature death is measured in "years of potential life lost," by subtracting the age of death associated with a disease from 75 years, because the average U.S. life expectancy is over 75 years. The 2006 estimates indicate twice as many years of potential life lost for blacks due to heart disease (1,969 versus 1,024 years for every 100,000 people who died before age 75) and 2.5 times as many years of potential life lost because of diabetes (375 versus 150 years for every 100,000 people who died before age 75).<sup>38</sup>

Diabetes itself is a major cardiovascular disease risk factor.<sup>39</sup> The aforementioned six-year follow-up in the Black Women's Health Study provides strong evidence that soft drink consumption is associated with the development of diabetes.<sup>22</sup> After adjustment for potential confounding variables:

- ▶ Women who reported consuming two or more regular soft drinks per day at baseline had a 24 percent increased risk of developing diabetes during the six-year follow-up period compared with women who drank less than one soft drink per month.
- ▶ Women who drank two or more sweetened fruit drinks a day had a 31 percent increased risk of developing diabetes.
- ▶ In multivariate analyses adjusting for BMI at the start of the study, most of the increased risk of diabetes associated with soda consumption appeared to be due to BMI, which was associated with higher soda consumption. The association of fruit drink consumption with the development of diabetes was still present even after adjustment for BMI. A higher percentage of women in this study regularly drank fruit drinks than soft drinks.

## Dental Disease in Black Americans Related to SSB consumption

The Surgeon General's Report on Oral Health emphasized the critical importance of oral health to health and well being.<sup>19</sup> Dental caries, which have been associated with SSB consumption, can lead to tooth loss if left untreated.<sup>6</sup> Persistent disparities in the prevalence of dental caries by both race/ethnicity and income levels have been documented in national health surveys, with notably higher rates in blacks and Mexican Americans compared with whites and, within these populations, among those living in poverty.<sup>19</sup> Trend data for untreated caries are shown in Table 6.<sup>41</sup>

**TABLE 6. Prevalence (%) of Untreated Tooth Decay in black and white children and adults in the 1988-1994 and 1999-2004 National Health and Nutrition Examination Surveys<sup>41</sup>**

Age Group	Blacks		Whites	
	1988-1994	1999-2000	1988-1994	1999-2000
2 to 11 years*	28.1	27.6	18.2	19.5
6 to 11 years	13.1	8.6 <sup>#</sup>	6.2	5.6
12 to 19 years	33.2	25.7 <sup>#</sup>	15.4	16.2
20 to 64 years**	47.9	40.5 <sup>#</sup>	23.6	20.8

\*primary teeth; other data are for permanent teeth

\*\*of dentate adults <sup>#</sup>statistically significant decline

In the Detroit Dental Health Project, several indices of dental caries were analyzed in association with patterns of beverage consumption among low-income children and adult caregivers.<sup>20</sup>

- ▶ Children ages 3 to 5 were grouped into clusters according to whether most of their beverage calories came from milk, fruit juice, or soft drinks, and whether their consumption patterns changed during the two-year follow up. In multivariate analyses that adjusted for potential confounding variables, including oral health behaviors and family income level, children who changed from a low to a high soft drink consumption pattern were approximately 1.8 times more likely to develop new caries compared with children with a high milk/fruit juice consumption pattern. Children with a high soft drink consumption pattern at either time point or who changed from a low to a high soft drink consumption pattern were 2.7 times more likely to have new fillings during this period. In contrast, children who changed from a high to a low soft drink consumption pattern did not have elevated risk of developing caries or new fillings compared with the reference group.<sup>20</sup> For children with a high intake at both time points, the average volume of soft drink consumption was 31 ounces per day at the two-year follow up, accounting for nearly three-fourths of their total beverage intake.
- ▶ Daily consumption of “sugared soda” was reported by 30 percent of the study population, second only to tap water. Soft drinks contributed 19 percent of dietary calories from sugars and were the only dietary factor significantly associated with caries.<sup>42</sup>

## Decreasing SSB Intake: Addressing the Higher Exposure to Food and Beverage Marketing

Public health leaders agree that SSBs are nutritionally expendable and potentially harmful.<sup>17, 43</sup> This finding is especially relevant for black Americans given the consumption data and health implications highlighted in this brief. The personal and environmental factors that influence SSB consumption in black Americans have not been well-studied. However, heavier marketing of SSBs to black Americans is strongly implicated as an important environmental influence. While causal studies that make a direct link from marketing to consumption are difficult to identify, experts have concluded that heavier marketing of high-calorie, low-nutrient foods and beverages encourages people to consume them.<sup>44-45</sup> SSB marketing may also interfere with efforts to decrease consumption levels, by limiting the impact of public health-oriented regulatory or counter-marketing strategies intended to discourage consumption. Key data related to SSB advertising to black Americans are highlighted below.

*Across a variety of mediums, such as TV, magazines, and outdoor signage, blacks are exposed to more advertisements for foods and beverages than whites per unit of advertising time or space (Table 7).<sup>46-48</sup> Additionally, exposure to TV advertising is greater overall. Studies of media-use patterns for 8- to 18-year-olds indicate more television watching among that black children (5 hours and 54 minutes per day) and Hispanic children (5 hours and 21 minutes per day) than white children (3 hours and 36 minutes per day).<sup>49</sup>*

**TABLE 7. Findings of studies reporting frequency of SSB advertising to blacks vs. general audiences**

Type of Advertising	Type of Data	Key Finding Related to SSBs
TV ads	Content analysis of four comedy shows watched most often by predominantly white audiences and the four most watched by black audiences in the fall of 1999 according to Nielsen data <sup>16</sup>	<ul style="list-style-type: none"> <li>▶ Black prime time shows had more food ads: Per 30 minute program there were 4.8 food ads compared with 2.9 on general prime time.</li> <li>▶ Soda ads comprised 13 percent of the ads on black prime time shows, compared with 2 percent of ads on general prime time shows</li> </ul>
TV ads	Content analysis of 553 food advertisements on popular prime time TV programs in the general and primarily black audiences during October and November 2003 <sup>14</sup>	<ul style="list-style-type: none"> <li>▶ Food advertisements were 24.3 percent of ads aired on shows viewed by black audiences compared with 14.9 percent of ads on shows in the general market. Soft drink advertisements were 10.6 percent of packaged food advertisements in the black markets, compared to 2 percent of those in the general market.</li> </ul>
TV ads	Differences in types of products advertised in prime-time ads with white vs. ethnic minority actors for 31 TV shows aired in spring of 1999, including 11 shows with primarily black casts <sup>50</sup>	<ul style="list-style-type: none"> <li>▶ Soft drinks were 13.5 percent of ads with non-whites (almost exclusively blacks) compared with 6.2 percent of ads with whites.</li> </ul>
TV ads	Trends, from analyses of Nielsen data, in TV ad exposure of children and adolescents ages 2 to 17, for selected food and beverage product categories, by age group and by black or white race for 2003, 2005, and 2007 <sup>15</sup>	<ul style="list-style-type: none"> <li>▶ Exposure to SSB ads decreased over time at all ages, but the decrease was less for black than white children. From 2003 to 2007, there were increases in the black to white ratio of ads viewed for fruit drinks in all age groups, which were statistically significant (<math>p &lt; .05</math>) in 6- to 11- and 12- to 17-year-olds and approached significance (<math>p &lt; .10</math>) in 2- to 5-year olds.</li> </ul>
Magazine ads	Content analysis of 500 food advertisements in three well established black-oriented magazines sampled from issues published in February, May, and November of 1984-2003 <sup>51</sup>	<ul style="list-style-type: none"> <li>▶ Sweetened beverages were the most frequent category of food-related advertisements in three black-oriented magazines: <i>Ebony</i> (13 percent of ads), <i>Essence</i> (14 percent of ads), and <i>Jet</i> (18 percent of ads). Diet beverages were 8 percent and 12 percent of ads in <i>Ebony</i> and <i>Essence</i> respectively, and 5 percent of ads in <i>Jet</i>.</li> </ul>
Outdoor ads	Content analysis of outdoor advertisements identified through field surveys of low- and high-income black, Latino, and white neighborhoods in Austin, TX, Los Angeles CA, New York, NY, and Philadelphia, PA <sup>48</sup>	<ul style="list-style-type: none"> <li>▶ Regarding outdoor ads in general, higher income neighborhoods had lower numbers. Black and Latino neighborhoods had the most ads for higher calorie/low-nutrient foods, which included sugary beverages.</li> </ul>

Showing products within movies (“product placements”) is a common form of advertising. A study of product placements in movies from 1996 through 2005 found that SSBs constituted 76 percent of all advertised beverages.<sup>52</sup> Media-use studies also indicate that, on average, more time is spent at movie theaters by black children (43 minutes per day) and Hispanic children (33 minutes per day) than white children (13 minutes per day).<sup>49</sup> Black and Hispanic teens are higher users of digital media (e.g., cell phones) than white teens and are heavily exposed to advertising through this route as well.<sup>53-54</sup>

However, advertising is just one component of a more complex and multifaceted marketing system. Many soft drink companies have been using targeted marketing to reach black Americans since the 1930s.<sup>55-56</sup> These companies have used a variety of marketing tools to target black consumers—not only advertising, but also sales promotions, public relations, sponsorships and the provision of employment opportunities. Black teens have been identified as a particularly important target market.<sup>57</sup> In 2006, Coca-Cola re-established their focus on targeting marketing to blacks based on evidence of black population growth, purchasing power and the recognition of black youth as trendsetters in the United States.<sup>58</sup> A 2010 report from the Coca-Cola company describes their strong focus on multicultural marketing, including a comprehensive focus on blacks through market research, scholarship programs, and sponsorship of events with black communities and organizations.<sup>59</sup> Other SSB companies also focus on black consumers. For example, in 2009, Pepsi launched their “We Inspire” campaign aimed directly at black women. In addition to print ads in *Essence* and *Black Enterprise* featuring black actresses, such as Taraji P. Henson and Raven-Symoné,<sup>60</sup> the campaign features a social networking component with Facebook and an interactive Web site at [www.pepsiweinspire.com](http://www.pepsiweinspire.com) which features prominent black women, such as Queen Latifah, Keyshia Cole, and Dr. Robin L. Smith. These specially designed campaigns may increase consumer receptivity to the advertised products<sup>61</sup> and this effect may be over and above the potential effects of a higher frequency and volume of ads seen.

## Research Needs

Research needs related to SSBs and black Americans' health fall into three general categories that mirror research needs in the general population, but focus in particular on ways to reduce health disparities associated with SSB consumption.

- 1. Behavioral epidemiology and political economy of SSB consumption and marketing patterns:** Research is needed to further document patterns of SSB purchasing and consumption behaviors and the drivers of these trends. This research might be conducted by scholars from a variety of disciplines, including epidemiology, consumer research, retailing, communications, or economics. Specific research questions might address the following: who is making the purchasing decisions for various types of SSBs; what are key individual and contextual determinants of SSB purchases and consumption; which are the

most responsive demographic or psychographic subgroups of SSB consumers within the black population; what is the extent and nature of targeted SSB marketing across media (including digital) and across black subgroups; and what are some ways to counteract the disproportionately high levels of SSB targeted marketing to blacks. Marketers routinely collect data that may address these questions, particularly, increasingly through digital channels,<sup>62</sup> but these data are not readily available to public health researchers.<sup>63</sup>

- 2. Public Health Impact:** Research is needed to further assess impacts of SSBs on black Americans' health to inform advocacy and potentially strengthen the case for policies and interventions to reduce SSB consumption through both public and private sector initiatives. Specific research questions might address impacts of SSB consumption on weight gain and type 2 diabetes, and on metabolic and cardiovascular disease.
  
- 3. Estimating Effects of Interventions:** Evaluations or estimates of the relative and absolute impact of proposed policy or programmatic initiatives to reduce SSB consumption and increase consumption of recommended alternatives also are needed. Such evaluations should consider the quantitative reach and impact of the proposed measures, factors that might enhance or detract from the impact of the measures on black consumers, and ways to encourage substitution of recommended alternative beverages, such as water, milk, unsweetened tea, or low-calorie versions of SSBs for sweetened versions.<sup>11</sup> An analysis of the potential impact of soda taxes on children's BMI is an example of a potential policy evaluation that highlights the importance of focusing on high-risk groups in the development and evaluation of interventions. Sturm and colleagues combined data from the Early Childhood Longitudinal Study Kindergarten Cohort (1998-2004) with data on state level grocery store sales tax rates for the relevant geographic area and time period to model the potential effects of initiating different levels of SSB taxation.<sup>64</sup> The overall finding showed no association between SSB taxes and total SSB consumption and only a marginally significant association with consumption at school. However, in further analyses, statistically significant associations of SSB taxes with school-based consumption were observed for children from low-income families, black children, and children who were heavy TV watchers (nine or more hours per week); these subgroups of children were examined separately because of their high risk of obesity.

## Summary

Sugar-sweetened beverages are the primary source of added sugar to the American diet. The adverse health consequences associated with SSB consumption relate to conditions that are more common in blacks than whites. The data strongly suggest that advocates for black community health should support policy measures that can help reduce SSB consumption, particularly in the black population. However, more research is needed to design effective public health initiatives in this area.



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**About the African American Collaborative Obesity Research Network (AACORN)**

Founded in 2002, AACORN seeks to improve the quality, quantity and effective translation of research to address weight-related issues in African American communities. AACORN was established by Dr. Shiriki Kumanyika, an African American public health and nutrition researcher and professor of epidemiology at the University of Pennsylvania School of Medicine. The network was developed to support greater participation in framing and implementing the obesity research agenda by investigators who have both obesity-related scientific expertise, and social and cultural grounding in African American life experiences. AACORN is based at the University of Pennsylvania and is a collaboration of African American and other U.S. researchers, scholars-in-training and community-based research partners.

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Support for this brief was provided by the Robert Wood Johnson Foundation (RWJF). AACORN is funded by RWJF and the National Institutes of Health. The ideas in this brief do not necessarily reflect the opinions of AACORN's funders.

**Also see:**

The Negative Impact of Sugar-Sweetened Beverages on Children's Health. A Research Synthesis. Robert Wood Johnson Foundation Healthy Eating Research Program. November 2009. Available at: <http://www.rwjf.org/files/research/20091203herssb.pdf>

Sugar-Sweetened Beverage Taxes and Public Health. Research Brief. July 2009. Robert Wood Johnson Foundation Healthy Eating Research Program. Available at: [http://www.impactteen.org/generalarea\\_PDFs/Beverage%20Tax%20Research%20Brief%207.31.09%20FINAL.pdf](http://www.impactteen.org/generalarea_PDFs/Beverage%20Tax%20Research%20Brief%207.31.09%20FINAL.pdf)