Improving Water Consumption in Schools: Challenges, Promising Practices, and Next Steps

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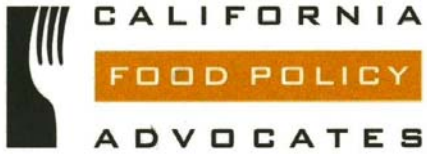
CALIFORNIA FOOD POLICY ADVOCATES

California Food Policy Advocates is a statewide public policy and advocacy organization dedicated to improving the health and well being of low-income Californians by increasing their access to nutritious, affordable food.



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Goal: To increase free, tap water consumption by low-income children in schools during mealtimes.

Figure 1. Water Station in a School Cafeteria in the Folsom-Cordova Unified School District

In 2008, California Food Policy Advocates (CFPA) sponsored Assembly Bill 2704, authored by Mark Leno (D-SF), to remove barriers to offering free drinking water in school cafeterias. The Legislature passed this bill, but it was vetoed by Governor Schwarzenegger. In his veto message, the Governor stated that he felt that the bill was unnecessary but that he was willing to work with the Legislature to find "more positive and constructive ways to promote the accessibility and consumption" of water in schools.

The purpose of this briefing paper is to follow-up on this veto message by exploring issues related to promoting water consumption in schools as well as best practices and strategies to implement this goal. This briefing paper highlights the importance of water for health and obesity prevention, explains the current landscape of water-related policies in schools, provides a few case studies of innovative best practices to promote water consumption, and lays out strategies, potential next steps, policy recommendations, and further research needs. The paper also incorporates the discussion of a meeting of stakeholders convened in Oakland in mid-September 2009 to discuss this issue.

THE IMPORTANCE OF WATER FOR HEALTH AND OBESITY PREVENTION

The focus of national health care reform on curbing the problem of escalating health care costs underscores the urgent need for action to combat obesity, given its direct contribution to rising health care costs. The increase in obesity rates over the past thirty years is well-known and well-documented. Similarly, obesity's impact on health, well-being, and the economy are also well-known and well-documented. A recent report

puts the cost of overweight, obesity, and physical inactivity in California at $42 billion.[1] Action is necessary in a variety of settings and at a range of levels to be successful. Since childhood is when lifelong dietary habits and preferences are developed, places where children spend much of their time are important settings for shaping habits and preferences. One such setting is schools, where children spend much of their day. Many school-based interventions can also be applied in child care and afterschool programs.

Strategies to combat obesity in these settings include promoting the consumption of healthy food and beverages, reducing consumption of foods and beverages with low or no nutritional value, and encouraging physical activity. Specifically, there are efforts underway to reduce the consumption of sugar-sweetened beverages (SSB), such as soda, sports drinks, and juice. A growing body of literature links consumption of these beverages to obesity.[2] In fact, recent research suggests that Americans are consuming approximately 278 more calories today than they did in the mid-1970s with 43 percent of these calories coming from SSBs.[3] While preferable to soda and juice with sugar added, even 100 percent fruit juice can be obesogenic if consumed in excess. Although the evidence is not conclusive, some research suggests that liquid calories may contribute to overeating due to liquids' reduction of basic sensations of satiety and internal cues to stop consuming.[4]

At the same time that efforts grow to limit consumption of SSBs, research is mounting that highlights the importance of water consumption. Water is an essential nutrient with no calories. Evidence is growing to suggest that increasing consumption of water in the place of SSBs and juice could help combat obesity.[5,6] In fact, recent research found that such a substitution could result in 235 fewer excess calories per day being

[1] "The Economic Costs of Overweight, Obesity, and Physical Inactivity". Conducted by Chenoweth & Associates, Inc. Published by California Center for Public Health Advocacy. July 2009. Available at http://publichealthadvocacy.org/PDFs/Costofobesity_BRIEF.pdf.

[2] Babey SH et al. "Bubbling Over: Soda Consumption and its Link to Obesity in California". UCLA Center for Health Policy Research and the California Center for Public Health Advocacy. September 2009. Available at http://www.publichealthadvocacy.org/PDFs/Bubbling_PolicyBrief.pdf.

[3] Forthcoming. Woodward-Lopez G et al. "To What Extent Have Sugar-Sweetened Beverages Contributed to the Obesity Epidemic." Center for Weight and Health, UC Berkeley

[4] Almiron-Roig E, Chen Y, and Drewnoski A. "Liquid Calories and the Failure of Satiety: How Good is the Evidence?". *Obesity Reviews*. Vol 4, Issue 4. 5 Nov 2003.

[5] Muckelbauer R et al. "Promotion and Provision of Drinking Water in Schools for Overweight Prevention: Randomized, Controlled Cluster Trial". *Pediatrics*. Vol. 123, No. 4, April 2009.

[6] Ebbeling CB et al. "Effects of Decreasing Sugar-Sweetened Beverage Consumption on Body Weight in Adolescents: A Randomized, Controlled Pilot Study". *Pediatrics*. Vol. 117, No. 3, March 2006.

consumed by children and adolescents.[7] In addition to water's role in maintaining a healthy weight, replacing SSB consumption with fluoridated water consumption could help to prevent dental caries, one of the most common chronic diseases of childhood.

The Dietary Guidelines for Americans recommend water consumption but do not provide specific quantitative recommendations for target levels of consumption. However, they do assume that consumption of fluids during meals is a necessary strategy to maintain proper hydration.[8]

Studies indicate that dehydration is a potential issue among children, regardless of climate. Recent research conducted in Los Angeles and New York City suggest that 60 percent of children are dehydrated at a level associated with compromised cognitive function upon arrival at school in these two cities.[9] Research demonstrates that dehydration is associated with impaired cognitive function and dehydration can adversely affect memory, reasoning, hand-eye coordination, concentration, alertness, attention, perception, and language skills.[10]

In short, there is a growing research base that demonstrates that increasing water consumption is beneficial for a student's health and well-being and can positively impact weight and academic performance.

While this paper will focus on water consumption in schools during mealtimes, much of the content is applicable to other related settings, such as in afterschool programs and child care. Indeed, there is a sizable public health benefit to encouraging water consumption more broadly across the whole population, in all settings, and at all times. However, in this paper we have selected to focus on a narrow slice of the much broader issue, in order to ensure that we are successful in defining the problem, addressing challenges and barriers, and identifying tangible, short-term next steps. We believe that success in increasing water consumption in schools during meal times will set the stage for future actions in broader settings, such as encouraging water consumption in other federal nutrition programs, in other publically operated spaces frequented by children, and in the greater community.

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[7] Wang YC et al. "Impact of Change in Sweetened Caloric Beverage Consumption on Energy Intake Among Children and Adolescents". *Archives of Pediatrics and Adolescent Medicine*. Vol. 163, No. 4, April 2009.

[8] Dietary Guidelines for Americans, 2005. US Department of Health and Human Services, US Department of Agriculture. Available at http://www.health.gov/dietaryguidelines/dga2005/document/html/chapter2.htm

[9] Stookey J. Presentation. Oakland, CA. September 14, 2009.

[10] Stookey J. Forthcoming article.

STATE OF THE TAP

Infrastructure Policies

Currently, schools are under no obligation that specifically requires ready access[11] to water during meal times. While there is a requirement to ensure the availability of drinking water in schools generally, there is neither a requirement nor an encouragement to provide water in student eating areas or to promote water consumption during meal times. Specifically, state plumbing code requires one drinking fountain per 150 people in a K-12 school.[12] A 1999 memo from former Superintendent of Public Instruction Delaine Eastin indicated that this ratio was "obviously inadequate".[13] Anecdotal evidence from school visits and student feedback suggests that many of these drinking fountains in schools throughout the state are actually non-functional, in poor repair, or so unappealing as to discourage use.

Moreover, water fountains alone are unlikely to provide children with an adequate serving of water in a timely fashion. Without cups or water bottles, a child can simply get a quick drink of water at a fountain. Even with cups or bottles, filling them is likely a slow process at most water fountains. Systems such as water jets, pitchers, or large water dispensers are better able to fill cups and bottles. Examples of these systems are described later in this paper.

Current Practices

Even if water fountains are actually operational and useable, this does not guarantee ready access nor encourage consumption during mealtimes. Why mealtimes? Students have repeatedly identified their desire for chilled, free water during meals or in student eating areas. Additionally, it is during meal times that too many students consume sugar-sweetened beverages.

Yet, a recent survey suggests that many students do not have access to free drinking water during meal times. California Project LEAN recently conducted a survey of school districts across the state. This survey gauged a number of health and nutrition related issues, including questions related to water access and availability. Only about

[11] We propose to define "ready access" as an environment where a student can easily consume a free drink of palatable, safe water in a quantity to satisfy his/her thirst in an appropriate amount of time.
[12] "K-12 Toilet Requirement Summary". CA Department of Education. Available at http://www.cde.ca.gov/LS/fa/sf/toiletrequire.asp.
[13] "School Building, Health and Sanitation Code Requirements, - Code Compliance Responsibility". CA Department of Education. Available at http://www.cde.ca.gov/ls/fa/sf/sfpd9902sanicode.asp.

a quarter of schools reported having a policy on availability of drinking water. Approximately 40 percent of respondents indicated that none of the school cafeterias in their district provided students with access to free drinking water during school meals. An additional 15 percent of respondents reported that less than half of schools in their district provided access. Barriers to water consumption included warm, unappealing water, too few fountains, and poor maintenance of fountains.[14]

From Access to Consumption

Even of the approximately 60 percent of schools that indicated they have access to drinking water in eating areas, it is necessary to parse these numbers. Based on previous surveys of, and discussions with, school food service directors, the definition of ready access varies widely. Some respondents define ready access as water jets that can fill up reusable bottles and cups in the cafeteria, while others define ready access as a water fountain down the hallway from the cafeteria. Because the survey did not obligate respondents to use a standard definition of "access", it is likely that some portion of those schools reporting sufficient access to free drinking water actually had fairly inadequate access. Finally, even with adequate access to water, access does not necessarily translate into consumption. Given that many children may not be drinking enough water and too many calorie-dense, nutrient-poor beverages, it is important for schools to more actively encourage water consumption.

CHALLENGES/BARRIERS TO WATER CONSUMPTION DURING MEALS

There are a number of barriers preventing access to and consumption of free drinking water in eating areas of schools.

Infrastructure

An obvious and most apparent barrier is lack of infrastructure, such as adequate water fountains, water jets, and hydration stations. The cost of adding such infrastructure is likely daunting to many cash-strapped school districts. Even with access to water through drinking fountains, children still may not drink an adequate amount of water. It may be difficult to drink a full serving of water at a fountain, particularly when water fountains are in short supply, but high demand, and deliver low pressure. Moreover, many water fountains are in poor states of repair and the water might not taste good or be warm and unappealing. Access that actually promotes adequate consumption might

[14] CA Project Lean. Presentation. Oakland, CA. September 14, 2009.

include active delivery mechanisms, such as pitchers and cups, large water dispensers and coolers, or water jets with refillable, reusable bottles.

One-time and Ongoing Costs

To make significant improvements, some schools will need to make investments. These range from potentially expensive facilities projects to create or modernize the infrastructure to serve chilled and filtered water in cafeterias to relatively inexpensive changes, such as offering pitchers of cold tap water and a stack of paper cups. Each of these changes raises potential cost concerns with using limited bond funds, new maintenance obligations, concerns around the waste created with disposable paper cups, or the labor needed to rinse and reuse reusable cups, bottles, and water dispensers. While reusable water bottles are also an option, children (particularly young children) may be prone to losing the bottles or may not carry backpacks. Some have overcome this obstacle by keeping the bottles at school rather than allowing children to take them home. To the extent that drinking free tap water displaces the purchase of beverages from vending machines or the student store, there are also potential concerns around declining revenues and funding for student groups. Despite these challenges, the following section describes case studies of increasing "ready access" to free water in schools.

School Meal and Vending Regulations

Misconceptions about restrictive beverage contracts and National School Lunch Program regulations have limited water service in some cafeterias. Recent experiences with efforts to promote water consumption in schools in Los Angeles highlighted these barriers. Some schools believed that contracts with private beverage companies prohibited the service of free drinking water, particularly because schools sell bottled water in vending machines, student stores, and some cafeteria lines. In addition, some school cafeteria staff believed that the only beverages that could be provided during mealtimes were milk and juice, per federal regulations. Thus, efforts to distribute free tap water during mealtimes were perceived to conflict with contracts and regulations.

California Assembly Bill (AB) 2704, authored by Mark Leno (D-SF), was introduced in 2008 to resolve two misinformation-driven barriers mentioned above – beverage contracts and school meal regulations. The bill's intent was to clarify existing education statutes and to open the doors to local efforts to push water consumption. However, the Governor vetoed this bill stating that it was unnecessary. In his veto message, the Governor indicated his desire to work with the Legislature on finding more "positive and constructive" ways to promote access and consumption of water in schools.

Water Quality

Given environmental and cost concerns with bottled water, efforts to promote water consumption should focus on tap water. In general, tap water is more regulated and tested than bottled water and many bottled water companies simply sell filtered tap water.[15] However, in some parts of the state, the public has expressed concerns – both real and perceived – about the quality and safety of local tap water supplies. Recent articles in the *Sacramento Bee*[16], *New York Times*[17], and *Los Angeles Times*[18] call attention to real concerns with the safety of tap water in certain cities and communities. School districts across the country, including in Los Angeles, New York City, the District of Columbia, and Seattle, all have had concerns with lead contamination.

In some areas of the state, particularly regions of the Central Valley, unsafe tap water poses a true public health concern and in some cases, for certain vulnerable populations, such as immunocompromised individuals, pregnant women, very young children, and the elderly.[19] Some simple steps may be taken to mitigate these concerns, such as basic filtration or pipe flushing. However, even these relatively inexpensive actions may be infeasible or too costly for cash-strapped schools. In addition, many water contamination concerns may require more extensive actions taken further upstream to fully remedy the problem.

We were not able to identify a reliable data source to evaluate the extent of compromised tap water in California schools. Local schools and county health departments should be aware of the state of their water supplies and make appropriate decisions about providing free, tap water. One possible strategy to achieve this is a requirement for local water agencies, county public health departments, or the California Department of Public Health to annually inform schools about water quality. However, many caution that government agencies are not required to test for all chemicals or contaminants of concern. For those schools in communities with unsafe

[15] "Bottled Water: Melting the Myth of Purity". Food and Water Watch. Available at http://takebackthetap.org/learn-more/health.
[16] "Central Valley continues marathon fight for clean drinking water" *Sacramento Bee*, August 26, 2009. Available at http://www.sacbee.com/politics/story/2120939.html.
[17] "Toxic Waters: A series about the worsening pollution in American waters and regulators' response". *The New York Times*. Available at http://projects.nytimes.com/toxic-waters.
[18] "California moves toward stringent chromium 6 standard for drinking water" *Los Angeles Times*, August 21, 2009. Available at http://www.latimes.com/news/science/environment/la-me-chromium21-2009aug21,0,3193050.story?track=rss.
[19] "Tap Water Quality and Safety". Natural Resources Defense Council. Available at http://www.nrdc.org/water/drinking/qtap.asp.

drinking water, local advocates should work with the appropriate agencies to improve their water supply.

The bottom line regarding water quality is that many, if not most, communities in the state have safe water supplies. Systems should be established such that schools are notified if their water supply is unsafe. For those schools determined to have unsafe water, interventions to encourage tap water consumption should obviously be abandoned. In these schools, parallel efforts should be undertaken to both improve the water supply as well as to devise alternative systems to bring safe water to the school.

The second water quality related concern is not about safety but about appeal. While some may conflate the two and believe that water that does not have an appealing taste is actually of poor quality, this is not necessarily the case. Many perceive the quality of tap water to be poor due to taste or temperature concerns. Additionally, the appeal of many water fountains in schools is limited due to poor maintenance. These concerns can be alleviated through installation of filters, water coolers, and other facilities upgrades to improve the palatability and appeal of water delivery infrastructure.

Displacement of Food

Other concerns sometimes raised are that children will fill up on water and therefore not consume the food or drink the milk that are parts of school meals. However, research and past experience suggests that this is not the case. A growing body of literature suggests that liquids do not result in satiety. A 2005 study found that regardless of whether one drank nothing, water, juice, soda, or milk before a meal, virtually the same amount of food was consumed at lunch.[20] NYC's experience (describe below) demonstrates that increasing availability of water does not compromise USDA requirements for school meals.[21] Also, the pilot intervention conducted in Los Angeles (and described below) found that offering water did not reduce milk consumption.[22] Moreover, water can be placed in areas that make it clear that priority is given to the school meals, but, once meals are consumed, if students are thirsty, water is freely and readily available for consumption.

[20] DellValle DM et al. "Does the consumption of caloric and non-caloric beverages with a meal affect energy intake?". *Appetite.* Vol. 44, Iss. 2, April 2005.

[21] "Water Jets in School Cafeteria". City of New York Department of Health and Mental Hygiene. Available at http://www.cfpa.net/water/nyc_waterjets.pdf.

[22] Increasing the Availability and Consumption of Drinking Water in Public Schools: A Pilot Intervention. Pediatric Academic Societies Meeting, Baltimore, May 2009.

Safety and Sanitation

When using reusable dispensers, cups, or bottles, there are potentially concerns about cleanliness and sanitation. All these items would have to be regularly cleaned to avoid safety concerns. These cleanings contribute to labor costs. In addition, recent concerns have arisen around chemicals, such as Bisphenol-A, in plastic bottles, but companies are now producing chemical-free bottles.

INTERVENTIONS TO ENCOURAGE WATER CONSUMPTION

Schools across California, the country, and in other countries are experimenting with innovative methods of encouraging water consumption in schools. A few examples are discussed below. While the examples below largely describe interventions conducted at individual schools, they provide insights on how to build and structure actions at a broader level rather than on a school-by-school basis. Future campaigns and policy actions can employ lessons learned in these examples, such as capitalizing on the private sector, academia, and existing school-based organizations.

Los Angeles County

In Los Angeles County school districts, the University of California at Los Angeles and the RAND Corporation pilot tested a cafeteria water program in response to student requests. In this program, cafeteria staff provided lead-free, filtered, chilled tap water to students in 5-gallon dispensers in the cafeteria at mealtimes. Students and staff were given donated reusable water bottles from CamelBak. The intervention also included student engagement, education, and marketing. Water consumption spiked to 30 gallons per day in the first week but declined as students stopped bringing bottles to school. When paper cups were provided, water consumption increased. Annual costs for lead tests, filter installation and replacement, 5-gallon dispensers, and paper cups were $2000 for a school of 1668 students.

Figure 2. Materials from LA Intervention

Oakland, CA

The PTA from a public elementary school in Oakland, CA worked on installing a "hydration station" in a location that was close to the cafeteria, playground, and a well-used entrance to the school. The experience in this school demonstrated that committed parents could work with school district officials, school food service workers, and others to achieve progress in their local school.[23] This project relied upon volunteer work from parents and some fundraising, but demonstrated that local efforts can make an impact.

[23] "Water in Schools". California Food Policy Advocates. Available at http://www.cfpa.net/water/water_in_schools.htm.

Figure 3 and 4. "Hydration Station" in an Oakland, CA School

Berkeley, CA

The Berkeley Unified School District provides tap water for students during lunch in schools district-wide. Each school eating area has a five gallon water container that is refilled each day with tap water and the school provides cups for students to use. According to the manager of nutrition services at Berkeley Unified, the cost of providing this water is "very minimal", staff spends less than five minutes per day on set-up, and consumption is "enormous."[24]

Bay Area, CA

The Bay Area Nutrition and Physical Activity Collaborative (BANPAC), a regional collaborative of health-related organizations, created the "Soda Free Summer" campaign to encourage kids to replace soda consumption with healthier alternatives, particularly water. While this campaign is not an intervention to specifically increase access to water, it does use marketing, education, the internet, and other tools to promote water consumption. Different Bay Area counties are working in different ways to promote this campaign. Buses, placards, and billboards throughout the region promote the "Soda Free Summer" campaign. Campaign sponsors include local health-related organizations.

[24] Personal Communication.

Figure 5. "Soda Free Summer" Campaign

In San Francisco county, part of the campaign is promoting a children's book entitled "'Drink Water!' Said the Otter". San Francisco's First Lady, Jennifer Siebel Newsom, participated in a kick-off event reading the book to children. This effort was funded by Kaiser Permanente and First 5 San Francisco.

Figure 6. "Drink Water!" Said the Otter

This example highlights innovative partnerships that can generate funding for a regional social marketing approach to encourage water consumption.

New York City

In late 2007, the City of New York's Departments of Education and Health and Mental Hygiene collaborated on a pilot project to install water jets in five school cafeterias. Initial reports were that principals and staff were happy with the equipment and reported no unanticipated problems. Importantly, student meals continued to meet USDA requirements for reimbursement. At this time, the City of New York has yet to

complete a formal evaluation but preliminary results suggest that up to 90 percent of students used the water jets during the lunch period.[25]

Figure 7. Water Jets in NYC School

England

A regional drinking water company in England, Anglian Water, began a campaign, AW Fresh, to promote drinking tap water in schools. The company conducted a pilot survey and intervention in secondary schools and found that, at baseline, 77 percent of students wanted more access to water and only one percent of students drank the recommended daily amount of water. During the intervention, Anglian Water provided water coolers to schools that dispensed chilled tap water. The water company also sold branded water bottles at a subsidized rate to the school. The water bottles could then be resold as a fundraiser or given to students. After three months, they found that 83 percent of students found it easier to drink water, 39 percent reported to drink more water (3.5 more glasses per day), and nearly 70 percent reported using their refillable water bottles. Finally, the students who drank more water also reported being less thirsty, feeling healthier, being able to better concentrate, and performing better at sports or physical education.[26]

[25] "Water Jets in School Cafeteria". City of New York Department of Health and Mental Hygiene. Available at http://www.cfpa.net/water/nyc_waterjets.pdf.
[26] "Water for Health in Secondary Schools". Anglian Water. Available at http://www.anglianwater.co.uk/community/education/water-for-health/secondary-schools/.

NEXT STEPS, STRATEGIES, AND SOLUTIONS

Lessons Learned

The examples above demonstrate unique and innovative strategies to bring free drinking water to schools and promote healthy beverage consumption. A number of lessons can be learned from these examples that can be applied to other schools. The Anglian Water example demonstrates the role that a water agency can play in encouraging water consumption. Given the popularity of reusable water bottles and water filters, schools can negotiate with these industries, such as CamelBak and Brita, to receive subsidized or donated products. Other partnerships can be established with the PTA, local health advocates, or the local health department.

The advantages of some of the systems described above are that they can allow water to be filtered and chilled and can be presented in attractive and familiar methods. In addition, some allow children to fill cups and water bottles. While the hydration station and water jets used in the Oakland and NYC examples require some infrastructure investment, other lower-tech options include using water jugs that are refillable with tap water or pitchers and cups. Although these methods also require some investment, it is a significantly smaller up-front investment than those described above and require less installation time. For all these interventions, support and buy-in from school staff and administrators is key.

Funding

The examples above demonstrate various methods and partnerships that are available for communities and schools seeking to promote water consumption in their cafeterias and eating areas. In these tight budget times, schools may face challenges funding extra staff and resources to devote to new initiatives. Despite the importance of water consumption, promoting drinking water may not be a priority issue for schools. This highlights the need for outside pressure and innovative partnerships. The examples

above demonstrate that if free, readily available drinking water is promoted in cafeterias, students will drink it.

Many of these projects require larger initial investment in infrastructure (such as filters, pipes, coolers, etc.). However, because ongoing costs are smaller and more absorbable, many of these efforts become sustainable in the long run if start-up funding and resources can be found.

Sugar-Sweetened Beverages (SSBs)

An on-going question is to what degree would these efforts to promote water consumption displace the consumption of SSBs. It is not clear from the interventions described above if children who drank more water also drank fewer SSBs. In California, most schools do not have ready access to SSBs on campus except for sports drinks in high schools. However, students can certainly bring them in from home or purchase them from neighborhood stores. One possible strategy to reduce SSB consumption may be to simultaneously promote water while also more rigorously restricting SSBs on campus.

Preferences

A related concern is whether kids have developed a taste preference for water. This question highlights the need to develop healthy habits at younger ages and ensure that kids in child care and at home during their earliest years grow accustomed to drinking water rather than sweet juices, sodas, and other drinks. But, in schools, the water can also be made to taste better through filtration and chilling. Schools can even add lemon wedges or mint to enhance the flavor, although this will carry a cost. Preferences can also be shaped through education and marketing in the schools to promote water and to incorporate the importance of hydration into classroom education, such as in physical education, health, or nutrition classes.

Beverage Companies

As public health advocates increasingly push to eliminate sodas, sports drinks, and other sugary beverages from schools, beverage companies respond by introducing bottled water lines as well as low-calorie and artificially-sweetened alternatives. This paper has focused on encouraging tap water consumption rather than bottled water due to cost considerations for children (and their families) and the environmental impact of bottled water. From a nutrition perspective, low-calorie and artificially-sweetened beverages should be considered a “less bad” alternative rather than a healthy option to

promote. Particularly for younger children, these choices contribute to the development of a taste preference for sweet drinks. Schools should help students develop healthier taste preferences. Because a campaign to push tap water consumption over soda, bottled water, and artificially-sweetened drinks cuts into the beverage industry's market, opposition from this industry is likely down the road.

Research Needs

Given the variety of factors influencing student demands, preferences, and the food and beverage environment in schools, further research is needed to discover how to appropriately meet students' needs at various grade levels. The research might consist of surveys, focus groups, and pilot projects to determine how best to offer water and how to ensure that students consume this water.

Given the complexity of the water safety issue, research is needed to clarify how best to proceed on improving the water supply in areas of concern. Research could untangle the web of federal, state, and local actors with authority over water safety and the water supply. This research could also explore the strength and scope of the current water safety inspection system, identify gaps in testing protocols and resources, and examine the system by which schools are notified if water safety concerns exist. Finally, this research could also identify current and future funding sources to remedy water safety concerns.

Research is also needed to learn if efforts to promote water consumption in schools also triggers a reduction in SSB consumption. This research could also explore if increased water consumption in schools translates to increased consumption outside of school, such as at home or other settings.

Further research would also be useful to identify challenges and opportunities for expanding water access and consumption in non-school settings, such as parks, child care, afterschool sites, and other community locations.

Actions and Strategies

In the short term, given the state's current budget realities, sweeping statewide investment in this issue is unlikely. However, the state can take action to promote water consumption through existing resources devoted to training, outreach, and nutrition education. The California Department Education (CDE) will be issuing a Management Bulletin highlighting this issue. CDE can also incorporate the importance of water consumption into ongoing trainings. In addition, the Governor and Superintendent of Public Instruction can use their bully pulpits to draw attention to this

issue. The California Department of Public Health and related agencies can use existing resources to highlight and promote the importance of water for health.

But, local and federal action will also be necessary. In general, a key strategy for local advocates is to identify partners and funding sources at the state, regional, and local levels. As discussed above, there are a wide range of potential partners and funders from the private sector to the PTA to municipal water districts. At the federal level, changes to the child nutrition programs are necessary as well as expanding authority, oversight, and resources for the relevant agencies that monitor and regulate water safety.

Potential solutions include:

- Federal changes – Currently, water is not a required component of child nutrition programs, such as school lunch, child care food, afterschool snacks, or summer food. Federal rules can be changed to require water service through the upcoming reauthorization of the child nutrition programs.

- Minimum statewide standard for all schools – At a state level, a statewide minimum level of access to free drinking water can be established. This minimum can be implemented differently in different schools to allow for local autonomy. One strategy can also be to frame this minimum as a social justice issue that all children deserve access to free, clean, safe water in schools.

- Funding sources – Many of the strategies described in this paper require an investment from schools to establish a system of delivering water to kids. Pools of funding may currently exist from federal and state sources, such as stimulus or bond funds. In addition, future federal and state funding sources may exist in legislation related to obesity prevention, school infrastructure, and water systems improvements.

- Marketing campaigns – Schools can establish campaigns to promote water consumption with marketing and education. Water can be incorporated into lessons on biology, health, nutrition, and physical education. Signs and advertisements can be posted in the cafeteria and throughout campus promoting water consumption.

- Student, parent, and local community engagement – Related to the point above on marketing, students, parents, and community members must be engaged in this effort. Soliciting feedback on how best to encourage water consumption and how

to overcome current barriers to water consumption can help ensure a successful campaign.

- Wellness policies – Schools should incorporate access to and promotion of free tap water during meals into wellness policies.

- Water quality monitoring – The state and federal governments should strengthen water quality monitoring to include all contaminants causing human health concerns. In addition, the Department of Public Health should notify schools on an annual basis whether their water supply is safe.

- Competitive food standards – Competitive food standards should be strengthened to eliminate all sugar-sweetened and artificially-sweetened beverages from all school campuses.

- Beverage fees – Fees on SSBs could serve the dual purpose of reducing demand for these products as well as generating a revenue source for the promotion of healthier alternatives, such as water.

As of the writing of this paper, Assembly Bill 1242 (Ruskin, which would establish a human right to clean, affordable and accessible water for the health and well-being of the individual and family, is on the Governor's desk. If this bill were to pass, it is unclear what effect it would have on access to water in schools. A broad reading of the bill might suggest that schools bear a responsibility to ensure that students have access to clean water and must establish policies to fulfill this responsibility.