



Increasing Access to Safe Drinking Water in Schools and Communities

Policy Statement

Approved by AdCC June 2015

Position

The United States is experiencing an obesity epidemic of historical proportions. More than 78.6 million adults are obese, and another one third are overweight.¹ Unfortunately, our nation's children are not immune: 32.3% percent are overweight or obese, and 17.3% percent are obese.² The American Heart Association (AHA) supports a multi-pronged approach to address the nation's obesity epidemic that includes creating policies to improve access to, and affordability of, healthy foods and beverages for all people. One promising policy is to incentivize the purchase of healthy foods and beverages, including water, through competitive pricing and increased access to encourage consumption. This would bring food and beverage pricing in line with the AHA's Diet and Lifestyle Recommendations and federal dietary guidelines.

Communities are becoming increasingly aware that sugar-sweetened beverages contribute to poor diet and rising obesity rates, yet water intake remains insufficient among many children and adults. Promoting water consumption may be an effective way for communities to decrease sugar-sweetened beverage consumption. The AHA supports initiatives that increase access to, and promotion of, free, potable water, policies that price water at lower cost than sugar-sweetened beverages, and policies that favor the promotion of water over the promotion of unhealthy beverages. The AHA also believes that evaluation must be prioritized to assess the impact of these initiatives on consumer behavior, water availability and consumption trends, essential stakeholder involvement, and implementation barriers.

Background

Water plays numerous, critical roles to help the body function, including regulating temperature, protecting sensitive tissues, transporting nutrients, and ridding the body of wastes.³ Drinking sufficient amounts of water can have many health benefits, such as reduced dental caries.⁴ Increasing consumption of water, particularly as a substitute for sugar-sweetened beverages, can lead to lower calorie intake, improved overall health, and a lower risk for obesity.^{5, 6, 7}

Most children and adolescents do not consume enough water.⁸ Adequate water intake not only supports a range of positive health outcomes, but it may also positively impact cognition.⁹ It has been shown to improve students' classroom focus and academic performance.^{10, 11, 12} While water intake needs will vary based partly on body size, age, gender, physical activity levels, and exposure to heat stress levels, the U.S. Institute of Medicine (IOM) has set recommendations for total water intake based on median intake estimated from U.S. dietary surveys.¹³ The IOM recommends that boys and girls between the ages of 4-8 years consume at least 1.7 liters (roughly 7 cups) of *total* water each day that

includes plain drinking water as well as the water content of all foods and beverages consumed. Not all total recommended water intake is expected to come from plain drinking water. Girls between the ages of 9-13 years should consume at least 2.1 L (roughly 9 cups), and boys in the same age group should consume at least 2.4 L (roughly 10 cups).¹⁴ However fewer than one-third of children and adolescents meet or exceed these recommendations,¹⁵ and one-fourth of adolescents drink less than one serving of water per day.¹⁶

Recent assessments of urine osmolality in national samples of children and youth in NHANES suggest that these low levels of water consumption correspond with poor hydration status: more than half of U.S. children and adolescents are inadequately hydrated.¹⁷ Research reaffirms what we would intuitively think - more water consumption leads to lower risk of inadequate hydration.¹⁸ Inadequate hydration is defined by urine osmolality >800 mOsm/kg, a level associated with poorer performance on cognitive tests. Inadequate hydration is more prevalent among non-Hispanic Blacks and younger children. Both girls and boys aged 9-13 years fail to meet the recommendations.¹⁹ For example, girls aged 9-13 years were 444 mL per day (roughly 2 cups) short of meeting the recommendations, whereas boys aged 9-13 years were 633 mL/d short (nearly 3 cups).²⁰ Moreover, children aged 4-8 years consume about 15% less water on average than the daily-recommended amount.

For adults, the IOM recommends that men 19 and older consume at least 3.7 L (roughly 16 cups) of total water each day, and women 19 and older consume 2.7 L (roughly 12 cups).²¹ As with children, adults fail to meet daily recommendations for water intake, especially as they age. Among adults 20 to 50 years old, 42.7% of men and 40.6% of women failed to meet the IOM recommendations. For 51 to 70 year olds, 59.1% of men and 44.9% of women failed to meet the recommendations. For adults over 70, 94.7% of men and 82.6% of women failed to meet to meet the recommendations.²² Data on water consumption habits for children and adults should continue to be collected, evaluated, and further understood.

The U.S. Environmental Protection Agency (EPA) is responsible for overseeing water safety.²³ While many of the following policies and strategies are state or local based, the EPA should ensure consistency of water safety, quality, and access across systems in order to eliminate national disparities long-term, and work with states and localities to implement safe water programs and monitoring systems.

Water Access and Quality in Academic Settings

Providing free, clean, drinking water in schools is an important strategy to increase consumption. Water plays an important role in maintaining a child's overall health.^{24,25} Since children spend a large portion of their day at school,²⁶ in early care and education and afterschool programs, proactive policies have the potential to significantly influence water consumption among children and adolescents.²⁷ However, free drinking water is not always as easily accessible, or as widely promoted, as other beverages in schools,²⁸ and most children drink insufficient quantities of water at school.

In 2010, the U.S. Congress passed the Healthy, Hunger-Free Kids Act, which requires schools to offer healthy beverages such as milk, water and 100% juice across the school environment and make potable drinking water available to students at no charge during mealtimes in areas where meals are served.²⁹ Additionally, the U.S. Department of Agriculture (USDA) released a proposed rule encouraging schools to include provisions for drinking water in their school wellness policies in order to make water available and more accessible throughout the school day.³⁰ Implementation remains inconsistent, and a large number of schools still fail to meet federal recommendations to provide water throughout the day.³¹

Water intake and prevalence of water in elementary schools is higher than in middle schools, junior high schools, and high schools,^{32,33} with newer schools being the most likely to maintain water sources.³⁴ Many school districts are unaware of the laws requiring drinking water in schools, but even if they know the law, insufficient funding is a barrier to implementation.³⁵ Other barriers include inadequate, inconveniently located, or poorly maintained drinking fountains.³⁶ In some districts, students are not allowed to bring water bottles to school due to security and underage drinking concerns. Schools may also fear that by offering free access to drinking water, they could lose revenue from selling bottled water, and other drinks in vending machines or school concession stands that may help fund school activities.³⁷ Some schools may have difficulty managing the costs associated with providing and maintaining free drinking water outlets, such as the one-time cost of replacing an old water fountain, or the ongoing cost of providing disposable cups for a water dispenser.³⁸

The drinking water infrastructure found in older schools is often deteriorated, and the pipes may contain high levels of lead which leaches into the water.³⁹ In some states, such as California, the contamination issues are broader than lead, and include arsenic (naturally occurring), and other contaminants like nitrate and chromium that effect rural communities in particular.⁴⁰ Many students do not drink tap water from school drinking fountains because of water quality and safety concerns.⁴¹ Students often view their existing water provision as poor and want sufficient supplies of cooled, filtered water in school.⁴² This perceived tap water risk has been shown to be more prevalent among African-Americans, Hispanics, and lower-income youth.⁴³ However, when water is available from non-fountain sources such as water coolers, the percentage of students who drink free water increases.⁴⁴ The evaluation of school water fountains as unsafe and unclean has been associated with increased daily sugary drink intake among Hispanics.⁴⁵ Regular testing of the water for quality and safety is needed, and should be a transparent process, whereby parents and students are informed of the results, and made aware of any plans to improve the quality and safety of the schools' water.

There are a variety of options schools can take to overcome barriers to providing water to students. District superintendents and school principals, as well as school food service and wellness staff, can play an important role in ensuring that schools implement drinking water requirements, as well as promote education and behavior-change strategies to increase student consumption of water at school.⁴⁶ Water provision strategies relying on tap water rather than bottled water tend to be more economical in the long term, and should be encouraged in places where the quality is sufficient. In a study of schools in Massachusetts, the ten-year cost per school for providing water during mealtimes to students, including dispenser units, installation, water testing, water, cups, and labor, ranged from \$12,544 to \$27,922, depending on water delivery options, and assuming average school enrollment.⁴⁷

The appropriate timing of water intake before, during, and after meals may help reduce energy intake and contribute to the maintenance of body weight in overweight individuals.⁴⁸ Thus, it is critically important for schools to make free water available during meals, but it is equally important to make free, potable water available to children outside of food service areas so they have access throughout the day.⁴⁹ Currently, only a little over half of schools across the country have drinking fountains or dispensers widely available, with availability differing by race, ethnicity, census region, and the fountain-to-student ratio specified in plumbing codes.⁵⁰

Provision of filtered, cooled drinking water in school cafeterias, coupled with education and active promotion, may be an effective way to increase students' water intake.⁵¹ This can be accomplished by providing fountains with cooled and filtered water, offering free refillable water bottles, providing cups near drinking water sources, and through encouraging students to fill them each morning, and teaching

lessons focused on water sources^{52,53} Free access to water bottles or cups, in particular, has been associated with a significantly higher total fluid intake in children.⁵⁴ Furthermore, the average volume of water consumed by students each day appears to be greater in schools that provide *and* promote water.⁵⁵

To date, the education and promotion of water has not been proven to affect the consumption of sugar-sweetened beverages in schools.^{56,57} However, research does show that replacing caloric beverages with non-caloric ones, such as water, results in average weight losses of 2% to 2.5%,⁵⁸ and could cut up to 235 calories per day from the average American child's diet.⁵⁹ Efforts must be made to increase access and quality of water in schools, along with rigorous evaluations on consumption. To effectively shift student preferences from sugary beverages to water, schools need to address the full offerings of beverages on the school's campus, and promote and advertise water over sugar-sweetened beverages.

Early care and education (ECE) and afterschool programs can also play a significant role in helping children drink more water. Children spend a substantial amount of time outside of the school setting with millions participating in structured Out-of-School Time (OST) programs on a regular basis.⁶⁰ Nationwide, more than 8 million children and adolescents spend an average of eight hours a week in afterschool programs alone.⁶¹ In 2011, the National Afterschool Association adopted the first comprehensive standards for healthy eating and physical activity (HEPA) for OST programs.⁶² These standards encourage OST programs to offer water with snacks, and make water accessible to participants at all times. The Child and Adult Care Food Program (CACFP) standards proposed by the USDA also promote water access in early care and education programs, requiring potable water to be made available to children throughout the day and during meal times.⁶³ A learning collaborative in Boston focused on increasing healthy eating, drinking, and physical activity opportunities during afterschool time established water delivery systems to ensure children received water during snack time. The program led to an increased average volume of water served and an average decrease of 60 calories from beverages served.⁶⁴

Water Access in Public Spaces

Access to free, potable water in public places, especially those where people are most active, such as parks, playgrounds, and recreation centers, can play an equally important role in encouraging water intake among children and adults. A study that looked at accessibility of water fountains in parks and playgrounds found that of the 54.7% participants who reported using parks or playgrounds, only 55% reported having access to water fountains.⁶⁵ There is also a prevalence of adults who believe that their local tap water is unsafe to drink, favoring bottled water instead, and are more likely to report a lower intake of plain water. Mistrust of tap water is most prevalent among young adults, people of color, and participants with lower income and less education.⁶⁶

Studies of water access and consumption in public places are limited, and more research and policy evaluation is needed. The California Endowment's *Agua4All* pilot project is one current effort focusing on water access at the community level. By installing water dispensers in schools and other public places in rural areas of California, this campaign aims to increase public access to, and consumption of, safe potable drinking water. If successful upon evaluation, the project plans to expand across rural California.⁶⁷ To address some of the gaps in access to water in public places, the American Planning Association, with funding from the Centers for Disease Control and Prevention, published a report identifying how local governments can use comprehensive planning, municipal codes, and directed initiatives to address access to free, potable water within their communities.⁶⁸ Report recommendations included providing promotional language near water sources, enforcement measures to ensure

cleanliness and maintenance, and educational campaigns to address the challenge of the public's perception of water safety.

Water Taxation and Other Strategies to Encourage Water Consumption

Removing disincentives to purchasing drinking water, such as pricing it below sugar-sweetened beverages or labeling at point of purchase, are other strategies to encourage water intake. Seventeen states and the District of Columbia (D.C.) impose a sales tax on bottled drinking water sold in food stores, and 34 states and D.C. apply sales taxes to bottled water sold in vending machines.⁶⁹ For bottled water sold in food stores, the average tax in taxing states is 3.949% compared to a 1.316% tax across all states while the average tax on bottled water sold in vending machines in taxing states is 5.035% compared to a 3.356% tax across all states. In four states the sales tax on bottled water sold in food stores is higher than the state sales taxes applied to food products generally, and in 22 states the sales tax on bottled water sold in vending machines is higher than the state sales tax applied to food products generally.⁷⁰ Some efforts have been made to remove the taxes on bottled water in order to make it more affordable for consumers, as well as more competitively priced with sugar-sweetened beverages. A few small studies have compared prices for bottled water and sugar-sweetened beverages at point-of-purchase in select markets, but more research and evaluation is needed to determine price differentials at the county, state, and national level.

Few studies have examined the impact of taxation on bottled water. One cross-sectional study used data of retailer purchases to measure the effects of a bottled water tax, and later the tax's removal, and found that when a tax was imposed on bottled water, sales dropped by 6.4%. However, when the tax was later removed, the sales did not increase, remaining 3.6% lower than at baseline.⁷¹ More research and policy evaluation is needed to determine the potential effectiveness of removing taxes on consumer purchasing behavior and water intake levels.

Point of purchase interventions have found encouraging results in changing what people drink over a two year period, suggesting that food environment interventions can promote long-term changes in population eating and drinking behaviors. A large hospital cafeteria-based study analyzed sales for all customers, and a longitudinal cohort of hospital employees. A traffic-light labeling invention was implemented whereby cafeteria items were labeled green (healthy), yellow (less healthy), or red (unhealthy). Changes in 12- and 24-month sales were compared to baseline for all transactions, and found that beverages labeled red decreased from 26% to 17% at 24 months, and green beverages increased from 52% to 60%.⁷² Additional behavior economics research and evaluation is needed to determine other approaches to sway decision making towards healthier options at point of purchase.

While removing disincentives or encouraging the purchase of bottled water could make water more accessible and affordable, they may also have unintended consequences including a negative environmental impact from greater use of disposable plastic bottles which generate large volumes of plastic waste. Additionally, the water and fossil fuels used to produce the bottles can be costly, leading to higher prices on bottled water compared to tap water.⁷³ Some of these concerns, however, can be addressed by promoting access to, and use of, drinking fountains and tap water in place of bottled water. Communities could provide free access to water fountains, making sure they are clean and in working order. Another way to reduce the environmental impact, and encourage recycling, may be for states to apply a redemption fee on bottle purchases that could be refunded when consumers recycle bottles at designated centers in their jurisdiction.⁷⁴

One University took another approach, and banned bottled water in an effort to reduce the number of plastic bottles entering the waste stream. Researchers evaluating the effort found that the ban did not reduce the number of plastic bottles shipped to the University. In fact, the per capita number of bottles increased after the ban. Furthermore the consumption of sugary drinks, calories, and added sugars increased substantially after the ban. Researchers concluded that bottled water bans should be approached cautiously and should be accompanied by a robust campaign to increase the use of tap water.⁷⁵

Specific Policy Recommendations

A key priority for the American Heart Association to improve cardiovascular health is to encourage the U.S. population to replace their sugar-sweetened beverage consumption with healthier beverage choices like water.

- Schools and districts must comply with provisions under USDA's Healthy Hunger-Free Kids Act (HHFKA) that require free, potable water be provided in the cafeteria during breakfast and lunch.
- Schools should also go beyond HHFKA by ensuring that drinking water is truly accessible to students throughout the school day and after school; schools should implement evidence-based strategies for promoting water to students, such as providing cups near water sources; installing bottle fillers; or providing chilled water. State school nutrition regulations may be a key policy mechanism for implementing these water promotion activities. Public funding to support these efforts should be considered.
- Local School Wellness policies should include policies to provide water, along with implementation guidance, in order to support schools in meeting HHFKA and beyond.
- On school grounds where advertising exists, schools should promote water, not sugar-sweetened beverages.
- States should review school building standards to ensure that drinking water access is provided in all spaces where children are physical active, including gymnasiums, playgrounds, and sports practice fields.
- In order to increase access to free potable water in public spaces, State Departments of Health or other appropriate State agencies should assure that water stations/fountains are placed in highly-used public places, that they are maintained and that water at the tap is tested annually for cleanliness and safety at schools, libraries, playing fields and parks, and at other government locations at the city, county, state, and special districts level. Results should be publicized and posted near water fountains and other water access points.
- Policies that incentivize water consumption while discouraging the consumption of sugar-sweetened beverages through taxation and subsidies, labeling (including at point of purchase), and other policies should be supported in order to make water the less expensive and preferable choice.

Conclusion

The American Heart Association supports additional research and policy approaches to determine the impact of these water access and quality strategies on consumption trends, public health, and the alternative choices children in schools and consumers would make if they replace their sugar-sweetened beverages. The AHA prioritizes robust evaluation as part of any access, quality, or tax measures that are passed. The AHA will continue to be a resource to policy makers on nutrition science and policy

implementation. Finally, the AHA advocates for broader nutrition policy efforts that make healthy foods more affordable and accessible to all consumers and bring food pricing and subsidies in line with federal dietary guidelines and AHA nutrition recommendations.

References

- ¹ Centers for Disease Control and Prevention. National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey Data. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011-2012
- ² Skinner AC and Skelton JA. Prevalence and Trends in Obesity and Severe Obesity Among Children in the United States, 1999-2012. *JAMA Pediatrics*; doi:10.1001/jamapediatrics.2014.21. Published online April 7, 2014.
- ³ Jequier E, Constant F. Water as an essential nutrient: the physiological basis of hydration. *European J Clinical Nutr.* 2010. 64: 115-123.
- ⁴ Patel AI, Hampton KE. Encouraging Consumption of Water in School and Child Care Settings: Access, Challenges, and Strategies for Improvement. *American Journal of Public Health.* 2011; 101(8):1370-1379.
- ⁵ Popkin BM, D'Anci KE, Rosenberg IH. Water, hydration, and health. *Nutrition Reviews* 68.8 (2010): 439-458.
- ⁶ Muckelbauer R, Libuda L, Clausen K, et al. Promotion and Provision of Drinking Water in Schools for Overweight Prevention: Randomized, Controlled Cluster Trial. *Pediatrics* 123.4 (2009): e661-e667.
- ⁷ James J, Thomas P, Cavan D, Kerr D. Preventing childhood obesity by reducing consumption of carbonated drinks: cluster randomised controlled trial. *BMJ* 328.7450 (2004): 1237.
- ⁸ Popkin BM, D'Anci KE, Rosenberg IH. Water, hydration, and health. *Nutr Rev.* 2010;68(8):439-458.
- ⁹ Popkin BM, D'Anci KE, Rosenberg IH. Water, hydration, and health. *Nutr Rev.* 2010;68(8):439-458.
- ¹⁰ Edmonds CJ and Jeffes B. Does having a drink help you think? 6-7-Year-old children show improvements in cognitive performance from baseline to test after having a drink of water. *Appetite* 53.3 (2009): 469-472.
- ¹¹ D'Anci KE, Constant F and Rosenberg IH. Hydration and cognitive function in children. *Nutrition Reviews* 64.10 Pt. 1 (2006): 457-464.
- ¹² Benton D and Burgess N. The effect of the consumption of water on the memory and attention of children. *Appetite*, 53.1 (2009): 143-146.
- ¹³ U.S. Department of Agriculture, Center for Nutrition Policy and Promotion. Report of the dietary guidelines advisory committee on the dietary guidelines for Americans. 2010.
http://www.cnpp.usda.gov/sites/default/files/dietary_guidelines_for_americans/PolicyDoc.pdf.
- ¹⁴ Institute of Medicine. *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate*. Washington, DC: The National Academies, 2004.
- ¹⁵ Popkin BM, D'Anci KE, Rosenberg IH. Water, hydration, and health. *Nutr Rev.* 2010;68(8):439-458.
- ¹⁶ Centers for Disease Control and Prevention. Beverage consumption among high school students ---United States, 2010. *MMWR Morb Mortal Wkly Rep.* 2013;60(23):778-780.
- ¹⁷ Kenney EL, Long MW, Cradock AL, Gortmaker SL. Prevalence of inadequate hydration among U.S. children and disparities by gender and race/ethnicity: National Health and Nutrition Examination Survey, 2009-2010. *Am J Public Health* 2015, published online ahead of print June 11, 2015: e1-e6.
- ¹⁸ Kenney EL, Long MW, Cradock AL, Gortmaker SL. Prevalence of inadequate hydration among U.S. children and disparities by gender and race/ethnicity: National Health and Nutrition Examination Survey, 2009-2010. *Am J Public Health* 2015, published online ahead of print June 11, 2015: e1-e6.
- ¹⁹ Drewnowski A, Rehm CD, Constant F. Water and beverage consumption among children age 4-13y in the United States: analyses of 2005 -2010 NHANES dataset. *Nutrition Journal.* 2013;12(85).
- ²⁰ Drewnowski A, Rehm CD, Constant F. Water and beverage consumption among children age 4-13y in the United States: analyses of 2005 -2010 NHANES dataset. *Nutrition Journal.* 2013;12(85).
- ²¹ Institute of Medicine. *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate*. Washington, DC: The National Academies, 2004.
- ²² Drewnowski, A, Rehm CD, Constant F. Water and beverage consumption among adults in the United States: cross-sectional study using data from NHANES 2005- 2010. *BMC Public Health*, Vol.13(1):1068.
- ²³ U.S. Environmental Protection Agency. Safe Drinking Water Act.
<http://water.epa.gov/lawsregs/guidance/sdwa/index.cfm>

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- ²⁴ Popkin BM, D'Anci KE, Rosenberg IH. Water, hydration, and health. *Nutrition Reviews* 68.8 (2010): 439-458.
- ²⁵ "Water Access in Schools." *Adolescent and School Health: Nutrition, Physical Activity, & Obesity*. Centers for Disease Control and Prevention, 1 Jul. 2013. Web. <<http://www.cdc.gov/healthyyouth/npao/wateraccess.htm>>.
- ²⁶ Guinhouya BC, et al. How school time physical activity is the "big one" for daily activity among schoolchildren: a semi-experimental approach. *J Phys Act Health*, 6(4):510-519, 2009.
- ²⁷ Patel AI and Hampton KE. Encouraging Consumption of Water in School and Child Care Settings: Access, Challenges, and Strategies for Improvement. *American Journal of Public Health* 101.8 (2011): 1370-1379.
- ²⁸ NPLAN. *Drinking Water Access in Schools*. Public Health Law and Policy, October 2011. Available at: <http://changelabsolutions.org/publications/drinking-water-access-schools>.
- ²⁹ Healthy, Hunger-Free Kids Act of 2010, Pub. L. No. 111-296 § 204, 124 Stat. 3183 (2010).
- ³⁰ Local School Wellness Policy Implementation Under the Healthy, Hunger-Free Kids Act of 2010, 79 7 CFR Parts 210 and 220 et seq. (2014). Print.
- ³¹ Patel AI, Hecht K, Hampton KE, Grumbach JM, Braff-Guajardo E, Brindis CD. Tapping Into Water: Key Considerations for Achieving Excellence in School Drinking Water Access. *American Journal of Public Health*. 2014; 104(7): 1314-1319
- ³² Patel AI, Chandran K, Hampton KE, Hecht K, Grumbach JM, Kimura AT, et al. Observations of Drinking Water Access in School Food Service Areas Before Implementation of Federal and State School Water Policy, California, 2011. *Prev Chronic Dis*. 2012; 9:110315.
- ³³ Patel AI, Hecht K, Hampton KE, Grumbach JM, Braff-Guajardo E, Brindis CD. Tapping Into Water: Key Considerations for Achieving Excellence in School Drinking Water Access. *American Journal of Public Health*. 2014; 104(7): 1314-1319.
- ³⁴ Patel AI, Hecht K, Hampton KE, Grumbach JM, Braff-Guajardo E, Brindis CD. Tapping Into Water: Key Considerations for Achieving Excellence in School Drinking Water Access. *American Journal of Public Health*. 2014; 104(7): 1314-1319.
- ³⁵ Patel AI, Chandran K, Hampton KE, Hecht K, Grumbach JM, Kimura AT, et al. Observations of Drinking Water Access in School Food Service Areas Before Implementation of Federal and State School Water Policy, California, 2011. *Prev Chronic Dis*. 2012; 9:110315.
- ³⁶ Patel AI and Hampton KE. Encouraging Consumption of Water in School and Child Care Settings: Access, Challenges, and Strategies for Improvement. *American Journal of Public Health* 101.8 (2011): 1370-1379.
- ³⁷ Patel AI and Hampton KE. Encouraging Consumption of Water in School and Child Care Settings: Access, Challenges, and Strategies for Improvement. *American Journal of Public Health* 101.8 (2011): 1370-1379.
- ³⁸ Patel AI and Hampton KE. Encouraging Consumption of Water in School and Child Care Settings: Access, Challenges, and Strategies for Improvement. *American Journal of Public Health* 101.8 (2011): 1370-1379.
- ³⁹ Patel AI and Hampton KE. Encouraging Consumption of Water in School and Child Care Settings: Access, Challenges, and Strategies for Improvement. *American Journal of Public Health* 101.8 (2011): 1370-1379.
- ⁴⁰ *2000 California 305(b) Report on Water Quality*, State Water Resources Control Board (Oct. 2000).
- ⁴¹ Patel AI, MD, Bogart LM, Uyeda KE, Rabin A, Schuster MA. Perceptions About Availability and Adequacy of Drinking Water in a Large California School District. *Prev Chronic Dis* 2010;7(2):A39.
- ⁴² Loughridge JL, Barratt J. Does the provision of cooled filtered water in secondary school cafeterias increase water drinking and decrease the purchase of soft drinks? *J Hum Nutr Diet*. 2005; 18(4):281-6.
- ⁴³ Onufrak SJ, Park S, Sharkey JR, Merlo C, Dean WR, Sherry B. Perceptions of tap water and school water fountains and association with intake of plain water and sugar-sweetened beverages. *J School Health*. 2014; 84(3): 195-204.
- ⁴⁴ Patel AI, Chandran K, Hampton KE, Hecht K, Grumbach JM, Kimura AT, et al. Observations of Drinking Water Access in School Food Service Areas Before Implementation of Federal and State School Water Policy, California, 2011. *Prev Chronic Dis*. 2012; 9:110315.
- ⁴⁵ Onufrak SJ, Park S, Sharkey JR, Merlo C, Dean WR, Sherry B. Perceptions of tap water and school water fountains and association with intake of plain water and sugar-sweetened beverages. *J School Health*. 2014; 84(3): 195-204.
- ⁴⁶ Hood NE, Turner L, Colabianchi N, Chaloupka FJ, Johnston LD, Availability of Drinking Water in US Public School Cafeterias. *Journal of the Academy of Nutrition and Dietetics*. 2014; 114(9):1389-1395.

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- ⁴⁷ Craddock AL, Wilking CL, Olliges SA, Gortmaker SL. Getting Back on Tap: The Policy Context and Cost of Ensuring Access to Low-Cost Drinking Water in Massachusetts Schools. *American Journal of Preventive Medicine*. 2012;43(3): S95-S101.
- ⁴⁸ Horswill, CA, Janas, LM. Hydration and health (2011) *Am J Lifestyle Med*. July/August 2011; 5(4): 304-315.
- ⁴⁹ Hood NE, Turner L, Colabianchi N, Chaloupka FJ, Johnston LD, Availability of Drinking Water in US Public School Cafeterias. *Journal of the Academy of Nutrition and Dietetics*. 2014; 114(9):1389-1395.
- ⁵⁰ Onufrak SJ, Park S, Wilking C. Student-Reported School Drinking Fountain Availability by Youth Characteristics and State Plumbing Codes. *Prev Chronic Dis*. 2014;11:130314.
- ⁵¹ Patel AI, Bogart LM, Elliott MN, Lamb S, Uyeda KE, Hawes-Dawson J, Klein DJ, Schuster MA. Increasing the availability and consumption of drinking water in middle schools: a pilot study. *Prev Chronic Dis*. 2011;8(3):A60.
- ⁵² Muckelbauer R, Libuda L, Clausen K, Toschke AM, Reinehr T, Kersting M. Promotion and provision of drinking water in schools for overweight prevention: randomized, controlled cluster trial. *Pediatrics*. 2009;123(4):e661-7.
- ⁵³ Kaushik A, Mullee MA, Bryant TN, Hill CM. A study of the association between children's access to drinking water in primary schools and their fluid intake: can water be 'cool' in school? *Child: Care, Health and Development*. 2007; 33(4): 409-15.
- ⁵⁴ Kaushik A, Mullee MA, Bryant TN, Hill CM. A study of the association between children's access to drinking water in primary schools and their fluid intake: can water be 'cool' in school? *Child: Care, Health and Development*. 2007; 33(4): 409-15.
- ⁵⁵ Loughridge JL, Barratt J. Does the provision of cooled filtered water in secondary school cafeterias increase water drinking and decrease the purchase of soft drinks? *J Hum Nutr Diet*. 2005; 18(4):281-6.
- ⁵⁶ Muckelbauer R, Libuda L, Clausen K, Toschke AM, Reinehr T, Kersting M. Promotion and provision of drinking water in schools for overweight prevention: randomized, controlled cluster trial. *Pediatrics*. 2009;123(4):e661-7.
- ⁵⁷ Patel AI, Bogart LM, Elliott MN, Lamb S, Uyeda KE, Hawes-Dawson J, Klein DJ, Schuster MA. Increasing the availability and consumption of drinking water in middle schools: a pilot study. *Prev Chronic Dis*. 2011;8(3):A60.
- ⁵⁸ Tate, DF. *Replacing caloric beverages with water or diet beverages for weight loss in adults: main results of the Choose Healthy Options Consciously Everyday (CHOICE) randomized clinical trial*. American Journal of Clinical Nutrition, 2012.
- ⁵⁹ Y. Claire Wang et al., *Impact of Change in Sweetened Caloric Beverage Consumption on Energy Intake Among Children and Adolescents*, 163 Arch. Pediatric Adolescent Med. 336, 336 (2009).
- ⁶⁰ Wimer C, Bouffard SM, Caronongan P, et al. What are kids getting into these days? Demographic differences in youth out-of-school-time participation. Cambridge, MA: Harvard Family Research Project, Harvard University; 2006.
- ⁶¹ America After 3 PM. America After 3 PM: A Household Survey on Afterschool in America. 2009.
- ⁶² Wiecha JL, Hall G, Gannett E, Roth B. National AfterSchool Association Standards for Healthy Eating and Physical Activity. 2011. <http://www.niost.org/Standards-and-Guidelines/national-afterschool-association-standards-for-healthy-eating-and-physical-activity-in-out-of-school-time-programs>.
- ⁶³ Child and Adult Care Food Program: Meal Pattern Revisions Related to the Healthy, Hunger-Free Kids Act of 2010, 80 CFR Parts 210, 215, 220, and 226. (2015). Print.
- ⁶⁴ Giles CM, Kenney EL, Gortmaker SL, Lee RM, Thayer JC, Mont-Ferguson H, Craddock AL. Increasing Water Availability During Afterschool Snack: Evidence, Strategies, and Partnerships from a Group Randomized Trial. *American Journal of Preventive Medicine*. 2012; 43(3): S136-S142.
- ⁶⁵ Park S, Sherry B, Wethington H, Pan L. Use of parks or playgrounds: reported access to drinking water fountains among US adults, 2009. *Journal of Public Health* 2011;34(1):65-72.
- ⁶⁶ Onufrak SJ, Park S, Sharkey JR, Sherry B. The relationship of perceptions of tap water safety with intake of sugar-sweetened beverages and plain water among US adults. *Public Health Nutr*. 2014;17(1): 179-85.
- ⁶⁷ Agua4All. Rural Community Assistance Corporation, Community Water Center and Pueblo Unido CDC. 2015. <http://www.rcac.org/agua4all>
- ⁶⁸ Kushner N. Quenching Community Thirst: Planning for more access to drinking water in public places. American Planning Association. November 2013.

⁶⁹ Chriqui JF, Eidson SS, Chaloupka FJ. State Sales Taxes on Bottled Water (as of January 1, 2014). Bridging the Gap Fact Sheet. Chicago, IL: Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago; 2014.

⁷⁰ Chriqui JF, Eidson SS, Chaloupka FJ. State Sales Taxes on Bottled Water (as of January 1, 2014). Bridging the Gap Fact Sheet. Chicago, IL: Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago; 2014.

⁷¹ Berck P, Lange JM et al. Measuring Consumer Responses to a Bottled Water Tax Policy. *University of California-Berkeley*. Published November 27, 2013. Accessed December 22, 2014.

⁷² Thorndike, Anne N. et al. Traffic-Light Labels and Choice Architecture. *American Journal of Preventive Medicine*, Volume 46, Issue 2, 143 – 149.

⁷³ Public Health Law Center. Thirsty for Health: Tap Water and Healthcare. March 2013. Available at: http://publichealthlawcenter.org/sites/default/files/resources/phlc-fs-Healthy%20Bevs_Thirsty%20for%20Health%20June%202013.pdf.

⁷⁴ NPLAN. Every Drop Counts: Promoting Health by Removing a Tax on Bottled Water. September 2014. Available at: http://changelabsolutions.org/sites/default/files/Every_Drop_Counts_FINAL_20140905.pdf.

⁷⁵ Berman ER, Johnson RK. The Unintended Consequences of Changes in Beverage Options and the Removal of Bottled Water on a University Campus. *Am J of Public Health*. 2015: e1–e5. doi:10.2105/AJPH.2015.302593.