
Harnessing the Public Health Power of Model Codes to Increase Drinking Water Access in Schools and Childcare

Cara L. Wilking, Angie L. Cradock, and Steven L. Gortmaker

Introduction

Drinking water is an important health behavior to support overall child health. Research indicates that children are consuming too little water and too many sugary drinks.¹ Overconsumption of sugary drinks increases child risk for the epidemics of obesity and diet-related chronic diseases like type-II diabetes, stroke, and heart disease.² Increasing access to appealing, low-cost drinking water in schools and childcare where children spend much of their time supports efforts to reduce sugary drink consumption. Drinking water infrastructure is key to water access in childcare and schools. In 2012-2013, almost one-third of permanent U.S. school buildings had plumbing systems in fair or poor condition, and almost 40 percent had major renovations or repairs planned.³ Basic plumbing standards for new construction and major renovations or repairs are contained in state and local plumbing codes, and many of these codes are derived from model codes established by private organizations. This article describes the model code process and intervention points where the public health community can work to improve plumbing standards in school buildings and childcare centers.

Model Codes and Public Health

There is precedent for using model code revisions to address public health concerns. In the mid-1980s, ven-

tilation standards incorporated by reference in building codes across the U.S. implied, contrary to known scientific evidence, that second-hand smoke could be remedied by certain ventilation techniques.⁴ Over a period of years, public health advocates engaged in the model ventilation standards setting process to change these tobacco industry-friendly rules.⁵ Similar public health efforts may be useful to improve water access in schools.

Plumbing codes traditionally focused on acute threats of waterborne disease and contaminants. For example, the dangers of lead pipes have been known since the late 1800s, and local, state and model plumbing codes were revised to limit the use of lead pipes.⁶ Adequate access to drinking water in schools and childcare also depends upon the physical drinking water infrastructure. Currently, many schools have old pipes and fixtures that make it difficult to provide safe water that is easily accessible and appealing for students to drink.⁷ Water is a healthy, low-cost beverage alternative to sugary drinks. However, from 2005-2010 more than one-quarter (28%) of U.S. children aged 4-13 years old did not have a drink of plain water on two consecutive days.⁸

The Model Code Process and Current Standards

Plumbing codes regulate all of the elements that make up a building's plumbing system.⁹ Plumbing codes are truly a creature of local government because that is where they are implemented through the inspection and permitting process. In the 1940s, approximately 1,600 plumbing codes were in use in the United States.¹⁰ Since then, there has been a major shift to model codes, and the International Code Council (ICC) and the International Association of Plumbing

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and Mechanical Officials (IAPMO) are now the two primary model code organizations. The ICC's *International Plumbing Code* (IPC) has been either adopted statewide or by local governments in 36 states and 2 U.S. territories.¹¹ The IAPMO produces the *Uniform Plumbing Code* (UPC). California is a notable UPC adoptee.

The ICC and the IAPMO draft and revise their model codes using a committee system with final approval by a voting membership. The ICC publishes a revised code every three years and uses a government consensus model whereby one-third of voting members are government officials.¹² The process starts several years prior to the release of the revised code. Interested parties can submit proposed changes, testify if permitted, submit comments about proposed changes, and seek formal membership.

stand-in for drinking fountains in school buildings could reduce student access to free, plumbed drinking water.

State and Local Adoption of Model Codes

Model codes are adopted at the state and/or local level. State legislatures authorize an agency to establish a statewide plumbing code setting minimum standards. The agency can adopt a model plumbing code or draft its own. The agency then periodically adopts a newer version of the model code or revises its own code. Most states do not follow a model code in its entirety, but rather amend the code to suit the needs of the state.¹⁸ Plumbing codes are enacted and enforced at the local level pursuant to the authority vested in local governments by the state constitution, statutory grants of authority, and/or a city charter. Cities and counties use this authority to enact

The constitutional and procedural protections create intervention points for the public health community in the model plumbing code process. Intervention points include state-level revisions to a model code, local-level revisions to a statewide code, and the setting of school building standards. The public health community can work within these policymaking spheres to improve the plumbing code and to prevent the adoption of revisions that could reduce drinking water access.

The ICC and the UPC define drinking fountain density in terms of a required number of fixtures per building occupants. For primary and secondary school buildings and non-residential childcare, the 2012 IPC requires 1 drinking fountain per 100 occupants, and 50% of fountains required for these settings can be substituted by a water cooler or bottled water dispenser.¹³ For school buildings and non-residential childcare, the 2012 UPC requires 1 drinking fountain per 150 occupants.¹⁴ The inclusion of bottled water and other drinking fountain substitutes reflects a societal shift away from tap water to bottled water. The first version of the IPC published in 2000, allowed "bottled water coolers" to stand-in for 100% of required drinking fountains.¹⁵ Since 2003, the IPC has allowed no more than 50% of required drinking fountains to be substituted by water coolers or "bottled water dispensers."¹⁶ The ICC noted that the change was "necessary to prevent a situation of no drinking water should the bottle run dry or the bottled water service be discontinued."¹⁷ In contrast, the UPC does not reference bottled water. Allowing bottled water dispensers or vending machines to

and enforce plumbing codes that are at least as stringent as the statewide code. In states without a statewide code, local governments draft their own plumbing codes or adopt a model code and amend as necessary.

The state and local model code adoption and amendment process must comply with constitutional and procedural protections designed to allow for public comment, avoid vagueness, and guard against violations of the non-delegation doctrine.¹⁹ The wholesale adoption of model building and plumbing codes has been an exception to the general rule against adoption of "promulgations of private entities."²⁰ Incorporating model codes by reference into state and local law has been upheld against constitutional challenges so long as nothing in the law permits automatic incorporation of future revisions promulgated by a private entity.²¹ Thus, when a state or locality wants to adopt a revised version of a model code, it must go through the full procedural process.

School Building Construction and Repair Standards

School settings are a primary focus of the obesity prevention movement. Federal school nutrition poli-

cies reduce exposure to unhealthy foods and beverages and require water provision during meals. These policies are designed to reduce chronic diseases like type-II diabetes, stroke, and heart disease. Drinking fountains remain the primary source of plain drinking water in schools. Whether a local plumbing code is enforceable against a school district by local authorities varies from state to state.

School districts are independent entities authorized by the state. In general, in states where there is no delegation of authority over school construction standards to a state agency like a state architect or department of education, the local plumbing code will apply to school construction and repair.²² Many state legislatures, however, confer local authority to regulate building construction, and also authorize state school authorities to “establish reasonable standards for schoolhouse construction....”²³ This grant of authority is typically accompanied by a delegation of authority to an existing agency, or a statute establishing a state agency to set standards for and oversee construction and major repair of school buildings.²⁴ When these factors are present, the local plumbing code is not enforceable against school buildings as it would be for other buildings. Model codes and state and local plumbing codes do, however, still impact school building construction and repair in these jurisdictions, because the statewide plumbing code can be incorporated by reference into the school building standard.

Intervention Points for Public Health

The constitutional and procedural protections outlined above create intervention points for the public health community in the model plumbing code process. Intervention points include state-level revisions to a model code, local-level revisions to a statewide code, and the setting of school building standards. The public health community can work within these policymaking spheres to improve the plumbing code and to prevent the adoption of revisions that could reduce drinking water access.

Current drinking fountain standards should be updated to support water during mealtimes in schools and childcare, and other efforts to reduce sugary drink consumption. A starting point is to determine whether the current ratios of fountains to students are adequate and revise to optimal levels. Standards also should: specify childcare centers with a focus on service sinks to meet the needs of young children who are learning to drink from cups; specify placement of drinking water delivery devices in school cafeterias in adequate numbers to service large numbers of children during meal service; clarify permissible use of

bottle-fillers to modernize traditional drinking fountains; and remove provisions allowing bottled water to substitute for plumbed fountains.

Conclusion

Excellent access to healthy, low-cost drinking water in schools and childcare depends upon the physical drinking water infrastructure. Major renovation, repair, and new construction of these community assets can seem incredibly slow and greatly limited by budgetary constraints. Working to improve the policy framework for drinking water infrastructure is an investment the public health community can make now to ensure that future infrastructure improvements yield optimal drinking water access to support child health.

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