

## Improve Water Quality in Rural Immigrant Communities

By Caitlin French, Lucia Kaiser, Rosa Gomez-Camacho, UC Davis; Cathi Lamp, University of California Cooperative Extension; and Adela de la Torre, UC Davis

### Key Facts

Many water systems serving low-income immigrant communities in agricultural areas may have drinking water contamination levels above federal and international guidelines.

Research has shown that a negative perception about the safety of tap water, especially among Latino populations, is associated with higher consumption of sugar-sweetened beverages (SSBs).

Funding improvements to rural water systems and accessibly communicating the results to all community members would improve the lives of these underserved populations.

With obesity affecting over a third of the U.S. population,<sup>1</sup> public health advocates—including first lady Michelle Obama—have called to “drink up” on water instead of sugary beverages. In new work, supported by the Center for Poverty Research, we find that low-quality drinking water is a potential barrier to reducing the consumption of sugar-sweetened beverages in high-poverty rural immigrant communities.

The prevalence of obesity and Type 2 diabetes in California is higher among low-income minority populations than white affluent populations. A combination of environmental factors, including a lack of access to healthy foods and nutrition education<sup>2</sup>—and safe drinking water—likely contribute to these disparities.

Decreasing sugar-sweetened beverage (SSB) consumption is key to preventing obesity and nutrition-related chronic disease. However, perceptions of unsafe tap water, especially among Latinos, are associated with higher SSB consumption.<sup>3</sup>

To understand these challenges in agricultural immigrant communities, we are investigating the health of participants in the Niños Sanos, Familia Sana (Healthy Children, Healthy Family) program, as well as the water systems serving them.

### Underserved Rural Communities

We examined child health in two low-income rural towns in California’s Central Valley. These communities represent a population of Latino agricultural workers who have been historically underserved. The program, a partnership between UC Davis and these towns, targets Mexican-origin children ages 3-8 and their families to integrate nutrition, physical activity, economic and art interventions to create healthier communities.

We identified public water systems in these communities with the California Department of

Public Health (CDPH) Drinking Water Systems Geographic Reporting Tool. We assessed water quality by the frequency of violations reported by EPA EnviroFacts, and contaminant-level data from the CDPH Water Quality Monitoring Database. Interviews with 27 mothers in the study determined tap water use and perceptions of water quality.

Obesity among children 3-8 years (n=599) in these households was 28 percent. By comparison, the national obesity rate for children ages 2-5 was 8.4 percent, and for ages 6-11 was 17.7 percent.<sup>4</sup>

Based on parent reporting, at least 38.5 percent of children aged 3-8 years drank SSBs<sup>5</sup> more than 2-3 times per week. These children may drink SSBs so frequently in part because of a real or perceived lack of safe drinking water.

### Contaminants in Drinking Water

Two state-regulated water systems serve the majority of people in these communities. The remaining rely on at least 11 small public or private water systems, which may be regulated directly by the state, locally by county regulators, or may lack any regulation at all. Most of the current water quality problems affect these smaller systems.

Each of these 13 systems has had monitoring violations in the last 12 years. Two have had reporting violations, indicating that they either did not test for contaminants or did not report and plain water among US adults.” *Public Health Nutrition*. 2014: 17(1), 179-185.

<sup>4</sup> Ogden, CL, MD Carroll, et. al. “Prevalence of Obesity in the United States.” *JAMA*. 2014: 312(2):189-190.

<sup>5</sup> SSB included soda and other bottled sugar-sweetened beverages, but excluded homemade drinks.

<sup>1</sup> Centers for Disease Control and Prevention.

<sup>2</sup> Diamant, AL, SH Babey, et. al. “Diabetes and Obesity: Two Growing Epidemics in California.” UCLA Center for Health Policy Research, 2010.

<sup>3</sup> S.J. Onufrak, Park, S., et. al. “The relationship of perceptions of tap water safety with intake of sugar-sweetened beverages

# Understanding poverty, shaping the future of poverty research

findings to those they serve.

The Environmental Protection Agency (EPA) sets primary Maximum Contaminant Levels (MCLs) for contaminants considered to be health risks, and secondary non-mandatory MCLs for contaminants affecting taste, color and smell.

Primary MCLs pose real health risks. At very high exposures, arsenic causes serious effects—including skin lesions, cancer, and blindness—but the effects of chronic low-level exposure may include heightened risk for type 2 diabetes. Disinfectants, such as chlorine, remove bacteria, but harmful byproducts sometimes result.

## Perceptions of Unsafe Water

All 27 mothers interviewed reported avoiding drinking tap water, citing its unpleasant taste, dirty or yellow appearance, excessive iron and/or general contamination. These comments are

water from alternative sources and also cannot improve and maintain their water treatment systems. Increased state funds to agencies already working to identify who is at risk would bring more small water systems into compliance.

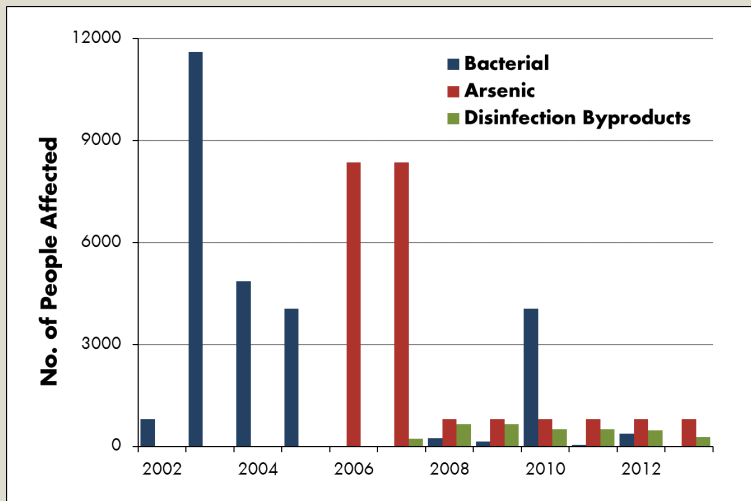
To improve information about unregulated systems, subsidies for home water filters and/or testing costs could be offered to private well owners in exchange for testing reports. In addition, outreach efforts should be expanded to target private systems in known problem areas, especially those that are severely disadvantaged.

Removing primary contaminants may not matter if perceptions and drinkability are not improved. Reduced secondary contaminants could increase confidence in the public water supply.

These improvements must also be clearly communicated. A simple step could be to require water system operators to send clear water quality

“Funding improvements to rural water systems and accessibly communicating the results to all community members would improve the lives of these underserved populations.”

## Number in the Study Area Affected by Reported Water Contaminant Violations



This figure shows primary MCL violations for major contaminants in these communities and the number of people affected over the last 12 years. These data indicate past and present issues of water contamination, with most of the current problems affecting smaller systems.

consistent with high mineral content in samples from the largest water system serving this community. These minerals—manganese and iron—are considered secondary contaminants and do not have enforceable limits set by the EPA.

Apart from contributing to negative perceptions, the World Health Organization (WHO) has set health benchmarks for manganese that these samples exceeded. The neurotoxic effects of manganese and arsenic at chronic low-level exposures warrant further investigation.

Most of these women reported relying instead on purchased and, to a lesser extent, home-filtered water for drinking and cooking. This additional cost represents an extra burden.

## Rethinking Water Issues

Safe tap water should be assured for all communities. Disadvantaged communities, like those in this study, have limited means to purchase

reports not only to property owners, who currently receive them, but also to renters in their preferred language to provide clear and interpretable information to affected residents. Social marketing campaigns would also create greater awareness of these issues and strategies to improve water safety.

*Caitlin French* is a Ph.D. student in Nutritional Biology at UC Davis.

*Lucia Kaiser* is a Cooperative Extension nutrition specialist and registered dietitian. She earned her M.S. and Ph.D. in the Department of Nutrition at UC Davis.

*Rosa Gomez-Camacho* is a post-doctoral fellow at the Center for Transnational Health at UC Davis.

*Cathi Lamp* is a nutrition advisor in Tulare and Kings Counties who works on community solutions to improve nutrition in low-income families.

*Adela de la Torre*, an agricultural economist, is a professor in Chicana/o Studies and director of the Center for Transnational Health at UC Davis.

## About the Center

The Center for Poverty Research at UC Davis is one of three federally designated National Poverty Centers whose mission is to facilitate non-partisan academic research on poverty in the U.S., to disseminate this research, and to train the next generation of poverty scholars. Our research agenda spans four themed areas of focus:

- Labor Markets and Poverty
- Children and the Intergenerational Transmission of Poverty
- The Non-traditional Safety Net, focusing on health and education
- The Relationship Between Poverty and Immigration

For more information, visit us online at:

[poverty.ucdavis.edu](http://poverty.ucdavis.edu)

Center for Poverty Research  
University of California, Davis  
1 Shields Ave | Davis, CA 95616  
(530) 752-0401