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*Feature Article***Many Poor Americans Are Not Getting Access to Clean Drinking Water, A Basic Human Right**

Keimer Raymond

Clean drinking water is vital to good health, and it is a basic human right. However, many poor communities in America do not have access to pollutant-free, clean water. The inability to access clean water increases the chances of developing health problems, of which the poor are already vulnerable and susceptible.¹ A recent report regarding the tap water lead contamination in Flint, Michigan, where more than 41 percent of its residents live below the poverty line, exposes the fact that not all Americans are getting access to clean drinking water.²

In theory, there are national drinking water regulations in place to prevent such travesties from happening. However, such regulations, set forth by the United States Environmental Protection Agency (EPA), permit the presence of *some* level of contaminants in drinking water.³ For example, the regulations permit water to be categorized as lead-free even though the water might not actually be lead-free.⁴

WHAT YOU SHOULD KNOW ABOUT THE NATIONAL PRIMARY AND SECONDARY DRINKING WATER STANDARDS

Two of the most notable drinking water regulations created by the EPA are the National Primary Drinking Water Regulations (NPDWR) and the National Secondary Drinking Water Regulations (NSDWR).⁵ The NPDWR categorizes primary contaminants as inorganic chemicals, organic chemicals, radionuclides and microorganisms; and designates maximum contaminant levels (MCL) and maximum contaminant level goals (MCLG). If either the

¹ Amy Vanderwarker, *Water and Environmental Justice*, in *A TWENTY-FIRST CENTURY U.S. WATER POLICY* 52-89 (Juliet Christian-Smith et al. eds., 2012), available at http://pacinst.org/wp-content/uploads/sites/21/2014/04/21st-century-water_environmental_justice_ch3.pdf.

² Michael Martinez, *Flint Michigan: Did Race and Poverty Factor Into Water Crisis?*, CNN, Jan. 28, 2016, <http://www.cnn.com/2016/01/26/us/flint-michigan-water-crisis-race-poverty/>.

³ *National Primary and Secondary Drinking Water Regulations*, HEALTH GOODS, http://www.healthgoods.com/EPA_Drinking_Water_Standards_s/393.htm (last visited May 20, 2016).

⁴ *Id.*

⁵ *Id.*

MCL or MCGL is exceeded in the water supply, they could pose health risks.⁶ Primary contaminants include legionella, total coliforms, total trihalomethanes (TTHMs), chlorine, lead, nitrites, and nitrates.⁷

To determine the MCL, the EPA “considers the impact the contaminant will have on human health and what is technologically and economically feasible for removal by the treatment facility.”⁸ The MCGL is non-enforceable among municipalities, but it establishes the level at which a contaminant poses no human health risks.⁹ The NPDWR are treatment technique guidelines (TT)—in place to “reduce the level of contaminants in drinking water.”¹⁰

Additionally, the NSDWR contains non-enforceable guidelines that set limits on what are known as secondary contaminants. If such contaminants are found in the water supply above certain levels, then they could cause water to look cloudy or colored and taste and smell unsavory.¹¹

The NSDWR is “established as a guideline to assist public water systems in managing their drinking water for aesthetic considerations.”¹² Because the NSDWR is non-enforceable, public water systems are not required to test for secondary contaminants (e.g., corrosivity, chloride, iron, manganese, color).¹³ The presence of secondary contaminants in drinking water can result in skin discoloration and pitting as well as tooth discoloration.¹⁴ According to the EPA, “these contaminants are not considered to present a risk to human health” when at or below the secondary maximum contaminant levels.¹⁵

THE SCIENCE BEHIND & PHYSICALLY ADVERSE HEALTH EFFECTS OF WATER CONTAMINATION ON POOR COMMUNITIES

Flint, Michigan (Flint) is an example of the blatant violation of the NPDWR. Since April 2014, Flint’s tap water has been contaminated with

⁶ *National Primary and Secondary Drinking Water Regulations*, HEALTH GOODS, http://www.healthgoods.com/EPA_Drinking_Water_Standards_s/393.htm (last visited May 20, 2016).

⁷ *Id.*

⁸ *Id.*

⁹ HEALTH GOODS, *supra* note 3.

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ HEALTH GOODS, *supra* note 3

lead.¹⁶ In an effort to cut costs for the city, Flint switched its drinking water source from Lake Huron to the Flint River and failed to add the necessary chemicals to reduce the water's corrosivity.¹⁷ As a result, the community was exposed to as much as 13,000 parts per billion (ppb) of lead,¹⁸ which is well above the EPA's permitted maximum of 15 ppb.¹⁹

The EPA considers 5,000 ppb as "toxic waste."²⁰ Since Flint exceeded that limit, it violated health and safety standards.²¹ Due to lead exposure, the Flint community faced extreme adverse health effects, including compromised brain development and damage to children and fetuses' nervous systems.²² The lead contamination particularly affected over 8,500 Flint children under the age of six—a population that is more susceptible to lead poisoning than adults.²³

The switch also contributed to the death of twelve people who suffered from Legionnaire's disease—a type of pneumonia that stems from the legionella, a naturally occurring bacteria in water that multiplies in heating systems.^{24, 25} To add insult to injury, the lead exposure could lead to future adverse health effects in the Flint community; including the possibility of cardiovascular problems as well as kidney damage and memory problems.²⁶

Currently, many parts of Flint have lead and iron pipes that are highly corrosive to Flint River water.²⁷ Additionally, Flint water contains high concentrations of chloride that cause lead pipe corrosion.²⁸ It is possible that Flint city water officials were not concerned with the high chloride concentrations at any point leading up to the media exposure on the crisis because chloride is a

¹⁶ Jessica Durando, *How Water Crisis In Flint, Michigan, Became Federal State of Emergency*, USA TODAY, Jan. 20, 2016, <http://www.usatoday.com/story/news/nation-now/2016/01/19/michigan-flint-water-contamination/78996052>.

¹⁷ Martinez, *supra* note 2.

¹⁸ Christopher Ingraham, *This is How Toxic Flint's Water Really is*, WASHINGTON POST, Jan. 15, 2016, <https://www.washingtonpost.com/news/wonk/wp/2016/01/15/this-is-how-toxic-flints-water-really-is>.

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

²² Durando, *supra* note 16.

²³ *Id.*

²⁴ Sarah Ganim, *Flint water official says he could have done things differently*, CNN, Apr. 21, 2016), <http://www.cnn.com/2016/04/21/us/mike-glasgow-flint-water/index.html>.

²⁵ HEALTH GOODS, *supra* note 3.

²⁶ Ingraham, *supra* note 18.

²⁷ Dr. Mark A. Edwards, *Why is it possible that Flint River water cannot be treated to meet Federal Standards?*, FLINT WATER STUDY UPDATES, Aug. 24, 2015, <http://flintwaterstudy.org/2015/08/why-is-it-possible-that-flint-river-water-cannot-be-treated-to-meet-federal-standards>.

²⁸ *Id.*

secondary contaminant that states and municipalities are not required to limit.²⁹ But according to the NSDWR, when chloride is present in the water above 250 mg/L it affects the tastes and color of the water.³⁰ Additionally, secondary contaminants like chloride can cause skin and tooth discoloration as well as pitting.³¹

Furthermore, the presence of chloride that contributes to lead pipe corrosion makes it increasingly difficult to cure the water through disinfection agents like chlorine—used to prevent the growth of microorganisms that cause disease—because when it is added to a water source such as Flint water, iron corrosion consumes it.³² That causes the chlorine to disappear from the water.³³ Once chlorine disappears, it is more likely that harmful organisms will multiply in the water source.³⁴ The disappearance of chlorine has damaged the Flint water distribution system.³⁵

Not only did the city exceed the permissible lead concentration limits, but also coliform and TTHMs were found in the water.³⁶ According to the NPDWR, the MCL for TTHMs is 0.10 mg/L.³⁷ At a level above 0.10 mg/L its impact on human health increases.³⁸ TTHMs are associated with liver, kidney, and central nervous system problems as well as increased risk of cancer.³⁹ Coliforms, on the other hand, are not a threat in and of themselves but can indicate the presence of “other potentially harmful bacteria in the water.”⁴⁰ High concentrations of coliforms can indicate the presence of fecal contamination in the water supply.⁴¹ Undoubtedly, the high presence of lead violated the NPDWR; the presence of TTHMs and coliform heightened the possibility of adverse health effects.

²⁹ NATIONAL PRIMARY AND SECONDARY DRINKING WATER REGULATIONS, *supra* note 3.

³⁰ *Id.*

³¹ *Id.*

³² Edwards, *supra* note 27.

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ Ni Zhu and Siddhartha Roy, *The Unintended Consequences of migrating to Flint River water*, FLINT WATER STUDY UPDATES, Aug. 23, 2015, <http://flintwaterstudy.org/2015/08/the-unintended-consequences-of-migrating-to-flint-river-water>.

³⁷ HEALTH GOODS, *supra* note 3.

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ Zhu and Roy, *supra* note 36.

THE OTHER FLINTS

There are many other poor communities, aside from Flint, Michigan that have dealt with water contamination. In East Oroshi, California for example, where more than half the residents live below the poverty line,⁴² the city faced groundwater nitrate contamination in 2012.⁴³ This was not the first time that the city violated drinking water standards.⁴⁴ In fact, the city had violated nitrate standards 12 times!⁴⁵

According to East Oroshi Environmental Health News, “nitrates are by-products of nitrogen in synthetic fertilizers, animal manure, septic tanks and wastewater treatment plants.”⁴⁶ Nitrates are a primary contaminant⁴⁷ and become toxic when ingested because consumption converts it into nitrites; nitrites converts hemoglobin into methemoglobin—which stifles oxygen to tissues.⁴⁸ Also, nitrate exposure has been linked to miscarriages, digestive disorders, thyroid damage and cancer in adults.⁴⁹ Nitrates particularly affect babies causing them to develop cyanosis—which makes it difficult to breathe.⁵⁰ Left untreated, babies can suffocate.⁵¹ It is very possible that babies have already suffered from the ill health effects of nitrate water contamination because of the city’s various drinking water violations.

Outdated water pipes, if not replaced quickly enough, exacerbate water contamination problems. For example, in St. Joseph, Louisiana—where approximately 34 percent of the population lives below the poverty line—decrepit pipes were a breeding ground for brain eating amoeba.⁵² Additionally, in 2013, the outdated water pipes leached iron and manganese, at 32 and 9 times the EPA-recommended levels, respectively, into the water supply.⁵³ Iron and

⁴² Lisa Gross, POLLUTION, POVERTY, PEOPLE OF COLOR: NO BEBA EL AGUA. DON’T DRINK THE WATER, Jun 11, 2012, <http://www.environmentalhealthnews.org/ehs/news/2012/pollution-poverty-and-people-of-color-nitrate-day-4>.

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ HEALTH GOODS, *supra* note 3.

⁴⁸ Gross, *supra* note 42.

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² Lauren Zanolli, *Water Woes: Tap Runs Brown in Louisiana’s Impoverished Northeast*, AL JAZEERA AMERICA, Feb 7, 2016, <http://america.aljazeera.com/articles/2016/2/7/louisiana-northeast-water-woes.html>.

⁵³ *Id.*

manganese are considered secondary contaminants that when found at levels of 0.3 mg/L and 0.05 mg/L, respectively, have potential to cause water to look and taste bad.⁵⁴ Because iron and manganese are secondary contaminants that states and municipalities are not required to set limits on⁵⁵—it is likely that St. Joseph water officials were not too concerned with eliminating their presence.

WATER CONTAMINATION CAN TRANSLATE INTO FINANCIAL BURDENS FOR THE POOR

As a result of water contamination in poor communities' drinking water, many citizens are forced to buy bottled water while still paying for polluted tap water.⁵⁶ For Flint residents, water bills ranged from \$78 to approximately \$110 per month after the lead contamination discovery.⁵⁷ Such costs translate to \$936 to \$1320 per year. It should be noted that the EPA defines water service affordability to be not more than 2.5 percent of median household income.⁵⁸ That percentage does not include the cost of buying bottled water.⁵⁹

Placing water service affordability into context, consider the fact that in 2015, the poverty threshold was set at approximately \$24,000 for a family of four.⁶⁰ Hypothetically, for a family making \$24,000 annually, \$600 would represent the water affordability threshold for the year. However, there are instances where families are spending \$3,600 on water annually. Specifically, in St. Joseph, Louisiana, a citizen was forced to pay as much as \$300 per month for bottled water.⁶¹ Essentially, the point is that, it is safe to say that high water bills can pose financial burdens on families below the poverty line. Furthermore, drinking such water increases the chances that poor families will face astronomical medical bills to treat health ailments.

⁵⁴ HEALTH GOODS, *supra* note 3.

⁵⁵ *Id.*

⁵⁶ Michelle Woo, *Flint Residents Forced to Pay for Poisoned Water: See the Bills*, UPVOTED (Jan 20, 2016), <https://upvoted.com/2016/01/20/flint-residents-forced-to-pay-for-poisoned-water-see-the-bills>; Gross, *supra* note 42.

⁵⁷ Woo, *supra* note 56.

⁵⁸ A TWENTY-FIRST CENTURY U.S. WATER POLICY, *supra* note 1.

⁵⁹ *Id.*

⁶⁰ *Poverty Thresholds*, U.S. CENSUS BUREAU, Feb 3, 2016, <https://www.census.gov/hhes/www/poverty/data/threshld> (last visited May 20, 2016).

⁶¹ Zanolli, *supra* note 52.

MITIGATING THE DAUNTING & PROBABLE HEALTH EFFECTS
OF DRINKING CONTAMINATED WATER

The Flint water lead crisis violated a basic human right—access to clean drinking water. As a result, the health of many children and adults was compromised. There is hope, however, because there are ways to mitigate adverse health risks caused by water contamination. In terms of lead water contamination, homeowners and young children should flush their water systems.⁶² This essentially means that consumers should let cold tap water run for about three to five minutes before consumption.⁶³ Additionally, guardians with young children in the home can help protect their children from lead poisoning by providing foods rich in vitamin C, iron, and calcium.⁶⁴ Providing children with proper nutrients is extremely important because they are more susceptible to lead poisoning than adults.⁶⁵

The water violations in poor communities like East Orosi, California and St. Joseph, Louisiana were also extreme violations to the basic human right of clean drinking water. In the future, there are options to mitigate the ill effects of water contamination in these communities. Residents can call their local health department or state certified laboratory to schedule water performance tests. If the water tests positive for high contaminant levels, a temporary solution—until the city corrects the problem—would be to boil the water for at least one minute to disinfect and render harmless all bacteria, parasites and viruses in the drinking water.⁶⁶ In a home located at altitudes higher than 6,562 feet, one can boil the water for three minutes.⁶⁷ No one in America should have to be worried that his or her drinking water will result in illness or death. However, it is an unfortunate possibility in the twenty-first century.

⁶² Phone Interview with Deanna Durica, Director of Lead Poisoning & Healthy Homes Unit, Cook County Department of Public Health, Apr 29, 2016.

⁶³ *Id.*

⁶⁴ *Lead Fact Sheet*, COOK COUNTY DEPT OF PUBLIC HEALTH, Nov 2014, <http://cook-countypublichealth.org/healthy-environments/lead-poisoning>.

⁶⁵ Martinez, *supra* note 2.

⁶⁶ *Id.*

⁶⁷ *Id.*