Poisoned Water: "NOVA" science series broadcasts segment on Flint water crisis

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On Wednesday evening, the Public Broadcasting Service's (PBS) weekly science program "NOVA" aired a segment on the Flint water crisis, titled "Poisoned Water." An hour-long format, the program roughly follows the chronological sequence of events after the button was pushed three years ago to switch the city's water supply from treated water provided by the Detroit system to water from the heavily polluted Flint River, treated by the local, archaic water treatment plant.

Immediately, residents started noticing problems with their water. Ugly, brown, smelly water started coming out of their taps. Clothes coming out of the wash started smelling bad. Rashes and hair loss were widespread and unusual medical problems were described, such as muscular aches and pains, and listlessness.

The narrative focuses on Flint mother LeeAnne Walters, who, in the midst of experiencing discolored and unpleasant water, noticed slow and uneven growth in her four-year-old twin boys. Walters refused to believe either her doctor's explanation that her sons' stunted growth was normal for twins or the city's claim that the water anomalies were due to the "winterizing" of the system. When her child began screaming in pain from the bathwater, she began doing her own investigating.

Treating river water

In answer to the question, "How does water get treated?" NOVA examines another city that treats river water: Cincinnati. It has been treating water from the Ohio River for 200 years. A spokesman from the city's water works outlines the steps involved.

Coagulants are used to make particulates adhere together and drop to the bottom of filtration beds, where 90 percent of them are removed. Then carbon filtration is used to remove smaller particles, including any industrial toxins, which in the Ohio River are much less prevalent than in the Flint River.

Michael Schock from the US Environmental Protection Agency's (EPA) Office of Research and Development describes the process:

"River waters are just a big engineering challenge relative to a lake water source. Rainwater, snow melts, runoff that goes into the river from agricultural sources. You can get road salts. River waters change very rapidly, and so the entire treatment plant has to be geared to respond within literally minutes to hours of big changes in chemistry."

The narrator poses the question: "Complex chemistry, and a plant that hadn't been fully operational in 50 years. Was Flint in over its head from the start?"

Lead poisoning

E. coli began to be detected in Flint's water in 2014. More and more chlorine was added, creating toxic by-products in residents' tap water. This set the stage for an even more toxic poison—lead.

In one of the more chilling clips, NOVA interviews Dr. Kim Cecil, an investigator for the Cincinnati Lead Study, the longest-running study of its kind in the world. Explaining why lead in the human body is so dangerous, she says: "Lead tricks the body into thinking it's calcium. Whenever lead gets into your body, primarily through ingestion, it goes and hides where calcium should be—in the bones and in the cells of the brain."

As calcium is vital for the functioning of the synapses between the nerve cells of the brain, when it is replaced with lead, the lead blocks communication and causes brain cells to atrophy. Cecil points to comparative scans of brains, showing that the volume of the brain is reduced in lead-poisoned subjects. She points out that "the average IQ of the Cincinnati study is 86. It should be 100 in a typically developing population."

She adds that most of the volume loss is in the frontal lobe—the area of the brain that makes us most human. And lead poisoning can be passed on to the next generation. "When the body needs calcium for the developing fetus, it's pulling lead instead."

When LeeAnne Walters' child Gavin is diagnosed with lead poisoning, she demands that her home water be tested for lead. The results show 104 parts per billion (ppb)—almost seven times the EPA's "action level" of 15 ppb under the Lead and Copper Rule. She makes contact with EPA water expert Miguel Del Toral. They find that the state has been lying about Flint's lack of a corrosion control program, violating federal law under EPA standards requiring that cities with over 50,000 people have corrosion control treatment in place.

Washington, D.C. lead crisis

Del Toral puts Walters in touch with Professor Marc Edwards from Virginia Tech University, the central actor in exposing the lead-in-water crisis in Washington, D.C. a decade earlier. Edwards describes that disaster: "From 2001 to 2010, they suffered the worst lead contamination event in modern US history." It wasn't until 2004, after residents had been drinking lead-contaminated water for almost three years, that the public was finally notified due to the efforts of Edwards.

But the US Centers for Disease Control and Prevention (CDC) published a report stating that the blood-lead levels in children who drank D.C. water with high lead content were not "high enough to be of concern." Edwards says that "the claim was that kids could drink any amount of lead in water and it wouldn't hurt them." He continues, "And that story spread nationally and internationally and did all kinds of harm

to kids. That's the danger of bad science."

Edwards spent six years and thousands of dollars of his own money challenging the validity and integrity of the CDC'c findings: "It's not so much the initial crime. It's when people read these papers and believe it, act on it. And then you had cheating all around the country because it didn't matter how much lead-in-water your kid drank."

According to his colleague Siddartha Roy, Edwards had been "radicalized" by his experience in Washington, D.C. After getting the results from Walters' tap water, he gathered a team to conduct an independent study of Flint's water, working with Walters, who had hundreds of contacts and friends in Flint from months of protests against the foul water. Citizens complaining about the water had been ignored and lied to from the beginning by city and state officials and were eager to participate in an unbiased study of their water.

Independent studies

By early September 2015, Virginia Tech's testing of Flint's water showed that 40 percent of homes and as many as 8,000 children were exposed to high levels of lead. But after press conferences and public statements, state water officials denounced the findings, insisting that the water was safe and the Virginia Tech team was provoking mass hysteria for no reason.

A colleague of Edwards during the Washington, D.C. water crisis, Elin Betanzo, is interviewed. Her experience in Washington caused her to regret that she may have been able to do more. In 2015, she is located in Southeast Michigan and is following the situation in Flint very closely. Coincidently, Betanzo is a long-time friend from high school of Dr. Mona Hanna-Attisha, a pediatrician at Flint's Hurley Children's Hospital. At a dinner party, Betanzo urges Hanna-Attisha to conduct a study of children's blood-lead levels.

It is the announcement of Hanna-Attisha's findings showing elevated lead levels in Flint children that breaks the back of the official edifice of lies and forces Michigan Governor Rick Snyder to order a return to Detroit Water and Sewerage Department (DWSD) water.

It is revealed that a hitherto unannounced outbreak of Legionnaire's disease in the Flint area following the water switch sickened 90 people and killed 12. According to Virginia Tech's Amy Pruden and Marc Edwards, Flint's lack of corrosion control filled water in the pipes with rusty iron particles that combined with chlorine in the system, depleting the chlorine and preventing it from acting as an anti-bacterial agent. This allowed the legionnella bacteria to thrive, resulting in the largest outbreak in the country.

Going forward

Reconnecting to its original treated water source has not solved the problem with Flint's water. NOVA's narrator says rebuilding the protective scale inside the pipes will take many months and even though lead levels are going down, the water is still not safe to drink without a filter.

Interviews with those overseeing and working on the replacement of lead service lines in Flint reveal wider concerns. Michael McDaniel, who heads the Flint pipe replacement program, says, "This is going to happen over and over again. If you're seeing it here, you're going to see it across the rest of the country. Any older industrial city, you've got older service lines and older mains that have been there for 80-90 years. If we aren't replacing those on a regular basis, you're going to have the same problems here."

Schock of the EPA says replacing many millions of lead pipes is going to take "decades and decades."

As for Flint, the narrator says, "For now, bottled water is a way of life."

Despite the film's admirable job in elaborating the science, certain questions are misrepresented or overlooked in the documentary. NOVA makes the point several times that the switch from Flint's original water source was carried out to "save money," obscuring the profit interests of the players involved. In fact, as the Detroit system argued in an attempt to keep Flint from switching to a different source, the city would end up paying more for water under the new system.

At the outset, the narration presents the events as follows: "For decades, the city of Flint purchased treated water at a premium price from Detroit. Now, the emergency manager and city officials pursue a plan to save millions by building a pipeline to Lake Huron. It would take years to finish. Until then, the city would draw water from the Flint River and treat it at the old Flint water plant."

NOVA's satellite view shows Detroit as being far to the south of Flint, implying that getting Detroit water was inefficient and expensive. From the map, it appears that building a new pipeline to Lake Huron is a completely reasonable endeavor. But Flint was already getting treated Lake Huron water from the existing pipeline built by the DWSD in 1970.

The documentary does not give the name of the new water system—the Karegnondi Water Authority (KWA). The building of the KWA pipeline was not Flint's endeavor, but a pet project of Jeff Wright, the Gennessee County Drain Commissioner, also CEO of the KWA. He needed, and got, with the collaboration of the Flint emergency manager, Flint's commitment to sign on in order to build the new water pipeline, which would bring raw, untreated water from Lake Huron.

The "saving money" narrative obscures the fact that in today's economic climate, water revenues have become an attractive investment target for private interests and speculators.

Haphazardly inserted in the documentary devoted to science is a clip of filmmaker Michael Moore declaring that the Flint crisis is not so much a water crisis as a racial crisis. His supporters flank him, shouting, "Genocide! Genocide!"

NOVA's executive producer, Paula Apsell, at a Flint pre-screening, explained: "As an observer of this situation, I have to say I think it's pretty damn obvious the role that race and poverty played in it. It didn't take a lot of belaboring."

Flint is a racially mixed and largely impoverished working-class city, the former center of General Motors' auto production. Families of all races have been devastated by the criminal actions of federal, state and local politicians of both parties, some of whom are African-American. These officials acted in behalf of wealthy corporate and financial interests that saw an opportunity to, as they say, "make a killing." In the case of Flint, this phrase has taken on more than a financial meaning.

In the Flint crisis, it is the fundamental issues of class, not race, that clearly predominate. Yet a racialist narrative is incessantly pushed by the so-called "liberal" establishment.

Despite these limitations, the NOVA documentary is well worth viewing. It can be accessed on PBS' website.