

## Instructor's Note

# Flint, Michigan: Lethal Water

2017

### Overview

The 2014-2015 toxic water crisis in Flint, Michigan, was a disaster with profound health implications. A complex network of interrelated factors contributed to the disaster: culture, ethics, society, environment, politics, urban design, economic justice, and governance—both the governance of health as well as non-health-sector governance issues (such as political decision making about finances) that affect health. The accompanying materials and associated links and educational tools aim to help users understand these multiple contributing factors and think about how governance and global health connect.

The Flint crisis is not a simple problem; its causes cannot be blamed on just one or another individual. And it does not have a simple solution. Certain corrective and preventive actions are absolutely essential, and yet many of its consequences—especially for children affected by lead poisoning—are irreversible. The opportunity to think through this complex situation can help students better understand health challenges globally—both within the United States and around the world.

This Instructor's Note is designed to accompany the following related tools:

#### Preparation Materials:

- Case study: "Flint, Michigan: Lethal Water"
- "Flint Water Crisis Wheel" graphic

#### Classroom Activities

- Discussion questions
- Suggested Role Play Exercise

#### Additional Flint Resources

- Links to external sources (embedded in the Case and its concluding Bibliography)
- Links to related materials on the Flint crisis created by the Global Health Education and Learning Incubator (GHELI) at Harvard University and links to external materials in the GHELI Repository.

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## Learning Objectives

- Understand the complex network of factors that led to the Flint water crisis;
- Understand that many health issues may be caused by events outside of the traditional health sector, and that solutions for these issues may also be found outside of the health sector;
- Understand that seeking a solution to Flint's water crisis requires coordinated collaboration across diverse sectors;
- Understand that the issue of lead-poisoned water is a global concern that extends beyond the community of Flint, is an issue for many US communities, and is relevant to the effects of globalization across national boundaries;
- Consider multiple issues of water, including: human rights; the role of government and governance on ecological resources and utilities/infrastructure; citizen action; and health related to economic development.

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## Flint, Michigan: Lethal Water

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Between December 2011 and April 2015, the city of Flint, Michigan, was in legal “receivership,” a state of financial emergency that is usually a last-ditch attempt to avoid total bankruptcy. Over approximately 65 years, Flint had gone from automotive manufacturing powerhouse second only to Detroit in the 1950s,<sup>1</sup> to a city with high levels of poverty and unemployment. Starting in the 1960s Flint started losing residents to better opportunities elsewhere. Over the period of 55 years 100,000 citizens fled. By 2015, only 99,000 citizens were still living in Flint.<sup>2</sup> Like its neighbor, Detroit, located about 70 miles to the southeast, Flint’s fortunes had dwindled with the decline of the American automobile industry. By 2015, approximately 57 percent of Flint citizens were Black or African American; 41 percent lived in poverty, and the median household Flint income was \$24,000; nearly one in five of citizens had a disability, and as of 2014, 14 percent had no health insurance.<sup>3</sup> In 2015, Flint was rated the third most dangerous city in the United States for violent crime and sexual assault.<sup>4</sup> By some estimates, the city’s unemployment rate in 2016 was more than twice the national average.<sup>5</sup>

### Dollars, Cents, and Water

During Flint’s 2011-2015 fiscal crisis, the city’s finances were directed by Emergency Managers (EMs) appointed by Michigan Governor, Rick Snyder, who took office on January 1, 2011. Under the interim governance of these EMs, Flint city officials decided to slash costs by changing the source of the city’s municipal water. For decades, Flint’s water had been piped from Lake Huron through the Detroit Water and Sewerage Department. The Karegnondi Water Authority (KWA) of Genesee County, where Flint is located, was in the process of planning a new water system separate from the Detroit system. In March 2013, Ed Kurtz, one of the four EMs to serve between 2011 and 2015, signed an agreement for Flint to switch over to the KWA system when it was ready. Construction on the new water system, however, would not be complete until 2016 at the earliest. Meanwhile, the Detroit water department raised Flint’s water payment rates to a level that would cost the city an additional \$10 million over the interim two years—funds not readily available in the near-bankrupt city budget. In June, Kurtz—in an unprecedented move for Flint’s local water supply—signed an order for an engineering contract that would return to operation Flint’s own water treatment plant—not used since 1967,<sup>6</sup> using water from the Flint River “as a primary drinking source for approximately two years and then converting to KWA delivered lake water when available.”<sup>7</sup>

This decision was made despite the known fact that, for decades, the Flint River had served “as the local industry’s sewage collection system.”<sup>8</sup> Early in the fiscal crisis—in 2012—officials went on record to recommend against using the Flint River for city water.<sup>9</sup> In September 2013, a new Emergency

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Manager—Michael Brown—approved an order for a contract between Flint, Genesee County, and the KWA. In October 2013, Brown was replaced by yet another Emergency Manager, a longtime state employee, Darnell Earley. Earley had served Flint in the early 2000s as both city administrator and interim mayor. During this time Earley was not a local resident, living almost 90 miles away in Lansing, yet he still earned \$180,000 annually as Flint's city manager.<sup>10</sup>

The city of Flint continued to use the Detroit water system until April 25, 2014. On that day, city officials—including Earley and then-Mayor, Dayne Walling, celebrated a public switch of the valve that controlled the city's water source, switching it from Lake Huron water, treated through Detroit, to water from the Flint River.

## No Cause for Celebration

Immediately residents complained. Complainants noted changes in water's color, smell, and taste. In August 2014, the water tested positive for *E. coli*, a bacterium commonly associated with food poisoning; *E. coli* causes serious debilitating intestinal illness and can also cause kidney disease. Officials told citizens to boil water; complaints about the odor and discoloration continued.<sup>11</sup>

To try and address these concerns, the city added chlorine treatment, at levels so high that residents complained of not only worse odor but also burning symptoms in any contact with the water. Soon officials noted that high chlorine levels were causing unsafe production of a chlorine byproduct, trihalomethane; another warning was issued.<sup>12</sup>

Meanwhile, in Flint's General Motors plant—historically one of Flint's largest employers—workers alerted the company that the water was also corroding engine parts. Once this complaint reached Governor Snyder's office, the governor, it was said, “quietly spent \$440,000 to hook GM back up to the Lake Huron water”<sup>13</sup> through connections in Flint Township, an adjacent municipality that had not gone with the city of Flint in the switch.

## “There is No Need to Worry”

By January 2015 the city's mayor, Dayne Walling, was continuing to insist that Flint's water was safe,<sup>14</sup> despite increasingly vocal complaints from residents. The concern was so great that officials in the Detroit water treatment system offered to reconnect Flint to its water at no cost. Earley turned down this offer for reasons that remain unclear.<sup>15</sup> A few weeks later, Snyder re-appointed Earley to a new position, as Emergency Manager for the Detroit Public Schools; Gerald Ambrose took Earley's place in Flint. Ambrose, determined to balance the books and fix Flint's finances, also rejected an attempt to switch back to Lake Huron water, calling a city council vote for this change in March 2015 “incomprehensible.”<sup>16</sup>

Throughout these months, Flint's concerned citizens began to flock to city hall and city council meetings in repeated but futile attempts to persuade the city governance to recognize and admit that a problem existed with the water that needed urgent attention and action.

One of these citizens was LeeAnn Walters. Walters had moved to Flint in June 2011 with her husband, a Navy Reserve officer, and their four children. When they bought their house, it was missing all of its interior plumbing; the Walters had the plumbing restored with a renovation that used safety-compliant PVC plastic pipes and filters. Soon after the city switched to the Flint River water, Walters and her children began to suffer from inexplicable skin rashes and hair loss even before December 2014, when the water coming out of their faucets turned consistently brown. In February 2015, Flint's Utilities Administrator, Mike Glasgow, visited Walters' home in response to her complaints about the discolored

water. It was Glasgow who first identified elevated lead levels in her water and immediately warned the family to stop using it.<sup>17</sup> Periodic retesting confirmed increasingly elevated lead levels.

Lead ingestion of any kind and at any level poses a health risk; the ideal lead level in water is zero parts per billion (ppb). In the United States today, any level over 15 ppb is considered a serious problem. Walters' water measured 104 ppb on Glasgow's first visit. It eventually skyrocketed on subsequent testing to over 13,000 ppb, nearly three times the level considered to be toxic waste. Lead itself is invisible in water; the discoloration was caused by other substances such as iron and copper that were leaching into the water due to corrosion of the old pipes throughout the city's water system.

## Demanding to be Heard

Walters immediately took action to learn exactly what her family was experiencing and what all the measurements meant for Flint's water and public health. She contacted the U.S. Environmental Protection Agency (EPA) and spoke with Miguel Del Toral, the Regulations Manager for the ground water and drinking water branch. With Walters' information, Del Toral soon identified that the Flint River water plant failed to include corrosion control treatment. Corrosion control is a standard part of water treatment, and helps to coat water pipes with substances that prevent old lead, iron, and copper pipes from leaching their metals into the water; corrosion control was standard protocol in the Detroit water treatment system. The corrosive (and untreated) nature of the Flint River water had stripped the pipes of its protective coatings and pulled toxins into the water that the city's citizens were using for drinking and bathing.

Del Toral—who one EPA official would later call a “hero”<sup>18</sup>—chose to go public with the information. He wrote an interim report citing Walters' data and test results, and allowed it to “leak” to the press when it became obvious that top officials at Michigan's Department of Environmental Quality (MDEQ) were failing to take citizens' concerns seriously. “Where these problems exist, I will not ignore them,” he would write later.<sup>19</sup> “I understand that this is not a comfortable situation, but the State is complicit in this and the public has a right to know what they are doing because it is their children that are being harmed,” Del Toral wrote. “At a MINIMUM [emphasis in original text], the city should be warning residents about the high lead, not hiding it telling them there is no lead in the water.”<sup>20</sup> While Del Toral's superiors attempted to “silence” him, calling him a “rogue employee,”<sup>21</sup> the publicity of his report continued to advance public concerns in Flint. Even so, top officials persisted in their claims that the water was safe, and Flint citizens felt they were still not taken seriously in concerns they expressed with officials at a meeting in August 2015.

It was immediately following this meeting that LeeAnn Walters decided to get in touch with Marc Edwards, a water supply safety and engineering professor at Virginia Tech. Considered to be a world expert on water corrosion and water safety, Edwards had been awarded a MacArthur “genius” grant in 2007 for his research and work that forced national attention on elevated lead levels in the Washington, D.C., municipal water supply, resulting in intervention to fix the problems.<sup>22</sup> After talking with Walters on the phone, Edwards took immediate action. On his own time and at his own expense, he and four graduate students, armed with a large supply of lead test kits, drove to Flint and began asking residents for water samples. Forty percent of the first 252 kits they got back (out of 300 initially distributed; the numbers tested would eventually total more than 800) came back with lead levels over 5 ppb; while the EPA allows 15 ppb in high-risk homes, any level of lead in water is considered a health risk, and many samples were far above this threshold.<sup>23</sup> Edwards' team concurred that “Flint has a very serious lead in water problem.”<sup>24</sup> Edwards also became a public spokesperson to both citizens and public officials in Flint, adding his voice to those who warned the city to do something quickly, and not drink or use the Flint River water. Edwards and his researchers would later charge that the MDEQ had even gone so far

as to fail to test the “worst case scenario” homes as federal law mandated. The result, it was charged, “skewed the outcome of its tests to produce favorable results.”<sup>25</sup>

## Effects of Lead Poisoning: Long-lasting and Irreversible

The most serious risk of lead poisoning is its effect on children. Lead poisoning affects behavioral, growth, and learning abilities, and its effects on young children are lifelong and irreversible. While nothing can remove lead from the body once it is present, healthy fresh foods rich in calcium, iron, and vitamin C are believed to play a limited but positive role in reducing the body’s absorption of lead.<sup>26</sup> But for many of Flint’s children even this protection was missing due to poverty and lack of accessible grocery stores stocked with fresh fruits and vegetables.<sup>a</sup> LeeAnn Walters knew that it was not just her own two youngest children who faced lifelong consequences after they tested positive for high lead levels. The crisis meant that every child in Flint was now at risk.

Despite the public outcry, some low-income Flint residents remained unaware of the risks. Among them were members of the city’s small Latino community, many of whom were undocumented immigrants and unable to read English. According to one civic activist for this community, “relatives of these families from Mexico and other countries were calling asking what was going on, and in some cases that’s how people found out about it.” After many Latinos shied away from the free bottled water distributions across the city—fearful staff at such distributions would ask for identification—local religious groups began an effort to distribute free water to all, without requiring identification or proof of Flint residency.<sup>27</sup>

To understand the effects, one local pediatrician, Dr. Mona Hanna-Attisha, head of the Pediatric Residency Program at Hurley Medical Center in Flint, decided to measure blood lead levels in Children’s Clinic patients and compare them to available Flint records prior to the Flint River water transition. Results demonstrated that the percentage of children with high lead levels had nearly doubled since the switch. In September 2015, Hanna-Attisha and other worried medical colleagues held a press conference to announce their findings and concerns, demanding that the city return to Lake Huron water in order to protect public health. While city officials initially dismissed her comments, calling them “unfortunate,”<sup>28</sup> this press conference marked a point of transition. On October 16, 2015, Flint’s city officials made the switch back to the Detroit water treatment system.

## A Return to Lake Huron’s Water, and Yet...

While Flint residents once again had access to a safe and properly treated water supply, the return to Lake Huron did not solve many of the problems that contributed to Flint’s water crisis. The switch did not reverse the effects of lead poisoning and other related toxicities that residents suffered as a result of their exposure to Flint River water. It did not fix urban violence inherent in the dominant poverty, improve home property values, address the widespread lack of public confidence in the governance system nor lingering distrust about any water flowing from their pipes, nor did it fill the health insurance

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<sup>a</sup> Flint was a “food desert,” a community that lacks access to a full-scale, reasonably priced, well-stocked grocery store. Instead Flint residents—like many others who live in poor communities—had to rely for food on local corner stores, which were often expensive and lacked fresh vegetables and fruits. For more on food deserts, see R. Walker et al. Disparities and Access to Healthy Food in the United States: A Review of Food Deserts Literature. *Health and Place* 2010; 16:876-884. DOI: 10.1016/j.healthplace.2010.04.013. <http://www.sciencedirect.com/science/article/pii/S1353829210000584>.

gap that prevented many of Flint's families and young children from easy access to necessary medical care.

One of the many challenges Flint still faced at the end of 2015 was the city's utilities infrastructure. There remained, for example, the simple structural question of how to remove and replace the affected pipes. Many of Flint's water pipes were more than a hundred years old. To remove ancient iron and lead-lined pipes, city workers first needed to know where they were and how to access them. The city's government records of water pipes was stored in the form of disorganized card files and fraying paper records.<sup>29</sup> Moreover, Flint's dwindling population left the city with an insufficient tax base to maintain the system, let alone upgrade it.

During the late fall and winter of 2015-2016, many officials implicated in the crisis stepped down or were fired, but Governor Rick Snyder stayed in office and remained actively engaged in addressing the storm of media controversy. As part of Snyder's efforts to address public perception and action on the problems, he appointed a Flint Water Interagency Coordinating Committee.<sup>30</sup> Among those he appointed as committee members, Snyder included both Edwards and Hanna-Attisha as "subject matter experts," in addition to the new Flint Mayor, Karen Weaver, and other county and city representatives. Snyder's office also commissioned a Flint Water Advisory Task Force report, released in March 2016.<sup>31</sup> The report admitted that the crisis was due to "government failure, intransigency, unpreparedness, delay, inaction, and environmental injustice."<sup>32</sup> It lay the blame, however, on the Michigan Department of Environmental Quality (MDEQ), together with the Michigan Department of Health and Human Services, and not on the governor himself. The report admitted inaction by the governor's office, explaining that this inaction was due to the "continued reassurances from MDEQ that the water was safe."<sup>33</sup> As part of Snyder's responses in the face of widespread lack of confidence for his decisions during the crisis, he announced in mid-April 2016 that he would drink Flint water for 30 days, in an effort to "alleviate some of the skepticism and mistrust."<sup>34</sup> His staff collected a few gallons of water from a nearby home in Flint for Snyder to carry and drink at work and home even as he also warned pregnant women and children ages 5 and under to continue to drink bottled water.<sup>35</sup>

Snyder's response illustrates the local nature of both environmental problems as well as efforts at resolution in such crises. While the federal Environmental Protection Agency can act based on legislation mandating safe water (the Safe Drinking Water Act), it is the responsibility of individual states to enforce the Act and make decisions based on any evidence of its violation.<sup>36</sup>

Snyder's efforts at swaying public opinion to his favor were not entirely successful. On November 16, 2015, lawyers announced a class action suit on behalf of Flint residents against the city and state officials, including both Snyder and the MDEQ Director, Dan Wymont. A federal judge in Detroit dismissed the suit in April 2016.<sup>37</sup>

Legal wrangles continued. In April 2016, many Flint citizens expressed satisfaction at the Michigan Attorney General's announcement of felony charges against three government officials involved in the crisis: Flint's laboratory and water quality supervisor, Mike Glasgow; Michigan Department of Environmental Quality official Mike Prysby, and Lansing district coordinator for the MDEQ's Office of Drinking Water and Municipal Assistance, Stephen Busch.<sup>38</sup> Reflecting on the news, one Flint citizen, retired Flint school teacher Nadine Roberts, noted, "Clean water is a human right that definitely a lot of people violated in Flint, for greed."<sup>39</sup> In mid-June 2016, Michigan's Attorney General announced a lawsuit against two private-sector companies, one based in Houston, Texas, the other a subsidiary of an international corporation based in France. Hired to ensure Flint's water safety, the failure of both consultant reports to identify obvious problems made them, the attorney general charged, "complicit in the series of events that caused lead to leach from pipes and poison children."<sup>40</sup>



Meanwhile, citizen action groups in Flint continue to band together to provide emergency resources to their neighbors, including faith groups such as the Michigan Muslim Community Council<sup>41</sup> and the Flint Grassroots Initiative,<sup>42</sup> supporting residents who remain in the community with donated time, money, goods, information, and even a few new grocery stores.<sup>43</sup>

## What is the Next Chapter in Flint's Story?

The Walters family moved to Virginia in October 2015. It was “to get us out of Flint,” says LeeAnn Walters, of her husband’s choice to return to active duty with the United States Navy, “Because of what it was doing and the health concerns and the fact that we weren’t being listened to with our child being poisoned.”<sup>44</sup> Yet Walters remained part of citizen action group efforts to address the long-term consequences of the water crisis in Flint. She was among the cofounders of the Community Development Organization of Flint (“C Do”<sup>45</sup>), which “addresses the city of Flint, Michigan’s infrastructure, healthcare, educational, family assistance, and economic development needs that have resulted from the Flint Water Crisis and the long-term economic and civic challenges.”<sup>46</sup> Many residents who left Flint remain suspicious of the water supplies in other cities. Indeed, Flint’s lead crisis has resulted in heightened attention to both safe water and the risks of lead pipes in urban infrastructure across the country.<sup>47</sup>

On June 23, 2016, the U.S. Environmental Protection Agency (EPA) announced that filtered water in Flint was now officially safe to drink, even for pregnant women, nursing mothers, and children. But Mayor Karen Weaver readily admits that the situation is far from solved. “While it’s good to know we can safely drink filtered water,” she added, “this is not the ultimate solution to the problem in Flint. We still need new infrastructure, replacing the lead-tainted pipes in the city remains my top priority.”<sup>48</sup>

Flint eventually received \$27 million to replace thousands of corroded water pipes, but as of November 2016 fewer than 200 pipes had been fixed.<sup>49</sup> Laura Sullivan, a professor at Kettering University who has worked on clean water projects around the world, expressed frustration with Flint’s lack of progress. During a previous interview with National Public Radio (NRP) in January 2016, Sullivan had optimistically thought that the spotlight on Flint would cause the situation to improve rapidly. However in a follow-up interview ten months later in September 2016 she ruefully noted,

“It [Flint] ought to be just a one-time, oh, my gosh, people weren’t paying attention and they were reckless, and now we figured it out and now we fixed it. But unfortunately, it feels more and more like a system in parts of the world where the government is corrupt, and there are too many hands that are involved that don’t involve the people who are actually living in poverty. And the people who are living in poverty aren’t empowered to be part of the solution.”<sup>50</sup>

Indeed in November 2016, two years after the city’s water switch, residents without properly working filters still did not have access to safe water in their homes. A federal district court judge ruled that the city had to begin to provide and deliver at least 96 half-liter bottles weekly to each Flint resident until the city found a permanent solution. Flint fought against the suit, maintaining that city water distribution centers provided clean water to residents in need. However the judge found otherwise, citing obstacles such as language, old age, cognitive barriers, a lack of necessary tools, and challenges transporting water from the distribution centers to their homes. The ruling was effective immediately.<sup>51</sup>



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- <sup>5</sup> <http://www.bestplaces.net/economy/city/michigan/flint>, accessed 6/22/16. It is important to note that there is often a wide range of variance about this information, depending on data sources.
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## Discussion Guide

# Flint, Michigan: Lethal Water

2017

### Assignment

1. Read the case “Flint, Michigan: Lethal Water.”
2. Look at the associated graphic, “Flint, Michigan: Lethal Water: Understanding the Connections.”
3. Reflecting on the case and the wheel graphic, select from the following collection of discussion questions to help your class or group explore these issues.

### Discussion Questions: Understanding the Connections

The graphic contains a photograph of the inside of one of the city water pipes in Flint, Michigan, that was affected by the contaminated water discussed in the case. The wheel of words around the pipe name 15 different themes or connecting factors (circles of influence) related to the community that played a role in the water/lead crisis in Flint, Michigan, and responses to it. The 15 “circles of influence” each overlap, a reminder that the crisis had many causes and requires interconnected responses. Encourage students to consider each of the 15 themes individually and in relation to each other, across and among different groups of theme factors.

Below are sample discussion questions organized by each of the 15 themes and how they might be interrelated. Teachers might divide the class into small groups around the room, with each group discussing among themselves one of the following areas and series of questions. Each group might then represent that perspective in a class-wide discussion of the whole. Alternatively, choose several themes most relevant to the class you are teaching and focus classroom discussion on those themes, pointing to the other (also related) themes as they come up, to emphasize the connection between the many different parts of community governance and its effect on global health.

#### Science

- How did science play a role in diagnosing the problem?
- Did outdated scientific standards contribute to the crisis?
- Science is data – numbers. Where in the story were people trying to argue their case using data? Whose data was believed? Whose data was questioned? Why?

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This discussion guide accompanies a case which was originally developed by the Global Health Education and Learning Incubator at Harvard University by Rachel Gordon, MBA, Case Studies Program Manager, and Susan R. Holman, PhD, Senior Writer. It is used and distributed with permission by the Global Health Education and Learning Incubator at Harvard University. Cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

- As you consider the other themes/factors (below), think about how science is connected with them in creating (or solving) health problems.

### Local Industry, Economics, Employment

- What local industry is Flint, Michigan, best known for?
- Who was the leading employer, and how did change in industry and employment affect the economic security and prosperity of Flint residents and the city? Did these economic changes play any role in the original plan to find a cheaper water source?
- How does the current employment situation in Flint affect those who live there after the water crisis? Think about how jobs and industry affect: loss of industry, abandoned homes, lower tax income to pay for city utilities, and the efforts to maintain a survival infrastructure (water, electricity, schools, jobs, security, food, governance).

### Civil Rights

- Why are civil rights important for Flint residents?
- What do you know about potential racial discrimination in civil rights in America? How might such discrimination play a role in the Flint crisis? (hint:<sup>a</sup>)
- Some critics of the Flint crisis called the Emergency Managers “dictators” because of the decision-making power they had due to the city’s impending risk of bankruptcy. Do you think that Flint citizens’ civil rights curtailed by disenfranchisement due to the appointment of “emergency managers”?
- How might a focus on civil rights help address attempts at urban renewal in Flint?

### Poverty

- How does poverty in Flint compare to poverty rates elsewhere in the United States?
- Compare poverty as *inequity* with the idea of poverty as *inequality*. (Inequity is a lack of fairness or injustice while inequality is a disparity or difference in size or circumstances.)
- How did poverty increase Flint children’s risk of exposure to lead in the water? How did poverty affect families’ access to healthy foods and the ability to find and purchase safe water alternatives?
- What is the connection between poverty and health care access in the United States? Consider the stressors of poverty. How might they increase poor health?

### National Risks

- Flint illustrates the failure of an American governance structure despite careful political systems to ideally empower national norms for all who live in the U.S. What happened in Flint alarms many experts because it is a symptom of a crisis that could happen elsewhere. For example, Professor Marc Edwards’ interest in the Flint story was rooted in his work on similar issues in Washington, D.C. The crisis in Flint concerned many because it was so easy for incompetence and governmental choices to result in the violation of carefully designed national standards to keep people safe and healthy in their homes. Many who moved away from Flint said they will never quite trust the water, no matter where they live. Discuss the role of national safety in this local crisis.

### Politics

- Political factors play a big role in the Flint water crisis. How did politics affect health in this story? Compare the role of local government in Michigan with that of national organizations such as the Environmental Protection Agency (EPA).

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- How influential in decisions about safe water was: Political budgetary concerns? The Receivership (near-bankruptcy) status of the city? The EPA? The literal cost of raising water prices? What were the negative political consequences of the crisis?
- How do you think political factors can play a positive role in cleaning up water and healthy access to water in Flint?

### Health

- In Flint, a non-health-related series of crisis situations led to a health crisis. Consider how health depends on social factors much more than it depends on good medicine. What social factors in Flint are not directly about health that nonetheless harmed children's health?
- Are Flint's children at special risk because they are poor and may have substandard access to proper medical care? Why?
- Discuss the consequences of lead exposure. What is the short-term vs. long-term impact? What amount of lead is a healthy dose?
- Discuss the consequences and potential health costs to Flint citizens of other contaminants that were discussed in this story (e.g. *E. coli*; trihalomethane).

### Policy

- What policies did state government workers pay attention to in deciding to switch Flint's water source?
- What is the role of government policy in the legal debates over costs and consequences? Does this change depending on what level of government (federal, state and local) is acting? What policies were ignored?
- How are legal policy, environmental policy, and health policy all part of the debates and factors in this narrative?

### Parents' and Citizen Advocacy

- How important were the voices of parents in identifying the Flint water crisis and pushing for national attention and change?
- What parent voices did you hear and which did you most identify with? Do you think racial bias played a role in the crisis, since the most vocal parent covered in the news—and the researcher and physician who championed the need for change—were not members of the African American community in Flint?
- Discuss the importance of citizen action in local environmental crises.

### Environment

- The Flint water crisis was caused by human action that led to environmental contamination. Environment includes not only the natural environment (water, soil, air), but also the social environment of urbanization. How did the crisis affect Flint's environment?
- Think about overlapping connections that led to a complex problem with no simple solution.

### Legal Action

- Who blamed who in the Flint water crisis? Who had power to push for legal action? What positive role does legal action play in a crisis like Flint's?
- Debate the issue of liability in a situation where government workers were expected to comply with their supervisors and act on decisions they did not always understand.
- What legal action might have the greatest power to improve the lives of those children whose learning potential is permanently affected by lead poisoning as a result of the crisis?

### Public Health Campaigns

- How was public awareness of health issues a factor in this story? What form did public information about health and health risk in Flint take?

- Usually public health campaigns are driven by citizens in collaboration with local public health organizations, including local government. Discuss the role of the public health organizations in the Flint crisis in communicating effective timely information about the risks in the water.

### Governance

- International, national, state, and local government organizations are responsible for governance decisions that make it possible for ordinary people to live well, affecting both economics and health. Yet often those responsible for economic governance (the budgets) compete with those responsible for health governance (health systems and health care access). Discuss these competing governance tensions as they played a role in the Flint water crisis. How can those who govern budgets increase their focus on the importance of health?
- How can those who govern health effectively communicate with politicians who care primarily about balancing the books?
- Why is health important for economic flourishing and development around the world?

### Public Safety Regulation

- Public safety is regulated by policies, by laws, by citizen action, and by national influence. How was public safety compromised in the Flint water crisis?
- What regulations played a role in the debates? Think about how public safety regulations relate to the other connecting influences and related factors in the “Flint Water Crisis Wheel.”

### Natural Resource Management

- Do you agree that everyone has a human right to water? What should the role of government be in ensuring essential water is safe? Affordable?
- Do some research to find the international documents online that spell out exactly what global leaders have agreed upon related to the human right to water. Look at the language in these documents that describe issues of: affordability, access, safety, and health. Think about similar issues related to debates over access and ownership to natural resources such as clean air, adequate food supply, and fossil fuels.

## Suggested Role-Play Exercise

# Flint, Michigan: Lethal Water

2017

Read the case, “Flint, Michigan: Lethal Water,” carefully trying to understand each person’s perspective and decision making. In class, break up into small groups of four or five students per group. Each member of the group then chooses to assume the role of one of the individuals listed below who has some influence in the Flint water crisis. Take time to think about how you would defend that individual’s position; refer to the information in the case. The teacher should decide whether students might also take the opportunity to do further research on their “persona.” With each student assuming their “role,” groups take about 20-30 minutes together to debate on finding a solution that will (a) improve children’s health potential, (b) support citizens who wish to remain in Flint, and (c) guarantee safe housing and water access in equitable measure.

### State Government

- Governor Rick Snyder
- Emergency Manager Darnell Earley

### Government Agencies

- Brad Wurfel, Former Communication Director of the Michigan Dept. of Environmental Quality
- A representative of the U.S. Environmental Protection Agency (based in Chicago)

### Activists

- Leanne Walters, Flint mother

### Researcher

- Marc Edwards, Professor, Virginia Tech

### Physician

- Mona Hanna-Attisha, Pediatrician who studied rising blood levels in infants and children in Flint

### Local Government

- Karen Weaver, Mayor of Flint

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