

*Following Procedure or Sounding the Alarm:
Dr. Mona Hanna-Attisha and the Flint Water Crisis*

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Abstract: This case study explores the unfolding of a public health crisis in Flint, Michigan, through the experience of Dr. Mona Hanna-Attisha, a pediatrician whose discovery of a silent threat to children's health placed her at the center of a growing public health controversy. At the heart of the case is a physician confronted with mounting evidence of environmental harm and the troubling silence of those in power. Set against a backdrop of systemic disinvestment, racial and economic inequality, and diminishing public trust, this case offers a lens into the personal and professional stakes of advocacy in times of crisis. It invites reflection on the cost of truth-telling, the fragility of credibility, and the enduring impact of courageous leadership in the face of denial.

Introduction

The pediatric clinic at Hurley Children's Hospital in Flint, Michigan, a city within Genesee County, was never quiet, but on that September afternoon in 2015, Dr. Mona Hanna-Attisha could not hear the usual laughter and chatter. Her mind was fixated on a spreadsheet glowing on her computer screen, which showed rows and rows of lead levels from the blood of Flint's children. One after another, the numbers rose higher than they should have. Each row represented a child, each number; a measure of something invisible, yet devastating blood lead levels were rising across Flint. She retraced the columns, hoping she had made a mistake, but the pattern was undeniable.

For months, parents had come to her with stories that unsettled her. Their children were developing rashes, losing hair, and growing irritable in ways that did not match any ordinary diagnosis. Many had started to suspect the city's new water supply, but officials insisted everything was safe. Dr. Mona wanted to believe them. She had spent her career trusting public health institutions to protect families like these, to protect the city she had grown up in. Yet the data on her screen told a different story, one that demanded she make an impossible choice.

If she spoke out, she could lose her credibility, her research privileges, and the trust of the medical community she had worked so hard to earn. But if she stayed silent, she would be complicit in the harm that was unfolding before her. In that quiet office, surrounded by evidence no one wanted to see, Dr. Mona realized that she had to decide.

Before the Crisis: The Social, Economic, and Political Landscape of Flint, Michigan

Before the Flint Water Crisis erupted in 2014, Flint, Michigan had experienced decades of economic decline and structural neglect. Once a prosperous industrial hub and the birthplace of General Motors, Flint was emblematic of the American manufacturing boom in the early to

mid-twentieth century. At its peak in the 1960s, the city had a population of nearly 200,000 and exhibited one of the highest per capita incomes in the country, mainly due to the strength of the automobile industry (Kitzmilller 2015). Union jobs provided stable employment, and the city's infrastructure reflected its economic vitality. Flint, Michigan was also the site of the historic sit-down strikes in 1936–37 that resulted in unions, like the United Auto Workers (UAW), which effectively created the middle class in America (Hanna-Attisha 2018, 29). These labor victories secured living wages, health benefits, and workplace protections that transformed Flint into one of the most economically prosperous cities in the country (Hanna-Attisha 2018, 127). This success meant people from all over the world viewed the city as an ideal place to live and work, especially for its living wage jobs and excellent infrastructure (Scorsone and Bateson 2011). This economic vitality resulted in Flint having one of the highest per capita incomes in the nation in 2010 (Scorsone and Bateson 2011).

Despite its industrial prosperity, Flint's environmental health was already under strain during its manufacturing heyday. For decades, the automobile industry used the Flint River as an industrial waste dumping ground. This legacy of contamination left behind high levels of pollutants, including oil, heavy metals, and debris (Butler et al. 2016). Within this economically distressed, majority-Black city, the most common family type with children was a female householder with no spouse present (55.3%) (Pulido 2016). These structural shifts had profound gendered implications. As Flint's economy collapsed and public services deteriorated, women—particularly Black mothers and grandmothers—became the primary managers of household health, water, and safety (Pulido 2016). Domestic labor increased as city infrastructure failed, placing heavier burdens on women who already carried much of Flint's caregiving responsibilities (Pulido 2016).

The Environmental Protection Agency (EPA) is an independent agency of the United States Federal Government responsible for environmental protection and regulating hazardous substances, including lead, in public water supplies under the Safe Drinking Water Act Lead and Copper Rule (LCR) (Qatteea 2019). By the 1970s, the EPA had already declared sections of the Flint River environmentally damaged (Compton 2021). This status was rooted in the river's decades-long history as a dumping ground for industrial activity. Because cleanup efforts proceeded slowly and unevenly, this long-term pollution and ecological degradation continued (Pulido 2016).

In the mid-twentieth century, Flint was a powerful symbol of middle-class prosperity. Tens of thousands of General Motors employees powered a local economy bolstered by vigorous union activity, accessible public services, and some of the highest homeownership rates in the country. However, by the late 1970s, this image began to unravel. Globalization, automation, and the outsourcing of industrial jobs rapidly eroded Flint's economic base. Between 1978 and 2010, General Motors reduced its Flint workforce from 80,000 to under 8,000 (Barba 2020). Entire neighborhoods emptied, local businesses shuttered, and property values plummeted. The same industry that built Flint was now disassembling it piece by piece.

As jobs disappeared and schools deteriorated, Flint's demographic makeup shifted dramatically. White residents fled to the suburbs because of both economic instability and longstanding patterns of racism (IWL Rutgers 2022). Discriminatory housing policies and redlining had long separated Black residents into underfunded and under sourced neighborhoods (Pulido 2016). By 2010, Flint had become a majority Black city with more than 57% of the population identifying as African American, and over 40% of all residents living below the poverty line (Pulido 2016). Public services deteriorated. Trash collection became irregular, streetlights

failed, and water mains aged without replacement. Residents' access to clean water, public safety, and health services diminished, not through a sudden catastrophe, but through years of slow erosion and public abandonment (Pulido 2016). This acute financial distress triggered the imposition of the state's Emergency Manager (EM) system in 2011 (Pulido 2016). This policy created an extreme difference in state control based on race: by 2013, 50% of all Black residents in Michigan lived under EM, compared to just 2% of white residents (Pulido 2016). The appointments stripped elected officials of their power, replacing them with unelected officials, known as Emergency Managers (IWL Rutgers 2022). The Emergency Managers operated under a philosophy of extreme austerity, where the rule was to save money (Compton 2021). This meant that generating budget savings took priority over providing essential services or protecting public health (Pulido 2016). The state ignored community voices and concerns raised by the predominantly poor and minority population. In Flint, this dynamic eroded trust and removed mechanisms for local accountability. The imposition of emergency management also had gendered consequences. Local governance structures that historically relied on women's civic leadership—school boards, neighborhood councils, community health groups—were sidelined, disempowering many of the women who served as the connective tissue of Flint's public life. This political disenfranchisement magnified the vulnerability of families who depended on these women-led community networks.

Despite mounting infrastructural failures, Flint remained largely invisible in mainstream national discourse. Media scholars have pointed out that the long-term neglect of majority-Black cities like Flint rarely makes headlines unless catalyzed by scandal (Pulido 2016). This invisibility contributed to a policy environment where short-term cost savings were prioritized over long-term safety, especially for marginalized populations with limited political capital.

Flint had been under state-appointed emergency management since 2011, a governance structure that transferred decision-making authority from locally elected officials to unelected state appointees (Scorson 2011). Critics argued that the system disproportionately impacted the majority Black cities and silenced local democratic processes (AAPexperience 2016) While supporters claimed emergency managers were needed to prevent bankruptcy, many Flint residents saw their authority as undemocratic. The city council and mayor were stripped of decision-making power. Residents no longer had meaningful input into key public policies (AAPexperience 2016).

Amid this state of economic collapse, racial inequity, and political disenfranchisement, Flint's public health infrastructure weakened just as its residents' needs grew most urgent (Hanna-Attisha et al. 2016). The absence of responsive government oversight compelled physicians to assume roles beyond clinical care, positioning them as advocates as well as healers (Riley 2024). In communities like Flint, doctors served as critical witnesses to systemic neglect, using science and compassion to illuminate what politics ignored. It was within this climate that Dr. Mona, a pediatrician firmly rooted in Flint's community, would come to embody the moral and civic responsibilities of medicine in times of crisis.

Dr. Mona Hanna-Attisha: Immigrant, Physician, Advocate

Dr. Mona was born in 1976 to Iraqi Parents in Sheffield, England, after her family fled the oppression of Saddam Hussein's Baathist regime in the 1970s (Hanna-Attisha 2018, 8). Her parents were trained scientists who chose exile over living under tyranny, sacrificing their home for the chance to live in peace and freedom (Hanna-Attisha 2018, 10). When Mona was still an infant, the Hanna family emigrated to the United States, eventually settling down in Michigan. Her father found work as a metallurgical engineer with General Motors, and her mother became a

teacher, by teaching English to fellow immigrants as the family built a new life in the American Midwest (Hanna-Attisha 2018, 10).

Growing up in her immigrant household, Dr. Mona had a foundational sense of community and justice. Her parents' experiences as newcomers instilled in her the ideals of public service and an acute awareness of how precious freedom and safety are (TEDMED 2017). As a child, Dr. Mona received prevalent lessons about injustice that seared themselves into her conscience. Around the age of ten, her father showed her photographs of victims of various chemical weapon attacks on the Kurdish city of Halabja in modern-day Iraq. These images consisted of men, women, and children who were cruelly gassed by Saddam's regime (Hanna-Attisha 2018, 11). She also grew up reading letters from relatives who remained in Iraq, which were often censored or contained descriptions of life under dictatorship (Hanna-Attisha 2018, 11). Together, these early experiences shaped her understanding of injustice as something lived and embodied, rather than abstract, and left a lasting imprint on how she viewed responsibility and care (Burke 2018).

Dr. Mona's conscience quickly translated into action as she grew older. As a high schooler in Royal Oak, Michigan, she emerged as an outspoken environmental activist, channeling her awareness of injustice into local causes (Hanna-Attisha 2018, 37). She joined her school's environmental club and began a campaign to stop a toxic waste incinerator from reopening near a neighborhood elementary school in Madison Heights (Hanna-Attisha 2018, 48). Alongside other friends, Mona organized community protests and petition drives against the trash-burning incinerator, which was spewing pollution linked to asthma and other health problems in nearby working-class suburbs (Hanna-Attisha 2018, 48). The teenagers' grassroots campaign succeeded, and they helped shut down the Madison Heights incinerator in 1992, eliminating a source of poisonous emissions in their community (Hanna-Attisha 2018, 49). Seeing that evidence-based advocacy and collective action could tangibly improve people's lives was a revelation for young Dr. Mona.

"Going to protests, wearing a lot of tie dye, that was my thing," she later said of her teenage years, fondly recalling how deeply she embraced advocacy as part of her identity (Michigan Environmental Council 2016). Organizing against the incinerator was an early lesson in how science and civic engagement intersect. She saw that data about pollution's health effects could be a powerful tool to persuade officials and that a determined community could demand change (Michigan Environmental Council 2016). Dr. Mona's early years of advocacy trained her in evidence-based advocacy, a skill that would serve her well in the future (Hanna-Attisha 2018, 46). Dr. Mona carried her commitment to social and environmental justice into her higher education, deliberately weaving together scientific inquiry and civic action. She enrolled at the University of Michigan for her undergraduate studies from 1994-98, where she continued to distinguish herself as a scholar and organizer (Michigan Environmental Council 2016). Mona led voter registration drives on campus and organized alternative spring break trips focused on community service. She served as an undergraduate representative on a committee that established an environmental theme semester at the university and created an honors concentration in ecological health within the University of Michigan's School of Natural Resources and Environment (Michigan Environmental Council 2016). As an undergraduate researcher, she investigated how industrial pollutants like PCBs affect pregnancy outcomes, even publishing findings as an undergrad. She was mentored by Professor Bunyan Bryant, a Flint native and pioneer in environmental justice (Michigan Environmental Council 2016).

Reflecting on that period, she later recalled that "everything in my past had trained me to be cognizant of the role of the environment in health," a realization that "prompted me to go to

medical school” (Michigan Environmental Council 2016). She earned a Bachelor of Science and a Master of Public Health from the University of Michigan before attending Michigan State University’s College of Human Medicine. Understanding that individual care alone would not solve systemic problems, she pursued advanced training in public health policy and management alongside her MD (Michigan Environmental Council 2016). After her medical school years in 1998-2002, she completed her pediatric residency at the Children’s Hospital of Michigan in Detroit, including a year in leadership as chief resident in 2005-06. Practicing in Detroit gave her frontline experience with children from communities plagued by poverty and environmental health disparities. This reinforced her conviction that physicians must address the upstream causes of illness, not just the symptoms. She emerged as a pediatrician and physician-advocate blending science, ethics, and activism (Burke 2018).

Launching her career in the late 2000s, Dr. Mona moved back to Flint in 2011 to direct the pediatric residency program at Hurley Medical Center (AAPexperience 2016). She worked to integrate community engagement and preventive care into pediatric education. In 2015, she spearheaded the relocation of Hurley’s pediatric clinic into the Flint Farmers’ Market, aiming to embed healthcare where families accessed food and to promote nutrition as part of pediatric care (AAPexperience 2016).

Beyond clinical innovation, she served on the Michigan State Board of the American Academy of Pediatrics and was appointed to a Public Health Code Advisory Committee by Governor Rick Snyder in 2016 (Pietila 2016). These leadership roles allowed Dr. Mona to advocate for policies benefiting vulnerable children. She also mentored students and gave talks about urban health disparities, consistently encouraging healthcare providers to be vocal advocates. For Dr. Mona, being a pediatrician meant more than treating illness; it meant speaking up for children who could not speak for themselves (AAPexperience 2016).

By the mid-2010s, Dr. Mona had come to embody a rare blend of roles, including pediatricians, researchers, educators, and activists (SuperSummary n.d.). Her upbringing, education, and early career had prepared her for the challenge ahead. Her story was shaped by a blend of immigrant resilience, scientific training, and a moral imperative to protect society’s most vulnerable, specifically children, even in the face of political backlash. These formative experiences also shaped how Dr. Mona understood her role as a woman physician. Pediatric care is culturally coded as communal work because of the nurturing, protective, and child-focused traits expected of women. She would later leverage that gendered moral authority to justify moving quickly, even as she anticipated being judged more harshly for “breaking ranks” than a male counterpart might be (Burke 2018; AAPexperience 2016).

The Crisis Unfolds: A City Poisoned by Negligence

It was an ordinary summer evening in 2015 when Dr. Mona’s world quietly shifted. At a casual backyard barbecue, she found herself deep in conversation with her high school friend, Elin Betanzo, an environmental engineer and former Environmental Protection Agency (EPA) official. Their talk turned to Flint’s recent switch to the Flint River as its water source, which was an issue that, until that moment, Dr. Mona had trusted was under control. Betanzo’s tone was grave and quiet when she explained that Flint’s water was not being treated with the federally required corrosion control chemicals, a failure that would allow lead to leach from the city’s aging pipes into residents’ drinking water (Hanna-Attisha 2018, 43).

In that moment, time seemed slow. Hanna-Attisha felt an icy wave of realization course through her (Hanna-Attisha 2018, 37). As a pediatrician, she did not need to consult a textbook

to grasp the implications. She knew that lead was a potent, irreversible neurotoxin, particularly dangerous to children whose brains are still developing. A neurotoxin is defined as a chemical that causes damage and impacts the efficiency of the central nervous system and peripheral nervous system in the human body (ScienceDirect n.d.). “All pediatricians know lead,” she would later write, recalling how Betanzo’s warning left her stunned (Hanna-Attisha 2018, 217). She felt the fog of her assumptions begin to lift. Dr. Mona found herself returning again and again to Reeve and her infant daughter, Nakala. Reeve, a young Black mother working as a waitress with little flexibility and no paid time off, had made a practical decision based on what she had been told was safe, never imagining that something as ordinary as tap water could place her child at risk. Like many in the medical community, she had believed that the state and federal authorities were protecting public health. But now, the terrifying possibility emerged that Flint’s children—her patients—were being silently poisoned by the very water they drank. That realization pointed beyond the clinic and toward decisions made far upstream from any examination room.

Betano’s warning was rooted in a decision made in April 2014. Under the authority of a state-appointed emergency manager, the city of Flint, Michigan, switched its water supply from the Detroit Water and Sewage Department’s treated Lake Huron water to the long-contaminated Flint River (Myers 2018). The switch was presented as a temporary cost-saving measure (Wang n.d.). City officials estimated that using the Flint River instead of joining the regional water system would save eight million dollars (Menendian 2018). At the time, Flint was already struggling financially and operating under state control, and state officials viewed the change as necessary to balance the budget.

Construction on the Karegnondi Water Authority (KWA), a regional water pipeline intended to provide Flint with a long-term independent water supply from Lake Huron, began in 2013 (Qattea 2019). This infrastructure project unfolded under Michigan’s emergency management system, which allowed state-appointed officials to govern financially distressed cities and drew criticism for sidelining resident input. This combination of fiscal strain, austerity-driven decisions, and reduced local oversight created the context that set the stage for the crisis that followed (AAPexperience 2016). The KWA project was the new pipeline to Lake Huron and was not expected to be completed until 2016 (Hanna-Attisha et al. 2016). In the interim, under emergency management, Flint officials switched to the Flint River as a temporary water source during this perpetual transition period (Qattea 2019). The switch was intended to be temporary. However, the Flint River water was highly corrosive, and officials failed to apply corrosion inhibitors, which create a protective coating inside pipes and prevent lead from leaching into the water. This failure of the state to adhere to standard water treatment practices had severe consequences, exposing how children were being silently poisoned by the very water they drank (TEDMED 2017).

Within days, residents began noticing the change. The water was murky, foul-smelling, and tasted metallic (Ruckart 2019). Parents bathed their children in water that left rashes. Elderly residents grew sick, yet officials insisted everything was normal and following schedule (AAPexperience 2016). These initial complaints were dismissed, and the residents were told the water was safe (Hanna-Attisha et al. 2016).

This government reassurance quickly became a broken record. Officials repeatedly claimed the water was safe to drink, even as citizens, many of them mothers, came forward with photos of discolored water and stories of unexplained illnesses in their children (AAPexperience 2016). Mothers who documented changes in their children’s health were not treated as early witnesses to

a public health failure, but as anxious parents whose concerns could be brushed aside. In some neighborhoods, children began experiencing frequent nosebleeds, stomach aches, and behavioral changes (Kennedy 2016). One mother, LeeAnne Walters, noticed her twin boys had stopped growing, and her daughter developed mysterious rashes (Mack 2018).

Walters, a stay-at-home mother of four, became a crucial early detector of the crisis, which required close monitoring of her children and home environment. Her initial concerns began with noticing an orange-brown tinge to the tap water and observing physical symptoms in her family, including an unexplained rash on both of her three-year-old twins and hair loss for all four of her children (Kennedy 2016). Walters' diligence led to private testing in February 2015, which confirmed lead levels in her drinking water at 104 parts per billion (ppb), far exceeding federal action levels (Kennedy 2016). Her immediate awareness of her children's daily exposure to the contaminated water, used for bathing and formula preparation, positioned her to detect the harm faster than municipal officials (Mack 2018). However, officials aggressively dismissed her documented findings, assuring residents the water was safe and minimizing her high lead result as an "outlier" or an "isolated case" (Mack 2018; Kennedy 2016). This institutional resistance was rooted in the prevailing sociopolitical context of Flint, a poor, predominantly minority city, where the complaints of residents, especially mothers, were systematically devalued; officials focused on "technical compliance" rather than public protection (Bridge Staff 2016, n.p.). Officials disregarded citizen activists like Walters, describing them internally as "very vocal residents" who were "keeping everyone hopped-up and misinformed" (Bridge Staff 2016, n.p.).

The Michigan Department of Environmental Quality (MDEQ) issued statements declaring that the water met all safety standards (Hanna-Attisha 2018, 125). Meanwhile, the Flint River's corrosive water, untreated with federally mandated corrosion inhibitors, was eroding lead from aging piped into homes across the city (Natural Resources Defense Council 2024). This silent contamination unfolded beneath a guard of political denial, as officials downplayed or ignored the mounting evidence of a problem.

In the summer of 2015, independent engineers led by Marc Edwards at Virginia Tech conducted extensive in-home tap water testing across Flint using citizen-collected samples (Hanna-Attisha 2018, 98). Their analysis showed that approximately 40% of first-draw samples exceeded 5 parts per billion (ppb) of lead, with numerous samples surpassing the EPA action level of 15 ppb and some exceeding 100 ppb, raising urgent concerns about the safety of Flint's drinking water (Hanna-Attisha 2018, 136). These findings intensified concerns raised earlier by water experts and provided critical context for Dr. Mona's subsequent analysis of pediatric blood lead levels, which sought to determine whether children were already being harmed.

In the hours after reviewing pediatric blood lead level spreadsheets drawn from hospital records, Dr. Mona and her team repeatedly reanalyzed the data, testing multiple assumptions and methods, only to arrive at the same unsettling conclusion: the proportion of Flint children with elevated lead levels was rising at a time when such levels had been declining nationwide (Hanna-Attisha 2018, 271-272). Seeking independent technical validation, Dr. Mona collaborated with Dr. Marc Edwards, a municipal water-quality expert from Virginia Tech, whose scientific and engineering expertise in water corrosion and lead contamination helped validate her research findings. Dr. Edwards' data provided the technical foundation and context needed to strengthen her evidence and to better understand the scope and implications of the emerging evidence (Hanna-Attisha 2018, 255).

Scientific Investigation: Exposing the Truth

Dr. Mona's clinical duty to act quickly stood in contrast to the slower, methodical pace of the scientific establishment (Hanna-Attisha 2018, 230). She was expected to gather data, seek peer review, and publish it. That process would take months, and children were poisoned during that time. Dr. Hanna saw several routes she could take. She could wait and go through the lengthy publication and peer review processes, or she could go public immediately to protect Flint's children.

Dr. Mona, recognizing the potential for irreversible harm from lead, chose to conduct a critical study rapidly, defying the typical academic publishing process, which generally entails long peer-review periods before a public announcement is made (Hanna-Attisha 2018, 230). Titled "Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response," the study aimed to prove that the city's change to the highly corrosive Flint River water, without necessary corrosion control, was the probable cause of lead exposure in children (Hanna-Attisha et al. 2016). Utilizing a retrospective, epidemiological approach, her team analyzed Blood Lead Levels (BLLs) for all children younger than five years whose blood tests were processed through the Hurley Medical Center laboratory (Hanna-Attisha et al. 2016). The study compared two identical time periods, January 1 through September 15, 2013 (pre-switch), and January 1 through September 15, 2015 (post-switch), examining the incidence of elevated blood lead levels (≥ 5 $\mu\text{g}/\text{dL}$) among children living inside Flint relative to those living outside the city who remained on an unchanged water source (Hanna-Attisha et al. 2016). Crucially, the researchers leveraged the Epic electronic medical record (EMR) system to quickly extract and analyze the data. As Dr. Mona stated, "If we did not have Epic, if we did not have EMRs, if we were still on paper, it would have taken forever to get these results" (Versel 2016, n.p.).

The results of the analysis provided evidence of a public health disaster: the proportion of children in Flint with EBLLs doubled overall after the switch, rising from 2.4% to 4.9% (Hanna-Attisha et al. 2016). This increase was a statistically significant reversal of a four-year declining national trend (Hanna-Attisha et al. 2016). Using Geographic Information System (GIS) technology for spatial analysis, the team observed uneven geographic patterns that suggested higher risk in certain neighborhoods within the city (Hanna-Attisha et al. 2016). In the wards with the highest documented Water Lead Levels (WLLs), the percentage of children with EBLLs nearly tripled, skyrocketing from 4.0% to 10.6% (Hanna-Attisha et al. 2016). Given that no alternative environmental factors could account for the increase, the findings strongly implicated the water source change.

Although Dr. Mona's study followed standard clinical-epidemiologic methods, it had not yet completed peer review; the ethical question she faced was whether waiting for publication was acceptable given ongoing pediatric harm (Hanna-Attisha 2018, 231). The norms of academic publishing generally discourage researchers from making bold public claims without extensive peer review, especially women and early-career scientists (Compton 2021; IWL Rutgers 2022). Her internal debate was not just about scientific ethics, but also about navigating a professional culture that often penalizes women more harshly for stepping out of line.

Beyond the practical risk for her career, Dr. Mona also worried about alienating professional allies. She had spent years cultivating credibility in the medical and academic community. Would releasing non-peer-reviewed data damage that reputation permanently? The decision left her feeling isolated, without clear institutional guidance or support.

As the evidence accumulated, Hanna-Attisha faced several possible courses of action, each holding distinct implications for her professional standing and for the unfolding public health emergency. One option was to continue gathering data until she achieved the level of scientific certainty typically required for publication. This approach aligned with disciplinary norms and would limit professional risk, but it would also prolong the period during which Flint's children were exposed to lead. A second option was to bring her concerns quietly to state agencies and internal medical leadership. This path preserved institutional relationships and minimized public conflict, yet the state's prior pattern of dismissing residents' complaints suggested that quiet channels might not prompt immediate action. A third option was to publicly disclose her preliminary findings, prioritizing rapid communication over the slower pace of traditional scientific review. This carried the greatest personal and professional risk, including potential criticism for acting before peer review, but it offered the most immediate chance of alerting families, reducing exposure, and shifting public attention toward the crisis. The tension among these options reflected the broader dilemma she confronted as a physician whose duty to protect children operated on a timeline far more urgent than that of scientific consensus or state bureaucracy.

Conclusion

Dr. Mona's experience raises broader questions about leadership in public health crises. How should clinicians navigate the slow norms of peer review when children face immediate exposure to neurotoxins? What does it mean for a woman physician, especially a brown immigrant woman, as she described herself, to confront state authority in defense of marginalized communities (Hanna-Attisha 2018, 226)? To what extent are women leaders penalized for deviating from expectations of composure and deference, even when acting on empirical evidence? Her case also highlights the significance of gendered networks of care, including mothers like LeeAnne Walters, community advocates, and interdisciplinary collaborators, whose labor and expertise strengthened her airtight argument and amplified her call to action (Hanna-Attisha et al. 2016; IWL Rutgers 2022). Dr. Mona's dilemma invites readers to consider how feminist leadership operates at the intersection of science, ethics, and political power, and what responsible action looks like when institutional norms collide with the urgent needs of children.

Epilogue

The tide began to turn following Dr. Mona Hanna-Attisha's historic press conference on September 24, 2015, where she stood before the public in her white coat and announced that Flint's children had been exposed to lead-contaminated water. Despite the professional risks of losing her credibility, damaging her reputation, or jeopardizing her medical license, she chose to act on preliminary data rather than wait for peer-reviewed publication, explaining that; "waiting would mean more children being harmed" (Hanna-Attisha 2018, 238). State officials immediately rejected her conclusions as irresponsible, "unfortunate," and "near hysteria," language that Hanna-Attisha later identified as a familiar form of sexist hysteria used to discredit women who raise scientific alarms (Hanna-Attisha 2018, 264; 277). Yet within 24 hours, the state issued a lead advisory that implicitly validated her findings (Hanna-Attisha 2018, 270). Independent confirmation by the Virginia Tech team revealed dangerous lead levels in household samples (Pieper et al. 2018). Subsequent CDC and Agency for Toxic Substances and Disease Registry (ATSDR) analyses showed that the percentage of Flint children with elevated blood lead levels increased from 3.1% to 5% after the switch, aligning with Dr. Mona's findings (Centers for

Diseases and Control and Prevention 2025). Genesee County then declared a public health emergency, and Flint reconnected to the Detroit water system after eighteen months of corrosive, untreated water (Hanna-Attisha et al. 2016).

National attention reframed the crisis as environmental injustice affecting primarily poor Black families and federal action followed, with President Obama's emergency declaration and Governor Snyder's admission that the state's data aligned with Dr. Mona's findings (Kennedy 2016). The arc from dismissal to validation also reveals a gendered pattern: once male-led institutions, including state agencies and engineering teams, publicly aligned with her conclusions, Dr. Mona's claims were reframed as legitimate. Long-term consequences for Flint families persisted, as the Flint Registry documented elevated anxiety, depression, and educational challenges among exposed children (Riley 2024). An independent task force later faulted the Michigan Department of Environmental Quality and criticized the emergency manager system for prioritizing budgets over health (IWL Rutgers 2022). Media attention also amplified the efforts of women like LeeAnne Walters, whose early warnings were dismissed until substantiated by external experts, underscoring how gender and positionality shaped which voices were treated as credible throughout the crisis (Kennedy 2016).

Ultimately, the crisis reshaped understandings of leadership in public health. Dr. Mona's refusal to be silenced, even amid institutional resistance and gendered attacks, demonstrated the moral courage required when scientific evidence and political power collide. She later reflected, "We each have the power to fix things. We can open one another's eyes to problems." (Hanna-Attisha 2018, 17). Dr. Mona's decision to continue fighting for Flint's children after 2015 evolved into a sustained public health advocacy campaign. She emphasized that uncovering the crisis was only the beginning: "Science had been ignored and denied in Flint, but it was science that was critical to uncovering the crisis. Our science spoke truth to power. And now I wanted the science of child development to lead the way in our recovery," (Hanna-Attisha 2018, 275). In early 2016, she partnered with Michigan State University and Hurley Children's Hospital to launch the Pediatric Public Health Initiative (PPHI), bringing together experts to assess, monitor, and intervene to support Flint's children (IWL Rutgers 2022, n.p.).

Through PPHI's nutrition programs, developmental services, and educational support, she helped establish a long-term safety net for families. Dr. Mona's leadership gained national recognition, including honors from *Time*, *USA Today*, and the Ridenhour Prize for Truth-Telling (Chicago Studies 2021; IWL Rutgers 2022; Booker 2021). She also became a prominent voice in national policy debates, testifying before Congress and challenging weaknesses in the federal Lead and Copper Rule while urging stronger protections grounded in Flint's lessons (Chicago Studies 2021; IWL Rutgers 2022).

Dr. Mona's post-2016 advocacy ensured that Flint's crisis became a catalyst for reforms rather than a forgotten disaster. Through PPHI and her national outreach, she continued urging the country to address inequities so that no community would again rely on children's resilience to survive preventable harms (Riley 2024). Her commitment transformed a local public health emergency into a national call for accountability and justice.

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Appendix A: Timeline of Key Events of the Flint Water Crisis Involving Dr. Mona Hanna-Attisha

1. **1960s** – Flint, Michigan, thrives as a General Motors hub with a population of nearly 200,000 and high union employment (Kitzmilller 2015).
2. **1970s–2000s** – Economic decline begins due to globalization and automation; GM reduces its Flint workforce from 80,000 to under 8,000 by 2010 (Barba 2020).
3. **2011** – Flint placed under emergency management due to financial distress (Scorsone 2011).
4. **2013** – Construction begins on the Karegnondi Water Authority (KWA) pipeline, projected for completion in 2016 (Qatteea 2019).
5. **April 2014** – Flint switches from Detroit Water to the Flint River as a temporary source to save money under emergency manager control (Lee et al. 2016).
6. **Summer 2014** – Residents begin complaining of discolored, foul-smelling water and health symptoms like rashes and hair loss.
7. **February–July 2015** – LeAnne Walters partners with Marc Edwards (Virginia Tech) to conduct independent water testing; data reveals extreme lead levels (Mack 2018).
8. **August 2015** – Dr. Mona Hanna-Attisha learns from Elin Betanzo that Flint’s water lacks corrosion control, sparking her own investigation (Hanna-Attisha 2018, 36–37).
9. **September 24, 2015** – Dr. Mona holds a press conference announcing elevated blood lead levels in Flint children (Hanna-Attisha 2018, 256).
10. **October 1, 2015** – Genesee County declares a public health emergency.
11. **October 16, 2015** – Flint reconnects to Detroit’s water system after 18 months on Flint River water.
12. **December 14, 2015** – Flint’s mayor declares a state of emergency.
13. **January 5, 2016** – Michigan Governor Rick Snyder declares a state of emergency.
14. **January 16, 2016** – President Obama issues a federal emergency declaration.
15. **2016** – Dr. Mona co-founds the Pediatric Public Health Initiative (PPHI) with MSU and Hurley Medical Center.
16. **2016–2021** – Independent studies from CDC and Virginia Tech confirm Dr. Mona’s findings; national media and policy attention follow.
17. **2021** – \$641 million settlement awarded to Flint residents, primarily children (Cohen Milstein Sellers & Toll PLLC. n.d. 2021).
18. **2020–2024** – Dr. Mona testifies before Congress, advocates for stronger lead regulations, and continues to work through PPHI and Flint Registry (Harvard Public Health 2024).

Appendix B: Table of Demographic Comparison of EBLs conducted during Dr. Mona Hanna-Attisha’s co-authored Study

TABLE 1—Demographic Comparison of the Time Periods Before (Pre) and After (Post) Water Source Change From Detroit-Supplied Lake Huron Water to the Flint River, by Area: Flint, MI, 2013 and 2015

Characteristic	Outside Flint		All Flint		High WLL Flint		Lower WLL Flint	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Gender, %								
Male	51.6	49.5	48.6	52.9	47.6	54.4	49.1	52.3
Female	48.4	50.5	51.4	47.1	52.4	45.6	50.9	47.7
Race/ethnicity, %								
African American	24.3	24.5	69.4	70.6	74.9	78.8	67.0	66.9
Other categories	75.7	75.5	30.6	29.4	25.1	21.2	33.0	33.1
Age, y, mean	1.89	1.83	2.09	2.06	2.06	2.02	2.11	2.07
Overall socioeconomic disadvantage score	-0.83	-0.98	2.94	2.88	2.18	2.39	3.28	3.10

Note. WLL = water lead level. No statistically significant differences were found in any pre–post value within any of the 4 geographical areas.

(Hanna-Attisha et al. 2016)