



SCHOOL OF HEALTH PROFESSIONS & STUDIES

PUBLIC HEALTH & HEALTH SCIENCES

The Flint Water Crisis: How Inequities Poison

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March 31,2017



FLINT WATER CRISIS

Where is Flint, Michigan?

- Surrounded by the large constellation of the Great Lakes
- Largest concentration of fresh water in the world
- Lake Huron is the source of water for Flint





Flint - Vehicle City

- A booming auto town in early 1900's
- 1978 population: >200,000
- General Motors employs about 80,000 Flint residents in 1978 with highest US per income capita



- Factories begin to close in 1980's
- Residents employed by GM falls by 90% to ~8,000 by 2006
- Population <100,00 by 2011



Tiebout Model

A PURE THEORY OF LOCAL EXPENDITURES¹

CHARLES M. TIEBOUT
Northwestern University

...NE of the most important recent goods which reflects the preferences of

Tiebout Model Concepts

- Consumers free to choose their community
- Local control of cities improves services
- Competition between cities promotes improvement

Results

- Growth of independent townships weakened Flint tax base
- Promoted racial segregation
- Contributed to financial crisis



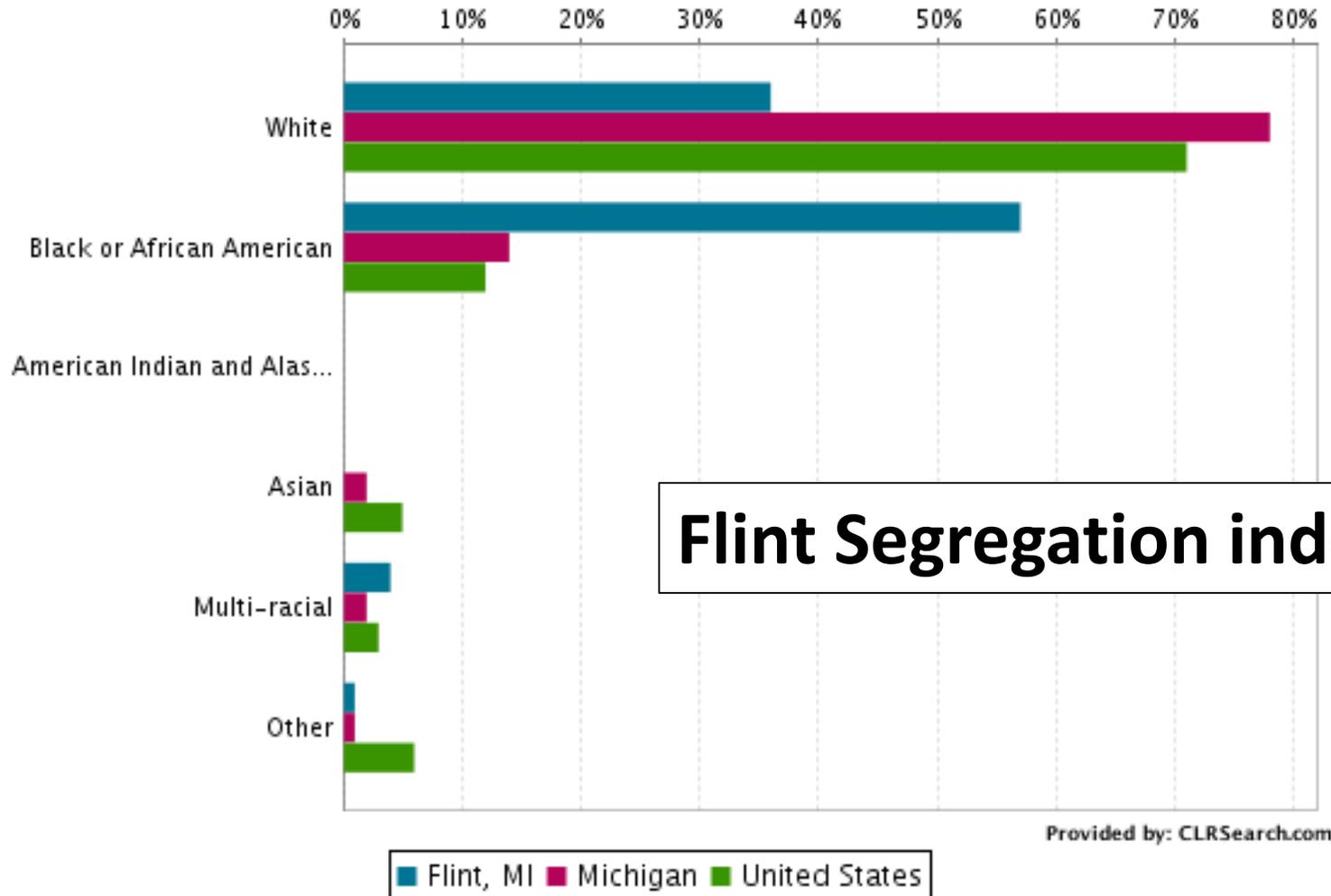
Who were the residents of Flint, Michigan in 2014?

Population	99,000
Under 18 years old	27.3%
African American	56.6%
White	37.3%
H.S. Graduate (>25 yrs old)	81.7%
Bachelors Degree (>25 yrs old)	11.0%
Median Household Income	\$24,834
Households under Poverty Level	41.6%
Median Home Value	\$24,834
Grocery Stores	4 (3 have since closed)



Racial Makeup: Flint, Michigan and US

2012 Population by Race for Flint, MI



Flint Segregation index score = 94.4



Source of Drinking Water

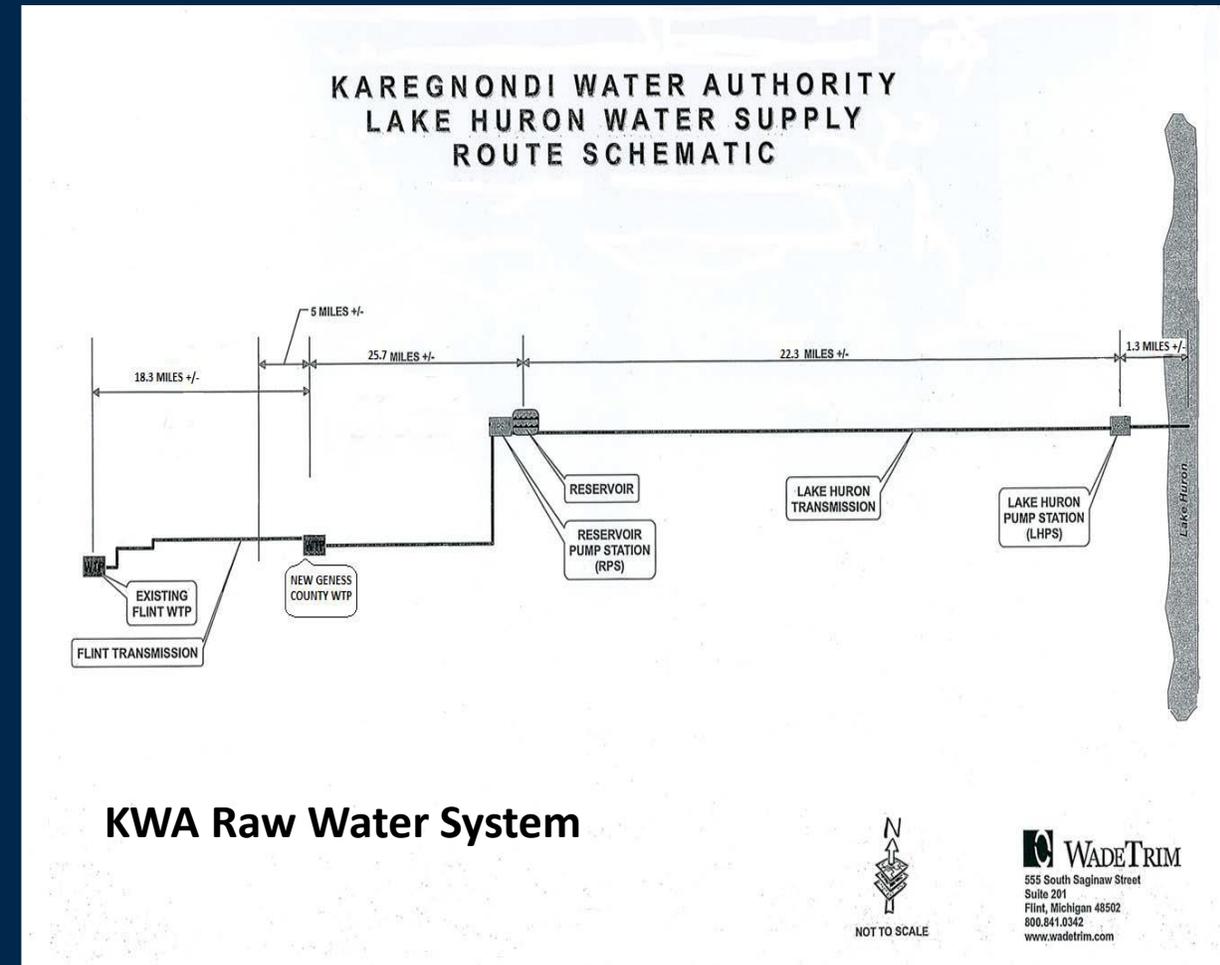
- Prior to 2014 Flint purchased water from the Detroit Water and Sewerage Authority (DWSA)
- City was mandated to clean up Flint River which had been contaminated by industrial waste and dumping
- Water rates spiked
- Flint leaves DWSA to sign on with proposed pipeline project, Karegnondi Water Authority (KWA)
- Needed interim water supply





Karegnondi Water Authority (KWA) April 16, 2013

- Pipeline project to acquire water directly from Lake Huron instead of Detroit Water and Sewerage Department (DWSD)
- Projected to save Flint \$19 million over 8 years
- Not scheduled to open until 2016
- Approved by state
- Signed by EM, Ed Kurtz



http://mediad.publicbroadcasting.net/p/michigan/files/201512/water_report.pdf



Switch is Flipped April 25, 2014

The City of Flint's water supply is switched from the DWSD to water taken from the Flint River as a toast is made by City officials including EM Earley



<http://www.motherjones.com/files/flint-water-toast-315.png>



Problems with the Flint River as a Source

- Local water treatment plan did not have capacity to treat water
- Water not treated properly, anti-corrosives not added
- Protective biofilm broke down and leached lead and copper from pipes
- E.coli and unsafe levels of chlorine by-product to kill E.coli



<http://rightmi.com/flint-water-quality-michigan-taxpayers-are-going-to-pay-for-it>



Complaints Begin May 2014



- Color
- Smell
- Taste

- Rashes
- Sickness
- Hair loss



www.flintwaterstudy.org



General Motors Stops using Flint River Water - October 2014

General Motors shutting off Flint River water at engine plant over corrosion worries



By Bob Foster | [ifoster@mlive.com](http://www.mlive.com)

AN OCTOBER 13, 2014, 10:18:00 PM; UPDATED JANUARY 17, 2015, 10:15:00 AM

FLINT, Mich. — Chloride levels in treated Flint River water are so high that General Motors will no longer use it at its engine plant here because of fears it will cause corrosion.

GM spokesman Tom Wolkstein said Monday, Oct. 13, that the company has reached a temporary agreement to buy Lake Huron water from Flint Township for Flint Engine Operations on West Britton Road.

FLINT WATER

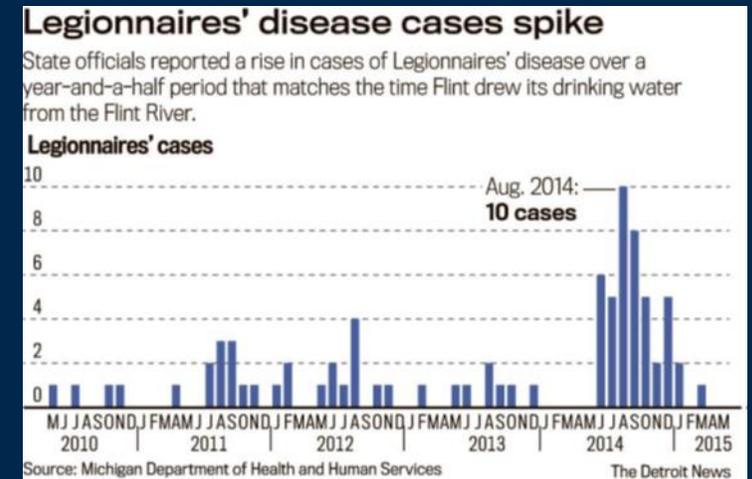
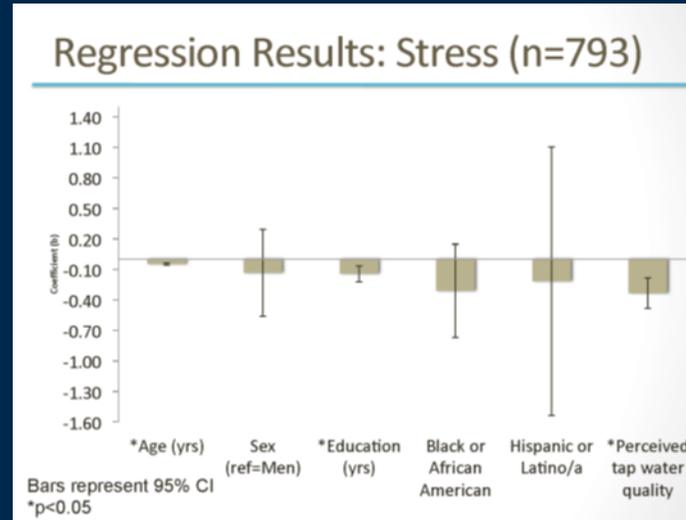
[New Flint election Democrats
call for Snyder resignation](#)

[How Flint water crisis is unfolding](#)



Damage to Flint Residents

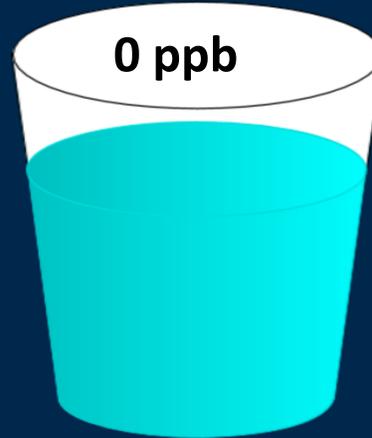
- Various medical problems were reported: skin rashes, hair loss, fatigue, stress, depression, high blood pressure
- Local health department reported epidemic levels of shigellosis and legionnaires disease
- Local agencies identified high levels of PTSD and stress among residents





Flint Resident's Home Water Tests High for Lead – February 25, 2015

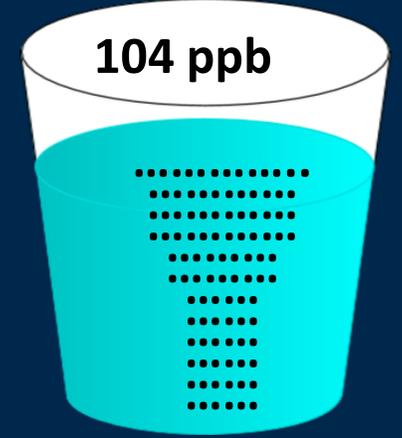
Flint Resident LeeAnn Walters' water is tested and has a lead level of 104 ppb



EPA Maximum Contaminant Level Goal



EPA Action Level



Level in Walters' Home

- In April 2015, Ms. Walters' son tests positive for lead poisoning
- City officials find lead in the service line leading to the Walters' home
- The Walters' water is shut off and the home is connected to the neighboring home's garden hose



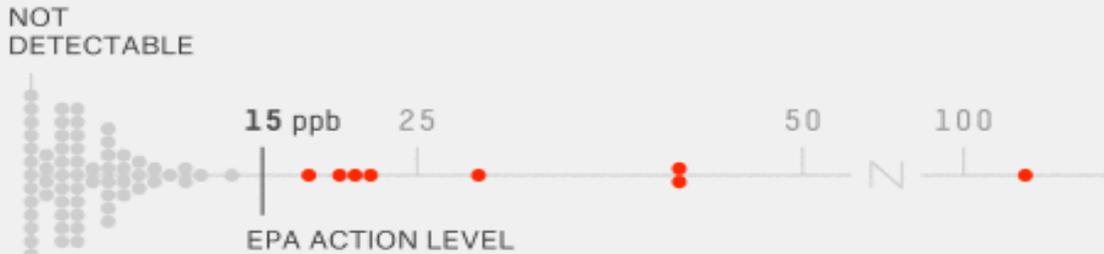
State Revises City's Samples

August 20, 2015

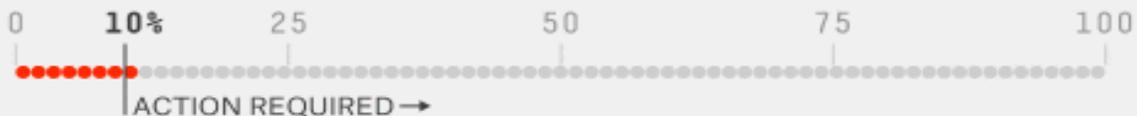
State excludes 2 of City's 71 water samples collected
Citing violation of testing guidelines

If the DEQ had **included all of the water samples it took**, federal law would have demanded further steps ...

LEAD LEVELS IN WATER SAMPLES



PERCENTAGE OF SAMPLES EXCEEDING 15 PPB



... but the **exclusion of two high-lead samples** put the city's water supply below the threshold for mandatory action.





Inaccuracies in Water Sampling and Testing

- Water sampling was incomplete and samples that tested high were discarded by the State
- Academic researchers with expertise in water sampling came to Flint and conducted more accurate sampling
- Results confirmed that there was a major problem
- Local pediatrician had data on children's blood lead levels which revealed major problem



Officials Say Water is Safe to Drink

January 6, 2015

- City officials say the water is safe
 - Advise that people with infants, the elderly and with compromised immunity check with their doctor before drinking the water
- Flint mayor, Dayne Walling says he and his family drink the water everyday
- State starts supplying its buildings in Flint with coolers of bottled water.



Fallout from Crisis: Who can I trust?

- Government lost credibility
- Causes schisms between levels of government
 - Federal, State, Local
- Mayor was replaced with current recall effort underway
- Decline in property values
- Damage to local businesses



The Flint Water Crisis Course

- Community engaged learning method
- Committee of university and community residents selected topics and speakers
- Skilled moderator who valued the concerns and anxieties of residents
- Faculty, students and community residents
- “Expert” panel members
- Bi-directional dialogue with community residents





Impact of the Water Course

- Community Voices heard
- Experts influenced by hearing residents' stories
- Empowered Flint residents
- Increased level of residents' engagement in supporting resolutions on HEiAP and Tobacco 21



Michigan Civil Rights Commission (MCRC) Report February 17, 2017

THE FLINT WATER CRISIS:

Systemic Racism
Through the
Lens

Report of the
Civil Rights Commission
FEBRUARY 17, 2017



**“...was race a factor in the Flint Water Crisis?”
Our answer is an unreserved and undeniable
— “yes” - MCRC**

1. The MCRC and the Michigan...
better job of resp...
represent...
2. ...non-making
Michigan
emergency manager law
and racism have played in our history,
to impact our present
trust and credibility through the creation of a “Truth and
Reconciliation Commission” and the integration of a racial equity
framework within state government
7. Create and implement a form of regional government (or at least
regional cooperation) that would require suburbs and the urban
cores from which they grew to work collaboratively to solve
problems



Investigating Skin Rashes

- Interviewers talked to 390 people with rashes and hair loss
- 80% classified as having water related skin conditions
- Identified large swings in chlorine levels, pH and water hardness from April 2014 to October 2015 (months when Flint River was water source)



Health Impact on Seniors



City of Flint Senior Needs Assessment How does the Flint water crisis impact its older citizens?



Submitted by
Public Policy Associates, Incorporated

July 18, 2016

- 30% of men and 40% of women report illnesses attributable to water crisis
 - Teeth loss and gum pain
 - Hair loss
 - Stomach and digestive complications
 - Psychological problems and stress
- 45% of senior do not have internet access



Water Use Avoidance

NEWS FLINT WATER CRISIS OCT 12 2016, 1:34 PM ET

Water Wary Flint Residents Face Bacterial Outbreak

by SAFIA SAMEE ALI

SHARE   

Flint residents and the surrounding counties are facing an uptick in a bacterial illness frequently associated with poor hand washing hygiene.

Genesee County, where Flint is the largest city, has seen a significant increase in shigellosis, a highly communicable illness that "can be stopped by frequent and careful hand washing with soap and taking other hygiene measures," according to the Centers for Disease Control and Prevention.



Registered Nurse Brian Jones draws a blood sample from Grayling Stiefek, 5, at the Eisenhower Elementary School, on Jan. 26, 2016 in Flint, Mich. The students were being tested for lead after the metal was found in the city's drinking water.  Carlos Osorio / AP

"It is not a pleasant illness," said Suzanne Cupal, Public Health Division Director with the Genesee County Health Department. "You lose weight, get dehydrated, vomit, and have bloody diarrhea."

Read More: Six More Officials Charged in Flint Water Crisis for Alleged Cover-Up

Genesee county had 76 confirmed of shigellosis since October of last year, she said. The average is about

20 per year. Neighboring Saginaw County has also seen a sharp rise in the infectious disease, she said.

"Most of what we're seeing is one person in a family contracts it and spreads it to the rest of household," she said. Proper hand-washing and water hygiene is an easy way to prevent the illness from spreading.

But many residents in the county still hold strong aversions to using tap water.

The sentiment resonates as collateral damage from the city's lead contamination crisis. Countless Flint residents suffered rashes, hair loss, and other health problems associated with using the city's water—which contained dangerously elevated levels of lead.

Read More: Water Systems Violate Lead Rules Nationwide, Advocacy Group Finds

The county also experienced an inordinate hike in legionnaires disease, which is still being investigated in connection with the water crisis. From May 2015 through November 2015, there were 42 cases of legionnaires. Three cases ended in death.

This year, 11 cases have been reported within Genesee County. The disease is spread by breathing in contaminated mists of water.

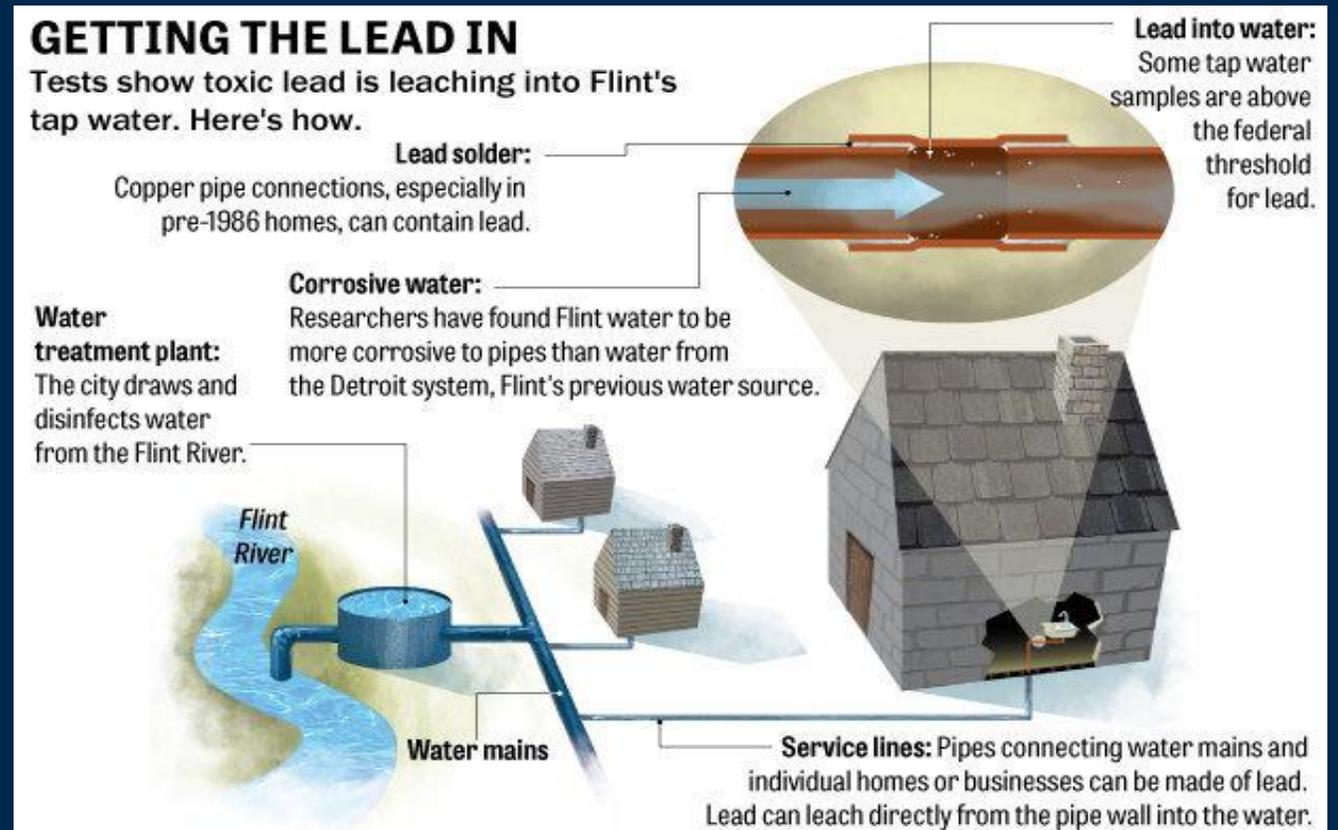
Genesee County had 76 confirmed of shigellosis since October average is ~20 per year

....can be stopped by careful and frequent handwashing



Where Did the Lead Come From?

- Lead was used in pipes because it is soft and easy to shape
- 1986 Safe Drinking Water Act required “lead free” pipes (<8%) and solder
- Amended in 2014 to <0.25%

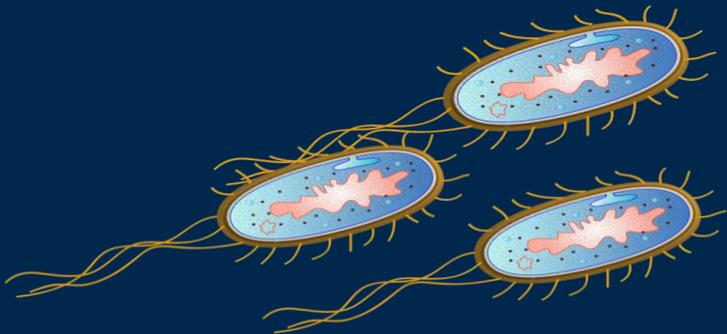




Boil Advisories

August 14 to September 9, 2014

- Water tests high for total coliform bacteria
- Residents and businesses told to boil or use bottled water for:
 - Drinking and making ice
 - Bathing and brushing teeth
 - Washing dishes and preparing food





Flint in Violation of Safe Drinking Water Act - January 2, 2015

- MDEQ issues notice of violation for total trihalomethanes (TTHM)
 - byproducts of disinfecting water
 - can be exposed by any contact with water
 - Associated with:
 - increased incidence of cancer
 - adverse reproductive outcomes
 - liver and kidney damage





EPA Asks Questions

February 27, 2015

- MDEQ's Michael Busch tells EPA that Flint Has a optimized corrosion control plan
 - Anti-corrosion chemicals (i.e., phosphates) should be added to water
 - Later found out that Flint was NOT using anti-corrosive chemicals



EPA's Miguel Del Toral Pens Memo – April 2015

- LeeAnn Walters contacts Miguel Del Toral from the EPA who visits her home and finds:
 - Extremely high lead levels in the water
 - No lead fixtures within the home
- Del Toral writes memo to the MDEQ
 - Voices concern about lead levels
 - Is told that Flint has a corrosion control plan in place



Del Toral's Memo Leaked

June 25, 2015

- Del Toral's memo is leaked to public in June
- EPA claims the memo was yet to be verified by federal regulators
- MDEQ's spokesperson, Brad Wurfel, tells Flint residents to "relax" and that it does not look like there is a lead problem on a broad scale



Michigan Emergency Manager (EM) Law – Public Act 4

- EM is appointed by the governor to manage the city if a city is having financial difficulties
- Governor Snyder appoints Mike Brown as Flint EM in November of 2011
- Brown is the first of four EMs for the City of Flint



<http://nbc25news.com/news/local/snyder-appoints-mike-brown-as-emergency-manager-in-flint?id=914408>



EM Earley Refuses to Switch Back

January 11, 2015

- City Council members ask to switch back to Detroit water
- EM Earley refuses says:
 - City will hire water consultants to fix water
 - Switching back to DWSD will cost \$12 million more



Emergency Manager
Darnell Earley



What can an Emergency Manager do?

- Hire/fire local government employees
- Renegotiate, terminate, modify labor contracts
- Sell, lease, or privatize local assets
- Revise contract obligations
- Change local budgets
- Initiate municipal bankruptcy proceedings
- Hire support staff
- **Cannot raise taxes**



Virginia Tech Finds High Lead Levels September 2015

- Miguel Del Toral puts LeeAnn Walters in touch with Dr. Marc Edwards, an expert on water treatment and corrosion, from Virginia Tech University
- Edwards and his team sampled and tested water from over 250 Flint homes and found:
 - Over 40% had concerning levels of lead
 - One sample tested at 13,000ppb



Dr. Edwards makes Announcements September, 2015

- Edwards
 - Flint has lead problem
 - City and state cannot be trusted to deal with it
- Flint and MDEQ
 - lead has not tested high
- Brad Wurfel
 - current lead levels are not new....hasty reaction would be irresponsible

Edwards shows what Flint water vs. Detroit water does to a nail





Damage to the Water System Infrastructure

- Pipes were damaged, need to be replaced
- Expensive and time consuming
- Pipes within homes needed to be replaced
- October 2014 – General Motors stops using Flint River Water
- Who will pay for this?



Conflicting Narratives

The People

- Flint residents very active in reporting problems with the water: taste, smell, color
- Reported skin rashes
- Used every means to bring concerns to health officials



The State Government

- Local health officials silenced by State Government
- Claimed water was safe to drink
- Lack of transparency
- Denied the problem
- Labelled residents as complainers





Confusion, Chaos and Conflicting Reports

Residents received conflicting information about safety of the water





Social Determinants of Health (SDH)

Foundational to Health Equity in All Policies (HEiAP)

- Public's health is impacted by broad array of factors beyond the purview of the health authority
- How are non-health public officials informed about SDH?
- Aligning priorities
 - Dialogue between stakeholders (both health and non-health focused)
 - Need to understand health implications of actions and decisions



Positive Outcomes: Health Equity in All Policies

- Local Board of Commissioners adopted a HEiAP resolution
- Subsequently adopted a Tobacco 21 policy which used the HEiAP framework
- Recognition of the importance of resilience in addressing this crisis
- Social networks and connectedness within communities



What is needed for HEiAP to succeed?

- Education of public officials outside of the health area of the Social Determinants of Health
- Show impact of policies that do not consider health: transportation, zoning, education, etc.
- Have to have an engaged public to demand enforcement of the resolution (involved, informed)
- Listen to the voices of those impacted by the problem



Hearing the Voices of those Impacted by Problem

- Create public spaces and opportunities to listen to and hear the voices of the people
- Create partnerships with organizations which have retained the trust of the people
- Engage the community in designing the format and content of forums and invite public officials





Principles of Health (Equity) in All Policies

Government of South Australia

Flint, Michigan- passed July 2016

Health in All Policies – the 10 principles

In November 2007, following the second part of Professor Ilona Kickbusch's Residency, a cross-government Health in All Policies (HIAP) Conference was held to discuss the opportunity to apply a HIAP approach in South Australia. During this conference Professor Kickbusch led the development of a series of principles which emphasised the importance of across-government work in addressing the determinants of health. These principles have played a pivotal role in underpinning the South Australian approach to HIAP.

A HIAP approach reflects health as a shared goal of all government. In particular it:

1. Recognises the value of health for the wellbeing of all citizens and for the overall social and economic development of South Australia—health is a human right, a vital resource for everyday life and a key factor of sustainability.
2. Recognises that health is an outcome of a wide range of factors—such as changes to the natural and built environments and to social and work environments—many of which lie outside the activities of the health sector and require a shared responsibility and an integrated and sustained policy response across Government.
3. Acknowledges that all Government policies can have positive or negative impacts on the determinants of health and such impacts are reflected both in the health status of the South Australian population today and in the health prospects of future generations.
4. Recognises that the impacts of health determinants are not equally distributed among population groups in South Australia and aims at closing the health gap, in particular for the Aboriginal peoples.
5. Recognises that health is central to achieving the objectives of the South Australian Strategic Plan (SASP)—it requires both the identification of potential health impacts and the recognition that good health can contribute to achieving SASP targets.
6. Acknowledges that efforts to improve the health of all South Australians will require sustainable mechanisms that support Government agencies to work collaboratively to develop integrated solutions to both current and future policy challenges.
7. Acknowledges that many of the most pressing health problems of the population require long-term policy and budgetary commitment as well as innovative budgetary approaches.
8. Recognises that indicators of success will be equally long-term and that regular monitoring and intermediate measures of progress will need to be established and reported back to South Australian citizens.
9. Recognises the need to regularly consult with citizens to link policy changes with wider social and cultural changes around health and wellbeing.
10. Recognises the potential of partnerships for policy implementation between Government levels, science and academia, business, professional organisations and non-governmental organisations to bring about sustained change.



Genesee County Board of Health

RESOLUTION IN SUPPORT OF ADOPTING A HEALTH-EQUITY-IN-ALL-POLICIES APPROACH TO DECISION MAKING IN GENESSEE COUNTY GOVERNMENT

Over several months, the Genesee County Board of Health has reviewed and considered the benefits of an approach to decision-making that has been adopted by many municipal and county governments across the nation. This approach is commonly referred to as "Health in All Policies." Health Equity ensures that everyone has the opportunity to attain their highest level of health and is a crucial component of population health. If applied in a concrete and rigorous way, this approach provides both a mindset and a process for incorporating considerations of health equity into all public policy decisions.

In most communities that have successfully adopted a Health in All Policies approach, the primary mechanism for applying it has been an interdepartmental body with representation from all sectors of community life over which the governing body (in the case of a county, a Board of Commissioners) has influence. The members of this interdepartmental body receive training and technical assistance in understanding the ways in which decisions about housing, employment, education, transportation, land use, etc., can create the conditions that promote or discourage health, especially for residents who are already marginalized by virtue of their race or ethnicity, socio-economic status, mental or physical disability, language of origin, age, or other aspect of their identity. The primary function of the interdepartmental body is to serve the governing body by 1) considering any new governmental policy for which the likely health impacts are not clear; 2) considering current governmental policy whose negative health impacts have been called into question by the public; 3) analyzing the health impacts of any such policy; and 4) providing recommendations to the governing body on any changes in these policies that would reduce negative health impacts.

There are several important tools that members of such an interdepartmental team can use in carrying out their analyses. The most important of these are various forms of Health Impact Assessment. The Genesee County Health Department has considerable experience in developing and applying Health Impact Assessments with varying levels of sophistication. The department's considerable work and collaboration with the Medical Community, Universities and Community Based Partners in promoting health equity and environmental justice are additional assets that can inform the development and orientation of an interdepartmental team.

The Genesee County Board of Health believes that the promotion of good health requires attention to the underlying conditions in which people live, in addition to behavioral choices and access to quality health care. It further believes that every Genesee County resident should have the opportunity to make choices that will allow for a long and healthy life, and that policies in all aspects of community life may limit or expand those choices for some people.

The health consequences resulting from changes to the Flint Water Supply in 2014 highlight the urgency for adoption of Health Equity in All Policies. Therefore, we encourage the Genesee County Board of Commissioners to adopt a Health Equity in All Policies approach to decision-making in Genesee County government, and that in doing so Genesee County serve as a model for other units of government throughout Michigan.

The Genesee County Board of Health, confirms its support for each and all the above statements. The undersigned authorizes and encourages the Genesee County Board of Commissioners to use this signed Resolution to promote the above-stated objective.

Organization Name: Genesee County Board of Health Number of Members: 5
Contact Person (Print): Mrs. Kay Doerr
Address: 630 S. Saginaw Street, Suite 4, Flint, MI 48502
Phone, Fax, E-mail: Phone: (810) 210-8618, Fax: (810) 257-3147,
E-mail: doerrkay@gmail.com

Authorized Signature:  Date: 7-7-16

Please Print Name: Kay Doerr Title: Chairperson



What would HEiAP have prevented?

- State-appointed Emergency manager
- Change to Flint water as a source due to perceived lower cost
- Inadequate water treatment
- Loss of trust
- Medical and behavioral problems



What Would HEiAP Have Achieved?

- More resources allocated to the Flint Water Treatment plant
- Closer study and control of the chemicals used to treat water
- More scrutiny by State officials as to the quality of the water



Can U.S. Citizens Expect HEiAP at All Levels of Government?

- Health is not considered as a human right in the U.S.
- Continued weakening of the Federal Government will further erode consistent attention to addressing the health and well being of the population





Michigan Civil Rights Commission (MCRC) Report February 17, 2017

THE FLINT WATER CRISIS:

Systemic Racism
Through the
Lens of Flint

Report of the Michigan
Civil Rights Commission

FEBRUARY 17, 2017



1. The MCRC and the Michigan Department of Civil Rights must do a better job of responding and *listening to the constituents* we represent, and of *making their priorities our priorities*
2. Develop a deeper understanding of the roles of structural *racialization and implicit bias*, and how they affect decision-making
3. Provide *environmental justice* to all people in Michigan
4. Replace or restructure Michigan's *emergency manager law*
5. Acknowledge the *role race and racism* have played in our history, and how it continues to impact our present
6. Rebuild trust and credibility through the creation of a "*Truth and Reconciliation Commission*" and the integration of a racial equity framework within state government
7. Create and implement a form of *regional government* (or at least regional cooperation) that would require suburbs and the urban cores from which they grew to work collaboratively to solve problems



Thank you!



Decision to Use Flint River Water June 2013 - April 2014

Engineering Firm
Hired
June 2013



EM Earley
Declines DWSD's
Offer
March 7, 2014



Michigan
Department of
Environmental
Quality (MDEQ)
Approves Switch
April 9, 2014



Flint River at
University of
Michigan -
Flint Campus



DWSD Gives Flint Notice

April 17, 2013

- DWSD offers proposal for continuing to supply water for 30 years, claiming this would save about \$800 million vs. building a pipeline
- Flint rejects DWSD's "final best offer" to continue supplying water
- EM, Ed Kurtz, claims rates would be too unreliable