#FlintWaterCrisis

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#flintwatercrisis
Perfect storm for lead leaching

- Flint River water more corrosive
- Lack of corrosion control
- Aging infrastructure (up to 80% lead plumbing)
- Decreased water use - population loss, high water rates
Why do we care about lead?

- Lead is a potent irreversible neurotoxin with lifelong, multigenerational impacts
- NO safe blood lead level
- Disproportionately impacts low income and minority children; environmental injustice
- Primary prevention
Lead in Water

- Soluble metal
- Drinking and cooking risks

- Not what medicine/public health used to
  - Lead paint obsessed (CDC vs EPA)
  - Younger kids exposed
  - But “plumbing”...
Hurley Children’s RESEARCH FINDINGS

Sept 24
Medical Community Press Conference
Methods

- HMC IRB approved
- Data from all blood lead levels processed at Hurley Medical Center
- Two periods of comparison (same seasons):
  - WATER SWITCH APRIL 26, 2014
  - POST-SWITCH: January 1, 2015 – September 15, 2015

- Analyzed % Elevated Blood Lead (EBLL)
  - EBLL = Blood lead Levels >= 5 ug/dL
• N= 1473 for Flint water children (pre n=736, post n=737)
• N= 2202 for non-Flint water children (pre n=1210, post n=992)

Flint results for children 5 years and under:
• PRE-SWITCH % E BLL: **2.4%**
• POST-SWITCH % E BLL: **4.9%**
• p < 0.05; STATISTICALLY SIGNIFICANT CHANGE
High WLL Wards Results:
- PRE-SWITCH % EBLL: 4.0%
- POST-SWITCH % EBLL: 10.6%
- p < 0.05; STATISTICALLY SIGNIFICANT CHANGE

Ward 5 Results:
- PRE-SWITCH % EBLL: 4.9%
- POST-SWITCH % EBLL: 15.7%
- p < 0.05; STATISTICALLY SIGNIFICANT CHANGE
Pre/Post EBLL

Comparison of Pre/Post EBL Percentage

* p<0.05

- Outside Flint
  - Pre: 0.7
  - Post: 1.2

- All Flint
  - Pre: 2.4
  - Post: 4.9

- High WLL Flint
  - Pre: 4
  - Post: 10.6
Research results

• % of children with EBLL in Flint increased
  • Most striking increase in areas with highest water lead levels

• **Results significantly underestimate exposure:**
  • Infants not screened for lead
  • BLL may have peaked before being measured (blood half life 20-30 days)

- Widened disparities
- Failure of primary prevention
Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response

Mona Hanna-Antisha, MD, MPH, Jenny LaChance, MS, Richard Casey Sadler, PhD, and Allison Champney Schnepf, MD

Objectives. We analyzed differences in pediatric elevated blood lead level incidence before and after Flint, Michigan, introduced a more corrosive water source into an aging water system without adequate corrosion control.

Methods. We reviewed blood lead levels for children younger than 5 years before (2013) and after (2015) water source change in Greater Flint, Michigan. We assessed the percentage of elevated blood lead levels in both time periods, and identified geographical locations through spatial analysis.

Results. Incidence of elevated blood lead levels increased from 2.4% to 4.9% (P<.05) after water source change, and neighborhoods with the highest water lead levels experienced a 6.6% increase. No significant change was seen outside the city. Geospatial analysis identified disadvantaged neighborhoods as having the greatest elevated blood lead level increases and informed response prioritization during the now-declared public health emergency.

Conclusions. The percentage of children with elevated blood lead levels increased after water source change, particularly in socioeconomically disadvantaged neighborhoods. Water is a growing source of childhood lead exposure because of aging infrastructure. (Am J Public Health. Published online ahead of print December 21, 2015: e1–e8. doi:10.2105/AJPH.2015.303003)
NOW

- Preventable population-wide exposure
- Community traumatized
- Loss of trust in government and agencies
  - In 2016, in the middle of the great lakes, no guarantee of safe drinking water
- Task forces, federal investigation, lawsuits, resignations, international media, celebrities...

Jan 2016 Federal State of Emergency
NOW

Water still not safe; water & filters

Moving Forward

- Unique opportunity to be proactive, to build a model public health program to buffer impact of exposure

- Serve as a model for other communities
MSU/Hurley Pediatric Public Health Initiative

- Assess
- Monitor
- Intervene

Experts and community

http://humanmedicine.msu.edu/pphi/
We know what works....

Stimulating Experiences, Parenting Education, Primary Health Care, Good Nutrition, and Safe Environments

Readiness to Succeed in School

And we know what hurts...

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Interventions

- Education
- Nutrition
- Medical/Health
Empower Flint App

ALERT: Boil Water Advisory in Effect
11 minutes ago - Flint residents are reminded to boil their water due to the drinking water warning issued by the city of Flint on Feb. 9. Until further notice, boiled filtered water or bottled water should be used for drinking, brushing teeth, washing dishes, preparing food and for pets.

Dashboard
- Water: 7 unread
- Food: 8 unread
- Health: 9 unread
- Pets: 5 unread

Nutrition is one of the first lines of defense against the harmful effects of lead. Some foods will help keep lead from being stored in the body - foods with a lot of calcium, vitamin C and iron.

Calcium
- Broccoli
- Kale
- Spinach
- collard greens
- Tofu
- Mushrooms
Flint Child Health & Development Fund

Focus is building the capacity to serve all Flint children exposed over the next 20 years

Fund will support children and families with interventions to support optimal child health & development, early childhood education, continuous access to a pediatric medical home, nutritional education, integrated social services, etc.

www.flintkids.org
Flint, Michigan
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Thank you!