



# Lessons Learned from Flint, MI: Implications for our Community

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Seminar: Current Topics in Safety, Health and  
Environmental Issues

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*Photo source: abcnews.go.com*

**National Center for Environmental Health  
Agency for Toxic Substances and Disease Registry**



## Outline

- **NCEH/ATSDR Overview**
- **Response to Water Contamination in Flint, MI**
- **NCEH/ATSDR Activities in Flint, MI**
- **Protecting Citizens from Lead Exposure**

# NCEH/ATSDR OVERVIEW

## NCEH/ATSDR Organization

- **CDC Director also Administrator of ATSDR**
- **ATSDR and CDC's NCEH share single Office of the Director**
- **ATSDR Divisions**
  - Division of Community Health Investigations
  - Division of Toxicology and Human Health Sciences
- **NCEH Divisions**
  - Division of Emergency and Environmental Health Services
  - Division of Environmental Hazards and Health Effects
  - Division of Laboratory Sciences

## NCEH/ATSDR Mission

- **Protect people's health from environmental hazards that can be present in the air we breathe, the water we drink, and the world that sustains us by**
  - Investigating the relationship between environmental factors and health
  - Developing guidance
  - Building partnerships to support healthy decision making





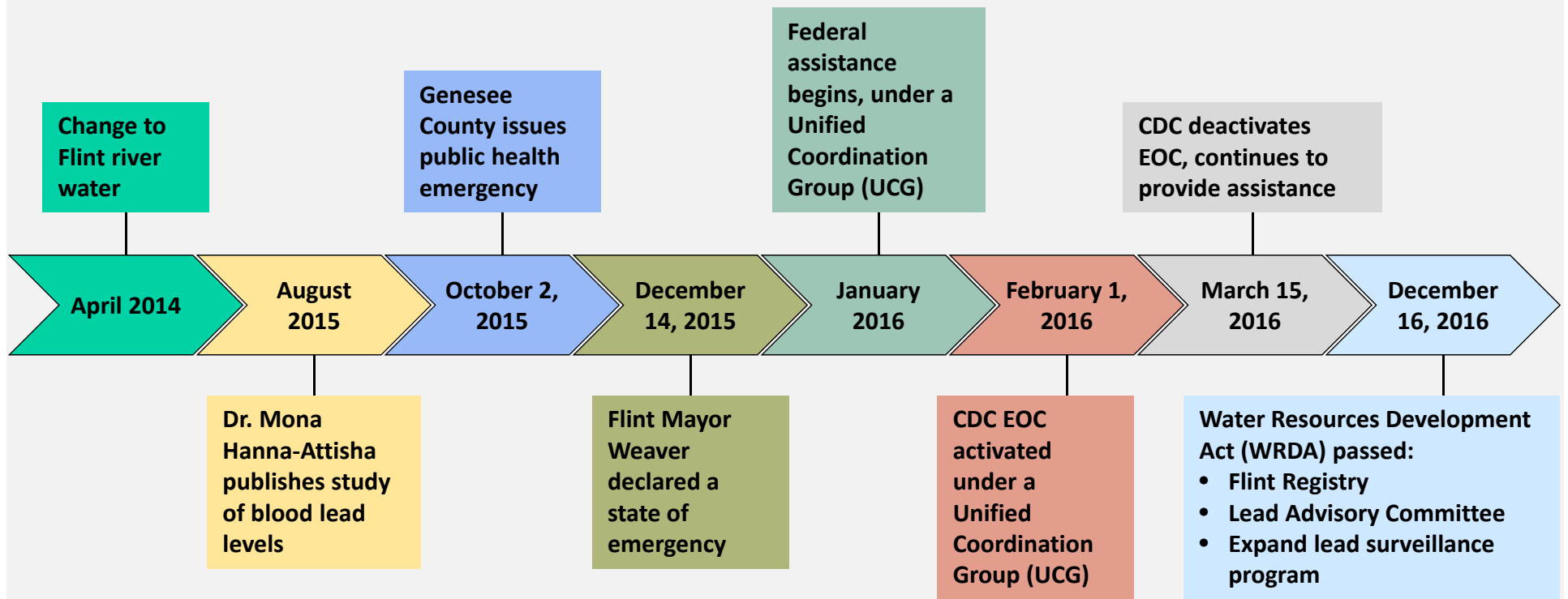
## NCEH/ATSDR Priorities

1. Ensure safe drinking water
2. Eliminate lead exposure, especially for children
3. Expand Environmental Public Health Tracking Network
4. Use laboratory measurements to detect, diagnose, and prevent disease caused by environmental exposures
5. Strengthen ATSDR



**RESPONSE TO WATER CONTAMINATION  
IN FLINT, MI**

# Background on Flint Water Contamination – Timeline





## U.S. Government Objectives in Flint

- Immediate access to safe water (FEMA)
- Long term safety of the water supply (EPA)
- Immediate needs regarding health (HHS and Unified Command Group)
- Community resilience (HHS and Unified Command Group)
- Long-term follow up



*Photo source: PBS Newshour website*

## NCEH/ATSDR Response to Flint

- **Mid-January 2016 – deployed first team to Flint**
- **Established three activities**
  - Rash investigation
  - Water quality
  - Case management
- **Issued guidance for Michigan to test Flint children <6 years old for lead**
- **Provided case management to families with children identified as elevated blood lead levels, reduced backlog**



## NCEH/ATSDR Response to Flint (cont.)

- Provided support for 107 communication products
- Conducted 12 Congressional briefings
- Responded to >12 Congressional requests for information
- Conducted CASPER behavioral health assessment with Substance Abuse and Mental Health Services Administration
- Fund Registry establishment



# NCEH/ATSDR ACTIVITIES IN FLINT, MI

## *Morbidity and Mortality Weekly Report (MMWR)*

- **Blood lead levels among children aged <6 years living in the City of Flint, MI, 2013–2016**
  - Released June 17, 2016
  - Report added
    - ❖ Proportion of children aged <6 years in Flint, MI with BLLs  $\geq 5$   $\mu\text{g}/\text{dL}$  was significantly higher during switch to Flint Water System
  - Implication for health practice
    - ❖ Encourage use of NSF certified water filters to remove lead
    - ❖ Use filtered or bottled water for drinking, cooking, and brushing teeth

Photo source: *MLive.com*





## MMWR Methods

- Examined distribution of BLLs  $\geq 5\mu\text{g}/\text{dL}$  among children aged  $<6$  years before, during, and after switch in water source
- Used cross-sectional analysis conducted during four time intervals
- Confirmed BLLs  $\geq 5\mu\text{g}/\text{dL}$  defined as having one venous blood lead test  $\geq 5\mu\text{g}/\text{dL}$  or two capillary blood lead tests  $\geq 5\mu\text{g}/\text{dL}$  drawn within 12 weeks of each other
- Analyses limited to children living in area serviced by FWS at time of test

Pre-Water Source Switch	Early Water Source Switch	Late Water Source Switch	Post-Water Source Switch
Before switch in water supply to Flint River	During switch in water supply to Flint River	When there was boil water advisory from city officials	After water supply switched from Flint River to DWS
04/25/2013–04/24/2014	04/25/2014–01/02/2015	01/03/2015–10/15/2015	10/16/2015–03/16/2016

**Table 3. Multivariate adjusted odds ratios\* comparing odds of elevated blood lead levels  $\geq 5$   $\mu\text{g}/\text{dL}$  among children† aged  $< 6$  years, by select covariates**

	OR (95% CI)
<b>Time period</b>	
Pre-Water Source Switch	1.0
Early Water Switch	1.46 (1.06–2.01)
Late Water Switch	1.28 (0.92–1.76)
Post-Water Source Switch	0.75 (0.51–1.12)
<b>Age group<sup>§</sup></b>	
$< 1$ year	1.0
1–2 years	2.25 (1.25–4.06)
3–5 years	1.36 (0.73–2.53)
<b>Season</b>	
Winter (Dec–Feb)	1.0
Spring (Mar–May)	1.41 (0.91–2.16)
Summer (Jun–Aug)	2.14 (1.44–3.18)
Fall (Sep–Nov)	2.25 (1.57–3.22)

\*Odds of having BLLs  $\geq 5$   $\mu\text{g}/\text{dL}$  during the pre-water–switch period compared with the early, late and post-water source switch periods.

†Flint resident defined as living in a house served by the Flint Water Service (FWS) at the time of test.

§At time of test.

## ***MMWR* Conclusions**

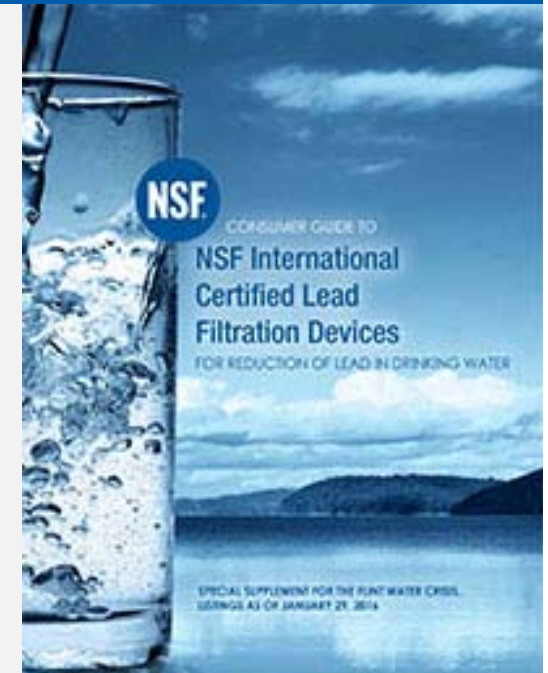
- **The use of water from the Flint River without proper corrosion control exposed the residents to excess amounts of lead.**
- **All children aged <6 years living in the City of Flint should have their blood tested for lead, if they have not had a blood lead test since October 2015.**
- **Case management should be provided to all children with BLLs  $\geq 5$   $\mu\text{g}/\text{dL}$ .**

## Rash Investigation

- **Consisted of three parts**
  - Questionnaire (406 fit case definition, 376 interviews conducted)
  - Clinical referral to a dermatologist (122 examined)
  - Water sampling in houses (87 samples)
- **Study found that one possible explanation for the majority of eczema-related rashes is the fluctuations in water quality while residents were using Flint River water**

## Pur and Brita Point-of-Use Water Filter Testing

- Worked with EPA to assess the effectiveness of the filters when the water concentrations are above the 150 ppb certification level
- Confirmed filters effectively remove lead from water even at very high levels
- Determined drinking filtered tap water is safe for everyone, including pregnant women and children





## **Community Assessment for Public Health Emergency Response (CASPER)**

- **51% of households feel that the physical health of at least one member has worsened due to the Flint water crisis**
- **43% of households perceived a need for behavioral health services for a member younger than 21 years**
- **41% of households reported experiencing fear using filtered tap water for drinking and cooking**

## Current Flint Situation

- **June 23, 2016 – EPA says filtered water deemed safe for everyone in the Flint community**
- **December 16, 2016 – Water Resources Development Act (WRDA) passed**
  - Flint Registry
  - Lead Advisory Committee
  - Expand lead surveillance program
- **CDC developing Registry funding opportunity announcement**

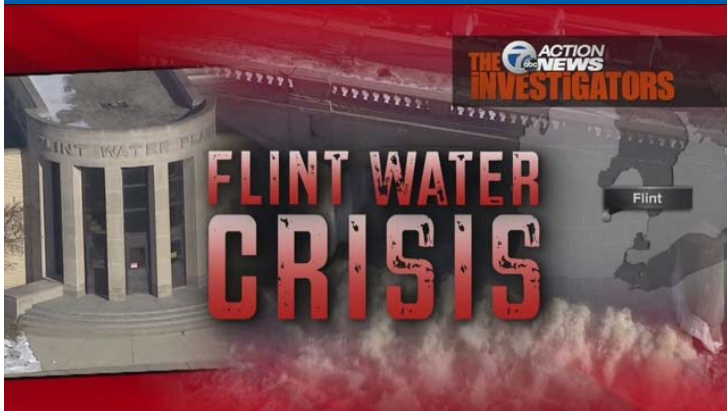
# **PROTECTING CITIZENS FROM LEAD EXPOSURE**

## Flint – Challenges and Opportunities

- Risk communications
- Environmental health infrastructure and surveillance
- Long-term monitoring
- Educational and social services to mitigate the potential cognitive deficits for young children



*Photo source: City of Flint website*



## Flint town hall meeting focuses on lead pipe replacement, medicaid expansion

Residents have various ways to enroll in Flint Medicaid program

May 9, 2016

Photo source: wxyz.com

## EPA, DEQ and City of Flint Recommend Flushing Water to Speed Recovery of System

FLINT, MI – The U.S. Environmental Protection Agency, in coordination with the State of Michigan Department of Environmental Quality and



Photo source: msnbc.com

## Teams Canvassing Flint to Ensure Every Resident Has a Filter

June 23, 2016



Photo source: abc12.com



## Flint, MI reminds us of...

- Importance of surveillance systems to help identify potential health risks
- Value of strong cooperative agreement programs to build capacity at state and local level to support lead poisoning prevention efforts
- How precious clean water is and how we must maintain constant vigilance to ensure access to clean water, especially for our most vulnerable citizens



## **CDC's National Childhood Lead Poisoning Prevention Program**

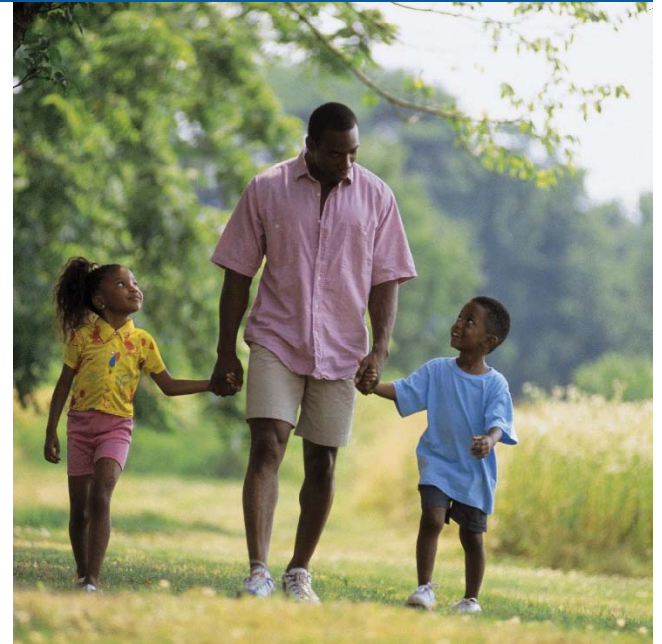
- **Funding of lead poisoning prevention programs and staff in state/local health departments**
- **Surveillance**
- **National expertise, guidance, and recommendations**
- **Collaboration with federal agencies**



## Lead in Water – A National Issue

- **Focus on safe water from all sources**
- **Ensure that water is sampled as potential source of lead in cities with aging infrastructure**
- **Implement more robust and sensitive surveillance system**
- **Revise existing Lead and Copper Rule to include notification of public health agencies**

# Questions



For more information, contact NCEH/ATSDR  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348      [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov)      [www.cdc.gov](http://www.cdc.gov)  
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry.

