



## Health sector in the implementation of the the Minamata Convention on mercury

Kingston, Jamaica, 18-19 October 2016

### Mercury spill decontamination

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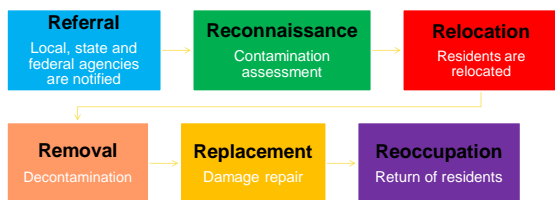


## Overview

- 6 Rs of emergency response to mercury contamination
- Background
- Follow up
- Lessons learned
- Final outcome



## 6 Rs of Emergency Response to Mercury Contamination



## Background

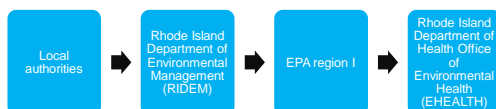
In 2004 1 liter (11kg) of elemental mercury was spilled inside the storage of an unsecured and unoccupied gas company in Rhode Island (U.S.) result of vandalism, causing a residential contamination:

- 56 apartments affected
- 140 residents displaced for 3 months
- Subsequent investigation of 130 additional sites in 15 cities across 2 states

Thompson, M. 2012. Mercury contamination: Review of a residential response. Professional Safety February 2012  
<https://www.ncsl.nim.nih.gov/pmc/articles/PMC3576874/>



## Referral



## Reconnaissance

- Use of direct reading instruments for initial (on site) environmental monitoring (Jerome Mercury Vapor Analyzer) and for reconnaissance, remediation and reoccupancy (Lumex)
- Initial assessment and clearance screening level (ACSL) of 3,000ng/m<sup>3</sup>
  - 3 out of 6 buildings' common areas failed this criteria



## Reconnaissance

RIDEM, EPA Region I and EHEALTH agreed to an ACSL of  $300\text{ng}/\text{m}^3$ , the inhalation reference concentration (RFC) for elemental mercury:

- 4 apartments had readings above  $28,000\text{ng}/\text{m}^3$
- 7 apartments had levels within 20% instrumentation error (240 to  $300\text{ng}/\text{m}^3$ )
- Highest readings found in apartment entryways; and generally found at floor level. Lowest readings found in bedrooms.

An RFC is an estimate of a continuous inhalation exposure concentration to people that is likely to be without harmful effects during a lifetime

$*300\text{ng}/\text{m}^3 = 0.3\mu\text{g}/\text{m}^3$   
(to compare with Lowest Observable Adverse Effect Level for tremor:  $30\mu\text{g}/\text{m}^3$ ; WHO air quality guidelines)

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## Relocation

- 140 residents were sent to local hotels with the assistance of Red Cross
- Some residents and belongings not screened prior to relocation
- Property and building access continued – secondary contamination

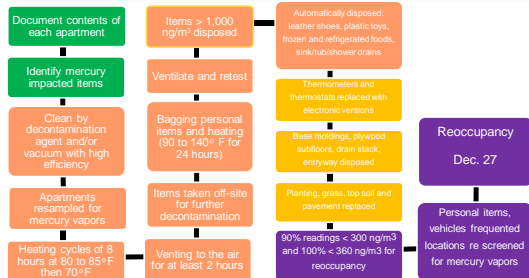
## Removal

- Gas company hired contractors to perform removal and replacement
- Each contractor created and implemented a safety and health plan

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## Decontamination Process



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## Follow Up

### Biological monitoring:

- 64% of residents voluntarily submitted blood samples within 30 days of first exposure. 91 non-residents at secondary mercury impacted locations were voluntarily tested for total blood mercury. A month later, only 7% of these individuals voluntarily submitted random urine samples.

### Risk communication:

- Regularly scheduled meetings were held between residents and representatives from RIDEM, EHEALTH and gas company to address resident's concerns. Reported challenges indicated residents' distrust in the company.

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## Lessons Learned

- Property containing mercury did not have permit/ unsecured
- Lack of real-time equipment availability was a major obstacle to efficiency of decontamination
- Author suggests that RIDEM coordinate contractor's efforts and encourage health professional on site to ensure EPA guidelines are enforced
- Residents had access to apartments and contaminated belongings for 8 days – secondary contamination
- Lack of proper documentation of decontamination process
- Biological monitoring not initiated at the time of evacuation
- Inconsistencies in the information provided to residents during risk communication

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## Final Outcomes

- The decontamination and relocation of residents costed the gas company \$6.6 million
- Youths responsible for vandalism were arrested
- Gas company convicted by jury of knowingly storing liquid mercury without proper permits; fined \$18 million
- The company paid undisclosed sum of money to residents

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Thank you!

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