

STATE-BASED BIOMONITORING IN MASSACHUSETTS

Massachusetts Department of Public Health



BIOMONITORING MASSACHUSETTS STUDY

GOALS OF COOPERATIVE AGREEMENT

Enhance the capability, capacity and readiness of the State Public Health Laboratory and the Bureau of Environmental Health to evaluate

- 1. Vulnerable Populations in Targeted High Risk Communities (metals)**
- 2. Statewide Sample Surveillance (metals and PCBs)**
- 3. Acute Chemical Exposure (e.g., metals and PCBs)**

BIOMONITORING MASSACHUSETTS STUDY

Vulnerable Population

- ❑ Children ages 5-12 and women of childbearing age living in high risk communities
- ❑ Blood and urine analyses for:
 - Lead
 - Mercury
 - Cadmium
 - Manganese

Statewide Population

- ❑ Adult MA Residents
- ❑ Serum/blood analyses for PCBs and Mn
- ❑ Urine analyses for:

• Antimony	• Manganese
• Arsenic	• Mercury
• Barium	• Molybdenum
• Cadmium	• Thallium
• Cesium	• Tungsten
• Cobalt	• Uranium
• Lead	

Acute & Episodic Events

- ❑ MA Residents
- ❑ Accidental or intentional chemical releases
- ❑ Resource for Public Health Investigations

HIGHLIGHTS AND ACCOMPLISHMENTS

- ❑ **Purchase and Installation of New Instrumentation (ICP-MS)**
- ❑ **Staff hired (5 FTEs)**
- ❑ **Completion of Method Validation Plans & Experiments**
 - **Metals by ICP-MS; PCBs by GC-MS/MS**
- ❑ **Advisory Panel Established and Convened**
- ❑ **BRFSS Recruitment Implemented**
- ❑ **Developed Outreach Materials for Participants and collaborators**
- ❑ **Developed Technical Resources for Health-based Interpretation of biomonitoring results**
- ❑ **Respond to Episodic Chemical Exposure Incidents**

CHALLENGES

- ❑ **Recruitment & enrollment of participants**
- ❑ **Establishing health-based thresholds for analytes of interest**
- ❑ **Developing results communication to participants**
- ❑ **PCB Congener Analysis:**
 - Availability of a serum matrix blank free of PCBs
 - Complete removal of PCBs during clean-up step



PARTICIPANT RECRUITMENT & ENROLLMENT

- **Vulnerable Population Sampling ID**
 - **Leverage Community Health Networks and Partnerships**
- **Statewide Sampling ID**
 - **Leverage MDPH Health Survey Resources**
- **Acute Exposure Event ID**
 - **Leverage MDPH Emergency Response Network**
 - **Acute - Hazmat & Local Health Coordination**
 - **Chronic – Human Health Risk Assessment Network**



EXAMPLES OF YEAR 1 ACTIVITY

- **Response to Mercury Exposure Events**
 - Coordination with local BOH, and state agencies
 - Urine sample collection, analysis and interpretation
 - Educational outreach and results communication
- **Response to drinking water concerns**
 - Exposure to manganese in municipal drinking water
 - Clinical case: scientific literature review to establish a reference range for serum Mn (not readily available; NER in blood and urine)
 - Dermal exposure to arsenic in private well water
 - Evaluated cancer and non-cancer risks based on novel exposure model



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