

biomonitoring *New Hampshire*



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New Hampshire Health Officers
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- **biomonitoring** (noun) - a method for assessing human exposure to chemicals by measuring the chemicals or their metabolites in human tissues or specimens, such as blood or urine (CDC 2005).



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- Why do biomonitoring?
 - Emergency Response
 - Targeted Exposure Investigation
 - Known source of contamination
 - Potential disease cluster
 - Surveillance
 - Background levels
 - Identify emerging issues and trends
 - Inform and evaluate public policy interventions

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- Pediatric Lead Levels – (national data) sharp decline in levels concurrent with elimination of tetraethyl lead in gasoline
- Cotinine Levels – (New York) - 47% decrease in cotinine levels in non-smokers between 2003-2007
 - **Clean Indoor Air Act (2003)**

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- Project of the NH Public Health Laboratories
- Technical & financial assistance from CDC
 - 5-yr cooperative agreement, possibility of renewal
 - September 1, 2014 – August 30, 2019
 - NH, MA, NJ, VA, CA, UT (Four Corners States Consortium)

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- Hire 5 project staff
- Purchase equipment & computers
- Supplies & reagents
- Training
- Methodology
- CDC subject matter experts
- Analytical standards
- Proficiency testing

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Targeted study

- southern NH residents
reliant on private wells for
drinking water
- Total As, U, speciated As

Statewide surveillance

- analytes of concern
- nutritional biomarkers

Biomarker Selection Targeted Program

- ❑ Awareness of drinking water contamination
- ❑ Recognized health effects associated with consumption of contaminated water
- ❑ Non-invasive specimen collection
- ❑ Accepted biomonitoring methods
- ❑ Viable treatment options for highly exposed
- ❑ National Exposure Report
- ❑ Preliminary NH data indicating cause for concern

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Potential for Arsenic and Uranium Exposure

- ❑ Forty-six percent of the state population is reliant on bedrock wells for drinking water
- ❑ Geologic formations, past land use practices provide opportunities for exposure
- ❑ NPHL data (2005-2006) 31% of 121 samples collected in southern NH exceeded MCL
- ❑ Significant correlation between elevated drinking water arsenic and higher than average total urinary arsenic

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Study Design

- Recruit from High Risk Areas
 - Age, race, gender, sensitive sub-populations
 - 500 participants
 - Control population – Nashua, other communities on public water
 - Trusted partners
- Questionnaire
 - Residential, occupational & recreational histories
 - Food diary and drinking water patterns
 - Demographic, educational, socioeconomic status
 - Behavioral risk factors
- Collect urine & drinking water
 - Incent participation

Surveillance Biomonitoring Project

- ❑ Baseline information, NH specific ranges
- ❑ Statewide recruitment
 - Challenging
 - ❑ Trusted partners
 - ❑ Traditional & social media
 - ❑ Incentives
- ❑ Representative recruitment
 - BRFSS data
- ❑ Opportunistic recruitment
 - ❑ Blood donation centers
 - ❑ College campuses
 - ❑ State employee complex
- ❑ Clinical collaborators & academic partners

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Surveillance Program Biomarkers

- Collecting blood & urine
- Metals
- Pesticide metabolites
 - Organophosphate
 - Pyrethroid
- Environmental tobacco smoke
 - Cotinine
- Industrial chemicals
 - PFCs
- Nutritional biomarkers
 - Iron
 - Folate

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How can you help?

- Be a trusted partner in your community
 - Facilitate introductions to municipal officials
 - Identify community leaders and advocates
 - Share information in the community
 - Advise as to best practices
- Serve on an advisory board
 - Technical
 - Community
- Spread the word!!!

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