The New Hampshire Expanded Biomonitoring Program – Opportunities for Collaboration

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Two Phases of the NH Program

- Targeted Biomonitoring
  - Area of known contamination
  - Limited analytes

- Surveillance Program
  - Statewide
  - Broader analyte list
  - Gather baseline data, NH specific ranges
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
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.
- NHPHL 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.
Proposed Study Area
Targeted Biomonitoring

Affected Communities

Arsenic Contaminated Wells
Project Implementation

- Outreach to Prospective Communities
- Hiring of Project Staff
- Purchase of Equipment & Supplies
- Project Advisory Committee
  - Technical
  - Community
- Communication & Messaging
“Study Design”

- **Recruit from High Risk Areas**
  - Age, race, gender, sensitive sub-populations
  - Control population
  - Sample size

- **Questionnaire**
  - Residential, occupational & recreational histories
  - Food diary and drinking water patterns
  - Demographic, educational, socioeconomic status
  - Behavioral risk factors
  - Health status? Other indicators?

- **Collect & Analyze**
  - Drinking water - total As, U, ICP/MS
  - Urine - total As, U, creatinine - ICP/MS
    - Speciated arsenic - HPLC-ICP/MS
Potential Collaborations

- Massachusetts
  - Comparability of data
  - Questionnaire development?
  - Risk messaging
  - Release of results?

- Dartmouth College
  - NIEHS Center of Excellence
  - Specimen sharing
  - Collaboration with researchers conducting epigenetics work
Other Potential Collaborations

- Training
- Mentoring
- Recruitment strategies
- Reporting practices
Surveillance Biomonitoring Project

- Baseline information, NH specific ranges
- Statewide recruitment
  - Challenging
    - Incentives
  - Opportunistic recruitment
    - Blood donation centers
    - College campuses
    - State employee complex
- Clinical collaborators
- Academic partners
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Biomarker Selection
Surveillance Program

- Refine list with guidance from TAC and CDC
- Metals
- Pesticides
  - Organophosphate
  - Pyrethroid
- Environmental tobacco smoke
  - Cotinine
- Industrial chemicals
  - PFCs
Study Design

- Recruit Statewide
  - Age, race, gender, sensitive sub-populations
    - Sample size
    - Target/oversample sensitive populations

- Questionnaire
  - Residential, occupational & recreational histories
  - Food diary and drinking water patterns
  - Demographic, educational, socioeconomic status
  - Behavioral risk factors
  - Health status? Other indicators?

- Collect & Analyze
  - Urine – metals, pesticide metabolites
  - Whole blood – metals
  - Serum - cotinine, PFCs