

Illinois Feasibility Assessment for Biomonitoring

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Illinois Legislative Mandate

- Biomonitoring Feasibility Study Act
- Who:
 - University of Illinois at Chicago, Great Lakes Center for Occupational and Environmental Safety and Health
- What:
 - Conduct an Environmental Contaminant Biomonitoring Feasibility Study
- When:
 - January 2010

Illinois Legislative Mandate

Propose the best way to establish a biomonitoring program that will do all of the following:

1. Monitor selected chemicals in a representative sample of the population
2. Produce biomonitoring studies
3. Support Illinois public health by:
 - Filling data gap
 - Providing data that can be linked to human health outcomes

Illinois Legislative Mandate

- Funding: as yet unfunded
- Current team – all in-kind support:
 - Daniel Hryhorczuk, MD, MPH, Director, UIC Great Lakes Center for Occupational and Environmental Safety and Health
 - Team includes UIC-SPH post-docs, PhD students and an occupational-health resident
 - Expertise includes:
 - Toxicology, laboratory, risk assessment, ethics, social justice, epidemiology, public health surveillance, occupational medicine

Illinois Biomonitoring Feasibility Assessment –Plans and Progress

Draft goals:

- Establish baseline levels of exposure to contaminants of concern
 - Identify subpopulations at highest risk
 - Understand how exposures in IL differ within subpopulations
 - Understand how or if exposures in IL differ from the US pop.
- Track changes in exposure over time
- Use the information to help guide the planning and evaluation of programs to reduce population exposure
- Build environmental public health capacity

Illinois Biomonitoring Feasibility Assessment

- Approach – develop three models
 1. Illinois Health and Nutrition Examination Survey
 2. Special population studies/monitoring
 3. Convenience samples
- Models can be used alone or in combination

Illinois Biomonitoring Feasibility Assessment – Plans and Progress

For each of the models assess feasibility including:

- Resources needed
 - Laboratory, technical, financial, time
 - Cost
- Ethical/social justice issues
- Identify population and analytes
- Plan to identify and engage stakeholders
- Organizational issues

I-HANES and Biomonitoring

- Population-based sample - would minimally:
 - Test for prioritized analytes
 - Conduct interviews for basic demographics, environmental /occupational histories
- Advantages:
 - Can meet address most of mandates stated goals
 - Legislation specifically states:
“Monitor the presence and concentration of designated chemicals in a representative sample of the population of this State”

I-HANES and Biomonitoring

- Advantages (con't):
 - Standardized protocols and methods exist as well as the expertise to implement them
 - CDC has experience adapting NHANES to smaller geographic area (NYC, California, WI)
- Disadvantages:
 - Very, very resource intensive
 - For all that effort, should be broader than biomonitoring –
 - other PH interests should be involved

Special Population Studies

- Why?
 - To find those most at risk / most susceptible
 - Identify highly exposed communities
 - To capture those not represented in general population surveys
 - To assess unique exposures and exposure mixtures
- Legislation specifically discusses population subgroups
 - e.g. *"The degree of potential exposure to the public or specific subgroups, including, but not limited to, certain occupations."*

Special Population Studies

What makes a population “special”?

- Unique and/or high exposure, e.g.:
 - Occupation: agricultural pesticide exposure
 - Proximity to a hazard: lead smelter
 - Diet: subsistence fish consumers
- High rates of a potentially environmentally-related health outcomes
 - Asthma; childhood leukemia
- Life stage
 - Children, women of reproductive age, pregnant women

Special Population Studies

- Advantages:
 - Can gather a lot of data on one population, exposure and/or health outcome of concern
 - Supports research aspects of legislation
 - Likely need considerably fewer resources than I-HANES
- Disadvantages:
 - Not population-based
 - Identifying and prioritizing populations may be challenging

Convenience Samples

- What:
 - Use samples already coming into the PH systems in Illinois
 - e.g. Childhood blood lead; new born testing
 - Use access points
 - e.g. WIC, New-born nurse visits

Convenience Samples

- Advantages
 - Uses existing systems so saves on set-up/logistics
- Disadvantages
 - May need consent depending on analyte
 - Population may be hard to define
 - High-risk population may be different
e.g. testing childhood blood leads for mercury levels