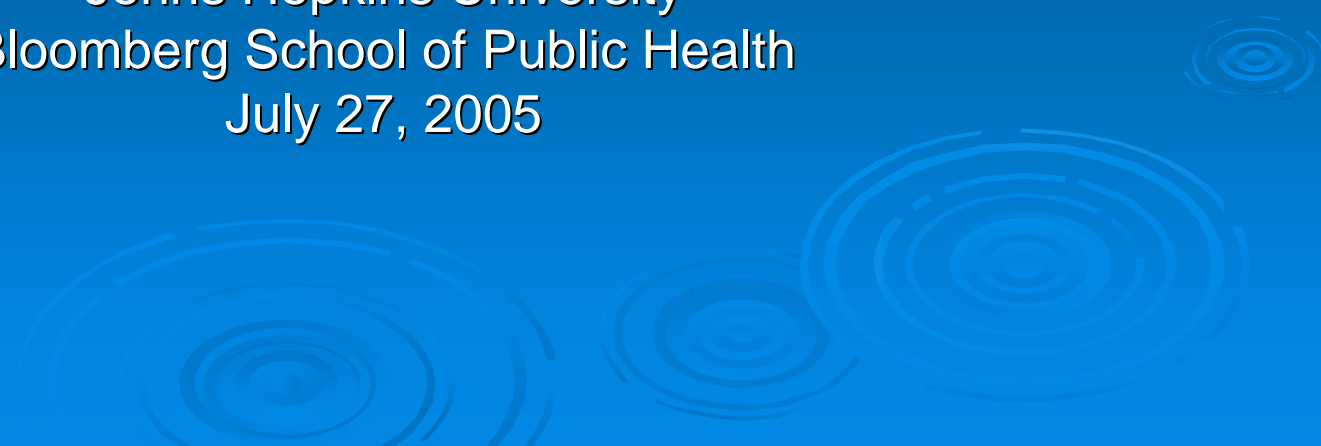


Biomonitoring for Environmental Toxicants

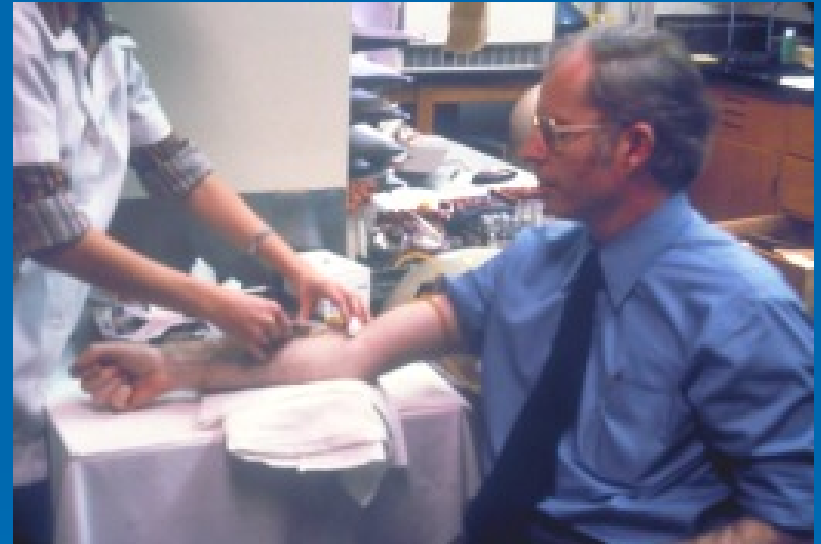
Thomas A. Burke
Professor
Johns Hopkins University
Bloomberg School of Public Health
July 27, 2005



Biomonitoring

What is it?

Measurement of chemicals or their metabolites in human specimens including blood, urine, hair, nails, cord blood, milk.



"This is a giant step forward to understanding the relationship between exposure to chemicals and their potential health effects"

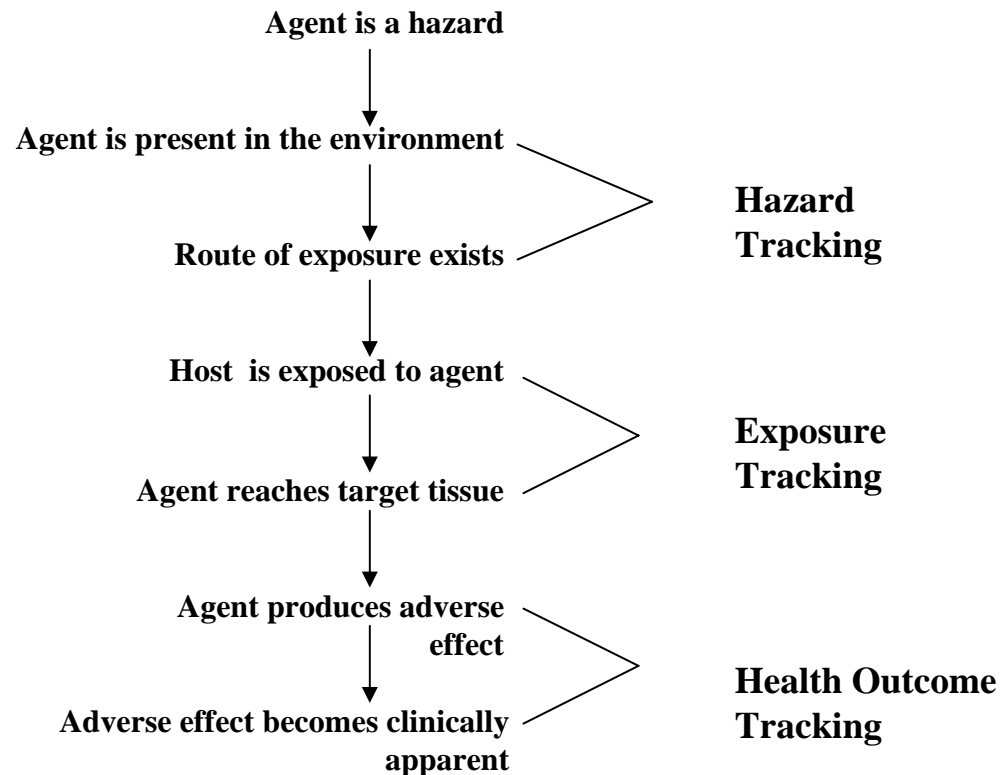
Dr. Julie Gerberding, CDC's director



Uses of Biomonitoring

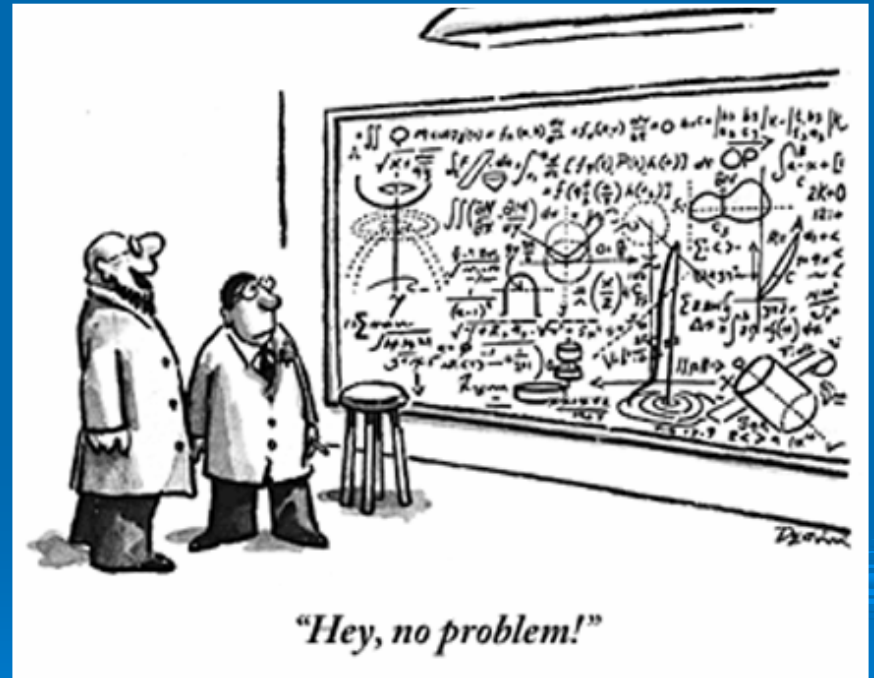
- Measure amount of chemical absorbed into the body
- Provide a measure of individual or population exposure levels
- Evaluate health effects
- Identify those at highest risk
- Track trends
- Guide prevention strategies

Environmental Health Tracking



What does it mean?

- Our ability to measure pollutants has outpaced our ability to understand the health effects.
- Thresholds
- Cumulative effects
- Chronic impacts



THE NATION; Rocket-Fuel Chemical Found in Breast Milk

Perchlorate is found in almost all samples tested, a study finds, raising concerns about the substance's effect on the thyroid and brain

Marla Cone. Los Angeles Times. Los Angeles, Calif.: Feb 23, 2005. pg. A.12

Measures of Success

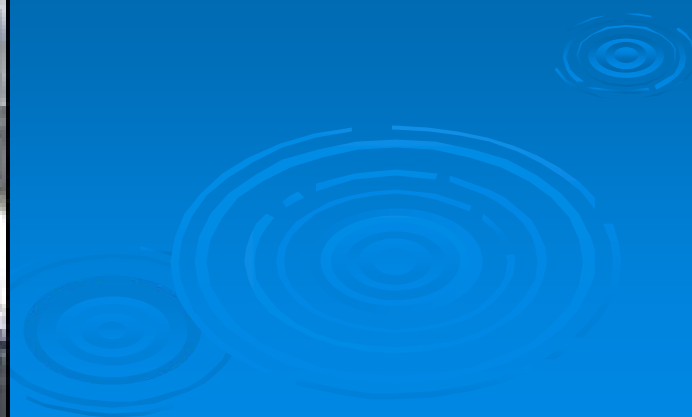
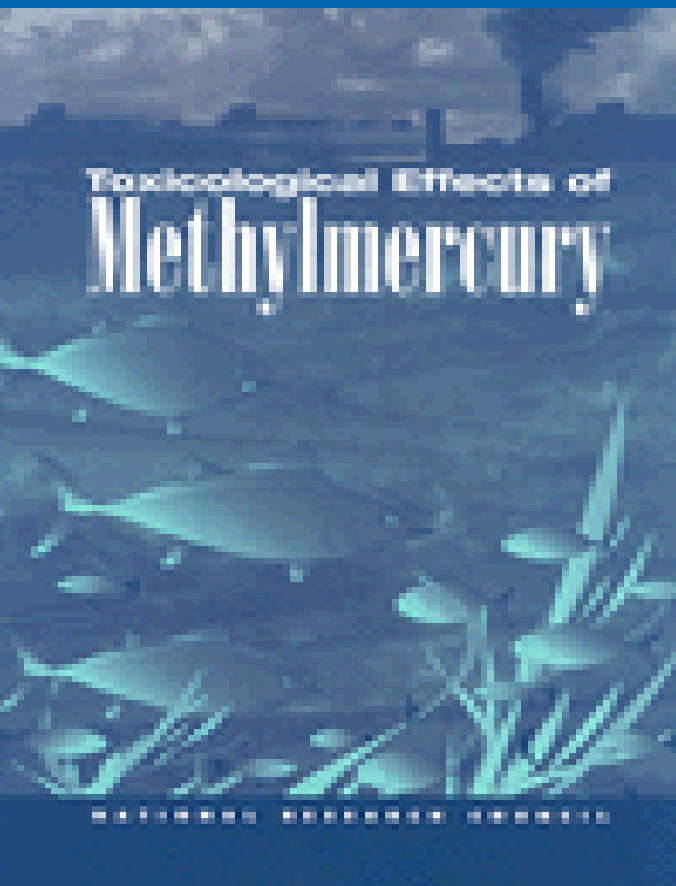
Biomonitoring is a tremendous tool for policy evaluation Examples:

- Lead exposure reduction
- Environmental tobacco smoke
- PCBs, dioxins
- Persistent pesticides

Advances Risk Assessment

- Improved measures of exposure reduce dependence upon assumptions
- Provide reassurance to workers, and community members
- Focus priorities
- Complement other Tracking Activities

Health Effects of Mercury



Expanding Applications of Biomonitoring

- National surveillance
- Risk assessment
- Worker protection
- State surveillance
- Epidemiologic investigations
- Community studies
- Individual clinical measures
- Advocacy
- Litigation
- New approaches to environmental health and protection?

Many challenges ahead

- Mercury
- Arsenic
- Cadmium
- Perchlorate
- PFOA
- PBDE flame retardants
- Pesticides
- Pthalates
- Nano materials
- Mixtures
- Chronic health effects
- Cancer
- Respiratory
- Immune system
- Reproductive
- Endocrine
- Neurological
- Cumulative impacts

The NAS Study

Committee on Biomonitoring for Environmental Toxicants

- Review current practices
- Recommend ways to improve the interpretation and uses of biomonitoring data
- Develop research agenda for improving the characterization of health risks
- Improve monitoring of changes relevant to public health and environmental policies

Future Directions

- Linkage to environmental monitoring
 - Epidemiological and toxicological research to evaluate health impacts and characterize risk
 - Links to prevention, early warning of emerging hazards
 - Policy evaluation and refinement
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