

# Research and Knowledge in Environmental Public Health

Presentation on Behalf of  
Berkeley Center for Environmental  
Public Health Tracking

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# Our group

- Interdisciplinary
  - Pulmonary medicine, exposure assessment, epidemiology, environmental policy, risk assessment, etc
  - Equally interested in “environment” and “health”
- Thinking about an environmental public health “system” and participants
  - As it is and as it could be

# Diverse areas of work in EPH

- Examples of other projects
  - International collaboration to research impacts of biomass fuels (Balmes)
  - International collaboration to develop tools for life cycle assessment (McKone)
  - National and international collaborations to on children's environmental health (Kyle)
  - State and local collaborations on asthma surveillance and epidemiology (Mann, Tager, Balmes)

*Special Issue Honoring Don Mackay*

## MULTIMEDIA PERSISTENCE AS AN INDICATOR OF POTENTIAL FOR POPULATION-LEVEL INTAKE OF ENVIRONMENTAL CONTAMINANTS

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**Abstract**—Although intuitively it is apparent that population-level exposure to contaminants dispersed in the environment must be related to the persistence of the contaminant, there has been little effort to quantify this link formally. In this paper we investigate the relationship between overall persistence and/or overall residence time in a multimedia exposure environment and the population-level intake of contaminants as expressed by intake fraction (IF), the cumulative fraction of chemical emitted to the environment that is taken up by members of the population. We demonstrate that for any given contaminant and emission scenario the definition of IF implies that it is directly proportional to the overall multimedia persistence ( $P_{OV}$ ), or the overall multimedia residence time ( $T_{OV}$ ). The proportionality constant has dimensions of time and represents the characteristic time for population intake (CTI) of the chemical from the environment. We then apply the CalTOX fate and exposure model to explore how  $T_{OV}$  and CTI combine to determine the magnitude of IF. We find that CTI has a narrow range of possible values relative to  $T_{OV}$  across multiple chemicals and emissions scenarios. We use data from the Canadian Environmental Protection Act Priority Substance List (PSL 1) Assessments and multimedia  $P_{OV}$  to show that exposure assessments based on empirical observation are consistent with interpretations from the model. Results indicate that  $P_{OV}$  derived from screening-level assessments of persistence, bioaccumulation potential, and toxicity (PBT) is a useful indicator of the potential for population-level exposure.

**Keywords**—Persistence    Intake fraction    Characteristic time/intake    Exposure model    Fugacity

# School-based asthma surveillance: A comparison of student and parental report

Magzamen S, Mortimer KM, Davis A, Tager IB. School-based asthma surveillance: A comparison of student and parental report.

*Pediatr Allergy Immunol* 2005; 16: 669–678. © 2005 Blackwell Munksgaard

This study addressed the comparability of data obtained from a student-based and parent-based asthma and respiratory health survey. Our goal was to ascertain whether there were meaningful and systematic differences in asthma classification based on symptom and diagnosis reports obtained separately from students and their parents. A brief, written survey, based on the International Study of Asthma and Allergy in Children questionnaire, was administered to 6th through 10th grade students in two schools in Oakland, CA, USA. Students who reported asthma-like indicators for the previous 12-month period were defined as positive and a more extensive questionnaire was mailed home to those parents. A more refined classification of asthma based on parent report of indicators was compared with student report. Forty-four percent of 1298 students were classified as positive for current asthma-like symp-

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Research

## Integrating Research, Surveillance, and Practice in Environmental Public Health Tracking

Amy D. Kyle, John R. Balmes, Patricia A. Buffler, and Philip R. Lee

Abstract

[Abstract in PDF](#)

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# Environmental public health system

- To See
  - Identify targets
  - Conduct surveillance and monitoring
- To Understand (and ascribe meaning)
  - Analyze and interpret data based on knowledge
- To Explain (to target audience)
  - Measures, maps, narratives, tools
- To Act
  - Policies, interventions and choices by individuals, communities, states, nations

# Needs exist at each step

- Data and information
- Relationships
- Some areas well know and some not
  
- New research
- Identification, synthesis of knowledge base
- Methods



# To see

- Identify targets (and reasons)
- Review and select data sources
  - Or surrogates
  - What do we need to capture to answer questions?
    - – e. g., on health disparities and environmental justice
- Distinguish types of data and what they tell us
- Develop technical standards and methods
  - Are there identifiable best practices?

# To understand

- Provide interpretation
  - What does it mean? Significant for health? How do we know? How do we describe degree of certainty?
- When are linkages scientifically appropriate? When are they not?
- What methods are applicable?
  - Are there identifiable best practices?

# To explain

- How can we best represent the information?
  - Indicators and measures → new for EPHT
  - SEHI C process and development work
- Issues of visual representation
- Issues of language
- Can we identify best practices?

# To act

- Actions will be taken by others
- But -- for data, knowledge, and information to matter, it must be relevant to those who can act
- Who are relevant policy and other audiences?
  - what are their needs?
  - how can they be met?

# Conclusion

- Academic centers can assist in providing
  - synthesis or adaptation of knowledge base
  - new research on how to do EPH
  - methods and approaches
- Questions relevant to each step of environmental public health system
  - Contribute to systematic approach to answering them
- Ultimately → understand positive and negative environmental determinants

