



# Washington Environmental Biomonitoring Survey (WEBS)

Ann Butler

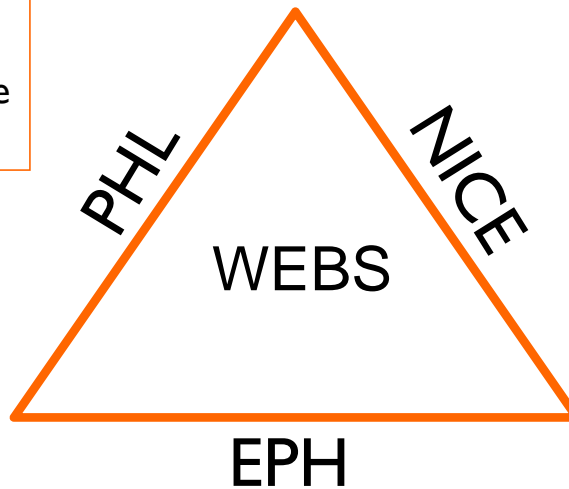
WA State Department of Health



# WEBS Team

Blaine Rhodes, PI  
Carolyn West  
Lynn Skidmore  
Tiffany Firestone  
Michel Lundy

Juliet VanEenwyk  
Denise LaFlamme  
Eric Ossiander  
Katie Curl  
Reed Sorensen  
Ann Butler



Barb Morrissey  
Glen Patrick

# Overview

- What is biomonitoring?
- CDC Grant
- Three completed projects
  - Selected findings
- Current project
  - Low Income Survey & Testing



# What is Biomonitoring?

- **Biomonitoring** measures the amount of environmental chemicals or their breakdown products (metabolites) in human blood, urine, hair or other body tissues.



## CDC Grant goals

- 2009, 5 years, 3 states
- Increase Washington State Public Health Laboratories' capacity for biomonitoring
- Compare WA populations with national baseline
- Assess exposures in high risk groups
- Use information for prevention efforts



# Why collect Biomonitoring data?

---

- Establish baseline or background levels
- Track changes in exposures over time
- Identify highly exposed groups
- Identify people or groups at risk
- Identify factors that contribute to high exposures
- Identify exposures associated with health impacts



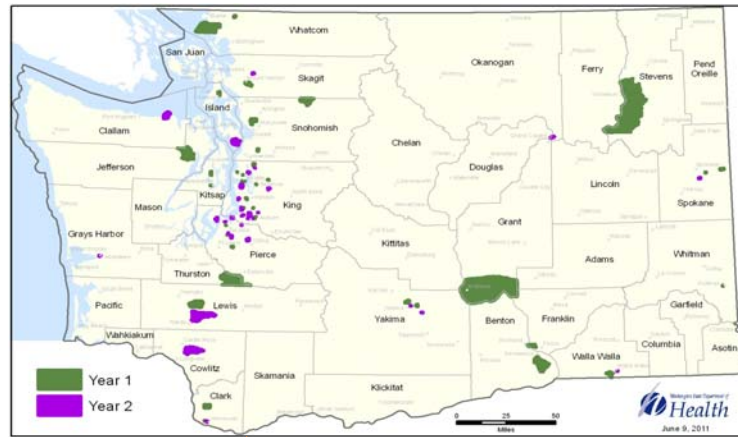
# Biomonitoring Studies

- WEBS general population
- WEBS high arsenic area
- Licensed pesticide applicators
  - Pyrethroid Exposure Survey & Test (PEST)
  - Residential & commercial
- Residents of subsidized housing
  - Low-income Survey & Testing (LIST)



# WEBS General Population

70 random census block groups



Two-stage Sampling Design

27 random housing units from each block group



Invited all household residents ages 6 or older





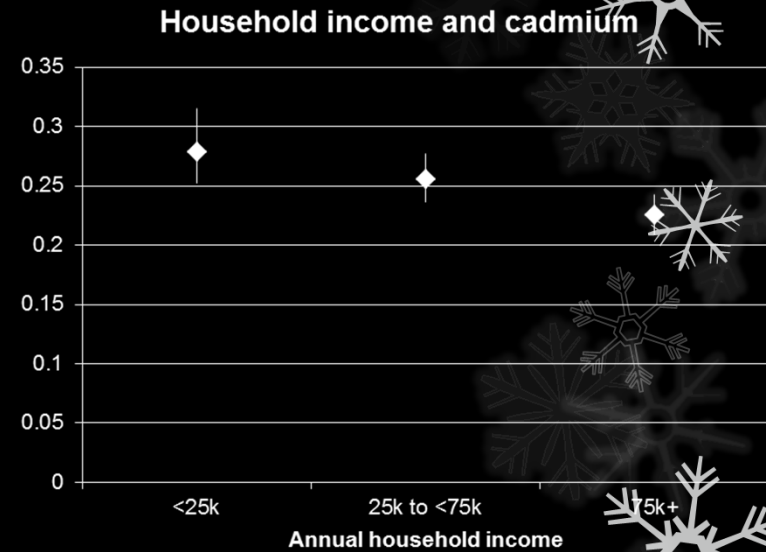
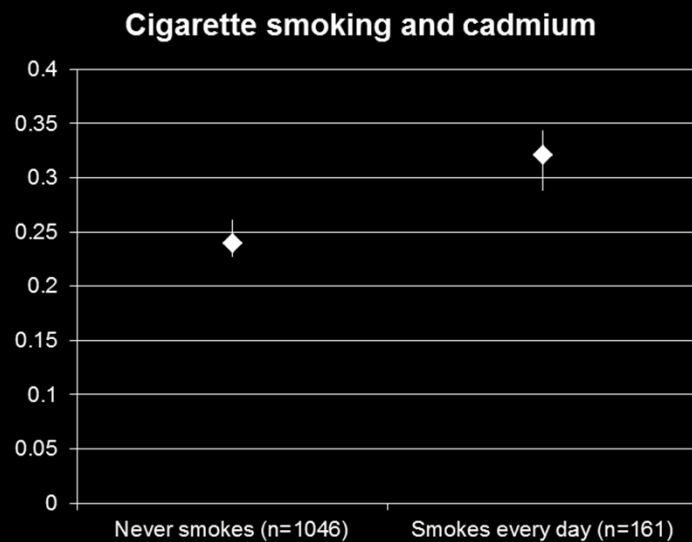
# WEBS General Population

- Participants
  - Recruitment May 2010 – June 2011
  - 1422 participants from 666 households
- Urine samples
  - Tested for arsenic, 12 metals, pesticides, and bisphenol A (BPA) and phthalates from plastics
- Water samples
  - Tested for arsenic and 5 metals
- Questionnaires
  - Household questionnaire
  - Participant questionnaire



# Results: General population sample (2010-2011)

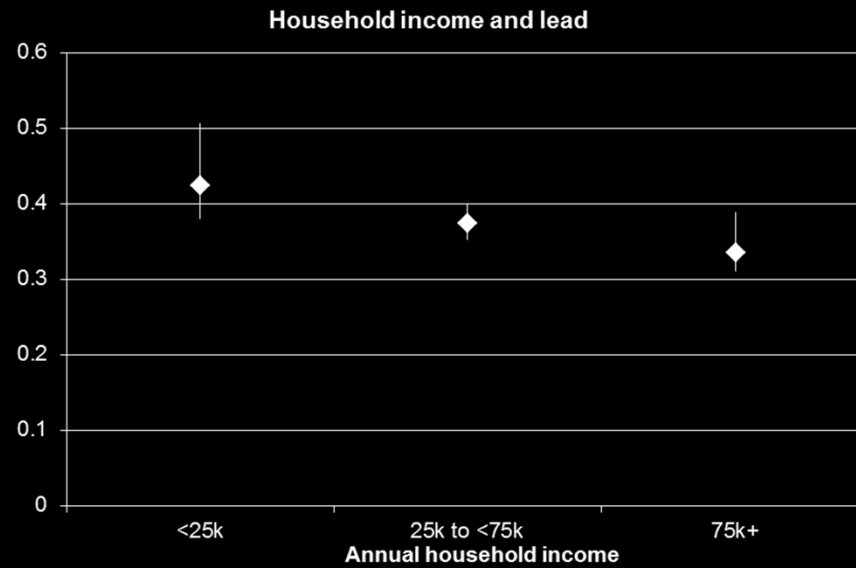
## A closer look at cadmium



Medians and 95% CI for creatinine-corrected urinary metal concentrations

# Results: General population sample (2010-2011)

## A closer look at lead



Medians and 95% CI for creatinine-corrected urinary metal concentrations

## High Risk Population Area of High Arsenic in Groundwater

- Participants
  - Recruitment July-Oct. 2011
  - Households on private wells or small drinking water systems (Group B)
  - Ages 6 and older
  - 172 participants from 84 households participated



## Pyrethroid Exposure Survey and Testing (PEST) Study



### Goals:

- Learn how work practices affect pyrethroid exposures
- Compare to state and national levels
- Use information to improve pesticide safety education (required) WSU
- Summer/fall 2012

## Low Income Survey & Testing (LIST)

- Residents of subsidized housing in King County
  - Women & children
- Data Collection
  - 2 urine samples; Household & participant questionnaires
  - Pesticide use & building materials from housing authority
- Urine Analytes
  - Pesticides: Organophosphate & Pyrethroid metabolites
  - BPA & phthalates – in plastics
  - Higher levels in low income population; Potential for endocrine disruption
- Results for Education/Prevention Activities

- Bisphenol A - used in some hard plastics such as water bottles and in the lining of food cans
  - Banned in baby bottles/sports bottles



Phthalates – used to make soft plastics, vinyl products, and food packaging materials. Found in some beauty & skin care products: shampoos, lotions, makeup





## Questionnaire data collected

- Diet
- Use of plastics
- Use of beauty and skin care products
- Pesticide use
- Income
- Education
- Race/ethnicity
- Time living in US



## Community outreach

- Community builders
- Health fairs
- Incentives
- Translated materials
- Field staff
- 575 participants
- Observing differences in diet



# Uses of Data from LIST

- Compare findings to state and national levels
  - U.S. (CDC National Health and Nutrition Examination Survey; NHANES)
  - Washington State general population data
  - Compare levels by education, income, race/ethnicity
- Use findings to develop education materials to reduce exposures
  - In partnership UW, Seattle/Renton Housing Authorities, agencies
  - Communication Plan



## Next steps

- Applied for CDC funds
- Final samples collected April 2014
- Summer 2014
  - Analysis
  - Results: survey group as a whole
  - Education/prevention activities



# Questions?

