CDPH
California Department of Public Health

BIOMONITORING CALIFORNIA

Program Update

Presentation to the Scientific Guidance Panel
November 16, 2026
Nerissa Wu

Program Updates

- Population-focused surveillance studies
- Community-focused studies
- Laboratory activities
- Outreach and communications

Population-Focused Surveillance Studies

Population-Focused Studies

Study	Coverage	Sample Collection	Analytes
CARE: California Regional Exposure Study	Southern/Southeastern California	2018-2020	Perfluoroalkyl and polyfluoroalkyl substances (PFASs), metals, phenols, 1-nitropyrene
MAMAS: Measuring Analytes in Maternal Archived Samples	Selected counties	2012, 2015-2016	PFASs, persistent organic pollutants
STEPS: Studying Trends in Exposure in Prenatal Samples	Orange, Fresno, and Los Angeles counties	2015-2027	PFASs
MCC: Measuring Chemicals in Californians	TBD	2029 onward	TBD

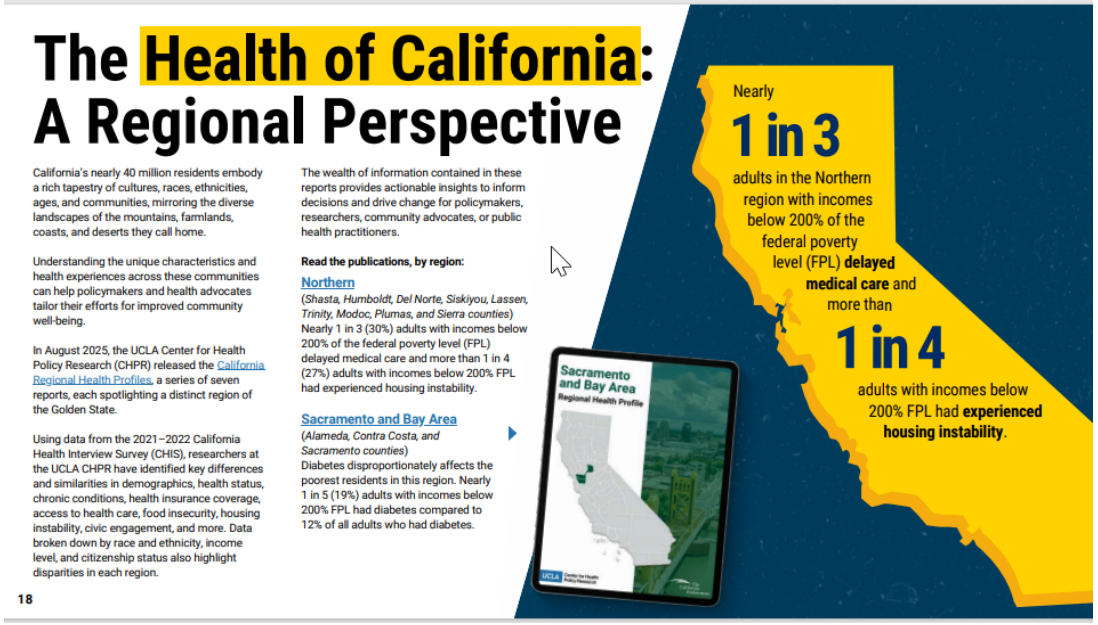
MCC: Measuring Chemicals in Californians

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MEASURING CHEMICALS IN CALIFORNIANS

MCC Sampling Frame: California Health Interview Survey (CHIS)

- Population-based health survey of more than 20,000 California households each year
- Population-based health and health-related estimates for California and local health jurisdictions
- Established mechanism for adding on secondary studies



The Health of California: A Regional Perspective

California's nearly 40 million residents embody a rich tapestry of cultures, races, ethnicities, ages, and communities, mirroring the diverse landscapes of the mountains, farmlands, coasts, and deserts they call home.

Understanding the unique characteristics and health experiences across these communities can help policymakers and health advocates tailor their efforts for improved community well-being.

In August 2025, the UCLA Center for Health Policy Research (CHPR) released the California Regional Health Profiles, a series of seven reports, each spotlighting a distinct region of the Golden State.

Using data from the 2021–2022 California Health Interview Survey (CHIS), researchers at the UCLA CHPR have identified key differences and similarities in demographics, health status, chronic conditions, health insurance coverage, access to health care, food insecurity, housing instability, civic engagement, and more. Data broken down by race and ethnicity, income level, and citizenship status also highlight disparities in each region.

The wealth of information contained in these reports provides actionable insights to inform decisions and drive change for policymakers, researchers, community advocates, or public health practitioners.

Read the publications, by region:

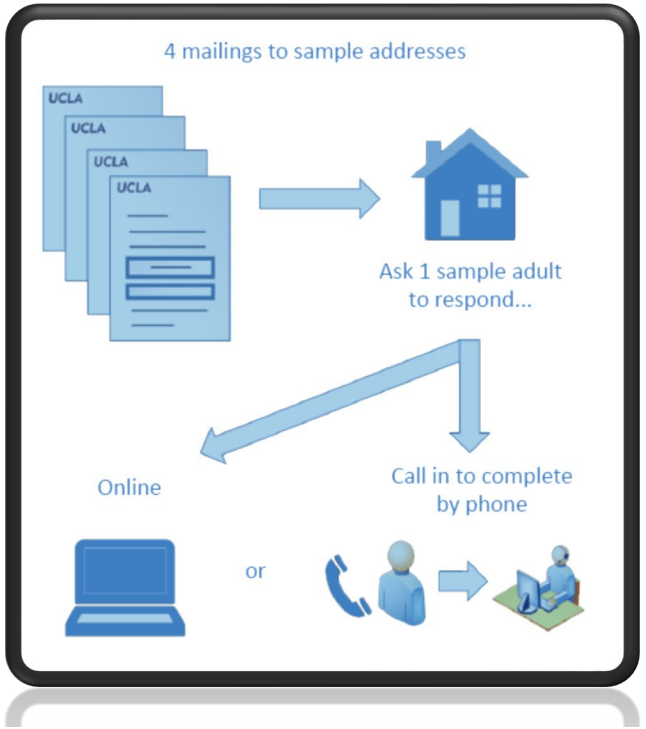
Northern
(*Shasta, Humboldt, Del Norte, Siskiyou, Lassen, Trinity, Modoc, Plumas, and Sierra counties*)
Nearly 1 in 3 (30%) adults with incomes below 200% of the federal poverty level (FPL) delayed medical care and more than 1 in 4 (27%) adults with incomes below 200% FPL had experienced housing instability.

Sacramento and Bay Area
(*Alameda, Contra Costa, and Sacramento counties*)
Diabetes disproportionately affects the poorest residents in this region. Nearly 1 in 5 (19%) adults with incomes below 200% FPL had diabetes compared to 12% of all adults who had diabetes.

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Nearly **1 in 3** adults in the Northern region with incomes below 200% of the federal poverty level (FPL) **delayed medical care** and more than **1 in 4** adults with incomes below 200% FPL had **experienced housing instability**.

Proposed Interface with CHIS



CHIS identifies and recruits participants



CHIS participants complete the survey on-line or on the phone

"Would you like to be part of a biomonitoring study?"

Biomonitoring California portal: consent form, survey, scheduling sample collection

MCC: Measuring Chemicals in Californians

- Three-year cycles, with recruitment starting in 2029
- Designed to generate population exposure estimates
  - Over time
  - By race/ethnicity
- Participants will be recruited from:
  - Adults who complete CHIS in English or Spanish;
  - Reside in Alameda, Contra Costa, Sacramento, San Francisco, or Solano counties

MCC: Primary Objectives

- Exposure estimates for regional population
- Time trends for overall population exposures
- Exposure estimates for four major race/ethnicity groups

Projected Timeline – MCC1

2029

- Recruit MCC1 participants through CHIS
- Collect samples and questionnaire data
- Labs initiate analyses

2030

- Labs complete analyses
- Results return
- Initial data summaries

2031

- Additional data analysis
- Preparation for field work

2032

- Recruit MCC2 participants through CHIS
- Collect samples and questionnaire data
- Labs initiate analyses

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Determining Study Size

- Minimum sample size is a function of the effect being measured and the variability in the population
- Modeled potential outcomes using historic NHANES and CARE Study data for analytes of interest
- Study size goal for MCC is 500 participants per cycle

MCC: Study Location

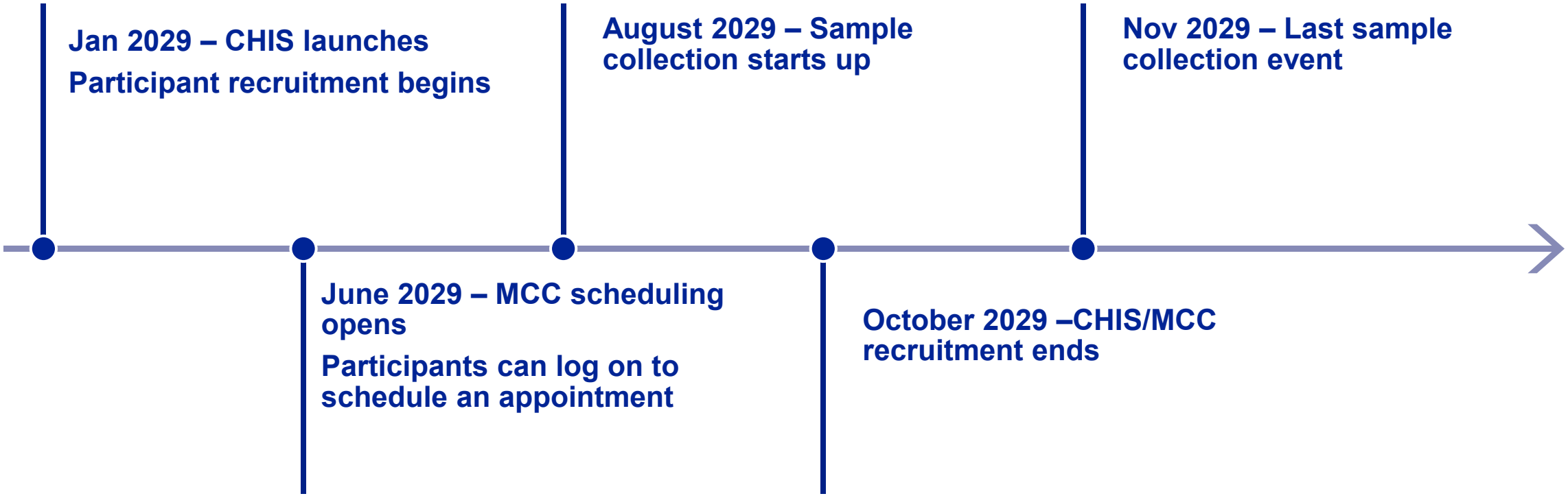


Considerations

- Sufficient population density/CHIS participant numbers
- Sufficient population diversity
- Budget

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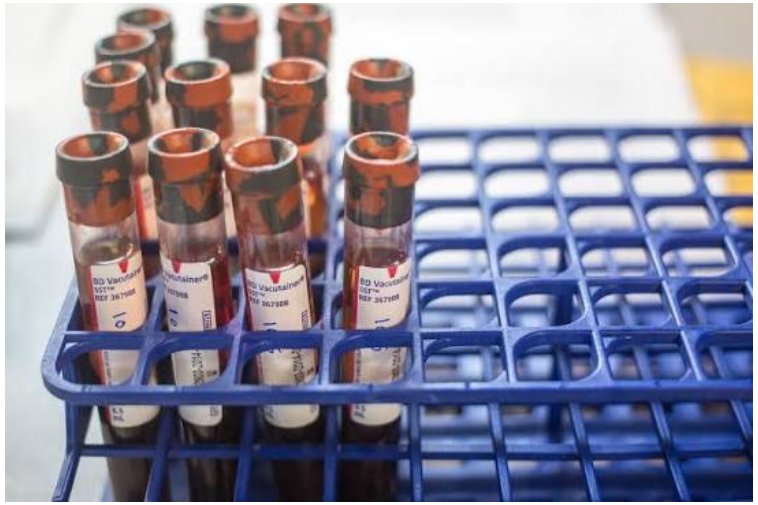
Projected MCC Timeline



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Sample Collection Events

- Sample collection will be scheduled August – November 2029
- Collection events will be held across the five-county study area
- Sample collection will include whole blood, serum, and urine
- Participants will fill out a brief exposure questionnaire



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Phlebotomy vs. Micro-samplers

- Intra-Program Pilot (IPP) Study found that micro-samplers have potential to replace phlebotomy in some applications
- Significant proportion of participants noted marking on their skin after micro-sampler use
- Volume of serum collected would be insufficient



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MCC: Upcoming Activities

PHASE 1

- ✓ Initiate collaboration with CHIS
- ✓ Finalize study objectives
- ✓ Develop outline of study design
- Conduct focus groups to evaluate recruitment question
- Develop overview of sample collection events

PHASE 2

- Create partnerships
- Consult with technical experts
- Develop detailed participant management/flow
- Develop outreach products
- Identify and pursue potential funding sources

PHASE 3

- Configure Redcap
- Finalize all study documents
- Obtain IRB approval
- Develop fieldwork protocol manual
- Translation of all docs
- Procurement of supplies
- Finalize analyte list

PHASE 4

- Identify and contract with collection sites
- Schedule collection events
- Staff training and scheduling
- Create field/sample kits
- Go Live - January 2029!

FY 26-27 → FY 27-28 → FY 28-29

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Community-Focused Studies





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CHAIRS-LA

Fall 2025 collection

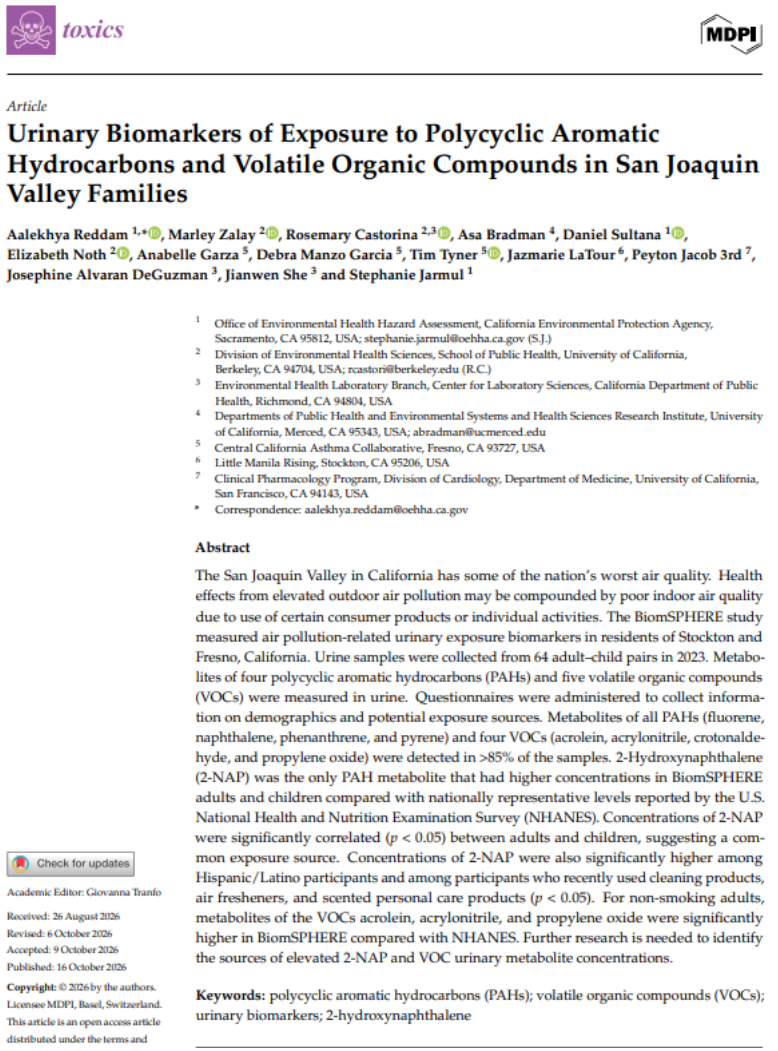
- Urine sample analysis (n=187) for metals, specific gravity, and creatinine completed by EHL
- Preparing for VOC analysis
- Metals results will be returned to participants in December or January
  - Program staff will be reaching out to participants for optional consultation

Fall 2026 collection

- Sample collection currently underway (Goal = 150 participants)

BiomSPHERE

- Publications:
  - Urinary Biomarkers of Polycyclic Aromatic Hydrocarbons and Volatile Organic Compounds in two San Joaquin Valley Communities (published October 2026)
  - *In preparation:* Indoor Air Pollutants and Urinary Biomarkers of Response in Parents and Children Living in California's San Joaquin Valley



toxics

MDPI

Article

Urinary Biomarkers of Exposure to Polycyclic Aromatic Hydrocarbons and Volatile Organic Compounds in San Joaquin Valley Families

Aalekhya Reddam [1,*], Marley Zalay [2], Rosemary Castorina [2,3], Asa Bradman [4], Daniel Sultana [1], Elizabeth Noth [2], Anabelle Garza [5], Debra Manzo Garcia [5], Tim Tyner [5], Jazmarie LaTour [6], Peyton Jacob 3rd [7], Josephine Alvaran DeGuzman [3], Jianwen She [3] and Stephanie Jarmul [1]

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Abstract

The San Joaquin Valley in California has some of the nation's worst air quality. Health effects from elevated outdoor air pollution may be compounded by poor indoor air quality due to use of certain consumer products or individual activities. The BiomSPHERE study measured air pollution-related urinary exposure biomarkers in residents of Stockton and Fresno, California. Urine samples were collected from 64 adult–child pairs in 2023. Metabolites of four polycyclic aromatic hydrocarbons (PAHs) and five volatile organic compounds (VOCs) were measured in urine. Questionnaires were administered to collect information on demographics and potential exposure sources. Metabolites of all PAHs (fluorene, naphthalene, phenanthrene, and pyrene) and four VOCs (acrolein, acrylonitrile, crotonaldehyde, and propylene oxide) were detected in >85% of the samples. 2-Hydroxynaphthalene (2-NAP) was the only PAH metabolite that had higher concentrations in BiomSPHERE adults and children compared with nationally representative levels reported by the U.S. National Health and Nutrition Examination Survey (NHANES). Concentrations of 2-NAP were significantly correlated ($p < 0.05$) between adults and children, suggesting a common exposure source. Concentrations of 2-NAP were also significantly higher among Hispanic/Latino participants and among participants who recently used cleaning products, air fresheners, and scented personal care products ($p < 0.05$). For non-smoking adults, metabolites of the VOCs acrolein, acrylonitrile, and propylene oxide were significantly higher in BiomSPHERE compared with NHANES. Further research is needed to identify the sources of elevated 2-NAP and VOC urinary metabolite concentrations.

Keywords: polycyclic aromatic hydrocarbons (PAHs); volatile organic compounds (VOCs); urinary biomarkers; 2-hydroxynaphthalene

Check for updates

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Laboratory Activities



Lab Analyses – Environmental Health Lab (EHL)

- **CHAIRS-LA**
  - Preparing for VOC analysis of 2025 samples (n=187)

- **Intra-Program Pilot (IPP) Study**
  - Metals analyses for samples collected using micro-samplers and phlebotomy completed

Lab Analyses – Environmental Chemistry Lab (ECL)

- **STEPS**
  - ECL completed validation of the expanded PFAS method, incorporating short-chain, long-chain, and new replacement PFAS into the ISO 17025 Scope of Accreditation.
  - Analyst proficiency demonstrated
  - External AMAP proficiency testing performed

Outreach and Communications



Conferences/Presentations

- International Society of Exposure Scientists – Annual Meeting
  - Human Biomonitoring Population Studies and Demographic Disparities
  - Environmental phenols exposure among Southern and Eastern California Adults in 2018-2019
  - Inorganic arsenic exposure among Southern and Eastern California adults in 2018-2019



- PFAS Summit: Class-Based Approaches to Addressing PFAS in Drinking Water in California

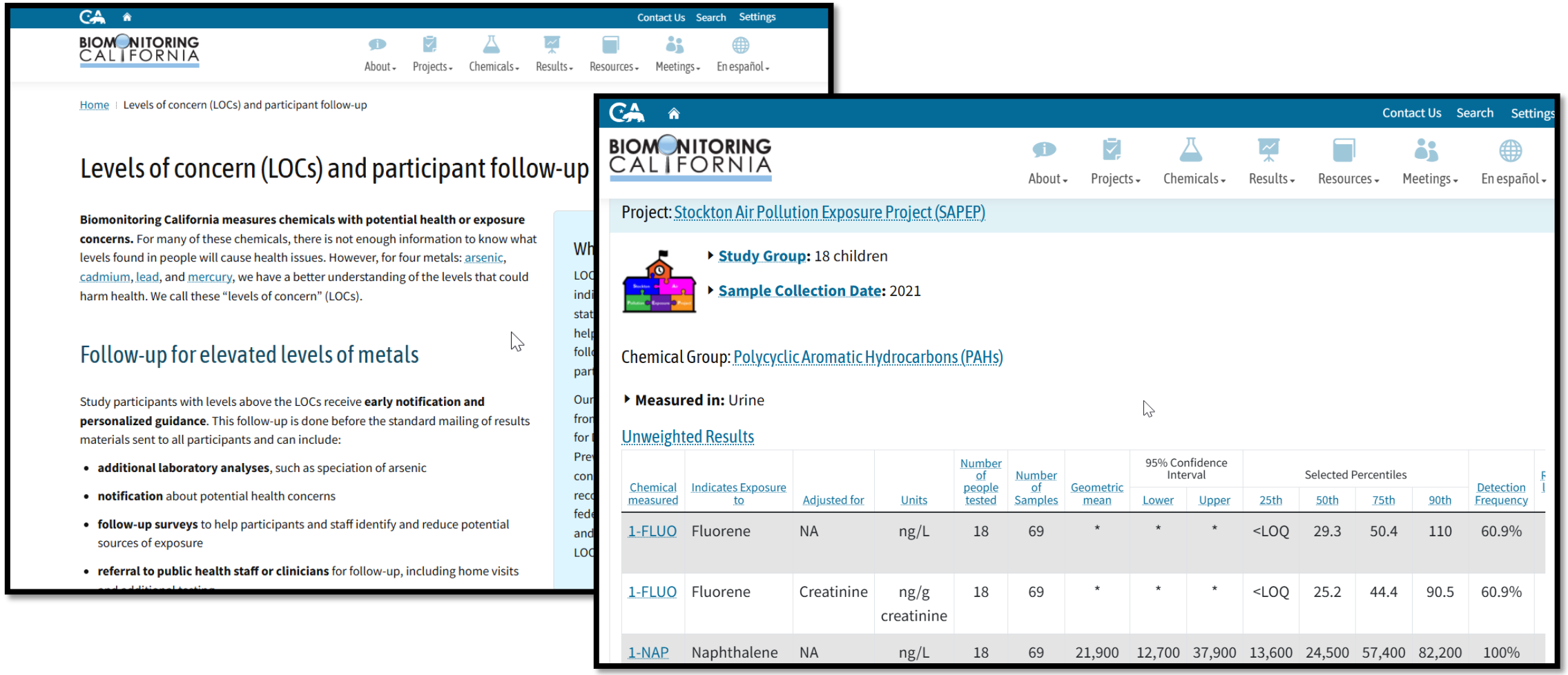
Community Events







Website Updates



Chemical measured	Indicates Exposure to	Adjusted for	Units	Number of people tested	Number of Samples	Geometric mean	95% Confidence Interval		Selected Percentiles				Detection Frequency
							Lower	Upper	25th	50th	75th	90th	
1-FLUO	Fluorene	NA	ng/L	18	69	*	*	*	<LOQ	29.3	50.4	110	60.9%
1-FLUO	Fluorene	Creatinine	ng/g creatinine	18	69	*	*	*	<LOQ	25.2	44.4	90.5	60.9%
1-NAP	Naphthalene	NA	ng/L	18	69	21,900	12,700	37,900	13,600	24,500	57,400	82,200	100%

PFASs and Seafood Postcard



- Now available in:
  - English
  - Spanish
  - Chinese (Traditional)
  - Chinese (Simplified)
  - Vietnamese
  - Tagalog
  - Korean
  - Thai
  - Lao
  - Khmer

https://biomonitoring.ca.gov/asianpacific-islander-community-exposures-ace-project-postcards

New Factsheet



We all come into contact with (or are exposed to) chemicals every day through the air we breathe, the food we eat, the water we drink, the products in our home, and the places we live and work. Often low-income and communities of color, especially those living near freeways, agricultural or industrial areas, may face higher exposures. Exposure to harmful chemicals can cause a wide range of health effects. While not all exposures can be avoided, small everyday actions can make a difference. **Here are some practical, low-cost steps for reducing chemical exposures.**

1. **Wash your hands often with plain soap and water,** especially before preparing or eating food. This helps remove chemicals that can get on our hands from dust, work, or consumer products. Choose plain soap instead of soaps labeled as “antimicrobial” or “antibacterial”.

2. **Clean surfaces and floors using a damp cloth or wet mop** regularly. Many chemicals can build up in household dust, and these chemicals can get into your body if you touch, swallow, or breathe in dust.

3. **Try to eat fresher and less processed foods.** While packaged and canned foods are helpful for busy lives, harmful chemicals from packaging and containers can get into your foods.

4. **When possible, choose foods that contain less harmful metals** like arsenic and mercury. Try to eat grains and seeds that are lower in arsenic like barley, farro, and quinoa. Also, choose fish that are lower in mercury like salmon, cod, and tilapia.

5. **Try different cooking methods like steaming, boiling, and stewing** to enjoy the foods you love. While grilling, charring, and frying foods are part of many family traditions, they can expose you to harmful chemicals.



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^ New staff
*** Departed staff**

BIOMONITORING CALIFORNIA

MEASURING CHEMICALS IN CALIFORNIANS

Questions?