CDPH
California Department of Public Health

BIOMONITORING CALIFORNIA

Program Update

Presentation to the Scientific Guidance Panel
March 25, 2025
Nerissa Wu

Program Update

- Los Angeles County Wildfires
- Surveillance
- Community-focused Studies
- Laboratory Activities
- Communications

Los Angeles County Wildfires (2025)

- Exploring collaborations to study:
  - Occupational exposures
  - General population exposures
  - Health outcomes
- Potential use of CARE-LA (2018) data and archived samples for baseline comparisons

LA County Recovers

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Wildfires During or Prior to CARE

CARE-LA*

Major fires in LA County

Fire	Date	Acres burned
Creek	Dec 2017	15,600
Thomas	Dec 2017	282,000
Stone	June 2018	1,300

* CARE-LA samples collected Feb 2018 – Jun 2018

CARE-2

Major fires in Region 2

Fire	Date	Acres burned
Valley	July 2018	1,400
Georges	July 2018	2,900
Cranston	July 2018	13,000
Boot	Sept 2018	7,000

Region 2 includes San Bernardino, Riverside, Imperial, Mono, and Inyo counties. CARE-2 samples collected Feb 2019 – Apr 2019

CARE Study: Questions Related to Wildfires

RECENT EVENTS

32. Did you experience any of the following related to the fires in Southern California in December 2017 (or afterwards)? Check all that apply.

- ☐ Performed emergency response duties in the field such as fire suppression, creating fire breaks, or evacuating residents
- ☐ Performed debris or ash clean-up on the job
- ☐ Performed debris or ash clean-up for own home or as a volunteer
- ☐ After the fires, lived in an area with fire damage
- ☐ Other (please specify): _____

RECENT EVENTS

31. Did you experience any of the following related to wild fires in your area in the last 6 months? Check all that apply.

- ☐ Performed emergency response duties in the field such as fire suppression, creating fire breaks, or evacuating residents
- ☐ Performed debris or ash clean-up on the job
- ☐ Performed debris or ash clean-up for your own home or as a volunteer
- ☐ After the fires, lived in an area with fire damage
- ☐ Not applicable
- ☐ Other (please specify): _____
- ☐ Don't know
- ☐ Prefer not to answer

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Reported Wildfire Exposures in CARE

	CARE-LA (n=430)		CARE-2 (n=359)	
	Number	Percent	Number	Percent
Performed emergency field duties	8	2%	3	1%
Performed debris or ash cleanup on the job	6	1%	6	2%
Performed debris or ash cleanup for own home or as volunteer	22	5%	10	3%
After the fires, lived in area with fire damage	20	5%	17	5%
Any wildfire exposure (answered “Yes” to at least one of the above)	41	10%	32	9%

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Wildfire-related Activities and Metals Concentrations

- Urinary mercury levels were about 2x higher in participants (n = 32) who reported cleaning up debris/ash ($p<0.02$)
  - Result seen in both CARE-LA and CARE-2
  - Persisted after adjusting for age, race and income
- No associations identified between other metals and wildfire activities

NOTE: Interpret with caution given small numbers. Other sources of exposure (e.g., diet), and other potential confounders not accounted for.

Elevations in Mercury in California Firefighter Studies

Study/Fire	Location	Year	n	Findings
FOX Study	Southern California	2010-11	101	Elevated blood mercury compared with NHANES; similar urinary mercury levels
Tubbs Fire	Northern California	2017	180	Deployed firefighters had higher blood mercury than non-deployed firefighters
Camp Fire	Butte County	2018	61	Firefighters had higher blood mercury, and a higher detection frequency of urinary mercury, compared with NHANES

Challenges of Biomonitoring Firefighters

- Biomonitored levels may depend on:
  - Timing of sample collection
  - Sample matrix
  - Type/location of fire fought
  - Use of protective breathing apparatus/other protective gear
  - Additional sources of exposure

Use of Surveillance Data for Specific Exposure Scenarios

- Specific exposure events may not impact the general surveillance study population
- Questionnaires may not cover specific exposure scenarios
- Surveillance provides baseline biomonitoring data that may be useful for comparisons

Surveillance

Surveillance Studies

Study	Coverage	Sample Collection	Analytes
California Regional Exposure (CARE) Study	3 regions	2018 – 2020	PFASs, metals, phenols, 1-nitropyrene
Studying Trends in Exposure in Prenatal Samples (STEPS)	3 counties	2015 – 2027	PFASs
Future Surveillance	TBD	2028 onward	TBD

Studying Trends in Exposures in Prenatal Samples (STEPS)

Sample Collection Location/Years	# Samples Acquired	Status
Orange County (2015-2021)	521	331 samples analyzed
Fresno County (2015-2021)	523	149 samples analyzed
Los Angeles County (2024)	1856	Analysis not yet initiated

Community-Focused Studies

Community-Focused Studies

- Asian/Pacific Islander Community Exposures (ACE) Project
- Biomonitoring component of the San Joaquin Valley Pollution and Health Environmental Research Study (BiomSPHERE)
- Farmworker women & Respiratory Exposure to Smoke from Swamp Cooler Air (FRESSCA–Mujeres Project)

Asian/Pacific Islander Community Exposures (ACE) Project

- Manuscript on associations between seafood consumption and participant PFAS levels to be submitted for publication
- Communication plan for dissemination of findings includes:
    - Two-page factsheet
    - Website posting
    - Social media

BiomSPHERE

- Results for urinary metabolites of PAHs and nicotine to be returned to participants in April 2025
- Preparing results return materials for urinary metabolites of VOCs
- Evaluating biomonitoring, environmental, and questionnaire data
- Community meeting planned for Summer 2025

FRESSCA-Mujeres

- Follow-up for participants with elevated levels of urinary metals completed in February 2025
- Analysis of urine samples for VOCs on-going
- Preparation of results return materials for urinary metabolites of PAHs, VOCs, metals and nicotine in progress
- Evaluating biomonitoring, environmental, and questionnaire data
- Community meeting planned for Summer 2025

Laboratory Updates

Environmental Chemistry Laboratory

- ISO/IEC 17025:2017 Accreditation
  - Re-accredited
  - PFAS analysis on scope
  - Valid through January 2027

ilac-MRA A2LA

Accredited Laboratory

A2LA has accredited

DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC)
ENVIRONMENTAL CHEMISTRY LABORATORY (ECL) - BERKELEY
Berkeley, CA

for technical competence in the field of

Chemical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

CORPORATE SEAL

Presented this 2nd Day of January 2025.

Mr. Trace McInturff, Vice President Accreditation Services
For the Accreditation Council
Certificate Number 5006.01
Valid to January 31, 2027

For the tests to which this accreditation applies, please refer to the laboratory's Chemical Scope of Accreditation.

Environmental Chemistry Laboratory

STEPS Samples

- 480 samples analyzed
- Orange County: 331 samples analyzed
- Fresno County: 149 samples analyzed

International Proficiency Testing (PT)

- Passed for 9 PFASs in serum in 2024
- Passed for 11 PCBs, 6 OCPs, and 8 PBDEs in serum in 2024
- Participating in another PT for PFASs in March 2025

Continued Method Development

- Cyclosiloxanes in serum
- PAHs in serum

Environmental Health Laboratory (EHLB)

- **California Regional Exposure (CARE) Study**
  - CARE-LA: Environmental phenols analyses completed; data under review (n=345)
  - CARE-2: Arsenic speciation analyses to begin in March (n=307)
- **Intraprogram Pilot Project (IPP)**
  - OH-PAHs and VOCs: analyses completed; data under review (n=38)
- **FRESSCA-Mujeres**
  - OH-PAHs: analyses completed; data under review (n=155)
- **Camp Fire Firefighter Study**
  - VOCs: Analyses completed and pending review (n=66)

EHLB Presentations

- Isotope Dilution UPLC-ESI-MS/MS Method for the Determination of Urinary VOC Metabolites. P. Behniwal, J. Gallardo, J. DeGuzman, S. Patton, J. She. APHL annual meeting, May 5, 2025.

- Polycyclic aromatic hydrocarbons in female firefighters post-fire response: concentrations and occupational risk factors. J. A. Shearston, E. S. Glazer, J. Trowbridge, L. Baehner, S. Wang, J. DeGuzman, J. She, R. A. Rudel, H. Buren, R. Morello-Frosch. ISES_ISEE conference, Aug 17, 2025.

Communications

Evaluating Program Impact

- First round of interviews (2023)
  - Collected feedback on how program data and communications materials are being used
  - Included researchers, environmental health advocates, State and Federal biomonitoring programs, and other California departments
  - Information used to inform program directions and create recommendations for the 8th Legislative Report (July 2021 – June 2023)

Recommendations to the Program (2023)

- Increase dissemination of information on Program activities
- Increase engagement with communities
- Collaborate with other state partners and academic researchers to compliment biomonitoring with other methods of exposure assessment
- Bring more attention to microplastics and plastic-related chemicals, bisphenols, antimicrobials, and pesticides
- Identify changes in chemical exposures that result from chemical substitution and regulatory actions
- Conduct studies to measure the impacts of wildfires
- Make data publicly available more quickly

Biomonitoring Resources

Handouts, newsletters, and videos about biomonitoring and the Biomonitoring California program

BIOMONITORING CALIFORNIA
MEASURING CHEMICALS IN CALIFORNIANS
CELEBRATING 15 YEARS

Fact Sheets

Short handouts about what we do, and why

- What is Biomonitoring?
- How Biomonitoring Studies Work
- Supporting the Community Air Protection Program

Newsletters

Updates on our work

- Biomonitoring California – 15 years of Impact
- Biomonitoring California Matters – vol 2 (en español)
- Biomonitoring California Matters – vol 1 (en español)

Videos

Short videos about our program and what it's like to participate in a biomonitoring study

- An Introduction to Biomonitoring California
- How to Collect a Urine Sample (en español)

Supporting the Safer Consumer Products Program

- The Safer Consumer Products Program solicits input on potential human exposure as part of the process to evaluate chemical/product pairs for prioritization
- Biomonitoring California submitted data from multiple studies on detection frequencies for parabens and quaternary ammonium compounds (QACs)

SAFER CONSUMER PRODUCTS

Upcoming Evaluation Project

Second round of interviews scheduled for Summer 2025

- Solicit input from collaborators, public health organizations, and other interested parties
- Focus questions specifically on how to maximize the utility of surveillance data
- Identify Program impacts

Staff Update

Dinesh Adhikari

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Emilie Kadhim*

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Kiera Melton

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June-Soo Park

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Roshni Sarala

Maya Shattuck^

Jianwen She

Kaitlin Stitt^

Wenlu Song

Justin Sturgess

Dan Sultana

Sayaka Takaku-Pugh

Ian Tang

Darcy Tarrant

McKenna Thompson

Jeff Wagner

Miaomiao Wang

Shizhong Wang

Yunzhu (Judy) Wang

Nerissa Wu

Ruihong Xiao*^

^ New staff
*** Departed staff**


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Questions?