



BIOMONITORING CALIFORNIA

Program Update

Presentation to the Scientific Guidance Panel

August 3, 2026

Nerissa Wu

Program Updates

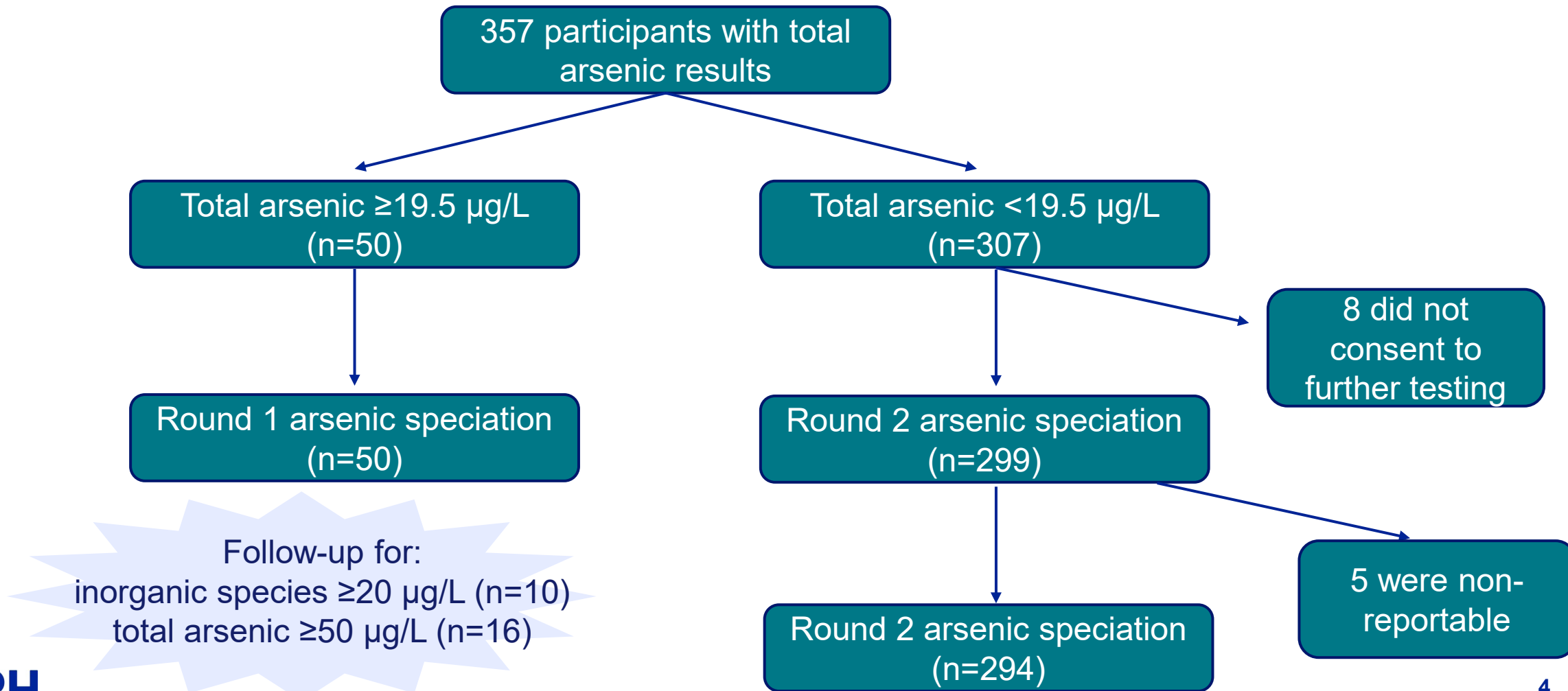
- Surveillance
- Community-focused studies
- Laboratory activities
- Outreach and communications

BIOMONITORING
CALIFORNIA

Surveillance 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	2011-2012 2015-2017	PFASs, persistent organic pollutants
STEPS: Studying Trends in Exposure in Prenatal Samples	Orange, Fresno, and Los Angeles counties	2015-2027	PFASs
Future Surveillance	TBD	2029 onward	TBD

CARE-2: Completion of Arsenic Speciation



CARE-2: Results for Speciated Arsenic (n=344)

Analyte	Detection frequency	Geometric mean (µg/g creatinine)	95th percentile (µg/g creatinine)
Sum of inorganic-related species	100%	4.8	12.1
Arsenous (III) acid	75%	0.3	0.8
Arsenic (V) acid	39%	*	0.7
Dimethylarsinic acid	100%	3.7	9.8
Monomethylarsonic acid	98%	0.6	1.6
Sum of organic species	78%	1.6	35.6
Arsenobetaine	77%	1.3	35.3
Arsenocholine	6%	*	0.5

Data weighted to underlying population

* GM not reported for analytes with DF ≤ 65%

Arsenic Species: Comparison of Detection Frequencies in CARE and NHANES

Analyte	CARE-LA	CARE-2	NHANES (2017-2020)
Sum of inorganic-related species	92%	85%	74%
Arsenous (III) acid	79%	68%	33%
Arsenic (V) acid	1%	0%	5%
Dimethylarsinic acid	78%	70%	69%
Monomethylarsonic acid	87%	81%	45%
Sum of organic species	47%	50%	47%
Arsenobetaine	47%	50%	46%
Arsenocholine	10%	6%	9%

Weighted data re-censored to highest MDL

* GM not reported for analytes with DF $\leq$ 65%

Inorganic Arsenic: Higher Levels in CARE Compared with NHANES

Analyte	CARE-LA	CARE-2	NHANES (2017-2020)
Sum of inorganic-related species	7.0 ↑	5.9 ↑	4.7
Arsenous (III) acid	0.4	0.3	*
Arsenic (V) acid	*	*	*
Dimethylarsinic acid	4.9 ↑	4.0 ↑	3.2
Monomethylarsonic acid	0.6	0.6	*
Sum of organic species	*	*	*
Arsenobetaine	*	*	*
Arsenocholine	*	*	*

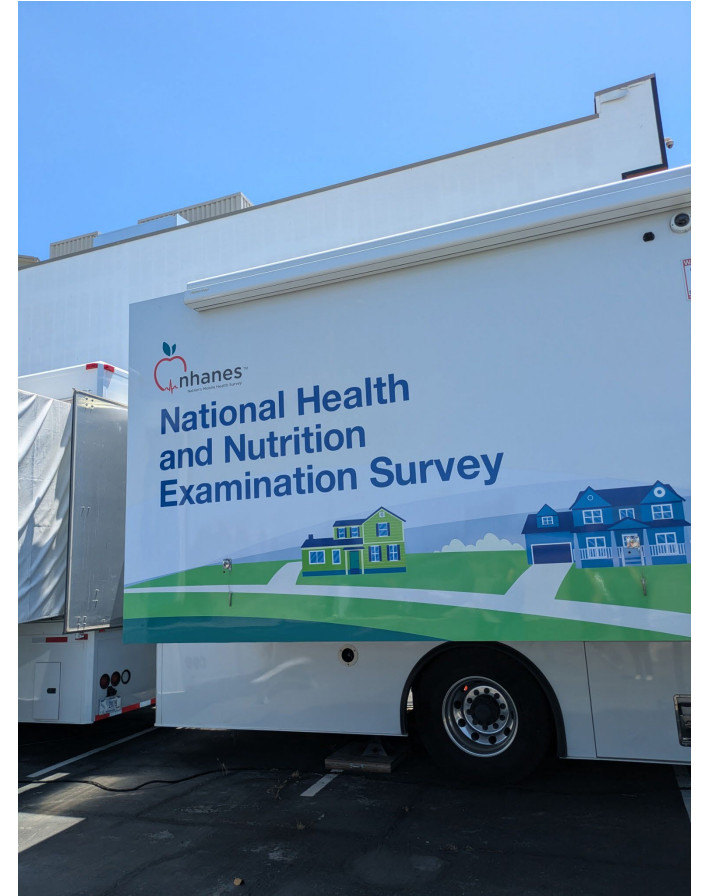
- Weighted data re-censored to highest MDL
- Results were creatinine adjusted to account for urine dilution
- GM not reported for analytes with DF ≤ 65%
- Arrow indicates significant difference from national levels

Next Steps: Inorganic Arsenic

- Demographic trends evaluated for CARE Report Supplement
- Preliminary analyses screening exposure-questionnaire responses completed (e.g., rice consumption and diet)
- Exploration of public water system arsenic data in progress

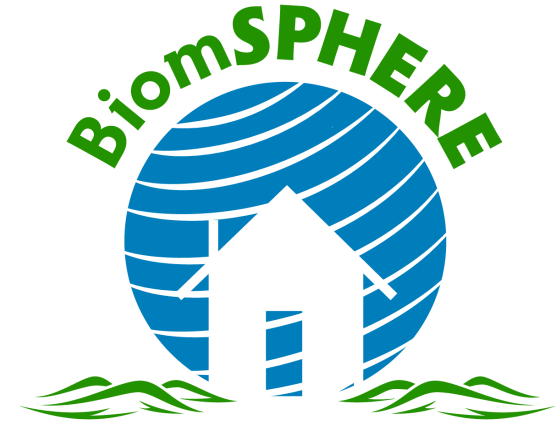
Developing New Surveillance

- Study Design
 - Identifying study priorities
 - Setting parameters based on power calculations and program capacity
- Developing Tools
 - Consulting with survey methodologists
 - Evaluating on-line platforms including the Digital Exposure Report-back Interface (DERBI)



Updates on Community-Focused Studies

- BiomSPHERE: Biomonitoring component of the San Joaquin Valley Pollution and Health Environmental Research Study
- CHAIRS-LA: Community Health and Air Quality Implications of Refinery Retirements in Los Angeles



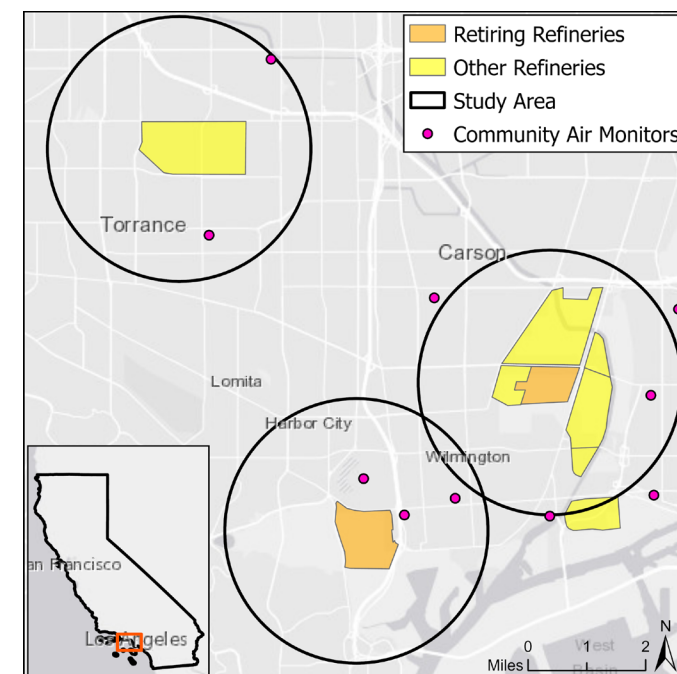
BiomSPHERE

- Community meeting held in April 2026
- Results Return Evaluation complete
- Publications (in preparation):
 - Indoor Air Pollutants and Urinary Biomarkers of Response in Parents and Children Living in California's San Joaquin Valley
 - Urinary Biomarkers of Exposure to Polycyclic Aromatic Hydrocarbons and Volatile Organic Compounds in San Joaquin Valley Families



CHAIRS-LA: Community Health and Air Quality Implications of Refinery Retirements in Los Angeles Study

- Followed up with 12 participants with results above Biomonitoring California's level of concern (LOC) for either mercury or arsenic
- Planning to return metals results to all 86 participants later this summer



UCLA



Yale





OPEN ACCESS

EDITED BY

Renata Sisto,
National Institute for Insurance Against
Accidents at Work (INAIL), Italy

REVIEWED BY

Erick Sierra-Díaz,
Instituto Mexicano del Seguro Social,
Mexico
Elavarasan Mathivanan,
Public Health England, United Kingdom

*CORRESPONDENCE

Susan Hurley
✉ Susan.hurley@cdph.ca.gov

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CITATION

High levels of urinary naphthalene metabolites measured in a sample of California schoolchildren: a call to expand monitoring and identify exposure sources

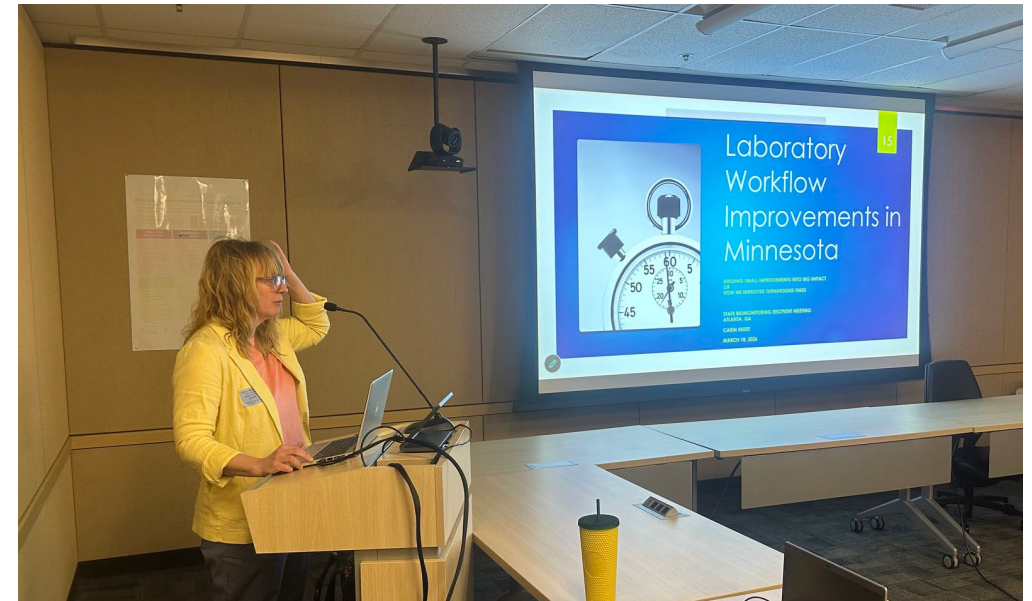
Susan Hurley^{1,2*}, Rosemary Castorina^{3,4}, Daniel Sultana¹, McKenna Thompson^{1,3}, Stephanie Jarmul¹, Robert B. Gunier³, Anuroop Nirula³, Lizbeth Ortiz-Pivaral³, Peyton Jacob⁵, Jianwen She⁴, Josephine DeGuzman⁴, Noehmi Garcia-Jauregui⁶, Matt Holmes⁷ and Asa Bradman⁸

Laboratory Activities



APHL Biomonitoring Peer to Peer program

- Participated in the Biomonitoring Peer to Peer Program sponsored by the Association of Public Health Laboratories (APHL)
 - Carin Huset (MN Dept. of Health) visited California laboratories. Jianwen She visited the Minnesota laboratories.
 - Discussed Standard Operating Procedures (SOPs) and method validation procedures
 - Compared methods to identify ways to improve accuracy and capacity



Lab Analyses in Progress

- **CHAIRS-LA**

- Analyses completed and results reported for total metals and creatinine (n=187) and As speciation (n=29)
- Urinary VOC analyses will be started in the fall, 2026 (n=187)

- **Intra-program Pilot Project (IPP)**

- Blood metals analyses is on-going (n=85)

- **STEPS Study**

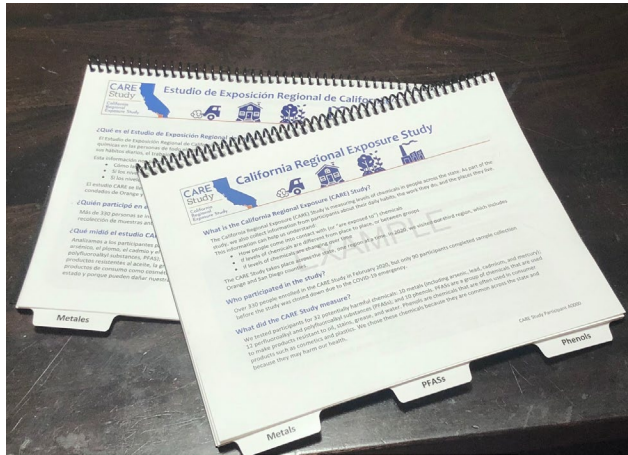
- Analyses of Orange County samples for PFAS is on-going (n=521)

Method Development

- Transfer of EHL's PAHs metabolite method from DFS machine to a newer GC-QQQ for improved capacity and accuracy
- ECL method to measure PAHs in serum is in the validation stage
- EHL continuing to work on automation of class-based semi-targeted analyses
 - Identification of emerging chemicals of concern
 - Expanding capacity to identify chemicals structurally related to benzophenone-3

Outreach and Communications

Results Return



- CARE-2 speciated arsenic
- 344 participants
- Via mail



- IPP-7 PAHs
- 35 participants
- Via digital platform

In Media



WHAT MY RESULTS MEAN FOR MY HEALTH

Given that I'd been drinking New Jersey tap water for most of my life, I bit the bullet and asked Dr. Roy if PFAS accumulate in the body over time. "They absolutely do," he responded. A 2025 California study published in the *Journal of Exposure Science & Environmental Epidemiology* found that PFAS levels in public drinking water were associated with measurably higher PFAS levels in residents' blood — not at industrial-disaster concentrations, but at ordinary city water levels. Of the 563 Southern California adults studied, nearly all had detectable PFAS in their blood, and 86% had levels high enough to flag potential health effects under National Academies guidance.



A [2026 study](#) measured the direct results of flame retardant regulation. Participants who replaced old furniture saw flame retardant levels in their bodies drop by half in about 1.4 years, compared to 2.6 to 5.2 years for people who kept old couches.

"This is the first study proving that updating safety standards directly improves human health," GSPI's Blum said. "We can make safer products without giving up fire protection."

Comments on UK Fire Safety Regulations



Department for
Business & Trade



Office for Product
Safety & Standards

Consultation: The Fire Safety of Domestic Upholstered Furniture

https://biomonitoring.ca.gov/sites/default/files/downloads/BiomCA_comments_UK_fire_safety_regs.pdf

Disseminating Information

 **CDPH** | **BIOMONITORING CALIFORNIA**



Flame Retardants

PFAS

Harmful chemicals from products and in dust can stay on our hands.

Chemical exposure awareness campaign

 **CDPH** | **BIOMONITORING CALIFORNIA**

California Department of Public Health
97,849 followers
1mo • 

New Publication Alert

We're excited to share that Biomonitoring California has published a study in *Frontiers in Public Health*! The pilot study identifies chemical exposures to toxic air pollutants in a group of schoolchildren who live in a predominantly Hispanic/Latino community that is heavily impacted by air pollution.



New publication identifies chemical exposure to toxic air pollutants in children

Promotion of SAPEP publication

 **CDPH** | **BIOMONITORING CALIFORNIA**

Update from the Asian/Pacific Islander Community Exposures (ACE) Project
亞裔/太平洋島民社區環境暴露 (ACE) 研究專案最新發現 - 詳細內容請參閱內文或掃描 QR 碼
Cập nhật từ Dự án ACE - đọc thêm bên trong hoặc quét mã QR



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Translating ACE findings to 10 languages

Increasing Visibility

- Biomonitoring California resources featured in CDPH's newsletter
- Newsletter audience
 - 3000+ subscribers
 - Local Health Jurisdictions

Communications Tools & Information

California Department of Public Health



Your weekly newsletter for the latest communications tools, resources, guidance and messages from the California Department of Public Health.

Suggested Messages and Resources



Harmful chemicals from products can collect in dust.



BPA

Flame retardants

PFASs

Dust – and the harmful chemicals it can carry – can get on our hands, then end up in our bodies without us knowing. Take simple steps to reduce how much dust gets in your body, such as washing hands often, wiping surfaces with a damp cloth and cleaning floors with a wet mop or HEPA vacuum.

[Learn How to Reduce Exposure to Harmful Chemicals](#)

[Share the Message](#)



Plastics affect more than our planet.



Give Plastic Free July a try! Plastics can pollute our planet and expose us to harmful chemicals, like Bisphenol A and S (BPA and BPS). Harmful chemicals can get into the foods we eat from plastic containers. Take simple steps to reduce your exposure like choosing glass containers for food and drinks, limiting the amount of packaged foods you eat and washing your hands often.

[Learn Ways to Reduce Harmful Chemical Exposures](#)

[Share the Message](#)

Website updates

- The June 2026 updates of the lists of **designated** and **priority** chemicals for Biomonitoring California are now available online.
- 18 additional pages have been translated into Spanish.

Biomonitoring California Designated Chemicals June 2026	
The following is a list of designated chemicals for Biomonitoring California.* Designated chemicals consist of those substances that are included in the Centers for Disease Control and Prevention's (CDC's) biomonitoring studies* and additional chemicals that are recommended by the Scientific Guidance Panel (SGP) for Biomonitoring California. Designated chemicals are the pool of chemicals from which the SGP can recommend priority chemicals for biomonitoring. Targets for measurement in biomonitoring studies could include the parent chemical, metabolites and other chemical products formed in the body or the environment (e.g., hemoglobin adduct, environmental degradation product). The approach for biomonitoring a chemical may change as methods development proceeds. For some of the parent chemicals listed below, metabolites or other targets for measurement are shown indented underneath. Chemicals are grouped into categories (like "metals" and "pesticides"), some are included in more than one category. The Program determines the chemicals that are actually biomonitoring and the appropriate targets for measurement. To jump to each footnote referenced in the list below, click on the relevant number.	
Acrylamide Acrylamide hemoglobin adducts Glycidamide hemoglobin adducts <i>N</i> -Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine <i>N</i> -Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine	2-Amino- o-Anilin 2,8-Dim o-Toluid
Aldehydes ¹ Benzaldehyde Butyraldehyde Crotonaldehyde Decanaldehyde Formaldehyde Formaldehyde hemoglobin adducts Heptanaldehyde Hexanaldehyde Isopentanaldehyde Nonanaldehyde Octanaldehyde Pentanaldehyde Propanaldehyde o-Tolualdehyde	Arom 4,4'-Dial 1,5-Dial 2,4-Dial 2,6-Dial p-Pheny
Antimicrobials used in Food Production ²	Bromi Comp Retard
Aromatic Amines ³ 4-Aminobiphenyl 1-Aminonaphthalene	Allyl 2,4 2,2-Bis Bis(2-ch Bis(hexa (Decyl 1,2-Bis 2-Brom Chlorom Chlorom Decabro
a. California Environmental Contaminant Biomonitoring Program, section 105440 et seq. b. Known collectively as the National Reports on Human Exposure	

Biomonitoring California Priority Chemicals June 2026	
The following is a list of priority chemicals for Biomonitoring California.* The Scientific Guidance Panel (SGP) recommends chemicals from the designated list as priority chemicals for biomonitoring. Targets for measurement in biomonitoring studies could include the parent chemical, metabolites and other chemical products formed in the body or the environment (e.g., hemoglobin adduct, environmental degradation product). The approach for biomonitoring a chemical may change as methods development proceeds. For some of the parent chemicals listed below, metabolites or other targets for measurement are shown indented underneath. Chemicals are grouped into categories (like "metals" and "pesticides"), some are included in more than one category. The Program determines the chemicals that are actually biomonitoring and the appropriate targets for measurement. To jump to each footnote referenced in the list below, click on the relevant number.	
Brominated and Chlorinated Organic Compounds used as Flame Retardants ¹ Allyl 2,4,6-tribromophenyl ether (ATE) 2,2-Bis(bromomethyl)-1,3-propanediol 2,2-Bis(chloromethyl)trimethylene bis(bis(2-chloroethyl)phosphate) Bis(2-ethyl-1-hexyl)tetraabromophthalate (TBPH) Bis(hexachlorocyclopentadienyl)cyclooctane (Dichlorane Plus) 1,2-Bis(2,4,6-tribromophenoxy)ethane (BTBPE) 2-Bromoisobutyl-2,4,6-tribromophenyl ether (BATE) Chloronic acid Chlorinated paraffins Decabromodiphenylethane (DBDPE) 1,2-Dibromo-4-(1,2,3-dibromoethyl)cyclohexane (TBEC) 2,4-Dibromophenol 2,3-Dibromopropyl-2,4,6-tribromophenyl ether (DPTE) 2-Ethyl-1-hexyl-2,3,4,5-tetrabromobenzoate (TBB) 2,3,4,5-Tetrabromobenzoic acid (TBSA) N,N'-Ethylenebis(tetrabromophthalimide) Hexabromobenzene (HBB) 2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153) Hexabromocyclohexane (HBCD) Hexachlorocyclopentadienyl-dibromocyclooctane 2-Hydroxypropyl 2-(2-hydroxyethyl)ethyl tetraabromophthalate Isobutoxyperfluorobromocyclohexanecarboxylates (BPBDCs) Octabromodimethylphenylindane (OBIND) Pentabromomethylbenzene (PBMB) Pentabromophenol (PBP) Pentabromotoluene (PBT) 1,1'-Sulfonylbis(3,5-dibromo-4-(2,3-dibromopropoxy) benzene Tetrabromobisphenol A (TBBPA)	Tetrabromobisphenol A bis(2,3-dibromopropyl) ether (TBBPA-DBPE) Tetrabromobisphenol A bis(2-hydroxyethyl) ether (TBBPA-DHEE) Tetrabromobisphenol A diallyl ether Tetrabromophthalic acid, mixed esters Tetrabromophthalic anhydride 2,3,5,6-Tetrabromo-p-xylene Tetrachlorophthalic anhydride 2,4,6-Tribromophenol Tribromoneopentylalcohol Tris(2-chloroethyl)phosphate (TCPP) Bis(2-chloroethyl)phosphate (BCEP, BCEPP) Tris(1-chloro-2-propyl)phosphate (TCPP) Bis(1-chloro-2-propyl)phosphate (BCPP) Tris(2,3-dibromopropyl) isocyanurate Tris(2,3-dibromopropyl)phosphate (TDBPP) Tris(1,3-dichloro-2-propyl)phosphate (TDCPP) Bis(1,3-dichloro-2-propyl)phosphate (BOCPP) Tris(2,3-dichloro-1-propyl)phosphate Tris(tribromoneopentyl)phosphate 2,4,6-Tris(2,4,6-tribromophenoxy)-1,3,5-triazine
Polybrominated diphenyl ethers (PBDEs) ² 2,2',4,4'-Tribromodiphenyl ether (BDE 17) 2,4,4'-Tribromodiphenyl ether (BDE 28) 2,2',4,4'-Tetrabromodiphenyl ether (BDE 47) 2,3,4,4'-Tetrabromodiphenyl ether (BDE 66) 2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85) 2,2',4,4',5-Pentabromodiphenyl ether (BDE 99) 2,2',4,4',6-Pentabromodiphenyl ether (BDE 100) 2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153) 2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154) 2,2',3,4,4',5'-Heptabromodiphenyl ether (BDE 183) 2,2',3,3',4,4',5,6'-Octabromodiphenyl ether (BDE 196)	
a. California Environmental Contaminant Biomonitoring Program, codified at Health and Safety Code section 105440 et seq.	

Staff Update

Dinesh Adhikari	Songmei Gao	Meltem Musa	Dan Sultana
Kathleen Attfield	Qi Gavin	Bishnu Neupane	Sayaka Takaku-Pugh
Hyoung Gee Baek	Ranjit Gill	June-Soo Park	Ian Tang
Paramjit Behniwal	Emily Gokun	Michelle Pearl	Darcy Tarrant
Rebecca Belloso	Weihong Guo	Eimi Percival	McKenna Thompson
Lily Borak	Susan Hurley	Aalekhya Reddam	Jeff Wagner
Kelly Chen	Xiaowen Ji	Martha Sandy	Miaomiao Wang
Key-Young Choe	Stephanie Jarmul	Maya Shattuck	Shizhong Wang
Josephine DeGuzman	Duyen Kauffman	Jianwen She	Yunzhu (Judy) Wang
Dina Dobraca	Junhe Lu	Alex Shing	Nerissa Wu
Julian Edwards	Ana Mejia	Wenlu Song	Ruihong Xiao
Toki Fillman	Kiera Melton	Justin Sturgess	Mylanah Yolangco



Questions?