CDPH
California Department of Public Health

BIOMONITORING CALIFORNIA

Program update

Presentation to the Scientific Guidance Panel
November 7th, 2024
Kathleen Attfield

Outline

1. Surveillance study updates
2. Community-focused study updates
3. Laboratory updates
4. Communications updates

Surveillance

Surveillance

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

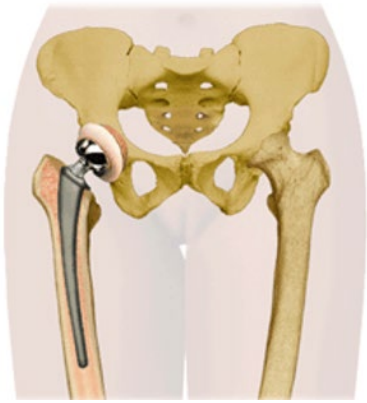
CARE – current work

Planning Phase	Sample Collection	Lab Analysis	Results Return/ Website	Deeper Data Dive	Communications
-	-	Arsenic speciation • CARE-LA - Finished • CARE-2 - Planned Phenols • CARE-LA - In progress • CARE-2 - Planned	Planned for Winter/ Spring	Diet and PFAS • Finished Drinking water and PFAS • Finalizing Metals with levels of concern • Exploring questionnaire data Other metals • Distribution summaries	Publications • PFAS and diet- submitted • PFAS and Drinking water - in progress Factsheets and other public facing material • In progress Presentations • American Water Works Assn (DW) • International Society of Exposure Science

CARE Metals

- Metals with levels of concern and program follow-up
  - Arsenic, cadmium, lead, mercury

- Other metals
  - Antimony, cobalt, manganese, molybdenum, thallium, uranium



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CARE Metals

	Notification of elevated levels	Results return/ website posting	Comparisons to national levels	Describing demographic/ regional trends	Associations with questionnaires and other data
LOC metals	Finished	Finished except now adding speciated arsenic, CARE-LA in early 2025	In CARE report	In CARE report	In progress
Other metals	NA	Finished	In progress	In progress	Future, if warranted

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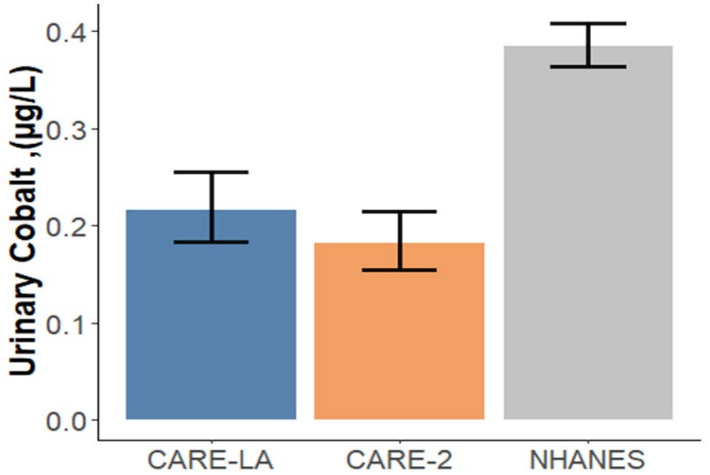
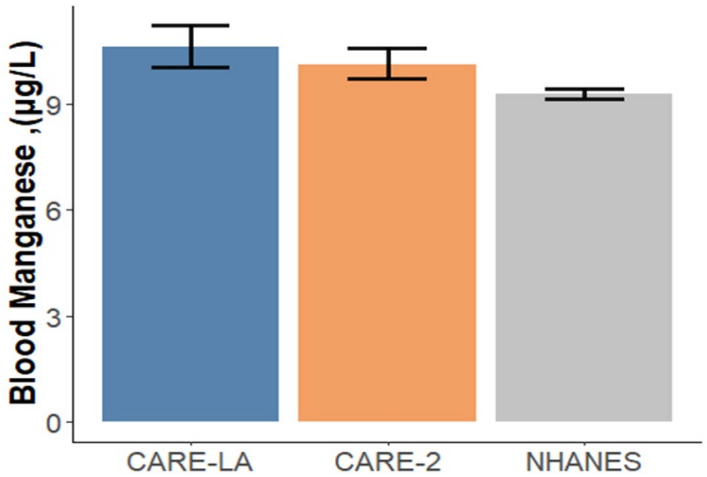
Urinary cobalt levels are lower than NHANES



Blood manganese levels are higher than NHANES



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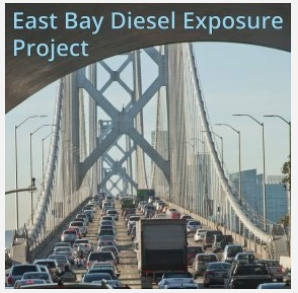
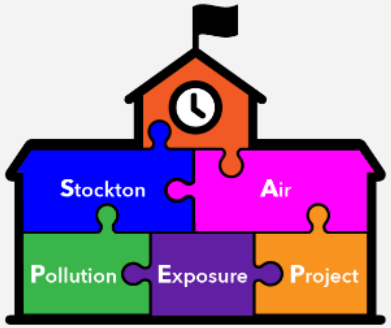
LOC metals	Finished	Finished except now adding speciated arsenic, CARE-LA in early 2025	In CARE report	In CARE report	In progress
Other metals	NA	Finished	In progress	In progress	Future, if warranted

Other surveillance projects

Study	Coverage	Sample Collection	Analytes	Current work
Studying Trends in Exposure in Prenatal Samples (STEPS)	3 counties	2015 – 2027	PFASs	- Receiving 2024 LA specimens selected per month - Ongoing laboratory analyses for Orange County (2015, 2018, 2021)
Future Surveillance	TBD	2028 onward	TBD	- Exploring possible collaborating surveys - Developing criteria for study design

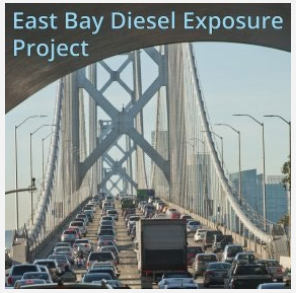
Community-focused studies

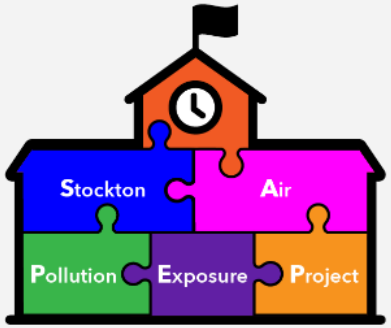




Community-focused studies

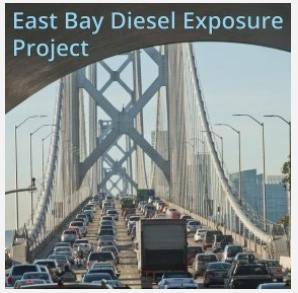
- Asian/Pacific Islander Community Exposures (ACE) Project
- East Bay Diesel Exposure Project (EBDEP)
- Stockton Air Pollution Exposure Project (SAPEP)
- Biomonitoring component of the San Joaquin Valley Pollution and Health Environmental Research Study (BiomSPHERE)
- Farmworker women & Respiratory Exposure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

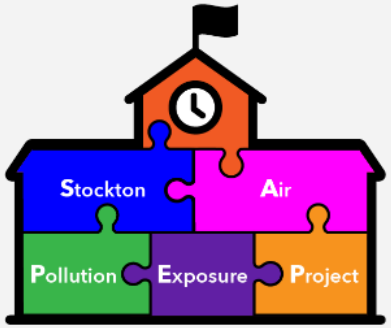




Asian/Pacific Islander Community Exposures (ACE) Project

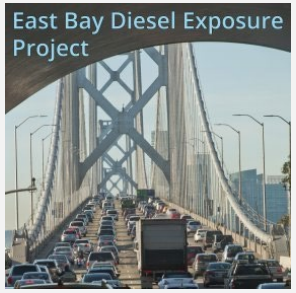
- Presentation to International Society of Exposure Science in October
- Draft paper

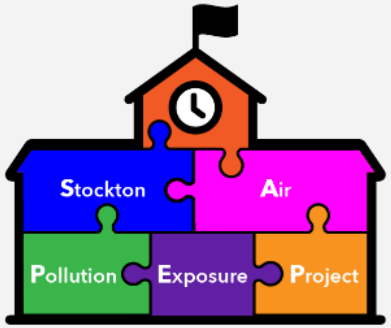




FRESSCA-Mujeres

- Air monitoring results reported at community meeting held in August 2024
- Evaluating air monitoring and questionnaire data
- Laboratories analyzing urine samples for VOCs, PAHs, heavy metals, and tobacco smoke





BiomSPHERE

- Biomarkers of response results returned to participants in September 2024
- Evaluating air monitoring and questionnaire data
- Laboratories analyzing urine samples for VOCs
- Preparing to evaluate results return materials

Laboratory updates

DTSC – Environmental Chemistry Lab

	Method development	Proficiency testing/Standard material check/Certifications	Sample analysis	Communications
Cyclosiloxanes	Serum: In progress			SETAC conference in October 2024
PAHs	Serum: In progress			SETAC conference in October 2024
PFASs		PT: 9 PFASs in serum (passed two times this year, international) ISO/IEC 17025 assessment (scheduled on Nov 12-14, 2024)	STEPS: 300 samples analyzed	SETAC conference in October 2024
PCBs, OCPs, and PBDEs		PT: 11 PCBs, 6 OCPs, and 8 PBDEs in serum (submitted on Oct 25, 2024)		

CDPH – Environmental Health Lab

	Method development	Proficiency testing /Standard material check/ Certifications	Sample analysis
Metals	Nickel	Total metals: NYS DOH Biomonitoring Proficiency Testing Program for Trace Elements Pb: College of American Pathologists Blood Lead Survey CDC Proficiency in Arsenic Speciation (PAsS) Program CLIA certification	IPP-4: provided to EHIB in June FRESSCA-Mujeres: provided to OEHHA staff in October, further As speciation in progress

CDPH – Environmental Health Lab

	Method development	Proficiency testing /Standard material check/Certifications	Sample analysis
Phenols	NA	-	CARE-LA: finalizing analyses and data under review (n=346)
OH-PAHs	NA	CDC Biomonitoring Proficiency Testing Program samples	IPP-7: analyses completed and data under review (n=38) FRESSCA-Mujeres: finalizing analyses (n=155)
VOCs	NA	CDC reference materials and quality control samples	IPP-7: analyses completed and under review (n=39) California Fire Fighters Study: analyses completed and under review (n=66)

Intraprogram pilot projects

- Demonstrate readiness of new or modified methods for use in studies involving the public
  - “Dress rehearsal”: Follow process from sample collection to laboratory analysis to participant report back
  - Provide evidence of detectable values in range of assay/media type
  - Provide seed data for method publication
  - Interest in developing similar procedure for external laboratories

- Recent examples
  - Expanded PFAS panel (up to 44)
  - Quaternary ammonium compounds (external)
  - Nickel

Nickel method development

- Air pollutant of interest for AB 617-related community studies
- Method development
  - Intraprogram pilot project (IPP-4): addition to metals panel method, no changes
- IPP-4 (n=32), in ug/L

	MDL	Detection frequency	50%ile	90%ile
IPP-4 (2018)	0.30	84%	0.78	2.9
NHANES (2017-2018)	0.31	92%	1.1	2.8

Nickel method development

- Air pollutant of interest for AB 617-related community studies
- Method development
  - Intraprogram pilot project (IPP-4): addition to metals panel method, no changes
- IPP-4 (n=32), in ug/g creatinine

	50%ile	90%ile
IPP-4 (2018)	1.4	3.9
NHANES (2017-2018)	1.1	2.5

Environmental Health Laboratory- method updates

- Use of semi-targeted approaches is identifying additional biomarkers for inclusion in older methods and/or additions to the list of Designated Chemicals
  - Adding additional metabolites to the existing PAH and VOC panels
  - Identifying potential Designated Chemicals: additional environmental phenols

Communications

Results return

- Nickel, IPP-4
- Biomarkers of response, BiomSPHERE
- Evaluating results return activities

Your Lab Result for Nickel

Nickel is a metal found in soil, water, air, and some foods. It occurs naturally and from human activity.

Your nickel result	Middle level in this project	90th percentile in this project	Middle level in the U.S.	90th percentile in the U.S.	Number of participants in this project with nickel found in their urine
[redacted]	0.78	2.9	1.1	2.8	27 of 32

Results for nickel in urine are reported in micrograms per liter (µg/L).

Did you find nickel in my urine?

Yes. Your nickel result was [redacted]

How can I compare my result to others?

You can compare your result to others in the IPP Project. We found nickel in 27 of the 32 participants who had their urine tested. The table above can be used to compare your nickel result to:

- **Middle level in this study.** Half the participants tested in this project had a result below this level, and half had a result above it.
- **90th percentile in this study.** 90% of participants tested in this project had a result below this level, and 10% had a result above it.

You can also use the table to compare your nickel result to adults tested in the United States in 2017-2018:

- **Middle level in the U.S.** Half the adults tested in the U.S. had a result below this level, and half had a result above it.
- **90th percentile in the U.S.** 90% of adults tested in the U.S. had a result below this level, and 10% had a result above it.

The middle level and 90th percentile do not tell us anything about what level of nickel in urine might be a health concern. We are providing this information so that you can compare your result to those of others.

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The next two pages explain more about nickel.

Frequently Asked Questions about **Nickel**

Where is nickel found?

- Smoke from the burning of tobacco, cannabis, wood, fuel oils, and wildfires.
- Some drinking water, most commonly as a result of leaching from metal pipes and fittings.
- Dust and fumes from metal production and processing (nickel smelters, refineries, welding and electroplating).
- Stainless steel, and in some jewelry (including some costume jewelry).
- Some batteries, including nickel-cadmium (NiCd or NiCad) rechargeable batteries, lithium-ion batteries, and batteries used in portable electronic equipment and electric vehicles.
- Some paints and coatings, which may be used on glassware, pottery, and ceramics.
- Some foods and drinks, including nuts, sunflower seeds, legumes (beans, lentils, peas), cereals, chocolate products, and teas.

What are possible health concerns?

Nickel:

- May harm the developing infant and child.
- May harm the male reproductive system.
- May cause skin, eye, nose, and throat irritation.
- Can cause dermatitis in people who are allergic or have become sensitized to nickel.
- Can damage the lungs.
- Can cause cancers of the lung, nasal cavity, and nasal sinuses.

What are possible ways to reduce exposure?

- Do not smoke or allow others to smoke in your home, car, or around your child.
- Properly handle and recycle batteries (see links to recycling information below), especially if they are damaged or leaking. Do not let children handle batteries.
- Avoid costume jewelry if you are sensitized to nickel.
- If possible, use a high-efficiency filter in your home's central heating and air system.
- Consider buying a portable air cleaner (or "air purifier") that can remove heavy metals, including nickel, from the air in your home. See links to additional resources below.
- If you do any welding or metal working, or work with nickel in other ways:
  - Be sure that your work area is well ventilated, and use proper protective equipment.
  - Follow other safe work practices, including washing hands frequently, keeping work dust out of your home, and washing work clothes separately.
  - Keep children away from welding fumes and other metal vapors and dusts.

(continued on next page)

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- Because nickel can collect in dust:
  - Wash your and your child's hands often, especially before preparing or eating food.
  - Clean your floors regularly, using a wet mop or high efficiency particulate air (HEPA) vacuum if possible, and use a damp cloth to dust.
- Include plenty of variety in your and your child's diet. Eat a well-balanced diet with enough iron, which can help reduce the amount of nickel that your body absorbs.

For more information:

Agency for Toxic Substances and Disease Registry ToxFAQs™ for Nickel: https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=244&toxid=44

Recycle Stewardship: https://calrecycle.ca.gov/epr/batteries/

Battery recycling location: https://recyclenation.com/

HEPA filters: https://www.epa.gov/indoor-air-quality-iaq/what-hepa-filter

EPA's Guide to Air Cleaners: https://www.epa.gov/sites/default/files/2018-07/documents/guide_to_air_cleaners_in_the_home_2nd_edition.pdf

- And available online: https://biomonitoring.ca.gov/sites/default/files/downloads/NickelFactSheet.pdf

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Factsheets in progress

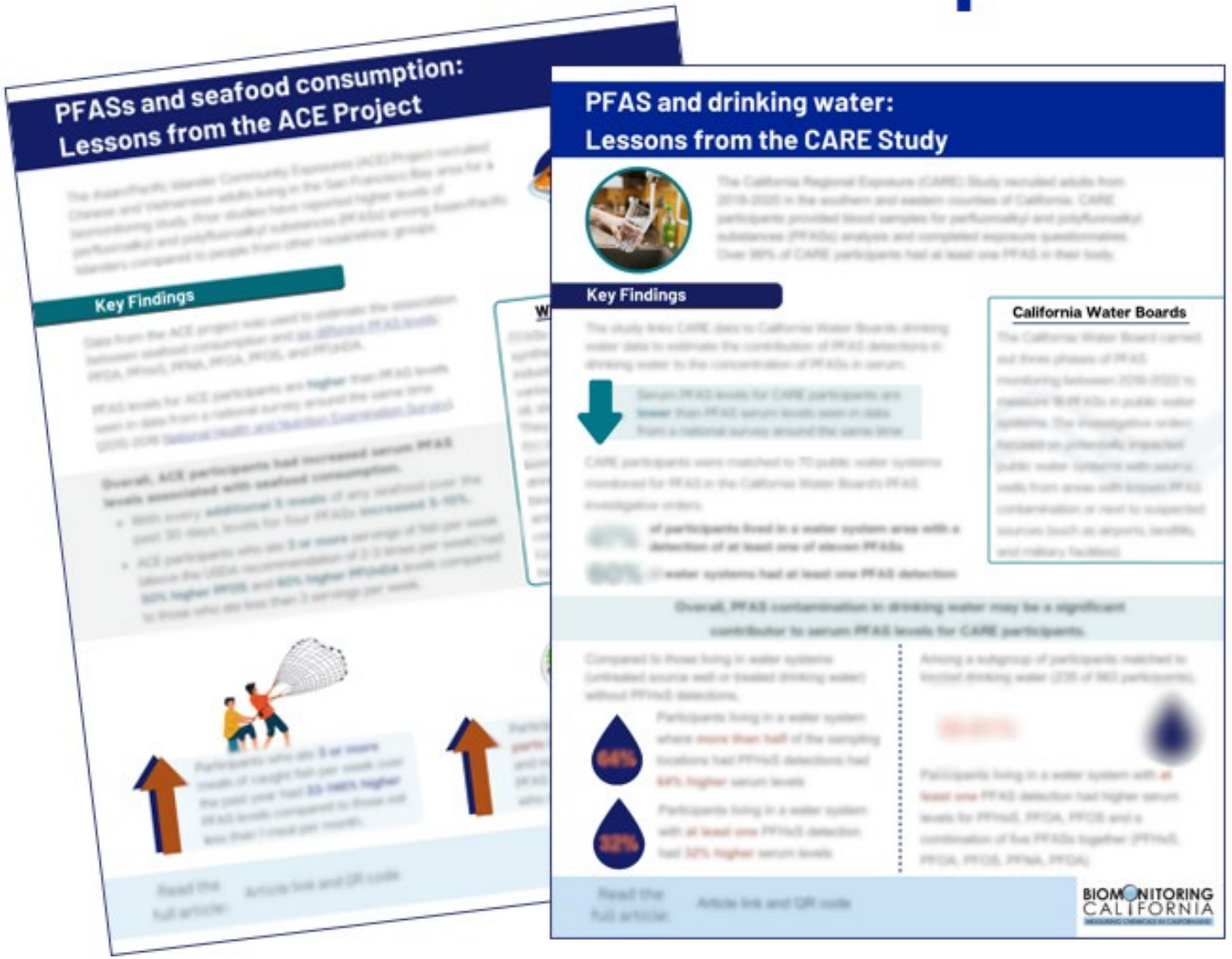
Arsenic in Rice factsheet – in final editing stages before remediation

- Chinese (traditional, Simplified), Vietnamese, and Spanish transcreation

Foam Replacement and Environmental Exposure Study (FREES) – factsheet in review

Lay-friendly factsheets for manuscripts

Making science accessible



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Staff Update

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Ilaria Lentrichia

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Meltem Musa

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^ New staff
*** Departed staff**

Thanks and questions?