

Unweighted Results for the California Regional Exposure Study, Phase 2

The goal of the [California Regional Exposure \(CARE\) Study](#) is to measure and compare environmental chemicals in people across the state, one region at a time. In 2019, 359 residents of Riverside, San Bernardino, Imperial, Mono, and Inyo counties participated in the second phase of the study, [CARE-2](#). All study participants donated blood and urine samples and completed surveys to identify potential sources of exposure to chemicals.

Samples from all CARE-2 participants were tested for ten metals, including arsenic, cadmium, lead, and mercury, and twelve perfluoroalkyl and polyfluoroalkyl substances (PFASs). A subset of 158 participant samples was also measured for 1-nitropyrene, a chemical that shows if a person was exposed to diesel exhaust. In addition, 151 participants were analyzed for seven phenols, a group of chemicals that are often used in personal care and other consumer products, and a related chemical called triclocarban.

This document contains unweighted biomonitoring results for CARE-2 participants. They are called unweighted results because they have not been adjusted to be representative of the underlying population in Riverside, San Bernardino, Imperial, Mono, and Inyo counties. Some demographic characteristics were underrepresented in the CARE-2 study while others were overrepresented. Weighted results, which more accurately reflect the regional population, were generated for metals and PFASs. To view these weighted summaries, please visit the [Biomonitoring California website](#).

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Diesel Exhaust

Measured in Urine

Subset: Subsample of 158 CARE-2 participants

Chemical measured	Indicates Exposure to	Units	Number of people tested	Geometric mean (95% Confidence Interval)	Selected Percentiles				Detection Frequency	Limit of Detection (LOD), wet-weight
					25th	50th	75th	95th		
6-Hydroxy-1-nitropyrene	1-Nitropyrene	pg/L [^]	142	150 (120, 180)	83	150	300	960	88.7%	13 pg/L
8-Hydroxy-1-nitropyrene	1-Nitropyrene	pg/L [^]	155	89 (76, 100)	49	78	160	410	76.1%	22 pg/L

[^]Concentrations were adjusted for specific gravity using a reference value of 1.017 from NHANES 2007-2008Environmental Phenols

Measured in Urine

Subset: Subsample of 151 CARE-2 participants

Chemical measured	Indicates Exposure to	Units	Number of people tested	Geometric mean (95% Confidence Interval)	Selected Percentiles				Detection Frequency	Limit of Detection (LOD), wet-weight
					25th	50th	75th	95th		
Benzophenone-3 (Oxybenzone)	Benzophenone-3	µg/L	151	18.5 (13.7, 25.1)	5.59	18.0	50.0	493	96.0%	1.00 µg/L
Bisphenol A (BPA)	Bisphenol A	µg/L	151	0.503 (0.419, 0.603)	<LOD	0.466	1.12	3.19	69.5%	0.200 µg/L
Bisphenol S (BPS)	Bisphenol S	µg/L	151	*	<LOD	0.233	0.593	2.25	64.9%	0.100 µg/L
Ethyl paraben	Ethyl paraben	µg/L	151	*	<LOD	<LOD	2.02	69.7	35.8%	0.500 µg/L
Methyl paraben	Methyl paraben	µg/L	151	15.3 (10.9, 21.5)	3.11	12.6	79.4	535	94.0%	0.500 µg/L
Propyl paraben	Propyl paraben	µg/L	151	*	<LOD	1.54	14.8	223	60.3%	0.200 µg/L
Triclocarban	Triclocarban	µg/L	151	*	<LOD	<LOD	<LOD	0.307	11.3%	0.100 µg/L
Triclosan	Triclosan	µg/L	151	*	<LOD	<LOD	3.02	389	45.0%	1.00 µg/L

*Geometric mean was not calculated because the chemical was found in less than 65% of the study group

Metals

Measured in Blood

Chemical measured	Indicates Exposure to	Units	Number of people tested	Geometric mean (95% Confidence Interval)	Selected Percentiles				Detection Frequency	Limit of Detection (LOD), wet-weight
					25th	50th	75th	95th		
Cadmium	Cadmium	µg/L	359	0.270 (0.251, 0.290)	0.162	0.265	0.432	0.809	98.3%	0.0750 µg/L
Lead	Lead	µg/dL	359	0.676 (0.632, 0.723)	0.415	0.717	1.09	1.81	100%	0.0250 µg/dL
Manganese	Manganese	µg/L	359	10.2 (9.91, 10.6)	8.24	10.2	12.7	16.4	100%	0.250 µg/L
Mercury	Mercury	µg/L	359	0.651 (0.575, 0.738)	0.277	0.676	1.39	5.02	95.0%	0.0750 µg/L

Metals

Measured in Urine

Chemical measured	Indicates Exposure to	Units	Number of people tested	Geometric mean (95% Confidence Interval)	Selected Percentiles				Detection Frequency	Limit of Detection (LOD), wet-weight
					25th	50th	75th	95th		
Antimony	Antimony	µg/L	357	*	<LOD	<LOD	<LOD	0.168	17.6%	0.0500 µg/L
Arsenic	Arsenic	µg/L	357	6.01 (5.32, 6.78)	2.70	6.19	11.9	49.2	100%	0.100 µg/L
Cadmium	Cadmium	µg/g creatinine	357	0.238 (0.219, 0.259)	0.136	0.241	0.409	0.914	95.0%	0.0300 µg/L
Cobalt	Cobalt	µg/L	357	0.193 (0.173, 0.216)	0.100	0.192	0.385	1.21	94.1%	0.0300 µg/L
Manganese	Manganese	µg/L	357	*	<LOD	<LOD	<LOD	0.310	19.0%	0.100 µg/L
Mercury	Mercury	µg/L	357	0.155 (0.136, 0.177)	0.0613	0.159	0.359	1.29	87.1%	0.0300 µg/L
Molybdenum	Molybdenum	µg/L	357	30.9 (27.8, 34.4)	15.5	34.4	64.3	140	100%	0.300 µg/L
Thallium	Thallium	µg/L	357	0.148 (0.136, 0.161)	0.0820	0.166	0.275	0.469	99.7%	0.0100 µg/L
Uranium	Uranium	µg/L	357	*	<LOD	0.0109	0.0256	0.108	53.2%	0.0100 µg/L

*Geometric mean was not calculated because the chemical was found in less than 65% of the study group

Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs)

Measured in Serum

Chemical measured	Indicates Exposure to	Units	Number of people tested	Geometric mean (95% Confidence Interval)	Selected Percentiles				Detection Frequency	Limit of Detection (LOD), wet-weight
					25th	50th	75th	95th		
2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid [Et-PFOSA-AcOH]	Et-PFOSA-AcOH	ng/mL	358	*	<LOD	<LOD	<LOD	0.0461	19.3%	0.0115 ng/mL
2-(N-Methyl-perfluorooctane sulfonamido) acetic acid [Me-PFOSA-AcOH]	Me-PFOSA-AcOH	ng/mL	358	0.0384 (0.0340, 0.0434)	0.0159	0.0365	0.0721	0.323	78.8%	0.0114 ng/mL
Perfluorobutane sulfonic acid (PFBS)	PFBS	ng/mL	357	*	<LOD	<LOD	<LOD	0.0500	10.9%	0.0303 ng/mL
Perfluorodecanoic acid (PFDA)	PFDA	ng/mL	358	0.0835 (0.0776, 0.0898)	<LOD	0.0785	0.132	0.287	65.9%	0.0560 ng/mL
Perfluorododecanoic acid (PFDoA)	PFDoA	ng/mL	358	*	<LOD	<LOD	<LOD	<LOD	0.3%	0.110 ng/mL
Perfluoroheptanoic acid (PFHpA)	PFHpA	ng/mL	358	*	<LOD	<LOD	0.0483	0.0994	43.3%	0.0256 ng/mL
Perfluorohexane sulfonic acid (PFHxS)	PFHxS	ng/mL	358	0.784 (0.703, 0.874)	0.460	0.839	1.57	3.79	99.7%	0.0177 ng/mL
Perfluorononanoic acid (PFNA)	PFNA	ng/mL	358	0.205 (0.187, 0.225)	0.122	0.231	0.351	0.791	92.2%	0.0424 ng/mL
Perfluorooctanoic acid (PFOA)	PFOA	ng/mL	358	0.977 (0.898, 1.06)	0.666	1.11	1.71	2.70	98.6%	0.0606 ng/mL
Perfluorooctane sulfonic acid (PFOS)	PFOS	ng/mL	357	2.40 (2.17, 2.65)	1.46	2.80	4.32	8.72	98.3%	0.0615 ng/mL
Perfluorooctane sulfonamide (PFOSA)	PFOSA	ng/mL	358	*	<LOD	<LOD	<LOD	0.0562	19.8%	0.0144 ng/mL
Perfluoroundecanoic acid (PFUnDA)	PFUnDA	ng/mL	358	*	<LOD	0.0404	0.0906	0.262	58.4%	0.0285 ng/mL

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