Biomonitoring California: Program Update and Initial Results from the California Regional Exposure (CARE) Study

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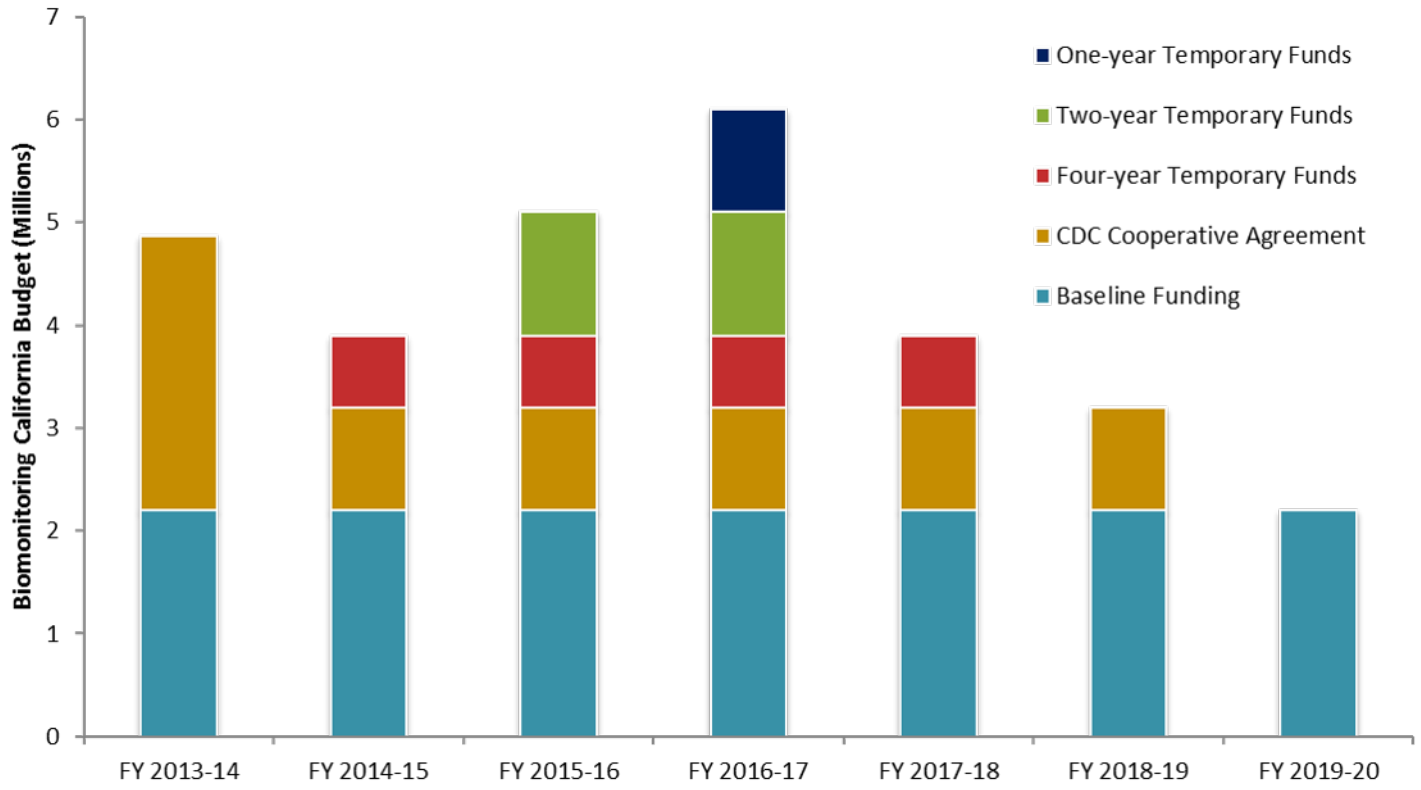
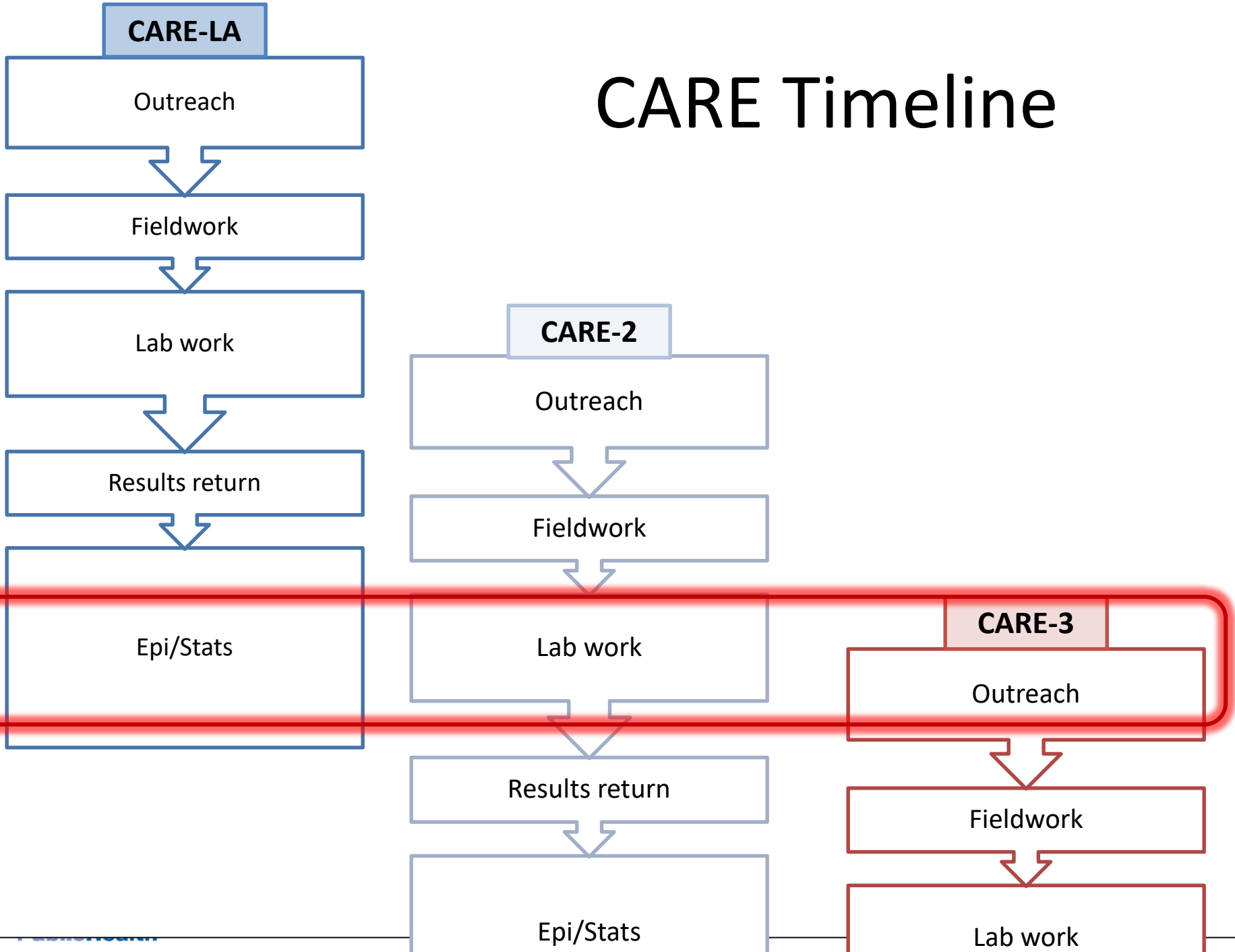
Presentation to the Scientific Guidance Panel Meeting
November 6, 2019 – Oakland, CA

Center for Healthy Communities
EHIB/Biomonitoring California

Program Budget



CARE Timeline



CARE-2: Impacting participants' lives

- Urinary mercury measured above the Level of Concern (LOC)
- Conducted follow-up in accordance with our LOC protocol
- Participant was under medical care for numerous symptoms
- Biomonitoring data enabled appropriate clinical follow-up

CARE Study: Available data

- Personal/demographic information
  - Age
  - Race
  - Sex
  - Address/residence
  - Income
  - Reproductive history

CARE Study: Available Data

- Potential exposure sources
  - Home furnishing
  - Water source
  - Diet
  - Occupation
  - Product usage
  - Smoking status
  - Wildfire exposure

Overview of data plan

- Results return
- Public meeting/web posting
  - Summarize and compare results by demographics
- Examination of potential exposure sources
  - Multivariable models with demographic, behavioral, and geographic parameters

CARE-LA: Blood Metals

Metal N=425	CARE-LA Detection Frequency (%)	CARE-LA Geometric Mean (µg/L)	NHANES 2015-2016 Geometric Mean µg/L
Cadmium	99	0.301	0.295
Mercury	95	1.05*	0.814
Manganese	100	10.3*	9.34
Lead (µg/dL)	100	0.783	0.920*

* Indicates statistically significant difference

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CARE-LA: Urinary metals

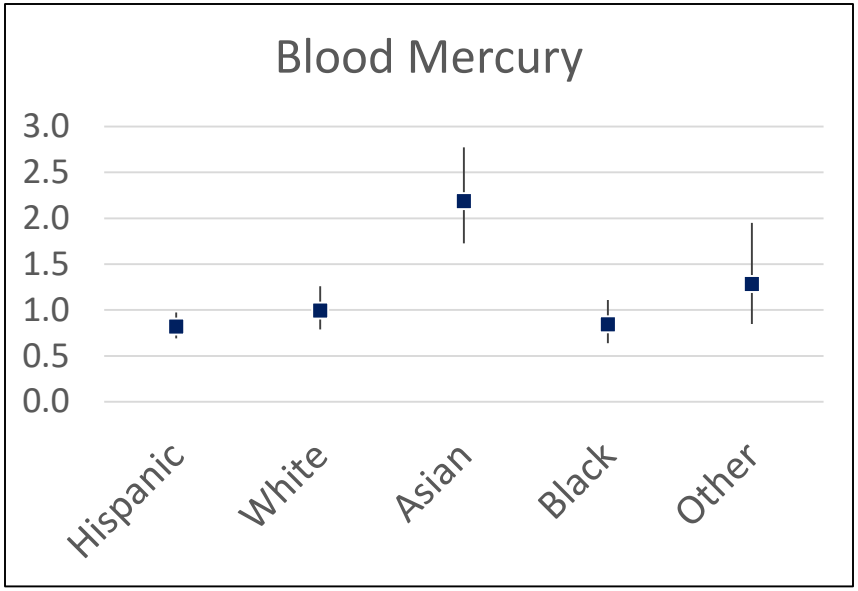
Metal N=428	CARE-LA Detection Frequency (%)	CARE-LA Geometric Mean (µg/g)**	NHANES 2015-2016 Geometric Mean (µg/g)**
Antimony	25	----	0.049
Arsenic	100	12.1*	6.92
Cadmium	100	0.249*	0.190
Cobalt	100	0.312	0.420*
Manganese	15	----	----
Mercury	98	0.265	-----
Molybdenum	100	34.9	42.7*
Thallium	100	0.163	0.236*
Uranium	50	----	0.006

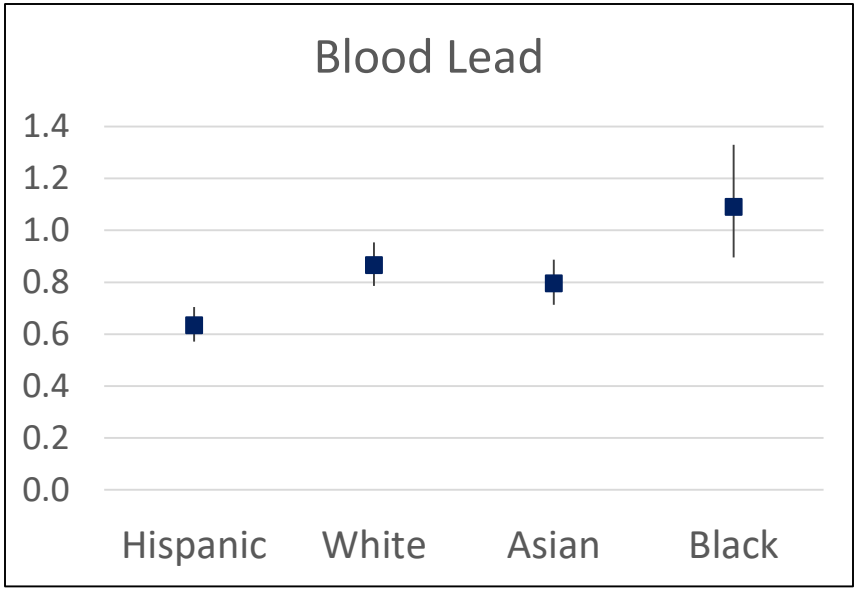
* Indicates statistically significant difference
** Values are creatinine-adjusted

CARE-LA: Elevated metals levels

Metal	# Exceedances	Level of Concern
Blood mercury	18	≥ 5.8 µg/L for women 18-49 yrs ≥ 10 µg/L for others
Inorganic arsenic	20	≥ 20 µg/L
Blood lead	1	≥ 5 µg/dL

CARE-LA : Comparison of metals by race





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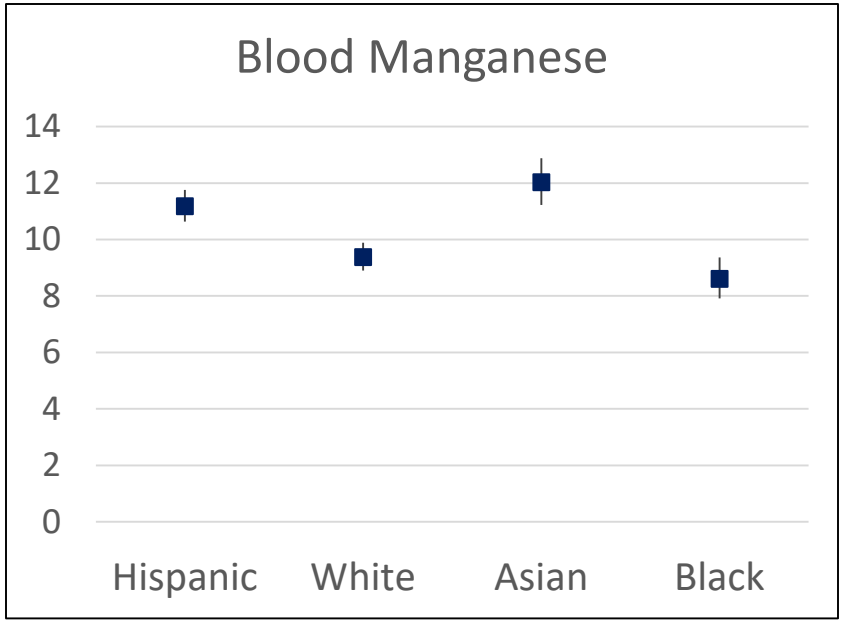
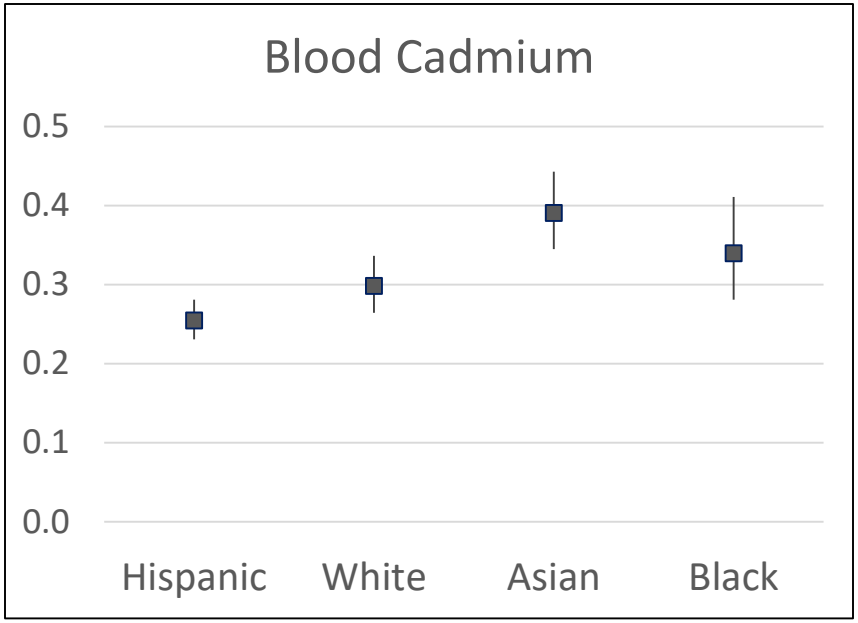
CARE-LA : Comparison of metals by race





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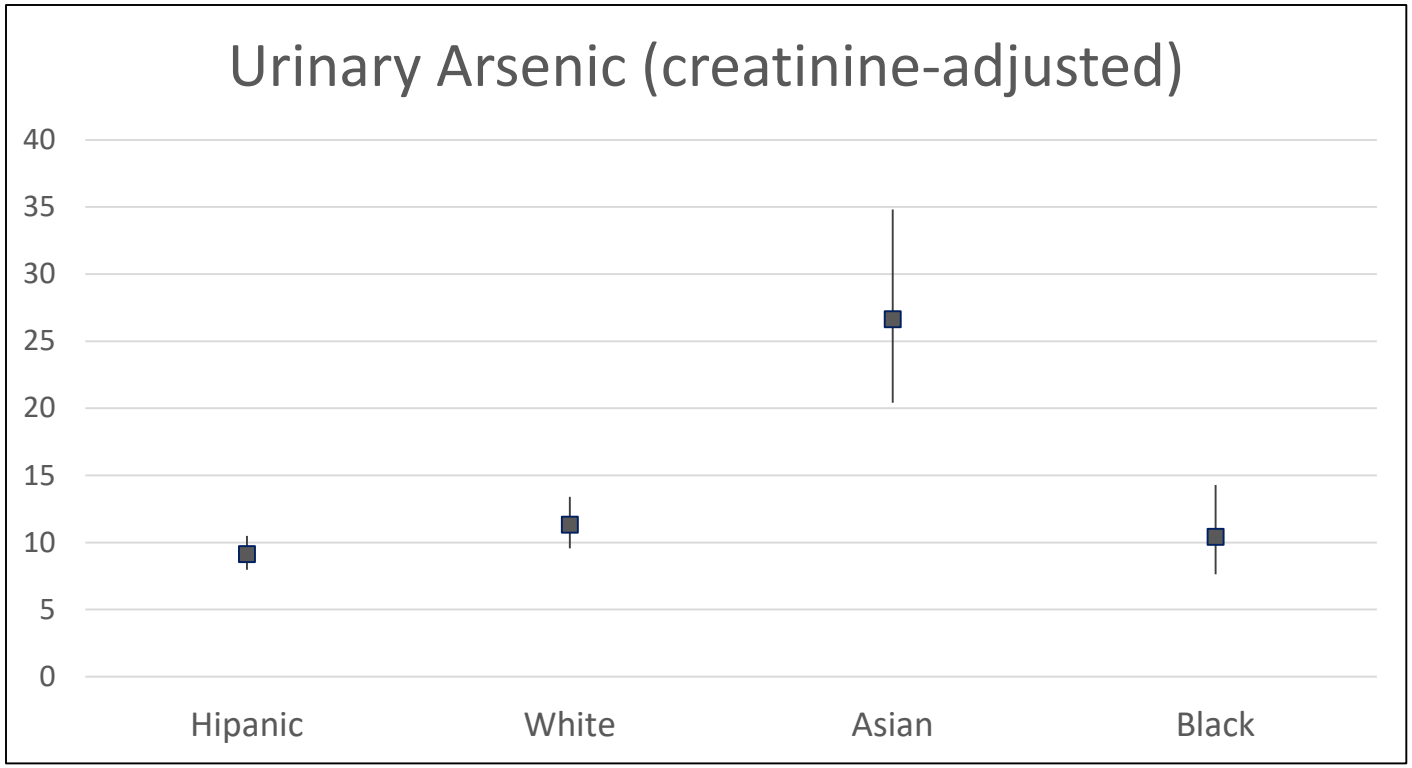
CARE-LA : Comparison of metals by race



CARE-LA: PFASs

PFAS N=425	CARE-LA Detection Frequency (%)	CARE-LA Geometric Mean (µg/L)	NHANES 2015-2016 Geometric Mean (µg/L)
Me-PFOSA-AcOH	100	0.0680	----
PFOA	99	1.05	1.60*
PFHxS	99	0.614	1.22*
PFOS	98	2.13	5.02*
PFNA	97	0.300	0.591*
PFUA	82	0.0829	----
PFDeA	70	0.0966	0.160*

Detection frequencies for PFHpA, EtFOSAA, PFOSA, PFBS, and PFDoA were below 65%.

* Indicates statistically significant difference

CARE-LA: PFASs

- Levels of PFOS, PFDeA, and PFNA were approximately 2 times higher in Asian participants than in other groups
- Asian CARE-LA participants overall had lower PFAS levels than participants from the Asian/Pacific Islander Community Exposures (ACE) Project

CARE-LA: PFASs

- PFOA and PFUdA were higher in participants with more than a high school education
- Levels of PFHxS, PFNA, PFOA, and PFOS were higher in CARE-LA men than women
- Levels of PFASs increased with age

CARE-LA: Phenols

Creatinine-adjusted phenol N=60	CARE-LA Detection Frequency (%)	CARE-LA Geometric Mean (µg/g)**	NHANES 2015-16 Geometric Mean (µg/g)**
Benzophenone-3	95	56.2	33.4
Methyl paraben	95	27.9*	75.7
Triclosan	82	2.98*	7.46
Bisphenol S	77	0.681	0.544
Propyl paraben	67	3.73*	12.4

* Indicates statistically significant difference
** Values are creatinine-adjusted

CARE samples are from a subset of 60 female participants, equally distributed between four racial groups. NHANES comparison is based on 18+ year old females.

CARE-LA: Phenols

- Levels of methyl paraben, propyl paraben and triclosan were significantly lower in CARE-LA than NHANES (2013-2014)
- Levels of methyl paraben in Black participants were significantly higher than levels in White, Asian and Hispanic participants

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