BIOMONITORING CALIFORNIA

Program Update

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California Department of Public Health

Biomonitoring California
Scientific Guidance Panel Meeting
March 16, 2012 – Oakland, CA

BIOMONITORING CALIFORNIA

CDPH

Program Updates

1. Staffing
2. Projects:
   - Maternal and Infant Environmental Exposure Project
   - Firefighter Occupational Exposures Project
   - Biomonitoring Exposures Study
3. Additional Activities
4. Upcoming Activities

Staff Changes

- Results Return Coordinator – Duyen Kauffman
- Research Scientist II – Wei Zou
- Research Scientist Supervisor I – Ryszard Gajek
- Sample Management Specialist – Alanna Viegas
- Associate Toxicologist – Laurel Plummer

- Environmental Laboratory Scientist – unfilled

Maternal and Infant Environmental Exposure Project (MIEEP)

Chemicals in Our Bodies Project

MIEEP

- Collaboration with UCSF and UC Berkeley
- Convenience sample from SFGH
- 92 mothers enrolled; 65 mother-infant pairs
- Current status:
  - Sample analyses ongoing
  - Preparation of first set of results return materials

MIEEP Analyses

Analyte	Status
Metals in blood (cadmium, lead, mercury)	Complete
Perfluorinated compounds (PFCs)	Complete
Polybrominated diphenyl ethers (PBDEs)	Complete
Polychlorinated biphenyls (PCBs)	Complete
Organochlorine pesticides (OCPs)	Complete
Selected brominated flame retardants (BFRs)	Complete (subset)
Phthalates	Under review
Pyrethroid and Organophosphate (OP) metabolites	Under review
Bisphenol A (BPA) and triclosan	Under review
Metals in urine	In progress
Hydroxy polycyclic aromatic hydrocarbons (OH-PAHs)	In progress

Previous MIEEP Status

Recruitment	Collection	Data	Results
✓ Recruit, enroll, and consent participants	✓ Collect maternal urine	Analyze 1st set of chemicals	Translate materials into Spanish
✓ Preliminary interview	✓ Interview participant	Analyze 2nd set of chemicals	Return 1st set of results
✓ Distribute exposure questionnaire	✓ Collect take-home questionnaire	Abstract medical records	Return 2nd set of results
	✓ Collect maternal blood	Enter questionnaires & medical records	Analyze participant understanding
	✓ Collect umbilical cord blood	Analyze data	

Current MIEEP Status

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MIEEP Results Return Evaluation

- Collaboration with Rachel Morello-Frosch
- Two phases of participant interviews
  - Assess understanding of first set of results to inform future results return efforts (State funding)
  - Final assessment after all results have been returned (non-CDC grant funding)

Mercury Consumer Alert

FDA Consumer Health Information
www.fda.gov/consumer

Mercury Poisoning Linked to Skin Products

Federal health officials are warning consumers not to use skin creams, beauty and antiseptic soaps, or lotions that might contain mercury.

The products are marketed as skin lighteners and anti-aging treatments that remove age spots, freckles, blemishes and wrinkles, says Gary Coody, national health fraud coordinator in the Food and Drug Administration's Office of Regulatory Affairs. Adolescents also may use these products as acne treatments, adds Coody. Products with this toxic metal have been found in at least seven states.

The products are manufactured abroad and sold illegally in the United States—often in shops in Latino, Asian, African or Middle Eastern neighborhoods and online. Consumers may also have bought them in another country and brought them back to the U.S. for personal use.

"If you have a product that matches these descriptions (and others listed below), stop using it immediately," says Coody.

"Even though these products are promoted as cosmetics, they also may be unapproved new drugs under the law," says Linda Katz, M.D., director of FDA's Office of Cosmetics and Colors. FDA does not allow mercury in drugs or in cosmetics, except under very specific conditions, which these products do not meet.

"Sellers and distributors should not market these illegal products and may be subject to enforcement action, which could include seizure of the products and other legal sanctions," says attorney Brad Pace, J.D., of the Heath Fraud and Consumer Outreach Branch within FDA's Center for Drug Evaluation and Research.

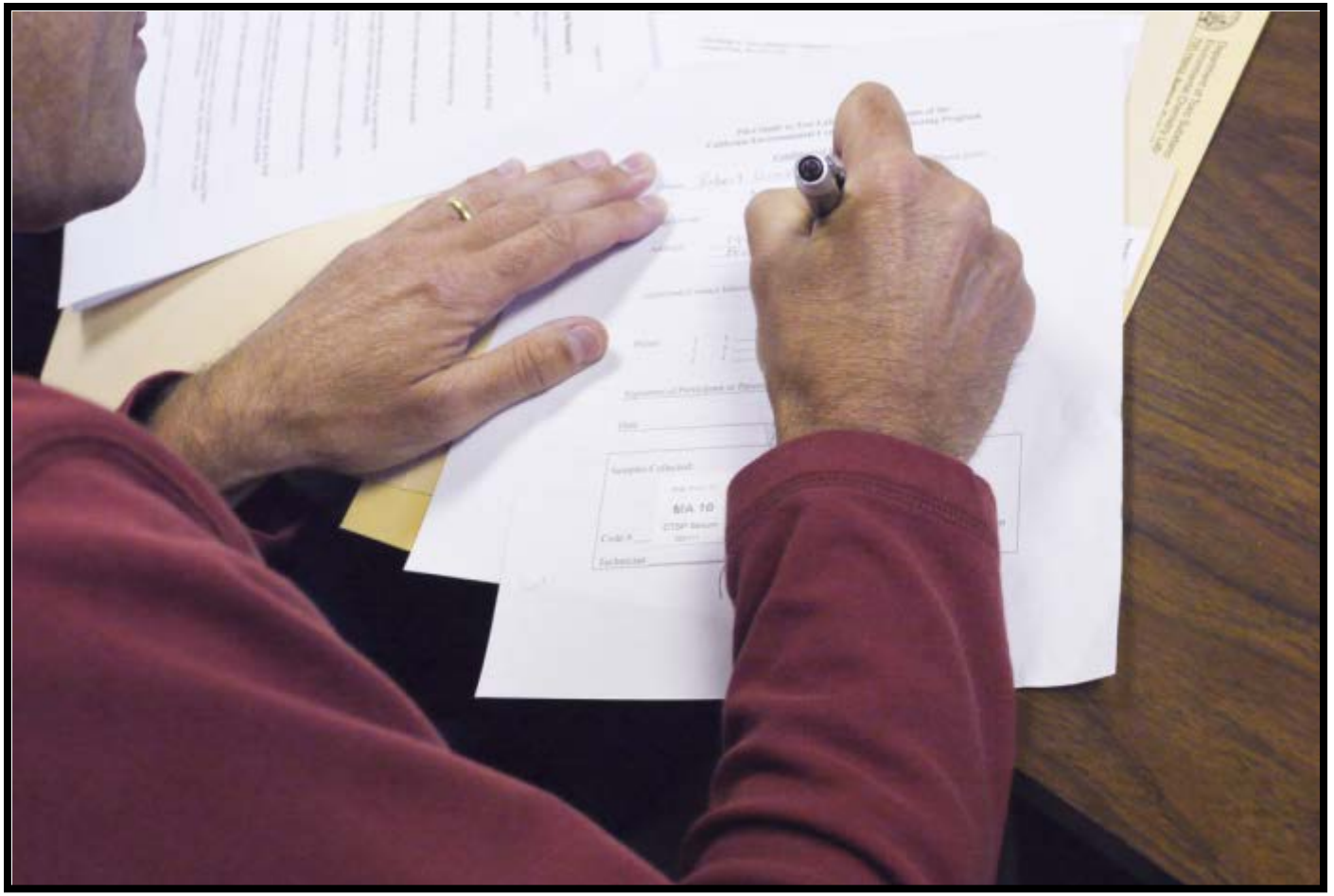
Dangers of Mercury

"Exposure to mercury can have serious health consequences," says Charles Lee, M.D., a senior medical advisor at FDA. "It can damage the kidneys and the nervous system, and interfere with the

These skin creams manufactured in other countries are among the products found in recent years to contain mercury.

http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM294876.pdf

Biomonitoring Exposures Study (BEST)



Pilot BEST

- Collaboration with Kaiser Permanente Northern California, Division of Research
- Stratified random sample of adult KPNC members from California's Central Valley
- Pilot goal: 100 participants
- Current status:
  - Recruitment, sample collection

Previous BEST Status

Recruitment	Collection	Data	Results
Recruit participants from random sample	Collect blood and urine	Enter data	Return results (2 sets)
Schedule home visit	Collect exposure assessment questionnaire	Analyze samples	Evaluation survey
Consent & enroll participant at visit	Abstract information from medical records		

Current BEST Status

Recruitment	Collection	Data	Results
Recruit participants from random sample	Collect blood and urine	Enter data	Return results (2 sets)
Schedule home visit	Collect exposure assessment questionnaire	Analyze samples for blood metals	Evaluation survey
Consent & enroll participant at visit	Abstract information from medical record	Analyze urine and serum samples	

Expanded BEST

- Goal: enroll additional 200 participants by 2013
- English- and Spanish-speaking participants
  - All materials developed in both languages
- Materials under IRB review

Expanded BEST

- Changes to study design
  - Electronic consent and questionnaire developed and accessible through a secure web login
  - Samples collected at KPNC through their lab orders system
- Modifications increase efficiency
  - Expedited participant enrollment at reduced cost to Program
  - Increased ease for participants

Firefighter Occupational Exposures (FOX)

FOX Project

- Collaboration with UC Irvine and Orange County Fire Authority (OCFA)
- Convenience sample of 101 OCFA Firefighters
- Current status:
  - Returned first set of results (blood metals & PFCs)
  - Completed collection of firehouse environment checklists
  - Ongoing laboratory data analyses

Previous FOX Status

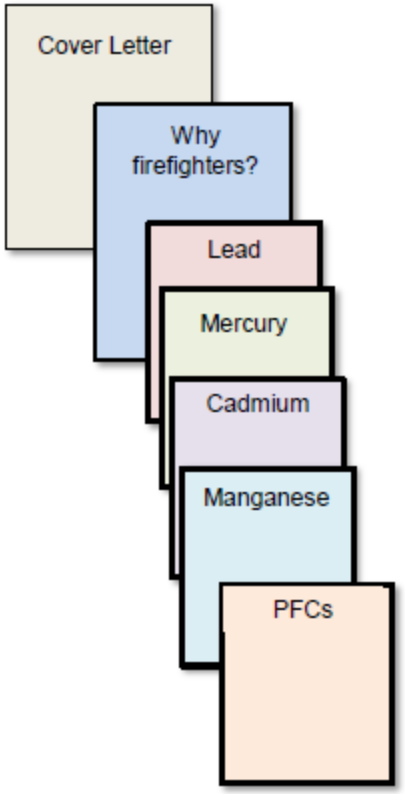
Recruitment	Collection	Data	Results
✓ Recruit participants	✓ Collect blood and urine	✓ Data entry	Return 1st set of results
✓ Enroll participants at wellness exam	✓ Collect exposure assessment questionnaire	Analyze 1st set of chemicals	Return 2nd set of results
	✓ Abstract information from medical record	Analyze 2nd set of chemicals	Evaluation survey
	✓ Collect environmental samples	Evaluation and review of data	
	✓ Collect information on firehouses	Analyze & review environmental sample data	

Current FOX Status

Recruitment	Collection	Data	Results
✓ Recruit participants	✓ Collect blood and urine	✓ Data entry	✓ Return 1st set of results
✓ Enroll participants at wellness exam	✓ Collect exposure assessment questionnaire	✓ Analyze 1st set of chemicals	Return 2nd set of results
	✓ Abstract information from medical record	Analyze 2nd set of chemicals	Evaluation survey
	✓ Collect environmental samples	Evaluation and review of data	
	✓ Collect information on firehouses	Analyze & review environmental sample data	

FOX Sample Results Packet Contents

- Cover letter
- Fact sheet with project goals
- Mock chemical results for each metal and PFCs as a group:
  - Laboratory test results page
  - Frequently asked questions (FAQ's)
  - Graph



FOX Fact Sheet

Why are We Studying Firefighters?

Firefighters, by the nature of their profession, may be exposed to more toxic chemicals than the general population. During a fire or overhaul process, firefighters may inhale gases, vapors, or dust particles, and may ingest particles. Chemicals found in building structures and contents can be released and new chemicals can be formed during the combustion process. Firefighters may also be exposed to chemicals while responding to incidents involving spills or leaks.

Only a few studies have looked at chemicals in firefighters. The Firefighter Occupational Exposures (FOX) Project, which will measure more than 75 chemicals, will provide information on how the levels of these chemicals measured in firefighters compare to levels in the general population.

Your participation helps us learn about chemical exposures in the California population. Your results will become part of a larger anonymous database that will include findings from other Californians who may be exposed to chemicals in a variety of ways at home or work. FOX and similar studies will help the State assess the effectiveness of its current programs to decrease exposures to harmful environmental chemicals and inform policies to improve public health. We truly appreciate your contribution to this project.

What can Firefighters Learn from FOX?

- How chemical levels in OCFA firefighters compare with chemical levels in the general U.S. population
- Whether or not job categories and other factors affect chemical levels in OCFA firefighters

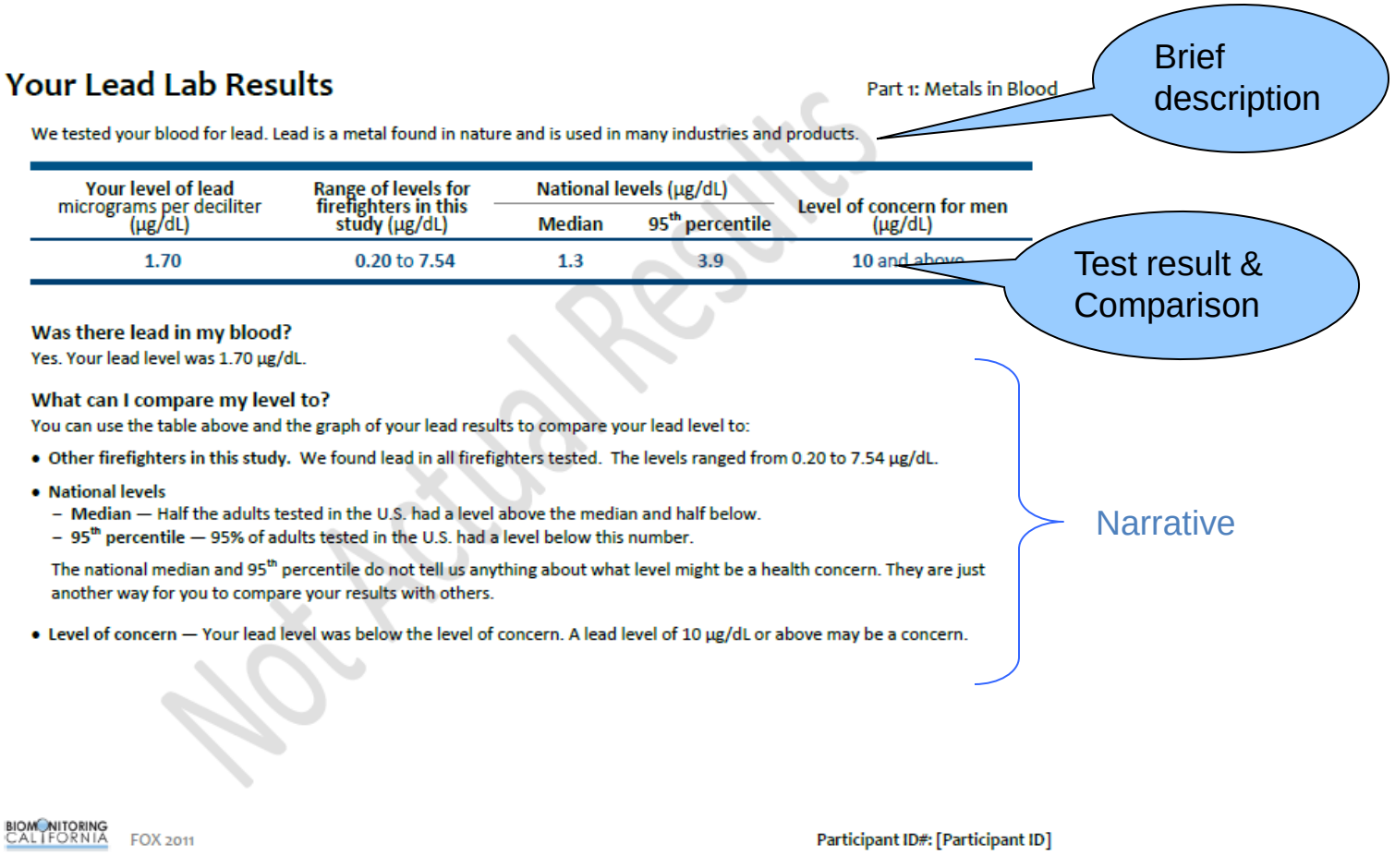
What are Some Ways for Firefighters to Protect Themselves from Chemical Exposures on the Job?

- Wear your personal protective equipment.
- Wash your hands regularly with soap and water, especially before preparing food or eating.

Not Actual Results

Participant ID#: [Participant ID]

Mock Test Results: Lead



Your Lead Lab Results

Part 1: Metals in Blood

We tested your blood for lead. Lead is a metal found in nature and is used in many industries and products.

Your level of lead micrograms per deciliter (µg/dL)	Range of levels for firefighters in this study (µg/dL)	National levels (µg/dL)		Level of concern for men (µg/dL)
		Median	95th percentile	
1.70	0.20 to 7.54	1.3	3.9	10 and above

Was there lead in my blood?

Yes. Your lead level was 1.70 µg/dL.

What can I compare my level to?

You can use the table above and the graph of your lead results to compare your lead level to:

- **Other firefighters in this study.** We found lead in all firefighters tested. The levels ranged from 0.20 to 7.54 µg/dL.
- **National levels**
  - **Median** — Half the adults tested in the U.S. had a level above the median and half below.
  - **95th percentile** — 95% of adults tested in the U.S. had a level below this number.

  The national median and 95th percentile do not tell us anything about what level might be a health concern. They are just another way for you to compare your results with others.
- **Level of concern** — Your lead level was below the level of concern. A lead level of 10 µg/dL or above may be a concern.

Not Actual Results

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Participant ID#: [Participant ID]

Brief description

Test result & Comparison

Narrative

Mock Test Results: Perfluorochemicals (PFCs)

PFC tested	Your level (µg/L)	Range of levels for firefighters in FOX (µg/L)	Number of FOX firefighters with this chemical found in their blood	National levels (µg/L)	
				Median	95th percentile
PFDeA Perfluorodecanoic acid	0.75	0.10 – 0.90	[# detected] of 101	0.3	0.9
PFOA Perfluorooctanoic acid	4.82	0.20 – 9.90	[# detected] of 101	4.3	9.8
PFOS Perfluorooctane sulfonic acid	34.21	1.51 – 49.68	[# detected] of 101	14.1	42.8
PFHpA Perfluoroheptanoic acid	0.42	0.10 – 0.60	[# detected] of 101	*	0.5
PFNA Perfluorononanoic acid	1.62	0.10 – 3.40	[# detected] of 101	1.5	4.1
PFUA Perfluoroundecanoic acid	0.11	0.10 – 0.60	[# detected] of 101	*	0.6
PFDoA Perfluorododecanoic acid	Not found	0.10-0.14	[# detected] of 101	*	**
PFBuS Perfluorobutane sulfonic acid	Not found	0.10 – 0.14	[# detected] of 101	*	**
PFHxS Perfluorohexane sulfonic acid	6.02	0.10 – 7.60	[# detected] of 101	2.0	9.0
PFOSA Perfluorooctane sulfonamide	0.15	0.10 – 0.30	[# detected] of 101	*	**
Me-PFOSA-AcOH 2(N-Methyl-perfluorooctane sulfonamido) acetic acid	0.67	0.10 – 1.20	[# detected] of 101	0.3	1.4
Et-PFOSA-AcOH 2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid	0.23	0.10 – 0.30	[# detected] of 101	*	**

* The national median cannot be calculated because this chemical was not found in enough people.
** The national 95th percentile cannot be calculated because this chemical was not found in enough people.

BIOMONITORING CALIFORNIA FOX 2011

Participant ID#: [Participant ID]

Not Actual Results

FAQs: Mercury

Frequently Asked Questions about Mercury

Where is mercury found?	• Certain types of fish and seafood – this is the most common source of exposure to mercury • Some imported face creams used for skin lightening, anti-aging, or acne • Silver-colored dental fillings • Glass thermometers, and older barometers and blood pressure gauges • Fluorescent light bulbs such as compact fluorescent light bulbs (CFL bulbs)
Can mercury harm people's health?	• Mercury can affect brain development and cause learning and behavior problems in children and in babies exposed in the womb. • Mercury can harm the nervous system and kidneys in adults. • Mercury may affect the heart.
What can I do?	• Choose fish that are lower in mercury. Examples include: salmon, tilapia, trout, canned light tuna, sardines, anchovies, and oysters. • Avoid fish that are high in mercury. Examples include: shark, swordfish, orange roughy, and bluefin and bigeye tuna. • Do not use imported creams for skin lightening, acne treatment, or anti-aging unless you are certain that they do not contain mercury. • Properly clean up any mercury spills, such as from broken thermometers or CFL bulbs (http://www.epa.gov/mercury/spills/). Do not let children play with the silver liquid from these items.

Not Actual Results

For more information:

- Choosing fish that are lower in mercury: http://www.oehha.ca.gov/fish/pdf/2011CommFishGuide_color.pdf
- Advice on mercury in fish that you catch: http://www.oehha.ca.gov/fish.hg.index.html or call (510) 622-3170
- Concerns about mercury exposure: call the California Poison Action Line, 1-800-222-1222, or go to http://calpoison.org/home.html

FAQ's: PFCs

Where are perfluorochemicals (PFCs) found?	• Some foods: Examples include some red meat and potato chips. Not much is known about which foods might regularly contain PFCs. • Certain grease-repellent paper food containers, such as some microwave popcorn bags, take-out boxes, or fast-food wrappers • Stain-resistant carpets and some carpet cleaning solutions • Stain-, water-, and wrinkle-resistant fabrics and some stain- and water- repellent sprays • Most non-stick cookware • Certain Class B aqueous film-forming foams used in firefighting
Can PFCs harm people's health?	Scientists are still studying how PFCs might affect people's health. There is concern that some PFCs: • May affect the developing fetus and child, including possible changes in growth, learning, and behavior; • May decrease fertility and affect hormone balance; • May contribute to cancer.
What can I do?	Scientists are not sure how best to reduce exposure to PFCs. However, you can: • Limit how often you eat foods from grease-repellent paper containers; • Avoid buying stain-resistant carpets; • Avoid buying products labeled stain-resistant, water-resistant, or wrinkle-free, such as some fabrics, furniture, or clothes; • Avoid using sprays and carpet cleaning solutions that contain PFCs.

For more information:

- PFC fact sheet: http://www.cdc.gov/exposurereport/PFCs_FactSheet.html

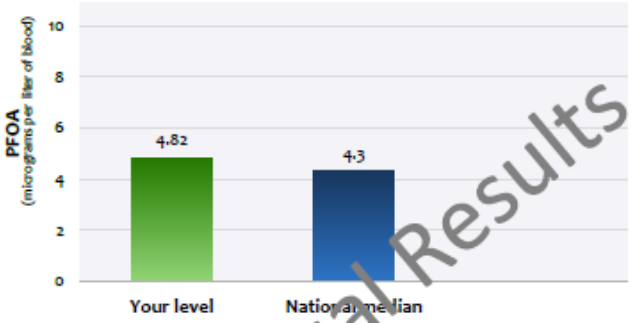
Not Actual Results

Graphs of Mock Test Results

Your PFOA Results

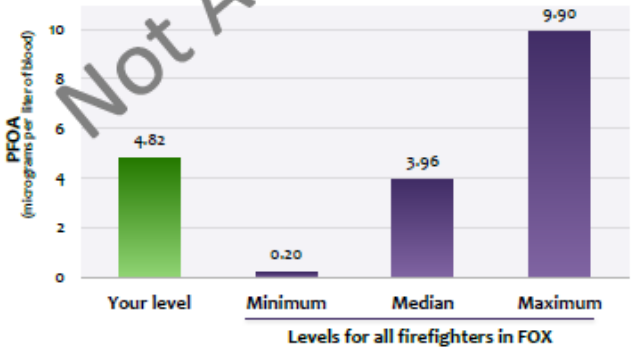
We are highlighting PFOA in graphic form because it is commonly found in both FOX participants and the general U.S. populatio

Your PFOA level compared to the national median



A level of concern for PFOA has not been established by a state or federal agency.

Your PFOA level compared to the other OCFA firefighters in FOX

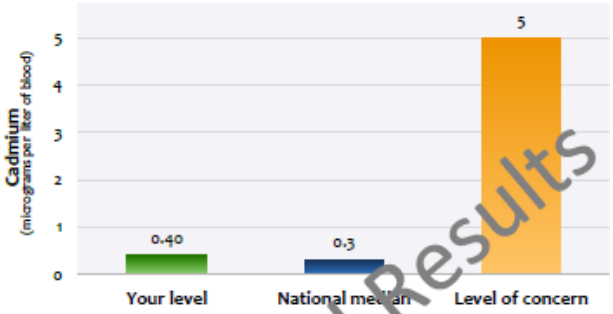


PFOA was found in [number detected] of the 101 firefighters tested.

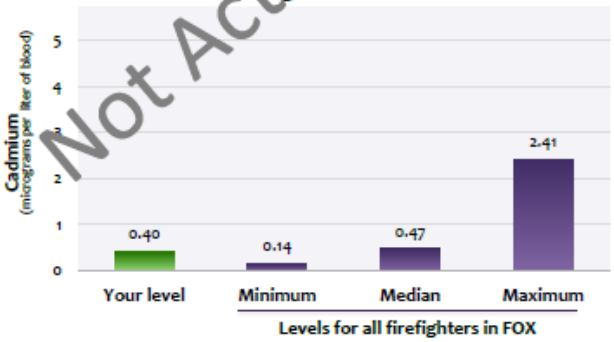
Not Actual Results

Your Cadmium Results

Your cadmium level compared to the national median and level of concern



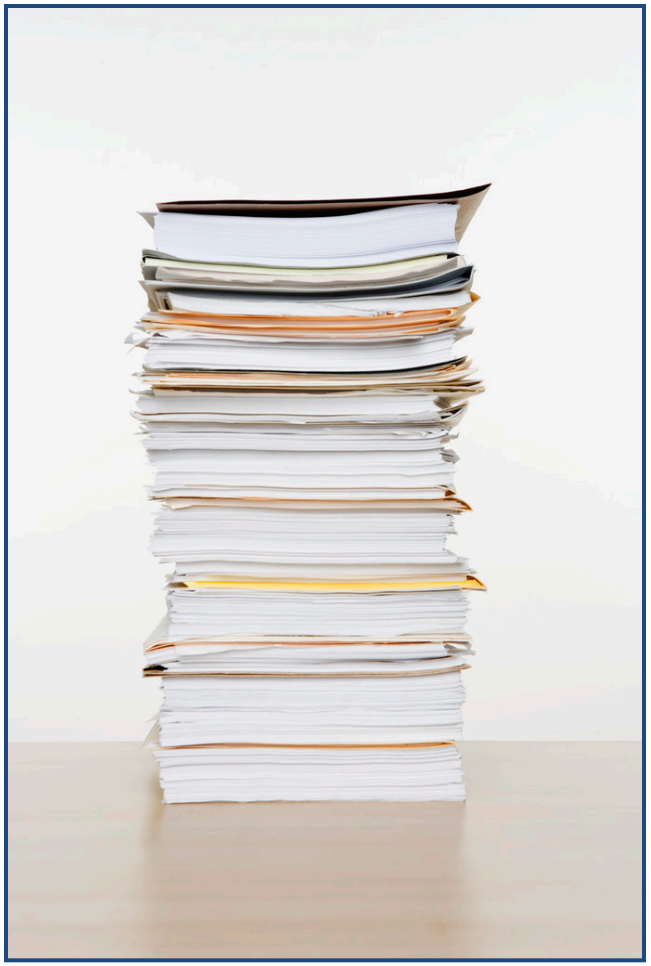
Your cadmium level compared to the other OCFA firefighters in FOX



Not Actual Results

QUESTIONS?

Additional Program Activities



Additional Activities

- Distribute survey on environmental health priorities to California Local Health Officers and Directors of Environmental Health
- Data summary report due July 2012
- CDC Year 3 progress report and proposal for Year 4 activities due March 30, 2012

Request for Information (RFI)

- Issued December 2011
- Criteria for selection include
  - California study population
  - Higher likelihood of potential exposure or health effect
  - Specimens collected in 2005 or later
  - Adequate sample volumes; collection, storage protocols
- Submission period closed February 2012; submissions are under review

Thank you for your contributions!

Josephine Alvaran	Ruifang Fan	Farla Kaufman	Jianwen She
Frank Barley	Laura Fenster	Gail Krowech	Beverly Shen
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Reber Brown	Ryszard Gajek	Nancy Lopez	Alanna Viegas
Shirley Cao	Qi Gavin	Amiko Mayeno	Jed Waldman
Sungyeol Choi	Phillip Gonzaga	Sandy McNeel	Dongli Wang
Robin Christensen	Tan Guo	June-Soo Park	Miaomiao Wang
Sabrina Crispo-Smith	Weihong Guo	Myrto Petreas	Yunzhu Wang
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QUESTIONS?