



Evaluation of Results Return Materials for Biomonitoring Exposures Study (BEST)

Duyen Kauffman
California Department of Public Health

Biomonitoring California
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Presentation overview

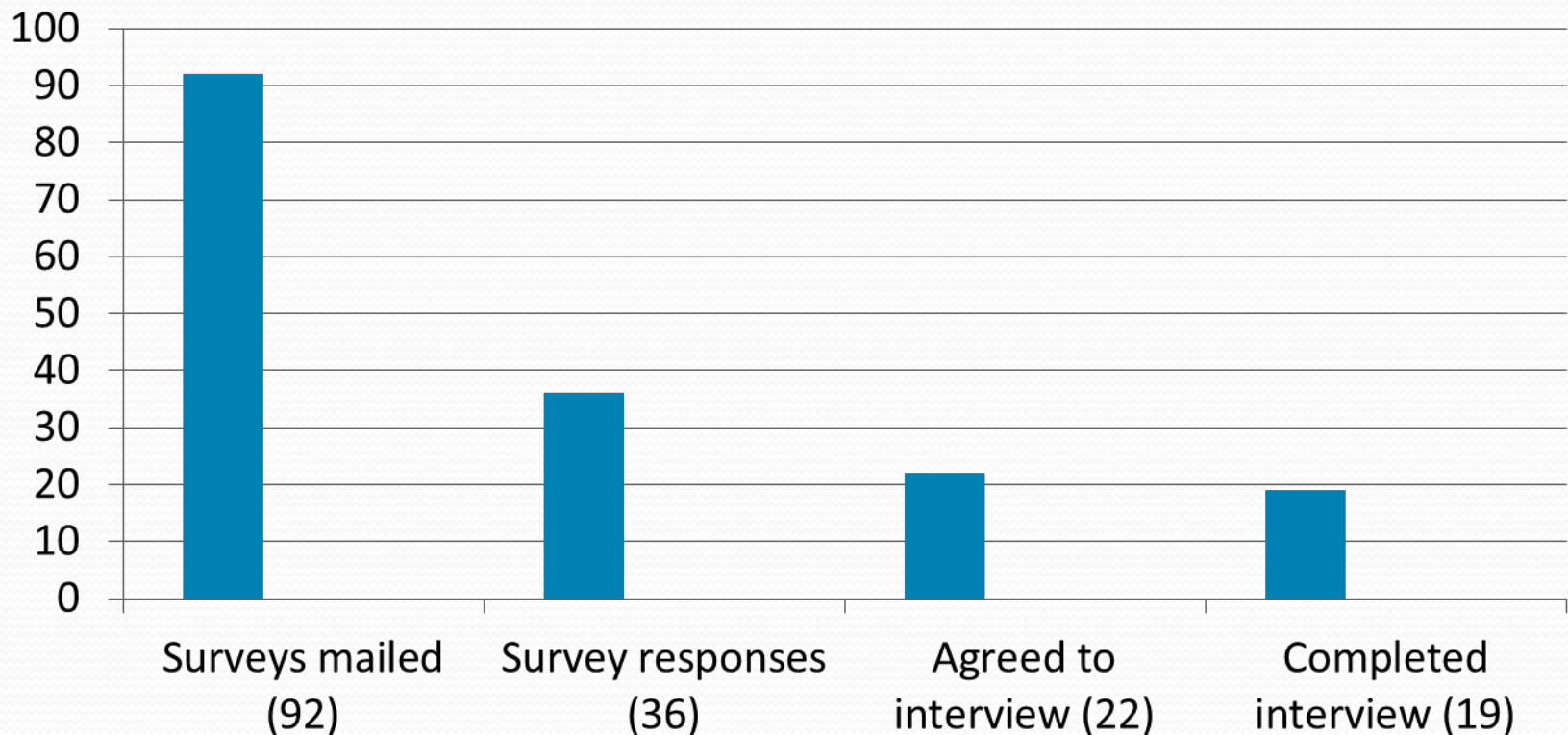
- Pilot Biomonitoring Exposures Study (BEST)
- Pilot BEST round 2 results return packet
- Results of participant evaluation

Pilot Biomonitoring Exposures Study (BEST)

- Collaboration with Division of Research, Kaiser Permanente Northern California (KPNC)
- Stratified random sample of English-speaking adult KPNC members from the Central Valley
- 112 participants recruited in 2011-2012; evenly distributed race/ethnicity, median age in 50's
- Study design
 - Enrollment by mail
 - Questionnaire & sample collection at home

Pilot BEST results return & evaluation

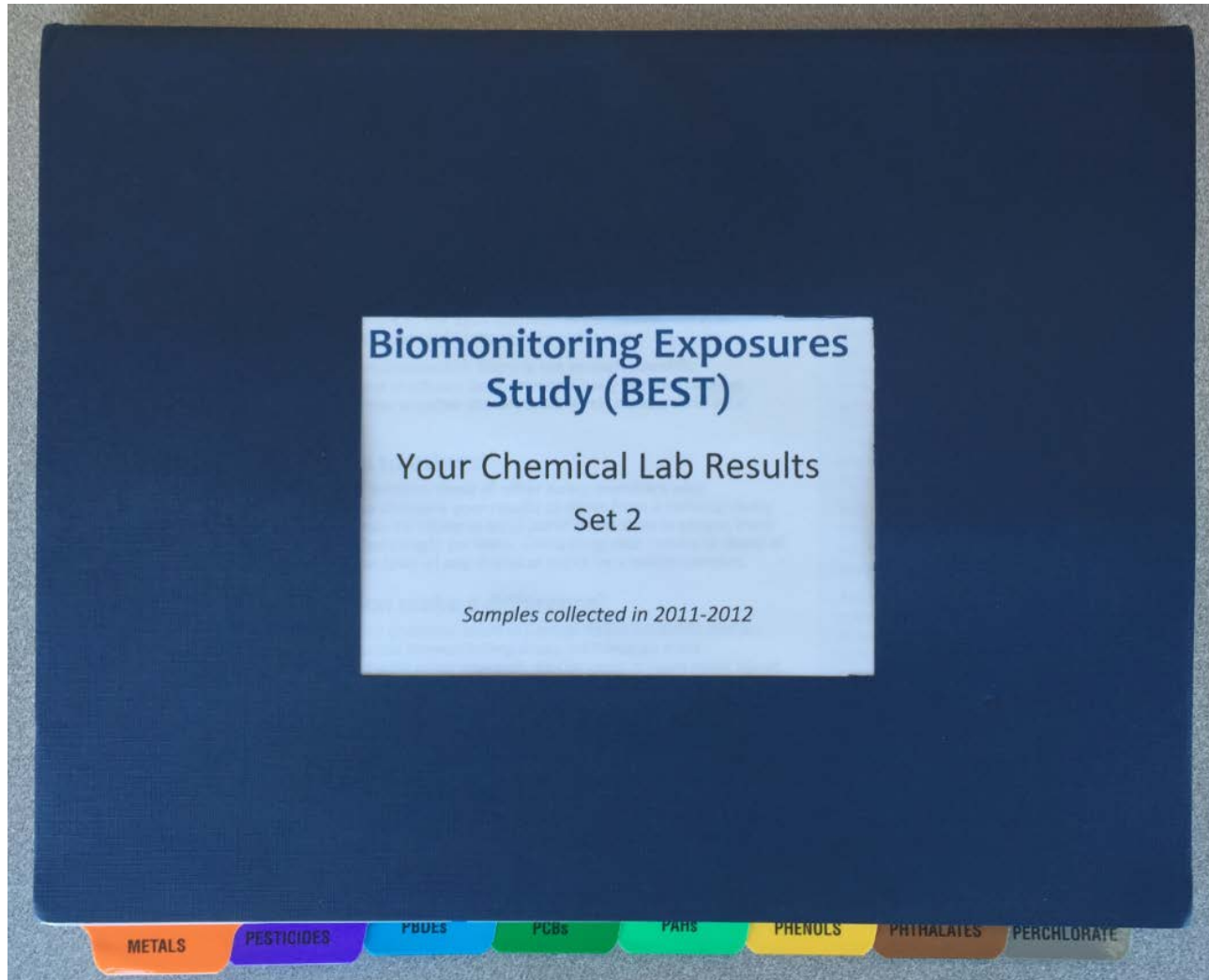
- Two rounds of results return: December 2012 & July 2014
- Evaluation mailed to 92 participants in January 2015



Research questions

- Did participants read their packets?
- How useful was the information?
- Did participants seek additional information or assistance to interpret their results?
- Was there other information that they would have liked to receive in the packets?
- Did participants take any actions to reduce their chemical exposures?
- How did participation/results impact them?

“Beautiful blue packet; very appealing... impressed by all the details, and all the chemicals you find!”



Sample results return packets:

<http://biomonitoring.ca.gov/results/communicating-results>

Logos



Basic study information:
name, year & purpose of study

Basic information about
results: how many chemicals
measured; which matrices

Table of
contents

Comparison
information

Usefulness of participation
in the study

Names & contact information
for both Principal Investigators

6/30/14

Name
Address
City, State Zip

Dear _____:

Thank you very much for taking part in the Biomonitoring Exposures Study or BEST, in late 2011 to early 2012. As part of BEST, we are measuring the levels of about 90 chemicals in participants' blood and urine.

Your participation in this important project is helping us learn more about the presence of chemicals in California residents and possible environmental sources of these chemicals.

The second and final set of laboratory tests has been completed and your individual results are enclosed. This final mailing includes results for chemicals we measured in your blood and urine.

This mailing includes:

Part 1: Metals in Urine – For each metal, you will find a summary of your results and information about that metal.
Part 2: Pesticides in Urine and Blood – This section includes a summary of your results, a list of the pesticides we tested, and information about these chemicals.
Part 3: PBDEs in Blood – This section includes a summary of your results, a list of the PBDEs we tested, and information about these chemicals.
Part 4: PCBs in Blood – This section includes a summary of your results, a list of the PCBs we tested, and information about these chemicals.
Part 5: PAHs in Urine – This section includes a summary of your results, a list of the PAHs we tested, and information about these chemicals.
Part 6: Phenols in Urine – This section includes a summary of your results, a list of the phenols we tested, and information about these chemicals.
Part 7: Phthalates in Urine – This section includes a summary of your results, a list of the phthalates we tested, and information about these chemicals.
Part 8: Perchlorate in Urine – This section includes a summary of your result and information about this chemical.

You can compare your results to:

- Summary results for other participants who participated in BEST.
- Results from a study of the general U.S. population.
- The level of concern for the chemical where one has been set. For most chemicals, very little is known about what level may be a concern.

Thank you again for your support of this study. Your participation in BEST will help us lay the foundation to measure chemicals in people throughout California. Ultimately, this information may be used to learn how chemicals affect our health and to support efforts to prevent exposure to harmful chemicals.

If you have any questions, please feel free to call either of us at the numbers listed below.

Sincerely,

Stephen K. Van Den Eeden, PhD
BEST Director
Division of Research
Kaiser Permanente
510-891-3718

Michael J. DiBartolomeis, PhD, DABT
BEST Director
Biomonitoring California
California Department of Public Health
510-620-3620

Frequently Asked Questions about the Biomonitoring Exposures Study

What can I learn from the *Biomonitoring Exposures Study (BEST)* about chemicals in my body?

As a participant in the BEST biomonitoring project, you are receiving in this packet the levels of chemicals our laboratory tested for in your blood and urine. We also provide information on ways you might have been exposed to these chemicals. Many of the chemicals we test for are widespread in the environment and consumer products, and it is difficult to avoid exposure to them. For each chemical in this packet, we also provide information about actions you could take to help reduce your exposure.

For most of the chemicals that we biomonitor, there is not enough scientific information available to know how much can be in anyone's body without causing harm. Therefore, we cannot tell you whether the chemical levels measured in your body might affect your health.

Can I compare my results to others?

You can compare your chemical levels to those of other Kaiser members who participated in BEST. You can also compare your results to those from a national study of U.S. adults. Some chemicals may be higher in BEST participants than in people from the rest of the country, while others might be lower. Comparing your results to those of other people cannot tell you what level of any chemical might be a health concern.

How does my participation make a difference?

BEST will help us learn more about chemical levels in Central Valley residents and lay the foundation for a larger statewide biomonitoring study. Information from biomonitoring studies, combined with other research, can be used to learn more about how chemicals may affect health. Biomonitoring can also support government efforts to reduce exposures to harmful chemicals.

Can the amount of a chemical in my body change over time?

Yes. The amount of a chemical in your body depends on many factors, including how much and how often you have had contact with that chemical, and how long it takes for your body to remove it.

What is the Biomonitoring Exposures Study (BEST)?

Researchers at Kaiser Permanente and Biomonitoring California conducted BEST to learn about levels of certain chemicals in residents of California's Central Valley. We chose these chemicals based on many factors, including whether: (1) they are commonly found in the environment or consumer products, and (2) there are known or suspected health concerns about them.

Individuals were recruited after being randomly selected from adult Kaiser Permanente members in six Central Valley counties.

About 100 Kaiser Permanente members completed questionnaires and donated blood and urine samples. These samples have been tested for about 90 chemicals.

Your Lab Result for Mercury

We tested your urine for mercury. Mercury is a metal that is found in nature. It is released into the environment when coal is burned, by some industries, and from past use in gold mines. Mercury builds up in certain types of fish.

Your mercury result	Lowest result found in this study	Highest result found in this study	Number of participants in this study with mercury in their urine	Middle level in the U.S.	95th percentile in the U.S.	Level of Concern
2.4	0.03	3.7	108 of 112	0.35	1.9	20

Results for mercury in urine are reported in micrograms per liter ($\mu\text{g/L}$).

Did you find mercury in my urine?

Yes. Your mercury results was 2.4 $\mu\text{g/L}$.

What can I compare my result to?

You can use the table above to compare your mercury result to:

Other participants in this study. We found mercury in most of the 112 participants tested. The results ranged from 0.03 to 3.7 $\mu\text{g/L}$.

Middle level in the U.S. Half the adults tested in the U.S. had a result below 0.35 $\mu\text{g/L}$ and half above.

95th percentile in the U.S. 95% of adults tested in the U.S. had a result below 1.9 $\mu\text{g/L}$.

The U.S. middle level and 95th percentile do not tell us anything about what level of mercury in urine might be a health concern. We are providing this information so that you can compare your result to those of other U.S. adults.

Level of concern. Your mercury result was below the level of concern.

The next page explains more about 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, older barometers, and blood pressure gauges.
 - Fluorescent lights, including compact fluorescent light (CFL) bulbs.
-

What are possible health concerns?

Mercury:

- Can affect brain development and cause learning and behavior problems in infants and children who were exposed in the womb.
 - Can harm the nervous system and kidneys.
 - May affect the heart.
 - May increase cancer risk.
-

What are possible ways to reduce exposure?

- Choose fish that are lower in mercury, such as salmon, tilapia, trout, canned light tuna, sardines, anchovies, and oysters.
 - Avoid fish that are high in mercury, such as shark, swordfish, orange roughy, bluefin, and bigeye tuna.
 - Do not use imported skin-lightening, acne treatment, or anti-aging creams unless you are certain that they do not contain mercury.
 - Properly recycle CFL bulbs (see below).
 - Properly clean up broken thermometers, CFL bulbs, and other items containing mercury (see below). Do not let children play with silver liquid from items like mercury thermometers.
-

For More Information

Guide for choosing fish that are lower in mercury: www.oehha.ca.gov/fish/pdf/2011CommFishGuide_color.pdf

Advice on mercury in fish that you catch: www.oehha.ca.gov/fish/hg/index.html or call (510) 622-3170

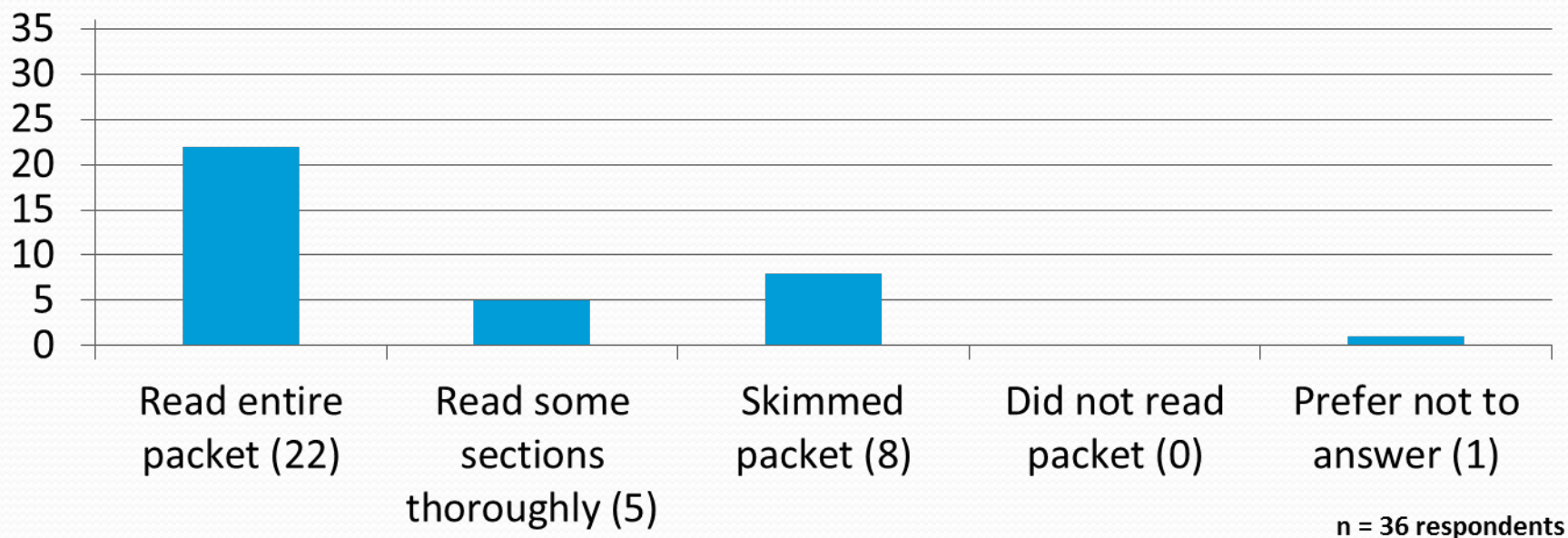
Concerns about mercury exposure — contact the California Poison Control System hotline:

www.calpoison.org/home.html or 1-800-222-1222

Cleaning up mercury spills, such as from broken thermometers or CFL bulbs: www.epa.gov/mercury/spills/

For CFL recycling location: Visit www.1800recycling.com, enter your zip code, choose “Hazardous”, and check box for “Compact Fluorescent Lights”; or call 1-(800) CLEANUP (253-2687).

Did participants read their packets?



Reasons for not reading the entire packet:

- Time constraints (e.g., work, family obligations)
- Focused only on their individual results (1)
- Too technical (1)

How useful was the information?

	Very useful	Somewhat useful
Cover Letter (n=36)	56%	33%
FAQs about BEST (n=34)	41%	38%

(Other choices: not very useful; not useful at all; prefer not to answer)

“It was clear and I could understand it easily. It explained exactly what the packet was and what it was about.”

How useful was the information? (2)

	Very useful	Somewhat useful
Chemical results pages (n=34)	65%	29%

“To be honest, I enjoyed this part the best. It gave me a threshold: how do I compare to others in the study and across the board?”

“These were MY results, which is more interesting than a general report; that's why I participated.”

How useful was the information? (3)

	Very useful	Somewhat useful
Chemical fact sheets (n=34)		
• Where chemical is found	50%	35%
• Possible health effects	59%	29%
• Possible ways to reduce exposure	56%	29%

“If you know where chemicals are found, you might want to avoid or cut back on consumption of that, depending on what the chemical was and how harmful it is. If it's something bad, then try to avoid it, or just cut back if you really like it.”

Did they seek additional information or assistance to interpret their results?

- Eight participants (22%) sought additional information or assistance from:
 - Internet (4)
 - Personal doctor at Kaiser (3)
 - Family member, friend, neighbor, or co-worker (1)
- Three participants specifically brought up (unprompted) the intention to keep packet as a reference

Was there other information that participants would have liked to receive in the packets?

- Overall response: the packet was thorough and well designed

“I think you guys covered it all.”

“Good layout – I liked the tabs; easy to navigate. In my work as a teacher, I had to do reports, so I know good materials.”

“I thought it was very thorough. I like the charts and explanations in words [i.e., chemical results pages]. I'm a second language learner and a visual learner, so I liked the [tables].”

Behavior changes

	Yes
Did you take any actions to try to reduce your exposure to chemicals?	66%
What actions did you take?	
• I clean fruits and vegetables more carefully before eating them	49%
• I wash my hands more frequently	46%

n = 35 respondents

Behavior changes (2)

What actions did you take? (continued)

• I choose different types of personal care and/or household products	26%
• When doing home improvement projects, I take more precautions to protect myself & my family from chemicals and dust	26%
• I clean more frequently using a wet mop or damp cloth	23%
• I eat different kinds of food	23%

n = 35 respondents

Other actions to reduce exposures

- Replaced disintegrating foam mattress, citing PBDE levels as motivation
- Use protective clothing and more ventilation, and wash work clothes regularly to reduce lead exposure
- Wear gloves
- Organic gardening

“I wondered how I got chemicals in my body. I used whitening creams after I was pregnant, when I had darkening on my cheeks. I don't use it anymore... I will check with my doctor.”

How did they feel about participating in the study?

	Strongly agree	Agree	Disagree	Strongly disagree	I prefer not to answer
I am glad that I participated in this study (n=33)	48.5%	48.5%	3%	0	0
I am satisfied with the information I have received about my results (n=34)	41%	56%	0	0	3%

“I have enjoyed the study and cooperating with you. You do important and good work for your company and the people you deal with, so I am happy to help you.”

How did they feel about participating in the study? (2)

	Strongly agree	Agree	Disagree	Strongly disagree	I prefer not to answer
I was well informed about the study and what my involvement would be when I agreed to participate (n=32)	25%	69%	6%	0	0

“The person who came did a really good job explaining it. That felt more accessible than talking to somebody at the lab. I was more comfortable asking questions in my own home with the person there.”

How did they feel about participating in the study? (3)

	Strongly agree	Agree	Disagree	Strongly disagree	I prefer not to answer
The results packet was too long (n=28)	11%	18%	50%	11%	11%
The results packet was confusing (n=26)	4%	19%	50%	15%	12%

“A lot of times when I was looking at [the packet], it didn't let me know if I should be worried. Why are you looking at this? Why aren't there regulations?”

“It was pretty clear and easy to read... You used down-to-earth language – I didn't have to put my thinking cap on.”

How did they feel about participating in the study? (4)

	Strongly agree	Agree	Disagree	Strongly disagree	I prefer not to answer
I am more interested in learning about chemicals that I might be exposed to (n=33)	36%	49%	6%	3%	6%
I have talked to my family, friends, neighbors, or co-workers about how to reduce exposure to some chemicals in the environment (n=33)	12%	49%	24%	3%	12%

“I'd like to see more information out to the public about fish, rice, etc. You raise awareness and then people can make their own choices. Some people could eat rice 7 times a week and have no problems, but other people might have problems.”

How else did their participation or results impact them?

“I’m surprised that I’m exposed to so many chemicals... Also surprised that you can find out so much from one little sample.”

“I was surprised I tested positive on so many chemicals. I had no idea that there were so many chemicals in everyday products... Is this really hazardous, or something that everybody lives with?”

How else did their participation or results impact them? (2)

- Other reactions

“I thought: oh my gosh, I want to read all of this. I looked at the elevations, graphs, then got overwhelmed.”

“I didn't have a big reaction, really. I did find it interesting how many bases you're covering.”

How else did their participation or results impact them? (3)

- Contribution to science and the “greater good”

“I just like to do altruistic things, to participate in something for the betterment of humanity.”

“Definitely useful. This gets people to pay attention individually so they will pay attention to the whole.”

“I hope you guys gained some knowledge from this study and apply it to future generations to help the planet.”

What did we learn?

- Participants had positive reactions overall
 - Found information interesting and useful
 - Felt empowered by their results
 - Took some actions to reduce chemical exposures
 - Motivated to learn and stay informed
 - Enjoyed making a contribution to research

“I would like to receive more letters and emails about future studies. I LOVE this, the feeling of knowing, and I would sign up for more studies.”

Future directions for results return

- Continue to evaluate our materials
- Explore options for producing graphics
- Develop new elements and approaches for upcoming studies
- Community meetings for input on materials and presentation of study results
- One-on-one meetings with participants
- Secure log-in on website

Acknowledgements

- Biomonitoring California staff
- Kaiser Permanente Division of Research
- Pilot BEST participants
- Funders: State of California and Centers for Disease Control and Prevention (CDC)

Questions and Discussion

“It was a very positive experience. Getting the information was very important; it’s good to know where you stand with environmental chemicals.”