

MEETING
STATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT
ENVIRONMENTAL CONTAMINANT BIOMONITORING PROGRAM
SCIENTIFIC GUIDANCE PANEL

CAL/EPA HEADQUARTERS
SIERRA HEARING ROOM
1001 I STREET
SACRAMENTO, CALIFORNIA

WEDNESDAY, MARCH 8, 2017
9:56 A.M.

JAMES F. PETERS, CSR
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A P P E A R A N C E S

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Asa Bradman, M.S., Ph.D., Chairperson

Scott Bartell, M.S., Ph.D.

Carl Cranor, Ph.D., M.S.L.

Oliver Fiehn, Ph.D.

Marion Kavanaugh-Lynch, M.D., M.P.H.

Ulrike Luderer, M.D., Ph.D.

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Megan R. Schwarzman, M.D., M.P.H.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY:

Gina Solomon, M.D., M.P.H., Deputy Secretary for Science
and Health

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT:

Lauren Zeise, Ph.D., Director

Amy Dunn, M.P.H., Research Scientist III, Safer
Alternatives Assessment and Biomonitoring Section

Sara Hoover, M.S., Chief, Safer Alternatives Assessment
and Biomonitoring Section

Carol Monahan Cummings, Chief Counsel

A P P E A R A N C E S C O N T I N U E D

DEPARTMENT OF PUBLIC HEALTH:

Robin Christensen, M.S., Biomonitoring California Grant
Coordinator, Sequoia Foundation

Nerissa Wu, M.P.H., Ph.D., Chief, Chemical Exposure
Investigations Unit, Environmental Health Investigations
Branch

DEPARTMENT OF TOXIC SUBSTANCES CONTROL:

Myrto Petreas, Ph.D., M.P.H., Chief, Environmental
Chemistry Branch

GUEST SPEAKERS:

Patrick Breyse, Ph.D., C.I.H., Director, National Center
for Environmental Health, Centers for Disease Control and
Prevention

Julia Brody, Ph.D., Executive Director and Senior
Scientist, Silent Spring Institute

Irva Hertz-Picciotto, M.P.H., Ph.D., Department of Public
Health Sciences, School of Medicine, UC Davis
Environmental Health Sciences Core Center

Thomas Webster, DSc, School of Public Health, Boston
University

ALSO PRESENT:

Davis Baltz

Nancy Buermeyer, Breast Cancer Prevention Partners

Marion Guyer, M.D., M.P.H., M.B.A., Alameda Health System

Catherine Porter, J.D., California Healthy Nail Salon
Collaborative

A P P E A R A N C E S C O N T I N U E D

ALSO PRESENT:

Lovisa Romanoff, M.S., M.P.H., Centers for Disease Control
and Prevention

Meredith Williams, Ph.D., California Department of Toxic
Substances Control

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1 P R O C E E D I N G S

2 MS. HOOVER: I just wanted to say hello,
3 everyone. My name's Sara Hoover of OEHHA, and we're going
4 to get started.

5 First I want to just let you all know that we're
6 getting started, so just a reminder that you should speak
7 directly into the microphone and introduce yourself before
8 speaking. This is for the benefit of the people
9 participating via webcast and for the transcriber.

10 The materials for this meeting were provided to
11 SGP members as well as posted on the Biomonitoring
12 California website. We actually have more than the usual
13 allotment of meeting materials at the back table in
14 folders that guests are welcome to take.

15 We actually have one break today, at lunch at
16 12:15.

17 Now I'm just going to do a little bit of
18 logistics. To get to the restrooms, you want to exit in
19 the back of the room, walk through the lobby, then make a
20 left. The restrooms will be in that small hallway on your
21 right.

22 In the event of an emergency, in which we need to
23 evacuate the building, please use the exit in the back of
24 the room, walk down the stairs and exit through the main
25 building doors.

1 And now I would like to introduce Dr. Lauren
2 Zeise, Director of the Office of Environmental Health
3 Hazard Assessment, who will get us started.

4 Lauren.

5 DIRECTOR ZEISE: Thanks.

6 Good morning, everyone. I want to welcome you to
7 this meeting of the California Environmental Contaminant
8 Biomonitoring Program, also known as Biomonitoring
9 California. And thank you all for participating, sharing
10 your expertise. So an early thanks.

11 As we start the meeting, I'd like to take a
12 moment to acknowledge a milestone in our program. This is
13 our 10th year, so we're celebrating our 10th year of the
14 Biomonitoring Program.

15 (Applause.)

16 (Cheers.)

17 DIRECTOR ZEISE: And, you know, it was
18 established in -- by legislation, SB 1379, and signed into
19 law by Governor Schwarzenegger in 2006. And in 2007 there
20 was a tremendous amount of hard work to pull things
21 together to start the program; and it included the first
22 meeting of the Scientific Guidance Panel, which was held
23 in Sacramento across the street. And then, you know,
24 guiding the development of the program were the goals that
25 were laid out in the legislation. And it was a very

1 innovative program, as we've -- as we've seen over the
2 years.

3 So the goals were first to determine levels of
4 environmental contaminants in a representative sample of
5 California, Californians, and to help identify highly
6 exposed communities. So that underlying it was -- and in
7 the legislation was an environmental justice motivation in
8 terms of looking for highly exposed communities, tracking
9 trends of chemicals over time and helping to assess the
10 effectiveness of public health in regulatory efforts to
11 decrease exposures to specific chemicals.

12 So in our past several meetings, you've seen how
13 these goals have guided our efforts. And as a case in
14 point, if we turn back to our November meeting, the Panel
15 gave input on a number of activities clearly touching on
16 these goals.

17 The first was the diesel exposure study that's
18 being designed for a Bay Area community, the
19 multi-regional study that's being launched this year,
20 community outreach efforts to identify priorities and
21 potential biomonitoring in environmental communities, and
22 our laboratories' semi-targeted screening methods that are
23 continuing to be developed to get at more -- a greater
24 body of chemicals to look at.

25 The SGP also had a rich discussion with one of

1 Biomonitoring California's collaborators, Dr. Peggy
2 Reynolds of the Cancer Prevention Institute of California.

3 She presented data from her collaborations with
4 the Department of Toxic Substances Control laboratory,
5 showing a preliminary data on decreases of perfluorinated
6 compounds in Californians -- California women through the
7 California Teachers Study. She also showed data that
8 showed that drinking water with contaminants -- with
9 perfluorinated contaminants was associated with greater
10 concentrations of these chemicals in biofluids in these
11 women that were tested. So pretty significant findings.

12 The SGP also provided advice in November on
13 possible classes of chemicals used in UV applications,
14 such as sunscreens, that could be considered in future
15 potential biomonitoring studies as designated chemicals.
16 So we got some guidance on that.

17 So we've got a great agenda ahead of us to help
18 us envision and think about our priorities for the next
19 decade. And we're going hear a lot more about that from
20 our Chair, Dr. Asa Bradman, in a moment. But I wanted to
21 make sure everybody knew about and invite you all to our
22 10th Annual -- our -- sorry -- our 10th Anniversary
23 celebration to celebrate the program's 10 years. We're
24 going to adjourn the Panel meeting at 2:30 to start the
25 event, and it's going to feature guest speakers, it's

1 going to highlight some of the accomplishments of our
2 program, and it will be followed by a reception outside in
3 the atrium outside this room that was graciously sponsored
4 by Biomonitoring California staff.

5 So we hope you all can join us.

6 And now I'll turn the meeting over to our Chair,
7 Dr. Asa Bradman.

8 CHAIRPERSON BRADMAN: Thank you, Lauren, for that
9 great introduction.

10 Is that better?

11 Okay. Again, I just want to thank Lauren for
12 that introduction. And also I want to say before I kind
13 of get into the nitty gritty here is that today's really I
14 think an interactive -- our goal is really to be
15 interactive today. We have this very formal dais up here
16 and this room is used for hearings. But let's kind of
17 imagine that we're all sitting like in a circle, and
18 really that -- the goal today is really to have a
19 discussion about -- to learn about -- review what we
20 found, celebrate that, and also think about where we want
21 to go going forward.

22 So with that, the primary goal of today's meeting
23 is to provide the program input on this overarching
24 question:

25 Given limited resources, what should be the main

1 priorities of Biomonitoring California going forward?

2 This overarching question will shape our
3 deliberations during the entire meeting today, and we'll
4 have a dedicated afternoon session facilitated by Dr. Gina
5 Solomon to discuss the question in detail. So please keep
6 that in your minds as we move forward today.

7 In the morning we'll be hearing a program update
8 from Dr. Nerissa Wu, who will be providing more detail on
9 aspects of new multi-regional study and noting some areas
10 for input.

11 Is that better?

12 Okay. I need a little lapel mic here.

13 Then our guest speaker, Dr. Patrick Breysse of
14 CDC, will present on the importance of biomonitoring and
15 addressing national, regional, and community chemical
16 exposures. We're also pleased to welcome three guest
17 discussants: Dr. Irva Hertz-Piccioto -- Irva, did I see
18 you?

19 -- Dr. Tom Webster, and Dr. Julia Brody, who will
20 each give brief remarks on our main discussion question
21 before we break for lunch.

22 We'll have about 15 minutes for questions and
23 brief discussion after each of the morning items and
24 additional one hour of discussion after lunch.

25 As Dr. Zeise noted, we adjourn the SGP meeting at

1 2:30 p.m. today to start our event to acknowledge and
2 celebrate the 10-year anniversary of the Biomonitoring
3 Program.

4 In terms of public comment, this is a formal
5 meeting until 2:30, and I'll call for audience questions
6 as time allows after each morning item. If you ask a
7 question in the morning session, please remember to
8 identify yourself.

9 Formal public comment will occur during the
10 afternoon discussion. If you'd like to provide formal
11 comment in the afternoon, please fill out a comment card
12 which can be obtained from the table near the entrance of
13 the room. Turn in the cards to Amy Dunn, right here.

14 And any public comments during the discussion
15 session will be subject to time limits if necessary. But
16 again we'll have I think many opportunities to discuss
17 today.

18 If you're joining the meeting via webcast, you
19 can provide comments via email at
20 biomonitoring@oehha.ca.gov; OEHHA being O-E-H-H-A.
21 Emailed comments relevant to the topic under discussion
22 will be read aloud during the afternoon session.

23 I want to note also that the program welcomes
24 public input via email at anytime, not just during the
25 session.

1 And also note, we'll be in a very tight time
2 frame today, so we're going to strictly adhere to time
3 limits.

4 So I'd like to now introduce Dr. Nerissa Wu,
5 who's the Acting Chief of the Exposure Assessment Section
6 in the Environmental Investigations Branch at CDPH and
7 Acting Lead of Biomonitoring California. Dr. Wu will be
8 presenting on the topic, "Biomonitoring California - Where
9 We Are Now."

10 Thank you.

11 (Thereupon an overhead presentation was
12 presented as follows.)

13 DR. WU: Good morning. Hello. Oh, that's
14 different.

15 Good morning. Welcome everybody to this special
16 10th Anniversary celebration and Scientific Guidance Panel
17 meeting. I want to thank everyone for coming out to
18 Sacramento, particularly today, March 8th, International
19 Women's Day.

20 (Applause.)

21 DR. WU: I know there's also been a call today
22 for a Day Without Women general strike. There were huge
23 amounts of logistics in getting this meeting together, so
24 we were not going to make Sara reschedule and replan this
25 meeting.

1 But I do want to at least acknowledge the day.
2 And certainly women play a very key role in the
3 biomonitoring program as well as public health research
4 overall. So I just want to acknowledge that.

5 --o0o--

6 DR. WU: I will be giving the customary program
7 updates - that's a little sneak preview of Michael -
8 including administrative and budget updates, and then some
9 project news.

10 There have been a number of staff changes that I
11 want to highlight:

12 In EHIB we have Thien Phan and Karyn Taylor, who
13 have joined us to do participant outreach and field work
14 on a number of studies.

15 We have Kathleen Attfield, who's our new Research
16 Scientist III in Epi and Biostats.

17 In EHLB we have Julian Perez as our new sample
18 manager.

19 And ECL has added Joginder Dhaliwal, Songmei Gao,
20 and Grace Lao, three new staff people.

21 So welcome to all of you. And we look forward to
22 hearing your contributions to the program.

23 We've also had to say goodbye to a few staff.
24 Weihong Guo from ECL and Wei Zhou from EHL have moved on
25 to new positions.

1 And we're very sad to announce that Duyen
2 Kauffman from EHIB at the end of this week will no longer
3 be at CDPH. But it's also a big relief; she's not going
4 very far. She's going across the aisle to Sara's team in
5 OEHHA. And so her talents and her experience with results
6 return will still be part of the Biomonitoring Program,
7 and EHIB will just have to miss her the rest of the week.

8 --o0o--

9 DR. WU: And as you know, Michael DiBartolomeis
10 has separated from State service after more than 25 years.
11 He has had an extremely productive prolific career
12 including over 15 years working with OEHHA and pesticide
13 assessment. He headed the occupational lead prevention --
14 lead poisoning prevention project at Occupational Health
15 and created and headed the California Safe Cosmetics
16 Program before moving over to EHIB and heading this
17 program for four years. So we miss him and his
18 leadership, and we hope he's enjoying his new life in
19 Hawaii.

20 --o0o--

21 DR. WU: Michael was just one of many people who
22 have supported and advocated for this program over the
23 years. As we report out today on all that we've
24 accomplished to date, I just want to recognize the many
25 people who have been part of this program. Many of you

1 are still sitting here today. This slide can't possibly
2 capture everyone who's been part of the program, from SGP
3 to State staff. It's an amazing group of people to work
4 with and it's a privilege every day to work with you.

5 --o0o--

6 DR. WU: And now to the program budget news,
7 which will resonate well with our discussion later today.
8 One thing that's been consistent over the years has been
9 our concern about a long-term sustainable budget, and we
10 report about this at every SGP meeting.

11 The history between 2009 and 2014, our program
12 budget has been a combination of our baseline State
13 funding and about 2.6 million annually from the CDC
14 cooperative agreement, for a total of a \$4.8 million
15 annual budget.

16 As shown here in 2014, the cooperative agreements
17 available from CDC were reduced from 2.6 to \$1 million
18 annually. And we were very fortunate to get the second
19 round of cooperative agreement funding, but it did mean
20 that our budget was reduced by that 1.6 million annually.

21 We have compensated partially through the budget
22 change proposal, and we've been granted two-year limited
23 term chunks of funding since 2014. And in this last year
24 we were fortunate to have some EJ funding, \$1,000,000 this
25 year to spend specifically on EJ projects for this year

1 the relevant panels, which would be relevant to consumer
2 product exposures, are the things that we can no longer
3 support.

4 Our laboratory capabilities, which are so key to
5 our program, you know, maintaining these important panels
6 but also looking forward to chemicals of concern that are
7 coming along and developing methods to meet those needs,
8 their ability to do so is severely impacted.

9 --o0o--

10 DR. WU: And we work hard to leverage the funding
11 we do have. So an example of this is the environmental
12 justice funding that we had this past year. In one fiscal
13 year we've been very productive. For the Asian/Pacific
14 Islander Project, we're moving into the second phase,
15 focusing on the Vietnamese community. Because we were
16 very poised and ready to go out into the field, we've been
17 able to get that project together quickly; and later this
18 month we should be out collecting samples.

19 We've conducted outreach to a number of different
20 organizations, over a hundred, and we're continuing to
21 survey and discuss our overlapping priorities with a
22 number of organizations. We have webinars and conference
23 calls with organizations throughout the State of
24 California planned in the coming months. And we are
25 putting together our new community newsletter to

1 environmental exposure study, for which we're looking at
2 participant flame retardant levels both before furniture
3 replacement and at the 6-, 12-, and 18-month point. We
4 have completed the 6-month sampling and the analyses are
5 just about ready, so we will be giving those results back
6 to participants in the spring. And at our next SGP
7 meeting we should be able to report back to you some of
8 those results.

9 We're about a third of the way through our
10 12-month point sample collection. So it will all be
11 interesting.

12 The Asian/Pacific Islander Community Exposures
13 Project which was started with the Chinese population in
14 San Francisco, we finished sample collection in November,
15 and we should have metals and PFAS data to give back in
16 the spring. And as I mentioned earlier, ACE II, the
17 second round, working with the Vietnamese Voluntary
18 Foundation in San Jose, will be going out into the field
19 later this month or early April and starting to enroll
20 participants and collect samples.

21 --o0o--

22 DR. WU: So let's move on to the multi-regional
23 sampling plan, which we talked about extensively last
24 time. Just to give a brief overview and remind you of the
25 overall protocol, we've decided to split the state into

1 eight regions. And we'll concentrate on one region at a
2 time, cycling through the regions to collect data, which
3 ideally we would be able to do within a two- to three-year
4 period and get a whole statewide sample that way.

5 The reality is, given our budget, we probably
6 won't be able to get to more than one region per year. So
7 that certainly compromises our ability to compare between
8 regions. But we still will have very complete regional
9 data and an ability to compare between regions depending
10 on when our data was collected for that region.

11 --o0o--

12 DR. WU: Last time we talked about this there
13 were a number of questions from the panel and from the
14 audience about recruitment. And we talked a lot about how
15 we would successfully meet our goal of recruiting 500
16 participants across the regions. We talked about random
17 recruitment versus community-based recruitment, and
18 stressed the importance of being inclusive, including the
19 cultural and linguistic diversity of California, getting
20 beyond San Francisco Bay to include rural as well as urban
21 communities, and to represent highly exposed communities.

22 Your input was great. Actually we've tried to
23 incorporate many of the comments as we've continued to
24 develop the protocol.

25 --o0o--

1 DR. WU: This is a pilot. And I often have to
2 remind our team of this, that this is the first region, so
3 it's going to be difficult and the hardest region to get
4 all of the pieces in order. But it is a great opportunity
5 for us to evaluate some of the protocol. And then
6 subsequent regions where we'll be building off of what we
7 learn in this first region, there will be room for tweaks
8 and improvements.

9 --o0o--

10 DR. WU: So this is an overview of the protocol
11 from participant recruitment all the way through sample
12 analysis. And I'll go into each one of these steps in
13 more detail.

14 --o0o--

15 DR. WU: So we're going to recruit participants
16 in two ways: Through a randomized protocol and through
17 community outreach. The randomized sample we'll select
18 through a postcard mailing, where we're going to just
19 randomly select mail routes in each region distributed
20 geographically, and we'll send postcards to each household
21 in the route. We're estimating that we'll get about a 1
22 percent response rate. So if we mail 65,000 postcards, we
23 expect to get about 650 respondents from that.

24 And the question has come up, why do postcards at
25 all? If we're expecting such a low response rate, why not

1 just focus on community-based recruitment? I think partly
2 because our mandate is to do representative sampling. We
3 should at least try a randomized approach. It also does
4 help reach people who are not part of community groups,
5 who are not hooked into social media or other means to
6 environmental groups. And focusing on community groups
7 can be biased in its own way. So a combination of these
8 two approaches I think will give us our best chance at a
9 representative sample.

10 At the same time we're sending out these
11 postcards, we'll be conducting community outreach, putting
12 information out into community centers, presenting the
13 project to community groups, and being available to get
14 people signed up, having environmental and health
15 organizations e-blast the information to Nextdoor and to
16 Facebook and to their own web pages. And the audiences of
17 both of these campaigns will be given the same message,
18 which is if you're interested in participating, go to this
19 website and participate in this pre-screening survey -
20 it's a very short demographic survey - and you'll be put
21 into this pre-screening pool.

22 We are trying to lower the barriers to
23 participation to be as inclusive as possible. So we will
24 have email and phone numbers on our information. So if
25 somebody just does not feel comfortable putting their

1 information on line, they can call us, we will walk them
2 through the pre-screening protocol and get them into that
3 pre-screening pool.

4 Pre-screening information is also available in
5 English and Spanish. There are obviously lots of people
6 who don't speak those two languages. So if somebody's
7 interested in participating but needs linguistic support,
8 we are noting that on the pre-screening survey, and we'll
9 provide an interpreter for them if they are selected for
10 the participation in the study.

11 But it doesn't eliminate the barriers to
12 participation. You still have to get the postcard and
13 figure it out. But at least we'll have lowered the
14 barriers to participation; and we are really committed to
15 making this as inclusive as possible.

16 So we anticipate between these two methods - and
17 we'll have about 2,000 people in our pre-screening pool -
18 70 percent or so we expect will be eligible. There may be
19 people who sign up but for one reason or another are not
20 eligible for the study. Either they haven't lived in L.A.
21 County, our first region, long enough or they're underage
22 or for some other reason they're not eligible for
23 participation.

24 --o0o--

25 DR. WU: But of that eligible pool, we want to

1 select our participant pool, and we want to have them
2 represent the region's diversity as well as possible. So,
3 for example, L.A. County, which we have selected as our
4 first region, we'll start with the regional -- the
5 regional racial breakdown and then we'll do -- we'll
6 adjust this somewhat.

7 You can see the L.A. County racial breakdown is
8 presented in the first slide and what proportionate
9 sampling would look like based on that racial breakdown.

10 We'll then adjust the sampling somewhat so that
11 we have enough people in each racial strata so that we can
12 do some statistical analysis. L.A. County itself is
13 pretty racially diverse so we don't need to do a lot of
14 adjusting to that sampling.

15 But, for example, for Gold Country, one of our
16 regions in the eastern part of the state, which is
17 considerably less racially diverse, you can see here how
18 we would have to adjust the sampling in order to get some
19 more representation across each race.

20 We do want to have a sample that's diverse also
21 with regard to sex and age and geography within the
22 region. But with only 500 samples per region, we're
23 really not going to be able to have large numbers per
24 strata.

25 And the other thing is we don't really know how

1 recruitment's going to go and how the distribution across
2 all of these parameters will look once we have people in
3 our pre-screening pool. So we will try to select
4 participants across these parameters. But ultimately
5 we're going to have to be flexible depending on who
6 enrolls in the study.

7 --o0o--

8 DR. WU: Once we have our participant pool
9 selected, our 500 people, we'll be sending out emails and
10 snail mail packages on what the study entails, and in --
11 the informed consent. The informed consent can be
12 submitted electronically or it can be mailed back to us.

13 We anticipate that of our participant pool we may
14 lose about 50 percent of the people who said, "Oh, I'm
15 interested," but then never actually get the informed
16 consent back to us. So, as we lose people from the study,
17 we will then go back to our pre-screening pool and select
18 more people and add them to the participant pile.

19 Once we have an informed consent from a
20 participant, they're enrolled in the study. They'll be
21 given access to an online questionnaire. And we've
22 elected to do an online questionnaire because we just
23 don't have staff to go out and implement an interview.

24 We'll be keeping the questionnaire short and focused.
25 Because it's self-administered, we have to be really

1 careful to make sure the questions are clear and
2 understandable. But for participants who just -- who
3 don't want to do a questionnaire on line, we will offer
4 telephone assistance. Also for participants who want
5 language assistance, we'll conduct the questionnaires on
6 the phone with the assistance of a translator.

7 Once questionnaires have been completed and
8 turned in, participants will be given access to an online
9 sampling app that will allow them to select a date and
10 time and location of sample collection. If we're on the
11 phone with them doing the survey, of course we'll go
12 through that process with them and get them scheduled in
13 for sample collection.

14 We anticipate that we will lose more people at
15 this point, people who go through the questionnaire and
16 then just never follow up for sample collection. And,
17 again, we have that reserve pool of people who have gone
18 through pre-screening. And we'll have to keep pulling
19 from people as we lose participants.

20 --o0o--

21 DR. WU: We're hoping to minimize our losses by
22 making it very easy for people to provide samples. And
23 we've considered two different models for sample
24 collection. One is sample collection at a centralized
25 location, which has the benefit of being less expensive if

1 you have lots of people showing up. But if you have high
2 overhead because of site rental and our staff being there,
3 and not a lot of people scheduling, it actually becomes
4 very expensive. So we have to be very careful about how
5 our participants get scheduled into these events.

6 It offers better control over sample storage
7 because we have a freezer right there.

8 On the other hand, it's not very inclusive,
9 because there are people who just will not be able to get
10 to centralized locations. They'll have transportation
11 issues. Their work hours aren't conducive for other
12 traveling. And so we will offer some days of mobile
13 phlebotomy where our staff will go out to a workplace or
14 to a home and visit with the person and actually collect
15 the samples there. This is very labor intensive, very
16 expensive for our staff to do, but it does offer the
17 ability for us to be inclusive.

18 These meetings, regardless of which method you
19 use, should be very short - a quick blood draw, a urine
20 sample - and then we will be doing a very brief
21 questionnaire on very recent exposures, in the last 24 to
22 48 hours in exposures.

23 --o0o--

24 DR. WU: And this would give us our 500 samples
25 from Region 1. We are working on this electronic tracking

1 process. So we'll have the ability to track people as
2 they go through the system; we'll be able to run reports
3 and look at metrics for where we're losing participants,
4 how our demographics look in our participant pool. And
5 we'll be able to use this mapping tool to say, well,
6 here's where our participants are, and maybe we need to
7 have another sample event there.

8 So the use of this electronic tracking, which is
9 something new in our program, will allow us to be much
10 more efficient and effective in tracking our participants.

11 --o0o--

12 DR. WU: Once we have those samples, we're going
13 to be analyzing them for select metals - certainly
14 mercury, cadmium, lead, and arsenic. One of the
15 outstanding questions is, what other metals would be
16 interesting for us to consider?

17 We also would like to do the perfluorinated
18 compounds. And there's some debate about the panel of 12
19 analytes, the original PFCs, or the expanded PFAS panel of
20 38 analytes. Some of the debate has to do with the cost
21 of running the panels. But we would like your input on
22 how we decide between those two panels.

23 --o0o--

24 DR. WU: Of course the results will be available
25 to participants, as always. We'll likely move to an

1 electronic system with an option for participants to
2 receive a paper version if they choose. And we'll follow
3 our usual protocol for flagging participants who meet a
4 threshold of concern for metals results.

5 We'd also like to do follow-up with participants
6 who fall into the highest and lowest percentiles per PFC
7 or PFAS result, and follow-up questionnaires for select
8 participants, so that we can collect more of the
9 information that won't be available through the short,
10 self-administered questionnaires.

11 --o0o--

12 DR. WU: So our plan's to be out in the field
13 early 2018, which means that the next nine months will be
14 spent getting our protocol finalized, meeting with L.A.
15 County partners and community partners to do some
16 usability testing of the protocol, getting our protocol
17 through the IRB and addressing their concerns, and then
18 continuing in late 2017, early 2018 to do community
19 outreach and recruitment.

20 --o0o--

21 DR. WU: There are a number of outstanding
22 questions, and we'd love your input on these:

23 The analytical panel question, which I've already
24 talked about.

25 Exposure questionnaires. There's always this

1 balance between all of the things we want to ask and the
2 attention span of a participant. And so some input on
3 what are those key things that we must include would be
4 great.

5 Key stakeholders in L.A. County, our first
6 region, and also other regions, who should we be including
7 in that outreach? If you have good contacts for us,
8 recommendations for stakeholders we should be reaching out
9 to, that would be helpful.

10 And how do we go forward to the next region?
11 We're starting in L.A. County. But as we're getting our
12 feet on the ground there, we already need to be looking
13 into the next region and setting up some of those
14 partnerships. So how do we decide which should be the
15 next region? Should we be con -- should we be looking at
16 what would be an interesting comparison to L.A. County or
17 looking at areas where we haven't done a lot of work? So
18 how we think about that question would be a good place for
19 you to offer some input.

20 --o0o--

21 DR. WU: So with that, I'd like to turn it back
22 over to the SGP if you guys have any questions or input.

23 CHAIRPERSON BRADMAN: So we have time now for
24 discussion by the Panel.

25 Dr. Bartell.

1 PANEL MEMBER BARTELL: I guess you could see I
2 had a question in my eyes.

3 (Laughter.)

4 PANEL MEMBER BARTELL: I was just curious whether
5 participants will be paid.

6 DR. WU: We do have the ability through our CDC
7 funding to offer an incentive, obviously through State
8 funding that's not allowed. So budget permitting, we are
9 planning a small incentive, maybe a \$10 incentive to
10 participants. As we go forward and no longer have CDC
11 funding, we'll have to change that protocol.

12 And so there's been some debate about how --
13 whether when we start up it would be helpful to have that
14 incentive, but whether it would be harmful to have an
15 incentive for some regions but not others. So it's a
16 little bit of an open question.

17 PANEL MEMBER BARTELL: Yeah, I guess it could
18 also harm you if you have portions of this with
19 longitudinal repeated measures designs where you're going
20 back to the same people and they're maybe expecting the
21 \$10 since you gave it to them on the first time.

22 And then another quick question for the
23 randomized part of the survey with postcards. You know,
24 you're expecting a pretty low response rate, which is
25 probably realistic. But I'm wondering if you have any

1 ability to collect even like -- or record basic like
2 demographic information, maybe connecting the randomized
3 addresses to other databases, like commercial databases,
4 marketing databases, so that you get at least a little
5 demographic information to tell you to what extent you've,
6 you know, got selective participation by SES or race or
7 age.

8 DR. WU: Right. We do have the mail codes -- we
9 can get the mail code information from the Postal Service,
10 which will tell us things like number of single-family
11 homes versus multi-family homes. I don't think it has
12 demographics, does it?

13 MS. CHRISTENSEN: It has.

14 DR. WU: Robin's been looking into that, so I'll
15 have her answer this question.

16 MS. CHRISTENSEN: It has limited demographics.
17 It has -- you can access certain ranges of income and,
18 like Nerissa said, household and whether there are
19 children within the family or not. So it's mostly
20 marketing.

21 PANEL MEMBER BARTELL: It's just a comment. I
22 think it's something worth thinking about, you know,
23 particularly when you have such a low response rate and a
24 goal is to have a representative sample. To whatever
25 extent you can get either individual level information

1 matched to those addresses you're mailing the postcards to
2 or, you know, census-tract kind of level data, that would
3 help you determine -- not only determine to what extent
4 you have maybe some participation selection bias, but also
5 maybe even allowing you to use some techniques from
6 missing data analysis techniques and statistics to try to
7 adjust the estimates after the fact.

8 DR. WU: Okay.

9 PANEL MEMBER BARTELL: It's done, for example, in
10 polling -- for election polling. You know, this kind of
11 information is collected to whatever extent possible since
12 there's pretty strong participation biases there as well.

13 DR. WU: I'm not sure how well the mail codes
14 match up with things like census tract on it's -- it's got
15 its own sort of division of -- by geography because it's
16 on -- it's based on how many routes a carrier can cover.

17 But that is something -- that's an interesting
18 thought to look into.

19 PANEL MEMBER LUDERER: Very interesting
20 presentation, and I'm excited to hear about this regional
21 study going forward.

22 And I have a question related to what Dr. Bartell
23 just asked, which is: So it sounds like for the random
24 sampling that you're doing, the unit is the household.
25 And I'm wondering whether you're going to be making any

1 effort to try to recruit multiple members from within the
2 same family, because that could provide very, you know,
3 informative information about household exposures
4 potentially that the family members might have in common.
5 And a related question is, are you planning on recruiting
6 children and what age?

7 DR. WU: Okay. At this point we are limiting it
8 to 18 years or up. We would love to be able to do
9 children and particularly parent-child pairs at some
10 point. Household of course is very interesting to look
11 at.

12 At this point I think we're trying to spread as
13 wide as possible and get one member per household, though
14 we won't limit it going forward to one member per
15 household. If two people sign up, I don't think we're
16 de-duplicating by household necessarily.

17 In the future, when we -- when we have our, you
18 know, plentiful resources and can come back and look at
19 things like specifically household exposures, that would
20 be great to be able to do.

21 And one of the things that our informed consent
22 will allow is to contact people for future studies if they
23 opt into that check box. And so that is something that we
24 might consider in the future.

25 CHAIRPERSON BRADMAN: Dr. McKone.

1 PANEL MEMBER MCKONE: It's really interesting. I
2 appreciate hearing about what you're doing, and it
3 looks -- it's a neat design. It's wonderful we're getting
4 into this.

5 Could you go back to the questions slide --

6 DR. WU: Oh, yeah.

7 PANEL MEMBER MCKONE: -- that you had for us.

8 So the one I was interested in is on the exposure
9 questionnaires; and, you know, you're kind of asking us
10 what to look at. And I'm thinking you might want to
11 convene, if it's possible, an expert -- half-day expert
12 panel, identify exposure scientists who are doing big
13 studies. There's several going on. We should look at
14 who's doing studies and ask, all right, if there's five
15 things you could ask in a questionnaire, what would it be?
16 Because I think we would all come up with a little bit
17 different points. And I think you need to kind of vet
18 this, especially for people who are really thinking about
19 this. So find the -- you know, work through some
20 organization to try to identify exposure scientists in
21 California who are out in the field. And then they'll say
22 "Oh, wish we knew what kind of furniture, or if they just
23 bought a new couch or not" or "I wish we knew how much
24 they clean their house" or "I wish we knew their diet." I
25 mean, because I don't think you're going to be able to ask

1 50 questions. You're going to wear everybody out. It's
2 going to take all day. They're going to have to be fairly
3 focused. And it would be really nice to find like
4 especially the top 10 that a lot of exposure scientists
5 agree on. I think you could get that probably in a half
6 day just -- probably has to be a public meeting or -- I
7 don't know. But, you know, just getting them in a room to
8 brainstorm and think this through and then vet it.

9 DR. WU: That's a great idea. And we've -- our
10 approach has been -- we have OEHHA's experts and we have
11 questionnaire experts at EHIB who have been combing
12 through existing questionnaires and looking through the
13 literature and using questions that have been vetted
14 through NHANES and other studies to come up with what
15 they -- you know, what seems to be the top questions and
16 that have been successful in other studies at getting the
17 actual information we're looking for. But it would be
18 great to have a panel to help us evaluate that.

19 PANEL MEMBER MCKONE: Uh-huh. And if I just add,
20 you know, on the next -- the region that should be next.
21 I understand there's a compelling reason to only do one
22 region on the first pilot. But I'm wondering if it might
23 be possible to do more than one region on the second
24 simply because you get more geographical coverage. It
25 might be more -- more of a logistics nightmare, but maybe

1 not so much if you pick two regions that are not too far
2 apart. And then you could get two regions that would
3 contrast with L.A. but could be two different kinds of
4 contrasts. Same number of people but just, you know,
5 randomly split up between two ar -- and, again, it -- it's
6 just, there's this quest for understanding California
7 exposure. And, you know, the criticism we're going to get
8 is, "Great, we did it. Now we understand L.A. region
9 exposure but what about all the rest of the state?"

10 So the sooner we could show a little broader
11 geographical coverage, I think the more we can kind of put
12 back that kind of criticism that we're still not doing a
13 California-wide probabilistic sample in the way NHANES
14 does a national probabilistic sample.

15 But, anyway, just a thought.

16 DR. WU: Yeah. No, I totally hear that. It
17 would be great if we could do two. And that was our
18 original goal, to cover two to three regions in one year.

19 The reality is a lot of the cost is the
20 logistics, getting on the ground, getting staff out there,
21 having phlebotomists in the field; I mean, your samples
22 collected. And we just don't have the staff to cover more
23 than one in a year or one at a time. It's already
24 difficult getting our staff to consent to move to these
25 places for weeks at a time.

1 So I don't -- I think at this point, given our
2 budget, it just doesn't seem realistic that we could do
3 that.

4 CHAIRPERSON BRADMAN: Question.

5 Dr. Schwarzman.

6 PANEL MEMBER SCHWARZMAN: Thanks so much. I
7 wanted to pick up on -- actually I had a couple
8 questions -- short questions and then a comment if that's
9 okay.

10 Partly on something you mentioned about the loss
11 of ability to maintain analytic panels with the decreasing
12 budget. How -- you've mentioned specifically PFASs, and I
13 wonder the time frame of that and how it relates to
14 including PFASs in this first regional sample.

15 DR. WU: Do you want to, Myrto, or June-Soo, do
16 you want to address that in terms of the PFAS panel?

17 I mean, I can address it in terms of saying that
18 the PFAS panel is more expensive to run than the PFC
19 panel, so some of the decision may be purely on whether we
20 have the resources to run it.

21 PANEL MEMBER SCHWARZMAN: My question is really
22 one of timing, like is it locked in for this first pass at
23 the regional sample, or is that open for question now, not
24 just in the future?

25 DR. WU: You want to talk about it.

1 DR. PETREAS: Myrto Petreas, DTSC, from the lab.
2 The Panel isn't -- well, we're doing it now, so we're
3 doing it for certain other studies. So it's not an issue
4 of being ready. We are ready. The question is timing,
5 how long will it take? It's more expensive, the standards
6 take longer. And will we have the staff available at the
7 time?

8 PANEL MEMBER SCHWARZMAN: Well, it is in question
9 whether there's the capacity, the funding to do that for
10 this first regional sample.

11 DR. PETREAS: During the time, which is two years
12 from now?

13 PANEL MEMBER SCHWARZMAN: Yes.

14 DR. PETREAS: As we speak now, we do it.

15 PANEL MEMBER SCHWARZMAN: Got it. Thank you.

16 And very briefly, a key stakeholder in L.A.
17 County, one group that I've worked with, is Black Women
18 for Wellness. I don't know if you've already connected
19 with them. Maybe you have.

20 DR. WU: Yes.

21 PANEL MEMBER SCHWARZMAN: And connecting to what
22 Dr. Bartell said initially, I'm wondering -- I wanted to
23 explore a little bit this idea of the mail codes. And I
24 understand they don't correspond exactly to census tract.
25 But I'm interested in census tract partly because of the

1 extensive work done for CalEnviroScreen with collecting
2 census-tract-level SES measures and preexisting disease
3 measures, and the power that that could provide for
4 helping us get more sort of insights into any
5 biomonitoring findings if we could relate them to the
6 census tract level.

7 And so I'm just wondering if there are any things
8 that we can strategize about before collecting the data
9 that would help us make those links to census-tract-level
10 information that's already existing in CalEnviroScreen.

11 And, likewise, I'm kind of thinking more about
12 just in leveraging the amount of information that we can
13 get from biomonitoring findings by connecting with
14 CalEnviroScreen, including like what is the granularity of
15 the information that we'll have on L.A. County because
16 there's so much disparity within L.A. County that's
17 captured by CalEnviroScreen, that maybe we could
18 understand some of those differences if we could relate
19 them to the census-tract-level information. And I don't
20 know if this is pie-in-the-sky thinking, but it's so
21 appealing if we could find a way of linking that
22 information.

23 DR. WU: Well, we should certainly take our mail
24 code map and, as we go to select our targeted audiences
25 for the postcard, we should overlay that over at

1 CalEnviroScreen and attempt to do that recruitment in a
2 thoughtful way.

3 I mean, we want to cover geography as well as
4 many different demographic parameters. And then as we do
5 our recruitment, our community-based recruitment, we are
6 starting to map out places where we should be doing that
7 outreach. And again, we should be looking at
8 CalEnviroScreen -- we will be looking at CalEnviroScreen
9 and at a general distribution across California through
10 other means to figure out where we need to be -- where we
11 need to be addressing different population centers. I
12 mean, not only just numbers of populations but particular
13 segments of the population.

14 PANEL MEMBER SCHWARZMAN: That's great to hear.
15 I'm not sure I was totally clear about what I meant. What
16 I'm suggesting is if we can in collecting -- or recruiting
17 participants and collecting the data on who participates,
18 if there's a way of maintaining sufficient information to
19 link each participant's results to a census tract within
20 CalEnviroScreen that would help us say we don't know about
21 this individual person and their SES, you know,
22 descriptors, but they come from this census tract that we
23 do have that information in CalEnviroScreen, because
24 there's so much that went into compiling that information
25 in CalEnviroScreen and it's relatively, you know, granular

1 in that it's down to the census tract. And it doesn't
2 tell us about the individual, and I understand the
3 potential flaws there. But if there's a way of collecting
4 enough information on the participants that would allow us
5 to place them in a census tract, then we could potentially
6 leverage some of the information that's already in
7 CalEnviroScreen.

8 DR. WU: Yeah, we will have their address, their
9 home of res -- well, their place of residence or place of
10 work, things like that. So we'll be able to geocode
11 those; and similar to what we've done in Project Best
12 looking at water sources, we'll be able to overlay that on
13 CalEnviroScreen information.

14 PANEL MEMBER SCHWARZMAN: Great.

15 CHAIRPERSON BRADMAN: I want to ask, is there
16 anyone in the audience or on line -- I don't know if we've
17 had any email questions. But this is an opportunity also
18 for comment from participants, so please feel free to ask
19 questions.

20 I want to leave a few minutes for this because
21 we -- make sure we make time for this.

22 Okay. No one -- go ahead, Dr. Quintana.

23 PANEL MEMBER QUINTANA: I'll be really brief.
24 This is Jenny Quintana. I had a couple quick suggestions
25 and then a question. I actually had the same question you

1 did about incorporating CalEnviroScreen. It's a very
2 powerful tool, and it seems that closer integration with
3 our program would be excellent.

4 But our brief comments or suggestions are to
5 really encourage the use of multiple languages on the
6 postcards. Even if it makes a really big postcard, I
7 think that helps with inclusiveness.

8 And also to see if you've thought about video
9 consent. That's being allowed by many human subjects
10 committees. And it might be moving to videos and
11 cell-phone based -- smartphone-based questionnaires, and
12 consenting seems to be the wave of the future.

13 And my last question is -- one of the questions
14 for our panel was which substances to look at. Of course,
15 we think of L.A., we think of traffic, disparities in
16 exposure to traffic. And so at some point it would be
17 very nice to look at polycyclic aromatic hydrocarbon metabolites
18 in the urine and metabolites of 1-nitropyrene. I
19 understand that funding's an issue, but have you given
20 much thought to sample archiving, where some of these
21 things take quite a bit of urine volume, for example, and
22 costs money to collect, transport, store. But I think it
23 would be very important to archive samples in a large
24 enough volume and in a manner that would allow further
25 analyses. But of course it does take money just to

1 archive.

2 DR. WU: Right. Let me address those in order.
3 Let's see.

4 We are working to get as modernized in the tech
5 world as we can through use of apps like DocuSign for the
6 informed consent, SurveyMonkey-type applications for the
7 questionnaire, applications that will text out and email
8 reminders to participants about their upcoming
9 appointments.

10 So we're really working towards that kind of
11 protocol. It has to be IRB approved and it has to get
12 through the CDPH IT -- the people who control our IT.

13 So as much as possible we will be making this as
14 multimedia as possible, to make it as accessible and as --
15 you know, people walk around with their phones all the
16 time. That would be a great way to get in touch with
17 people. We want to be inclusive to the people who aren't
18 on their phones, and we need to be savvy about security
19 and confidentiality and potential breaches of those apps.
20 But, yes, we are working on bringing ourselves into the
21 smart phone era.

22 We haven't really looked into video consent. We
23 have talked about this electronic informed consent. But
24 I remember you brought that up last time, and that is
25 something I will look into.

1 In terms of traffic disparities and sampling. So
2 when we see the participants one time, we have the ability
3 to get one urine sample. So there's a limit on the volume
4 we're going to have.

5 We are planning on having on the informed consent
6 the usual check box for "I will" -- "I consent to have my
7 samples stored for future analyses." And we will store as
8 much a sample as we have left over.

9 MS. BUERMEYER: Thank you. Nancy Buermeyer with
10 the Breast Cancer Prevention Partners, formerly the Breast
11 Cancer Fund. Sorry, I still haven't figured that out yet.

12 Just really quickly, you've talked a lot about
13 the randomized question -- or the randomized postcard
14 recruitment. In doing the community recruitment, I know
15 there's been a lot of interest particularly in L.A. County
16 around sampling near oil extraction facilities, which live
17 in people's neighborhoods. And I don't know if the panels
18 you're looking at are relevant to that kind of exposure.
19 But are those the kinds of things you'll look at in the
20 community recruitment piece of this?

21 DR. WU: I'm sorry. I'm not quite sure I
22 understood the question because I was having a little side
23 dialogue here. Are we looking at -- I'm sorry. Are we
24 looking at things like oil and gas extraction for -- as
25 part of the community outreach?

1 MS. BUERMEYER: Yes.

2 DR. WU: Okay. And recruitment.

3 I think we are looking at -- I mean, through our
4 Environmental Justice Project, which is outreaching to a
5 number of different environmental justice community
6 groups, we are bringing a lot of different people to the
7 table through whom we'll be doing this recruitment. So it
8 will bring people who are concerned about a number of
9 issues, not just the panel that we're looking at into
10 contact with the Biomonitoring Program. And we hope that
11 we are successful in recruiting through that means.

12 I don't know that our panels are particularly
13 relevant to the oil and gas extraction folks, and we don't
14 have methods for the chemicals that are relevant for those
15 exposures at this point. But again, we'd be able to
16 archive samples; and at some point if we're able to go
17 back and do some analyses, that would be interesting. And
18 we'll have the geocodes for those participants.

19 CHAIRPERSON BRADMAN: We have one minute. So we
20 have time for a very brief question. And there'll also be
21 time for discussion this afternoon. So we got one minute.

22 Thanks.

23 MS. PORTER: Hi. I'm Catherine Porter with the
24 California Healthy Nail Salon Collaborative. And I just
25 want to underscore the importance of the comment about

1 language access and the translation of the postcard. It
2 seems like similarly the pre-screen survey ought to be
3 also translated, or create some sort of mechanism maybe
4 more -- via some sort of spoken video survey. Because I
5 think if language access is not sufficiently and correctly
6 addressed, then the whole sense of randomizing is going to
7 be lost.

8 Thank you.

9 CHAIRPERSON BRADMAN: All right. Thank you for
10 that comment.

11 I don't think we have time for more discussion
12 right now. But again, we'll have plenty of time this
13 afternoon. And we're actually right on time right now.

14 And I wanted to introduce Dr. Breysse, who will
15 be speaking to us.

16 We're fortunate to have Dr. Breysse here as our
17 distinguished guest speaker. I've actually known
18 Dr. Breysse for almost 20 years now through our work with
19 the Children's Center at UC Berkeley. Dr. Breysse is the
20 Director of the National Center for Environmental Health
21 and the Agency for Toxic Substances and Disease Registry.
22 He joined CDC in 2014, after 30 years at Johns Hopkins
23 where he held a number of high-level positions, including
24 Co-Director of the Center for Childhood Asthma in the
25 Urban Environment.

1 He has a long-standing commitment to
2 investigating the relationship between environmental
3 factors and health. And today he'll be talking about the
4 importance of biomonitoring in addressing national,
5 regional, and community chemical exposures.

6 So thank you so much for coming out here for our
7 meeting. And I think we all look forward to your
8 presentation.

9 (Thereupon an overhead presentation was
10 presented as follows.)

11 DR. BREYSSE: Thank you very much for having me.
12 I'm happy to be here today.

13 So as you heard, I'm new to the federal
14 government. The years I spent in academia, I appreciated
15 the importance of biomonitoring in a research perspective.
16 But now at CDC we have to think more broadly about what it
17 means from a general public health perspective. And some
18 of those topics I'd like to touch base on today.

19 So today I'm going to talk to you about the
20 importance of biomonitoring, addressing national,
21 regional, community chemical exposures. But I'm also here
22 today in part to help recognize the importance of work you
23 do here in California. So we see California as leading
24 among states in terms of their biomonitoring efforts, and
25 I'd like to congratulate you and recognize that. And I'm

1 here in part today because of that.

2 --o0o--

3 DR. BREYSSE: But I'd like to begin by saying a
4 few words about some of our priorities. So as you heard,
5 I'm the Director of -- I have two hats. I'm the Director
6 of the National Center for Environmental Health, which is
7 one of the centers within CDC, the Centers for Disease
8 Control and Prevention; but I'm also the head of Agency
9 for Toxic Substances and Disease Registry, ATSDR. And in
10 spite its name, we're not really for toxic substances,
11 but --

12 (Laughter.)

13 DR. BREYSSE: -- it's an agency that's affiliated
14 with CDC. And its name actually was codified in
15 legislation so we have a hard time changing that name.

16 But it's kind of like IBM. Most people don't
17 remember what ATSDR stands for but a lot of people have
18 heard of ATSDR, and so I'll refer to it in that way.

19 And so one of our goals, one of our priorities is
20 to be a leader in public health -- public environmental
21 health surveillance. And biomonitoring plays an important
22 role in that. So we have an environmental public health
23 tracking program where we look at a variety of
24 environmental indicators. We try and link them with
25 health indicators. And that's our effort to create to the

1 extent feasible a national surveillance program. Now,
2 it's not national because we can only fund a number of
3 states for -- we don't fund every state, but we'd
4 obviously like to fund every state.

5 A number of our priorities is also to eliminate
6 harmful sources of lead from children's environments. So
7 we began focusing on this actually before the Flint
8 situation. But the Flint situation brought lead to the
9 national forefront. And we've been dealing with lead for
10 decades as public health professionals. And I think
11 there's a lot of consensus now that we know what to do to
12 eliminate harmful sources in children's environments.
13 Instead of trying to manage it and use surveillance -
14 canary in a coal mine situation - we need to just
15 eliminate lead from children's environments.

16 We also see there's growing concern about safe
17 drinking water in America. One of the things I learned
18 from Flint from talking to people about water -- and Flint
19 was more than a lead problem, as many of you know, in
20 terms of drinking water. The general public has an
21 impression of two things at least, in Flint they did, that
22 their water is, number one, sterile, and that it's
23 contaminant free. And of course it's neither of those
24 things. And to try to convince the public that that's
25 okay. And in terms of the contaminants, some of the

1 contaminants are contaminants we put there as part of the
2 disinfection process. It's a complex message to make.

3 But we do know there are many situations across the
4 country where there are harmful substances in our drinking
5 water that do need our attention, and it's gaining greater
6 and greater national focus and it's something that we want
7 to address at CDC.

8 Now, the ATSDR is an agency whose mission it is
9 to address health concerns in communities associated with
10 hazardous substances disposal and spills. ATSDR's budget,
11 like many things, has been flat for 20 years. The issue
12 of hazardous waste in this country has only grown over
13 that period of time. And we're looking for ways to expand
14 ATSDR's capacity to investigate harmful exposures in
15 communities. We're looking for more resources, being more
16 creative; and biomonitoring plays a big role in that.

17 Finally, the laboratory is one of the most
18 important parts of the National Center for Environmental
19 Health. There are three divisions within the National
20 Center for Environmental Health. One of them is the
21 Division of Laboratory Sciences. And the Laboratory
22 Sciences is -- our laboratory is a model for the country
23 and indeed for the world.

24 --o0o--

25 DR. BREYSSE: So I'd like to just say a few words

1 about the role of state-level biomonitoring.

2 --o0o--

3 DR. BREYSSE: So we would look towards states to
4 the extent feasible to provide population-based
5 representative exposures in terms of their -- by their
6 state or by some locality within a community. So it's
7 important to get local biomonitoring data. And the goal
8 obviously of the biomonitoring data is to identify where
9 exposures occur, quantify those exposures, with a goal of
10 reducing those exposures. And so the data at that level
11 are crucial.

12 So our Biomonitoring Program through NHANES
13 produces a national picture and it helps design national
14 policy, national programs. But we rely heavily on locally
15 collected data to look for situations where there's
16 exposures that need to be reduced or eliminated in order
17 to improve health.

18 So we know that data drives action. And when we
19 characterize exposures in communities, it's important that
20 we use those data to drive thing -- actions like reducing
21 exposures, getting people different water sources,
22 providing bottled water in the interim if we need to. And
23 I recognize that California's a leader in setting trends
24 and a model for other states, and I congratulate you for
25 that.

1 But we need to spend -- we need to have a greater
2 emphasis I think across the nation of developing this
3 local-level biomonitoring data. And we need to improve
4 capability in the states in order to do that.

5 I'd like to give one example of why this is
6 important. It's an example you're well familiar with here
7 in California. And it's something you've already talked
8 about.

9 --o0o--

10 DR. BREYSSE: And that's the perfluoro and
11 polyfluoro substances issue. So this is an issue that I
12 know you're addressing but people are addressing with it
13 nationally. I think you guys are ahead of the game
14 compared to most other states. But we know there's many
15 current and past uses that create opportunities for
16 exposure, we know there's many sources that create
17 pathways in communities that we need to quantify and
18 address. I won't spend a lot of time with this because
19 this is something obviously you've all thought about,
20 you're all very familiar with here. But this is playing
21 out across the country right now, and we're helping states
22 and local communities address this issue. Many of them
23 don't have the resources of the State of California, and
24 many of the communities have heightened concern about what
25 their exposures are.

1 And so we know this is important.

2 --o0o--

3 DR. BREYSSE: Again, I won't spend a lot of time
4 because -- there's widespread human exposure to the PFAS
5 chemicals. We know they're persistent in the environment,
6 degrees of persistence. We know that EPA has identified
7 them as contaminants of emerging concern, so we're
8 collecting more and more data about them in environmental
9 media like water. We know there's concern about increased
10 cancer risk. We know there's concern about the developing
11 fetus and children. And we know for a fact through the
12 EPA's monitoring and comparing to the long-term health
13 advisory level, that there are many communities across the
14 country that have PFASs in their drinking water above the
15 EPA's current long-term health advisory level.

16 So the publication of the EPA's long-term health
17 advisory level about a year ago set off a wave of concern
18 across the county, as community after community found out
19 that they had levels that were above this.

20 DR. BREYSSE: And here we see a map. And this
21 is -- you don't need to spend a lot of time on the colors
22 or the details. But the dots are -- through the
23 unregulated contaminant rule of monitoring the EPA did,
24 their version 3, we have identified at least - I say 65
25 because we think the number might change - communities

1 with drinking water levels potentially above the long-term
2 health advisory level for EPA.

3 And we know that the rule always samples
4 municipal drinking water systems that are above a certain
5 level. And so we're only talking about communities that
6 have larger drinking water systems.

7 And there are a large number of Americans who
8 either get their drinking water from private wells or from
9 smaller unregulated drinking water systems. So in many
10 ways this is perhaps the tip of the iceberg.

11 And if I address all your attention to northern
12 Alabama on this map. So this is an area where we've done
13 a lot of work at ATSDR because of a community where
14 there's a large area that was affected from a water
15 treatment plant that had sewage sludge that was
16 contaminated and they used the sewage sludge to amend
17 agricultural areas, so they created a water situation
18 which then was magnified by the water treatment plant
19 magnifying that material and then spreading it on the
20 land.

21 And so we know -- but if you look at it -- in
22 northern Alabama there, while there's a couple of drinking
23 water systems that were elevated because of the regulation
24 monitoring, if you look at water systems that were not
25 part of that regulation rule, there was a number of other

1 water systems that were contaminated as well. So the
2 issue was much bigger than just one or two communities you
3 might have thought were affected by just looking at what
4 the unregulated contaminant rule sampling would predict.

5 So we see we have issues across the country
6 already in dealing with this. So this is something that's
7 a big issue in California and I think it's a national
8 issue, and we've taken it as a priority at ATSDR and NCEH.

9 So this is a biomonitoring meeting; I have to
10 present a little bit of data.

11 --o0o--

12 DR. BREYSSE: And so we know from NHANES, if we
13 look at the NHANES cycle on the horizontal graphic --
14 graph, but versus the geometric mean level on the vertical
15 graph for PFOA and PFOS, we see a very nice public health
16 response. As the manufacturers decided to stop making
17 those chemicals, we've seen substantial decreases
18 particularly in PFOS over time.

19 But if you look at another PFAS chemical, PFHxS,
20 we don't see a corresponding decrease. In fact, we see
21 it's relatively level. So while we may have some success
22 with PFOA and PFOS, as we've heard already there's a large
23 number of chemicals in these families, that just because
24 PFOA and PFOS are going down, it doesn't mean everything's
25 going down and it doesn't mean the problem's been solved.

1 --o0o--

2 DR. BREYSSE: So one of the important goals about
3 monitoring, as you heard, is to set up -- if you look
4 back, to look at these trends over time. These trends
5 over time are important for setting policy. And we are
6 looking for data hopefully in the future from state and
7 local communities along these lines so that the -- the
8 information you're collecting as part of the initiative we
9 just heard about, we have population representative
10 sampling, is crucial to understanding trends over time.
11 And it's crucial for collecting data that you can use to
12 compare across communities as well.

13 In many cases, as we'll see in a minute, we have
14 a number of communities in the U.S. where they're offering
15 opportunity for convenience sampling for biomonitoring
16 purposes. And we argue that while it's important for
17 individual people who want to know what's in their body,
18 they have a right to know that, for public health
19 purposes, having population representative samples are
20 important, like I said, to look at the trends over time
21 and to compare across communities and to generate data
22 that might be helpful for future health effect studies.

23 --o0o--

24 DR. BREYSSE: So you see, by looking at the
25 priorities that we started with in terms of strengthening

1 ATSDR, expanding our laboratory work, improving public
2 health surveillance and focusing on safe water, the PFAS
3 issue crosses all those priority areas for us as an
4 agency.

5 So ATSDR, all those communities that have
6 contaminated drinking water systems, we're looking at
7 where it's coming from. Right? And if it's a
8 site-specific release, that's an ATSDR issue. That's now
9 something that ATSDR should help states deal with in terms
10 of chemical release into our drinking water system now
11 creates exposures in communities.

12 Now, it's important to recognize that just
13 because there's contaminant in the source water, it
14 doesn't necessarily mean that that's what's coming out of
15 people's taps. So the unregulated contaminant monitoring
16 rule is really looking at what the sources of the drinking
17 water is. And we know there's complex mixtures of waters
18 in many cases in drinking water systems. And so one of
19 the things we would like to know more about is actually
20 what's coming out of people's taps, not just what's going
21 into the drinking water system at the drinking water
22 plant.

23 So ATSDR is involved in helping communities
24 address this by looking at what the source might be and
25 treating it like they would any hazardous waste site

1 investigation. We have a number of sites that have
2 requested ATSDR assistance, and we're actually engaged in
3 getting a dozen or so sites across the U.S. right now that
4 are PFAS-related sites. Many of them are military sites
5 or former military sites or sites that use firefighting
6 foam; and some of them are also former or current
7 industrial sites as well.

8 So the laboratory also plays a critical role,
9 similar to your biomonitoring here, in order to keep up
10 with looking at the chemicals that are in the environment
11 and making sure the biomonitoring matches what the people
12 are exposed to. And this is a challenge, as you're aware,
13 because the chemical formulation of the PFAS chemicals are
14 changing as they try to eliminate the longer-chained
15 chemicals, they're coming in with a little shorter-chained
16 chemicals. And so looking at what's in the environment,
17 we have to look at also kind of the corresponding
18 development of the biomonitoring methods to measure that
19 as well.

20 The Public Health Tracking Network, as you know,
21 is our surveillance program, and so we're looking to
22 incorporate this biomonitoring data there. And obviously
23 since this is a water issue, it fits nicely into our Safe
24 Water Program

25 --o0o--

1 DR. BREYSSE: So our current work is develop a
2 technical tool support for states that gives them advice
3 on how to characterize water -- PFAS exposure in the water
4 distribution system; advice on how to conduct
5 biomonitoring, collecting a population-based
6 representative sample.

7 The convenience samples that many communities
8 across the U.S. are taking right now, like I said before,
9 do not provide the public health basis for looking at
10 trends and making policy decisions, as we commented
11 before.

12 We have an exposure and health effects question
13 bank that people can choose from.

14 We provide blank letters of support and
15 interpretation to provide information back to communities.

16 We have a variety of risk communication
17 materials.

18 And finally, we also provide water sampling
19 protocols from the EPA. So if you're in a person's home
20 and you're collecting a blood sample from them and you're
21 interested in what their PFAS level is, it might be an
22 excellent opportunity to also look at the water sample of
23 that home to know what the actual source is there.

24 So these are the toolkits that we're beginning to
25 make available to states. We hope to have this roll out

1 very soon.

2 --o0o--

3 DR. BREYSSE: So at the international level, I
4 was -- I had the pleasure of attending a European
5 commission meeting on human biomonitoring. And the kind
6 of issue we're talking about here in California and across
7 this country are happening in Europe as well.

8 So many countries in Europe have their national
9 biomonitoring programs. There's no European-wide
10 biomonitoring program, and so they don't have data that
11 are necessarily comparable. And so I'm happy to say that
12 within Europe they're looking to harmonize procedures for
13 biomonitoring. They're trying to create a European-wide
14 network similar to what you're trying to do across
15 different communities in California. So we can get some
16 European-wide data as well. And they've turned to us for
17 help and advice on that.

18 And so I'm happy that we're playing a leadership
19 role in helping to respond to that.

20 --o0o--

21 DR. BREYSSE: So one of the important outputs of
22 our biomonitoring program is -- I'm sure you're aware, is
23 the National Report on Human Exposure to Environmental
24 Chemicals. And I'm told this is one of the most highly
25 cited documents, publications that CDC produces.

1 And so this is a very important document that
2 highlights kind of the 300 plus chemicals, looking at the
3 levels collected in NHANES across the time period
4 appropriate for the NHANES sampling.

5 --o0o--

6 DR. BREYSSE: So we published updated tables in
7 2017, a two-volume set. It's a two-volume set because
8 it's easier to download. It was getting too big. It was
9 only one volume.

10 The first volume gives the general U.S.
11 population-wide data.

12 The second volume gives pooled samples for a very
13 purposeful analysis of comparing smokers and non-smokers.
14 And so smoking continues to be an important priority area
15 for the CDC, not just our laboratory. And we provide the
16 support for biomonitoring that helps document changes and
17 trends in exposure, especially as we look at, you know,
18 the new ways to kind of take on -- take on nicotine or
19 tobacco products. We see wide changes in the type of
20 chemicals appearing in your body.

21 So the present data we present 304 chemicals in
22 the current report. Twenty are reported for the first
23 time, and 96 are updated since 2015.

24 --o0o--

25 DR. BREYSSE: So here we see some of the new

1 chemicals include DEET metabolites, atrazine metabolites,
2 triclocarban, and six blood VOCs. So we continue to
3 change and add things as new science emerges.

4 We make sure we link the chemicals to the CAS
5 registry number so there's a common way to reference
6 things.

7 This report we began to look at linear and
8 branched isomers for people on PFAS. So these are new
9 data. In the past we looked at them without specifying
10 between whether the linear or branched chain. And we're
11 not sure exactly how important this is going to be just
12 now, but it could provide important information about a
13 potential where the source of a material might come,
14 because the -- whether they're linear or branch depends in
15 part on the manufacturing technique. And so it might help
16 with source identification among other things.

17 --o0o--

18 DR. BREYSSE: Here we see a group of chemicals.
19 I don't need to go over -- read the whole list. These are
20 the chemicals with updated data. And so you see we're
21 continuing to update data as part of this biomonitoring
22 report.

23 --o0o--

24 DR. BREYSSE: And this longitudinal data is I
25 think what's important. Having cross-sectional data is a

1 crucial starting point, but the longitudinal data I think
2 creates the national picture that we need for the evidence
3 to look at the increases and decreases in exposure or the
4 changes that might have come with different chemicals
5 being introduced into the environment.

6 --o0o--

7 DR. BREYSSE: In this slide we list the new
8 chemicals reported for the first time. And, again, I
9 won't necessarily read them all, but you'll see they
10 include a number of the PFAS chemicals we're looking at
11 for the very first time.

12 We see a number of volatile organic compounds
13 increased. We see triclocarban as an important consumer
14 product -- personal care product that we're looking at as
15 well.

16 --o0o--

17 DR. BREYSSE: So what are the goals of our
18 efforts at CDC? It's harmonized biomonitoring approaches
19 across the country. So in part through data that we
20 funded -- we provided the State of California and other
21 states. Our goal is to work with the APHL to come up with
22 harmonized approaches. So we make sure that we collect
23 data that we can compare across the country.

24 So we've had a longstanding collaboration with
25 the public health laboratories and with APHL. And our

1 goal here is to increase the capacity and capability
2 across the country for high-quality biomonitoring. We're
3 developing a National Biomonitoring Plan, and we're
4 looking for resources to increase funding to states
5 wherever possible. And we're establishing this formal
6 national biomonitoring network that we talked about
7 before.

8 So the National Biomonitoring Network has a
9 vision of a formal national network of regional, State,
10 and local laboratories conducting high-quality human
11 biomonitoring science for use in public health practice
12 and in response to environmental health emergencies.

13 So having this network all close and knitted
14 together using harmonized methods that communicates with
15 one another right away, can respond to regional issues,
16 and that also provides support if there's a national
17 emergency is a crucial I think resource for the country.

18 So we're formalizing the network, so there'll be
19 a steering committee; there'll be work groups that address
20 study design, laboratory methods and how to join them in
21 terms of membership. There'll be a central platform for
22 sharing issues on biomonitoring practice. We're working
23 to harmonize - and they use that word very carefully - not
24 standardize methods, because there are a number of ways to
25 get high-quality measurements to have the same limit of

1 detection, have the same quality control. And it's not
2 necessary for us to necessarily specify exactly how that
3 measurement has to be taken. Rather we specify things
4 like the quality control that it needs to achieve, limits
5 of detection it needs to achieve, and so forth.

6 But ultimately we want to incorporate
7 biomonitoring more into public health surveillance and
8 into public health practice. This is really our goal.

9 --o0o--

10 DR. BREYSSE: Well, in terms of final thoughts.
11 As we forge ahead we need to leverage expertise and
12 resources outside environmental health. We had a meeting
13 last week at CDC where we invited -- it was a telephone
14 conference meeting. We invited agencies across the
15 federal government who'd have an interest in PFAS
16 chemicals. And they range from, you know, the Food and
17 Drug Administration, Department of Agriculture, Consumer
18 Products Safety Commission, the Environmental Protection
19 Agency, NIEHS, EPA. So we know that there are people
20 beyond the environmental health community that have an
21 interest in biomonitoring, and so we need to make sure we
22 reach out to them and bring them into the fold, but talk
23 to them more about what they're concerned about and how
24 that might affect the measures we take and how we
25 interpret the measurements we make.

1 We need to do a better job of increasing local
2 and state-level data. As I mentioned before, California's
3 a leader in that regard. And we'd love to see other
4 states come up to your capability.

5 And, finally, we make sure that we share our data
6 and we pool our data so we can have data-driven knowledge
7 to help individuals and communities address their health
8 concern, because we can't forget that's ultimately what
9 we're here to do.

10 --o0o--

11 DR. BREYSSE: So with that, I'd be happy to take
12 a few questions.

13 Thank you for your time.

14 (Applause.)

15 CHAIRPERSON BRADMAN: Thank you. That was really
16 interesting, and I really appreciate the encouragement and
17 attempt to really build networks and collaboration, both
18 locally and internationally. And I think there's a lot of
19 real opportunity here to address environmental health and
20 public health issues.

21 So are there any questions?

22 Dr. Quintana.

23 PANEL MEMBER QUINTANA: Hi. I had a question
24 just asking for your opinion. We heard earlier that
25 California Biomonitoring has limited resources. So given

1 the very interesting and helpful data that's come from the
2 NHANES, DEH, the CDC program, what do you think are the
3 holes that state-level monitoring could really focus on to
4 kind of supplement what's already been going on at the
5 national level? What -- in your mind, what are the issues
6 you're not able to address through that program?

7 DR. BREYSSE: Yeah, so we sacrifice the ability
8 to look at more fine level, in terms of community-level
9 exposures, by emphasizing our national average.

10 And so we would look to states like California to
11 see if the picture in California is the same as the
12 nation. Or compare a community to another community, how
13 does that compare to California as a state, how does that
14 compare to the nation?

15 In many cases our benchmark for talking to
16 communities about what it means to have this stuff
17 measured in your body is compare it to a national average.
18 Now, oftentimes that's an okay place to start, but it's
19 not the only thing we'd like to know. And so having more
20 geographic specificity about what the biomonitoring levels
21 are like, and knowing what some of the local determinants
22 might be, could clearly help us I think focus our efforts
23 as we look at where it might be different, where it might
24 be higher, where it might be lower, and what the
25 determinants of why it might be higher or lower should be,

1 will help drive public health policy. So we looked to the
2 states for that specificity wherever possible.

3 PANEL MEMBER QUINTANA: And a quick follow-up
4 question. I saw that you added, for example, atrazine to
5 the latest report, which I would think would have a very
6 high amount of geographical differences. And so have you
7 looked at kind of a hypothesis generating differences in
8 your data that could be confirmed by state-level
9 monitoring? Geography hasn't been a main feature of these
10 reports till now.

11 DR. BREYSSE: I don't think we're necessarily
12 starting with a real hypothesis-generating goal for what
13 we do. But if I speak wrong, I'll look for some of my lab
14 colleagues here with me.

15 But our goal is to look at the data and
16 characterize the data. And then we turn to the public
17 health community to use that to generate hypotheses to ask
18 questions about what it means. As you know, there are,
19 you know, tens of thousands of publications that utilize
20 the data that we publish through the laboratory for
21 looking at, you know, analytical epidemiology or
22 exploratory epidemiology. And I think that's one of the
23 greatest services that these data provide. And a similar
24 service can be provided by local information like you can
25 provide in California.

1 CHAIRPERSON BRADMAN: Dr. Luderer.

2 PANEL MEMBER LUDERER: Thank you.

3 That was a really interesting presentation.

4 Kind of a related question. And also getting
5 back to one of the questions that Nerissa asked at the end
6 of her presentation about which panel of perfluorinated
7 substances should be measured. You know, that's the
8 original smaller panel vs. the larger one. And I think
9 given what you've been telling us with the national data,
10 with these new chemicals coming into the market and being
11 substituted for the older ones where we're happily seeing
12 declines in the biomonitoring data, would you agree that
13 that might be an argument for doing the larger panel if at
14 all financially feasible?

15 DR. BREYSSE: Well, I haven't seen the two things
16 lined up. But I think we are doing a larger panel than
17 just the straightforward PFCs used to be. So we're
18 looking towards doing more. And we're in conversations
19 with EPA, I'll say right now. As they are identifying new
20 compounds in different environmental media, we want to
21 know what they are. So wherever possible, biomonitoring
22 methods will keep up with what the environmental sampling
23 methods are. So that if they start seeing an increase in
24 something, we're in a position to say whether we're seeing
25 it in human tissues or not.

1 CHAIRPERSON BRADMAN: Dr. Cranor and then Dr.
2 Schwarzman. Then I have a question.

3 PANEL MEMBER CRANOR: This is probably going to
4 be a strange question, but I will ask.

5 You collect blood and urine. Do you store it,
6 and for how long?

7 DR. BREYSSE: We do store it, but I don't know
8 how long we store it for.

9 Lovisa Romanoff from the laboratory.

10 MS. ROMANOFF: So we store it until our analysis
11 has been completed, and then we actually return it to
12 NCHS.

13 PANEL MEMBER CRANOR: And then they store it?

14 DR. BREYSSE: To where?

15 MS. ROMANOFF: And then they store it. And I
16 don't know exactly how long they store it.

17 NCHS, the center who's responsible for NHANES.
18 So NHANES stores their samples.

19 PANEL MEMBER CRANOR: And it remains stored
20 there?

21 MS. ROMANOFF: Yes, yes.

22 PANEL MEMBER CRANOR: Okay.

23 MR. ROMANOFF: Yeah.

24 PANEL MEMBER CRANOR: So one concern that
25 somebody had -- I've had about biomonitoring is that -- it

1 serves very useful purposes but it's limited in terms of
2 the public health. With advances in cellular toxicology
3 and -- and I'm not even sure I'll use the right terms
4 here -- molecular information about what's going on in
5 human bodies, can you use -- is there any authority to use
6 the stored blood samples, for example? This person not
7 only is exposed but they had a reaction that is in the
8 direction of not good. That could be a way of extending
9 the public health impact, it seems to me, of
10 biomonitoring.

11 DR. BREYSSE: Yeah, I think that would have to be
12 done outside something like NHANES. I don't think we keep
13 that individual level data in such a format that we could
14 identify people who have some outcome in the future or
15 that we might want to go back and explore what they had
16 available in their blood.

17 But what we -- I think what we do make available
18 is if there's some biomarker of effect that you could look
19 at in a blood sample, that might be a reason to ask for
20 access to a limited number of samples for the future.

21 PANEL MEMBER CRANOR: Oh, right. I wasn't
22 necessarily thinking about individuals, although you may
23 want -- you may want to protect them of course.

24 DR. BREYSSE: Absolutely.

25 PANEL MEMBER CRANOR: But is this concentration

1 triggering at the cellular molecular level effects that
2 are not desirable?

3 DR. BREYSSE: That's entirely possible. And for
4 our state recommendations, we're recommending that they
5 might archive blood and serum -- and urine samples for
6 those purposes as well.

7 So for PFASs, you know, you might want to look at
8 early changes in -- if you have some new marker of -- I'll
9 pick one of the health effects -- of cholesterol
10 metabolism, you might want to be able to go back with
11 blood samples and look and see is there early indicators
12 of cholesterol metabolism that might be predictive of
13 disease in the future. So those are all --

14 PANEL MEMBER CRANOR: Exactly.

15 DR. BREYSSE: -- important hypotheses I think you
16 could do, if you archive samples. I'm not sure NHANES
17 samples would be useful for that -- utilized for that
18 purpose, in part because I don't really know the
19 parameters by which people could have access to the
20 samples in the -- at some point in the future.

21 CHAIRPERSON BRADMAN: Dr. Schwarzman.

22 PANEL MEMBER SCHWARZMAN: Thanks so much for the
23 presentation.

24 My question is a little bit related to what
25 Dr. Luderer asked with regard to emerging chemical

1 replacements. And, you know, you said something
2 specifically and presented some data about the sort of
3 shift in PFA -- PFASs. And I wonder how -- and you talked
4 a little bit about chemicals that are measured in the
5 environment and starting to look at those. But that's a
6 fairly late sign, I would say. And I wonder if NHANES is
7 looking a little bit more upstream at what's coming out in
8 replacements, for example, in phthalates, phthalate
9 plasticizers specifically, or -- anyway, other -- other --
10 OPFR flame retardants, other chemical uses; not so much
11 classes of compounds but applications, uses of chemicals,
12 their function, that is shifting from one compound to
13 another in the marketplace.

14 DR. BREYSSE: Let me -- let me -- before I
15 answer, let me just tell you what the parameters are that
16 restrict what can be done here.

17 So NHANES collects a fixed amount of blood that
18 can be -- that has to be used for very specific purposes,
19 some that come to the laboratory for chemical analysis as
20 well as maybe some other biochemical analysis the lab
21 might do.

22 It's very hard for our lab to say we need more
23 blood to do more samples. Now, that doesn't mean with the
24 same amount of blood we can't add new analytes. You could
25 always do that. But it's going to -- it's going to

1 require in some cases, you know, very creative chemists to
2 figure out how do we do more with the same amount of blood
3 going forward. So there's always that tradeoff.

4 So I do know that they're looking for -- they're
5 always considering adding new chemicals, as you just saw.
6 And the process to add new chemicals is not easy because
7 it has to go all the way up to HHS I think for approval.
8 And so -- I do know that they're petitioned all the time
9 to add new chemicals, and they consider that.

10 But the analytical challenge is often what drives
11 it to our lab. We'll first look and say, "Can we" -- "is
12 it feasible for us to do it with the amount of blood we
13 have," before they even kick it up the ladder and say is
14 it something that we want to get approved through the
15 National Center for Health Statistics, which is the group
16 that runs NHANES.

17 CHAIRPERSON BRADMAN: I had a couple of questions
18 then. One is just very specific.

19 Are there any plans to measure glyphosate in
20 urine?

21 And then I also want to get back to the question
22 we had about our own program that's been an issue for a
23 while is the age. I know NHANES focuses -- the youngest
24 age group is 6 to 11. And I know I'd like to encourage in
25 general more sampling of younger kids; and I'm wondering

1 if there's any plans to do that.

2 DR. BREYSSE: Well, glyphosate is under
3 consideration. It's one of the chemicals they're
4 considering. And I don't know what the status of that is.

5 Is there anything formally decided?

6 And I think they are evaluating looking at
7 younger children for some things. And so I pushed the
8 same thing myself.

9 We have no reference values for kids less than 6.
10 And in communities, you know, across the country we're
11 measuring, you know, PFAS, for example, in -- you know, in
12 small children. And we know nothing about how to -- what
13 to compare them to. So I think that's a big if.

14 So NHANES is looking at reaching out to lower
15 children. I just don't know -- younger children. I just
16 don't know what the status of that is right now.

17 Well, Lovisa, are you familiar with where they
18 are?

19 MS. ROMANOFF: (Shakes head.)

20 DR. BREYSSE: Okay. We can get that in you. But
21 I'll send that to an email, Lovisa.

22 CHAIRPERSON BRADMAN: Okay. That would be great.

23 And again going back to primary children, just a
24 little side note. IRB at Berkeley back in the day, 10, 15
25 years ago, they didn't let us return results to

1 individuals. And we worked with them and then they did
2 let us. And one of the key factors for them was that we
3 can make comparisons to representative data nationally,
4 and just to underscore how important that is to make
5 comparisons. And on the local basis it's really
6 definitely important.

7 Another comment too about looking at health
8 effects and things like that. And perhaps that's
9 something that can be done at the state level. Just to
10 give an example, I think of what Dr. Cranor was talking
11 about. We, for example, did an analysis of stored samples
12 and looked at -- we did metabolomic analysis of stored
13 urine samples, and then we looked at the relationship of
14 urinary metabolites related to lipid metabolism, for
15 example, in phthalate -- measurements of phthalates.

16 So -- and actually we see some associations
17 between some of those lipid-related metabolites and
18 exposure, and those are consistent actually with some
19 epidemiologic and animal data.

20 There was an example where this study was real
21 exploratory and I think these things -- these types of
22 projects need to be, you know, confirmed in a larger
23 population, et cetera. But I think there are, you know,
24 public-health-related outcomes that we can look at and
25 store examples that will inform both exposure and

1 potential impacts.

2 Any other questions in the panel?

3 PANEL MEMBER CRANOR: One more.

4 Just to add to that, it seems to me it's a very
5 efficient use of resources that one already has if you've
6 stored enough blood that can be pulled out for a further
7 purpose. And that's part of what was behind this, is that
8 you're doing it for one purpose, it has limits, it's
9 important, but it could be perhaps without great expense
10 used for other purposes since you already have it.

11 DR. BREYSSE: Yeah, having participated in one of
12 these from my previous life though, there's a huge effort
13 that goes into you have a little bit of something archived
14 and you're not quite sure what's going to be most
15 important in the future. And once you give it to somebody
16 for something, you're removing the opportunity for a host
17 of unknown things that might come down in the future. And
18 so these decisions that go through trying to decide if
19 this is a good use or not really are big kind of complex
20 decisions that have lots of discussions, because you
21 really have some people say, "Oh, my God, the answer of a
22 lifetime may require this blood 10 years from now. If we
23 give it away now, we don't have it."

24 (Laughter.)

25 DR. BREYSSE: You know, those are literally kind

1 of the unknowns you have to wrestle with. And I was on a
2 panel for a larger cohort study at Hopkins where we had a
3 lot of archived stuff and we went -- we agonized over
4 these decisions.

5 CHAIRPERSON BRADMAN: So we have just a couple of
6 minutes. Are there any questions from the audience? I
7 think we have a couple of minutes.

8 Are there any questions?

9 Gina.

10 CAL/EPA DEPUTY DIRECTOR SOLOMON: Gina Solomon,
11 Cal/EPA.

12 Just a wonderful presentation. Thank you.

13 Can you talk about any semi-targeted or
14 non-targeted testing that you're doing, if any, in your
15 laboratory.

16 DR. BREYSSE: What do you mean by that? I'm not
17 quite sure.

18 CAL/EPA DEPUTY DIRECTOR SOLOMON: Just whether
19 you're using -- whether you're doing any agnostic testing
20 of not targeting specific chemicals but looking -- okay.
21 I see head shaking.

22 DR. BREYSSE: No. I think we -- we have to --
23 since this is part of really the national survey, we have
24 to have a very specific reason for what we measure laid
25 out and approved in advance.

1 CHAIRPERSON BRADMAN: I think this question has
2 to be very brief. And if we don't have time to address
3 it, we'll have much more time in the afternoon.

4 So go ahead.

5 DR. GUYER: Hi. I'm Marion Guyer. I'm an
6 internist with Alameda Health System and I used to work
7 with Kaiser. I'm wondering if there are any sort of
8 private/public partnerships of linking up with health
9 organizations to get your samples.

10 DR. BREYSSE: Not that I know of. We -- the
11 lab -- in addition to the NHANES sampling we do, the
12 laboratory does a lot -- collaborates on a large number of
13 studies across the country that are hypothesis-driven
14 research projects that have NIH funding. And so I imagine
15 some of those probably have some private
16 partnership/government relationship with them.

17 But we do -- the laboratory does a lot more than
18 just the NHANES stuff. So they assist -- they assist
19 states that don't have the laboratory capacity you have in
20 California, and recognize that most states don't. And so
21 where there's a need at the state level, you know, we can
22 help fill that.

23 And we also, like I said, collaborate on, you
24 know, dozens if not many dozens of health studies that
25 have very specific biomonitoring needs associated with

1 them; range from everything, you know, PAHs, the whole
2 host of persistent organic pollutants, and you name it.
3 So some of those probably have the relationship that you
4 talked about.

5 CHAIRPERSON BRADMAN: I'm going to interrupt
6 there and say at this point we have to -- and thank you so
7 much, Dr. Breysse. And we're actually exactly on time. I
8 want to note that that clock up there is a minute fast.

9 (Laughter.)

10 CHAIRPERSON BRADMAN: So we're doing well.

11 But now I want to introduce our guest
12 discussants. We're going to be having brief remarks from
13 our three guest discussants on the question that we raised
14 earlier:

15 "Given limited resources, what should be the main
16 priorities of Biomonitoring California going forward?"

17 After they've all finished their remarks, we will have
18 about 15 minutes for clarifying questions.

19 So I'm really pleased to first -- to introduce
20 our first guest, Dr. Hertz-Piccioto. She is the Director
21 of the Environmental Health Sciences Center at UC Davis
22 and an expert on the effects of environmental exposures on
23 pregnancy, the newborn and child development. She
24 collaborated with Biomonitoring California to measure
25 urinary phthalates in a small subset of pregnant women who

1 previously had a child diagnosed with autism spectrum
2 disorder as part of her longitudinal study on markers of
3 autism risk infants. She has served on many expert
4 panels, including OEHHA's Carcinogen Identification
5 Committee for Proposition 65.

6 And I should say we had the privilege of actually
7 testifying last week before the Senate -- California
8 Senate Committee on Environmental Quality.

9 So welcome.

10 DR. HERTZ-PICCIOTTO: Thanks, Asa.

11 (Thereupon an overhead presentation was
12 presented as follows.)

13 DR. HERTZ-PICCIOTTO: So these are some
14 reflections. I actually have had no real contact with the
15 program since that very beginning where the first call
16 went out for, you know, possible sampling.

17 And so these are -- so I spent a little bit of
18 time looking at your website and thinking about what's up
19 there. So here are just some reflections, and so -- as an
20 outsider.

21 --o0o--

22 DR. HERTZ-PICCIOTTO: First thing I wanted to do
23 is praise all those people who labored year after year
24 after year to get this program in place. And, you know,
25 now it's been in place for a while but people may forget,

1 but it was many years of trying to first get it through
2 the legislature and then finally get it -- and then get it
3 through the Governor's office. So thanks to, if any of
4 those people are in this room.

5 And then encouragement. This is real -- it's
6 really come quite a ways in the last 10 years that -- in
7 terms of what you'e doing and how -- and just growing the
8 program.

9 I'm going to raise a couple questions about how
10 priorities -- how decisions are made and make some
11 suggestions about things -- ways to approach those issues
12 of next steps and some perspectives and maybe a few words
13 of caution.

14 --o0o--

15 DR. HERTZ-PICCIOTTO: So 2006 -- I always love
16 the language of these -- when you actually look at the
17 statutes. The people of the State of California do, you
18 know, these things. And truly, you know, that is supposed
19 to be the spirit and should be and in this case definitely
20 is.

21 So SB 1379 mandated the Biomonitoring Program.

22 In terms of who? The mandate actually says it
23 should be, you know, representative of the population.
24 And obviously, you folks have been struggling with the
25 fact that it's kind of an unfunded aspect of the mandate

1 that really is very expensive to try to do representative
2 sampling, and have tried to sort of come up with
3 compromises. And I think that's kind of an ongoing
4 question.

5 In terms of this is maybe one of my words of
6 caution, I -- listening to the presentation this morning,
7 I question the validity of using traditional approaches
8 for sampling the population when we know those are
9 absolutely incapable of getting us anything
10 representative, and thinking maybe a little more broadly
11 about new ways to achieve representative samples.

12 And this is something I know you folks have been
13 grappling with. It's -- I'm not really bringing anything
14 new here. But, you know, I have some questions about that
15 design we heard this morning.

16 In terms of what to measure, that was actually
17 laid out quite clearly in the statute, that it -- in terms
18 of certain general criteria, in terms of toxicity,
19 potential for toxicity, the degree of exposure in the
20 human California population, and the laboratory limits in
21 terms of limits of detection. But the -- and, you know,
22 you have -- looking at what you're doing, you've got this
23 amazing array of analytes that you're now able to measure,
24 and it appears that you've got lots of experts working to
25 use, you know, the state-of-the-art methodologies in those

1 chemical analyses.

2 But the question of why and prioritization is the
3 one I want to just spend a few minutes focusing on.

4 --o0o--

5 DR. HERTZ-PICCIOTTO: So this is the language in
6 the statute. And you'll notice that there are about eight
7 sort of goals that are set here, from establishing
8 trends -- time trends, validating modeling and survey
9 methods, supporting epi studies, identifying highly
10 exposed communities. And maybe this next one: Addressing
11 data gaps is kind of related to supporting epidemiologic
12 studies, in forming health risk responses to unanticipated
13 emergency situations, assessing the effectiveness of
14 current regulations, and helping to set priorities for
15 reform.

16 So my question is, to what extent do these goals
17 enter into the decision-making as you evaluate proposals
18 for projects? And do you want to put some focus on areas
19 that you maybe have not been actually addressing and
20 thinking through how to -- how to solicit projects or put
21 in place projects that would be doing things that maybe
22 you're not yet doing from this list.

23 Now, I know you've definitely identified some
24 highly exposed kinds of populations. The firefighters was
25 one. So that's an area where there's some work that's

1 been done. But I'm not sure about the, you know,
2 effectiveness of current regulations.

3 --o0o--

4 DR. HERTZ-PICCIOTTO: So a couple of thoughts I
5 have here. I do want to say, in terms of establishing
6 trends in chemical exposures, it's a good thing to do.
7 But I think it's really a problematic approach for
8 identifying health outcome associations, and that one has
9 to be really, really cautious. And, you know, I've been
10 studying autism very intensively for the last 15 years.
11 There's been a very strong time trend that we've shown as
12 not entirely due to a real increase, but yet a big part of
13 it probably is a real increase.

14 And all kinds of crazy studies get published
15 about these other time trends that have been running in
16 parallel. Those are all problematic studies. And then
17 there is the dilemma, which I think is actually not so
18 hard to reconcile, but why is it that we see things that
19 should result in a decrease? For instance, increased use
20 of folic acid. We see folic acid as a preventative. We
21 found it to be preventative. And maybe there actually
22 hasn't been as much of an increase in use as we thought.

23 But the parallel between an exposure and the
24 outcome is not going to -- there's so many exposures that
25 are changing over time, that that's just a -- that's not a

1 good use of the trend part. Not to say that you don't
2 want to know what the trends are of the exposures, but
3 just caution about how to interpret that.

4 One thing that could address this sort of problem
5 though is this use of non-targeted screens when you really
6 don't know, you know, kind of what could explain some
7 kinds of trends. And as hypothesis generating, I think
8 non-targeted chemical analysis is really a good way to go.

9 --o0o--

10 DR. HERTZ-PICCIOTTO: Validating models, there
11 are all kinds of issues related to testing assumptions.
12 One example I'm going to suggest here is we need to have a
13 good validation of PUR, the pesticide use reports, which
14 has already been done against air sampling, and it's shown
15 to be very, very valid from a report out of DPR. But then
16 taking that the next step to the biomarkers of pesticide
17 exposures and figuring out whether the biomarkers
18 actually -- maybe they're not the gold standard for the
19 variety of reasons that have to do with, you know, the
20 variability of exposure over time. But that would be good
21 to really figure that issue out.

22 --o0o--

23 DR. HERTZ-PICCIOTTO: From -- I want to make just
24 one suggestion on -- because my time's running out and I
25 don't want to run over -- fracked communities as a

1 possible highly exposed community. There -- 20 percent of
2 oil in California comes from fracking. And there's a big
3 cluster of that going on in Kern County.

4 Forest fires as a possible emergency exposure to
5 be considering. As far as effectiveness of current
6 regulations, this regulation that Asa -- Dr. Asa Bradman
7 and I were testifying about last week, that might be a
8 place as that regulation, if it goes forward, doing some
9 monitoring to see what the impacts of that might be.

10 And then helping set priorities for reform is
11 a -- you know, that might be a thing.

12 So my thought is look at your goals and see about
13 how you might use those goals to guide the work going
14 forward.

15 --o0o--

16 DR. HERTZ-PICCIOTTO: Just a final word about the
17 UC Davis Environmental Health Sciences Center. We are
18 targeting the San Joaquin Valley for a variety of reasons
19 on this slide.

20 --o0o--

21 DR. HERTZ-PICCIOTTO: And this is -- we're
22 bringing together scientists from the exposure sciences,
23 disease mechanisms, communities and policy and epi, and we
24 have a lot of different kinds of outcomes we're looking
25 at. We have a lot of cores. And we actually spend a lot

1 of time with our community stakeholders. And in fact, Dr.
2 Zeise has recently joined our stakeholder community. But
3 with that, we've actually -- and we're doing a lot of
4 development of new faculty and community-based
5 participatory research.

6 --o0o--

7 DR. HERTZ-PICCIOTTO: And at this point, you
8 know, I think the idea of partnering with the
9 Biomonitoring Program, because these community groups are
10 coming to us for scientific consultations on their
11 environmental health problems, and I think that maybe
12 biomonitoring in some cases, other activities of CalEPA
13 and OEHHA and DPR -- DPH are possible.

14 So I'm going to close with that.

15 (Applause.)

16 CHAIRPERSON BRADMAN: Thank you so much.

17 Now I want to introduce Dr. Tom Webster, who is a
18 Professor of Environmental Health at the Boston University
19 School of Public Health. His wide-ranging research
20 interests include the study of exposure and health
21 concerns associated with chemicals in consumer products,
22 health effects of exposure to mixtures, spatial
23 epidemiology, and the community context for environmental
24 health. He was one of the first U.S. investigators to
25 study flame retardants in the early 2000s, and has trained

1 a number of biomonitoring scientists, working in
2 universities, and state programs across this country.

3 So welcome.

4 (Thereupon an overhead presentation was
5 presented as follows.)

6 DR. WEBSTER: Including Nerissa, who was one of
7 my students back in the day.

8 (Laughter.)

9 DR. WEBSTER: So thank you very much for asking
10 me to be here. I actually grew up in San Diego. So I'm
11 always happy to come to California, particularly in the
12 winter.

13 So, you know, I just -- a few things. You all
14 know this. I mean, I think that what you're doing here in
15 California and what NHANES does is a fundamental public
16 health practice of doing exposure surveillance, and
17 there's lots of good reasons. One of the reasons for
18 state efforts is the geography that we talked about that
19 NHANES isn't really designed to do. And of course I'm
20 very interested in time trends. You all know the story
21 about PBDEs, that this came out of the Swedish
22 surveillance system. And I think of it as the graph that
23 launched a thousand ships and burnt the topless towers of
24 Ilium.

25 (Laughter.)

1 DR. WEBSTER: So among the issues for
2 biomonitoring are who to sample, which we heard about.
3 And I'm going to talk more about what to look for. And my
4 job as an academic is to try to peer five to ten years
5 into the future.

6 --o0o--

7 DR. WEBSTER: So I think of what we face as the
8 Hydra problem; that we cut off one head and ten more grow
9 back. And at least under the current regulatory regime, I
10 don't see any end to that in the near future.

11 So in a rational world we would do things
12 differently, but we don't.

13 So what do we do?

14 --o0o--

15 DR. WEBSTER: Now the two groups of compounds I
16 actually know something about are the flame retardants and
17 the PFASs.

18 So flame retardants, you know, we started off
19 really with PBDEs, although there were things before that.
20 And there's been an explosion of brominated flame
21 retardants. Basically these are variations on a theme.
22 And one of the horrible things about this is now people
23 are now finding photolytic breakdown products that they
24 have dioxin-like properties. So would that scare the heck
25 out of you?

1 And then there's the phosphorus-based flame
2 retardants, which again these are sort of exploding and
3 people kind of add more things on up -- a lot of them we
4 don't even know what they are. Some of them don't even
5 have CAS numbers. So...

6 --o0o--

7 DR. WEBSTER: Similarly on PFASs, there was a
8 really lovely paper that just came out called "PFASs - a
9 Never-Ending Story." And we're just really scratching the
10 surface of those as well.

11 --o0o--

12 DR. WEBSTER: Now, one of the interesting things
13 about those compounds is some of them are water soluble;
14 they bind protein, which is odd; and there's the
15 precursors. So a lot of things that we measure in people
16 are breakdown products of a lot of other stuff.

17 --o0o--

18 DR. WEBSTER: I like this paper that came out of
19 this group. And I think that's a good idea.

20 (Laughter.)

21 --o0o--

22 DR. WEBSTER: Now I want to turn to really where
23 I think our field is going at least from the academic
24 point of view. I mean, I think non-targeted analysis is
25 happening. And I really like the idea of screening for

1 stuff in things like dust. I think this is a great place
2 to look.

3 The other things that we've been looking at are
4 screening things in products such as foam. And we're now
5 working on screening stuff in silicone wrist bands. And
6 we found all kinds of interesting things.

7 There was a really interesting new paper that
8 just came out on azo dyes, that if this is true that this
9 is the major brominated compound found in house dust,
10 that's going to be incredible. I don't know if it's true.
11 But it's certainly worth thinking about.

12 And then a related really interesting idea is to
13 look at total organic fluorine and total organic bromine.
14 This won't work for phosphates, but for fluorine and
15 bromine. And there's been some very nice work.

16 Leo Yeung, who's working with Scott Mabury now,
17 did some great stuff on this. And he wrote this nice
18 paper where you take the total amount of organic fluorine
19 in blood and then see how much of it you can identify and
20 do a mass balance. You get an idea of what else is out
21 there. So I like that idea a lot.

22 --o0o--

23 DR. WEBSTER: There's some really nice stuff
24 going on using bioassays. We've been -- you may be
25 familiar with the CALUX method for AhR agonists. We've

1 been looking a lot at PPAR-gamma agonists, and we've
2 developed this assay both in rodents and we're using it to
3 measure human serum now so you can get an idea of the
4 total biological content of stuff.

5 And then the next step is to use something called
6 effect-directed analysis, where you have a cycle of
7 bioassays and fractionation. So you take the whole
8 sample, you analyze it for the total activity, you
9 chemically fractionate it, and then you reanalyze the
10 fractions. And you keep doing this till you get to the
11 point where you can do targeted and non-targeted analysis
12 to try to figure out what's actually driving activity.

13 We've been doing this with dust and looking at
14 PPAR-gamma agonists and found some really interesting
15 stuff.

16 I'd like to be able to do this with blood. I
17 don't think we're there yet, but we may be there at some
18 point.

19 So, anyway, I think these kind of activities are
20 going to be very helpful in the future and -- you know,
21 I'm not saying California Biomonitoring should do any of
22 this. I think this is the kind of stuff that us academics
23 are going to have to work out. And then as the technology
24 develops when we come up with new things that this
25 chemical looks like it may be picking up in dust, that

1 then the biomonitoring people can start looking for it in
2 blood. I think there's a good history of that. That's
3 the way it has -- say it happened with the organophosphate
4 flame retardants where we first found them in dust. Then
5 people developed methods to look in urine. And now CDC I
6 think is adding those into theirs. So there's a nice
7 track record of that.

8 --o0o--

9 DR. WEBSTER: In terms of mixtures, I think this
10 is another really important thing. And I really like this
11 paper from 2002 called "Something from 'Nothing.'" And
12 what they did in this in vitro experiment was to show that
13 compounds, each below their no-effect level for estrogenic
14 activity, when you mix them together, you got a whopping
15 big response.

16 And this is particularly important for endocrine
17 disruptors involving homodimer receptors, things like
18 estrogen and androgen and similar mechanisms. And I think
19 there's lots of really interesting things that could come
20 out of this as another way of thinking where we're going
21 to go.

22 --o0o--

23 DR. WEBSTER: Finally, as we start -- I think
24 we're -- in five to ten years we're going to be drowning
25 in data on exposure. I hope so anyway.

1 (Laughter.)

2 DR. WEBSTER: And one of the things we can think
3 of is not just individual compounds but patterns of
4 compounds and correlations between compounds. So we had a
5 symposium on this at ISES last year. And what we're
6 starting to see in comparing data from cohorts around the
7 world are things that look like this. These are heat maps
8 of correlation. The darker is stronger positive
9 correlations. And they come in these kind of block
10 diagonal patterns. That means you have groups of
11 compounds that are very highly correlated with each other,
12 and then they're not so correlated with other things. So
13 there's lots to think about there about why that might be.

14 But I think this has real implications actually
15 for biomonitoring as well. So, for example, in the PCB
16 world people have long used sort of the marker PCB
17 approach. You don't have to measure all the PCBs because
18 they're all really correlated within groups. You can
19 measure a couple of them so you get a lot bigger bang for
20 the buck. And you don't have to, you know, go down to the
21 decimal point on some with the minor ones.

22 So I'll stop there.

23 (Applause.)

24 CHAIRPERSON BRADMAN: Thank you, Tom.

25 Now I'd like to introduce Julia Brody. Dr. Brody

1 is the Executive Director and Senior Scientist at Silent
2 Spring Institute and an expert in breast cancer and
3 environmental exposures.

4 She recently led a collaborative project
5 connecting breast cancer advocacy and environmental
6 justice in a study of household exposures to endocrine
7 disruptors and air pollutants. She's dedicated to finding
8 accessible ways to report results of biomonitoring studies
9 to participants, and the Program is hoping to collaborate
10 with Dr. Brody in this area.

11 So thank you. We're very pleased to have you
12 here.

13 (Thereupon an overhead presentation was
14 presented as follows.)

15 DR. BRODY: I'm delighted to be here. And I know
16 that -- this was mentioned early. I know that some of the
17 individuals and organizations that created this program
18 are in the room. And I want to just express my enormous
19 gratitude and admiration for the work you did to create
20 this program. It's -- it was wonderful to reflect on 10
21 years and think about how strong and important this
22 program has been.

23 And in that -- in thinking about what's happened
24 in this last 10 years, I think that the science has
25 evolved in ways that tell us even more that exposure

1 biomonitoring is a crucial tool for public health.
2 This -- and we know that from NHANES. But I think that
3 the ways in which we've learned more about chronic
4 disease, the multifactorial nature of disease, the
5 interplay between exposures from all realms of life, and
6 the effect of early exposures on later disease lead us to
7 a new paradigm for public health in which exposure data
8 becomes even more important as a guide for action.

9 There have been a couple of major statements on
10 this, beginning with the President's Cancer Panel Report;
11 the Institute of Medicine "Breast Cancer and Environment"
12 report, which Irva led, also addresses this issue that
13 epidemiology is always going to lag and be limited; and
14 that when we have toxicologic information about chemicals
15 and exposure information, we have a basis for action.

16 So that led me to think about, okay, what should
17 you do to make your data most useful for -- as a public
18 health resource?

19 And I have several ideas about that. But one of
20 them starts with another piece of the law, which requires
21 that results be made to individuals.

22 And this is a passion of my own, so you have to
23 forgive me for talking about that. But I think that to
24 make this data important for public health also means
25 communicating about it with regular people, including your

1 study participants and also citizens statewide, so that
2 people begin to understand that this is actionable
3 information and what it means.

4 I got into the business of reporting results
5 because participants in the Cape Cod Breast Cancer and
6 Environment study, which is a deeply community-embedded
7 study founded by activists who founded Silent Spring
8 Institute, called us up and asked for their results. And
9 so we got into reporting results really for ethical
10 reasons, because it seemed like the right thing to do.

11 But as a result of that, I -- we were -- this was new
12 territory for us, as for other health scientists. So we
13 began studying it. We wanted to be sure we were doing
14 this in a responsible way, that people did understand
15 their results and were not overly alarmed or
16 inappropriately alarmed about them.

17 Yeah, like I try to remember that the field of
18 public health is all about generating worry, right? We --
19 that's -- so it's part of our job?

20 (Laughter.)

21 DR. BRODY: But only the right worry.

22 (Laughter.)

23 DR. BRODY: So we have now in collaboration with
24 Rachel Morello-Frosch here in California and Phil Brown at
25 Northeastern, we have interviewed over 200 people who got

1 their personal results in about 10 studies. And we found
2 that people do want their results, they do understand
3 them, they do understand uncertainty, they -- they go
4 through really major conceptual shifts in thinking about
5 pollution. So people often come into studies thinking
6 pollution comes from industry or waste dumps, which is not
7 untrue, but they get their own results. They start
8 reflecting on other sources in consumer products. And for
9 many people it's the first time that they became aware
10 that we don't require safety testing for chemicals before
11 they're put into products.

12 So I've come to think that this is not just the
13 right thing to do, but it's also an important public
14 health program. So that you should think about
15 communications not as ancillary, but this should become a
16 central part of the work.

17 I was excited to hear you're planning to move to
18 digital methods. We just developed a digital exposure
19 report back interface, DERBI, which you can read about in
20 the Environmental Health Perspectives. And we've deployed
21 it now in the Centers for Disease Control Green Housing
22 Study and in the Child Health and Development Studies as
23 part of the California Breast Cancer Research Program.

24 So we're excited to have other teams try to use
25 these digital methods. They -- they're not just --

1 they're economically efficient for sure. But they also I
2 believe can create better reports because they allow
3 layering of information, that you can have many languages,
4 you can have -- people can navigate to what they're
5 interested in. So you can be responsive to the person who
6 just wants their headlines and the person who wants to dig
7 in.

8 We're developing a smartphone platform for the
9 Superfund project PROTECT in Puerto Rico; and for the
10 BCERP project in Santiago, Chile. So this will be -- this
11 will provide digital access at all income levels. I just
12 looked at the Pew Research Center, and the only people who
13 are not -- who won't have access are people over -- very
14 low income people over 65. So -- and not that we
15 shouldn't -- not that we should ignore them, but we will
16 be able to reach other demographics with this smartphone
17 platform.

18 One of the things that people want to know is how
19 to reduce their exposures. And I think this is a
20 challenge for all of us. We do provide that information
21 in people's reports and sometimes it's easy.

22 Like triclosan is not -- you can get rid of
23 triclosan in your life pretty -- well, we think you can
24 get rid of it pretty well. And with -- if we keep the
25 triclosan rule, you'll really be able to get rid of it.

1 But that just shows you there are some exposures you can
2 get rid of yourself and then there's some that you cannot
3 control yourself. And I think we need to think about how
4 to incorporate it into biomonitoring projects' approaches
5 to help people engage in exposure reductions, if they want
6 to, for these other chemicals that are harder to reduce.

7 There is actually a happy story in California
8 that's in line with this about flame retardants. Ruthann
9 Rudel was the first person to measure brominated flame
10 retardants in the U.S. We found them at 10 times the
11 level in Eur -- on Cape Cod we found them 10 times the
12 level in dust as they had been in Europe. We wondered if
13 that was unusual. We came to California, to Richmond and
14 Bolinas, where we found even higher levels.

15 We went to NHANES. We got access to the
16 biomonitoring data, and were able to compare California
17 blood to the rest of the country and saw that blood levels
18 were twice as high in Californians.

19 And some of you in the room also took that story
20 from there to change the California flammability standard.
21 Other researchers, including Tom and others, came in and
22 confirmed our results, extended them into epidemiologic
23 studies that showed effects -- neurological effects. But
24 it was that NHANES biomonitoring data was a vital piece
25 that made it possible to translate into a public health

1 change.

2 And I'm sorry I'm out of time. And I look
3 forward to having further opportunities this afternoon to
4 talk about your important next steps.

5 (Applause.)

6 CHAIRPERSON BRADMAN: Thank you so much.

7 All three of those presentations were really good
8 and I hope will inflame some discussion right now.

9 And just a reminder that we'll also have time for
10 more in-depth discussion this afternoon. So if we don't
11 get into everything that you you'd like to, please hold
12 your questions and thoughts for then.

13 But right now we have some time.

14 From the panel, any questions?

15 Dr. McKone.

16 PANEL MEMBER MCKONE: Thank you.

17 All wonderful presentations. It was like -- it's
18 nice to get outside views. So thank you all for coming
19 here, some a great distance.

20 So one of the things I wanted to bring -- Dr.
21 Webster brought up an interesting point that caught my
22 attention about total bromine, total fluorine, and I just
23 wanted to explore that a bit further. I have two
24 questions.

25 One is, if you just looked at total bromine or

1 fluorine in blood, are there any sources other than
2 endogenous chemicals? It's not in -- there's no really --

3 DR. WEBSTER: At least for fluorine and bromine
4 there are naturally occurring compounds that contain them,
5 but not very many.

6 PANEL MEMBER MCKONE: So it's a pretty strong
7 indicator?

8 DR. WEBSTER: Pretty strong indicator.

9 PANEL MEMBER MCKONE: Right. And then my second
10 question --

11 DR. WEBSTER: Not true of phosphorous obviously.

12 PANEL MEMBER MCKONE: Right. No, that's a
13 different story.

14 But the second question is, is this sort of an
15 easy screen to do? In other words, like we really take an
16 interest in specific compounds. But it might be, you
17 know, cheaper and easier to do a lot of people and just do
18 total fluorine, total bromine. It doesn't tell you a lot,
19 but it lets you begin to bend people and look at trends.
20 And I'm just wondering if that -- I don't know what the
21 cost and --

22 DR. WEBSTER: Yeah. Well, I'm not an analytical
23 chemist and I'm -- so I can't say. You can't do total
24 fluorine and bromine. You have to do extractable organic,
25 because you have the ions there, right? So you have to

1 set those aside, and then the chemists do their magic. So
2 I -- you know. I mean, but there have been a handful of
3 groups that have tried this. And I think it's actually a
4 quite promising approach for those two groups of
5 compounds.

6 PANEL MEMBER MCKONE: And just to follow up. It
7 reminds me of the method of -- I guess it was
8 fluorescence, where you could take a couch and just do
9 total bromine with a really quick fluorescence, right?

10 DR. WEBSTER: Right. That's right.

11 PANEL MEMBER MCKONE: And I mean, if we could do
12 something like that with blood - I don't know if it's
13 possible - but, just again, it's the -- anything we could
14 do that is a broad screen, not specific. But, again, you
15 know, it's helpful because otherwise we can only do
16 in-depth studies and very, very few people. So you kind
17 of like to have -- I like this idea of having a broad
18 screen. Doesn't give you a lot of information, but it
19 gives you a -- it gives you an abundance of information.
20 And then you can decide where to dig in anyway.

21 DR. WEBSTER: It is possible to do it in blood,
22 individual blood samples.

23 CHAIRPERSON BRADMAN: Any other comments,
24 questions from the Panel?

25 Dr. Schwarzman.

1 PANEL MEMBER SCHWARZMAN: Thanks so much. Such
2 interesting presentations. I really appreciate it.

3 I had two thoughts. One question for Tom, if you
4 don't mind, is, can you say anything else other than
5 your -- your slides that showed the correlation among
6 exposures to different compounds in like classes I think
7 is very intriguing for this idea of identifying marker
8 compounds and reducing our need to test for multiple
9 congeners and all of that.

10 Aside from PCBs and PBDEs, could you identify for
11 us other classes of compounds that you think might be good
12 candidates for that kind of identifying a marker
13 compound -- or marker congener?

14 DR. WEBSTER: So one of the exposure science
15 issues about the graphs I showed you is why do they look
16 like that? So, for example -- so just real quick, I mean
17 it could be some of it is an artifact, right?

18 And so I think we would need to do those studies
19 first in order to be sure that we're getting what we think
20 we're getting. But I think with PCBs and PBDEs we're on
21 pretty solid ground.

22 PANEL MEMBER SCHWARZMAN: But at this point you
23 don't think we necessarily have those correlations
24 established for other classes -- compounds.

25 DR. WEBSTER: You know, I guess I don't want to

1 go out on a limb about other ones because I just don't
2 know as much about them. I mean, I think the PFASs is --
3 I don't think we're there yet on those. That's much more
4 complicated business.

5 PANEL MEMBER SCHWARZMAN: Okay. Thank you. I'm
6 just thinking of -- looking toward our afternoon
7 conversation about being judicious with our resources, how
8 we can apply that.

9 And the other thing I guess I just wanted to
10 reflect on from Dr. Brody's presentation is this -- the
11 sort of power of looking at outcomes from interventions,
12 and whether they're policy interventions or changes in the
13 marketplace, and think about what other compounds are
14 shifting or what other policy changes are happening that
15 we can look at trends, you know, taking
16 Dr. Hertz-Picciotto's caution into mind about using data
17 to evaluate -- to relate trends in exposures with trends
18 in health outcomes, you know, if that is less our goal,
19 which I think is quite wise. And if our goal is more
20 looking -- comparing exposures to exposures rather than
21 exposures to outcomes, that -- one of my thoughts for the
22 afternoon discussion just to kind of put that forward is
23 this notion of measuring the effect of interventions.

24 And I just wanted to kind of reflect back on that
25 and see if Dr. Brody has anything else you want to add

1 about what other interventions, policy or otherwise, we
2 might want to look at with respect to changes in exposure
3 levels over time.

4 DR. BRODY: Oh, I think that's a great direction
5 to go. And we have already seen changes in flame
6 retardants in California. We went back to the homes where
7 we originally found the very high levels, and we could see
8 the effect of companies removing PBDEs, and we could see
9 Fire Master 550 rising.

10 And we are now in Massachusetts testing. We
11 eventually came around to revising our own Boston
12 flammability standard to match the new California one.
13 And that affects all the college dorms.

14 And so we are now going to look before and after
15 the revision to the new standard. So I think -- but those
16 are environmental samples. And I mean, you do see -- in
17 the CDC data you see the big trends after the ban of
18 smoking in public places. And I think that kind of data
19 is just so valuable from the point of view of sustaining
20 those interventions. So I think that's a great direction
21 to go.

22 And -- but I also think the much high -- if
23 you're using biomonitoring, going back to the same person
24 multiple times gives you so much better statistical power.
25 That's something to think about.

1 CHAIRPERSON BRADMAN: Dr. Cranor.

2 PANEL MEMBER CRANOR: This is a question about,
3 in a sense, the conservative nature of science. My friend
4 Philippe Grandjean often lists the number of papers that
5 have been published in the last X years -- 10 years, and
6 they're clustered around a very small number of substances
7 that people are worried about. There might be a ton of
8 papers on lead still. We know a lot about lead. For
9 biomonitoring, I think it's perforce conservative because
10 you're looking at exposures you think are there and things
11 you're worried about.

12 Is there a way -- and then -- so I'm putting you
13 as a panel on the -- to help us think about this - and to
14 some extent California does it - but to think about the
15 ways in which biomonitoring can anticipate shifts -- and
16 that's been some of the discussion here already today --
17 but shifts and new things that we should be thinking
18 about, are there ways that that can be done with
19 biomonitoring to pick them up before they become adverse
20 health effects?

21 DR. BRODY: That's a great goal. And I think
22 some of the non-targeted analysis is a strategy for doing
23 that, because you have the potential to find something
24 that you weren't looking for.

25 I was thinking further about this, how to make

1 the biggest public health impact from biomonitoring. And
2 I do think that taking on non-targeted analysis and
3 mixtures and the early biological effects are an important
4 part of that. And that is all new.

5 DR. HERTZ-PICCIOTTO: So I noticed in looking
6 through some of the, you know, last 10 years that there's
7 been a lot of sort of piggybacking onto existing studies
8 where individual level data was really important for the
9 researchers and such. But from the perspective of -- you
10 know, what Julia just mentioned -- in terms of public
11 health and understanding trends over time and picking
12 things up, there's -- for a lot of compounds it might
13 be -- and using a non-targeted screen where you really are
14 giving 10 -- a thousand, 10 thousand analytes, and the
15 possibility of using pooled samples as a way to really
16 capture a broader swath of population, because you save
17 money by, you know, pooling the samples. You lose
18 information. You're not going to have the
19 individual-level data to give back. And where there's
20 huge, huge variability, you know, it's going to wash out.

21 But some sort of -- you can come up with a
22 sampling scheme that's going to involve, you know, some
23 individual and some pooled samples or pools of different
24 sizes and get a sense of what that kind of variability
25 would be.

1 And maybe, you know, increase the power of the
2 program for surveillance purposes, you know. And it's one
3 thought that I have about that.

4 DR. BRODY: I think that idea of combining both
5 pooled and individual is interesting. I would be very sad
6 to see the individual samples go because of the
7 variability issue that you mentioned. I was interested
8 that it came up, the possibility of following up on high
9 exposures. And I think that's a very good strategy for
10 finding important sources of health, important exposures.
11 And I actually had there been more time would have asked
12 if NHANES might consider doing that. I know NHANES now
13 reports back on lead and mercury, but I wondered about
14 reporting back on some of the very high exposures that get
15 detected so that you would have the opportunity to
16 interact with those people and find out what's different
17 about them.

18 DR. WEBSTER: I'll just add on that. I think the
19 answer on the pooling is it depends what the question is.
20 But Enrique Schisterman, who's a statistician, sent some
21 really nice stuff on sort of optimal mixtures of pooled
22 and individual to try to answer certain questions. So I
23 think that there's something there.

24 Back to your question. I mean, that was really
25 part of what I was trying to address in the second part of

1 my talk, is trying to think where are we going. And given
2 the resources you have, I'm not saying you should do
3 any -- necessarily do any of those, but be nimble enough
4 that when us in the academic community find things or
5 develop new methods, that you might be able to add
6 something in. The way we did with the fluorine -- the
7 phosphorus-based flame retardants that now once academics
8 sort of established those methods' importance, then they
9 can become routinized within the surveillance program.

10 MS. HOOVER: This is really a great spot to break
11 for lunch.

12 So --

13 (Laughter.)

14 MS. HOOVER: -- I want to remind people that this
15 was the clarifying question piece. And all of our guest
16 discussants and Dr. Breyse will be back for the
17 afternoon.

18 So, Asa, close up.

19 CHAIRPERSON BRADMAN: Thank you.

20 (Laughter.)

21 CHAIRPERSON BRADMAN: I was going to give one
22 more question.

23 (Laughter.)

24 CHAIRPERSON BRADMAN: But we're exactly on time
25 right now. We have another minute. So I just want to

1 remind everyone we have an hour and 10 minutes for lunch.
2 So we want everyone back by 1:25. If you want to set your
3 phones right now so it will ring at 1:23 so you'll walk
4 over - even 1:20. That would be good.

5 There's a cafeteria on the first floor, which
6 will be a quick dining option. And there's a couple
7 things out in the park. But again, we want to make sure
8 we reconvene on time.

9 Normally I think we have a Bagley-Keene
10 statement. But we're not making any decisions today, so
11 there's nothing formal like that. So I think this is an
12 opportunity actually, during lunch, we can talk about the
13 key question we're addressing today, and would encourage
14 that.

15 (Laughter.)

16 MS. HOOVER: Not the opposite.

17 CHAIRPERSON BRADMAN: What?

18 So anyway, I look forward to the discussion we
19 have this afternoon.

20 Thank you.

21 (Off record: 12:15 p.m)

22 (Thereupon a lunch break was taken.)

23

24

25

1 A F T E R N O O N S E S S I O N

2 (On record: 1:25 p.m.)

3 MS. HOOVER: Okay. We're going to get started.
4 If everybody could take your seats so we can kick things
5 off for the afternoon.

6 CHAIRPERSON BRADMAN: We're going to get started.
7 So I think we have a couple people straggling in.

8 MS. HOOVER: We're going to just go for it.

9 CHAIRPERSON BRADMAN: Well, it's -- I'll use this
10 time right now to introduce Dr. Solomon. And hopefully,
11 they will arrive shortly.

12 But, anyway, I'm pleased to introduce Dr. Gina
13 Solomon. She's the California EPA Deputy Secretary for
14 Science and Health. And Dr. Solomon will be facilitating
15 the afternoon discussion on our question of the day:

16 "Given Limited Resources, What Should be the Main
17 Priorities for Biomonitoring California Going Forward?"

18 So...

19 (Thereupon an overhead presentation was
20 presented as follows.)

21 CAL/EPA DEPUTY DIRECTOR SOLOMON: Thanks.

22 CHAIRPERSON BRADMAN: I think we have some
23 opening remarks. And I look forward to this afternoon. I
24 think this is going to be real crucial for our meeting
25 today.

1 CAL/EPA DEPUTY DIRECTOR SOLOMON: I'm on?

2 MS. HOOVER: We can give them two more minutes.

3 CAL/EPA DEPUTY DIRECTOR SOLOMON: Should I dance?

4 (Laughter.)

5 CHAIRPERSON BRADMAN: Do a song.

6 MS. HOOVER: Why don't I just give an outline.

7 While we're waiting for our stragglers - and we
8 have about one minute to go before we officially start -
9 the way this is going to work is Gina's going to
10 facilitate. She's going to be calling on Panel, guest
11 discussants, audience, as she sees fit, after giving her
12 opening remarks.

13 And then at about 2 o'clock, we're going to call
14 for formal public comment. So if you haven't been able to
15 get your comment in, make sure you've -- you turned in a
16 comment card, and we'll be sure to call on you.

17 And then we'll go back to some discussion. And
18 right around -- what time are we right now -- right around
19 2:20 Gina will start to wrap up. And then at 2:30 we're
20 going to officially adjourn the SGP meeting and kick off
21 our celebration. At that time the webcasts will end,
22 recording will continue. That will be only for our
23 private use. But I just want everyone to be aware of
24 that.

25 So if you have any concerns about being recorded,

1 you can let us know. That will continue at 2:30, but the
2 webcasts will stop.

3 Okay. Gina.

4 CAL/EPA DEPUTY DIRECTOR SOLOMON: Great. Thanks,
5 Sara.

6 So the -- this is actually an exciting
7 opportunity, because it's not that often that we get to
8 stop for a few minutes and step back and look at the big
9 picture and do some real strategic longer-term thinking.
10 And it's been quite a while actually I think for this
11 panel.

12 I remember early on in the program when -- I was
13 actually on the Panel, and there was a lot of strategic
14 thinking about how to shape the program. And I think that
15 actually has served us well over many years and really
16 helped guide the program. But now, as, you know, everyone
17 heard, there are, you know, ongoing funding challenges,
18 and so we're struggling with how to make the most of our
19 limited resources.

20 And over lunch, I shoveled food in my mouth as
21 quickly as I could while also juggling PowerPoint; and I
22 put together this presentation based on the discussion
23 that I heard this morning, because what I was hearing were
24 all these great suggestions and then some tension about,
25 well, how do we do all of these things?

1 And so I put a four-way tug-of-war. I would have
2 done a five-way tug-of-war if I could have in the middle.

3 But, you know, it isn't really necessarily a
4 tug-of-war. What we're looking for out of these tensions
5 is some synergy. And so I put this up here to show what
6 just sort of popped into my head. Others may think of
7 things that I missed. And I think that maybe it would be
8 helpful to sort of start by articulating what we see as
9 some of these, you know, tensions for resources, and then
10 move from there into thinking about where we see synergies
11 and ways to kind of, you know, escape that zero sum game
12 of, well, we have to do this or that. You know, how -- is
13 there a way that we can do both and that we can accomplish
14 multiple goals at once.

15 And then just to run through this very briefly.
16 You know, we've done a lot over the years of looking at
17 various communities and really trying to focus on
18 disproportionately exposed communities: Occupational --
19 and that certainly was the case with the FOX study and
20 working with the Asian-Pacific Islander Study -- racial
21 and ethnic groups. It is, you know, an issue -- you know,
22 definitely something that's been a focus of this work.

23 Socioeconomic considerations, environmental
24 justice.

25 And then we talked just this morning about the

1 geographic zones that we're going to be trying to cover,
2 which are vast in this State.

3 And then, Julia, you did I thought a really great
4 job of emphasizing the importance of really putting
5 resources into the communication piece and how important
6 that really is. And it is something also that has been a
7 priority, and we should think more about how to leverage
8 that and make it even more effective.

9 I think a lot of energy has gone into
10 communicating with participants, maybe a little less with
11 policy makers and the public. So I'd like to sort of
12 shine a little bit of attention on that and think about
13 how to move that forward.

14 And then obviously there are the lab issues: How
15 do we test for more chemicals? And there are a lot of
16 things that the labs have done to move that hugely
17 forward, including the ability to do semi-targeted and
18 non-targeted testing; and to test for these entire classes
19 of chemicals at once. So that is huge but also very
20 resource intensive. I think it's been one of our
21 strengths though as a -- at Biomonitoring California.

22 And then how do we make this health relevant? I
23 mean, I just love the FREES Study of doing testing pre and
24 post couch, you know, foam swap, because that really is
25 super health and policy relevant. And a lot of the time

1 trend data.

2 And so those kinds of things.

3 And the testing for unknowns I put it between
4 because really when you pick up something new, that's
5 immediately policy relevant.

6 And then obviously we want to test as many people
7 as we can. And there are different approaches for doing
8 that, one of which came up this morning; and there was
9 some discussion about, well, do we want to pool or not
10 want to pool?

11 So let's -- so I'd like to turn it over -- and
12 actually since the discussion with our panelists this
13 morning was sort of shortened, I would love to go back to
14 you guys, maybe just for some reactions to whether I
15 captured everything that you were saying and that came up,
16 whether I missed anything, and whether, you know, you see
17 any additional areas of -- that we should be thinking
18 about as we try to figure out how to move forward.

19 So, Irva, you're closest. May I start with you.

20 DR. HERTZ-PICCIOTTO: Well, I think one of the
21 points that I was trying to kind of put front and center
22 to this discussion is looking at, you know, those goals,
23 those original goals, and thinking about really what are
24 the priorities and -- you know, I think this captures kind
25 of all of the issues of the program in its -- in its, you

1 know, what's happened over the last 10 years and sort of
2 the kind of less -- I mean, some -- there is strategic
3 issues -- there are strategic issues on here, but from the
4 perspective of, you know, those original, I don't know,
5 eight goals that had to do with, you know, validating,
6 modeling, and survey methods. I'm not quite sure if that,
7 you know, fits in here.

8 Definitely the identifying -- identifying highly
9 exposed communities, which isn't quite the same as having
10 identified them, you know -- you know, measuring to find
11 out how high are they or that sort of thing.

12 You know, addressing gaps between chemical
13 exposures and specific health outcomes, I think that's the
14 kind of outcome focus that -- you know, there's some
15 question how big of an emphasis do you want to put on
16 that.

17 And then the setting priorities in terms of --
18 and assessing the effectiveness of regulations. So
19 how -- how critical is that to the -- you know, what the
20 program wants to achieve over the next 10 years. So
21 that's all I would add here.

22 CAL/EPA DEPUTY DIRECTOR SOLOMON: Thanks.

23 And, Julia, do you have thoughts as -- especially
24 on the communications piece but actually on all of them?

25 DR. BRODY: Well, I think you did an amazing job

1 of capturing -- capturing comments and putting them into
2 bigger buckets. That's quite helpful.

3 And just to reflect on a couple of these -- a
4 couple of them, the exposures sources. And that is
5 clearly policy relevant. If you want to have the public
6 health intervention, knowing the exposure sources is
7 really key.

8 And there were some things mentioned this morning
9 that were going in that direction, aside from the
10 swap -- like an intervention is a really good clean way to
11 do that. But the questionnaire is I imagine also intended
12 to do that. And the point raised by Dr. Schwarzman about
13 location can also do that.

14 The questionnaire, I thought the comment about
15 convening some experts, I -- this is something I've been
16 working on that I think is very tricky and perhaps not
17 going to be super successful for some of these chemicals.

18 You may have seen, we just published results
19 about fast food packaging. And it's really -- you can ask
20 people if they ate pizza or had bakery stuff in a wrapper.
21 But it's hard to really know what those questions should
22 be and how to calibrate them or -- and it's like a
23 fraction of the pizza boxes have this compound.

24 So I think maybe thinking about the exposure
25 sources in connection to action is something that would be

1 a good place to focus some energy.

2 And I was also thinking about the strength of
3 this program in trying to represent diversity in various
4 ways and the opportunity because of the population in
5 California, to think about diversity and try to engage
6 with the issue of vulnerability and protective resilience.
7 And that's like another way that this connects to broader
8 issues in public health.

9 CAL/EPA DEPUTY DIRECTOR SOLOMON: Thanks.

10 And, Dr. Breysse, I'd love your thoughts in
11 general as well, and also your thoughts about the
12 chemicals that we're testing for in particular and whether
13 there are others that you see from where you sit as being
14 sort of emerging areas or already emerged chemicals that
15 we should maybe be prioritizing to add to our list.

16 DR. BREYSSE: I'd like to begin by reminding
17 people that on my slides you may have saw there was a
18 disclaimer that says, you know, I'm not here to set policy
19 on behalf of CDC. And if I accidentally say something
20 that sounds like that, it's not the case.

21 (Laughter.)

22 DR. BREYSSE: So, you know, I'm here, I'm giving
23 my thoughts as an individual rather than trying to set
24 some sort of national policy. So I give that disclaimer
25 to my comments as well as the disclaimer that was on my

1 slides.

2 So I want to just follow up on what was just said
3 about the importance of sources and pathways. You have to
4 remember that biomonitoring is one piece of a broader
5 understanding that we need to have. And it tells us how
6 much is in our body. And if we know something about the
7 characteristics of chemicals and the half-life of the
8 chemical and with questionnaire data, we can infer
9 something about where it comes from. But without
10 environmental sampling data, we don't really know what the
11 complete picture is.

12 So while we -- it's important to know what we're
13 accumulating and what's in our bodies. It's also
14 important to know where it comes from. And that where it
15 comes from is key to designing interventions and stopping
16 exposure if we decide it indeed is too high.

17 And of course biomonitoring that way could play,
18 as we just heard, a crucial role in evaluating the
19 effectiveness of that intervention. If we think drinking
20 water is a significant source of chemical X, we eliminate
21 that from the drinking water, we can see a significant
22 reduction in our body that will show us we're on track.
23 But if we don't get significant reduction, what that
24 suggests is maybe drinking water is not the predominant
25 source of exposure. So I think we have to keep track of

1 that broader picture as well.

2 Now, in terms of chemicals for testing, you know,
3 that's a huge challenge to answer that question. I think
4 we have to all be surveilling the literature to see what
5 chemical toxicity data are emerging, what chemicals are
6 appearing on EPA databases, the kind of chemicals that are
7 being nominated for testing through the National
8 Toxicology Program. There's a number of sources for
9 information like this where we can identify chemicals that
10 we have to look at as potential for future concern.

11 I don't want to list a bunch of them right now.
12 I didn't quite come prepared with that. But I think those
13 are the kind of things we can look at for information on
14 the types of chemicals. And, you know, in particular,
15 seeing what people are nominating for the National
16 Toxicology Program testing and the chemicals that are in
17 the emerging contaminant database from EPA would be two
18 important places to start in terms of things.

19 But obviously we can't measure everything. And
20 we have to focus on things we think there is significant
21 exposure, things we think there's at least enough
22 information to worry about potential health effects. And
23 so all that has to be integrated in decisions about how to
24 add things.

25 And so as -- we talked a little bit about NHANES

1 and the work that we do and how -- what a challenge it is
2 to add new chemicals to that - and I'm sure you guys have
3 the same limitations that we do - so recognizing that it's
4 a challenge.

5 And I just want to add one answer to a question
6 if I can step back for a minute. Asa asked me about
7 children. And so since 2015, NHANES has started sampling
8 children down to age of 3. We haven't released any data
9 yet, but that'll be coming out in the future. So we have
10 lowered it below 6 down to 3. We'd still like to have
11 data for kids less than 3, but obviously there's
12 challenges -- real challenges with collecting blood and
13 urine from children less than 3. But I think we are
14 looking at children at younger ages, so I just wanted to
15 give you that piece of information.

16 So thank you.

17 CAL/EPA DEPUTY DIRECTOR SOLOMON: And one -- just
18 before you stop, one follow-up question about, you
19 mentioned that CDC gets a lot of nominations for chemicals
20 to add to the NHANES study. Where do those come from and
21 is there like a way for us to find out what's being
22 nominated to you?

23 DR. BREYSSE: No, I don't think there's a formal
24 nomination process. But I know the lab director will get
25 requests. I know I get requests. So I have over the last

1 six months probably requests from scientific activist
2 groups, probably five or six requests for asking how do we
3 get new chemicals added or saying we really got to start
4 adding new chemicals.

5 So there's a lot of concern about pesticides now,
6 in particular; in herbicides, so glyphosate is one that
7 people have asked us on a number of occasions to add. The
8 nicotinoids are also chemicals that we're being asked to
9 include.

10 But, again, we have to figure out mechanistically
11 if we can add something with the volume of blood we
12 already have. And that makes it easier than if we have to
13 ask for additional blood to run the samples.

14 So it comes from a variety of places.

15 CAL/EPA DEPUTY DIRECTOR SOLOMON: Sounds good.
16 Thank you. That's very helpful.

17 So, you'll probably -- Dr. Webster, you'll
18 probably see quite a number of the issues that you
19 mentioned sort of sprinkled up there. And I was really
20 interested in some of your thoughts about how to sort
21 of -- you know, again on this testing for more chemicals
22 area, you particularly had some suggestions in your
23 remarks. And so I just wanted to give you an opportunity
24 to take that a little step farther about how we could do
25 some more of that.

1 DR. WEBSTER: Yeah. So let me say a little bit
2 about the PFASs. So we have an interesting situation of
3 trying to deal with a legacy problem and emerging
4 contaminants at the same time.

5 Once these things get in an environment and get
6 into the water, then, you know, we're going to be exposed
7 for a long time, and we need to deal with that.

8 On the other hand, I actually think a lot of it
9 is -- for most people is probably coming either from
10 diet -- or from the indoor environment. And it's very
11 complicated because then we have the precursor problem.
12 And now what's happening is they're building shorter chain
13 molecules with like ether bonds, and then those get broken
14 down. So I think we need to start looking for some of
15 those.

16 And, again, I'm not an analytical chemist, so
17 it's easy for me to say. But I think that from my
18 perspective as an exposure scientist and epidemiologist, I
19 think we really need to start looking for those.

20 The other thing is I want to tell you why I am
21 doing a study of nail salons. So I'm now doing a
22 biomonitoring study of nail salons and workers in nail
23 salons. And the reason why is I was interested in flame
24 retardants and we found that the metabolites of diphenyl
25 phosphate are higher in women than men.

1 And this has reminded me of a story that came out
2 of CDC where one of the phthalates was higher in women
3 compared to men, and it turned out had to do with personal
4 care products. So I used the modern research tool called
5 Google and started Googling what the hell do they use
6 triphenyl phosphate for? And, sure enough, it's being
7 used apparently as a replacement for some of the
8 phthalates in nail polish as a plasticizer.

9 And so then, you know, one thing leads to another
10 and now I'm working on nail salons. So -- which is sort
11 of a horrible story. But I think that particularly what
12 that teaches us is that we -- as we have the sort of
13 regrettable substitution problem where we figure out one
14 thing and we work really hard and spend 10 years and,
15 okay, we get rid of that one, and then there's something
16 else that pops up; that we need to start paying attention
17 to that when that happens.

18 So I don't really have any more particular advice
19 than that, other than I think that's a real phenomena, and
20 unfortunately it's very hard to get the information from
21 manufacturers. Right? So we have that issue.

22 But, you know, one way we can do it is by again
23 testing things like dust; because if it's in personal care
24 products, it's going to end up in dust. And actually
25 testing products as well.

1 CAL/EPA DEPUTY DIRECTOR SOLOMON: Good. Thanks.

2 Let's shift a little bit to talking about who to
3 test instead of what to test for. Because some questions
4 came up this morning about where to go next, you know, in
5 the multi-regional study, and what sensitive populations
6 we should be focusing on in the next -- you know, coming
7 up next phases. And I'd love actually to turn to the
8 Panel here, because we've got more Californians on the
9 Panel -- on that panel than on this panel.

10 And so actually I was hoping, Jenny, that you
11 might start us off a little bit with some of your thoughts
12 about the communities to focus on, both geographically and
13 also from a vulnerability perspective.

14 PANEL MEMBER QUINTANA: Sure. Thank you.

15 This morning I was trying to think about what
16 makes California special or different and what could
17 California Biomonitoring do to address that.

18 And I thank Dr. Breysse for reiterating very
19 nicely the importance of population-based samples as a
20 reference to interpret findings. And so I just want to --
21 it reinforced my belief in that, as such an important part
22 of California Biomonitoring.

23 But having given that, special populations I
24 think, our refugees, immigrants, and foreign born, is very
25 much, especially in San Diego, very much part of our

1 population and it's something that could have very
2 different body burdens to certain chemicals.

3 I think that disparities are a big part of what
4 is a focus in California, environmental justice
5 disparities, EJ communities. And I do think the state has
6 a big focus on pregnant women and children, so as a
7 special population I guess. So that's some of the
8 thoughts I had written down.

9 The other thing that sounds a little off topic
10 but something else that makes California special is our
11 biotech. So in San Diego we have J. Craig Venter
12 Institute. And they are going great guns recruiting all
13 these people and sampling their DNA and getting all their
14 health information. But I realized -- I don't know if
15 you've talked to them about biomonitoring or augmenting
16 some of those other efforts that biotech is doing. And so
17 that was just another unique California piece.

18 But again I'd like to bring it back to what you
19 were talking about, and something else that's unique, is
20 this CalEnviroScreen, the detail that we have, and really
21 trying to build upon those disparities.

22 CAL/EPA DEPUTY DIRECTOR SOLOMON: Okay. Great
23 Thanks.

24 Dr. Fiehn, I was hoping you might talk about some
25 of these things. You were quiet this morning. And I --

1 PANEL MEMBER FIEHN: Yes, I was.

2 CAL/EPA DEPUTY DIRECTOR SOLOMON: -- you have a
3 lot to contribute from your perspective.

4 PANEL MEMBER FIEHN: Sure. I'm an elemental
5 chemist by training. I'm toxicologist by Ph.D. I guess.

6 So we -- I have been very interested in all these
7 discussion points, and obviously we all agree that, you
8 know -- the hydra -- I liked really the hydra approach
9 there, which is something we are all concerned about, by
10 chasing ghosts of the past and being very proud of
11 achieving a reduction in levels, just to see the
12 compounds, maybe even more potent compounds or at least of
13 unknown toxicity compounds, popping up.

14 At the same time non-targeted approaches are not
15 in the sense validated as targeted approaches are. So at
16 least with targeted approaches that are absolute
17 qualifications we know what we get, we can have very clear
18 qualification criteria. And with non-targeted approaches
19 it's much harder.

20 I would like to see a much broader use of
21 databases, an upload of databases of spectra, making
22 things publicly available, including spectra -- mass
23 spectra, of pollutants of anything that the state labs do
24 or have, or any other lab, should be uploaded to publicly
25 available databases. So that other people can actually

1 find and validate if they find these same compounds to
2 say, yes it is this compound and not something else.

3 That is an important part, these non-targeted
4 screening approaches, to be sure that what you claim you
5 found you actually found.

6 The second thing is, of course, we can also
7 ask -- or as the CalEPA, use our influence on NIEHS and
8 NIGMS and say, "You guys need to fund more method
9 developmental and validation, including round-robin
10 tests." So that different laboratories, not only the
11 state laboratories but also other, let's say, university
12 academia laboratories would have the ability to show their
13 proficiency in getting high-quality data. So that is an
14 important part, you know, in terms of reaching out to the
15community. But the NIEHS and NIGMS, they have to
16 understand that they also have to fund these types of
17 quality criteria assessments.

18 Eventually, I can see the -- I don't know when,
19 but the CalEPA being an agency that gives us contracts to
20 any lab. Because at the end of the day with too little
21 resources, we have to be able to say how can we make the
22 biggest bang out of the buck. And giving out contracts
23 for quality control laboratories, that include state labs
24 but it might be also including other labs.

25 What I was missing this morning when we talked

1 about budgets is a little bit like an idea where most of
2 the funding actually goes - is it like 80 percent - for
3 enrollments and, you know, phlebotomists and so on. Or is
4 it 80 percent for getting data? Or is it so mixed that
5 you can't just say, including, you know, because we have
6 all these -- we just had a minute ago, these big balloons.
7 And, you know, if we can put dollar signs to these big
8 balloons, it's also one way to think about how to go
9 further with less money.

10 What else? Then the idea of reaching out. It
11 was several times mentioned that we would love to get our
12 hands on more NHANES samples. You just mentioned the --
13 over there, the Kaiser samples were mentioned at some
14 point. The one million people, you know, presidential
15 campaign on genomics. You know, they actually try to get
16 a lot of people in there. And if we can get a hold of
17 them or get cooperative agreements so that we know who
18 these people are or -- so, then of course, you know, that
19 would be a huge resource that can also be leveraged in
20 California.

21 So I think all these creative ideas need to be
22 explored in -- and they have been explored before. I
23 mean, that all this piggybacking was always an idea
24 that -- you know, with the firefighters and so on, that
25 was always part of the bag.

1 But I really think that we have to be vocal. And
2 one thing we discussed at lunch is also to say, well, we
3 are the CalEPA -- well, you are the CalEPA.

4 (Laughter.)

5 PANEL MEMBER FIEHN: And when the -- when
6 maybe -- hopefully not, but maybe on the national level
7 things might change. Then maybe CalEPA should step up.

8 And we have to be also vocal in terms of our own
9 Governor and our own legislature to say we have to step up
10 here in California to, you know, make sure that the
11 resources are built and maintained, when resources at the
12 national levels may be decreasing.

13 So these are my 15 cents.

14 (Laughter.)

15 CAL/EPA DEPUTY DIRECTOR SOLOMON: Thank you.
16 Yeah, we may be spending the money to launch our own
17 satellite for our Governor.

18 (Laughter.)

19 CAL/EPA DEPUTY DIRECTOR SOLOMON: Yes, go ahead,
20 Dr. Breysse.

21 DR. BREYSSE: Can I just follow up in terms of
22 non-targeted analysis.

23 So I think, you know, a good chemist will look
24 for things that are appearing on a chromatogram that are
25 not expected. And I know in our case there's been a

1 couple of times where we've identified new phthalates that
2 are appearing just based on this non-targeted noticing
3 that there's a consistent peak in an analysis that they
4 don't know what it is; then they look at it and they find
5 indeed it's a new phthalate that's creeping into the -- in
6 the plasticizer business.

7 So I expect most chemists would see -- or be
8 curious about seeing something that they hadn't quantified
9 or that they weren't looking for in terms of a
10 chromatogram.

11 So I think informally a lot of that non-targeted
12 analysis goes on.

13 CAL/EPA DEPUTY DIRECTOR SOLOMON: Okay. Yeah.
14 Irva -- or -- okay. Let's go with Megan then.
15 Irva.

16 PANEL MEMBER SCHWARZMAN: Thanks. I just wanted
17 to, sort of continuing this thread, return to a point that
18 Dr. Webster raised in his presentation this morning that
19 really stuck in my mind and I've been kind of mulling
20 over, which is -- you know, you gave the example of the
21 "Something from 'Nothing'" study that tested estrogenic
22 mixtures. And, you know, while I recognize that we don't
23 yet have established ways of testing serum or blood
24 against these biological assays per se in an established
25 systematic way, I think it's a very interesting avenue

1 that we might explore as a panel or as a program over the
2 next -- in the future. And it's -- it's so intriguing to
3 me because it's a move away from simply measuring presence
4 of chemicals to measuring biological activity. And that's
5 more direct than trying to make the leap from presence of
6 chemicals to disease outcome over a physiologic response,
7 but to look collectively, you know. And it helps address
8 this issue of serial substitution and of, you know, the
9 constant moving target of what chemicals we're testing for
10 because we go beyond looking for individual chemicals that
11 we've identified and made the case for and start looking
12 for biological activity that may be the result of multiple
13 different exposures. And estrogenicity is one example;
14 androgenicity is another example; you know, thyroid active
15 hormones; et cetera, et cetera, we could go on.

16 I don't mean to suggest -- it doesn't replace
17 looking for specific chemical presence. But I would be
18 really interested in it being a topic that we explore in
19 the future on a Panel or just as the program about
20 thinking about adding an element of looking for biological
21 activity and whether that could be something that gets
22 prioritized in method development that's something that
23 California could add to what's being done nationally.

24 Anyway, I'm very intrigued by that idea and
25 exploring it further in the future.

1 CHAIRPERSON BRADMAN: I just want to interrupt.
2 And maybe after Irva, we budgeted some time for public
3 comment too. So --

4 MS. HOOVER: Actually let's just go for it now,
5 if you don't mind, Irva. I'm sorry. It's 2 o'clock. I
6 just want to make sure we get our public comment in.

7 DR. HERTZ-PICCIOTTO: Well, I can make a real
8 quick one.

9 MS. HOOVER: Okay. Go ahead.

10 DR. HERTZ-PICCIOTTO: I just want to --
11 connecting a couple of dots here.

12 Dr. FIEHN mentioned epigenetics. And you were
13 talking about, you know, activity. And I -- I think the
14 world of epigenetics has sort of changed the way we think
15 about environment now, from the point of view that
16 epigenetics has passed from generation to generation. So
17 I think taking into account some of the possibilities for
18 intergenerational kinds of things in some of the earlier
19 mentioned family members when you're going in. And of
20 course it would be great to get the grandparents and so
21 forth.

22 But the other part of this is I think that less
23 focus on trying to link exposures to outcomes, which I
24 think is really not what this program can do best, but the
25 epigenetic signatures related to environmental chemicals,

1 there's some work suggesting that those are completely
2 conserved across species and so forth, and that those as
3 outcomes using some of the kinds of databases that Oliver
4 mentioned and that are in existence could be a very
5 powerful and impactful way to link with partnerships. I
6 mean, I don't think your funding is going to cover the
7 epigenetic components, but getting, you know, DNA
8 methylation signatures, histone modifications and so forth
9 on some of these same people in partnerships with, you
10 know, other organizations could be really paradigm
11 changing.

12 CHAIRPERSON BRADMAN: Okay. Thank you.

13 And like Sara said, we want to budget some time
14 now for public comment.

15 And, Amy, after we're through I want to make sure
16 if anyone has submitted any comments by email that we
17 should acknowledge.

18 MS. DUNN: No email comments.

19 CHAIRPERSON BRADMAN: Okay.

20 MS. HOOVER: Well, let me -- Asa, just one
21 second.

22 So it turns out that our comment cards did not
23 get unloaded onto the back table. So if anybody else
24 wants to formally submit their name, you can use the
25 yellow stickies back there. We have two people who've

1 requested to comment. So we'll start with Meredith
2 Williams and followed by Davis Baltz.

3 DR. WILLIAMS: Thank you. I'm Meredith Williams,
4 Department of Toxic Substances Control. And one of the
5 responsibilities I have is for the Safer Consumer Products
6 program. And I've had the chance to talk to you before
7 about how relevant the work is of the Biomonitoring
8 program.

9 And I do -- I'm very glad to see that we took the
10 time today to take this step back, appreciate what was
11 done to establish the program, build the program, and
12 really get it up and running, because it's really doing
13 some great work.

14 And I guess that sounds immodest since it's our
15 department, but I'm still --

16 (Laughter.)

17 DR. WILLIAMS: -- I'm one step removed, so I'm
18 going to be thankful.

19 I could echo so many of the comments today. I
20 don't want to take time to really be redundant, but this
21 theme of regrettable substitutes is worth some mention.

22 First of all, one of the primary reasons the
23 Safer Consumer Products program was established was to try
24 to break the cycle of regrettable substitutes, and so
25 there are a couple things that biomonitoring has done that

1 are very helpful to us. The very fact that you have
2 prioritized chemicals in groupings and classes gives us
3 the ability to then turn around and look at these
4 chemicals in groups and anticipate what kind of -- what
5 kind of chemicals might be used. And so continuing to
6 focus on opportunities to group chemicals by function or
7 structure or other means I think is quite valuable.

8 For instance, right now we are looking at
9 perfluorinated -- the PFASs in carpets, rugs, and indoor
10 furniture, carpet-care cleaning products, things like
11 that. And I think our ability to take that on was really
12 enhanced by the fact that that whole class had been
13 prioritized through Biomonitoring California.

14 And then that then does take me to non-targeted
15 analysis. Again, I don't know what the answer is in terms
16 of trying to integrate that into the program. But I do
17 know it has an integral role to play in terms of how we
18 think about the regrettable substitutes.

19 So Dr. Webster suggested partnering with academic
20 institutions around the non-targeted analysis, and I think
21 that's an idea worth exploring.

22 Switching gears a little bit. I do want to talk
23 a little bit about environmental justice.

24 As we make decisions in our program, we would
25 love to have great tools to be able to differentiate the

1 burdens that certain populations bear based on the
2 consumer products they're exposed to. The nail salons
3 areas is an area that we're looking at, and that's a --
4 you know, that's a typically immigrant population. So
5 again the collect -- continuing to prioritize that area of
6 the program to try to find these differential burdens for
7 different parts of our communities I think is of very good
8 value to us.

9 So I'll stop there.

10 MR. BALTZ: Good afternoon. I'm Davis Baltz.
11 Some of you may remember me from years past, as I've
12 tracked this program since the beginning.

13 I'd like to start and just express my
14 appreciation, as others have, of the work of the program
15 over the last 10 years. The staff have been innovative
16 and entrepreneurial and really gone above and beyond to
17 make this program a success. Nerissa Wu is the current
18 leader, preceded by Michael DiBartolomeis, Rupali Das,
19 Michael Lipsett. So thanks to all of you.

20 And also acknowledge the Scientific Guidance
21 Panel, who throughout this last 10 years have provided
22 thoughtful guidance and advice to the program.

23 And for the charter members - Dr. Luderer, Dr.
24 McKone, Dr. Kavanaugh-Lynch, and Dr. Bradman - you are now
25 fully vested.

1 (Laughter.)

2 MR. BALTZ: So when this program came into being
3 10 years ago, SB 1379, I was then with Commonweal, which
4 was one of the two co-sponsors of the bill for the four
5 years that it took to get through the legislature before
6 Governor Schwarzenegger signed it, along with our
7 co-sponsor, the Breast Cancer Prevention Partners, the
8 rock band formerly known as Breast Cancer Fund.

9 (Laughter.)

10 MR. BALTZ: And the promise at that time was to
11 be -- have a program that every two years would generate a
12 statistically significant statewide survey of California's
13 exposures to environmental chemicals. And in the
14 alternate years have targeted community-based studies
15 based on the needs of the State and exposures of concern.
16 Well, as we all know, there was never enough money in the
17 program to do these every-two-year studies, which was
18 unfortunate; because if we had had that information, we
19 would have been able to achieve some of the goals that
20 were put up on an earlier slide to establish exposure
21 trends over time, and then importantly to devise
22 strategies to reduce exposure and see if they're working
23 or not.

24 One of the key aspects of the program was also
25 the results communication. And I know that's been

1 important for many people. Certainly it was for the
2 co-sponsors. We felt it was probably a violation of
3 medical practice to stick someone with a needle and take
4 their tissues and analyze them and not tell them what
5 happened in the aftermath of that.

6 And it's not something that's commonly done. And
7 I think the program has learned a lot that is of value
8 probably throughout the country on how to effectively
9 convey results in a study like this. And as many of us
10 commented publicly throughout the program's history,
11 people can handle this information. They're grown-ups and
12 they want to know. So to shield it from them is not
13 really an option; and to convey it in a most effective way
14 is certainly something that's important for the program to
15 do.

16 So the challenge now, from the slide -- first
17 slide that in the morning was the budget. And, you know,
18 it's not a very positive outlook. At its inception, I
19 think the estimate was \$10,000,000 a year would be what
20 was needed to fully fund the mandates of the program. We
21 never come close to that. But \$10,000,000 is a
22 significant piece of money, but in the wider scheme of
23 things, you know, some people might consider it as budget
24 dust. And I'm not saying that this program should receive
25 priority over other very important statewide programs, but

1 it's something that really needs to survive and hopefully
2 strengthen and grow.

3 So speaking as someone from the public interest
4 community, we need to roll up our sleeves now and figure
5 out innovative ways to help fund this program. And
6 certainly one thing is to go to the legislature and help
7 them understand more fully why this program is important.
8 It advances public health, it advances environmental
9 issues, it advances occupational health and, frankly,
10 human rights.

11 You will almost certainly save time over the long
12 term with saved environmental remediation costs and
13 reduced medical costs, as people reduce their exposures
14 and don't need to seek medical care.

15 So I think given what we are seeing in Washington
16 D.C. now with the attack on science, this is a good frame
17 for us in the public interest community to go to decision
18 makers with. The Biomonitoring Program is a scientific
19 program and we need to preserve and strengthen science.
20 Biomonitoring results are not alternate facts. They are
21 proof that we're exposed. And we need to continue to make
22 this information available and expand it so that all of
23 the goals I just mentioned can be achieved.

24 So thanks so much.

25 MS. HOOVER: Before I turn it back to Gina, I

1 just want to point out, I put up our main discussion
2 question, which was posted and circulated. And I know
3 we're not going to actually have time to hear from
4 everyone or even cover all of this, but I just wanted to
5 remind people about some of the things we're interested
6 in.

7 For example, something as simple as which metals
8 to measure in the multi-regional study. We're measuring
9 the usual suspects like arsenic, cadmium, lead, mercury.
10 We have capacity for more, and that was in your packet.

11 Anybody listening to this in the audience, by
12 webcast, any time you can email the program, and that
13 email is available on the website,
14 biomonitoring@oehha.ca.gov.

15 So I really encourage people to think about it
16 and email us other metals you might be interested in like
17 cobalt and manganese, other -- the geographical regions
18 that we're looking at. We're starting in L.A. County.
19 There was discussion about, wouldn't it be great to do
20 two? Probably not. But what would be your next one in
21 line, you know. So where -- where would you suggest we go
22 after L.A. County? That's important to provide input on.

23 And then we have lots and lots of ideas about
24 particularly sensitive populations or impacted
25 communities, but it -- and there were some comments about

1 that, but additional comments.

2 Just wanted to flag that because we won't have
3 time to hear from everyone. But I'm going to pass it back
4 to Gina now for the last bit.

5 CAL/EPA DEPUTY DIRECTOR SOLOMON: Thanks, Sara.

6 Though I'm happy to take -- you know, if anybody
7 in the audience has a comment on these issues, just pop
8 your hand up and we can just make this a broader
9 discussion for the next few minutes.

10 But I just wanted to turn back to the Panel one
11 more time. And actually, I was hoping to hear from
12 Dr. Kavanaugh-Lynch. You haven't spoken yet at this
13 meeting. And I thought you might have some thoughts on
14 the priority/sensitive populations in impacted communities
15 that should be areas of focus in the next phases.

16 PANEL MEMBER KAVANAUGH-LYNCH: Thanks, Gina. I
17 do have some thoughts.

18 I want to think about a little bit of reframing.
19 From some of the comments that, well, everyone's made, but
20 particularly Dr. Brody, in thinking about report-back not
21 as a communication issue but as a public health tool. So
22 Dr. Brody talked about how people who get their
23 report-backs are then motivated to make individual change
24 and public policy change. And frankly I've been
25 struggling with how to frame this in a way that doesn't

1 sound political. And maybe it can't be. That one of the
2 considerations should be where do we see opportunity and
3 need for movement in the individual and public policy
4 front and therefore can -- should part of our
5 prioritization be where do we want to engage the public in
6 making change?

7 And I think one opportunity for that is -- in my
8 own opinion, is the communities impacted by fracking in
9 California. Whether it could be a real opportunity to do
10 biomonitoring that's not being done anywhere else in -- I
11 mean, I believe in the country there is nobody else
12 biomonitoring these communities. And it's an issue of
13 serious concern for many, but for which we have very
14 little evidence, or very little monitoring. So this could
15 be one place where California could really, once again,
16 lead the country and the world.

17 I wanted to reiterate Dr. Schwarzman's comments
18 about monitoring for activity. Representing kind of the
19 breast cancer world, what would be incredibly important,
20 is to look not specifically at chemical by chemical but
21 at -- at the combined effect that -- of several chemicals
22 and maybe ones we don't even know about on particular
23 disease outcomes, without having to make the connection to
24 disease but just to look at biological activity.

25 So those are two of my thoughts.

1 CAL/EPA DEPUTY DIRECTOR SOLOMON: Thanks.

2 Anyone else from the Panel want to add anything?

3 PANEL MEMBER LUDERER: I'd like to just talk a
4 little bit about the sort of the priority/sensitive
5 populations and impacted communities in a little bit
6 different way, and maybe think about some occupational
7 populations that we can look at particularly as we know
8 that the big growth in jobs is in the service sector. And
9 we've heard today about the wonderful studies that are
10 being done around nail salon workers. What are some other
11 I think vulnerable worker populations largely in these
12 service sectors that we might be able to focus on? Which,
13 you know, some that come to mind would be people --
14 cleaners, house cleaners, janitors. Another group would
15 be gardeners, you know, landscape workers, which obviously
16 also overlap quite a bit with some of the populations that
17 Dr. Quintana mentioned in terms of, you know, immigrant
18 populations as well.

19 So I think we haven't -- we've had the FOX study.
20 But I think it would be something that would be good for
21 the program to do to try to see if we can look at some of
22 these other occupational populations where we may not know
23 as much about the exposures. I mean, we can imagine, for
24 example, with janitors and cleaners, that some of these
25 products that many of us are exposed to in our everyday

1 lives, but there would be much higher exposures because
2 they're using these constantly throughout the day in their
3 work. So those might be some very useful populations to
4 consider monitoring.

5 CAL/EPA DEPUTY DIRECTOR SOLOMON: Other
6 possibilities might be the health care sector, obviously
7 another big service sector.

8 And I was sort of also thinking as Meredith was
9 speaking about the building trades and some of the, you
10 know, work in that area where people are actually handling
11 a lot of these materials.

12 And, let's see, any other comments from the
13 audience? There are a number of folks who haven't said
14 anything, that I was surprised haven't said anything. But
15 I just want to give you one last chance, because I know
16 we're going to have to wrap up I think in like one minute.

17 And I don't want to be late because Sara will be
18 upset.

19 (Laughter.)

20 CHAIRPERSON BRADMAN: I have one last comment.
21 Hopefully not the last.

22 But, anyway -- but you made a point, Marian,
23 about not wanting to sound political. But rather I would
24 say as a public health program and as public health
25 professionals, we want to address issues and generate

1 information that can inform policy. And the political
2 process is the decision making. And, you know, like our,
3 you know, meeting last week on pesticide use near schools,
4 that's a political process. But I don't think that the
5 program should hesitate from trying to gather information
6 on potentially politically fraught or difficult issues.
7 All of these issues are, you know, fraught. We're looking
8 at chemicals that are used in commerce, and commerce is
9 important to our economy. However, understanding what the
10 exposures are and what the public health implications are
11 are also important and may impact how we -- you know, how
12 we do commerce. And so I think in California we have the
13 support and the understanding that generating the
14 information is crucial. What happens to it after that is
15 a separate process. And I think from the very beginning
16 we talked about kind of keeping separate the risk
17 management piece of the information from here from just
18 generating the information of what the exposures are and
19 then going from there.

20 MS. HOOVER: Let me just clarify something. No,
21 it's not one minute. We have till 2:30. But a thing that
22 was going to happen at 2:20 was that you're going to do a
23 wrap-up. But I don't think that's necessary because we're
24 going to have the transcript. So why don't we just
25 continue the discussion through 2:30.

1 Meg.

2 PANEL MEMBER SCHWARZMAN: Thanks.

3 I so appreciate that point, Dr. Bradman. I think
4 it is in our -- it's imperative, is -- you know, if our
5 goal is public health is to think about the priorities
6 from a public health perspective and go from there.

7 I wanted to return to a point that has surfaced
8 several times today, but just to highlight it because it
9 was my first thought in preparing for today and thinking
10 about sort of the future steps for the Biomonitoring
11 Program. And it's something that Dr. Hertz-Picciotto
12 raised in going back to the statute and looking at the
13 sort of established goals of the program. And that is
14 this question of assessing the outcomes of policies that
15 we have in place. Because we have so little feedback
16 often between the public policy decision-making sphere and
17 the environmental health assessment sphere. And to bridge
18 those two worlds I think could be enormously influential,
19 particularly in California because in California we have
20 several unique public policy levers like Proposition 65,
21 like pesticide use reporting, and making a link. So here
22 we are in California where we have these unique public
23 policy frameworks and very little data about their impact.

24 And if we had -- could generate -- and
25 biomonitoring is such an influential method for generating

1 data about impact. If the public policy outcome is
2 specifically meant to address chemical exposures and
3 chemical levels in people, we have this I think very
4 untapped opportunity so far to do direct assessments of
5 the impact of public policies that are specific to
6 California. And, you know, I know analyses like that are
7 full of potentially confounding variables. You know,
8 California's policies aren't the only thing that's
9 influencing the use of chemicals or their discharge into
10 the environment. But if we're not looking at it, we can't
11 even begin to see whether they're having an impact. And
12 so that's a piece of the discussion. And it's not the
13 first time it's come up today, but I just wanted to really
14 highlight it and flesh out my thinking on it a little bit.

15 CAL/EPA DEPUTY DIRECTOR SOLOMON: Dr. Quintana.

16 PANEL MEMBER QUINTANA: I just wanted to make a
17 quick comment on behalf of communities. That working with
18 communities, I more realize that it's so important to talk
19 about solutions to the problem. So let's say we find out
20 that children living near agricultural fields have higher
21 pesticides in their bodies and perhaps the pathway might
22 be house dust. It's helpful for this program to think
23 about if we had money to do something like a targeted
24 intervention: What kind of dust control methods would
25 lower their exposure? Just like you're saying the

1 furniture replacement for the flame retardants. I think
2 those -- even small studies give people a feeling of tools
3 they can use. And that's something that can be assessed
4 very effectively with biomonitoring.

5 CAL/EPA DEPUTY DIRECTOR SOLOMON: Great.

6 No other comments?

7 So I heard a lot -- I guess maybe I should
8 summarize a little bit. I mean, I heard a lot of really
9 helpful thoughts. And sort of -- some of them were very
10 big-picture thoughts about how to move forward. I think
11 one of the most -- one of the ones that seemed to get a
12 lot of traction was this idea of looking at some of the
13 early biomarkers of effect in connection with exposure
14 monitoring in the hopes that we might be able to sort of
15 ultimately move in that direction. And that's I think
16 come up a little bit in the past, and it's something that
17 deserves maybe more -- more consideration.

18 And also some places to specifically look, like
19 the chemicals nominated to the NTP as being a really -- a
20 good place to look for chemicals that may be emerging that
21 we may not have yet looked at in -- you know, in the
22 context of the Scientific Guidance Panel. And so those
23 were really helpful thoughts about new priority analytes
24 and other types of screening methods. A lot of very
25 interesting suggestions around collaborating with

1 researchers in the field of -- fields of omics and so
2 forth where we may not have that expertise in house in our
3 program, but we might through collaborations be able to
4 really do something very unusual and interesting there.

5 And then also on the chemical front, this idea of
6 looking at Prop 65 specifically. We've looked at some
7 things, you know, that might mark our differences from the
8 rest of the country - flame retardants, in general;
9 documenting declines in PBDEs; things like that. But, you
10 know, I don't know the degree to which we've really
11 focused on, okay, which Prop 65 chemicals could we
12 biomonitor, and might we be able to see either changes
13 over time or differences from NHANES. So that's an
14 interesting lens.

15 Didn't hear a whole lot specifically on the
16 metals, but that is definitely something we want input on.
17 So as Sara mentioned, please keep thinking about that,
18 because that's going to be important. We can do the usual
19 suspect metals, but we should probably do something
20 interesting while we're at it.

21 And then in terms of geographical regions, there
22 was some good suggestions about, without getting too
23 political, you know, wanting to think about areas where
24 people might need more education on, you know, chemical --
25 environmental health issues and chemical issues, and both

1 for their own health and also so that they better
2 understand the importance of public policy actions. And
3 so, you know, that's something we should think about as
4 we're picking geographical regions, maybe, that it's
5 certainly definitely worth considering.

6 And then really a very strong call for
7 occupational -- more occupationally focused studies, which
8 I very much support, for given the fact that, you know, in
9 workplaces people can be exposed to really much higher
10 concentrations and greater frequencies. So that sounded
11 like a very strong recommendation.

12 And then -- I didn't hear a lot about specific
13 collaborations to pursue, except -- but there were some
14 very good general directions of collaborations, especially
15 around the omics and the biomarker-type studies.

16 So that's pretty much what I heard. I'm sure all
17 of that plus way more is in the notes.

18 So I will hand back to -- oh, yeah. Go ahead,
19 Sara.

20 MS. HOOVER: I just wanted to pick up on two --
21 just really strongly pointing to Dr. Brody's point and
22 also Mel's point about using our -- we have incredible
23 capacity on results return that we've worked very hard on
24 since very early in the program, for many, many years.
25 And I really like that framing. It's not just about

1 communicating. It's about a tool. It's a public health
2 tool. And I like -- you know, we really have embraced
3 that, and I think that's a good framing for it.

4 Thank you.

5 CAL/EPA DEPUTY DIRECTOR SOLOMON: Yeah. And
6 thank you again to all of the folks who traveled so far to
7 come here and -- also not so far.

8 (Laughter.)

9 CAL/EPA DEPUTY DIRECTOR SOLOMON:

10 Dr. Hertz-Picciotto.

11 -- but to share their thoughts and expertise.

12 Because I think we learned quite a bit from our -- I
13 certainly learned quite a bit from those presentations and
14 that discussion this morning and afternoon.

15 So thank you all. And I'd love another round of
16 applause for our speakers and discussants.

17 (Applause.)

18 DR. BRODY: One last comment from the East Coast.
19 Tag, you're it, California.

20 (Laughter.)

21 CHAIRPERSON BRADMAN: It's 2:30, and I'm going to
22 officially adjourn the meeting. But then we'll switch
23 over into kind of our celebration and review of the
24 history, and then also some -- a reception later.

25 So I want to announce that the transcript of this

1 meeting will be posted on the Biomonitoring California
2 website when it's available.

3 The next Scientific Guidance Panel meeting will
4 be on July 20th, 2016, in Richmond.

5 So at this point, I'm officially adjourning the
6 SGP meeting. And I now will hand off facilitation over to
7 Dr. Lauren Zeise, Director of OEHHA, who will open the
8 10th Anniversary event.

9 I want to make one note though. The webcast is
10 now ending. But we will continue to record the event. So
11 beware.

12 (Thereupon the California Environmental
13 Contaminant Biomonitoring Program, Scientific
14 Guidance Panel meeting adjourned at 2:30 p.m.)

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1 C E R T I F I C A T E O F R E P O R T E R

2 I, JAMES F. PETERS, a Certified Shorthand
3 Reporter of the State of California, do hereby certify:

4 That I am a disinterested person herein; that the
5 foregoing California Environmental Contamination
6 Biomonitoring Program Scientific Guidance Panel meeting
7 was reported in shorthand by me, James F. Peters, a
8 Certified Shorthand Reporter of the State of California,
9 and thereafter transcribed under my direction, by
10 computer-assisted transcription.

11 I further certify that I am not of counsel or
12 attorney for any of the parties to said meeting nor in any
13 way interested in the outcome of said meeting.

14 IN WITNESS WHEREOF, I have hereunto set my hand
15 this 21st day of March, 2017.

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