

## November 2018 Meeting of the Scientific Guidance Panel for Biomonitoring California

### Summary of Panel Input and Recommendations

The Scientific Guidance Panel (SGP) for the California Environmental Contaminant Biomonitoring Program (also known as Biomonitoring California) met on November 8, 2018 in Richmond. This document briefly summarizes the Panel's input and recommendations on each agenda item, and related public comments. Visit the [November 2018 SGP meeting page](#) to access the presentations, other meeting materials, and the meeting transcript.

#### Panel Business

[Dr. Eunha Hoh](#) was sworn in as a new SGP member, appointed by Speaker of the Assembly, Anthony Rendon.

#### Program Update

[Presentation](#): Nerissa Wu, MPH, PhD, Chief, Exposure Assessment Section, Environmental Health Investigations Branch, California Department of Public Health (CDPH)

The Panel provided the following input:

- Suggested that the Program pursue additional funding opportunities, such as:
  - Funding from foundations or other groups with an interest in studying the impacts of chemical substitutions (e.g., the evolving flame retardant market).
  - Grant submissions in collaboration with university researchers.
  - Offering services (e.g., specialized lab methods) for a fee, which is done by other government institutions (e.g., the Centers for Disease Control and Prevention [CDC]).
- Highlighted the importance of designing biomonitoring studies to specifically assess regulatory effectiveness and advance public health goals. Pending adequate resources, these could include studies that:
  - Examine an intervention designed to reduce particular chemical exposures. One approach would be to work with the Safer Consumer Products program to test the effectiveness of one of their regulatory actions.
  - Test links between certain chemical exposures and health outcomes.
  - Monitor replacements for known toxic chemicals to help avoid regrettable substitutions.
  - Provide broad surveillance of a wide variety of chemicals and populations.

- Discussed the possibility of obtaining California-specific biomonitoring data from NHANES<sup>1</sup>, including the challenges involved because of CDC's data-sharing policies, and whether that data could be used to avoid duplicative effort by the Program.
- Recommended the Program engage with programs supported by the National Institutes of Health that include non-targeted screening work (e.g., CHEAR<sup>2</sup>) as one way to explore emerging chemicals of interest.
- Encouraged the Program to find ways to connect with other laboratories doing non-targeted screening work, including via conferences and workshops held in California, to learn about new software, sample preparation approaches, and other procedures.
- Described cutting-edge exposure research being conducted at UC Berkeley, such as measuring total estrogenicity in a sample and using non-targeted screening to identify suspect chemicals, and recommended the Program connect with those researchers to explore possible collaborations.
- Supported the Program's goal to build capacity for responding to emergency events, such as wildfires, including putting an Institutional Review Board (IRB) protocol in place.
- Recommended the Program continue to examine the available budget and prioritize the laboratory panels of analytes that can be measured within that funding, and those that are important to maintain for comparisons over time.

### **Community Exposures to Metals – Findings from the Biomonitoring Exposures Study (BEST) and the Asian/Pacific Islander Community Exposures (ACE) Project**

*Project pages:* [Pilot BEST](#), [Expanded BEST](#), [ACE 1](#) and [ACE 2](#)

[Presentation](#): Jennifer Mann, PhD, Research Scientist, Exposure Assessment Section, Environmental Health Investigations Branch, CDPH

[Presentation](#): Lauren Baehner, MPH, Research Scientist, Exposure Assessment Section, Environmental Health Investigations Branch, CDPH

The Panel, speakers, and audience discussed a range of topics, including:

- Timeline of analyses of BEST results beyond metals, specifically polybrominated diphenyl ethers (PBDEs) and phthalates, with the major limitation being availability of CDPH analysts. (Analysis of BEST results for perfluorinated compounds is already underway, as described in the [August 2018 SGP meeting](#).)

---

<sup>1</sup> National Health and Nutrition Examination Survey

<sup>2</sup> Children's Health Exposure Analysis Resource

- Analyzing possible associations between BEST results and commonly measured health benchmarks available in Kaiser Permanente Northern California records.
- Extending the analysis of exceedances of levels of concern for metals conducted for the ACE Project:
  - Conduct the same analysis for the BEST population, and compare the results to those for the ACE Project population. Examine the impacts of differences in the recruitment pools for the two studies.
  - Compare the demographics of those with exceedances within each study and across the two populations, including examining gender and race differences.
  - Examine relevant items from the questionnaire, like occupation, metal-working activities, housing characteristics, and proximity to roadways, to identify possible associations with the exceedances.
- Delving further into the analysis of exposure differences related to time in the U.S., with the BEST uranium findings highlighted as one example to look into.
  - For example, evaluate conditions in the other countries compared to the U.S. that could affect exposure, such as living close to a uranium mine, soil composition, levels in groundwater, levels in foods, and other factors.
- Examining data collected with the ACE Project questionnaires (see for example the [ACE 2 Questionnaire](#) and [Pictures](#)), such as which species and parts of the fish are consumed and whether the fish are caught locally, in analyzing mercury results.
- Assessing the risks of the measured metals levels.
  - For example, how high were the metals exceedances in comparison to levels observed in the Faroe Islands population, and do they pose significant health concerns?
- Various statistical issues, including:
  - Examining the impact of large numbers of non-detects in interpreting statistical results.
  - Looking at the differences in variance between groups.
  - Conducting novel statistical analyses to detect trends in a small dataset (e.g., LASSO - least absolute shrinkage and selection operator).
- The importance of presenting BEST findings to Kaiser health professionals.
- Development of an educational course for physicians focused on elevated metals exposures and available CDPH resources to address those. (Such a course could also cover other contaminants and the value of biomonitoring.)
- Impact of low income or other socioeconomic factors that could inhibit follow-up with study participants about elevated metal results.
- The importance of raising awareness in the ACE Project communities and similar

communities in terms of fish and rice consumption linked to elevated metals exposures, and providing culturally sensitive advice on reducing exposures.

### **Letter of Support for Biomonitoring California from SGP**

The SGP Chair Dr. Schwarzman and another SGP member, Dr. Veena Singla, prepared a letter to the Directors of OEHHA, CDPH, and the Department of Toxic Substances Control (DTSC) to formally express support for Biomonitoring California and request additional resources for future Program work. Preparation of this letter was publicly discussed at the [March 2018 SGP meeting](#). The other Panel members were invited to review and sign the letter if they wished. It was also available for public viewing. The signed letter is posted [here](#).

### **Afternoon Session: Community Exposures to Metals – Perspectives from County Health Departments**

Katie Butler, MPH, DABT, Senior Staff Analyst, Toxicology and Environmental Assessment Branch, Los Angeles County Department of Public Health. [Presentation](#)

Sara Cody, MD, Health Officer, Santa Clara County

Karen Cohn, MS, CIH, Program Manager, Children's Environmental Health Promotion Program, San Francisco Department of Public Health. [Presentation](#)

The Panel, guest discussants, and audience discussed a range of topics, including:

- Finding ways to share resources and expertise between state agencies/programs and the county health departments.
- Clearly communicating the kind of information participants will be getting at the beginning of a biomonitoring study; the larger context of their individual results (e.g., that everyone is exposed to these chemicals); and the length of time it will take to receive the results.
- Being responsive to the questions that are most important to the community, including:
  - Are the chemicals in my body harmful to my health? Will I die early?
  - What actions should I take?
  - How do I reduce my exposure?
  - What do I do if I have already been exposed above a level of concern?
  - Who can I go to for help?
- Being sensitive and clear in communicating complex results to a community and following up on study findings.
  - Avoid stigmatizing labels and black and white language. For example, do not refer to a community as “poisoned.”

- Acknowledge environmental injustices and the stress of a community impacted by elevated chemical exposures.
- Provide the larger context for the results (e.g., by showing how the community results compare to other similar communities across the U.S.), and convey any uncertainties.
- Engage and support the community, including helping them take positive actions for their health. Do not treat them like victims.
- Share public health successes within communities, not just the environmental problems.
- Giving proper support and follow-up to communities for exposure reduction approaches.
  - It is important that a community understands how to properly use mitigation equipment, such as air filtration devices to reduce exposures to certain air pollutants. Operator error can be a significant problem.
  - Affordability of some mitigation approaches can be a barrier in certain communities.
  - Housing insecurity can also be a barrier for exposure reduction. For example, community members with an insecure housing situation may be reluctant to risk code enforcement for lead mitigation.
  - If an adult has been found to have elevated metal levels, there is a public health obligation to follow up on testing their children, particularly for lead. Protecting children can be a strong motivating factor for community members to implement exposure reduction approaches.
  - Consider potential consequences of exposure reduction messages and address those as part of the solution. For example, lead mitigation approaches for soil can be designed to still encourage gardening (e.g., building raised beds with clean soil).
  - It is essential to follow up on how successful the mitigation approaches were.
- Engaging with communities before and after biomonitoring studies.
  - To generate interest in a biomonitoring study, connect with community advocates as well as local elected officials.
  - Consider using an electronic app to provide biomonitoring results.
  - Disseminate overall study results and important health messages via social media.
- Identifying known health disparities in communities; designing appropriate biomonitoring studies to investigate links with environmental contaminants; and engaging with the community all along the way, including implementing effective solutions.

- For example, seeking funding for a study on pre-term birth to examine environmental determinants could be considered. There are already well-funded research studies on social determinants.
- Working to advance scientific literacy in the community. For example, designing workshops to better educate the community about “chemical” exposures, including:
  - The difference between harmful chemicals and exogenous chemicals.
  - The importance of considering dose and not just detections.
  - The scientific uncertainties in measuring chemical exposures and interpreting chemical levels, particularly for less well-studied chemicals.
  - What results at a population level could mean to an individual – making these results relatable and understandable.
  - Various pathways of exposure, the relative importance of those for particular chemicals, and the implications for exposure reduction.
- Building community capacity in environmental health through youth internships.
- Connecting with cannabis-related programs/industry partners for possible funded collaborations. An area of common interest with biomonitoring could be pesticides.
- Addressing exposures to metals via traditional medicines or cosmetics, which are often imported.
  - Some of the highest exposures to lead and mercury can occur through use of these products.
  - It is important to raise community awareness about these issues in a culturally sensitive way.
- Translating biomonitoring results to public health policy.
  - It is not enough to provide advice on individual actions and products to avoid. There needs to be a systematic approach to identifying public health priorities from biomonitoring study findings.
  - There are chemical exposure issues beyond an individual’s control, which need to be acknowledged and addressed. Biomonitoring results can help evaluate the effectiveness of public health efforts and regulatory actions to reduce chemical exposures.

### **Possible Topics for 2019 SGP Meetings and Open Public Comment**

Presentation: Sara Hoover, MS, Chief, Safer Alternatives Assessment and Biomonitoring Section, Office of Environmental Health Hazard Assessment (OEHHA)

The Panel agreed with the 2019 agenda topics proposed in the presentation. Additional suggested topics included:

- The microbiome and its effects on health – can this be linked to environmental contaminant exposures?

- Tracking levels of PFASs in association with upstream biomarkers of lipid metabolism.
- Inviting an epidemiological researcher to discuss the value of exposure assessment through biomonitoring.
- Associations between exposures to toxic air contaminants and particulate matter and pre-term birth.

The Panel and audience were invited to send further input on 2019 agenda topics via email to [biomonitoring@oehha.ca.gov](mailto:biomonitoring@oehha.ca.gov) after the meeting.

**Open Public Comment:**

Ludmilla Bade of Oakland expressed interest in information about indoor and outdoor plants that could help mitigate the effects of air pollutants from all types of sources. She was also interested in air filtration systems that do not require a power source. Ms. Bade conveyed her support for obtaining baseline biomonitoring data as a way to better evaluate elevated chemical exposures, such as in a workplace.

