October 4, 2021

Tomás Aragón, MD, DrPH
Director, California Department of Public Health
By electronic correspondence to: tomas.aragon@cdph.ca.gov

Dear Dr. Aragón,

We are writing on behalf of the Scientific Guidance Panel (SGP) for the California Environmental Contaminant Biomonitoring Program (Biomonitoring California) with our recommendations for guiding the current and future efforts of the Program. Since its establishment by legislation (Senate Bill 1379, Perata and Ortiz, Chapter 599, Statutes of 2006), the SGP has met three times yearly to review progress and advise the program.

During our service on the panel, we have been deeply impressed with the significant impact of Biomonitoring California on the understanding of chemical exposures in California. In its first ten years, the program grew into a nationally recognized biomonitoring program with laboratory capability for measuring nearly 200 chemicals. The program has conducted over 20 biomonitoring studies with more than 40 collaborators, measuring chemicals in more than 7,500 Californians. In the process, the program detected elevated chemical exposures in at-risk populations and pioneered methods for returning results to participants, educating and empowering people to make decisions that could reduce chemical exposures. Biomonitoring California's studies have also identified emerging chemicals of concern—providing early warning of new environmental hazards—and have demonstrated the effectiveness of public health approaches that reduce chemical exposures.

At the most recent meeting in July, 2021, the SGP developed recommendations for the coming year to accompany the program's seventh report to the Legislature. To frame these recommendations, we note that the initial intent of the legislation was to create a comprehensive program to regularly test a representative sample of Californians for an extensive suite of known and emerging synthetic chemicals and pollutants. This type of surveillance study can provide valuable information, detecting significant exposures and assessing impacts of public health policy. This program has not yet been funded at the level needed to meet this mandate. In the current absence of such funding, the SGP recommendations are intended to make the best use of limited resources.

The following five recommendations emerged from the full panel's discussion:

1. Mitigate environmental health inequities;
2. Design intervention studies to identify the impact of public policy and non-regulatory actions;
3. Evaluate exposures associated with climate change;
4. Use non-targeted analyses to identify industrial or commercial chemicals previously unrecognized as pollutants;
5. Acknowledge the gap between what is feasible based on budget, and what would be required to meet the program's legislative mandate to conduct statewide surveillance.

We would like to briefly expand on each of these recommendations.

(1) The program should conduct studies to identify disparities in exposure to chemicals and pollutants in environmental justice communities and populations, as a first step toward addressing disproportionate harms. Studies designed to provide data on environmental health inequities could include biomonitoring for pesticide exposures in farmworker communities, or for diesel exhaust exposures in relation to distance from high-traffic roadways or other sources of particulate pollution, such as ports and distribution centers. Such studies can document disparities and inform targeted public health interventions. When they are representative, they can also provide a baseline for evaluating the effects of state and local policies.

(2) Intervention studies are often smaller studies that investigate questions specific to a particular public health or regulatory issue. They can help address health inequities (recommendation #1) by involving communities that are disproportionately affected by environmental contamination. This type of small-size but high-impact intervention studies can:

- Assess changes in exposure to a particular pollutant following intervention, such as in a currently planned study evaluating the impact of air filtration in a Central Valley community;
- Investigate the impact of consumer product changes. For example, the Foam Replacement Environmental Exposure Study (FREES) measures participants' flame retardant exposure before and after the removal or replacement of foam-containing furniture. The study includes residents of low-income housing;
- Examine the impacts of state or regional policy, such as CARB clean diesel rules.

Finally, these types of studies address community requests for action. Members of affected communities understandably and repeatedly call for agencies to go beyond data gathering and take action to reduce harms. Intervention studies contribute to both efforts simultaneously.

(3) The program should conduct studies that incorporate biomarkers of exposure to pollutants that are expected to increase with climate change, such as:

- Chemicals associated with fires at the wildland-urban interface;
- Pollutants in the private water supplies that rural communities depend on and that tend to concentrate as water scarcity worsens;
- Volatile or semi-volatile or persistent organic compounds whose concentrations rise with higher ambient temperatures.

Linking this recommendation with points (1) and (2) above, intervention studies can assess positive effects of infrastructure on exposure disparities, such as the presence of tree cover in mitigating exposure to air pollution, diversifying the community-level solutions to exposure disparities.

(4) Non-targeted analyses of chemical compounds conducted on biological samples can identify industrial or commercial chemicals and their byproducts and metabolites that were previously unrecognized pollutants. A majority of environmental chemical analysis is targeted, that is, biological samples are tested for a set of specific, known chemicals, and the concentration of those chemicals in the samples is compared to population-wide exposure data. Instead of testing for the presence of

specific chemicals, non-targeted analyses use new techniques such as gas chromatography coupled with time-of-flight mass spectrometry to detect and report-out a wide variety of chemicals present in biological samples.

One of the most valuable contributions that Biomonitoring California can make is to use non-targeted analysis to proactively identify health-relevant exposures in specific occupational groups, such as farmworkers and firefighters, or in high-risk groups, such as children from disproportionately polluted neighborhoods.

(5) Finally, in acknowledgement of the gap between the cost of statewide surveillance studies and the program's allocation, we recommend that Biomonitoring California design smaller studies that address other key elements of the program's mission, including generating data that assesses inequities and links exposures and health; evaluating temporal trends and the effectiveness of public health regulatory programs; and addressing community concerns.

We recognize that it is not within the purview of program staff to address budget issues, however the SGP has previously expressed concern that without additional funding Biomonitoring California could not fully meet its legislative mandate. SB 1379 directs the State to establish a biomonitoring program that, "will assist in the evaluation of the presence of toxic chemicals in *a representative sample of Californians* [emphasis added]," among other priorities. Although the Program launched the California Regional Exposure (CARE) Study as a surveillance project to measure and compare environmental chemicals in people in eight regions encompassing the entire state, the total resources allocated to the program have been insufficient to study a truly representative sample of Californians. Limited funding stretched the study's timeline over decades, making it impossible to compare results from different regions. Furthermore, each time funding decreases, the program risks losing lab personnel with specific analytical expertise with the result that the program can lose the ability to analyze particular panels of chemicals, irrespective of their public health significance.

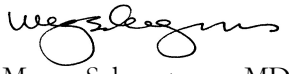
The most efficient way to fulfill the original legislative vision of statewide surveillance is to expand the reach of the CARE Study. We are buoyed by the recent investment the State has made in biomonitoring in the form of a $2 million budget augmentation for FY 2021-22. This augmentation will enable Biomonitoring California to hire additional staff, fund studies that have been limited by budget shortfalls and focus efforts on surveillance studies that can track trends in chemical exposures. However, while this budget augmentation is a step in the right direction, it will not on its own close the funding gap that keeps CARE from being truly representative. The study was initially expected to cost $10-12 millon per year (2007 dollars), significantly more than even the newly augmented program annual budget of $4.5 millon. With sufficient funding, the CARE study could:

- Devote sufficient resources for recruitment to ensure that disadvantaged populations are well-represented. Recruiting from California's marginalized communities is resource-intensive but prevents study populations from skewing toward wealthier and more highly educated groups.
- Increase sampling to simultaneously study more regions of California, ensuring that results are relevant to the whole state, and establishing time-trends that are comparable across the state.
- Expand chemical analyses—current measurements are limited to metals and some perfluoroalkyl and polyfluoroalkyl substances (PFASs). Sufficient funding would let the

program routinely measure a larger variety of chemicals in people, making efficient use of the study infrastructure that already exists. This would also enable the program to evaluate exposures relevant to high-prevalence diseases, such as breast cancer, which was among the founding rational for Biomonitoring California.

On behalf of the SGP, we reiterate our admiration for the extensive accomplishments of Biomonitoring California, particularly given the limitations based on available resources. We are grateful for the leadership of CDPH alongside the other state agencies charged with implementing this critical program, and we are pleased to offer our ongoing assistance.

Sincerely,



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