

IMPLEMENTATION OF THE CALIFORNIA ENVIRONMENTAL CONTAMINANT BIOMONITORING PROGRAM: 2010-2012

Report to the California Legislature

California Department of Public Health
In collaboration with
California Environmental Protection Agency's
Office of Environmental Health Hazard Assessment and
Department of Toxic Substances Control

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Executive Summary



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Executive Summary

People come into contact with many chemicals each day through using common materials such as personal care products, plastic items and cleaning agents, as well as consuming food and water. Biomonitoring measures chemicals in people's blood, urine, or other biological specimens to help determine which chemicals are present and in what amount. The California Environmental Contaminant Biomonitoring Program, also known as Biomonitoring California is a collaborative effort involving the California Department of Public Health (CDPH), the Office of Environmental Health Hazard Assessment (OEHHA), and the Department of Toxic Substances Control (DTSC). Biomonitoring California is the only ongoing legislatively mandated state biomonitoring program in the country. In SB 1379 (Perata, 2006 Session, chaptered as California Health & Safety Code sections 105440 et seq.), which established Biomonitoring California, the Legislature found that:

“...the establishment of a statewide biomonitoring program will assist in the evaluation of the presence of toxic chemicals in a representative sample of Californians, establish trends in the levels of these chemicals in Californians' bodies over time, and assess effectiveness of public health efforts and regulatory programs to decrease exposures of Californians to specific chemical contaminants. “

Measuring environmental chemicals in California residents will help scientists and policymakers answer such questions as:

- Which chemicals are in people's bodies and how high are the levels?
- Are the levels of chemicals changing over time?
- Are there groups or subpopulations in California that have higher exposures to specific toxic chemicals?
- Do regulatory efforts, including bans or phase-outs of chemicals, actually reduce exposures?
- Do certain chemicals contribute to the development of chronic diseases or conditions?

The principal goals of Biomonitoring California are to monitor, analyze, and report on specific environmental chemicals detected in blood, urine and potentially other biological specimens from a representative statewide sample of Californians and to assess the effectiveness of existing public health programs in reducing these chemical exposures. The Program is required to submit progress reports every two years to the Legislature, beginning in January 2010. This document is the second of these reports.

Program Structure and Resources

CDPH is the lead entity, with primary responsibility for: (1) overall design of the biomonitoring program, including both statewide and community surveys; (2) participant recruitment and sample collection; (3) receipt, storage and analysis of blood and urine samples for metals and chemicals that are not biologically persistent; (4) quality assurance and interpretation of laboratory test results; (5) communication of test results to participants; (6) data analysis; (7) generation of reports to the Legislature; and (8) dissemination of information to the public.

OEHHA has primary responsibility for: (1) administering and supporting the Scientific Guidance Panel; (2) evaluating and summarizing scientific information for the SGP's deliberations on chemicals for biomonitoring; (3) evaluating and summarizing scientific information used in returning test results to study participants (4) collaborating with CDPH on study design and data analysis; and (5) conducting public outreach efforts, including the program website.

DTSC has primary responsibility for: (1) analysis of blood samples for biologically persistent chemicals, and (2) quality assurance and interpretation of the laboratory's test results.

Biomonitoring California was envisioned in SB 1379 to include a statewide survey, in which the Program would measure levels of environmental chemicals in blood, urine, and possibly other biological specimens obtained from a representative sample of California residents. By successfully acquiring supplemental extramural support through a cooperative agreement with the U.S. Centers for Disease Control and Prevention (CDC), Biomonitoring California has been able to undertake smaller-scale community-based studies. The Cooperative Agreement's award period spans 2009-2014, with funding contingent upon available federal resources and adequate programmatic progress.

Scientific Guidance Panel

A nine-member Scientific Guidance Panel (SGP) appointed by the Governor and the Legislature provides technical peer review for the Program. SGP meetings provide opportunities for Biomonitoring California staff to update Panel members and the public on Program activities, request feedback and recommendations from the SGP members, and receive public comments. The SGP has played a critical role in advising the Program in many areas, including study design, collaborations with other researchers, reporting results to participants, and selection of chemicals for biomonitoring.

Study and Sample Design

During 2010-2011 Biomonitoring California staff conducted three pilot studies:

- Program staff collaborated with researchers from the University of California (UC), Berkeley and the UC San Francisco Program on Reproductive Health and the Environment on a pilot project in San Francisco County assessing exposures of 92 pregnant women and their infants to over 70 chemicals.
- Working with UC Irvine Center for Occupational and Environmental Health and the Orange County Fire Authority, staff conducted a project to measure levels of more than 75 chemicals in 100 Orange County firefighters.
- Biomonitoring California is collaborating with the Kaiser Permanente Northern California Research Program for Genes, the Environment and Health on a biomonitoring survey of California's Central Valley. Participants are similar in age, gender, and race/ethnicity to the general population in this region. This is the Program's first effort to obtain a sample representing the population of a large geographic region of the state.

The Program is exploring other methods of approximating a statewide survey. This includes examining whether blood samples collected through the State's Prenatal Screening Program (approximately 400,000 women annually) or dried blood spots from the Newborn Screening Program (approximately 500,000 infants annually) could be used for population-based biomonitoring surveillance.

A distinctive feature of Biomonitoring California is the requirement that biomonitoring results be returned to study participants who request them. The Program is collaborating with researchers at UC Berkeley and others to develop best practices and materials for returning individual test results to participants.

Laboratory Status

CDPH's Environmental Health Laboratory (EHL) and DTSC's Environmental Chemistry Laboratory (ECL) have implemented state-of-the-art testing methods for several types of chemicals in biological specimens. They have also developed standard operating procedures and quality assurance measures for chemicals analyzed as part of biomonitoring studies. Supplemental funding through the CDC Cooperative Agreement has allowed substantial augmentation in both laboratory capacity (i.e., the number of samples that can be analyzed in a given time) and capability (i.e., the types of chemicals that the laboratory can measure).

Public Participation Activities

Biomonitoring California staff has finalized a Public Involvement Plan (PIP) with goals and objectives that will guide the Program's efforts and activities. Staff also developed a brochure to provide basic information about the Program. Links to electronic versions of the PIP and brochure are available in the report.

A main portal for information about Biomonitoring California is the Program website, which provides public access to materials from past and upcoming SGP meetings and other Program activities. In addition, more than 750 stakeholders regularly receive Program email updates via the Biomonitoring California listserv.

Conclusions

In the years January 2010-December 2011, Biomonitoring California has made significant progress. Specifically, the program has:

- (i) greatly increased laboratory capability to analyze environmental chemicals;
- (ii) collaborated with several researcher partners;
- (iii) made significant progress on two targeted biomonitoring studies as well as a survey representing the population in a large region of California;
- (iv) detected elevated levels of mercury in the blood of a mother and infant in one of our studies which resulted in the two being referred to medical care providers; and
- (v) expanded outreach and developed materials to communicate biomonitoring results to study participants.

Notwithstanding the significant growth and development supported by CDC funding, the biggest challenge facing Biomonitoring California continues to be identifying sufficient stable, long-term resources to implement the mandate of the enabling legislation for a statewide biomonitoring survey and to continue operation of its complex laboratory infrastructure and functions. Biomonitoring California staff will continue to leverage State resources to acquire external funding to support and expand community and regional biomonitoring studies. Community-based projects focusing on specific populations add value by highlighting exposures in groups at particularly high risk for possible harmful effects from environmental chemical exposure; such studies provide information on chemical exposures in vulnerable populations and can inform environmental justice policies. Regional surveys complement community studies by providing information about exposures in large portions of California's diverse population. Surveys that represent the entire state's population are also needed to evaluate the effectiveness of California's environmental regulatory programs and provide information about environmental chemicals that pose the greatest hazards.

Note – this report covers the period through 2011 – subsequent reports will update this information. For updates about Biomonitoring California, visit our website at: <http://oehha.ca.gov/multimedia/biomon/index.html>.