

Increasing Awareness of Biomonitoring Findings – Upcoming Website Feature

Background Information

March 2018 Scientific Guidance Panel Meeting

Biomonitoring California is developing a website feature aimed at helping to increase awareness of key findings from our studies. At the [March 2018 Scientific Guidance Panel \(SGP\) meeting](#), we will demonstrate a draft version of this website feature.

The feature will include:

- Biomonitoring California findings described in simple, brief statements (examples provided below).
- Options to search and view findings by geographic region, group of people studied (e.g., pregnant women, firefighters, or children), or chemical measured.
- Web pages for each region that will display a map of the area, studies conducted in the region, and findings from those studies.
- Links to more information to dig deeper on a finding, including details on the study that produced the finding and fact sheets on the relevant chemicals.

While we will not have time at the March 2018 SGP meeting to discuss study findings in detail, we will provide a form on which Panel members and the public can make suggestions on possible approaches for summarizing findings and specific ideas on key findings to include in the website feature. We will collect input at the SGP meeting; suggestions can also be sent before or after the meeting to biomonitoring@oehha.ca.gov.

Below are examples of key findings to illustrate the kind of information proposed for inclusion in the feature. We also provide a list of recent publications from Biomonitoring California collaborative studies, to help inform suggestions for and discussion of ways to briefly summarize various types of findings.

Examples of findings

1. Higher levels of benzophenone-3 in firefighters compared to the general population.

Higher levels of benzophenone-3 (BP-3) were measured in [Southern California firefighters](#) compared to the general U.S. population. BP-3 is suspected of interfering with natural hormone activity. It is found in sunscreens, other personal care products, and plastic packaging. Protective equipment and clothing used by firefighters may also contain BP-3. More research is needed to pinpoint the source(s) of exposure responsible for the unusually high levels in this group of firefighters.

Finding drawn from: Waldman JM, Gavin Q, Anderson M, Hoover S, Alvaran J, Ip HSS, Fenster L, Wu NT, Krowech G, Plummer L, Israel L, Das R, She J (2016). Exposures to environmental phenols in Southern California firefighters and findings of elevated urinary benzophenone-3 levels. *Environ Int* 88:281–287. doi: 10.1016/j.envint.2015.11.014. [Link to abstract](#). Full article available upon request.

2. Higher levels of PBDE flame retardants in firefighters compared to the general population.

Higher levels of PBDE flame retardants were measured in [Southern California firefighters](#) compared to the U.S. general population. Within this group of firefighters, our study also found that the use of personal protective gear and regular cleaning of the gear were associated with lower flame retardant levels.

Finding drawn from: Park J-S, Voss RW, McNeel S, Wu N, Guo T, Wang Y, Israel L, Das R, Petreas M (2015). High exposure of California firefighters to polybrominated diphenyl ethers. *Environ. Sci. Technol* 49(5):2948-58. [Link to abstract](#). Full article available upon request.

3. Higher levels of persistent pollutants like PCBs in infants compared to their mothers.

In a [study of pregnant women and their infants in San Francisco](#), higher levels of some chemicals, including PCBs, organochlorine pesticides, and PBDE flame retardants were found in infants' cord blood compared to blood samples from their mothers. Exposure to these chemicals may harm the developing fetus and infant, possibly affecting later learning and behavior.

Finding drawn from: Morello-Frosch R, Cushing LJ, Jesdale BM, Schwartz JM, Guo W, Guo T, Wang M, Harwani S, Petropoulou S-SE, Duong W, Park J-S, Petreas M, Gajek R, Alvaran J, She J, Dobraca D, Das R, Woodruff TJ (2016). Environmental chemicals in an urban population of pregnant women and their newborns from San Francisco. *Environ Sci Technol* 50(22):12464-12472. [Link to abstract](#). Full article available upon request.

See <https://biomonitoring.ca.gov/program-accomplishments> for other examples of key Program findings.

Some recent publications

Publication with results from the [Health and Environmental Research in Make-up of Salinas Adolescents \(HERMOSA\) Study](#), an intervention study:

Berger KP, Kogut KR, Bradman A, She J, Gavin Q, Zahedi R, Parra KL, Harley KG (2018). Personal care product use as a predictor of urinary concentrations of certain phthalates, parabens, and phenols in the HERMOSA study. *J Expo Sci & Environ Epi*. Epub: Jan 9, 2018. DOI:10.1038/s41370-017-0003-z. [Link to abstract](#). Full article available upon request.

Publications that track exposures over time:

From the [California Teachers Study \(CTS\)](#): Hurley S, Goldberg D, Wang M, Park J-S, Petreas M, Bernstein L, Anto-Culver H, Nelson DO, Reynolds P (2018). Time trends in per- and polyfluoroalkyl substances (PFASs) in California women: Declining [serum](#) levels, 2011-2015. *Environ Sci Technol* 52(1): 277–287. [Link to abstract](#). Full article available upon request.

From [UCSF Studies of Pregnant Women](#): Parry E, Zota AR, Park J-S, Woodruff TJ (2018). Polybrominated diphenyl ethers (PBDEs) and hydroxylated PBDE metabolites (OH-PBDEs): A six-year temporal trend in Northern California pregnant women. *Chemosphere* 195:777-783. [Link to abstract](#). Full article available upon request.

Publication from the [Women's Health and the Environment \(WHE\)](#) Study, examining associations between exposure biomarkers and markers of reproductive function:

Luderer U, Christensen F, Johnson WO, She J, Ip HSS, Zhou J, Alvaran J, Krieg EF Jr, Kesner JS (2017). Associations between urinary biomarkers of polycyclic aromatic hydrocarbon exposure and reproductive function during menstrual cycles in women. *Environ Int* 100:110-120. [Link to abstract](#). Full article available upon request.

For a complete list of Biomonitoring California publications, visit:
<https://biomonitoring.ca.gov/biomonitoring-california-publications>.