

What Exactly Is An Environmentally Relevant Dose?



[Steven Hentges, Ph.D](#)

Tuesday, March 20, 2018 [SAFETY](#)

The term “environmentally relevant dose” is commonly used to characterize the dose of a chemical that is given to laboratory animals in scientific studies. More specifically the term is used to signal that the results of the study are important.

But what does the term actually mean? Presumably it means that the dose given to laboratory animals is comparable (i.e., relevant) to the levels that people are actually exposed to from their environments (e.g., from diet, drinking water, air).

In that light, a recent [press release](#) on a new study from Canadian researchers that referred to environmentally relevant doses of BPA is particularly puzzling. If the study was highlighted in a press release it must be important, right? But were the doses tested really relevant to actual human exposures?

If we know anything about BPA, we know very well how much BPA people are exposed to in their daily lives. In a [study published last year](#), a group of researchers in China searched the scientific literature for all available studies that measured the level of BPA in human urine.

Because people quickly eliminate BPA from the body through urine after exposure, measuring BPA in urine is considered the best way to evaluate exposure to BPA. What goes in (i.e., exposure) quickly comes out in urine where it’s easy to measure.

The researchers found “*over 140 peer-reviewed publications, which contained over 85,000 data [points] for urinary BPA concentrations derived from 30 countries.*” In comparison to this large body of globally representative data, the two doses given to mice in the new

study, which the authors described as “environmentally relevant,” were approximately 1,000 and 1,000,000 times higher than typical human exposure.

More recently the Canadian government released its [fourth biennial report](#) on exposure of the Canadian population to a variety of chemicals, including BPA. Since typical exposure to BPA in Canada is even lower than the global average, the Canadian researchers could not have been referring to environmentally relevant doses in Canada.

Not answered by the press release or the new study it highlighted is the most important question – are **actual** levels of human exposure to BPA safe or not? A resounding answer to that question was recently provided by the U.S. Food and Drug Administration after completion of its so-called [CLARITY study](#), the size and scope of which are [unprecedented](#). As [stated](#) by Dr. Stephen Ostroff, Deputy Commissioner for Foods and Veterinary Medicine at FDA: “*our initial review supports our determination that currently authorized uses of BPA continue to be safe for consumers.*”

So what could account for the wide discrepancy between the “environmentally relevant” doses tested in the new study and actual human exposure levels? Based on the extensive amount of data available on actual human exposures, the doses in the new study are better characterized as “environmentally *irrelevant*.”