

## **Bao et al study\* associating BPA and risk of mortality: highly questionable methodology and conclusion**

*In the study published 17.8.2020 in JAMA Network Open the authors suggest an association between single BPA spot urine measurements and risk of mortality in US adults over a period of 10 years – media have reported with simplified headlines that do not convey the reality of the study. In fact, the authors themselves note several weaknesses of their analysis and the underlying database. Especially as BPA is rapidly excreted after ingestion, this raises fundamental questions on any form of relationship between one single BPA exposure measurement and long term health effects. The authors' conclusion therefore appears highly questionable.*

### **Key issues of the current publication:**

- The authors *suggest an association* between BPA exposure and risk of mortality. However, the dataset used in this study does not allow to establish a cause-effect relationship, and the statistical method applied is prone to reflect coincidences, rather than robust cause-effect correlations.
- The underlying NHANES\*\* dataset is based on one single spot urine sample per study participant. This represents a snapshot of one moment in the life of this person. As such, it cannot provide valid information about respective longterm exposure to BPA, as BPA is rapidly metabolized and excreted within 24 hours.
- According to the US Center for Disease Control (CDC\*\*\*), NHANES serves as an important source of data for determining the burden of chronic diseases and prevalence of risk factors in the US. The-NHANES biomonitoring data can be used "... so that appropriate studies can be conducted to determine whether these levels pose a health risk". As noted above, the NHANES data and the way that BPA is metabolized and excreted illustrate why the Bao et al. study design is inappropriate for the health effect (mortality) being studied, which can occur up to 10 years after the exposure is recorded once in NHANES and after the BPA has been metabolized and excreted.
- Furthermore, the description of the study approach and applied statistical techniques is extremely limited and does not allow a robust assessment of the study methodology.

### **Facts: Exposure to BPA is very low and confirmed to be safe by authorities globally**

Total exposure to BPA from all sources is very low, and below the safe intake levels set by safety authorities around the globe. Small amounts of BPA that enter the body are rapidly inactivated via the normal metabolism, and subsequently fully eliminated via the urine within 24 hours.

In its recent assessment of BPA the European Food Safety Authority EFSA concluded that "BPA poses no risk to human health from foodstuffs because current levels of exposure are well below the t-TDI (temporary tolerable daily intake) of 4 µg/kg of bw/day."

"BPA is one of the most thoroughly tested chemicals used today and has a safety track record of more than 50 years. Regulatory bodies around the world have reviewed the science and have found BPA to be safe in its applications", said Jasmin Bird, PC/BPA-group of PlasticsEurope. "Total exposure to BPA, from all sources, is extremely low — and far below the safe intake levels set by the safety authorities globally."

Comments of other scientists provided on the study by Bao et al. can be accessed from the Science Media Centre. \*\*\*\* For example, Prof Kevin McConway, Emeritus Professor of Applied Statistics, The Open University, said: "... *this research (and any findings from similar studies, taken on their own) simply cannot establish whether having more BPA in one's body has a causal effect on the risk of death in a certain time period. This does not rule out that such an effect might exist, but it cannot show that it does exist, and there are alternative explanations for the findings.*"

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\* **JAMA Network Open.** 2020;3(8):e2011620. *Association Between Bisphenol A Exposure and Risk of All-Cause and Cause-Specific Mortality in US Adults*; Wei Bao, MD, PhD; Buyun Liu, MD, PhD; Shuang Rong, PhD; Susie Y. Dai, PhD; Leonardo Trasande, MD, MPP; Hans-Joachim Lehmler, PhD; doi:[10.1001/jamanetworkopen.2020.11620](https://doi.org/10.1001/jamanetworkopen.2020.11620)

\*\* **National Health and Nutrition Examination Survey (NHANES)** is a nationally representative health survey program of the population in the United States, administered by the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC).

\*\*\* US Center for Disease Control(CDC) <http://www.cdc.gov/exposurereport/faq.html>

\*\*\*\* <https://www.sciencemediacentre.org/expert-reaction-to-study-looking-at-bisphenol-a-bpa-and-risk-of-long-term-mortality/>

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