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When Science and Headlines Don't Align

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In our ongoing tracking of articles that purport to be science-based, we have noticed that flashy headlines and simplistic interpretations of scientific research seem to be appearing more and more in the media. To test our theory, we surveyed recent reporting on human health effect information related to bisphenol A (BPA). In our review, we evaluated article headlines from *Prevention*, a prominent health magazine that has published on BPA research and provided its readers with health advice based on that research.

Below are headlines reported in *Prevention*, along with an overview of the science as reported in the article, followed by a discussion of what the U.S. Food and Drug Administration (FDA) concluded when it reviewed each referenced article as part of its December 2014 assessment of BPA safety in food packaging.[1] As I am sure the editors at *Prevention* would agree, it is incumbent upon the magazine's reporters and editors to look closely into the science that forms the basis of their articles to make sure the actual findings and methodology match the story being presented to its readers. This is particularly important if the reporter goes on to encourage the reader to implement certain lifestyle changes as part of that science reporting.

2013 -- *The Truth About Canned Foods: What they're really doing to you*

In this article, *Prevention* reported on a study that linked BPA exposure to kidney damage. In the study, the researcher analyzed urine samples from 667 children between the ages of 6 and 19. The analysis looked at the level of BPA and the level of a protein, albumin, and attempted to correlate the high levels of BPA to high levels of albumin. The researcher stated that a higher level of albumin was associated with kidney damage and its presence showed this damage. The magazine article concluded with the suggestion that canned food should be avoided.

In its 2014 review of BPA research, the FDA reviewers pointed out that BPA is quickly metabolized and removed from the body, and as a result, a one-time measurement, which was the case in this particular study, is not reflective of a person's actual exposure. The critique of this study also stated: "Both BPA level and albuminuria can be related to lifestyle factors, and the investigator did not have information on diet and exercise which are potential confounders." Additionally, the FDA reviewers stated that the researcher mischaracterized what was considered "high" levels of albumin, which are actually considered to be normal. The FDA reviewers also noted that the very small increases in albumin seen by the researchers would not likely cause any adverse effects. FDA reviewers classified this study as of limited use for Hazard Identification and no use in the Risk Assessment process.

2012 -- *BPA Now, Heart Disease Later: The scary new connection between bisphenol A and heart disease*

In this article, the magazine reported on published research correlating higher levels of BPA in urine samples with adults reporting cardiovascular disease ten years after the measurement. The magazine stated: "What's of particular note with this study is that it suggests *everyone* is at risk to the harmful effects of BPA—not just developing fetuses and infants, as many researchers previously believed." The article also included a quote from a third party scientist, who reportedly stated: "This study suggests that adults are sensitive to this chemical, and probably other chemicals. There probably is no safe period of exposure."

FDA identified serious limitations in this study upon its review in 2014. The most glaring is the fact that the researchers used a single point-in-time measurement of BPA ten years earlier to extrapolate its effects on a lifetime condition like heart disease. In short, a single measurement of BPA in urine measures what that person ate in the last four to six hours. It is not relevant to actual exposures for later that same day, let alone a decade later. Single measurements of short-lived chemicals are used to evaluate what a population's exposure is and not an individual's exposure, as this study suggests. Additionally, FDA reviewers also noted that the high number of non-detectable BPA samples may have affected the study's statistics. FDA reviewers again stated the study has limited use for Hazard Identification and no use in the Risk Assessment.

2012 -- *10 Strange, New Suspects That Could Cause Breast Cancer: Everyday exposures could increase your breast cancer risk. Here's how to avoid them*

In this review, *Prevention* looked at ten everyday items that could increase a woman's chances to get breast cancer. The article references canned foods as a potential source, citing a study with primates. The magazine article states: "A 2012 study found monkeys exposed to BPA while pregnant were most likely to give birth to little girls with dense breasts, a known risk factor for breast cancer later in life."

In this study, the researchers attempted to expose monkeys to BPA using two different routes, one in a single daily dose and the other using a slow release capsule. These two groups are compared to a control group that was not exposed to BPA.

In the 2014 review, the FDA reviewers cited numerous flaws in this study and determined that the study had no utility in Hazard Identification and no utility in the Risk Assessment. Some of the key flaws include the fact that the data were varied dramatically and did not allow for the deduction of any sound conclusions. The reviewers also noted that unlike humans, monkeys are only fertile twice a year and the timing of the studies for the test animals was not synched to that cycle and varied for the three groups. Also, the intradermal implant drew criticism because it has little utility in actual exposures for humans. Another noted issue was the level of exposure, which was ~1,000 times higher than human exposure to BPA.

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This brief review of articles highlights a general lack of understanding of scientific research by the media, a disturbing lack of scientific justification, and a failure to provide an accurate analysis of scientific studies. This review suggests that the general public needs to be wary of sensationalistic headlines that may or may not provide full scientific information when it comes to complex health issues and chemicals like BPA.

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[1] U.S. Food and Drug Administration, Memorandum from Bisphenol A (BPA) Joint Emerging Science Working Group to FDA Chemical and Environmental Science Council (CESC), Office of the Commissioner, "2014 Updated Review of Literature and Data on Bisphenol A (CAS RN 80-05-7)" (June 6, 2014).