

June 1, 2016

Howard Bauchner, M.D.
 Editor in Chief
JAMA: The Journal of the American Medical Association

Via e-mail: howard.bauchner@jamanetwork.org

Dear Dr. Bauchner,

I am a wildlife veterinarian with the PETA Foundation and have worked with elephants as well as their handlers and veterinarians in both North America and India. I'm writing in response to the article "Potential Mechanisms for Cancer Resistance in Elephants and Comparative Cellular Response to DNA Damage in Humans" by Lisa M. Abegglen *et al.* published by *JAMA* on November 3, 2015. The calculations conducted and published in this article for the incidence of cancer in elephants are unreliable, and I respectfully request that the editors issue an expression of concern about the misleading conclusion that the article draws.

The authors calculated the incidence of cancer in elephants from data that were collected strictly from captive elephants. While wild elephants have a natural life expectancy similar to that of human beings, captive elephants in zoos suffer from a substantial list of physical and psychological illnesses that run rampant in zoological and circus settings and routinely result in premature death. Unlike wild elephants, those in zoos suffer from a high incidence of debilitating foot disease, including cracked, infected nails and abscesses beneath the soles of their feet. A variety of factors found in captivity, including unnatural substrates, confinement, and abnormal behavior, are also thought to play a role in the development of early onset osteoarthritis, which is commonly observed in captive elephants. In fact, osteoarthritis and foot disease are the leading causes of euthanasia among captive elephants, who routinely die decades earlier than their wild counterparts.¹

Indeed, Table 1, included in the article, presents data for 644 captive elephants. Excluding neonatal deaths, the ten-year period from ages 16 to 25 years has the highest number of elephant deaths, according to this data set, which reflects the highly premature age of death routinely observed in captivity as a result of captive conditions. Since cancer risk increases with age, the use of data from a captive elephant population would be expected to skew the true incidence of cancer in wild elephants dramatically.

Moreover, the authors obtained unreliable mortality data from an online source that is factually unverified. The data that the authors claimed to have obtained from an "Elephant Encyclopedia" were actually from a website (<http://elephant.se/>) that is by no means comprehensive, peer-reviewed, or a primary source. The information on this website, which is maintained by a

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¹Fowler, M.E. and Mikota, S.K. (Eds). *Biology, Medicine, and Surgery of Elephants*. Ames, Iowa: Blackwell Publishing, 2006.

Swedish Web developer, is hearsay gathered primarily from news reports and statements by elephant exhibitors. It is not comprehensive and is often unverifiable, and the data also often conflict with other sources, such as the Association of Zoos & Aquariums' elephant studbooks. Citing this source as the *basis* for the article's claims that elephants don't often get cancer (or don't often die of cancer) should be unacceptable in a publication such as *JAMA*, because this source is no more authoritative or credible than Wikipedia.

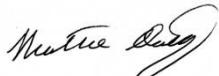
Furthermore, the data used to compare the incidence of cancer in 36 mammalian species were obtained from a population of animals housed at a single facility before 1983. The longevity of wild animals held in captivity varies widely because of species, the conditions of the captive environment, husbandry and veterinary care, and the particular disposition of the animal. There were apparently no efforts made by the authors to control for these confounding variables. Nowhere within the publication is there evidence that the authors used specific exclusion criteria, such as age at death, when selecting necropsies to include in their data set. This is important because elephants generally have shortened life spans in captivity, whereas some other mammals have increased life spans in captivity, which may skew cancer rates. Equally concerning is the fact that there is no information on the exact number of necropsies included on a per-species basis, except for a mention that there was a "minimum of 10." Comparing data for only 10 individuals of a species who have died after living an artificial life in captivity—where a number of unnatural factors influence their overall health and longevity—cannot be considered an adequate sample size or lead to a valid finding. In addition, these data are old. In the 33 years since this study was published, husbandry practices and conditions in many zoos have changed, which may further affect the incidence of cancer in captive populations.

Finally, as you know, two of the authors of this article are employees of Ringling Bros. and Barnum & Bailey Circus, which also helped to fund the study and to provide elephant blood samples. In the months since *JAMA* published the article, the circus has used it to publicize its shows in dozens of towns and to justify its use of bullhooks on elephants, which are abusive training weapons that have been banned in many towns. The circus has used the so-called findings of this study to propagate deceptive and misleading headlines implying that elephants don't get cancer. Citing such scientifically unfounded findings and employing them as a justification for the continued use of abusive training techniques with elephants is unethical.

Because the very premise of this article is based on unreliable data and its authors have used those unsubstantiated claims to mislead the public, I encourage the *JAMA* editorial board to issue a retraction or expression of concern about this article.

I appreciate your attention to this important matter.

Very truly yours,



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