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### The authors reply: Using lay media for epidemiology of snakebite fatality

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### The authors reply: Using lay media for epidemiology of snakebite fatality



We thank Dr. Mullins for his interest in our article “Epidemiology of fatal snakebites in the United States 1989 – 2018” [1]. Dr. Mullins is concerned that we used media reports to identify some of the snakebite fatalities. We clearly acknowledged that using Wikipedia and news sources was a limitation, but, realistically, the demographic information we included in our study requires no specific medical background to interpret. Our primary data included age, sex, location, circumstances of the envenoming, and suspected snake species. Healthcare professionals are no more likely to report this information correctly than non-medical personnel. In fact, a study from Mississippi proved that many people, including healthcare professionals, frequently misidentify snakes in areas where copperheads and cottonmouths coexist [2]. We would understand Dr. Mullins' concerns if we were relying on mainstream media to provide medical information, including cause of death. However, that was not a primary focus of our paper.

Dr. Mullins specifically addresses the three Missouri snakebite fatalities. He notes that the gentleman who died in 2012 may have had coronary artery disease. He points out that the 2015 victim may have consumed alcohol and prescription opioids following a bite which the patient then attempted to treat using pre-hospital “first aid” techniques that are contraindicated in snakebite. Dr. Mullins acknowledges that the fatality in 2014 was unequivocally due to a copperhead envenomation.

Dr. Mullins is undoubtedly aware that there are many elements that determine the overall severity of an envenomation. There are factors intrinsic to the snake itself, e.g., its health, the mixture of various venom components, and the volume of venom delivered. Similarly, there are patient characteristics that affect the response to the envenomation, including the victim's underlying health and concomitant medication and alcohol use. These factors may have affected the response to the envenomation, but there is no question that in both cases there were envenomations that were ultimately fatal.

In summary, we identified 101 fatalities due to native snakebites in the United States between 1989 and 2018. Although Dr. Mullins disapproves of our methodology, our conclusions are the ultimately the same.

Copperheads, cottonmouths, and multiple rattlesnake species can all cause fatal snake envenomations, with an average of 3.4 deaths annually.

### References

- [1] Greene SC, Folt J, Wyatt KM, Brandehoff NP. Epidemiology of fatal snakebites in the United States 1989–2018. *Am J Emerg Med.* 2020 Aug 29. <https://doi.org/10.1016/j.ajem.2020.08.083> S0735-6757(20)30777-4.
- [2] Cox RD, Parker CS, Cox ECE, Marlin MB, Galli RL. Misidentification of copperhead and cottonmouth snakes following snakebites. *Clin Toxicol (Phila).* 2018;56(12):1195–9.

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