Association between daily high temperature and copperhead envenomations reported to a regional poison center

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Background

- Venomous snakebite incidence is projected to increase as climate change progresses
- The northern terminus of the Eastern copperhead range may be more sensitive to temperature variation
- There is limited published literature on this association between weather and bites in this geographic area

Objectives

- Determine the association between ambient air temperature and incidence of copperhead envenomation between 2005 and 2022 in Maryland

Methods

- Retrospective case-crossover study using Maryland Poison Center Data 1/2005 - 11/2022
- Cases identified by generic code search, reviewed by two independent abstractors
- Cases excluded if: no bite occurred, case occurred outside of region covered by the poison center, or snake kept as a pet
- Daily high temperature data obtained from Climate Data Online for nearest weather station
- Control dates for temperature data were 7 days prior to envenomation date
- Odds ratio calculated using conditional logistic regression
- Student's t-test used to compare temperatures between groups

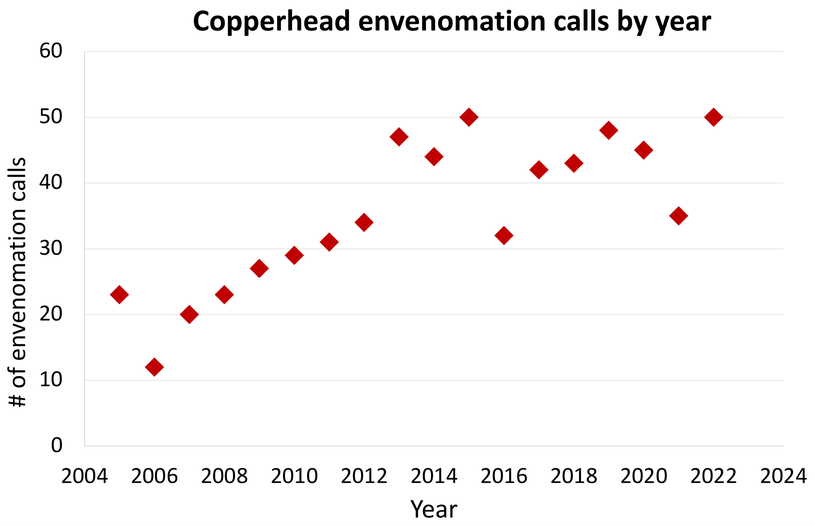
Conclusion

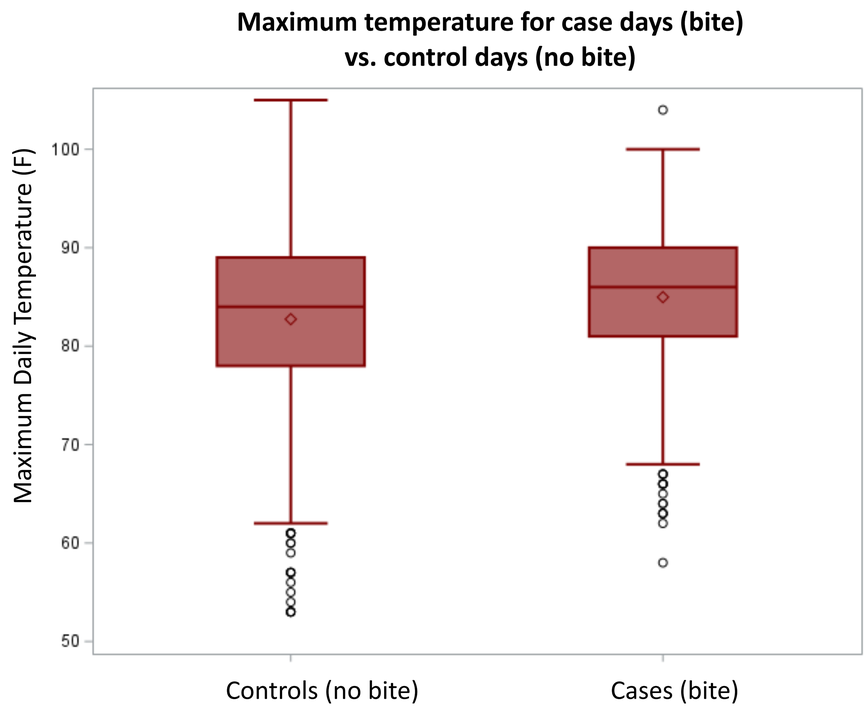
We found a **significant positive association** between **daily maximum temperature and copperhead envenomations.** For every 1-degree Fahrenheit increase in daily maximum temperature, we found a 6.5% relative increase in odds of envenomation.

Results

- **624** envenomations reported over included period

	N (%)
Age in years; mean (SD)	40.9 (20.1)
Age <18	109 (17%)
Male	389 (62%)
Time of day when bite occurred	
Night (2300-0459)	49 (8%)
Morning (0500-1059)	77 (13%)
Midday (1100-1659)	201 (33%)
Evening (1700-2259)	299 (50%)
Received antivenom (N, %)	343 (55%)
Location of bite on body	
Upper extremity	292 (46%)
Lower extremity	325 (51%)
Other location	3 (0.5%)
Not recorded	14 (2%)





- There was a 6.5% (95% CI: 4.5% - 8.5%) relative increase in odds of copperhead envenomation for each one-degree Fahrenheit increase in daily high temperature.
- Mean maximum temperature on case days was 84.98 degrees (Standard Error: 0.29) vs. 82.43 (0.36) degrees on control days ($p<0.0001$)