

# A Retrospective Analysis of Spatial Patterns of Chronic Wasting Disease in Kansas

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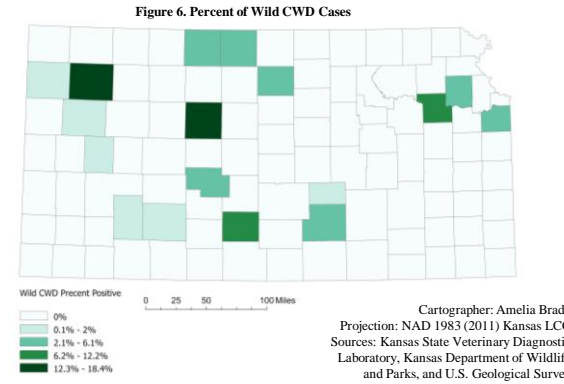
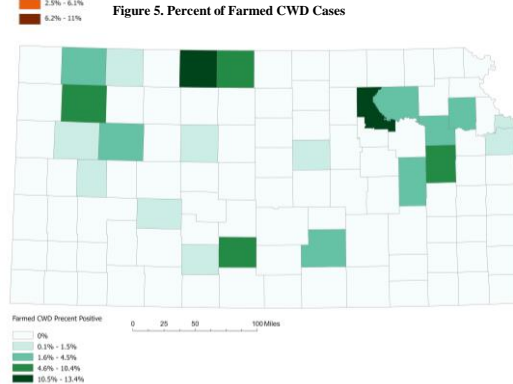
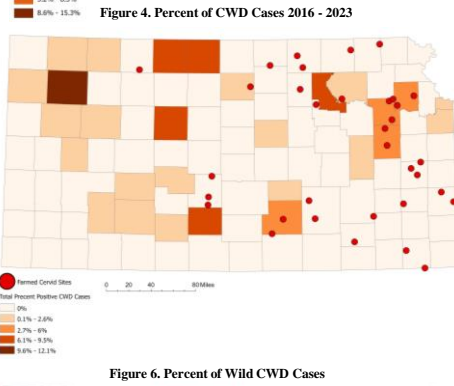
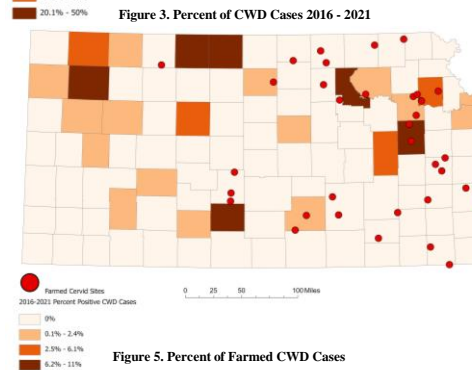
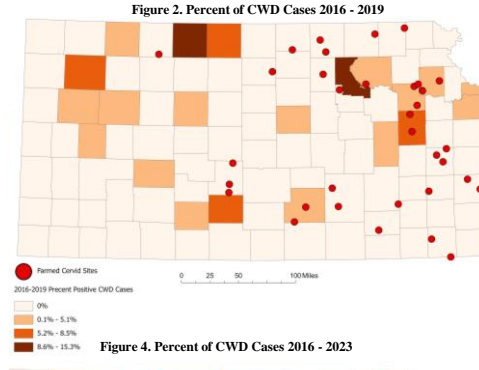
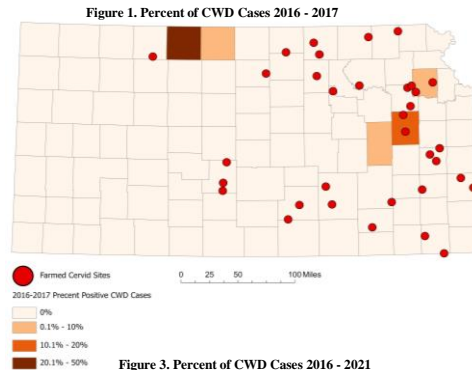
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## Background

- This preliminary study spatially identified Chronic Wasting Disease (CWD) patterns in Kansas.
- CWD is a prion disease in cervid species. The first cases of CWD were identified in 1967 in farmed mule deer in Colorado and Wyoming. [1]
- The incubation time for CWD in cervids is 2 to 4 years and cases are difficult to identify until symptoms emerge. [1]
- CWD transmission: Infected cervids can shed pathogenic prion proteins (PrP<sup>Sc</sup>) through bodily fluids. Blood and saliva have the highest levels of PrP<sup>Sc</sup>, and urine and fecal matter also contain PrP<sup>Sc</sup>. As cervids experience excessive drooling and urination, they spread PrP<sup>Sc</sup> throughout their environment. [1]

## Methods

- All Surveillance data was collected from the Kansas State University Veterinary Diagnostic Laboratory in cooperation with the Kansas Department of Wildlife and Parks.
- Data was cleaned and analyzed using R and Microsoft Excel.
- Using ArcGIS Pro, the percentage of positive CWD cases and farmed cervid sites were spatially mapped.



## Results

- Among the samples collected from 2006 to 2023, the greatest annual average of CWD cases occurred in 2022, with 14 positive cases, representing 1.3% of sampled cervids.
- The estimated overall prevalence of CWD in Kansas from 2006 to 2023 was 2.6 cases per 100 cervids.
- Zip-code level data was visually explored using geographic information system (GIS) mapping.
- The results revealed that zip code 67701, which covers portions of Thomas County and Rawlins County in Kansas, reported the highest total number of positive cases between 2006 and 2023.

## Conclusions

- These findings emphasize the necessity of continued CWD surveillance in Kansas cervids.
- For farmed and wild cervid, a multi-pronged One Health Approach could reduce CWD prevalence in hot spot areas and preserve cervid populations. (4)
- This multi-pronged approach should be interdisciplinary and bring together scientists, wildlife veterinarians, wildlife biologists, human health experts, agricultural economists, and policymakers. (4)

## Data Sources

- Rivera NA, Brandt AL, Novakofski JE, Mateus-Pinilla NE. 2019. Chronic Wasting Disease in Cervids: prevalence, impact and management strategies. *Veterinary Medicine: Research and Reports* Volume 10:123-139.
- Distribution of chronic wasting disease in North America | U.S. Geological Survey. <https://www.usgs.gov/media/images/distribution-chronic-wasting-disease-north-america-0>
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- Gilch S. 2022. Chronic wasting disease — A prion disease through a One Health lens, *The Canadian Veterinary Journal* 63:431-433.