ABSTRACT

TITLE:	Why Is the Four Corners Region a "Hot Spot" for Human Infection with Hantavirus?
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ABSTRACT: Sin Nombre virus (SNV) is a hantavirus hosted almost exclusively by deer mice (Peromyscus maniculatus) that causes high (~40%) mortality in humans. Transmission patterns of SNV in natural host populations are not well understood and, as such, represent a knowledge gap that has significant implications for human health. Since SNV's identification in the early 1990's, the Four Corners region of the southwestern United States has remained a "hotspot" for SNV infections in both deer mice and humans; however, the reason for this skewed geographic distribution of SNV remains unclear. Therefore, our objective was to observe regional patterns of SNV prevalence in deer mice along a latitudinal gradient in the Four Corners region and determine the extent to which prevalence is influenced by factors including deer mouse density, small mammal diversity, vegetation cover, plant moisture content, soil pH, and soil water content. Although we did not find a significant correlation between SNV prevalence and small mammal species diversity, SNV prevalence and deer mouse density were positively correlated. We found no relationship between soil pH and SNV prevalence; however, there was a strong negative correlation between SNV prevalence and soil water content. We also found strong positive correlations between SNV prevalence and total vegetation cover and between SNV prevalence and plant moisture content. Collectively, our results suggest that SNV prevalence is driven primarily by increased deer mouse densities and that deer mice are more likely to be associated with habitats that have higher plant moisture content, as well as greater total vegetation cover. Our results also indicate that, whereas soil pH is not a direct predictor of SNV prevalence, sites with dry soils at pH levels close to the optimal for SNV (6.9) that also contain high densities of deer mice may be hantavirus "hot spots".