HEAT-RELATED MORTALITY: A RURAL PROBLEM TOO

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One of the most commonly assumed beliefs about heat vulnerability is that it is solely an urban problem. Results from this study, which is unique in that it examines heat-related mortality on a sub-metropolitan area level, suggest otherwise. Across the state of Ohio, over the 24-year period examined, rural populations are as susceptible as urban populations to heat-related mortality. On a day of oppressive heat and the day following, mortality totals across the state as a whole increase by approximately 20 deaths above the baseline. While approximately two-thirds of these deaths are found within urban counties, when mortality rates are compared relative to the population, it is actually the rural and suburban locations where mortality increases most, approximately 5 percent. Urban counties are slightly lower (4 percent), although this difference is not statistically significant.

This research has been performed using a synoptic methodology, dividing days into Spatial Synoptic Classification weather types, based on similar surface weather characteristics (Sheridan 2002). This method is similar to that utilized in numerous new heat watch-warning systems, operating in Philadelphia (Kalkstein et al. 1996), southwestern Ohio, and over a dozen other locations worldwide. Two weather types, Dry Tropical (hot, sunny, and dry) and Moist Tropical Plus (very warm and oppressively humid), are associated with elevated mortality across the state (Table 1). These are the same weather types that trigger heat alerts and warnings in the Southwestern Ohio Heat Watch/Warning System. The rates listed in Table 1 include the mortality response on both a 0-day and 1-day lag for the summers (15 May to 30 September) of the period 1975-1998.

These results demonstrate that heat vulnerability is not merely an urban phenomenon. As much spatial variability has been observed on the individual county level, future work will endeavor to understand this variability in heat vulnerability by accounting for differences among the counties aside from their urban/rural character. A preliminary test showed that counties with a greater percentage of housing built prior to 1950 had greater increases in mortality with oppressive weather conditions, though this is only significant at α=.15. Other factors, including income level and percentage of those not in the work force may also help clarify the differences, though these have yet to be examined.

REFERENCES

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Table 1. Mean anomalous mortality, in total deaths and percentage change relative to baseline, by urbanization level of county for each of the two oppressive weather types. Urban counties include the center cities of metropolitan areas; suburban counties include all other counties in metropolitan areas; rural counties include all counties not part of a metropolitan area.

	DRY TROPICAL		MOIST TROPICAL PLUS	
County type	**Deaths**	**Percentage**	**Deaths**	**Percentage**
URBAN	+11.4	+3.5%	+13.3	+4.1%
SUBURBAN	+3.9	+4.1%	+5.6	+5.8%
RURAL	+4.3	+5.1%	+3.9	+4.7%