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Linking Synoptic Weather Types and Asthma-Related Hospital Admissions in New York State

C. Lee (1), S. Sheridan (2), and S. Lin (3)

(1) Kent State University, Kent, Ohio, United States (cclee@kent.edu), (2) Kent State University, Kent, Ohio, United States (ssherid1@kent.edu), (3) New York State Department of Health, Albany, New York, United States (sxl05@health.state.ny.us)

Asthma is one of the most widespread and costly afflictions in the United States and globally, costing tens of billions of dollars annually in the US alone, and affecting an estimated 11% of the US population. Due to a strong seasonal cycle in admissions and previous studies linking temperature and humidity to reduced lung function, many researchers have aimed to examine the relationship between weather and asthma. However, confounding meteorological factors and lag effects, among other reasons, have limited the understanding of this relationship in previous research. This study, therefore, aims to explore both of these aspects, utilizing the holistic weather types of the Spatial Synoptic Classification to examine the weather-asthma association within two age groups in the US state of New York. In accord with limited previous synoptic-based research, results show an uptick in asthma related hospital admissions under dry and cool autumn conditions in the New York City region for the school-aged population, and under dry and warm summer conditions for the adult population in that region. However, results do vary markedly by age group, season and region, with a spike-day analysis providing clearer results than those obtained with total anomalous admissions.