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A Study of Chronic Bronchitis in New York State using Spatial Synoptic Classification and Distributed Lag Non-Linear Modeling Techniques

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In this study, New York State (U.S.) hospital admissions (1992-2006) for chronic bronchitis (ICD-9, 490-491) are evaluated using the Spatial Synoptic Classification (SSC). Accounting for the overwhelming majority of admissions, only individuals over the age of 65 were used in this research. A descriptive analysis resulted in regional differences in hospital admissions possibly linked to regional economics, health-care access, and climate variability. While the largest number of hospital admissions occurred in major metropolitan areas, high rates are also found along the Mohawk River Valley between the Adirondak and Catskill Mountains. A seasonal pattern in hospital admissions is evident with the largest number of hospital admissions occurring during December and January. White females accounted for the majority of admissions during the period. Beyond descriptive statistics, this research evaluates the morbidity-weather relationship using distributed lag non-linear model (dlnm) techniques. Using the R Program, hospital admissions were evaluated across the various weather types of the Spatial Synoptic Classification. Seasons were evaluated independently as the variability of chronic bronchitis hospital admissions across seasons cannot be overlooked as an influencing factor in human health research. Differential responses were observed based on weather types although there may be similarities between regions. While a small number of studies have utilized distributed lag models to investigate health relationships, fewer have considered morbidity as an outcome. By evaluating chronic bronchitis hospital admissions through this technique, a better understanding of climatic influence may be gained.