

RAINFALL AND EMERGENCY DEPARTMENT VISITS FOR ACUTE GASTROINTESTINAL ILLNESS IN NORTH CAROLINA, 2006-2008

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Background & Aims: Climate models suggest the frequency of extreme rainfall events will continue to rise in coming decades. We aim to investigate the temporal relationship between daily variability of rainfall and acute gastrointestinal illness (AGI) in North Carolina (NC).

Methods: County-level rainfall and emergency department (ED) visits data were obtained from the NC Climate Retrieval and Observation Network of the Southeast and NC Disease Event Tracking and Epidemiologic Collection Tool databases, respectively. We examined associations between daily average rainfall (mm) and daily counts of ED visits for AGI at the county-level in NC between Jan. 1, 2006 and Dec. 31, 2008, controlling for time trends, seasonal patterns, and region. Using Poisson models, rates for AGI per unit change in rainfall (mm) were calculated for lags of 0-15 d. Age and water source were examined as potential modifiers.

Results: Statewide, the crude rate of AGI was 511 per 100,000 person-years (pyr) with variability by season (winter: 619/100,000 pyr; summer: 408/100,000 pyr), age (infants ≤ 1 yr: 2,814/100,000 pyr; children 10-14 yr: 240/100,000 pyr), sex (females: 583/100,000 pyr; males: 436/100,000 pyr), and region (Piedmont: 646/100,000 pyr; Coastal Plain: 385/100,000 pyr). A 25-mm (~1 inch) increase in daily average rainfall at a lag of 5 d was associated with 13.99 additional AGI ED visits per 100,000 pyr (95% CI = 13.95-14.02), with a higher rate among seniors (≥ 65 yr) (rate = 44.77; 95% CI = 44.68-44.86) and counties with >75% surface water source (rate = 19.16; 95% CI = 19.12, 19.19).

Conclusions: The observed temporal lag (5 d) between daily rainfall and AGI is consistent with waterborne transmission. (This abstract does not necessarily reflect EPA policy. The NC Public Health Data Group and NC DETECT do not take responsibility for the scientific validity or accuracy of methodology, results, statistical analyses, or conclusions presented.)