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Mapping risk of gastrointestinal diseases through association of storm events

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In recent years, the frequency and intensity of storm events have raised concerns about their potential impact on public health, particularly in relation to infectious disease outbreaks. Gastrointestinal diseases (e.g., salmonellosis, giardiasis) pose a significant public health concern, especially for vulnerable populations, including the elderly (over 70) and young children (under 5). Currently, community-level analysis of vulnerable populations is not possible due to the limited availability of fine-scale data. This study proposes a methodology to downscale state-level data of infectious disease counts to finer-spatial scales by redistributing state-level information to identified risk zones based on proximity to storm event locations. Further, this study aims to rank areas at high-risk of gastrointestinal disease based on the estimated case distribution and access to facilities with high degrees of human-environment interactions (e.g., water recreation). Storm event data will be obtained from the NOAA Storm Events Database, and gastrointestinal disease surveillance data from the CDC's NNDSS. This study aims to contribute to methodology in downscaling data in order to allow for finer-scale analysis. Further, we identify higher risk areas based on population impacted, location, and frequency. This can help enhance proactive public health strategies in storm-prone areas in Georgia. Downscaled data and high-risk zone identification will facilitate a more precise understanding of disease spread for public health preparedness and response, thus enabling targeted interventions and resource allocation based on historical patterns.

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