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Inland flooding –mapping emergency department diagnoses with social vulnerability and flood risk to identify targeted educational outreach

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Climate change has the potential to impact environmental and human health via extreme weather events. Flooding is associated with infectious disease outbreaks, increased asthma, and worsened mental health. Previous studies have focused on coastal communities rather than inland and river flooding, the incidence and severity of which are expected to increase. In 2019, 81 of 93 Nebraska counties were declared federal disaster areas due to flooding. Socially vulnerable populations are particularly at-risk as they may lack awareness of inland flooding and flood plan knowledge and have fewer resources to recover.

We sought to identify flood-related health outcomes, particularly targeting vulnerable populations. This cross-sectional analysis of de-identified data from the Nebraska Hospital Association compared diagnosis frequency for three time periods: 2018, 2019, and 2020-2021. Potentially flood-related diagnoses were identified by ICD-10 codes, including gastroenteritis, asthma, and respiratory infections/pneumonia. Patient ZIP code was linked to the Social Vulnerability Index (community-level vulnerability scores) and flood plain maps. A binomial generalized linear model with main effects and a period of flood risk interaction term tested whether specific ER diagnoses differed by time period. Increases in specific health conditions will be tabulated and displayed in figures. Moreover, differences by flood-specified time periods will be examined and reported. We predict that populations living in high flood risk areas are more prone to flood-related health issues compared to those in lower risk areas. Results of the study possibly shed light on the need for further education on flood risk and preparation to at-risk communities.

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