

Abstract

Increasing coastal populations and storm intensity may lead to more adverse health effects from tropical storms and hurricanes. Exposure during pregnancy can influence birth outcomes through mechanisms related to healthcare, infrastructure disruption, stress, nutrition, and injury. However, accurate estimation of health effects may be limited by nonspecific exposure definitions that create potential misclassification. The two predominant hurricane exposure assignments are (1) the county of a FEMA presidential disaster declaration; and (2) the specified area within a storm track. The authors propose a third method: meteorological severity of wind speed. Based on the Saffir-Simpson categories, wind speed was examined through binary and quartile comparisons. All three methods of exposure classification were compared by examining the associations with county-level preterm birth and low-birth-weight rates among Florida women who were pregnant during the 2004 hurricane season. The county-level environmental quality index developed by the EPA was used to control for county-level environmental factors. Although the models yielded unexpected negative results and insignificant rate differences, a descriptive and mapping analysis of the exposure methods showed clear heterogeneity of county exposure.