

ABSTRACT

The increasing threat and globalization of terrorism has heightened the need for estimating the geographical extent of population at risk to terrorist attacks. These estimations provide effective and efficient analyses to support various organizations for estimating necessary aid resources as well as identifying areas that require military and governmental involvement. With no consistent framework available for studying terrorism risk or handling data gaps, the goal of this study is to provide a baseline methodology for spatially estimating population at risk within a data-poor environment (Willis et al. 2005). This thesis examines the Islamic insurgent group, Boko Haram, and their historical attacks within Borno State, Nigeria over a five year period from July 2009 to June 2014. Data is disaggregated using a dasymetric mapping method designed to increase spatial quality to provide a more intimate look at risk throughout the state. Cox Regression, a statistical method to analyze time between events in accordance with covariates' relationships, estimates risk through hazard ratios which are applied to spatial cells. Classified risk cells are used to estimate population at risk in areas through this model. Results depict detailed areas and population at risk to Boko Haram terrorism, the spread of Boko Haram from Borno State to nearby areas over time, and geographic variables which increase odds of Boko Haram attacks to occur. These results are useful to understand the areas and amount of people affected by Boko Haram terrorism and aim to improve methods and techniques using geographic information systems (GIS) and statistical methods for risk analysis. Geographically disaggregating data in data-poor countries provides previously unknown insights to analytical problems potentially facilitating solutions for various subjects such as medical and environmental crises, terrorism, and urban development.