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Environmental factors and fatal injuries during Typhoon Haiyan: A framework for assessing impact, mitigating risk and promoting resilience during natural disasters

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Introduction: Typhoon Haiyan (locally known as "Yolanda") made landfall in central Philippines on 8 November 2013 and caused an estimated 6,300 deaths. Many deaths were due to injuries but it is unclear what role the environment played on mortality. The purposes of this study are: To assess the impact of environmental factors on fatal injuries and to use findings to develop a framework for the mitigation of risk and promotion of resilience during natural disasters.

Methods: The study has two phases. First an epidemiological study will assess the relationship between exposure to environmental factors and mortality (i.e., fatal injury rate) in the population (N=6,300). Environmental factors are categorized as: Water-related (i.e., drowning), vegetation-related (i.e., being hit by an uprooted tree) and built environment-related (e.g., electrocution, roof collapse). Existing data from the Philippines' National Disaster Risk Reduction and Management Council (NDRRMC) will be used. Second a literature review will identify and characterize impact assessment methods related to environment and health. Search terms/descriptors such as Medical Subject Headings (MeSH) will be used in the MEDLINE database according to a predefined search strategy. An integrative Natural Disaster Impact Assessment (NDIA) framework will be developed based on the findings.

Expected results: Mortality rates will be calculated as: Overall, fatal injury only and fatal injury by mechanism (e.g., asphyxiation, hypothermia). Univariable analysis with frequencies and counts as well as bivariable analysis with measures of associations and trends will be performed in SPSS. The level of significance (p) will be explicitly stated prior to data analysis. Measurements of effect size (correlation, odds ratios and relative risk) will be reported and confidence intervals (CI) will be estimated at a level of 95%. Stratification will be used to adjust findings for the effects of confounding variables. Sensitivity analysis will assess the quality/strength of the measurements and statistical models used. The study's proposed contributions will be: Quantifiable health impacts of Typhoon Haiyan; Assessment of the relationship between environmental factors and fatal injuries; Development of an integrated NDIA framework and set of evidence based recommendations for mitigating risk and promoting resilience during natural disasters.

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