

EGU22-5214

<https://doi.org/10.5194/egusphere-egu22-5214>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Global analysis of emergency service provision to vulnerable populations during floods of various magnitude under climate change

Sarah Johnson¹, Robert Wilby¹, Dapeng Yu¹, and Tom Matthews²

¹Loughborough University, Geography and Environment, School of Social Sciences and Humanities, LE11 3TU UK; S.Johnson@lboro.ac.uk

²King's College London, Department of Geography, School of Global Affairs, WC2R 2LS UK

In a world of increasing global flood hazards, vulnerable populations (very young and elderly) are disproportionately affected by flooding due to their low self-reliance, weak political voice and insufficient inclusion into climate adaptation and emergency response plans. These individuals account for most flood casualties and often rely on emergency services—due to flood induced injuries, exacerbated medical conditions, and requiring evacuee assistance. However, emergency service demand often exceeds the potential capacity whilst flooded roads and short emergency response timeframes decrease accessibility, service area, and population coverage; but how does this compare across the globe and what will the future hold?

To answer this question, a global analytical framework has been created to determine the spatial, temporal, and demographic variability of emergency service provision during floods. This is based on global fluvial and coastal flooding (at 10-year and 100-year return periods), and present and future flood conditions (present-day and 2050, under RCP 4.5 and RCP 8.5 climate scenarios). The framework includes a hotspot analysis to identify the extent and distribution of flood hazards and at-risk vulnerable populations, an accessibility analysis to identify emergency service accessibility to vulnerable populations based on restrictions of flood barriers and response-time frameworks, and a vulnerability analysis to compare the environmental injustice of emergency service provision between key demographic groups.

The highlighted geographical and temporal differences in emergency service provision globally and between regions, in addition to the framework itself, can be used by national and international organisations to inform strategic planning of emergency response operations and major investments of infrastructure, services, and facilities to maximise the benefit to the disproportionately affected vulnerable populations. This includes the production of more detailed flood hazard and evacuation maps that highlight vulnerability hotspots, the prioritisation of vulnerable population groups in emergency response plans to minimise geographic and population disparities of flood injuries and fatalities, and the allocation of emergency service hubs in regions of high vulnerability but low emergency response provision.

