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Analysis of the relationship of 41-yrs reanalysis rainfall data and flood fatalities in the Euro-Mediterranean region

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Flood fatalities are a significant challenge in the Euro-Mediterranean region, demanding a deeper exploration of the connection between rainfall patterns and the occurrence of flood-related deaths. While previous studies have documented the profiles, temporal and spatial contexts, and circumstances of flood fatalities in this region, they have primarily focused on demographic, social, and behavioural factors, often neglecting weather-related hazard parameters. This study aims to address this gap. In our research, we utilize the open-access Flood Fatalities from the Euro-Mediterranean region database (FFEM-DB), which encompasses 2,875 flood fatalities from 1980 to 2020. We define rainfall hazard variables by analyzing rainfall data from the Multi-Source Weighted-Ensemble Precipitation (MSWEP) V2.8 dataset. Then, we assess the role of rainfall amounts in explaining flood fatalities in conjunction with geomorphological parameters and socio-demographic changes over the study period. We employ various statistical techniques to investigate rainfall's temporal and spatial patterns and their association with flood fatalities. We also emphasize the importance of historical rainfall patterns in assessing flood risk and designing effective disaster management strategies. The insights gained from this study enhance the existing knowledge of the factors influencing flood fatalities in the Euro-Mediterranean region.

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