



## **ByMuR model: interaction and uncertainty treatment in long-term seismic and volcanic risk assessments in Naples, Italy**

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Multi-risk approaches have been recently proposed to assess and compare different risks in the same target area. The key points of multi-risk assessment are the development of homogeneous risk definitions and the treatment of risk interaction. Within the framework of the Italian project “ByMuR – Bayesian Multi-Risk assessment”, a formal model (ByMuR model) to assess multi-risk for a target area is under development, aiming (i) to treat interaction among different hazardous phenomena, accounting for possible effects of interaction at hazard, vulnerability and exposure levels, and (ii) to explicitly account for all uncertainties (aleatory and epistemic) through a Bayesian approach.

Here, it is presented the preliminary development of the ByMuR model. The applicability of the methodology is demonstrated through a preliminary application to seismic and volcanic long-term risks in Naples (Italy). In particular, volcanic (ash fall) and seismic (ground shaking) long-term risks are assessed in different areas of the city, accounting for interaction and epistemic uncertainties. In these areas, the impact of interactions on long-term risk assessments is specifically quantified, assessing the bias of single-risk assessments (assuming no interaction) and comparing it with uncertainties. Finally, the impact of epistemic uncertainties and interactions in long-term risk hierarchization is discussed.