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# Earthquake building debris estimation in historic city centres: from real world data to experimental-based criteria

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## ABSTRACT

Safety and availability of urban paths in case of earthquake depend on buildings vulnerability and related produced debris on streets, especially in historic city centres. Predicting probable critical debris amounts on evacuation paths (i.e.: up to path blockage) can help safety planners to propose focused interventions on buildings, to design more effective emergency plans and to improve the effectiveness of rescuers' actions while supporting evacuees during first emergency phases. This way, this work proposes new experimentally-based correlations aimed at estimating the amount of external debris for historic masonry buildings (in terms of percentage of facing street area occupied by debris and related debris depth) depending on the vulnerability of these buildings, on the seismic magnitude, and (for the first time) on the combination of these two factors and the path geometric ratio (i.e.: building height versus facing street width), so as to consider the effect of different urban contexts. Different vulnerability assessment methods are also considered to generalise the proposed methodology. Finally, starting from obtained experimental correlations, the method is tested on one case study to demonstrate its capabilities in post-earthquake scenario prevision. The method could be a fundamental tool for the assessment of possible paths blockages

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