

WP4 – MARS-2 MAppe di Rischio e Scenari di danno sismico (coord. A.Masi e S.Lagomarsino) Task 4.4 – Vulnerabilità di scuole e ospedali (coord. S.Cattari e V.Manfredi)

National risk assessment of Italian school buildings: the MARS project experience

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GOAL

Development of the “**School-MARS vulnerability model**” at a national scale, for reliable **seismic risk** assessment of the Italian school portfolio, through multi-approach fragility curves

METHOD

Database analysis and identification of the main attributes affecting seismic vulnerability (taxonomy)

49531 assets in AES (Anagrafe Edilizia Scolastica) provided by the Ministry of Education in 2005

Taxonomy for categorization:

- Structural material
- Age of construction
- Number of storeys
- Plan area

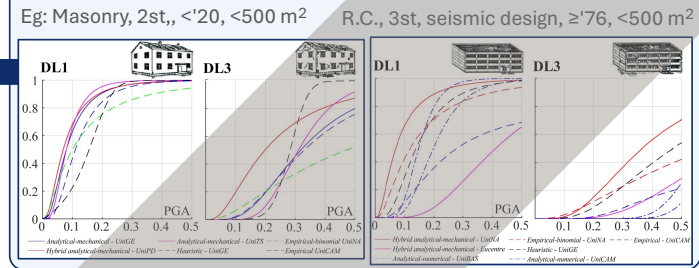
Integration of all fragility curves developed by URs to define a unified model for each structural type

Eg: Masonry, 2st, '21-'45, <500 m²

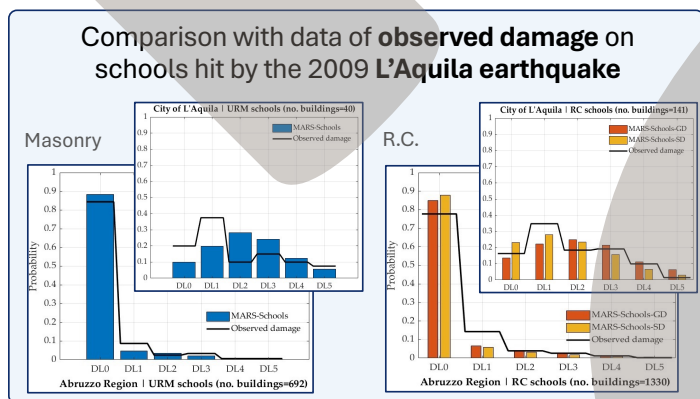
Eg: R.C., 2st, no seismic design <'46, <500 m²

Drawing sets of fragility curves, for the 5 EMS'98 Damage Levels, by using different approaches

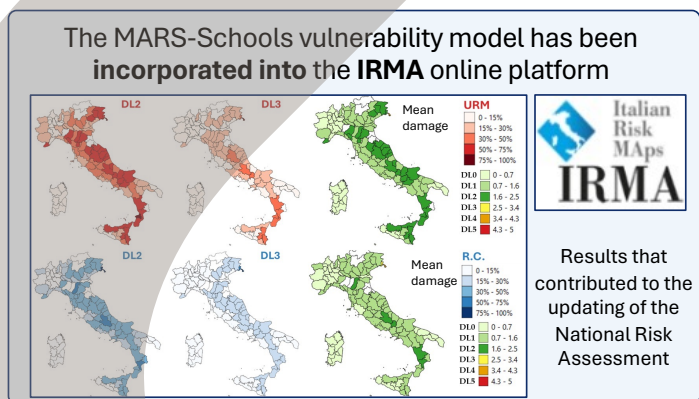
Approach	Research unit	Reference school buildings stock
M A	Empirical, empirical-binomial	UniNA
	Heuristic	UniGE-a
S O	Empirical	UniCAM
	Mechanical-analytical	UniGE-b
N R	Hybrid mechanical-analytical	UniTS
	Hybrid mechanical-analytical/macroseismic	UniPD
Y	Empirical, empirical-binomial	UniNA
	Heuristic	UniGE-a
R C	Empirical	UniCAM
	Hybrid - mechanical/analytical	UniNA
	Mechanical-numerical	UniNA
		UniBAS
		UniPD
		UniCAM



VALIDATION



RESULTS



REFERENCE: Cattari S. et al. (2024) National risk assessment of Italian school buildings: The MARS project experience, *International Journal of Disaster Risk Reduction*, vol, 113, 104822. <https://doi.org/10.1016/j.ijdrr.2024.104822>

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