

Message from author Agostino Goretti:

Enclosed you will find a preliminary draft of the Italian form for the PAGER project. We decided to have only 7 building classes because we believe that if you have to spread these building types all over Italy there is not much sense to differentiate too much. Population in each building class comes from the national census on population and buildings. Vulnerability comes from post-eqk observed damage data.

We had several discussion among us, mainly due to following reasons:

1. we do not have observed damage data for high intensities such as IMM=9. Hence we have to extrapolate our data and this can be done in several ways obtaining different estimates, even if we considered the macroseismic scale constraints.
2. Differences between IMM=8 and IMM=9 are great and intermediate points may be useful
3. We do not have data on the building type where people work, hence we have to estimate it through our expert judgement. However we do not have much experience on it.
4. Peak average number of occupants per building is not much clear. Is it the daily peak averaged over all the buildings belonging to that class or it is the peak among buildings averaged over the day or the year? Or is the peak a seasonal peak?. Consider also that within each class we may have buildings with different number of storey. Hence the peak value may be very large. However seasonal changes are not easy to be calculated and, in addition when you average all over Italy the effects are smoothed. Hence we decided to provide the following data: average number of people living in that building class. It is obtained simply dividing the number of people that lives in that class over the number of buildings belonging to that class (all over Italy). In case you want a different evaluation it may be useful to provide a clear description or an equation for it
5. We reported the percentage of the only collapsed buildings. However if you have to estimate victims it may be necessary to know the relative frequency of partial collapses. In our applications, victims are estimated considering a fraction of the population that lives in buildings affected by damage grade 5 (total collapse) and a reduced percentage of people that lives in buildings affected by damage grade 4 (partial collapse).

ITALY: Summary of Building Types, Vulnerability to Collapse and Occupancy

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WHE Construction Type or Material <i>(refer to Table 2 for suggested category(ies))</i>	Description of construction type (type of load- bearing structure) <i>(refer to Tables 2 and 3 for suggested categories and sources of data to help answer this question)</i>	Estimate of probability of collapse (%) of the building type when subjected to the specified shaking intensity (expressed as a range) <i>(refer to instructions page 5)</i> (3) MMI / EMS / MSK				Fraction of population who LIVES in this building type <i>(refer to instructions for help in estimating)</i>		Fraction of WORKING population who WORKS in this building type <i>(refer to instructions on page 5 for help in estimating)</i>		Peak average number of occupants per building <i>(refer to instructions on page 5 for help in estimating)</i> (8)
		IX (~0.65-1.24g)	VIII (~0.34-0.65g)	VII (~0.18-0.34g)	VI (~0.092-.18g)	urban areas (4)	rural areas (5)	urban areas (6)	rural areas (7)	
	Masonry - bad quality		37.4	10.1	1.6	13.5	2.0			1.8
	Masonry-medium quality		8.8	0.6	0.0	13.8	2.0			2.1
	Masonry - good quality		2.4	0.1	0.0	22.1	2.8			3.3
	RC, GLD, <=3 storeys		7.3	0.5	0.0	12.3	1.0			4.6
	RC, GLD, >=4 storeys		14.3	1.1	0.0	19.5	0.1			19.2
	RC, MSD, <=3 storeys		0.1	0.0	0.0	5.4	0.8			4.7
	RC, MSD, >=4 storeys		0.2	0.0	0.0	4.7	0.1			17.1

Refer to Part 3 (next 3 pages) for tables and links that may help you fill out this form.

Other sources consulted:

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1. ISTAT national census on population and buildings
2. Damage assessment after 1980 Irpinia eqk
3. MCS, MM, EMS98 macroseismic scales