

## Comparing the European (SHARE) and the reference Italian seismic hazard models

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A probabilistic seismic hazard evaluation for Europe has been recently released by the SHARE project ([www.share-eu.org](http://www.share-eu.org), Giardini et al., 2013; Woessner et al., 2015). A comparison between SHARE results for Italy and the official Italian seismic hazard model (MPS04, Stucchi et al., 2011), currently adopted by the building code, has been carried on to identify the main input elements that produce the differences between the two models. The SHARE model shows increased expected values (up to 70%) with respect to the MPS04 model for PGA with 10% probability of exceedance in 50 years. However, looking in detail at all output parameters of both the models, we observe that for spectral periods greater than 0.3 s, the reference PSHA for Italy proposes higher values than the SHARE model for many and large areas. This behaviour is mainly guided by the adoption of recent ground-motion prediction equations (GMPEs) that estimate higher values for PGA and for accelerations with periods lower than 0.3 s and lower values for higher periods with respect to older GMPEs used in MPS04. Another important set of tests consisted in analyzing separately the PSHA results obtained by the three source models adopted in SHARE (i.e. area sources, fault sources with background, and a refined smoothed seismicity model), whereas MPS04 only used area sources. Results show that, besides the strong impact of the GMPEs, the differences on the seismic hazard estimates among the three source models are relevant and, in particular, for some selected test sites, the fault-based model returns lowest estimates of seismic hazard. This result arises questions on the completeness of the fault database, their parameterization and assessment of activity rates as well as on the impact of the threshold magnitude between faults and background.

Giardini D. et al., 2013. Seismic Hazard Harmonization in Europe (SHARE): Online Data Resource, doi:10.12686/SED-00000001-SHARE.

Stucchi M. et al., 2011. Seismic Hazard Assessment (2003-2009) for the Italian Building Code. Bull. Seismol. Soc. Am. 101, 1885–1911.

Woessner J. et al., 2015. The 2013 European Seismic Hazard Model: key components and results. Bull. Earthq. Eng. 13, 3553–3596.