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# Earthquake Hazard Assessment: an Independent Review

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Seismic hazard assessment (SHA), from term-less (probabilistic PSHA or deterministic DSHA) to time-dependent (t-DASH) including short-term earthquake forecast/prediction (StEF), is not an easy task that implies a delicate application of statistics to data of limited size and different accuracy. Regretfully, in many cases of SHA, t-DASH, and StEF, the claims of a high potential and efficiency of the methodology are based on a flawed application of statistics and hardly suitable for communication to decision makers. The necessity and possibility of applying the modified tools of Earthquake Prediction Strategies, in particular, the Error Diagram, introduced by G.M. Molchan in early 1990ies for evaluation of SHA, and the Seismic Roulette null-hypothesis as a measure of the alerted space, is evident, and such a testing must be done in advance claiming hazardous areas and/or times. The set of errors, i.e. the rates of failure and of the alerted space-time volume, compared to those obtained in the same number of random guess trials permits evaluating the SHA method effectiveness and determining the optimal choice of the parameters in regard to specified cost-benefit functions. These and other information obtained in such a testing may supply us with a realistic estimate of confidence in SHA results and related recommendations on the level of risks for decision making in regard to engineering design, insurance, and emergency management.

These basics of SHA evaluation are exemplified with a few cases of misleading “seismic hazard maps”, “precursors”, and “forecast/prediction methods”.