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# Vulnerability Risk Assessment of Non-Engineered Houses Based on Damage Data of the 2009 Padang Earthquake 2009 in Padang City, Indonesia

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**Abstract :** Several powerful earthquakes have struck Padang during recent years, one of the largest of which was an M 7.6 event that occurred on September 30, 2009 and caused more than 1000 casualties. Following the event, we conducted a 12-site microtremor array investigation to gain a representative determination of the soil condition of subsurface structures in Padang. From the dispersion curve of array observations, the central business district of Padang corresponds to relatively soft soil condition with Vs30 less than 400 m/s. because only one accelerometer existed, we simulated the 2009 Padang earthquake to obtain peak ground acceleration for all sites in Padang city. By considering the damage data of the 2009 Padang earthquake, we produced seismic risk vulnerability estimation of non-engineered houses for rock, medium and soft soil condition. We estimated the loss ratio based on the ground response, seismic hazard of Padang and the existing damaged to non-engineered structure houses due to Padang earthquake in 2009 data for several return periods of earthquake events.

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