Fast assessment of strong aftershock hazard

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It is known that the probability of dangerous earthquake near the mainshock source increases by several times and the aftershock rate decreases obeying Omori's law. Thus, after a strong earthquake, it is important to make a simple and fast pre-assessment of the expected number of aftershocks with the magnitudes bigger than the threshold one and the strongest aftershock magnitude during some time period as well. Using Reasenberg-Jones approach representing aftershock process as a product of Gutenberg-Richter and Omori laws we derived that the aftershock numbers occurred in two non-overlapping time intervals are proportional and the proportionality factor is independent of the threshold magnitude. Based on this feature we calculated the proportionality factors for assessment of aftershock number with the magnitudes greater than threshold ones using data for the first 12 hours after mainshock for Kamchatka and Kuril Islands region (research area). We found another empirical relation, a linear dependence of the magnitude of the largest late aftershock (occurred later than 12 hours after the main shock) on the sum of seismic moments of aftershocks within 12 hours and estimated the regression parameters. This research was carried out at the expense of the Russian Science Foundation (Project No 16-17-00093).