Is it possible to forecast occurrence of a lager earthquake?

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We investigated what the probability of observing a larger earthquake is, when two or more earthquakes that exceed a certain threshold magnitude occur at a distance of 10km or less within 30 days. Data set is inland shallow earthquakes in the Japanese islands during the period from 1995 through 2000. Last year, we reported that when a larger earthquake occurs, the probability of observing a further lager earthquake is 17% for groups of earthquakes with M2.5 or larger and the probability is 19% for groups of earthquakes with M3.0 or larger.

There was, however, a problem in the algorithm of selecting groups of earthquake. We selected the groups of earthquakes by the link method. Consquently, there was no upper limit for area and period of the occurence of the groups of earthquakes. That algorithm is not suitable for evaluating the probability. This time, we assign upper limit for area and period to select the groups of earthquakes. By this change, it became possible to calculate the probability gain of the forcasting method.

We examined the probability gain, when we forcasted occurence of M5 earthquakes under the conditions that two or more earthquakes that exceed a certain threshold magnitude occur within some specified distance and period. When the upper limits of distance and period are set to be 30km and 30days, respectively, the maximum probability gain becomes 20.3. When the upper limits of distance and period are set to be 10km and 30days, respectively, the maximum probability gain is 218.8.