A statistics-based trip model of non-workers for the estimation of region-wide human exposure to natural hazards

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Abstract

Appearance of disaster considerably changes due to time of occurrence. For example when Kobe earthquake (1995) took place it was 5:46 a.m. most of people in affected area experienced while they asleep. On the other hand, Tohoku earthquake (2011) occurred in the afternoon. Because most of people were out for their work or school at the time, family members were forced to be separated each other evacuating from the tsunamis and taking a shelter for several following days.

Some methods are developed to estimate spatial and temporal distribution of population to estimate number of fatalities or people who cannot go back home due to transportation knock down caused by earthquake.

In our previous studies, a model has been developed which uses statistics available at arbitrary areas in Japan. It simulates travel behavior of individuals using multiple statistics to enhance its temporal resolution.

However, it is only applicable to the travel behavior of workers on weekdays, and that of non-workers were out of scope. In this paper, the model is extended to all the population including non-worker/student. Then human exposure to hazard is estimated by occurrence time assuming seismic impact distribution of past earthquake.

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