

Predicting Posttraumatic Stress Symptom Prevalence and Local Distribution after an Earthquake with Scarce Data

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Abstract

After a major earthquake, the assignment of scarce mental health emergency personnel to different geographic areas is crucial to the effective management of the crisis. The scarce information that is available in the aftermath of a disaster may be valuable in helping predict where are the populations that are in most need. The objectives of this study were to derive algorithms to predict posttraumatic stress (PTS) symptom prevalence and local distribution after an earthquake and to test whether there are algorithms that require few input data and are still reasonably predictive.

A rich database of PTS symptoms, informed after Chile's 2010 earthquake and tsunami, was used. Several model specifications for the mean and centiles of the distribution of PTS symptoms, together with posttraumatic stress disorder (PTSD) prevalence, were estimated via linear and quantile regressions. The models varied in the set of covariates included.

Adjusted R² for the most liberal specifications (in terms of numbers of covariates included) ranged from 0.62 to 0.74, depending on the outcome. When only including peak ground acceleration (PGA), poverty rate, and household damage in linear and quadratic form, predictive capacity was still good (adjusted R² from 0.59 to 0.67 were obtained).

Information about local poverty, household damage, and PGA can be used as an aid to predict PTS symptom prevalence and local distribution after an earthquake. This can be of help to improve the assignment of mental health personnel to the affected localities.

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