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Original article

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Medium- and long-term health effects of earthquakes in high-income countries: a systematic review and meta-analysis

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Abstract

Background: Accurate monitoring of population health is essential to ensure proper recovery after earthquakes. We aimed to summarize the findings and features of post-earthquake epidemiological studies conducted in high-income countries and to prompt the development of future surveillance plans.

Methods: Medline, Scopus and six sources of grey literature were systematically searched. Inclusion criteria were: observational study conducted in high-income countries with at least one comparison group of unexposed participants, and measurement of health outcomes at least 1 month after the earthquake.

Results: A total of 52 articles were included, assessing the effects of 13 earthquakes that occurred in eight countries. Most studies: had a time-series (33%) or cross-sectional (29%) design; included temporal comparison groups (63%); used routine data (58%); and focused on patient subgroups rather than the whole population (65%). Individuals exposed to earthquakes had: 2% higher all-cause mortality rates [95% confidence interval (CI), 1% to 3%]; 36% (95% CI, 19% to 57%) and 37% (95% CI, 29% to 46%) greater mortality rates from myocardial infarction and stroke, respectively; and 0.16 higher mean percent points of glycated haemoglobin (95% CI, 0.07% to 0.25% points). There was no evidence of earthquake effects for blood pressure, body mass index or lipid biomarkers.

Conclusions: A more regular and coordinated use of large and routinely collected datasets would benefit post-earthquake epidemiological surveillance. Whenever possible, a cohort design with geographical and temporal comparison groups should be used, and both communicable and non-communicable diseases should be assessed. Post-earthquake epidemiological surveillance should also capture the impact of seismic events on the access to and use of health care services.

Key words: Earthquake, health, methods, natural disaster, systematic review, meta-analysis