A case – control study of injuries arising from the earthquake in Armenia, 1988*

H.K. Armenian,[1] E.K. Noji,[2] & A.P Oganesian[3]

The study attempts to identify predictors of injuries among persons who were hospitalized following the Armenian earthquake of 7 December 1988. A total of 189 such individuals were identified through neighbourhood polyclinics in the city of Leninakan and 159 noninjured controls were selected from the same neighbourhoods. A standardized interview questionnaire was used. Cases and controls shared many social and demographic characteristics; however, 98% of persons who were hospitalized with injuries were inside a building at the time of the earthquake, compared with 83% of the controls (odds ratio = 12.20, 95% confidence interval (CI) = 3.62–63.79). The odds ratio of injuries for individuals who were in a building that had five or more floors, compared with those in lower buildings, was 3.65 (95% CI = 2.12–6.33). Leaving buildings after the first shock of the earthquake was a protective behaviour. The odds ratio for those staying indoors compared with those who ran out was 4.40 (95% CI = 2.24–8.71).

Introduction

Much of the epidemiological information on earthquake injuries has been based on descriptive case studies (*1–5*). Current efforts to investigate earthquake-related morbidity and mortality are, however, attempting to correlate death and injuries with structural factors (*6–9*),[a] housing damage, victim behaviour (*10–14*), as well as other possible determinants. A number of the earthquakes that have been studied previously occurred in rural areas, and few epidemiological data are available from urban earthquakes (*15–19*). Better understanding about the factors associated with death and injuries in such settings is essential to determine the relief needs and the appropriate public health response (*20, 22*).[b] Only by understanding how and where people are injured in earthquakes can we recommend safer building designs and appropriate occupant behaviours to improve survival, and provide information to direct search and rescue efforts for potential survivors.

An earthquake that registered 6.9 on the Richter scale occurred in the northern part of Armenia at 11h 41 on 7 December 1988 (*22*). A total of 500 000 to 700 000 persons were made homeless, with an estimated 25 000 deaths. Of the 130 000 persons who were injured, 14 000 were hospitalized, primarily in Armenia itself.[c] In a joint project with the Ministry of Health of Armenia and the Johns Hopkins University, a number of epidemiological investigations of the earthquake survivors were developed. The first of these aimed at identifying predictors of injuries in persons who were hospitalized from the city of Leninakan. The present case–control study was conducted to compare individuals who were hospitalized because of injuries with controls who remained unscathed following the earthquake. The objective of the study was to increase understanding about the role of the physical setting (e.g., type

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[1] Professor and Deputy Chairman, Department of Epidemiology, Johns Hopkins University School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, MD 21205, USA. Requests for reprints should be sent to this author.

[2] Assistant to the Branch Chief for Emergency Response, Health Studies Branch, Division of Environmental Hazards and Health Effects, National Center for Environmental Health and Injury Control, Centers for Disease Control, Atlanta, GA, USA.

[3] Director, Republican Information and Computer Centre, Ministry of Health, Armenia.

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[c] *Report on international relief assistance for the earthquake of 7 December 1988 in the SSR of Armenia*. United Nations Disaster Relief Organization, unpublished document UNDRO/89/6, 1989, pp. 1–35.