

EPIDEMIOLOGIC STUDIES FROM THE 1988 ARMENIA EARTHQUAKE:
IMPLICATIONS FOR CASUALTY MODELLING

Eric K. Noji, M.D., M.P.H.
U.S. Centers for Disease Control

Introduction

Better epidemiologic knowledge of the causes of death and the type of injuries and illnesses caused by earthquakes is clearly an essential requirement for determining appropriate relief supplies equipment and personnel needed to respond effectively to such catastrophic events.¹⁻⁴ At 11 41 AM on December 7, 1988, an earthquake registering 6.9 on the Richter scale hit the northern part of the Armenian Soviet Socialist Republic, one of the most seismically active regions of the Soviet Union⁵⁻⁸. Caused by movement along a geological fault near the town of Spitak in the northwestern part of the country, the quake affected 40% of the national territory.^{9,10} Of the 150 villages damaged, 58 were completely destroyed. A high percentage of Armenia's housing (eleven percent) was destroyed or rendered uninhabitable, and 500,000 to 700,000 persons were made homeless.¹¹ Bridges, lifelines (e.g., water, power, gas, sewage systems), and industrial facilities were also severely damaged.¹² The toll in human terms was devastating: 40,000 persons were reported trapped in collapsed buildings, of whom 15,000 were successfully rescued; 25,000 bodies were recovered from the rubble. Another 31,000 were known to be injured, of whom, 12,200 required hospitalization.^{11,13}

This paper describes the results of two studies of earthquake-related morbidity and mortality following the Armenian earthquake and the implications of these results to earthquake casualty modelling. The first study consisted of a rapid survey undertaken during the period immediately following the earthquake to assess the epidemiological impact of the disaster and to develop an understanding of the relationship between building characteristics, occupant actions, search and rescue, medical care and patient outcome. After completing this rapid on-site survey in December, 1988, we conducted a case-control study in Leninakan to compare persons hospitalized with injuries with controls who remained unscathed following the earthquake

i. Immediate Post-Earthquake Survey¹⁴