

An Attempt at More Accurate Estimation of the Number of Ambulances Needed at Disasters in The Netherlands

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Abbreviations:

n = number victims transported per journey
N = number of victims requiring hospital treatment
t = traveling time between disaster site and hospitals
T = total time available for transport
X = number of ambulances needed at disaster

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Abstract

A more accurate estimate of the number of ambulances needed at disasters prevents vehicles from being withdrawn unnecessarily from their "normal" duties, thereby curtailing needless expense and helping to ensure that disaster sites are not overcrowded with emergency workers impeding each other's effectiveness. This article discusses a formula for determining the number of ambulances needed at a disaster. Prehospital and Disaster Medicine 1996;11(2):125-129.

Introduction

There are several reasons why it is important that the ambulance capacity available in the event of a disaster should match the needs for first aid and medical transport. First, "normal" ambulance service must be continued for as long as possible. This makes financial sense, and provides a balanced response to the demand for first aid and transport. The personnel sent to a disaster are removed from the normal service, and sending too many of them not only depletes this service, but costs more money.

Methods

Because the number of ambulances needed at a disaster (X) is directly proportional to the number of victims requiring hospital treatment (N), and the average traveling time between the disaster site and the surrounding hospitals (t), and is inversely proportional to the number of victims who can be transported on each journey (n) and the total time (T) available for the transportation of N, the following formula can be applied:

$$X = \frac{Nt}{Tn} \quad (\text{Equation 1})$$

The example in Table 1 indicates that this formula is, in principle, mathematically sound. The formula would appear to make it possible to calculate the number of ambulances needed to transfer victims to nearby hospitals. However, it is very difficult to determine the number of victims requiring hospital treatment (N) and the average traveling time (t) to local hospitals. This is not the case with the other variables, T and n. Because the condition of triage category I victims must be stabilized within the "golden hour," and then, like the triage category