Mass Casualty: a Spatial Model to Support Triage Decision Making

Ofer Amram and Nadine Schuurman

Geography, Simon Fraser University, oamram@sfu.ca
Geography, Simon Fraser University, nadine@sfu.ca

Abstract

The survival or recovery of persons critically injured in incidents involving mass casualties is directly related to their access to timely and appropriate treatment. The management of mass casualty evacuation priorities has been underexplored from a spatial perspective. We have created a model for decision-making for evacuation and definitive care priorities. Using a web based GIS, the model incorporates driving time to hospital, hospital capacity in addition to injury type and severity as the basis for decisions about which patients are sent to which facilities. The model produces rapid result and the hope is that it will be used to assist emergency service personnel to optimize decision-making processes during critical stages of evacuation.

Background and Relevance

During a mass casualty incident, evacuation of patients to the appropriate health care facility is critical to survival. Despite this, no existing system provides the evidence required to make informed evacuation decisions from the scene of the incident. To mitigate this absence and enable more informed decision making, a web based spatial decision support system (SDSS) has been developed. This system supports decision making through the provision of data regarding hospital proximity, capacity, and treatment specializations to decision makers at the scene of the incident.

Methods and Data

The proposed web based SDSS uses pre calculated driving times to analyze the driving time to each hospital within the metro Vancouver region of British Columbia. In calculating and displaying its results, the model incorporates both road network and hospital data (e.g. capacity, treatment specialties, etc.). The model will also enable hospital personal to update hospital capacity in real time while producing results in a matter of seconds, as is required within an MCI situation.

Conclusions

The use of SDSS in the prioritization of MCI evacuation decision making has been demonstrably successful. Key to this success is the utilization of pre-calculated driving times from each hospital in the region to each point on the road network. The incorporation of real-time traffic and hospital capacity data would further improve this model.