USING NHTS TO ESTIMATE TRANSPORTATION NEEDS OF PEOPLE WITH MEDICAL CONDITIONS DURING DISASTERS IN HAWAII

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ABSTRACT

Transportation systems play a crucial role during disasters. A functional and operational transport system is vital for response and recovery in disaster stricken areas. At-risk vulnerable populations, including those with medical conditions, may need to be evacuated before the onset of hazards and threats. Disaster risk mapping and vulnerability assessments have been conductedl and many states have developed mitigation plans. State, tribal, and local governments are required to develop hazard mitigation plans as a condition for receiving non-emergency disaster assistance. A total of 23,033 communities and 121 tribal governments, comprising about 78% of the nation's population, have FEMA-approved or approvable-pending-adoption local multi-hazard mitigation plans. While, multi-hazard mitigation plans provide a starting point for planning resilient communities, but they typically do not include specific evacuation and sheltering needs assessments. HAZUS-MH, a multi-hazard regional assessment and mitigation planning tool is used to produce estimates of hazard-related damages before or after disaster. HAZUS-MH provides information about the economic and social impacts, including estimates of sheltering requirements, displaced households, and population exposed to floods, earthquakes and hurricanes. HAZUS-MH does not include assessments for evacuation or sheltering needs of people with medical conditions.

NHTS contains rich socio-demographic information and detailed inventories of travel behavior. NHTS data can be used to assess medical conditions of travelers. Figure 1, "A Framework for Assessing Demand and Routing during Hazard Events," illustrates how NHTS data can be used to estimate evacuation needs of those with medical conditions. The approach includes three analyses: (i) cluster and factor analysis of 9 medical conditions related to travel behavior using a national NHTS data sample; (ii) analysis of para-transit travel data for a particular study area to establish demand for assisted travel during "normal conditions;" and, (iii) overlay of hazard conditions and imputation of the demand and routing needs during hazardous events.

People with mobility limiting medical conditions are most vulnerable during disasters. They may require assistance to evacuate to a shelter. Health workers may need to provide home-based visits to residents who are unable to leave their homes. Evacuation or transportation routing for health services providers and recipients for hazard scenarios are essential to protect vulnerable populations. This research provides "a proof of concept" for estimating the demand and routing of people with medical conditions using the national NHTS dataset.

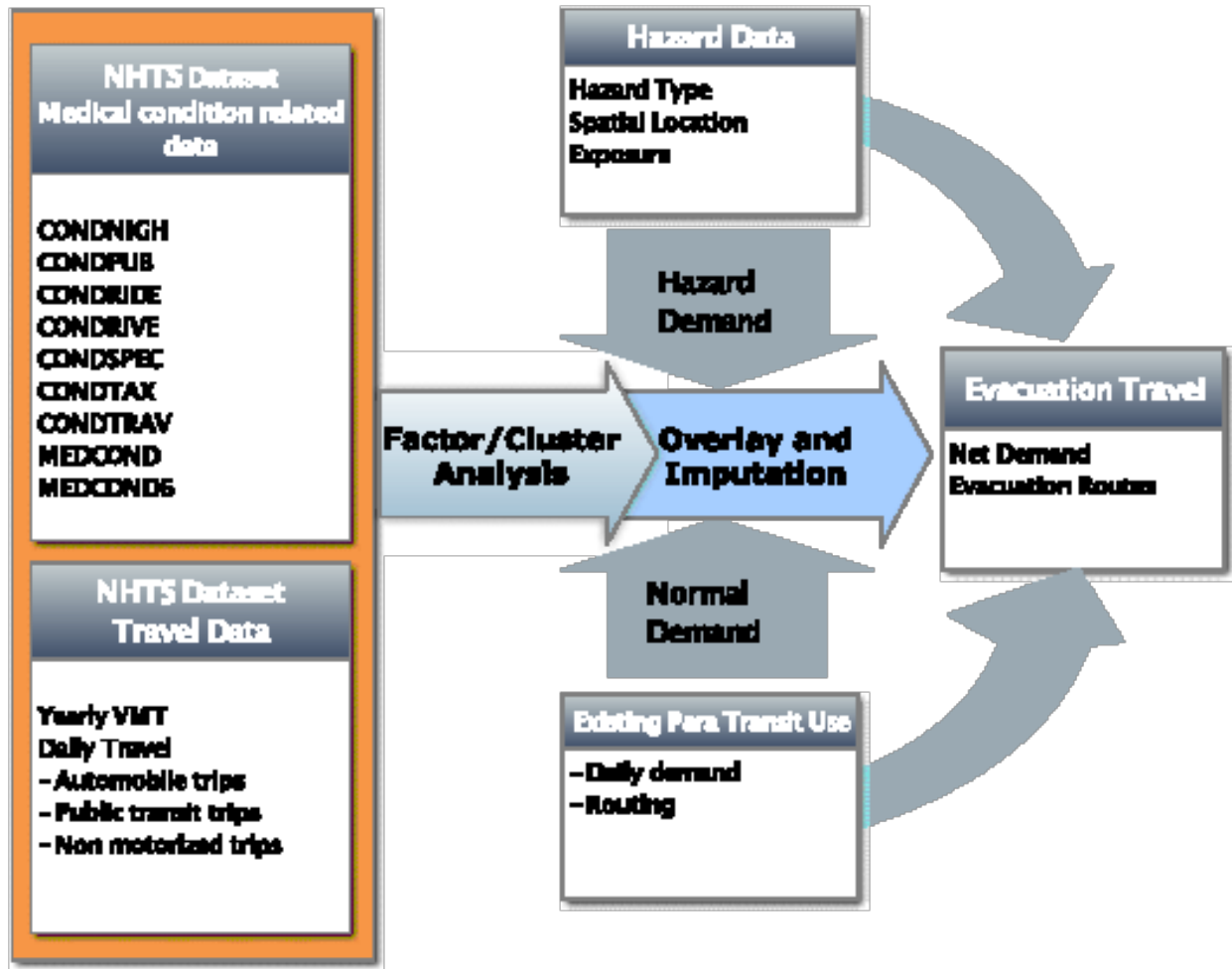Keyword: NHTS, evacuation, para-transit, medical conditions, disasters

Figure 1: A Framework for Assessing Demand and Routing during Hazard Events