

The Impact of State Funding on Triage and Mortality of Trauma Patients

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Background

- Regionalization of trauma care has lowered mortality of injured patients by bringing the patients to the right place at the right time
- Less than half of states dedicate stable funding towards trauma care and systems
- This study examines the association among state trauma funding, triage rate, and mortality among severely injured patients.

Research Objectives

- To quantify the association between state trauma funding and rates of re-triage
- To determine the role of state trauma funding as a moderator for the association between re-triage and adjusted in-hospital mortality

Methods

- Patient encounters with an injury diagnosis and Injury Severity Score (ISS) >15 were extracted from 2016 and 2017 Healthcare Cost and Utilization Project (HCUP) State Emergency Department Databases (SEDD) and State Inpatient Databases (SID) from five states (FL, MA, MD, NY, WI).
- Data were merged with the American Hospital Association (AHA) Survey and publicly available state trauma funding data from each state's health department.
- Patients were linked across emergency and inpatient encounters to determine triage status: appropriate triage (admitted to a Level I or II trauma center (TC)), under-triage (admitted to a Level III, IV, or non-TC), or re-triage (emergently transferred from the ED to a Level I or II TC).
- We tested the association between state trauma funding and mortality using a hierarchical logistic regression, controlling for triage status with a trauma funding by triage status interaction term and adjusting for age, sex, race, primary payer, Elixhauser comorbidity score, and ISS.
- Observations were clustered using a random intercept for hospital ID.

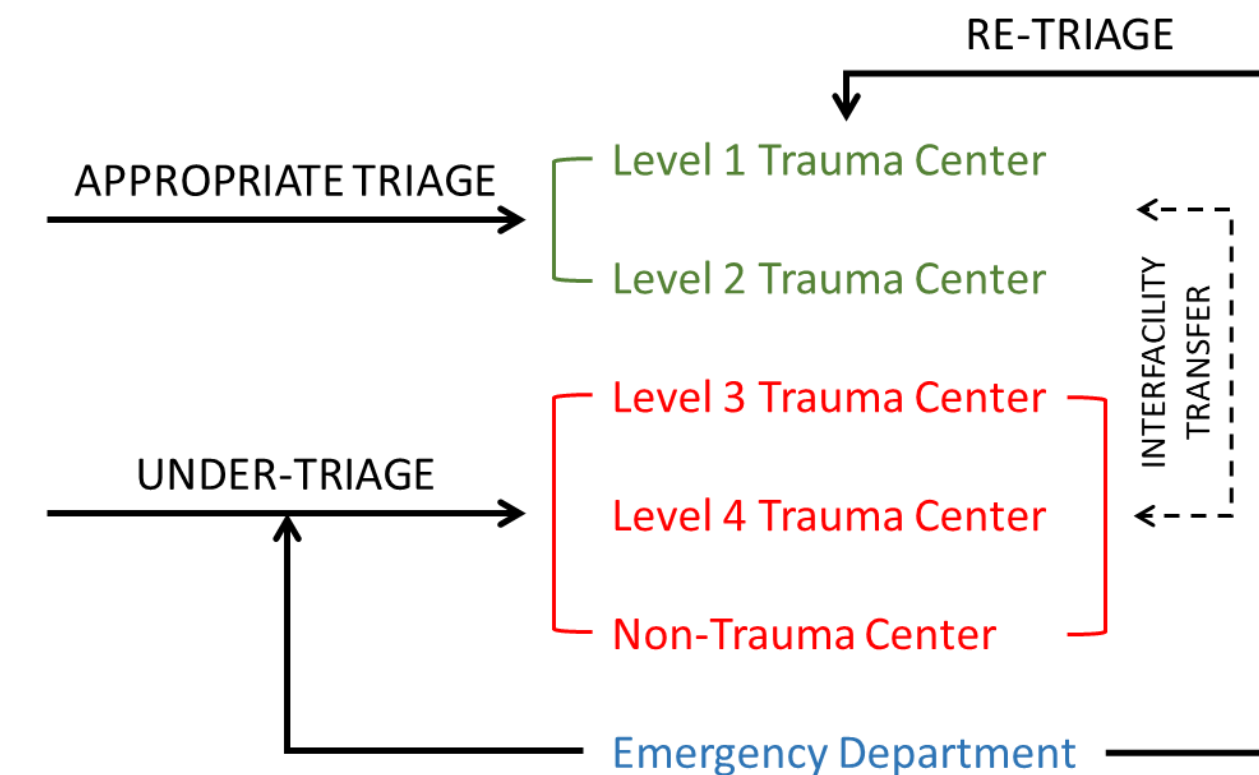


Table 1. Association between Funding Status and Rates of Re-Triage

	\$0.00 per capita (N=99304)	>\$0.00 per capita (N=142995)	p-value
Transfer Status			< 0.0001
Appropriate Field Triage	31088 (31.3%)	34588 (24.2%)	
Under-Triage	7493 (7.6%)	15782 (11.0%)	
Re-Triage	1246 (1.3%)	2183 (1.5%)	

Table 2. Association between Funding Status and Adjusted Odds of In-Hospital Mortality, by Triage Status

	Appropriate Field Triage	Under-Triage	Re-Triage
	Odds Ratio (CI)	Odds Ratio (CI)	Odds Ratio (CI)
Funding Status			
\$0.00 per Capita	Reference	Reference	Reference
>\$0.00 per Capita	0.84 (0.72-0.97)	0.75 (0.63-0.88)	0.63 (0.46-0.87)

Results

- 242,299 patients with ISS >15 met inclusion criteria
- Median age was 52 years (IQR=28-73). Median ISS was 17 (IQR=16-25).
- Two states (MA, NY) allocated \$0.00 per capita trauma funding, and three states (WI, FL, MD) allocated between \$0.09-\$1.80 per capita trauma funding.
- Compared to patients in states with no trauma funding, patients in states with trauma funding experienced decreased adjusted odds of mortality (OR=0.75 [0.60-0.93]).
- Funding was associated with decreased adjusted odds of mortality among all triage statuses, with the lowest estimate of adjusted odds for mortality among re-triaged patients (OR=0.63 [0.46-0.87]).

Limitations

- Critically injured patients were identified based on ISS, but clinically, patients are evaluated by Glasgow coma scale, systolic blood pressure, emergent anatomic injuries, etc.
- Funding is highly variable in amount, source, and allocation. Not all states clearly document a mechanism of trauma funding, and some states may have other mechanisms not managed by the state.
- Triage protocols vary from region to region. This study followed ACSCOT triage, but not all states have developed these guidelines

Conclusions

- Developing trauma systems with robust triage protocols requires stable, adequate funding.
- Regional agencies should be given autonomy to tailor their trauma system to local needs, but this should not limit sources of funding.
- Some states have found significant reductions in mortality following implementation of a statewide trauma system with dedicated trauma funding. These states can serve as an initial model of funding allocation.