



ACCESS TO CERTIFIED BURN CENTERS IN THE UNITED STATES: THE GEOSPATIAL AND TRANSPORT COST OF TRANSFER

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INTRODUCTION

- Approximately 300,000 burn injuries required medical intervention in the US in 2020, including 70,000 in pediatric patients.¹
- Although ABA-verified burn centers are pivotal in reducing burn associated morbidity and mortality, 25-50% of patients meeting transfer criteria are treated entirely at non-burn center hospitals.^{2,3}
- ABA-verified burn centers are limited in number and unequally distributed throughout the country – thereby contributing to access disparities for pediatric and rural patients.
- Patients with already limited access likely face greater financial hardship than their peers due to longer transport distances and the need for more costly modes of transport (i.e., Air Ambulance).⁴
- Present literature is insufficient to directly compare burn care access between different patient populations based on physical proximity and the estimated cost of transportation to the nearest verified burn center.

METHODS

- Verified centers (n = 59 adult and 43 pediatric) were identified via ABA burn center directory (accessed: September 28, 2022)
- We calculated and mapped distances from county centroids (n=3,106) to nearest center.
- Transport cost calculations were derived from the Centers for Medicare & Medicaid Services (CMS) Ambulance Fee Schedule Public Use Files.⁵
- Transportation costs were calculated for rural and urban counties separately based upon differing fee schedules in keeping with CMS guidelines
- Statistical Analysis: Paired (Adult vs. Pediatric) and Unpaired (Urban vs. Rural) T-Tests

RESULTS

Disparities of Burn Care Access Throughout the Southeast and Mountain West are Magnified for Pediatric Patients

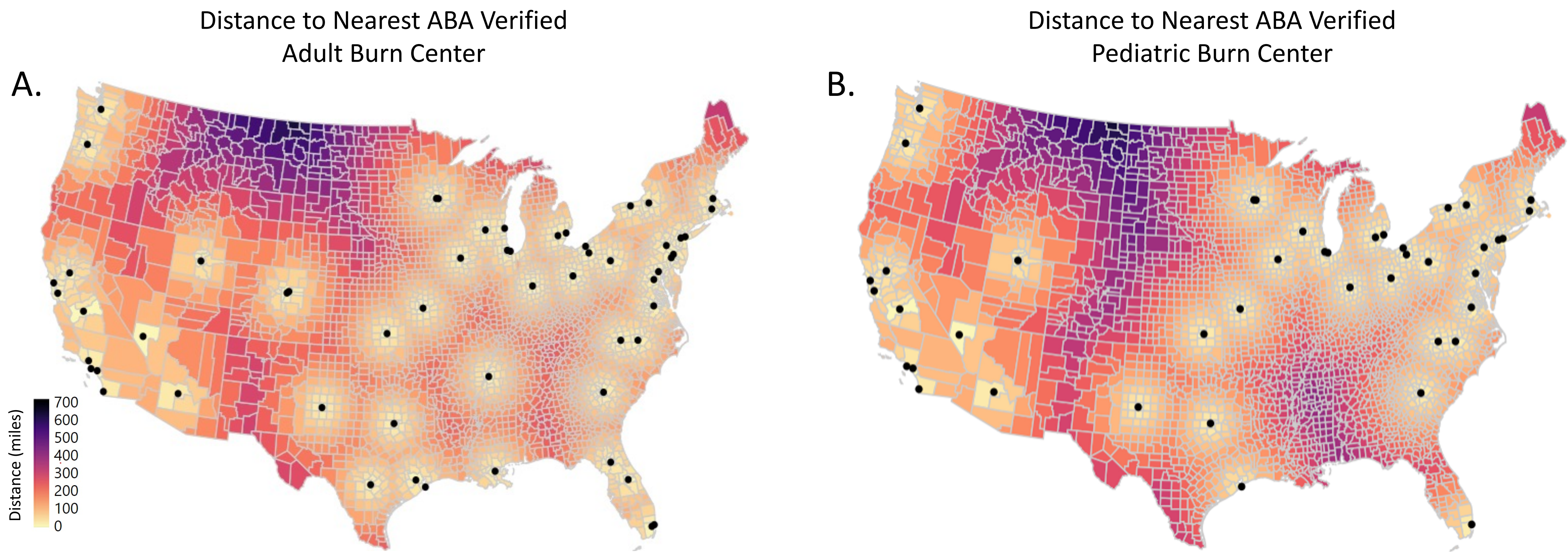


Figure 1. Distance (miles) from each county center to the nearest ABA verified Adult (A.) or pediatric (B.) burn center. Darker colors correspond to longer distances to the nearest center. Black circles denote verified centers.

Distance and Transport Cost Data for Pediatric and Rural Patients and Their Counterparts

		Average Distance (miles)	Difference [95% CI]	p	Air Transport Cost (USD)	Difference [95% CI]	p	Ground Transport Cost (USD)	Difference [95% CI]	p
All Counties (n=3106)	Adult	131.14	30.5 [33.0 to 28.0]	<0.0001	\$9,089	\$957 [1036 to 878]	<0.0001	\$1,551	\$245 [265 to 224]	<0.0001
	Pediatric	161.66			\$10,047			\$1,796		
All Patients	Rural	178.29	59.4 [53.2 to 65.66]	<0.0001	\$12,613	\$5,678 [5472 to 5883]	<0.0001	\$1,937	\$491 [441 to 541]	<0.0001
	Urban	118.84			\$6,936			\$1,446		

Table 1. Average county- level distance (miles) and transport costs (USD) for selected patient groups (adult, pediatric, rural, and urban). Statistical comparisons were made with either repeated measures (adult versus pediatric) or students t-tests (rural versus urban).

CONCLUSIONS

- Following burn injury, barriers to burn care access disproportionately affect certain patient populations. Prolonged transportation distances and the increased economic impact associated with transportation to verified burn centers may negatively impact patient outcomes.
- Specifically, pediatric and rural patient populations must travel farther than their counterparts to reach the nearest ABA-verified burn center – resulting in higher transportation costs.
- The Southeastern and Mountain Western regions represent areas of notable inaccessibility, and this effect is magnified for pediatric patients relative to their adult counterparts.
- Rurality appears to contribute more to the economic impact of burn injury associated transportation than patient age. In addition to differences in proximity, the increased base and per mileage costs assigned for rural versus urban transportation is a major contributor to this phenomenon.
- Future studies are needed to identify strategies to expand burn care access to those most in need.

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