

## Introduction

Longer travel time to healthcare facilities may negatively affect health outcomes [1]. This is particularly crucial if patients are children and need immediate care. The lack of access and distance to health care have been cited as major factors contributing to under-5 mortality and minimal healthcare utilization respectively [2]. A good or reliable access ( $\leq 60$  minutes of travel time) to a healthcare facility is considered crucial for families with children [2]. Access to health facilities, however, is impacted by certain factors such as presence or lack of facilities [3], quality of existing transport infrastructure [4], and availability of a vehicle [4, 5]. In an emergency, for example, the availability of a vehicle plays a critical role, especially in rural and remote areas with lower access to different forms of transportation and often at longer distances from a hospital [6].

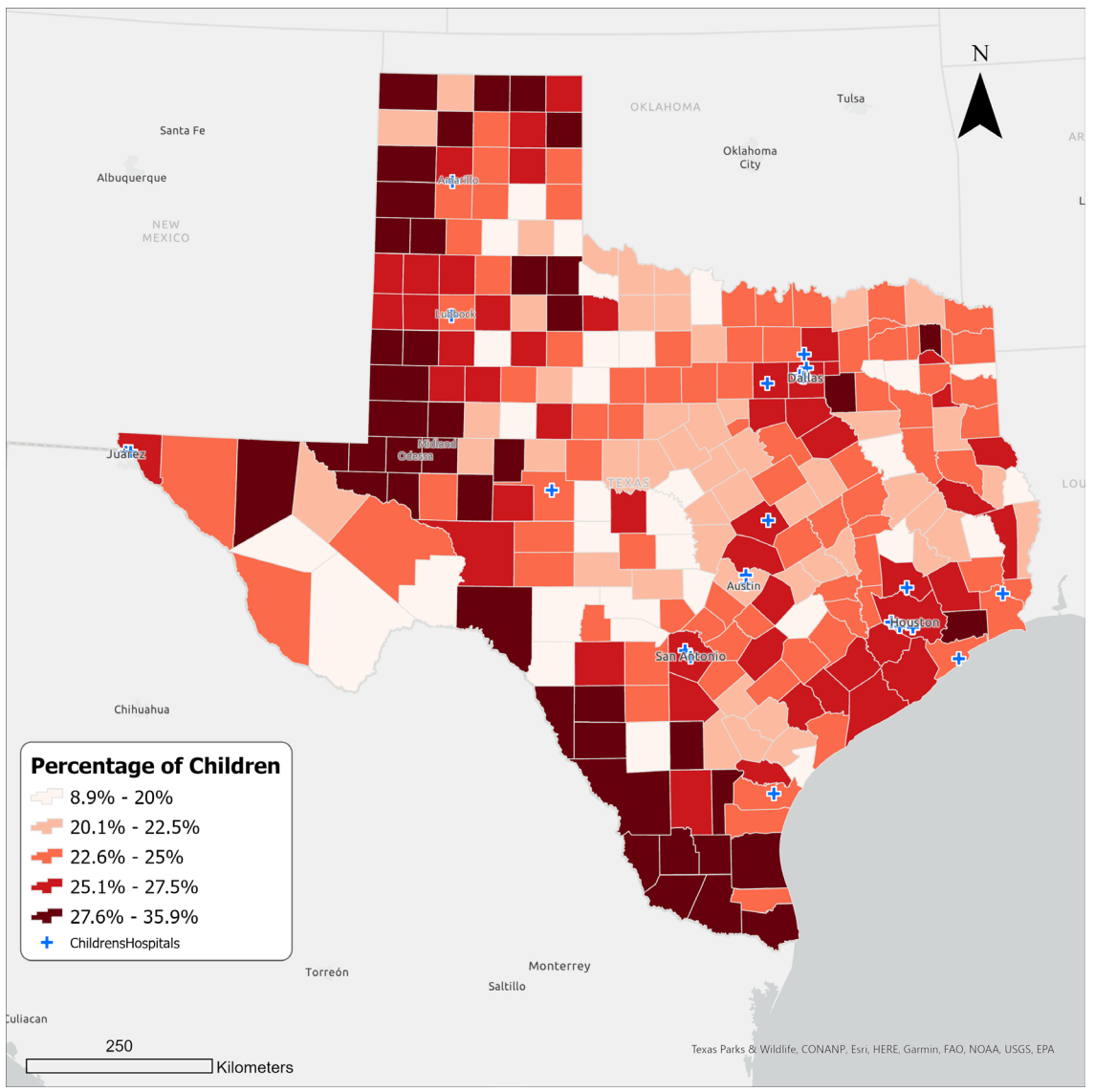
## Purpose Of Study

The purpose of this study is twofold. First, is to represent geographical accessibility to children's hospitals by calculating and mapping the 60-minute travel time service areas for individual children's hospitals in Texas. Spatial or geographical accessibility refers to physical accessibility and is often measured based on driving distance/time using a geographic information system (GIS). Second, is to model the hospital bed-patient ratio for each service area. This study uses the number of hospital beds as a proxy variable of resource availability, considered a primary indicator of healthcare resources in the literature [7].

## Research Questions

1. Which areas (counties) have the least access (> 60 minutes travel time)?
2. How many opportunities (children's hospitals) are available within a 60-minute travel time?
3. Considering the capacity constraints of the medical facilities, which areas have limited access to children's health care?

## Study Area

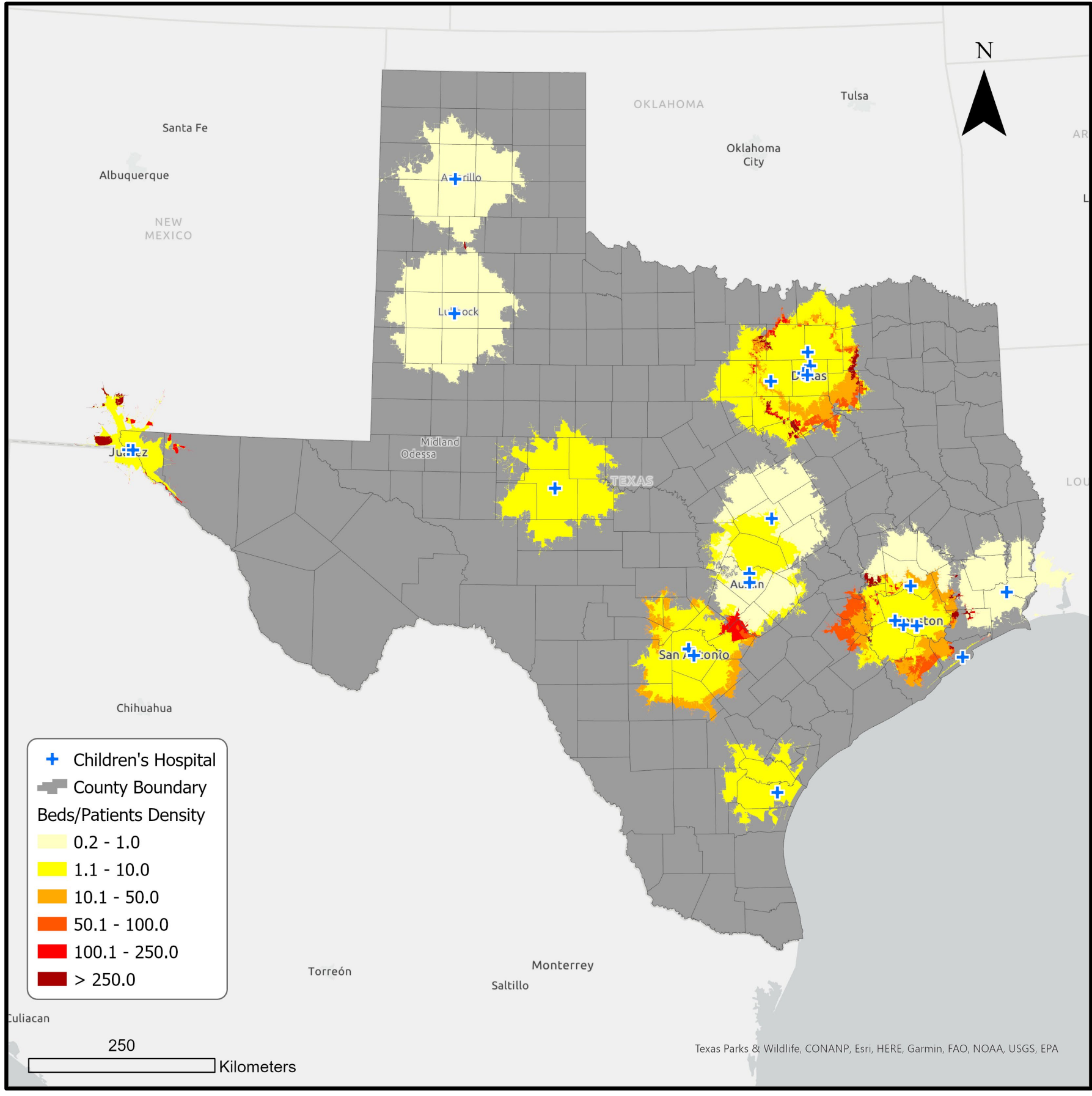
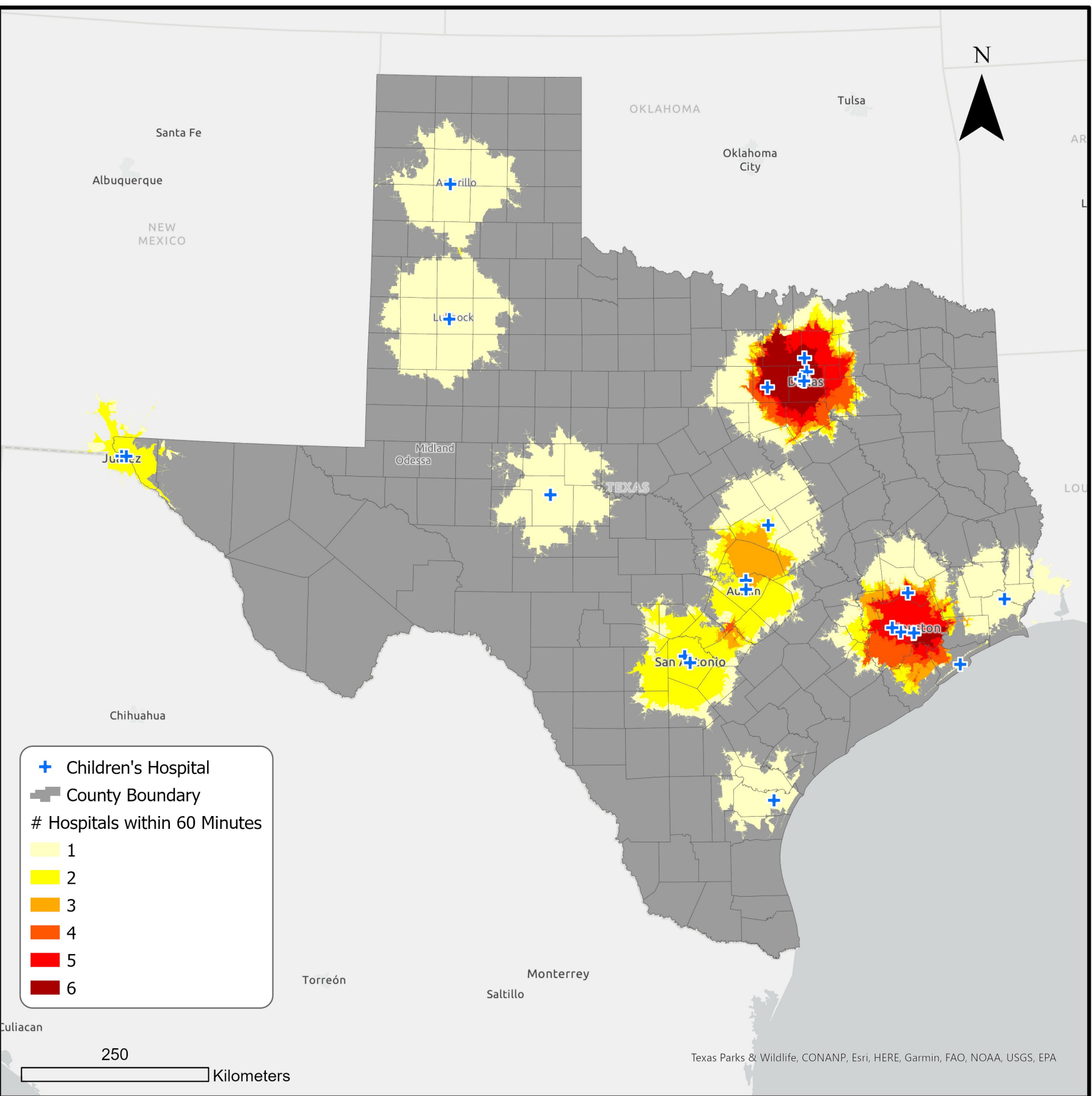
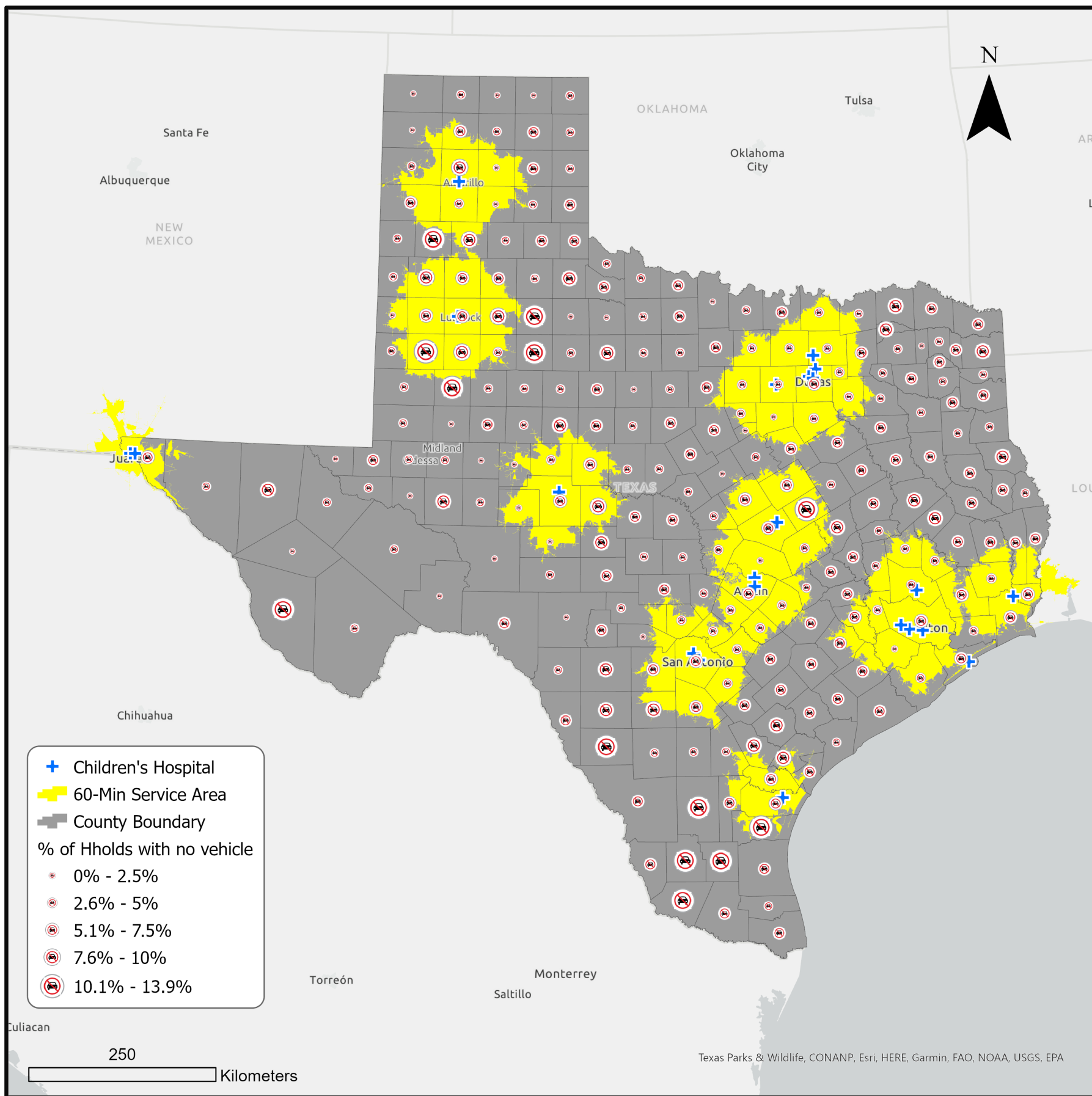
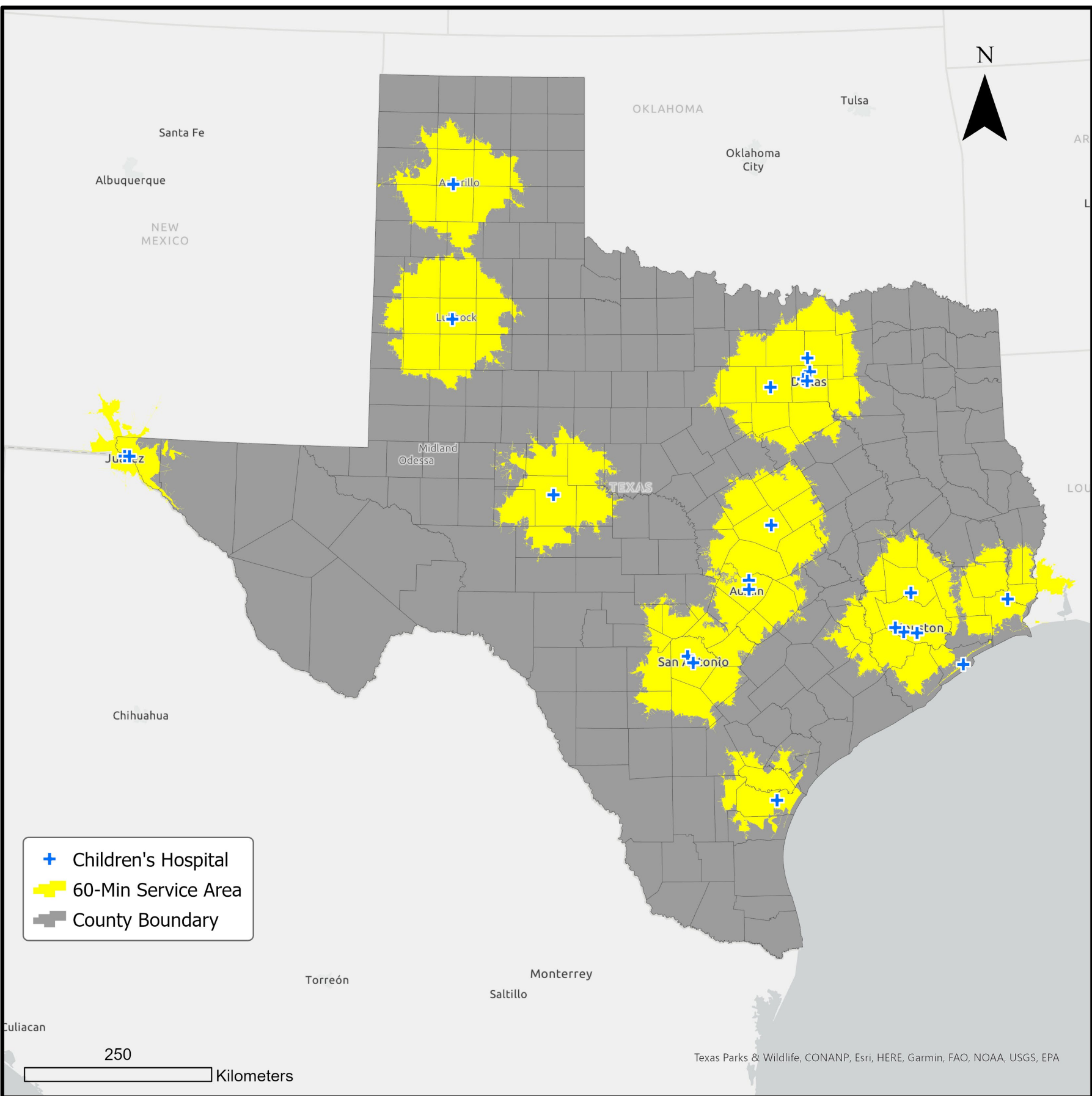


Characteristic	Value in 2021
State Population	29,164,943
Children's population	7,470,055 (25.6%)
Average percentage of children per county	24
Households without a vehicle	533,500 (5.4%)
Number of Children's Hospitals	24

## Methods and Analysis

- Compiled a database of children's hospitals and hospitals with pediatric emergency services in Texas from various sources.
- Created 60-minute drive-time service areas for each hospital.
- Produced 160 nonoverlapping service areas and calculated the children's population for each area.
- Calculated and mapped the hospital density and bed/patient density per 1000 children.

## Results



## Findings and Discussion

This study found that:

- 24.8% of the children population (over 1,850,000) in Texas live outside of a 60-minute travel time from a hospital. Most of these children are in the southern and western counties.
- 5.4% of TX households do not have a vehicle (533,500); 74.4% (396,832) of these households live outside of a hospital's 60-minute service area.
- While people living in metro areas such as Dallas and Houston have access to a greater number of children's hospitals within a 60-minute drive, they do not experience greater bed availability.
- There is a need for pediatric healthcare services in areas far from a hospital. Also, considering population growth in metro areas and their surroundings, there is a greater need for healthcare infrastructure in these areas as well.

## Future Work

- Identify locations in Texas that are in critical need of pediatric healthcare facilities and services.
- Explore the potential of healthcare facilities in areas without a children's hospital or far from one to serve as possible clinics for pediatric healthcare services.

## References

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