What's in a State? Comparing Rhode Island's Trauma Population to National Standards

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ABSTRACT

Variation in trauma patient populations has not been well quantified in the literature. Rhode Island's (RI's) population is substantially older than the national average. The unique needs of elderly trauma have implications for trauma system design and defining injury prevention goals. The objectives of this project are to: (1) develop a computational approach to quantify trauma population variation and (2) understand how such variation affects system outcomes and can inform policy. Trauma incidents in RI disproportionately affect the elderly and Black/African Americans, though the most common types of trauma injuries do not significantly differ from national trauma injuries.

INTRODUCTION

The RI population is not representative of the national population. RI census data show that 14.4% are at least 65 years old and 2.5% are among the "oldest-old" (85 years and older), the highest in the nation.[1] This project develops a computational approach to study population variation for trauma systems in RI and beyond. Quantifying variation is the first step in studying how it affects trauma systems' health and cost outcomes and how trauma policy can be better informed by registry data.

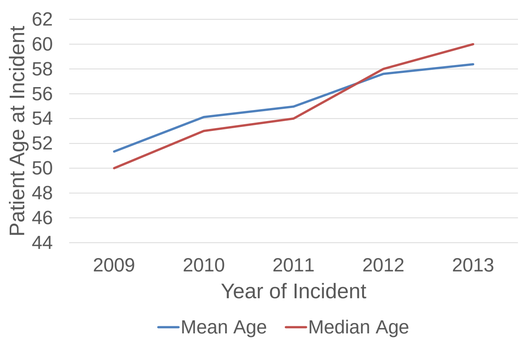
METHODS

A retrospective review of two trauma registry databases was performed using five years of data (2009-2013) from (1) Rhode Island Hospital's Trauma Registry and (2) the American College of Surgeon's National Trauma Data Bank (NTDB). NTDB is a nationally-representative trauma registry. Data cleaning and analysis algorithms were written in Julia. Preliminary results include descriptive statistics on demographic and ICD-9 CM diagnostic codes for each data source.

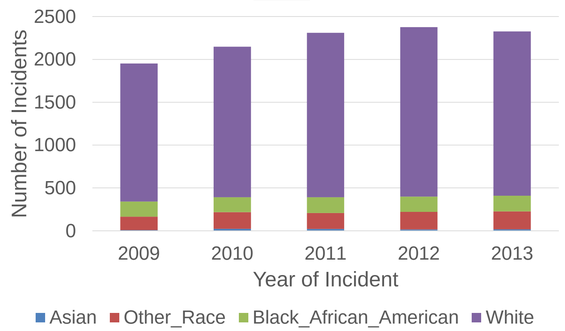
RESULTS

From 2009 to 2013, the median trauma patient age in RI increased by 10 years, from 50 to 60 years old. During this time period, RI trauma incidents rose from 1956 incidents in 2009 to 2332 in 2013, plateauing in 2012. In 2012, the median trauma patient age ranged from 39 to 52, depending on geographic region. Black/African Americans are the most overrepresented, comprising 8.1% of all trauma incidents from 2009-2013 but making up only 5.7% of the RI population.[2] Whites are also overrepresented (82.4% of trauma incidents compared to 81.4% of the population) while Asians are underrepresented (.8% compared to 2.9%). The most common trauma diagnoses were similar in RI and national samples, including fracture, superficial injury, open head wound, and crush injury.

RIH Trauma Incidents by Age, 2009-2013



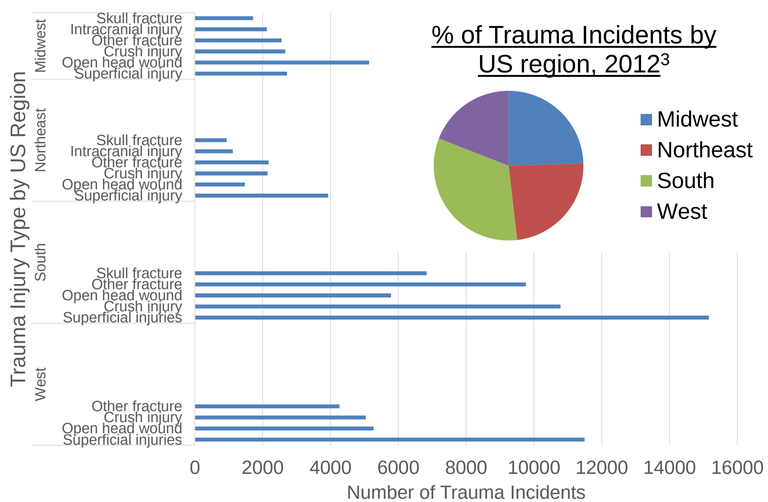
RIH Trauma Incidents by Race, 2009-2013



Most Common Trauma Injury Types in RI, 2013

1. **Other Fracture**: "Closed fracture of Lumbar or Thoracic vertebrae w/o spinal cord injury"
2. **Superficial injury**: "Contusion of face, scalp, and neck except eyes"
3. **Open head wound**: "Open wound of scalp, w/o complication"
4. **Crush injury**: "Traumatic pneumothorax"
5. **Skull fracture**: "Closed fracture of nasal bone"

Most Common Trauma Injury Types by US Region, 2012



% of Trauma Incidents by US region, 2012[3]

CONCLUSIONS

RI has a higher burden of elderly trauma incidents compared to national averages, though aggregate data does not show differences in the most common trauma incidents. Racial disparities in trauma disproportionately affect Black/African Americans in RI. This project suggests trauma policy in RI should focus on reducing incidents among the elderly and Black/African Americans. Using trauma registry data from state and national sources, a computational approach is useful in identifying state-level trends to inform future policy.

FUTURE DIRECTIONS

- What comorbidities and adverse events are associated with the most common trauma diagnoses? Are these preventable?
- What is the prevalence of different trauma incidents across demographic groups like age?
- Are there regional differences in certain trauma types (eg. gun violence)? How have these trauma cases changed over time?

REFERENCES

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