The Spatial Epidemiology of Pediatric Trauma: A Statewide Assessment

Allison Ertl\textsuperscript{1}, MS
Yuhong Zhou\textsuperscript{1}
Kirsten Beyer\textsuperscript{1}, PhD, MPH, MS
Sergey Tarima\textsuperscript{1}, PhD
Jonathan I. Groner\textsuperscript{2}, MD
Laura D. Cassidy\textsuperscript{1}, MS, PhD

Pediatric Trauma Society Annual Meeting
November 7, 2015

\textsuperscript{1} Medical College of Wisconsin, Milwaukee, WI
\textsuperscript{2} Nationwide Children’s Hospital, Columbus, OH
Funding Acknowledgement

Research reported in this presentation was supported by the NICHD of the National Institutes of Health under award number 1R03HD071924-01A1, Laura D. Cassidy, PhD Principal Investigator. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.
Introduction

• Trauma is the leading cause of death in children ages 19 years and younger

• Identification of areas with high rates of pediatric trauma needed

• Geographic Information Sciences (GIS) can be used for trauma surveillance and spatial organization of trauma data

• This study used GIS to analyze statewide data from the Ohio Trauma Registry (OTR) to identify spatial patterns in pediatric injury
Methods

• OTR contains 89% of Ohio’s Hospitals

• Data on 17,377 pediatric trauma patients under 16 years old from 2007-2012

• Adaptive spatial filtering effectively controls for population size

• Age- and sex- adjusted pediatric trauma rates

  1. Severe trauma indirect rate (Injury Severity Score (ISS) >15)

  2. Standardized Mortality Ratio
RESULTS
Pediatric Trauma Standardized Mortality Ratio Map, Ohio 2007-2012

SMR
- 0.23 - 1.00
- 1.01 - 1.50
- 1.51 - 3.00
- 3.01 - 4.50
- 4.51 - 6.00
- 6.01 - 10.92

Cities (pop>100k)

Interstates
Conclusion

• Areas with higher than expected age- and sex-adjusted rates of severe injury and mortality, particularly those >1 hour from a PTC or Level I ATC, should be further explored to identify opportunities for injury prevention and appropriate access to timely care.
Questions?

alertl@mcw.edu

Acknowledgment: The authors would like to acknowledge Timothy Erskine and Schuyler Schmidt of the Ohio Department of Public Safety for providing the data.