Medical Response Times and Their Effect on Prehospital Care

Storm J. Santos, Rural Health Scholar
Murray State University

Questions

1.What factors influence medical response times?

2. Do medical response times play a role in prehospital care and/or patient outcomes?

3. Are there discrepancies between rural and urban area medical response times?

Introduction

The Emergency Medical Response System (EMS) plays an important role in ensuring that people receive medical care as soon as possible. There are many times that this system saves lives; however, there are many times when patients are found dead by the time paramedics arrive, or they die while in the ambulance back to the hospital (see table 3 for mortality rates taken from a study involving pediatric patients).

There are specific guidelines and adages that EMS must follow while responding to an emergency. One specific adage has been nicknamed “The Golden Hour”. This term, first coined by R. Adams Cowley states that from activation to the time where the patient is in the hospital must be under an hour. Once an hour has passed often the patient will be deceased.

Response times may differ depending on if the emergency is in a rural or an urban area. The United State Census establishes a rural area as having a population less than 2,500, an urban cluster with a population between 2,500 and 50,000, and an urban area with a population of over 50,000 (Gonzalez 2009). For this and any following research, Census data will be used to determine whether an area is rural or urban.

About the Author

Learn More!

Findings

- Medical response times slowed due to:
  - -Time of activation
  - -Location of emergency
  - -Traffic flow
  - -Ambulance sites
  - -Available resources
- Severe vehicle trauma and mortality roughly twice as high in rural areas with an overall mortality rate of 13.8% (Mohanty et al 2006).
- Rural Areas have:
  - -fewer supplies
  - -fewer opportunities
  - -fewer staff
  - -poor infrastructure
  - -more ground to cover
- Distance directly impacts mortality rates (see figure 3)
- Found to be an over six times greater (figure 2) chance of sustaining long term injuries and/or death stemming from rural medical response when compared to those from urban areas; (Nicholl et al 2007).

Conclusions

The following conclusions have been taken from other research works (refer to the “future research” section to view plans for a research plan for this research group):

There is room for EMS response improvement in both urban and rural areas, but there is an apparent divide between the two. It has been found that the lack of money, resources, distance, and infrastructure contribute to the poor response times.

Many of the deficiencies in rural areas can be attributed to low population density. Low populations make it harder for businesses to become profitable, thus there are less opportunities for hospitals, or EMS posts. In terms of emergency first aid, if there are less people then there is less of a chance that there would be someone available to perform essential needs such as CPR and triggering the response system.

Reviewing other’s research conclusions, one way to improve EMS response times is for hospitals and EMS to become more efficient. Some examples of ways to become more efficient are the following: pre-stocking ambulances, creating alternate routes for traffic purposes, working with local and state government to pass legislation that helps improve traffic flow while EMS are in pursuit, and incorporating/improving GPS technology to find the fastest routes to the emergency site.

Figures

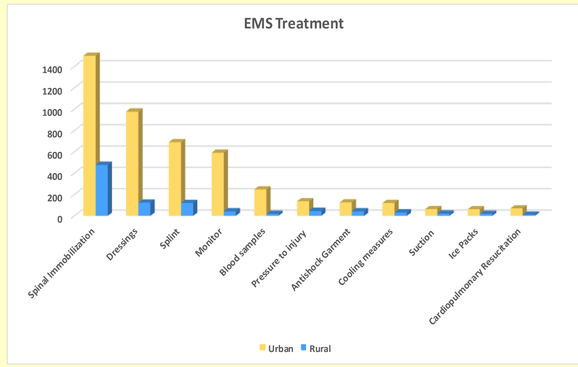

Figure 1: Pediatric Prehospital Care in Urban and Rural Areas by James S. Seidel, M.D. PhD

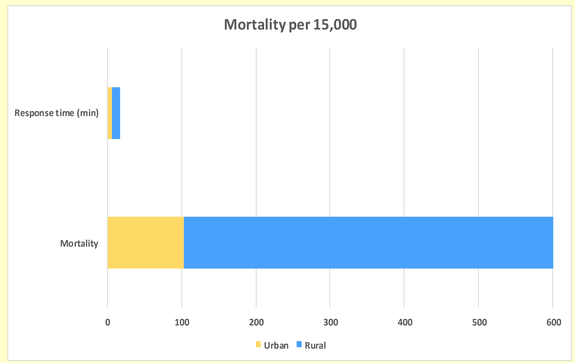

Figure 2: Does increased emergency medical services prehospital time affect patient mortality in rural motor vehicle crashes? A state wide analysis by Richard P. Gonzalez, M.D.

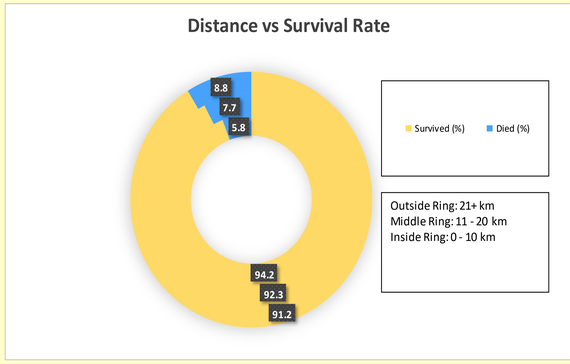

Figure 3: The relationship between distance to hospital and patient mortality in emergencies: an observational study by Jon Nicholl

Research Limitations

- No direct research involving Kentucky or surrounding areas.
- There has not been a published peer reviewed study regarding the difference between rural and urban medical response times.
- US Census has clearly defined labels of what is Rural, Urban Clusters, and Urban/Metropolitan Areas but Rural/Urban is seen very different in a social context.
- There was no research from a medical instructional institution i.e. School of Medicine used in the currently studies.

Future Research

- Focus on reduction of the “research limitations”
- This will be achieved through the following:
  - ⇒ Conducting research predominantly in the Western Kentucky area, including both rural and urban areas.
  - ⇒ Include data from different hospital groups, including teaming up with local universities.
  - ⇒ Work with selected hospitals for ways to improve response times.
  - ⇒ Data will be recorded and tracked for roughly a year and will be evaluated and published if findings are of interest.

References

Böttiger B, Grabner C, Martin E, et al. Long term outcome after out-of-hospital cardiac arrest with physician staffed emergency medical services: the Utstein style applied to a midsized urban/suburban area. Heart [serial online]. December 1999;82(6):674-679. Available from: CINAHL with Full Text, Ipswich, MA. Accessed June 26, 2017.

Gonzalez R, Cummings G, Phelan H, Mulekar M, Rodning C. Does increased emergency medical services prehospital time affect patient mortality in rural motor vehicle crashes? A statewide analysis. American Journal Of Surgery [serial online]. January 2009;197(1):30-34. Available from: MEDLINE, Ipswich, MA. Accessed June 26, 2017.

More Here!