Introduction

The response time is a crucial element of Emergency Medical Services (EMS). However, there are neither federal nor state (specifically Michigan) laws that provide the same type of regulations to regular EMS response times, and standards are being set by individual vendors or local organizations. Therefore, response time performance measures may vary from one agency to another.

The data utilized in this study was motor vehicle crash (MVC) data collected in the state of Michigan from January 2010 through March 2015. The dataset contains information about the accident victims, the EMS personnel involved at the crash sites, and a variety of other factors that may contribute to the response time to the MVC. The dataset does not contain information about the location of the accident or the region where the accident occurred.

The study did not identify any problem with the data collection process or the response time data. However, the data was not complete or consistent, and it is possible that the data is not representative of the entire population of MVCs.

The Chi-Squared Test evaluated the goodness-of-fit between the observed data and the theoretical distribution. The common issue of only having a small number of intervals available for Chi-Squared testing was avoided.

The Kolmogorov-Smirnov Test compares the cumulative distribution function (CDF) of the known theoretical distribution and the sample data. The CDF is placed on the x-axis and the cumulative probability on the y-axis.

American Heart Association: Timely Response to Cardiac Arrest (5)

- Cardiopulmonary Resuscitation (CPR) should be initiated within 4 minutes and established ventilation within 6 minutes.
- Defibrillation within 8 minutes of initial arrest.

The response time is a crucial element of Emergency Medical Services (EMS).

Rural & Urban Classification

- Geographical characterization is determined by population density.
- Urban population larger than or equal to 50,000.
- Rural populations less than or equal to 50,000.

65 Distributions: Goodness-of-Fit Tests

Chi-Squared Test

The goodness-of-fit between the observed data and the theoretical distribution is derived on the model of the known theoretical distribution. The common issue of only having a small number of intervals available for Chi-Squared testing was avoided.

Kolmogorov-Smirnov Test

The goodness-of-fit results suggest that the 3-Parameter Lognormal Distribution is one of the most suitable distributions for future predictive modeling. The 3-Parameter Lognormal Distribution was identified as the highest ranking distribution based on the Anderson-Darling test. However, distributions such as Pearson 3 (P3) and Inverse Gaussian, and others also presented plausible fits and may be considered in further modeling studies.

References


5. Chi-Squared Test: Approximation Line


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