Arizona Bureau of EMS and Trauma System, Services Section
Ben Fisher, Section Chief (602) 542-2246 benjamin.fisher@azdhs.gov
Vatsal Chikani, Statistician (602) 364-3191 vatsal.chikani@azdhs.gov
Anne Vossbrink, Registry Administrator (602) 364-3164 anne.vossbrink@azdhs.gov
Robyn Blust, Statistician, (520) 248-2877 rnblust@gmail.com

AUTOMATING EMS DATA QUALITY REPORTS USING STATISTICAL SOFTWARE

INTRODUCTION: Stakeholder complaints about frequent changes to the state EMS registry and poor data quality lead the state's EMS Council to approve a changes to Arizona's EMS data collection system. A new 126 element registry, the "Cactus Data Set" (CDS), was created from data elements used in EMS performance improvement reports over the last 7 years plus NEMSIS required elements.

OBJECTIVES: Increase EMS data quality by creating a scoring algorithm and disseminating data score reports to contributing agencies.

METHODS: Each element in the CDS is assigned to one or more time-sensitive illnesses and injuries (TSII) – Major Trauma, Acute Stroke, ST-Elevated Myocardial Infarction, Out of Hospital Cardiac Arrest, and Opioid Overdose/Death or a demographic data set.

A scoring algorithm created by the Bureau using SA version 9.4 calculates the data completion rate for each of the elements. The algorithm identifies the number of incidents meeting inclusion criteria (denominator) for each TSII using conditional logic. For example, the denominator in the "ED Pre-Notification-Trauma" measurement includes incidents where an injury is present and the disposition is transport to a hospital. The numerator includes incidents where data elements associated with that TSII are documented. When determining the numerator, null values were considered a documented response when appropriate. If a value was missing but a pertinent negative was provided, the response was considered documented.

A score is calculated for each data element. If the rate was greater than or equal to 90% then a score of 1 was assigned, if the rate was less than 90% then a score of 0 was assigned. Each TSII is scored based on the aggregate element scores. For each TSII, the percent of data elements with a score of 1 was calculated to give an overall summary score for that condition.

RESULTS: Using the programming algorithm developed in SAS, the Bureau of EMS staff are able to automatically create agency-specific reports for each TSII for a desired time frame. Each agency-specific report contains their scores and the aggregated scores for the entire registry. This allows EMS agencies to identify areas where documentation needs improvement. The State EMS Council sets annual data score targets.

CONCLUSION: Although developing an automated data quality scoring program using statistical software is time consuming, once developed, it significantly decreases the difficulty in creating frequent agency-level quality reports. The reports should lead to improvements in data documentation and allow the Bureau to create and share meaningful time sensitive illness and injury reports.