

# **Validity of the pre-hospital Cardiac Arrest Survival Rate Comparison Presented by Denver Health on a Map of the USA.**

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One of the key pieces of information that Denver Health states is evidence of the adequacy of Denver Health's Paramedic services is their reported medical cardiac arrest survival rates. This information is presented on a map of the USA with an explanation table in Denver Health's "White Paper"(Appendix D) This information is purported to show the cardiac arrest survival rates in several major cities including Denver. The survival rates on the map range from less than 1% to 40%. This map is clearly not an "apples to apples" comparison. Different cities excluded different groups of patients. Different cities also defined survival differently. Age of the comparison data is also a concern ranging from 2 years old to over 30 years old.

There are some other issues with the cardiac arrest survival numbers reported by Denver Health. One of these issues is the combining of cardiac arrests handled by street ambulances with those treated by the paramedics at DIA. The reason that this is vital is that Denver really has 2 separate types of EMS systems. Denver has one type of EMS system on the streets and another type at DIA. On the streets, Denver has a 2 tiered response system. This two tiered system starts with a basic life support first response by Denver Fire. Denver Fire usually arrives first and provides basic care including oxygen, bleeding control and automated defibrillation. The second street tier is the ALS response by Denver Health's Paramedic transport ambulances. The ALS paramedics provide a full complement of advanced procedures, medications and patient transport to the Emergency Department. Response times for street operations are measured from the time a fire truck or ambulance is assigned to the time that the unit (BLS or ALS) arrives at the reported address. The responders may not actually reach the patients side for several minutes after dispatch records indicate that a unit has arrived at the reported address.

DIA has a totally different response model. DIA has a rapid response/ALS (paramedic) first response. At DIA the first response is by Denver Health Paramedics stationed in the terminal and concourses. The Paramedics respond in a modified suburban or a fully equipped EMS cart. Denver Fire is the second response tier at DIA. DIA also has proportionately more Paramedic response units and response times are shorter at DIA than on the street DIA also uses a different way of recording on scene time for the ALS first response. The Paramedics are already at the airport so in most cases they have already arrived at the address. When a DIA paramedic reports he is at the scene what it means is that the Paramedic is at the patient's side. Reports suggest that many more

cardiac arrests are saved at DIA than they are on the streets. This is also the shared opinion of most all of the Paramedics that work at DIA. This is consistent with the findings from Denver Health and other systems that report better survival rates with faster ALS response times. When Denver Health reports their cardiac arrest survival rate without separating, or at least identifying, the DIA cardiac arrests it makes the survival rate for cardiac arrests in the City appear to be better than it actually is. This also hides the fact that the first response ALS system at DIA saves more lives than the BLS (DFD) first response system in the City.

Another issue is Denver Health's failure to separate out or at least identify patients who suffer cardiac arrest in front of the EMS providers. According to the internationally recognized Utstein Template for reporting pre-hospital cardiac arrest survival the survival rate of patients who suffer cardiac arrest in front of EMS should be reported separately from patients who are found in cardiac arrest. This is because the survival rate of patients who arrest in the presence of EMS is a measure of a different dynamic than measuring the overall EMS systems response to Cardiac Arrest in the community. The table from Denver Health's "White Paper" (Appendix D) explaining the cardiac arrest survival rate map states that Denver Health used the Utstein template but the information on EMS witnessed arrests is omitted.

The next issue is the failure of Denver Health to separate out or at least report separately Pts who were resuscitated prior to Denver's EMS system contacting the patient. These would be patients resuscitated on aircraft prior to arriving at DIA and Pts resuscitated PTA at clinics and public areas with AEDS. This group of patients is never under the care of Denver's EMS system while in cardiac arrest and including them in the survival rate makes the reported rate deceptive.

The final issue is the group of patients that the Paramedics get to after a prolonged response time and are declared dead at the scene. This group of patients is not included in the survival calculations because no resuscitation is attempted.