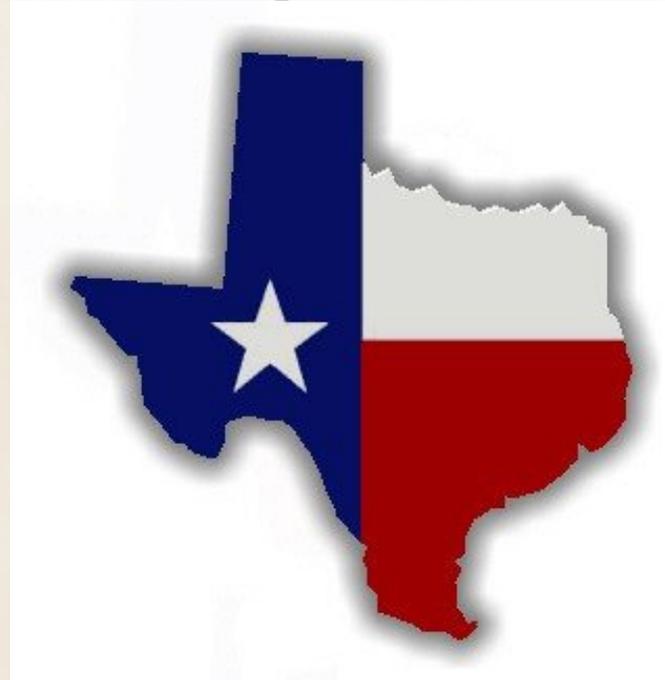




# EMSC State Partnership: EMS and Hospital Survey Data



**Manish I. Shah, MD** (Co-Investigator)  
**Tony Gilchrest, BS-EHS, MPA, EMT-P** (Program Manager)  
**Charles G. Macias, MD, MPH** (Principal Investigator)



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# Objectives

- To define the national EMSC performance measures
- To describe the survey methodology to assess certain performance measures
- To share results from the Texas survey
- To identify implications on pediatric emergency care in Texas





# Background:

## EMSC Performance Measures

- To measure the degree to which States/Territories have ensured the operational capacity to provide pediatric emergency care by assessing the percentage of **EMS agencies** that have
  - Online medical direction (#71)
  - Offline medical direction (#72)
  - Essential pediatric equipment and supplies (#73)





# Background: EMSC Performance Measures

- To measure the degree to which States/Territories have ensured the operational capacity to provide pediatric emergency care by assessing the existence of a statewide and/or regional **standardized system that recognizes hospitals** able to stabilize and/or manage
  - Pediatric medical emergencies (#74)
  - Pediatric trauma (#75)





# Background:

## EMSC Performance Measures

- To measure the degree to which States/Territories have ensured the operational capacity to provide pediatric emergency care by assessing the percentage of **hospitals** that have written
- Pediatric interfacility transfer guidelines (#76)
- Pediatric interfacility transfer agreements (#77)





# Background:

## EMSC Performance Measures

- To adopt a statewide requirement for **pediatric emergency education** for the license/certification renewal of BLS and ALS providers (#78)
- To establish **permanence of EMSC** in the EMS system through
  - An EMSC Advisory Committee (#79)
  - Pediatric representation on the State EMS Board (#79)
  - A full-time equivalent EMSC manager (#79)
  - Integration of EMSC priorities into existing mandates (#80)



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# Background: Survey

- Survey assesses 5 performance measures
  - EMS
    - ▣ Online/offline medical direction
    - ▣ Equipment and supplies
  - Hospital
    - ▣ Interfacility transfer guidelines
    - ▣ Interfacility transfer agreements
- Administered in all 56 States and Territories





## Background: Texas EMS Survey ('07-'08)

- Online medical direction availability
  - 64% of BLS units
  - 63% of ALS units
- Offline medical direction availability
  - 43% of BLS units
  - 86% of ALS units



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



## Background: Texas EMS Survey ('07-'08)

- Pediatric equipment and supplies
  - 17% of BLS units
  - 34% of ALS units
- Survey response rate of 48%
- Included non-911 agencies
- Urban bias





## Background: Texas Hospital Survey ('07-'08)

- 21% had all 6 components of the interfacility transfer guidelines
- 52% had transfer agreements
- Survey response rate of 55%

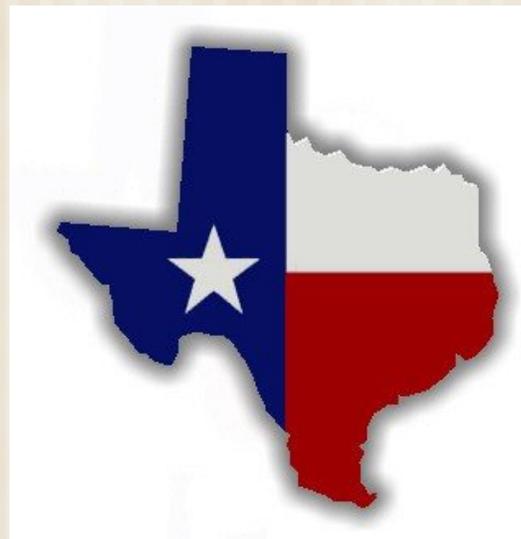


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# EMS Agency and Hospital Surveys



## Methods



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# Methods: EMS Survey

- Inclusion criteria
  - 2009 DSHS list of EMS providers
- Exclusion criteria
  - Military-based
  - Industrial
  - Air medical without ground response units
  - Do not respond to 911 calls
- Administered online





# Methods: Hospital Survey

- Inclusion criteria
  - 2009 THA list of general hospitals
- Exclusion criteria
  - Hospital does not have an emergency department
- Administered via phone





# Methods: Both Surveys

## Role of NEDARC

- Created and revised survey
- Created sampling scheme
- Compiled data





# Methods: Both Surveys

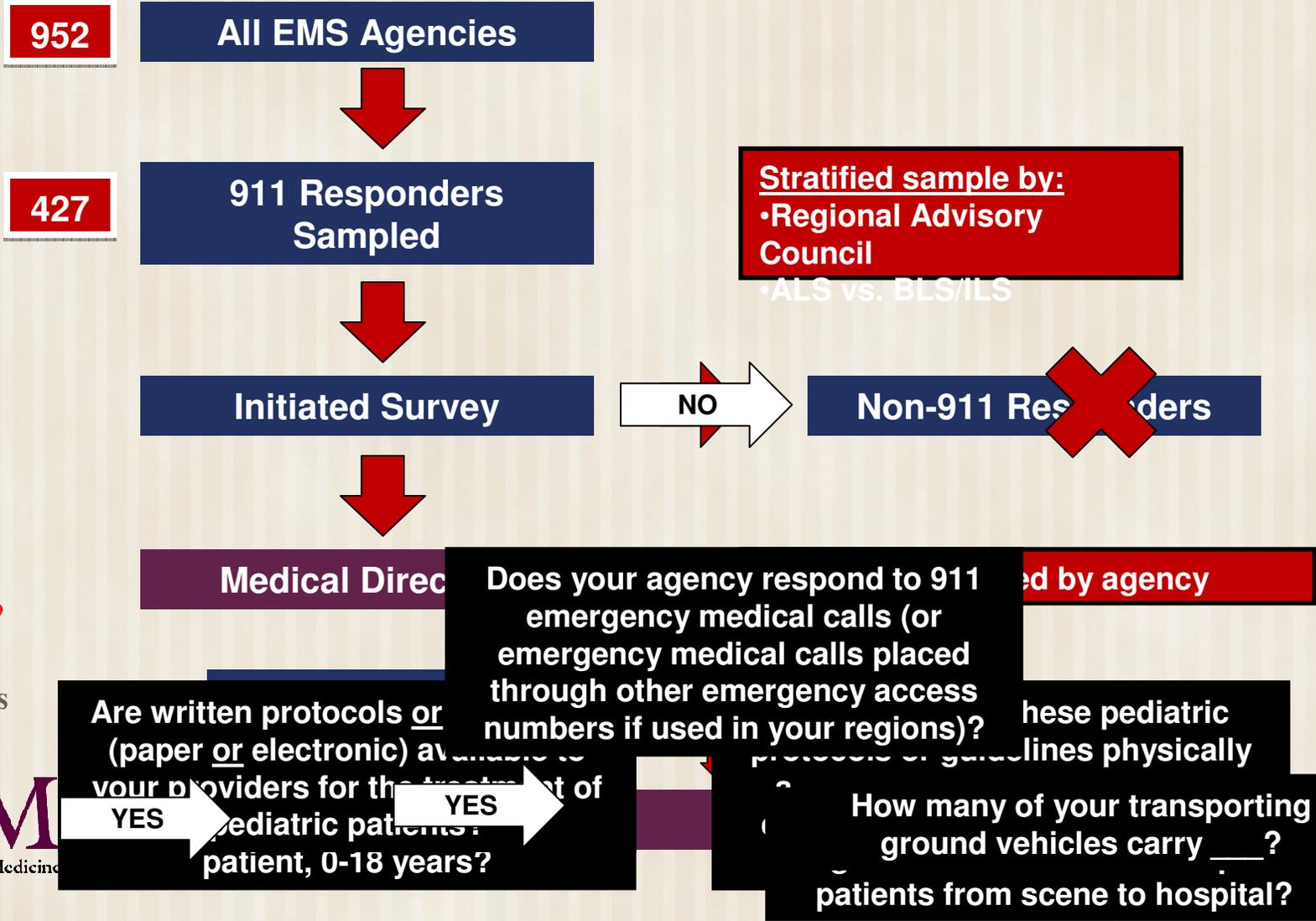
## Role of Texas EMSC State Partnership

- Created additional questions
- Surveyed participants
- Descriptive reporting of data
  - With and without outliers, when relevant
  - ALS vs. BLS
  - Rural vs. Nonrural





# Methods: EMS Survey





# Methods: EMS Survey Supplemental Questions

Equipment  
Offline Medical Direction

A LOCAL ED

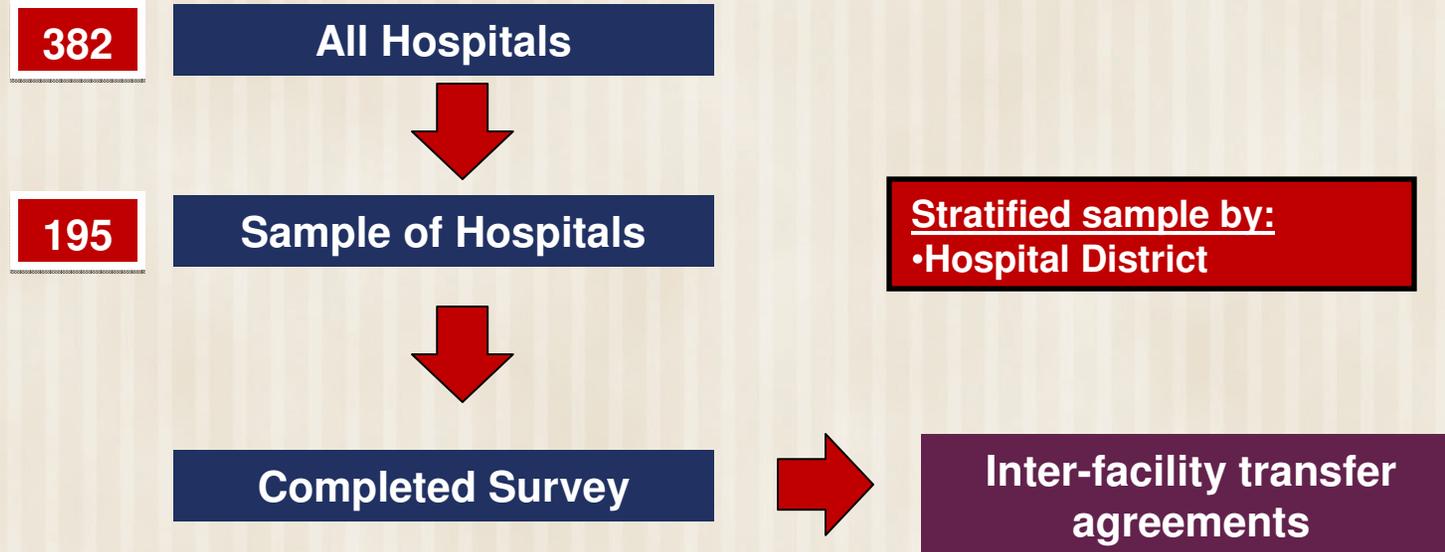
If the EMSC program in Texas created evidence-based pediatric protocols, would your EMS agency consider using them?  
your EMS agency be interested in this service?

These questions were placed at the end of the survey, so only transporting agencies responded to these questions





# Methods: Hospital Survey



Texas Children's Hospital

**BCM**  
Baylor College of Medicine

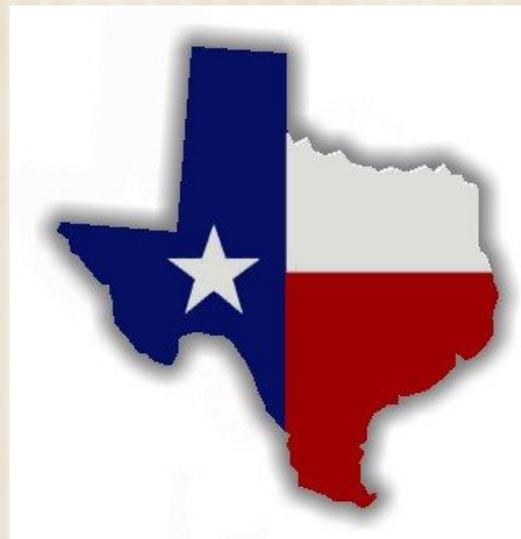


Does your hospital or medical facility have inter-facility guidelines and a plan for provision of directions and transportation?

Does your hospital or medical facility have written inter-facility agreements with other hospitals for the transfer of patients of all ages including children in need of care not available at your hospital?



# EMS Agency and Hospital Surveys



## Results

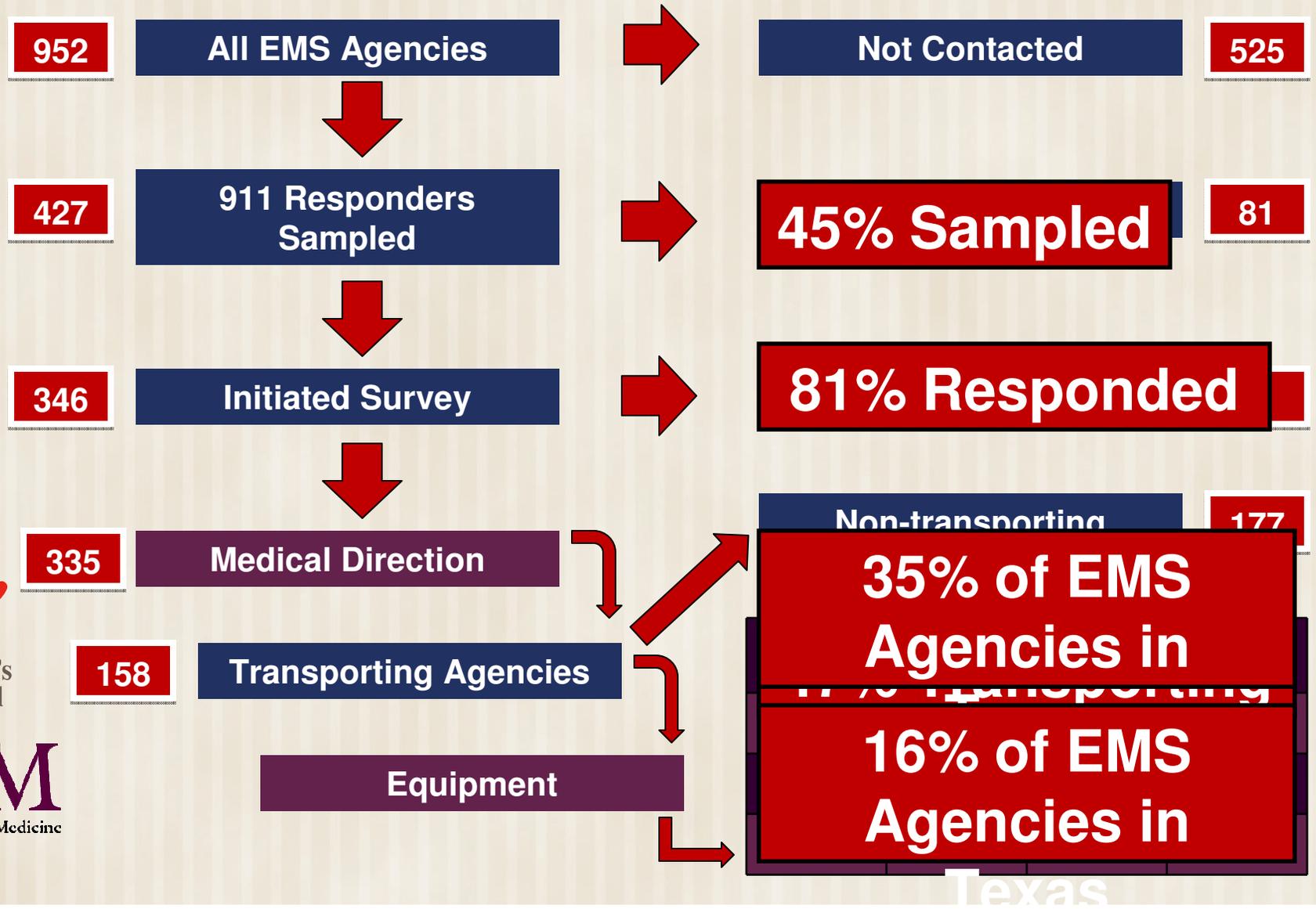


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

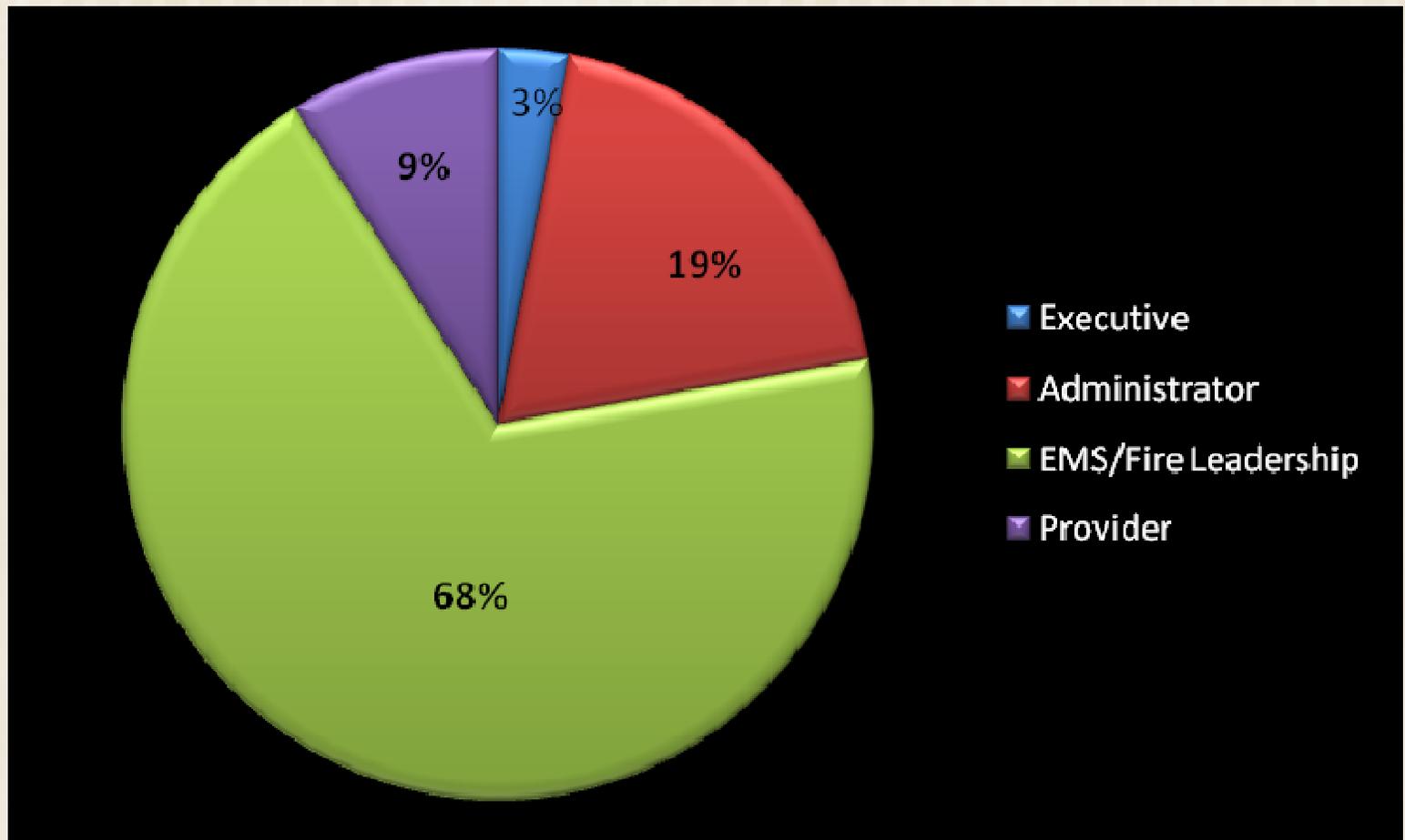


# Results: EMS Survey





# Survey Respondents



Texas Children's Hospital

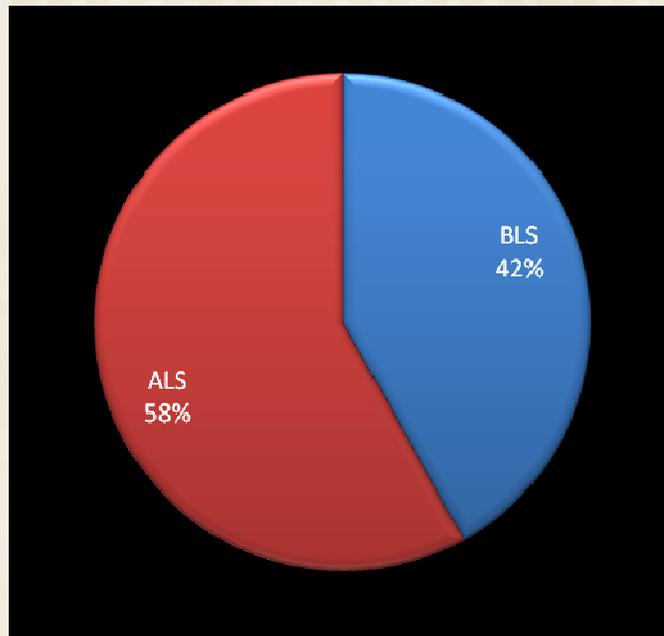
**BCM**  
Baylor College of Medicine

\*For 911-responding agencies only

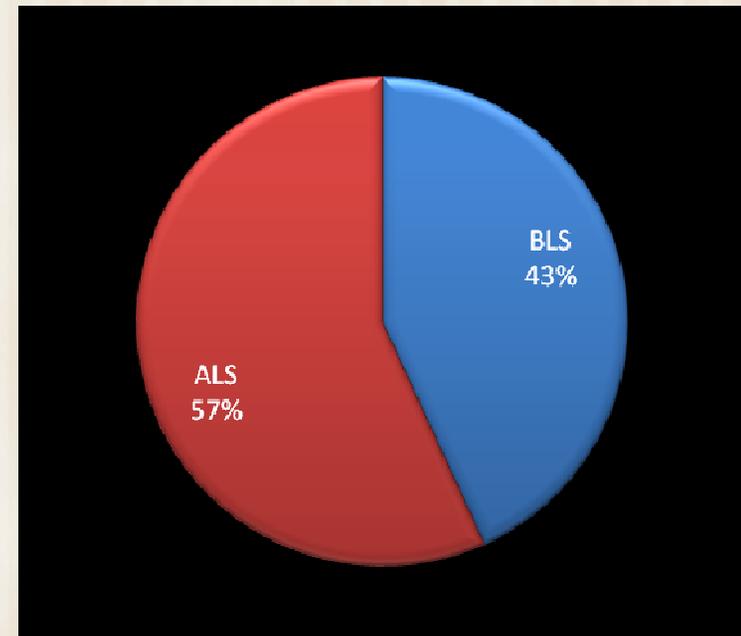


# Highest Level of Certification of the EMS Agencies

**NON-RURAL (63%)**



**RURAL (37%)**

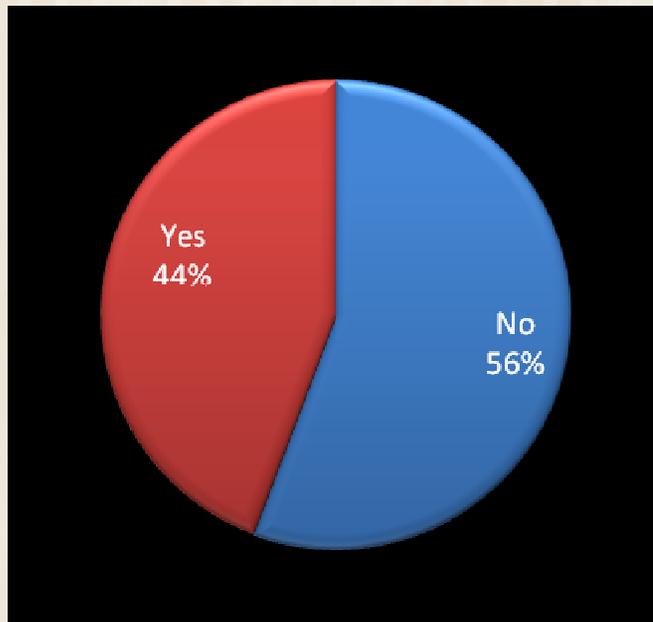


**\*For 911-responding agencies only**

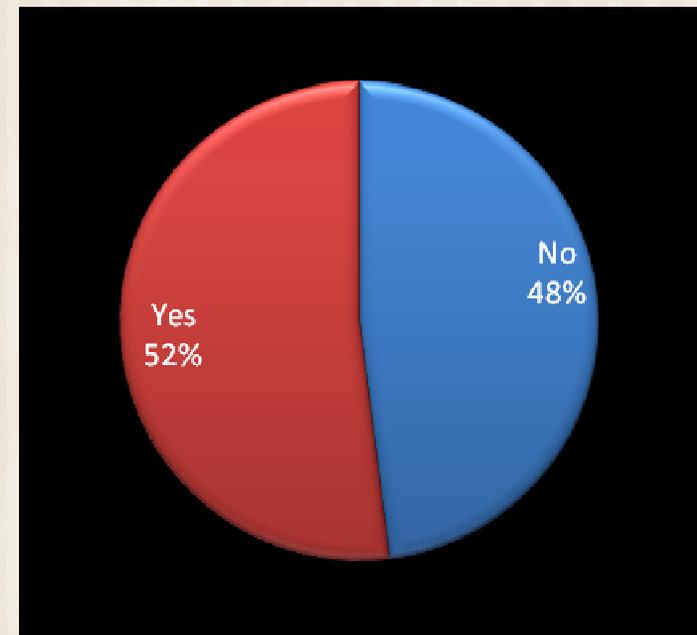


# Transport from Scene to Hospital?\*

## NON-RURAL (63%)



## RURAL (37%)

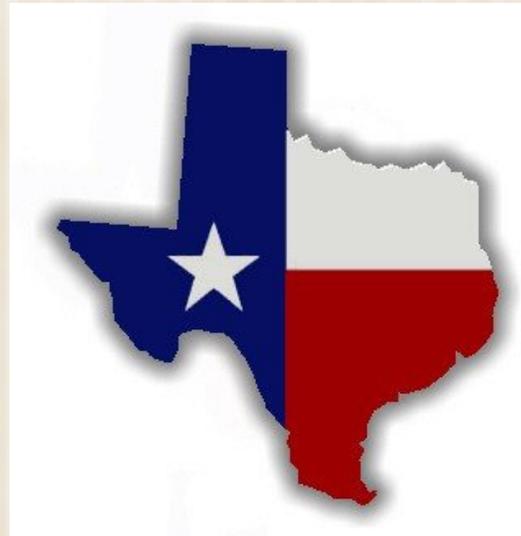


**Only those who answered "yes" were asked about their equipment**

\*Includes first responders; 911-responding agencies only



# EMS Agency Survey: Medical Direction



**Online**

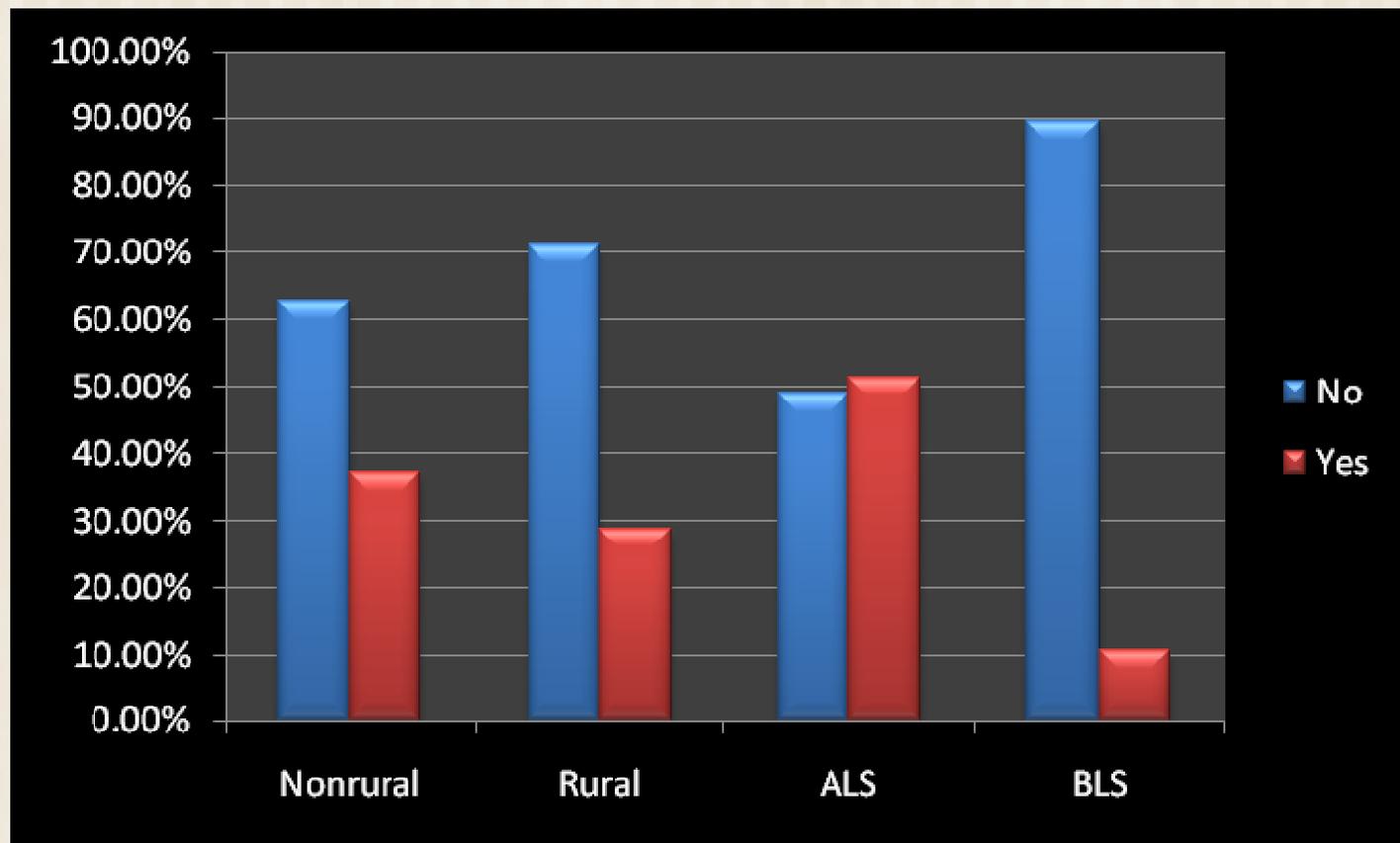


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



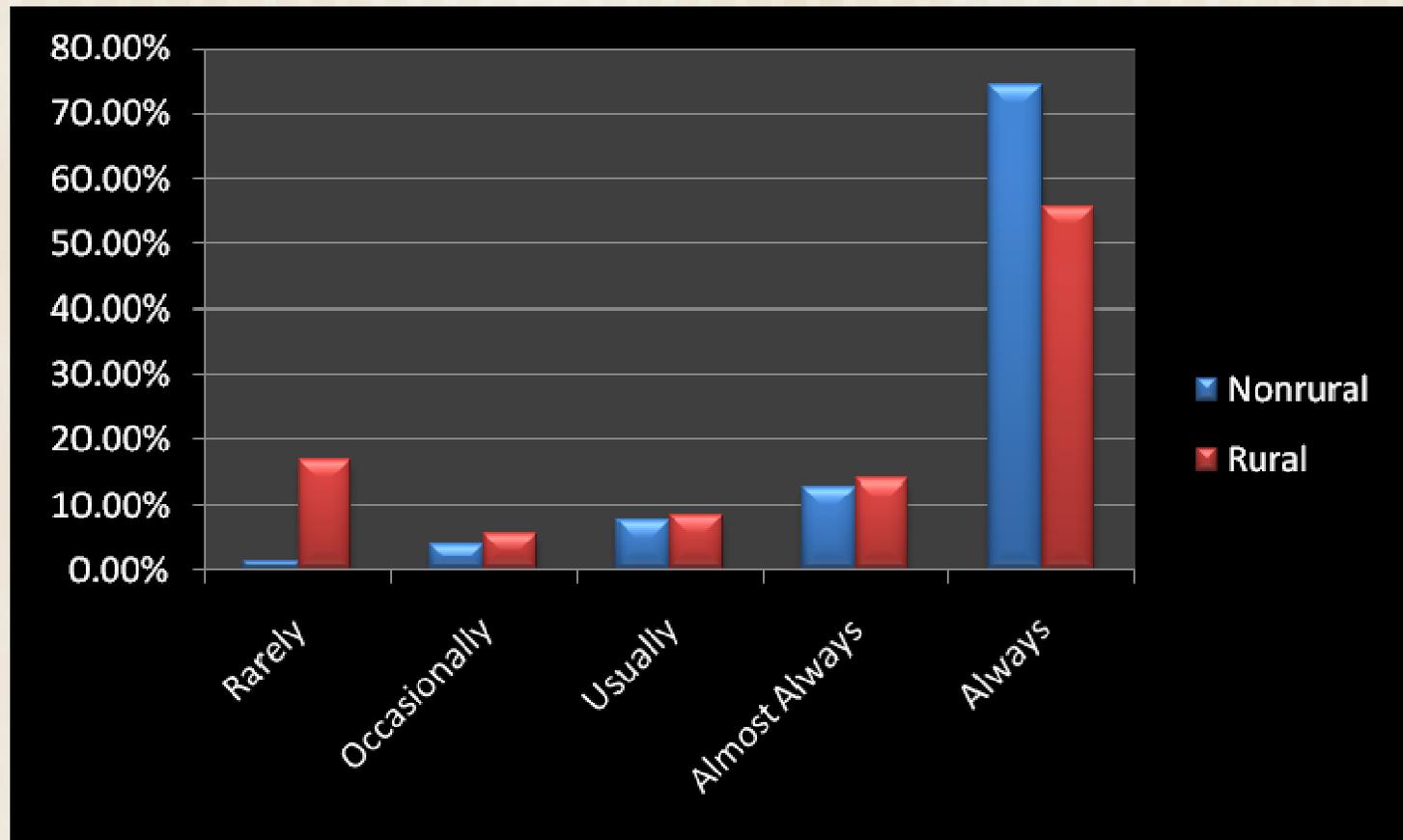
## Attempt Contact with Online Medical Direction in Past Year for Pediatric Patient?\*



\*Pediatric = 0-18 years; for 911-responding agencies



# How Often was Online Medical Direction Available for Pediatric Patients?\*



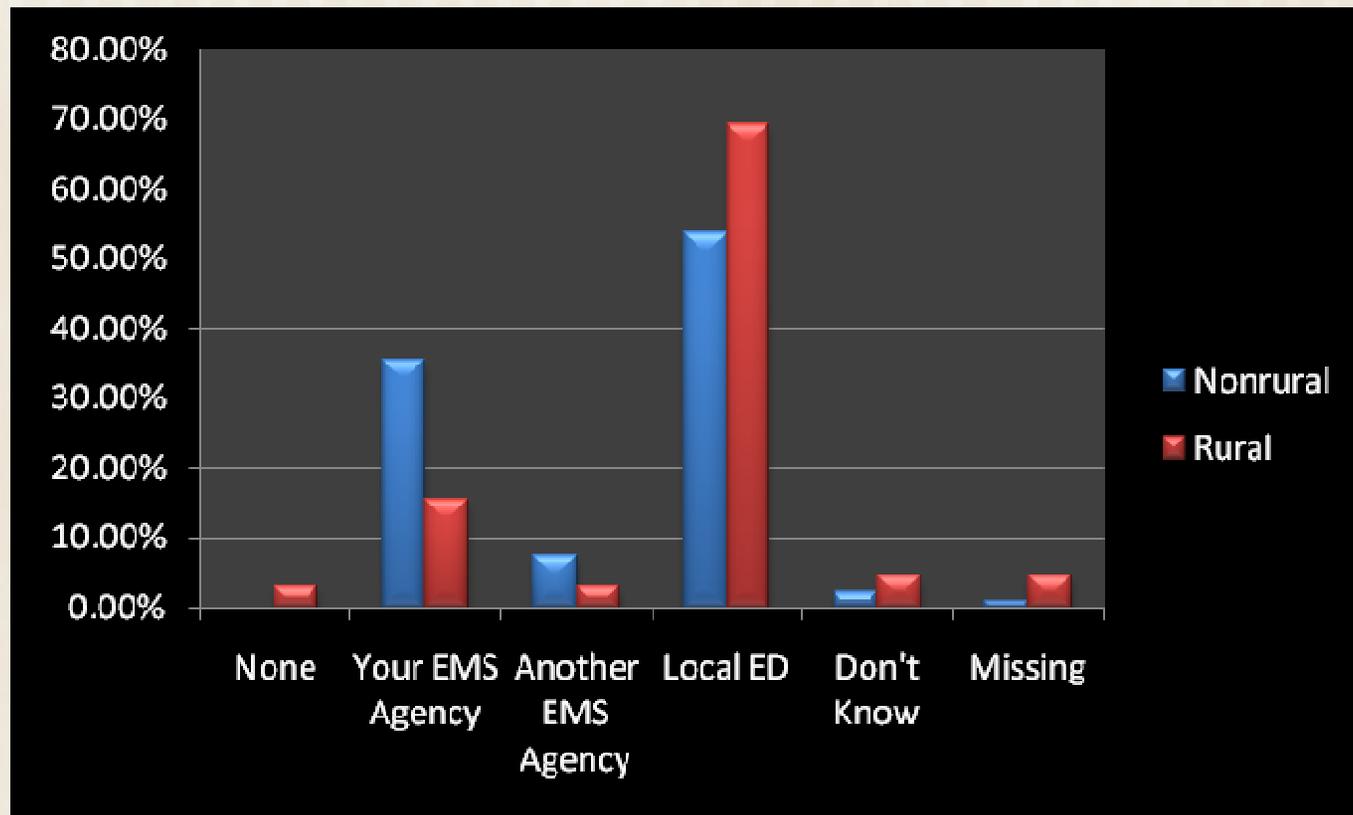
Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

\*For agencies that attempted contact w/in past year



# Primary Source of Online Medical Direction\*



Texas Children's Hospital

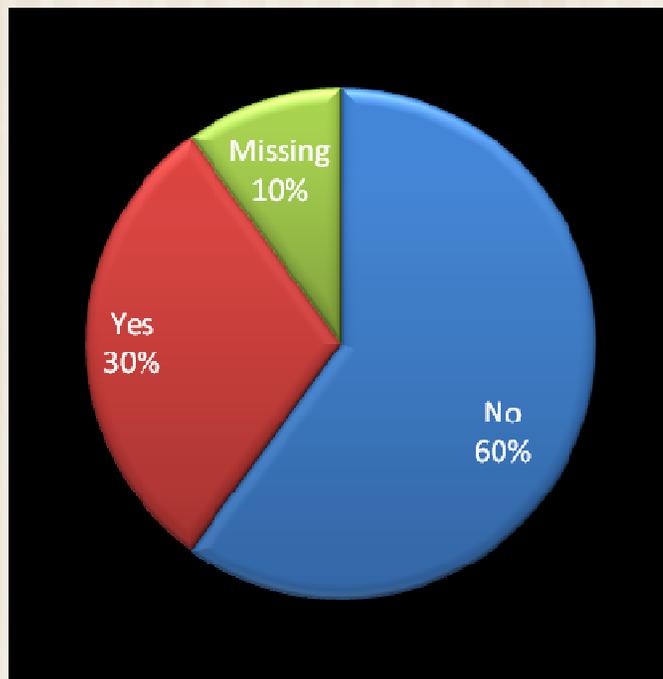
BCM  
Baylor College of Medicine

\*For transporting agencies only



# For Online Medical Direction, Is the Source a Children's Hospital?\*

## NON-RURAL



## RURAL



\*For agencies who contact a local ED for online medical direction



# Desire for Online Medical Direction Through Base Station at Regional Children's Hospital?\*

## NON-RURAL



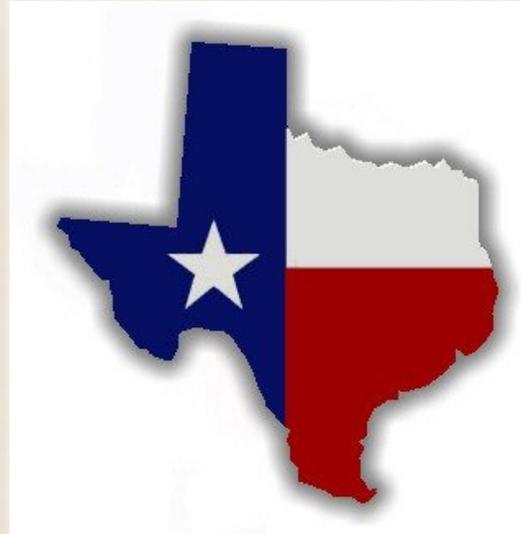
## RURAL



\*For transporting agencies only



# EMS Agency Survey: Medical Direction



**Offline**

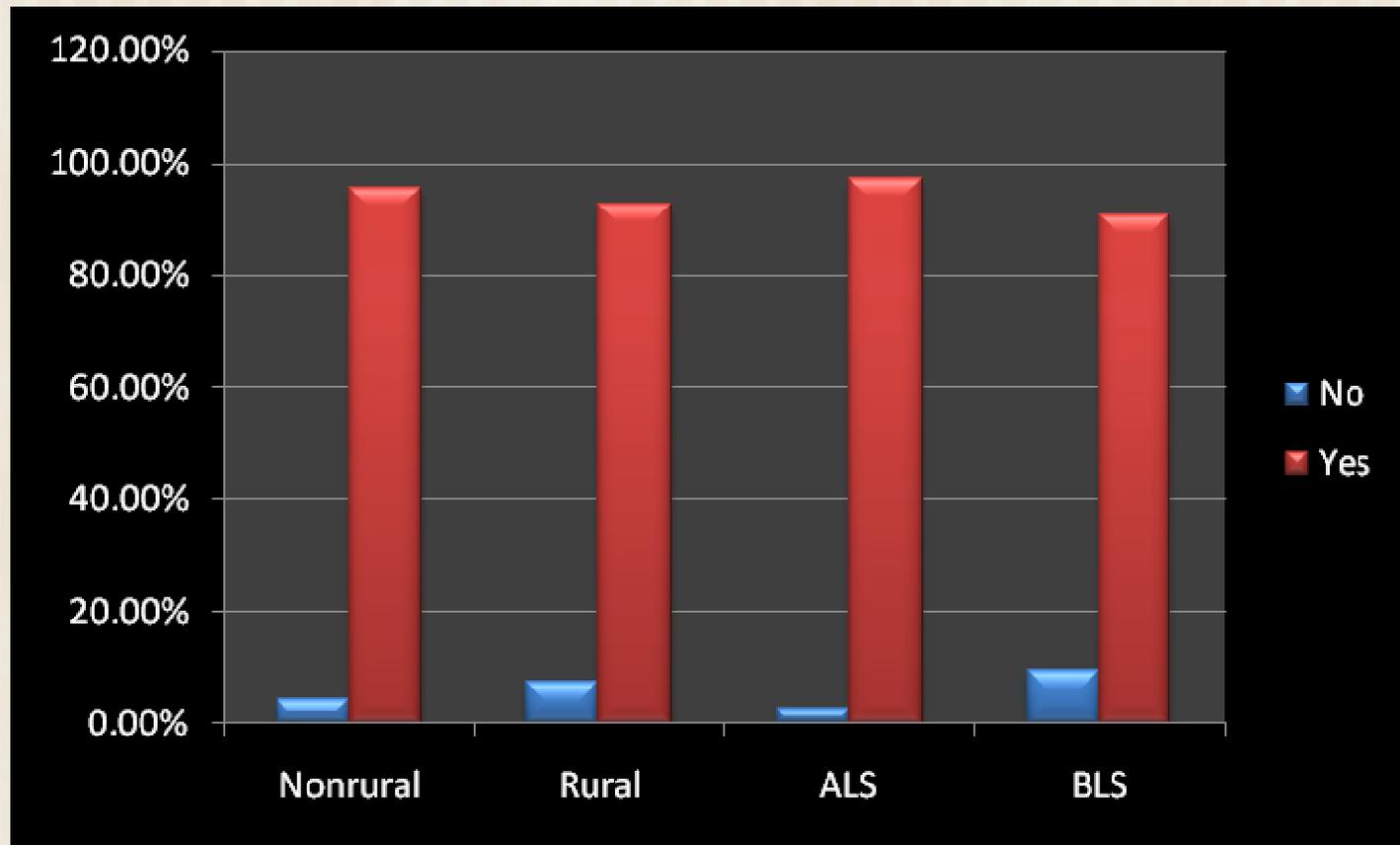


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



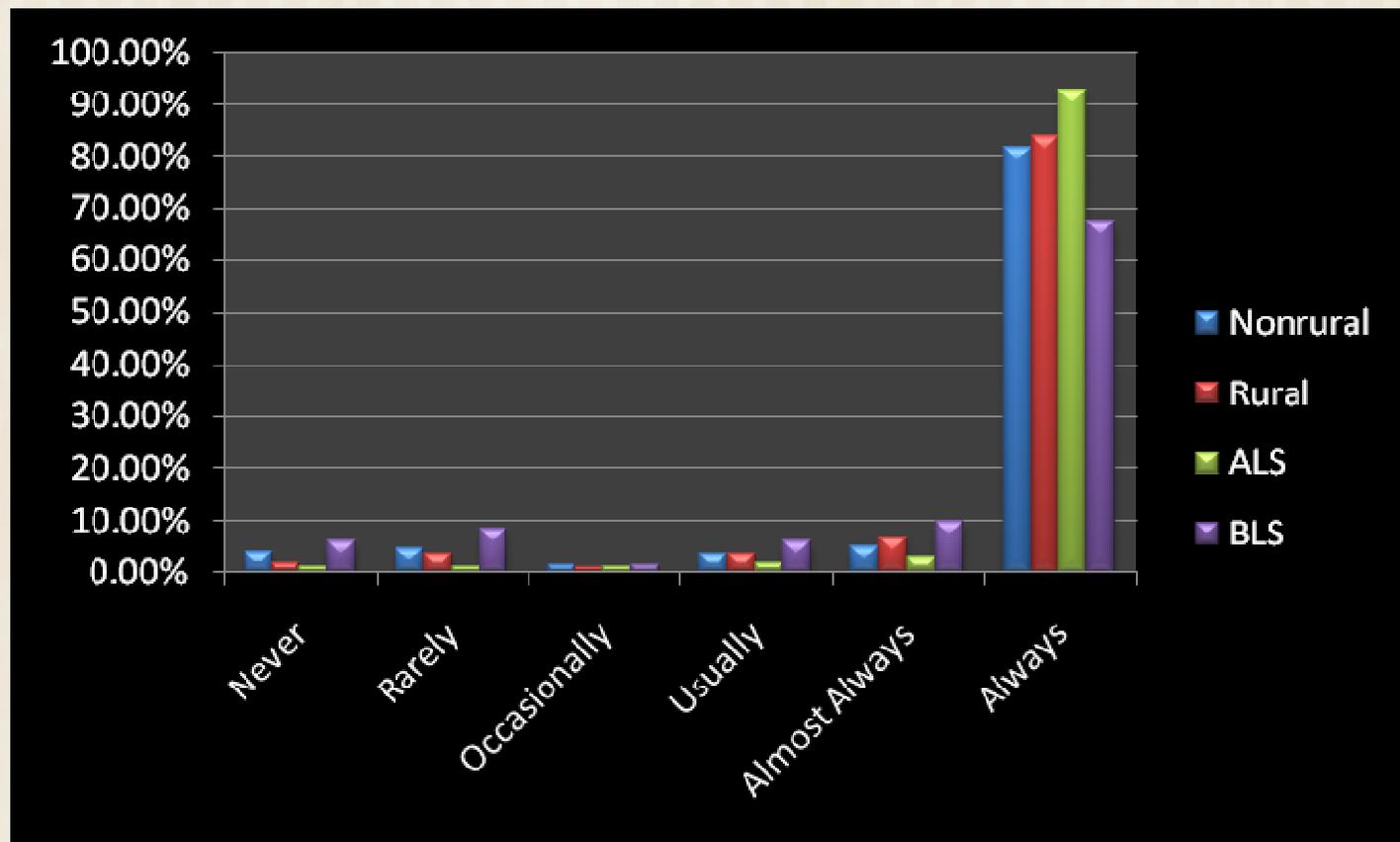
# Written Protocols Available?\*



\*Paper/electronic; for 911-responding agencies



# How Often Were Protocols Physically Available on Vehicle?\*



Texas Children's Hospital

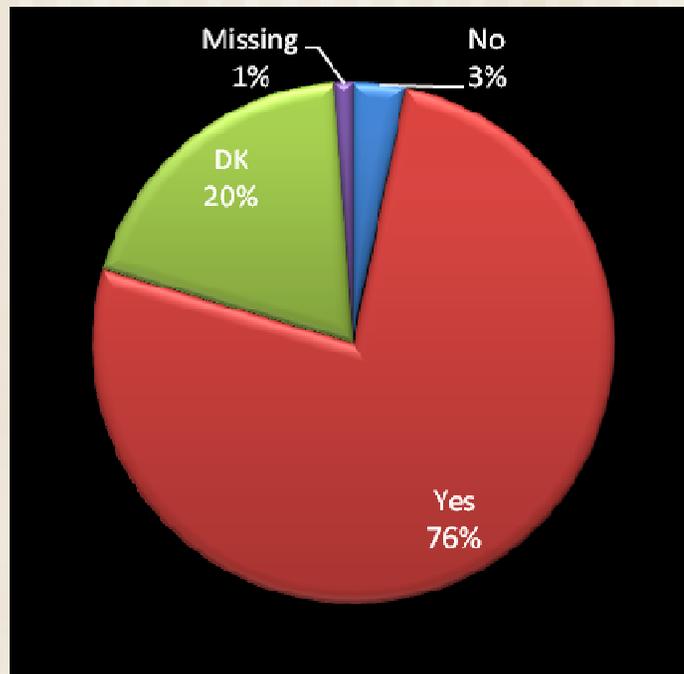
**BCM**  
Baylor College of Medicine

\*Paper/electronic protocols available; for 911-responding agencies only

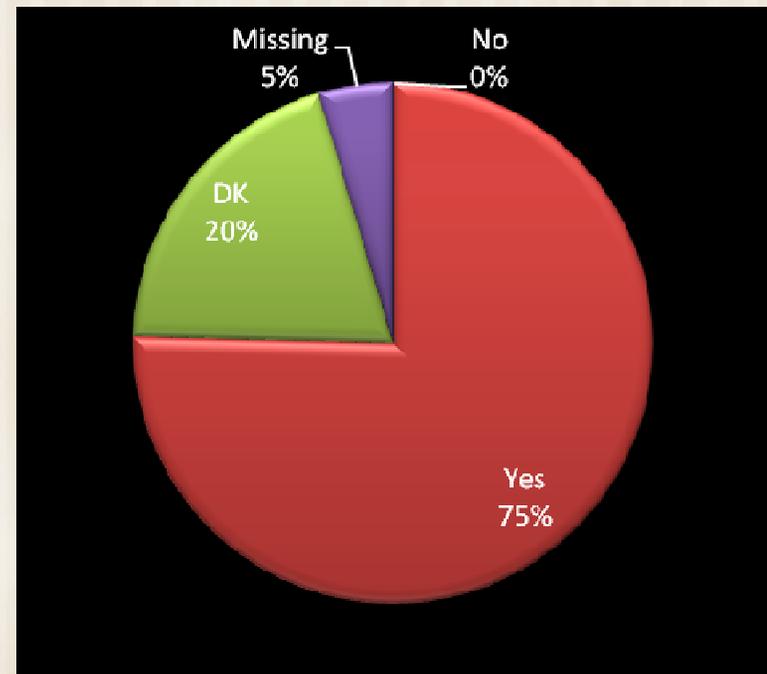


# Would Your Agency Use EMSC-Created Evidence-Based Pediatric Protocols?\*

## NON-RURAL



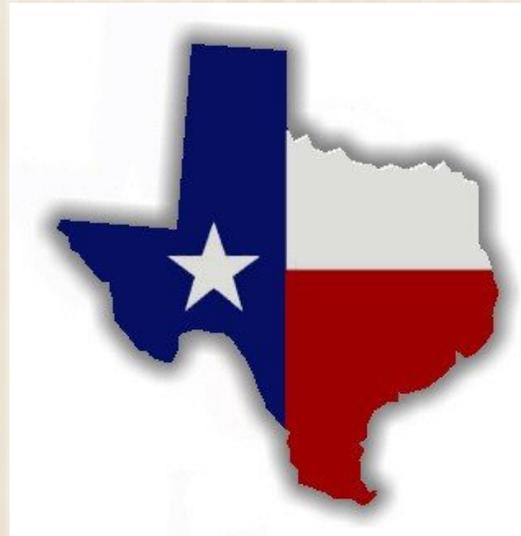
## RURAL



\*For transporting agencies only



# EMS Agency Survey: Equipment



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

# Outliers

- BLS vehicles per agency

- Range = 1-57
- Mode = 1
- Median = 6
- Average = 3.5

Data is reported both with and without the outlier BLS agency with 57 vehicles, when excluding it made a difference

- ALS vehicles per agency

- Range = 1-116
- Mode = 2
- Median = 8
- Average = 5.1

Data is reported both with and without the outlier ALS agency with 116 vehicles, when excluding it made a difference

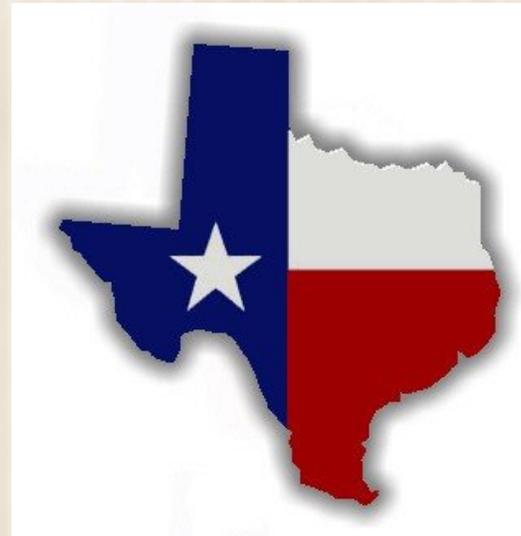


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# EMS Agency Survey: Equipment



## Basic Airway

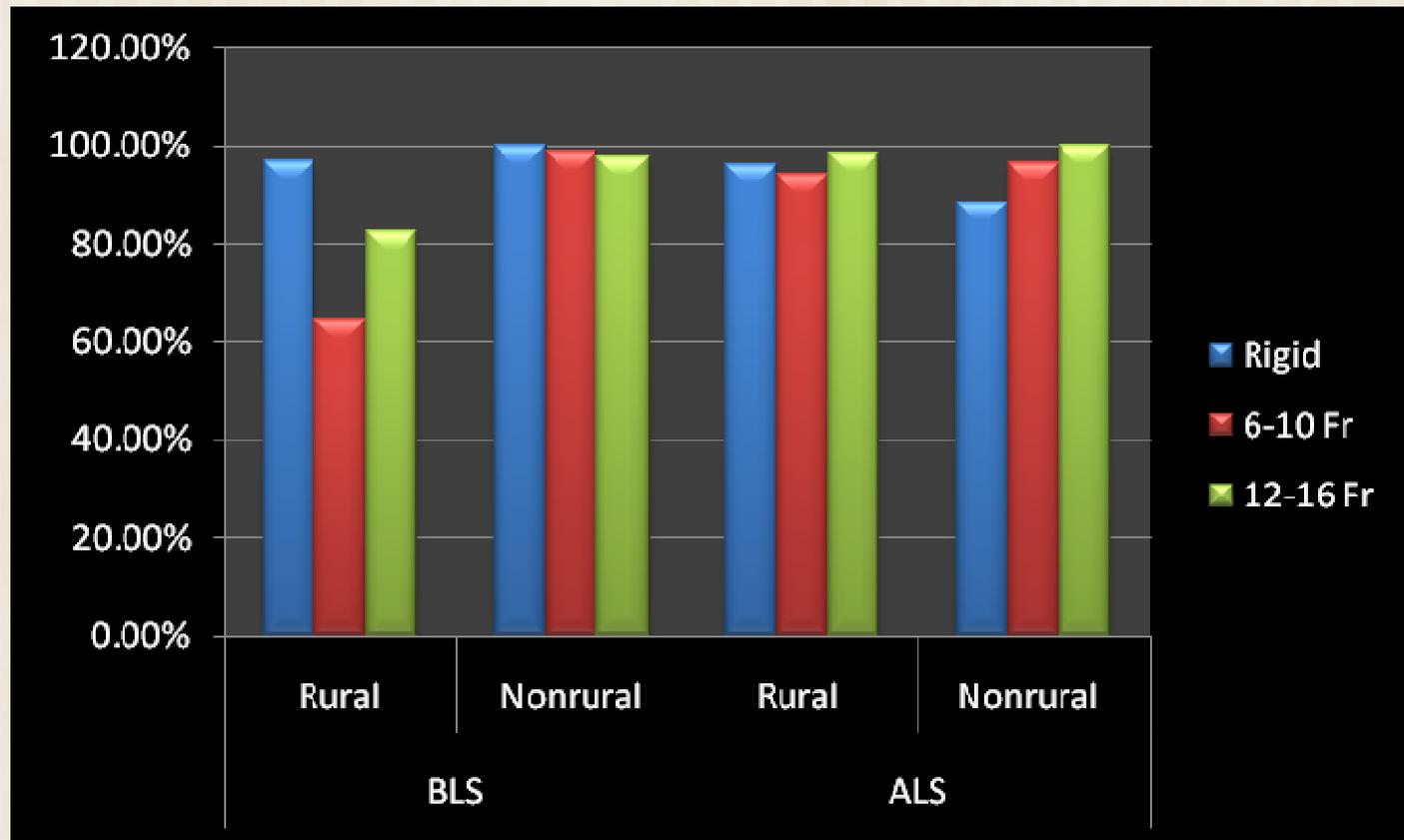


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

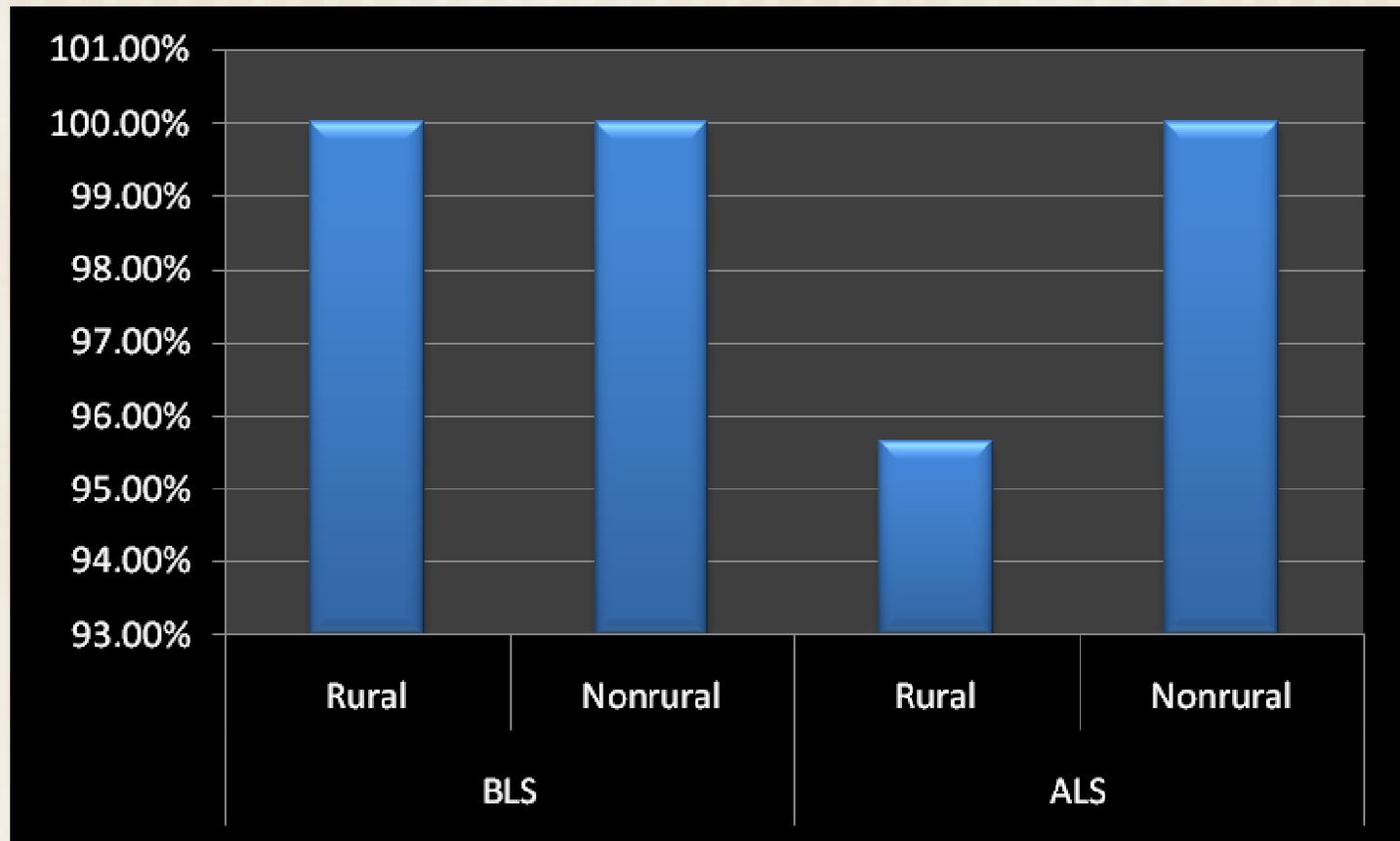


# Suction Catheters



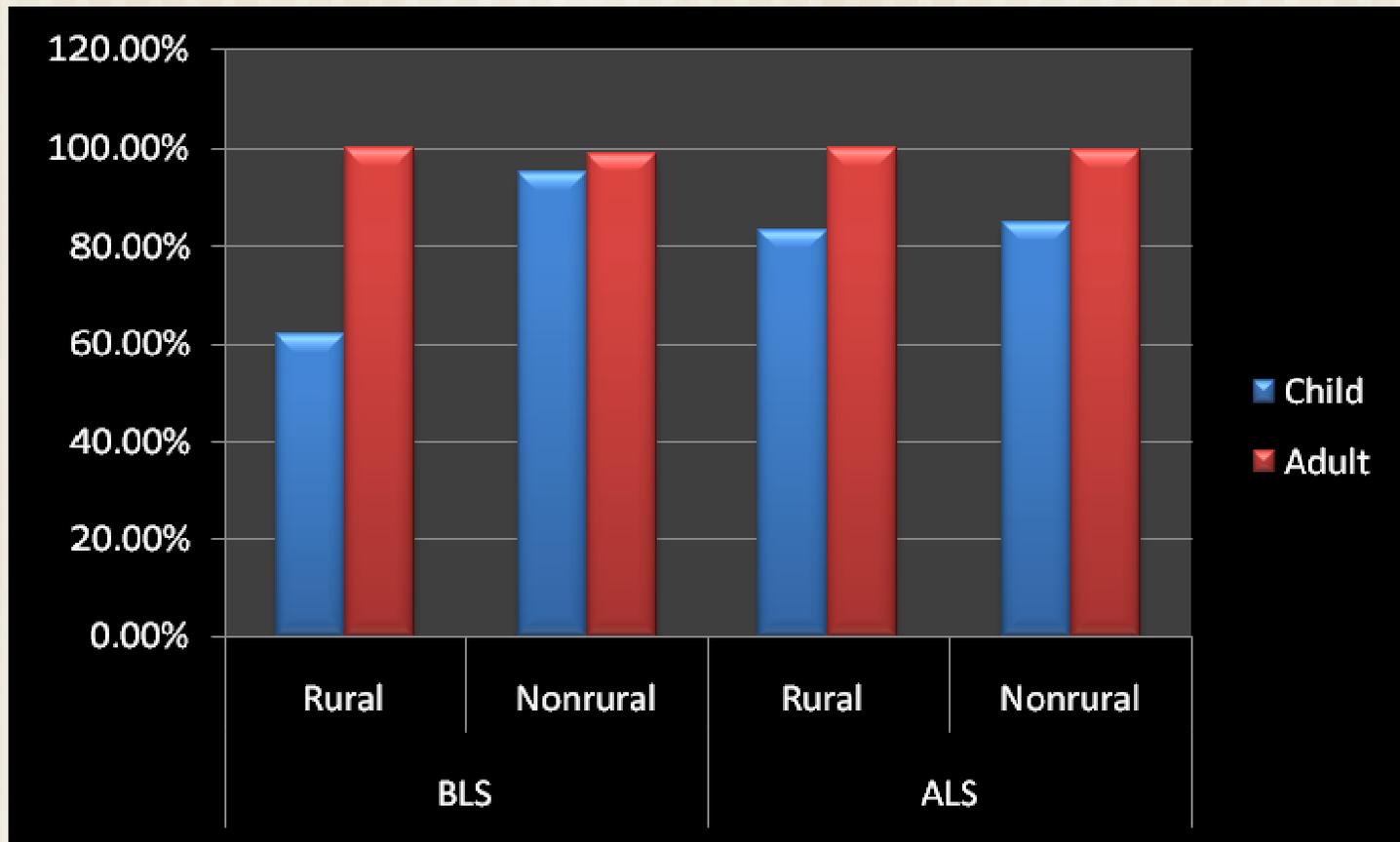


# Bulb Suction





# Nasal Cannula



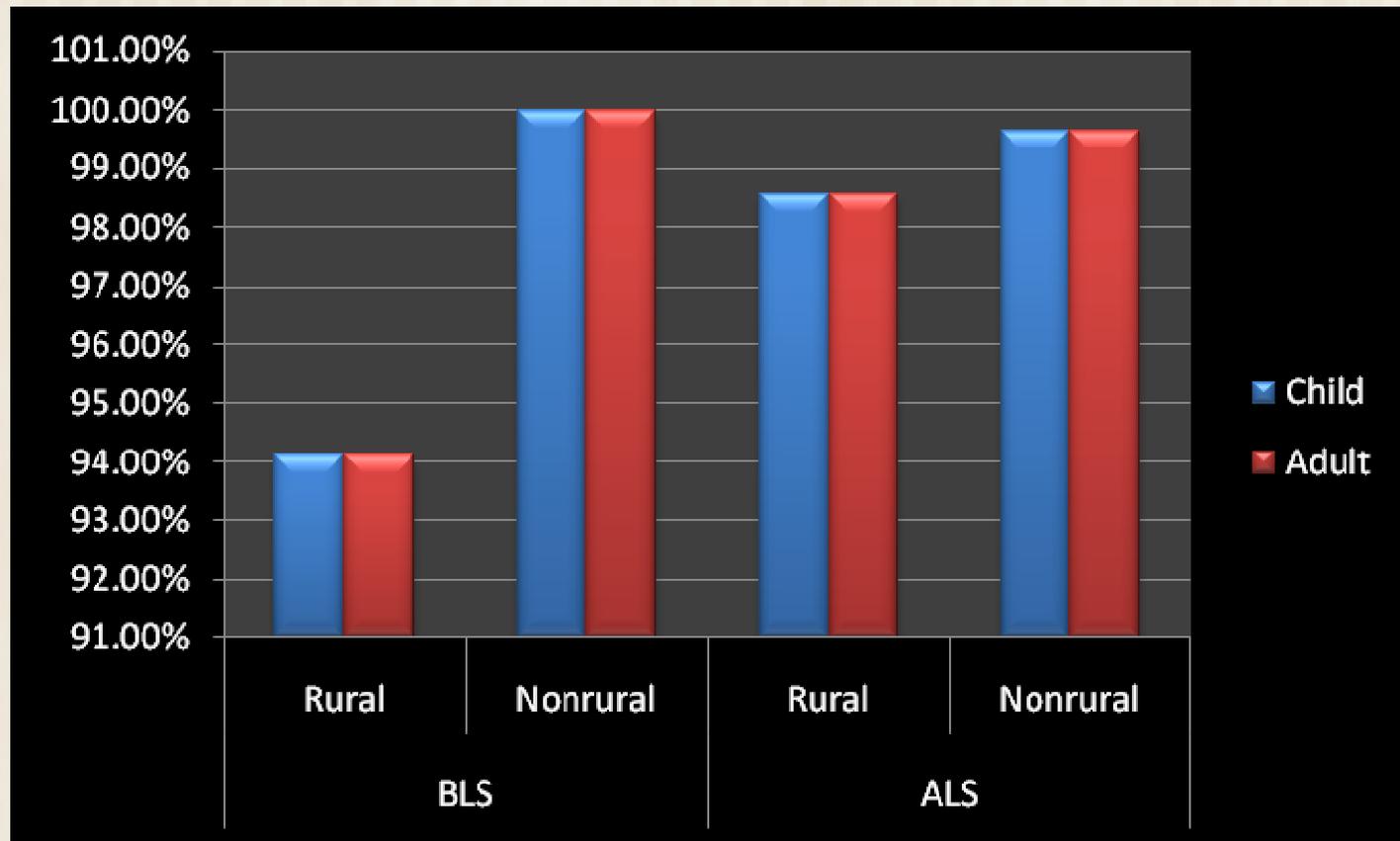


# Non-Rebreather Mask



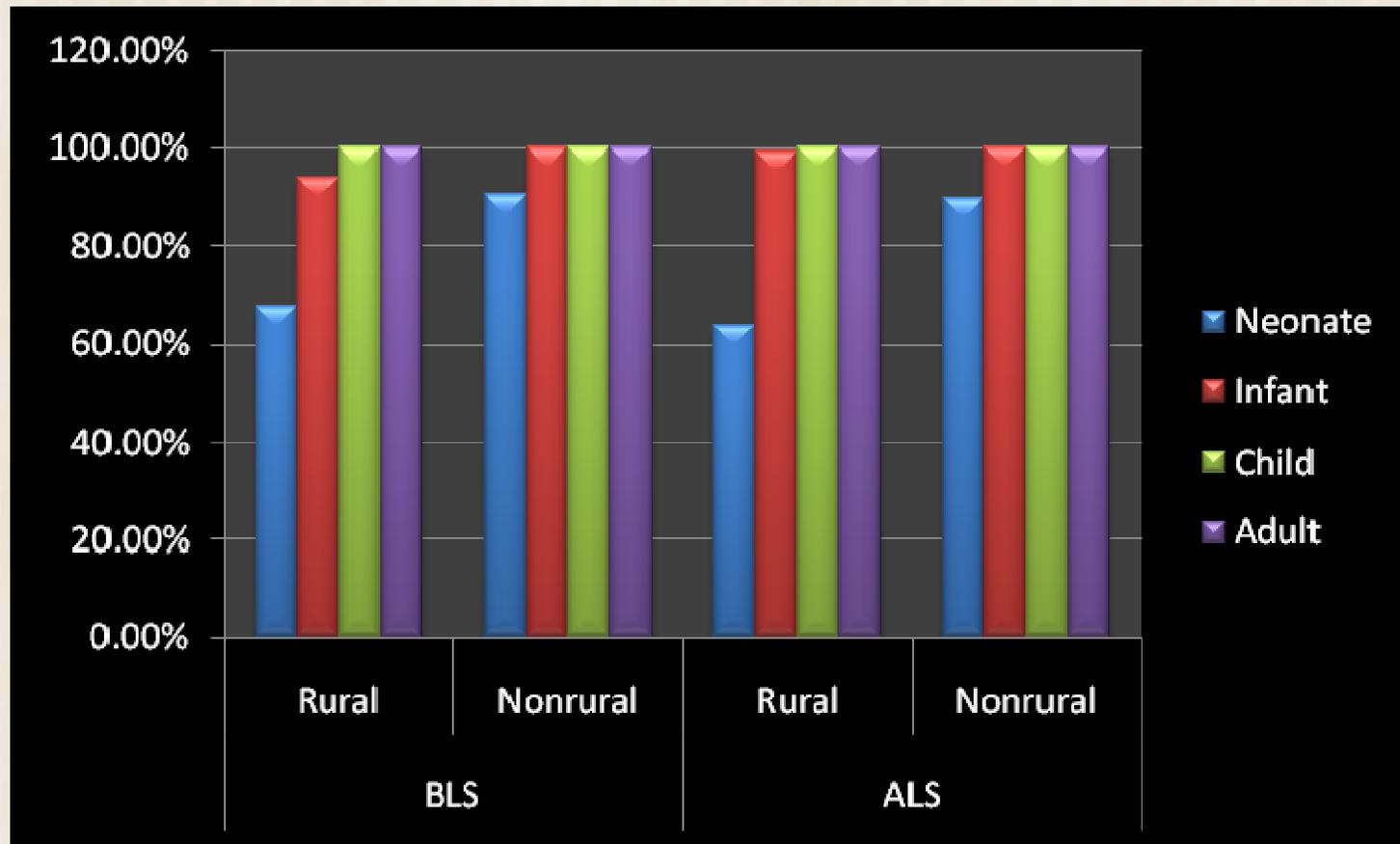


# Self-Expanding Bag Valve





# Mask for Bag-Valve

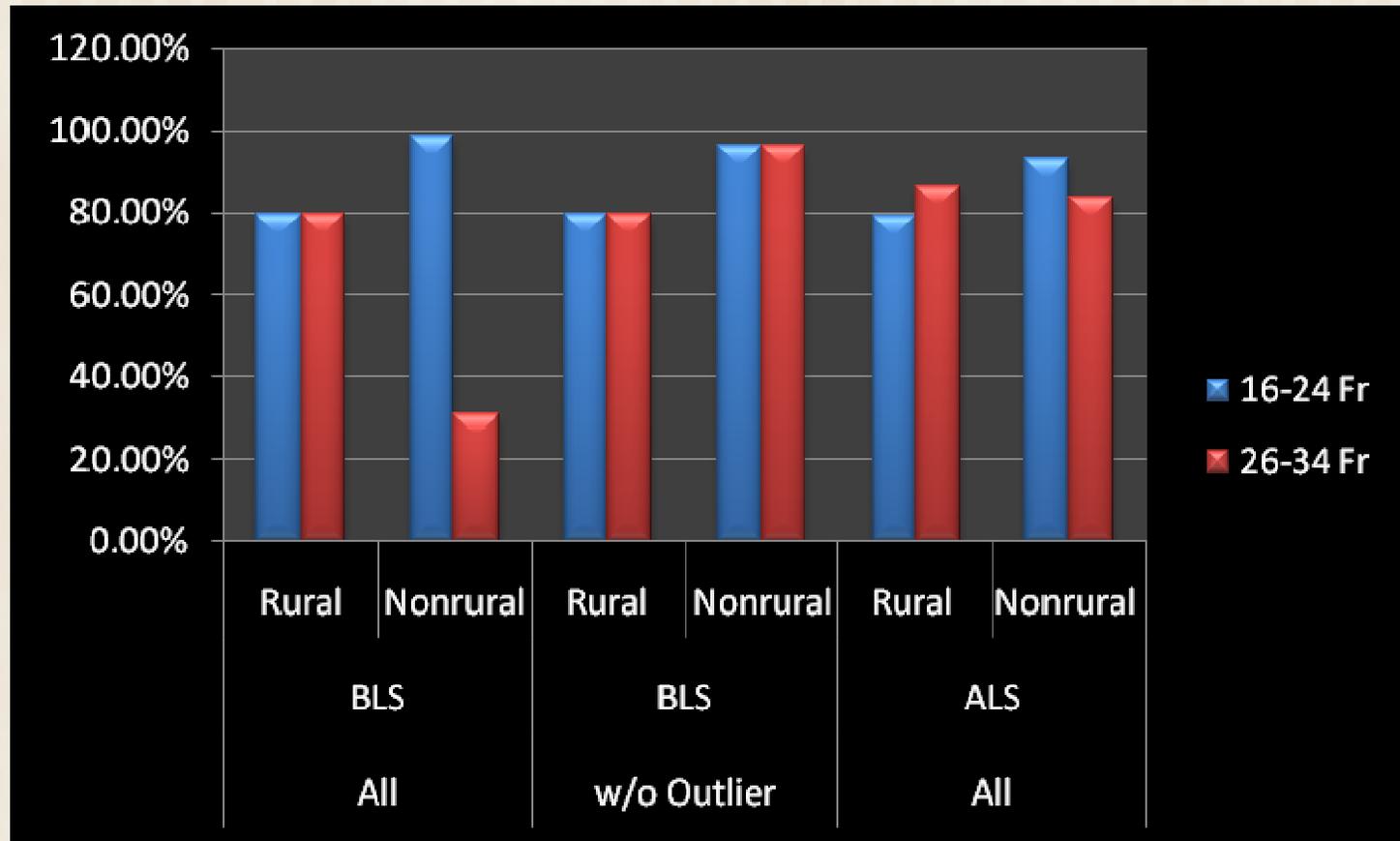


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

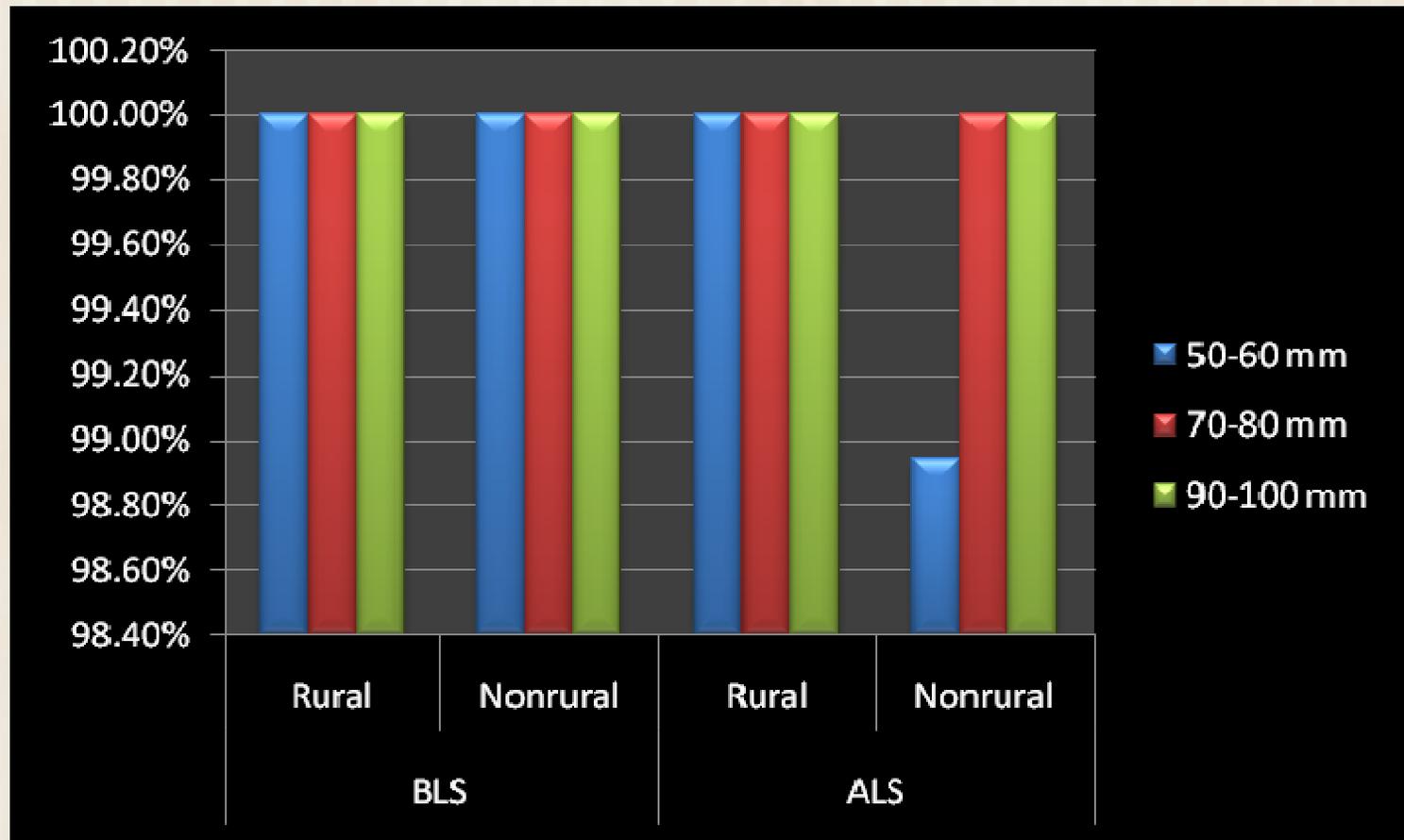


# Nasal Airway



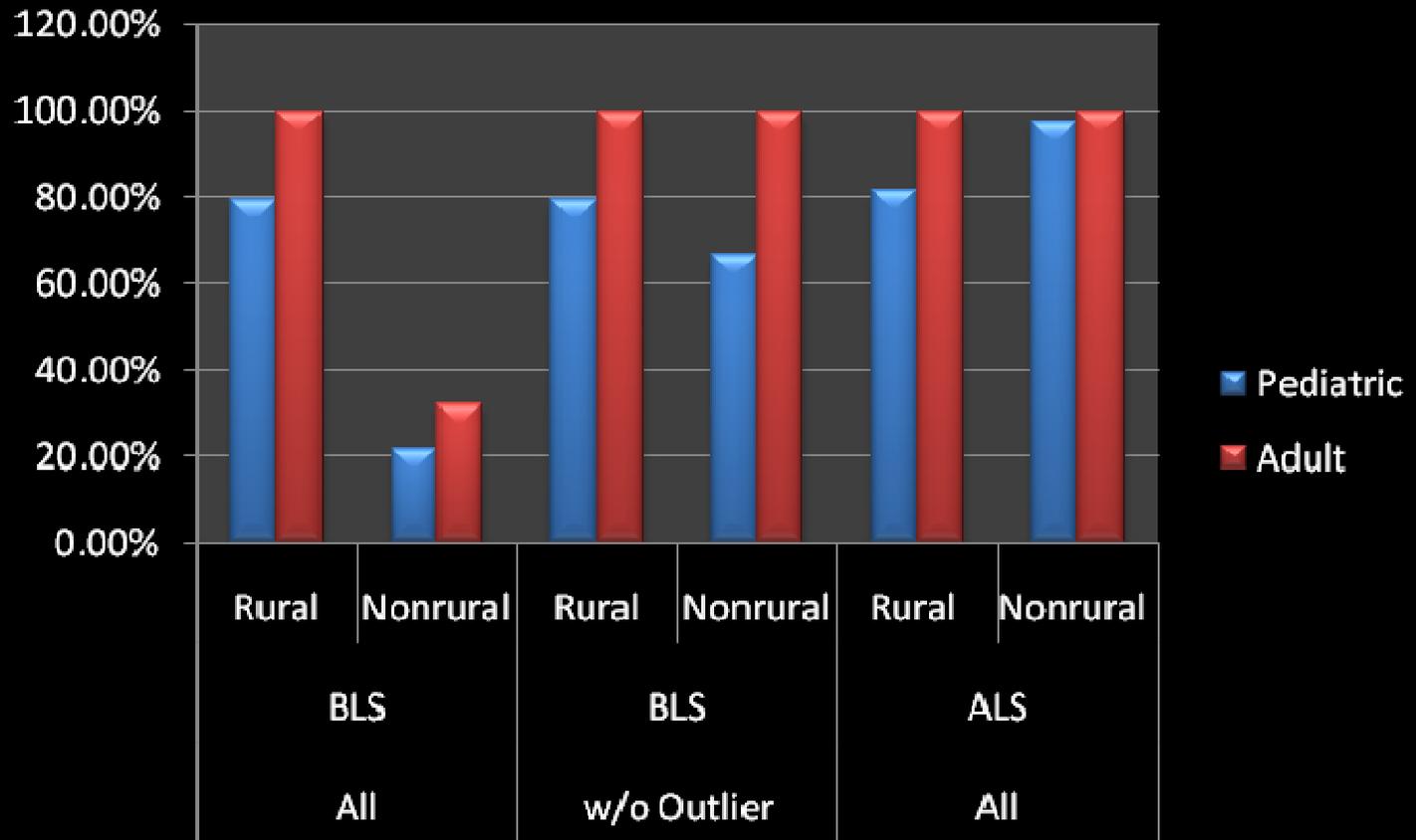


# Oral Airway



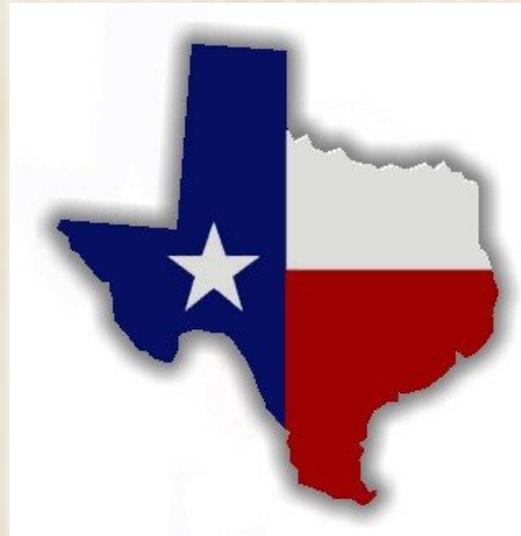


# Pulse Oximeter





# EMS Agency Survey: Equipment



## Advanced Airway

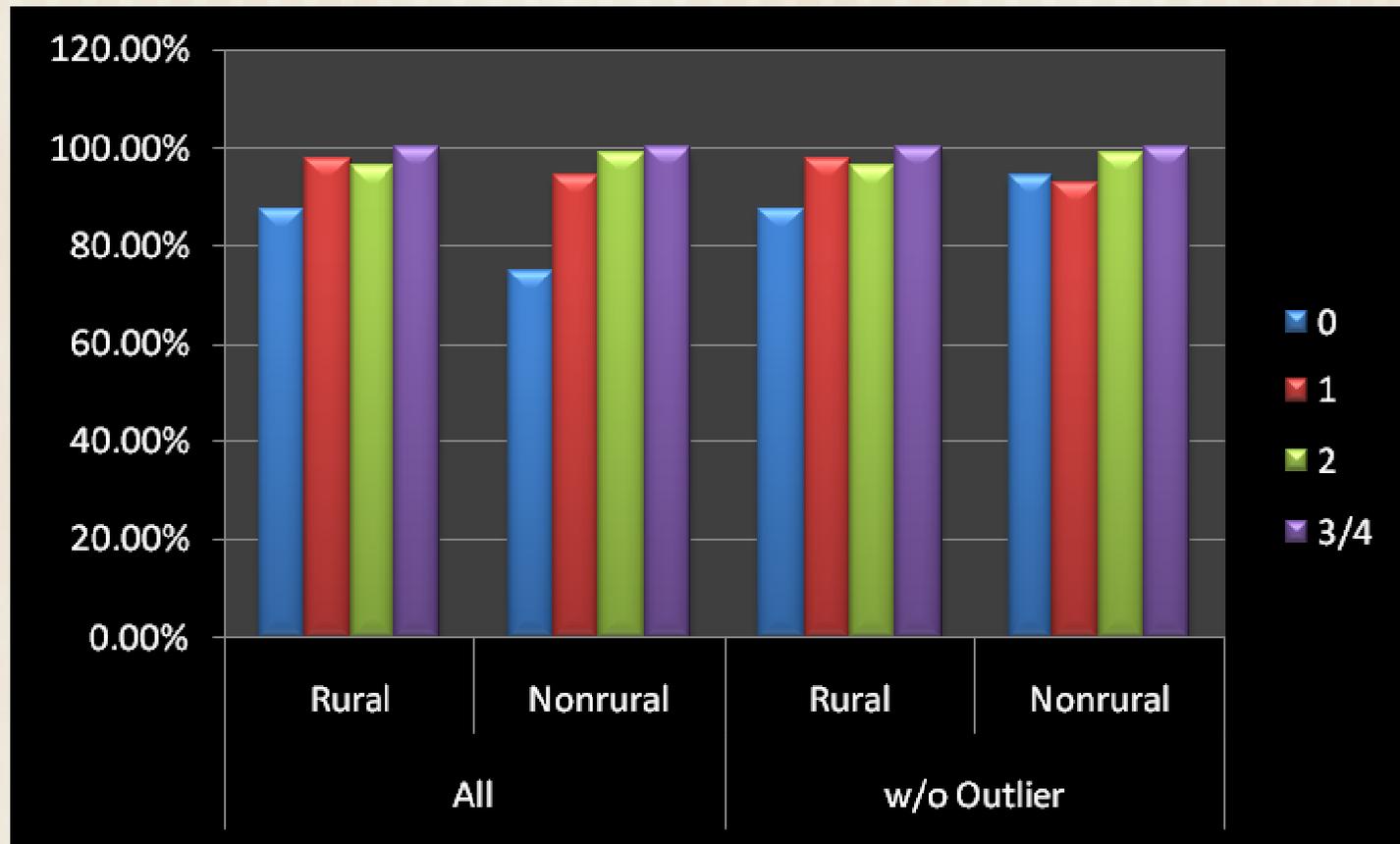


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



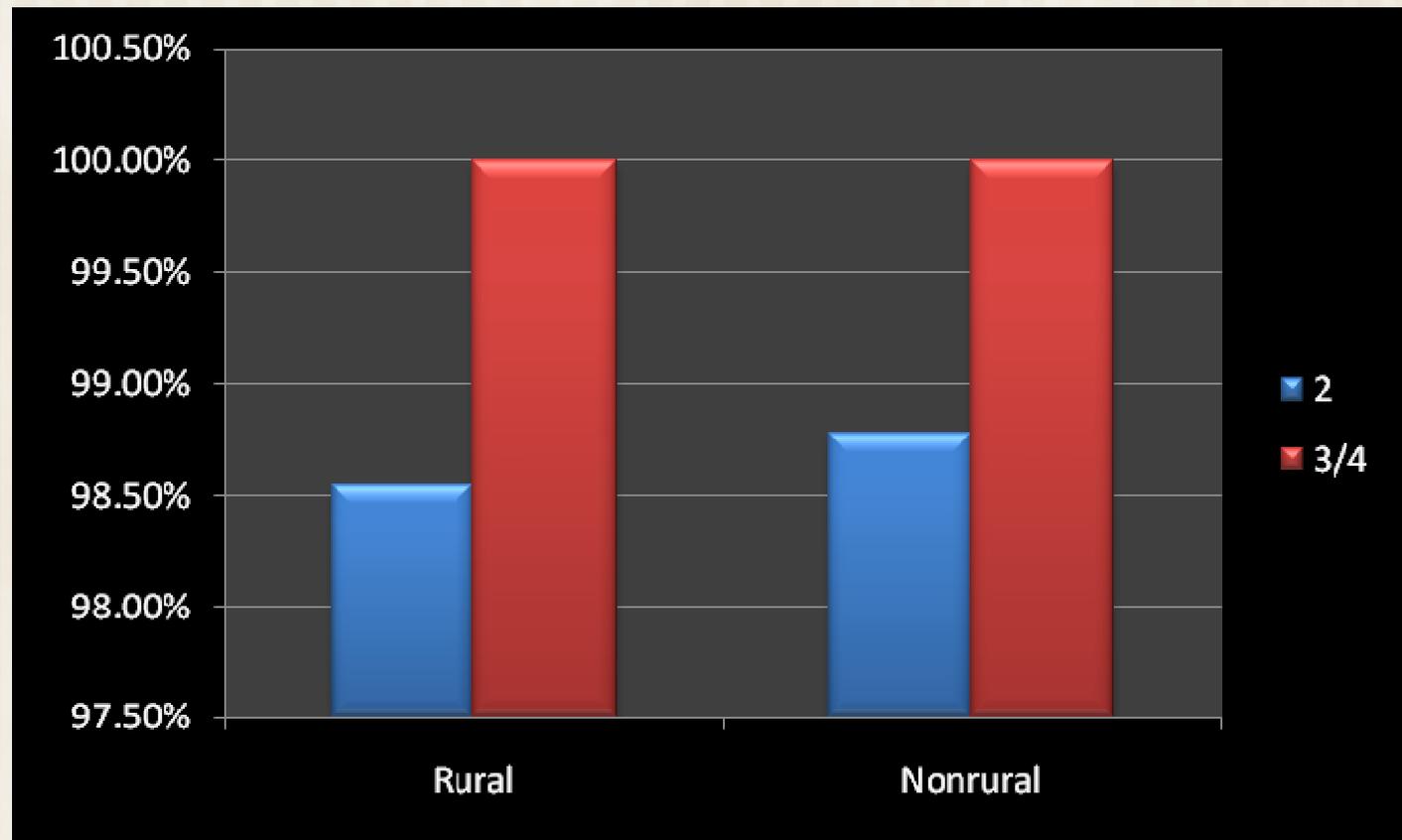
# Miller Laryngoscope Blades\*



\*ALS Vehicles



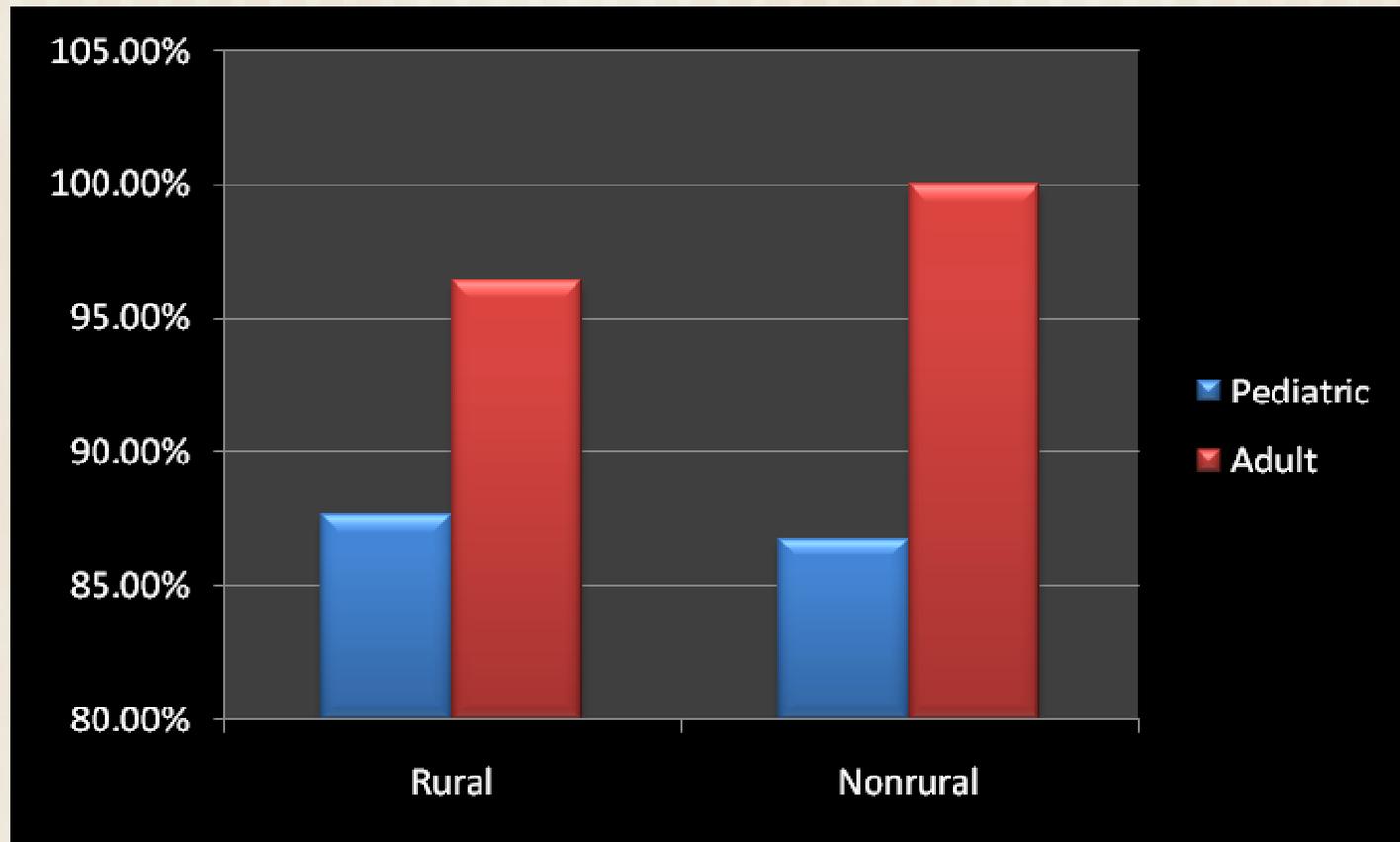
# Curved Laryngoscope Blades\*



\*ALS Vehicles



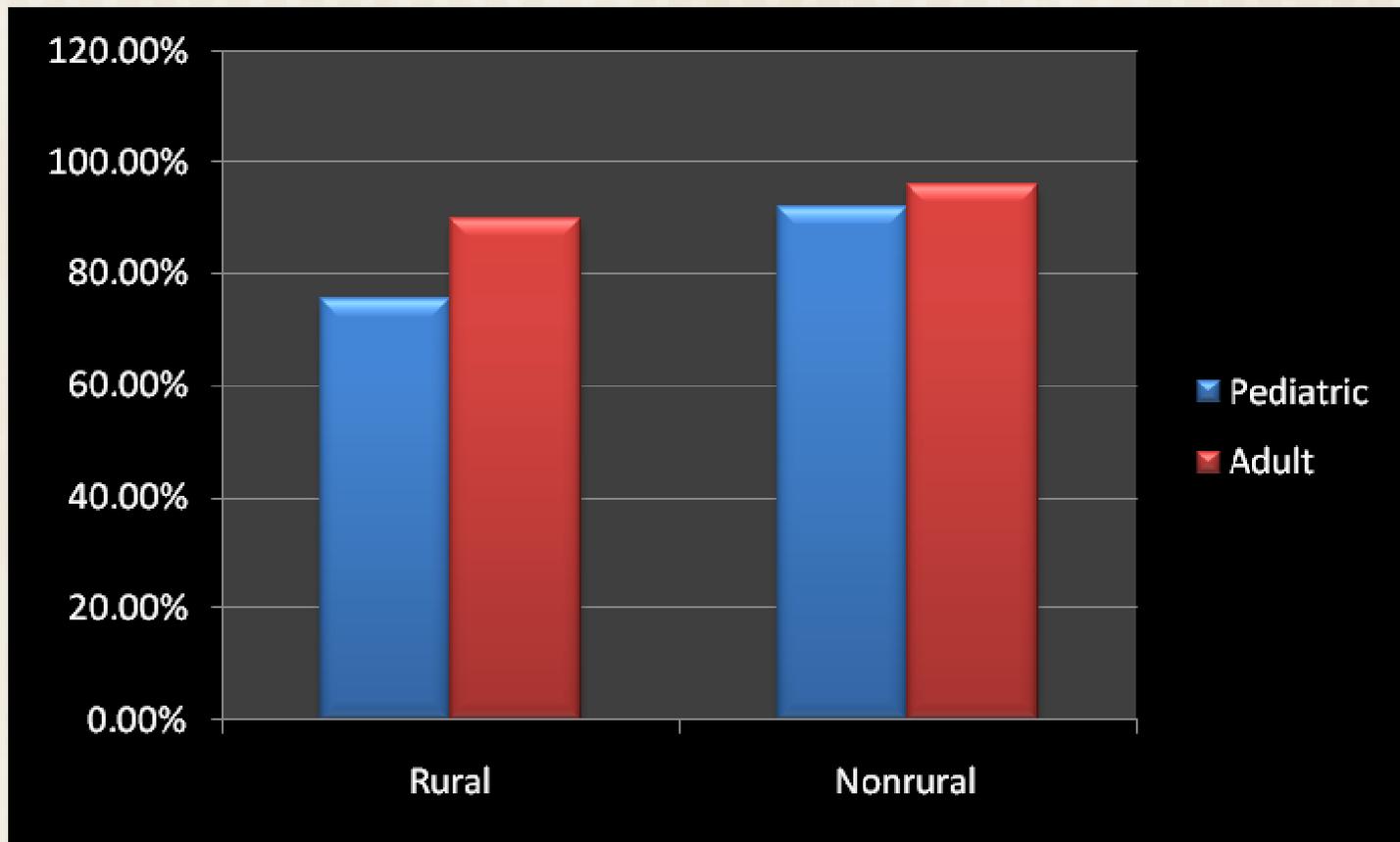
# Magill Forceps\*



\*ALS Vehicles



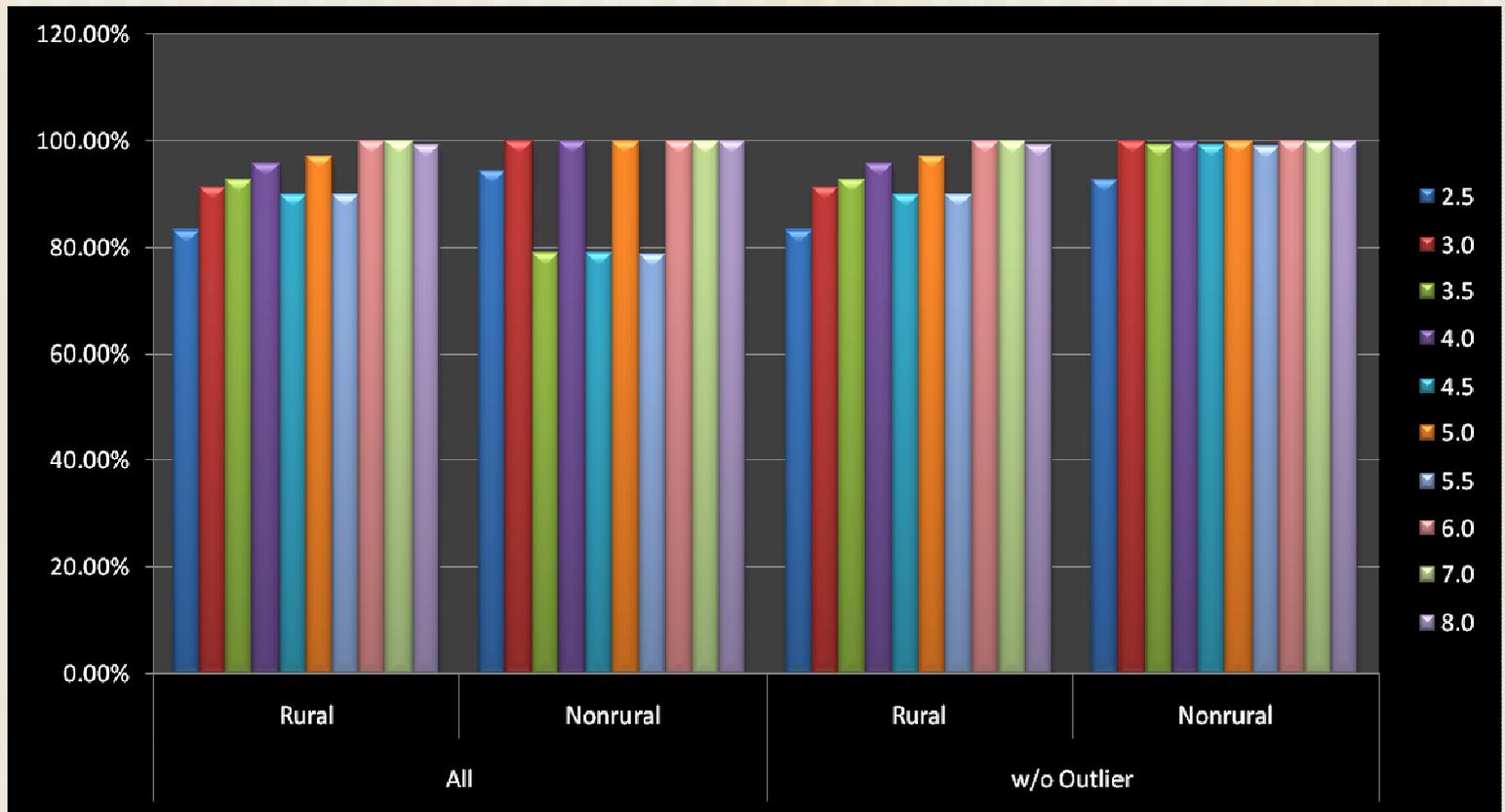
# End-tidal CO2 Detector\*



\*ALS Vehicles



# Un/Cuffed Endotracheal Tubes\*



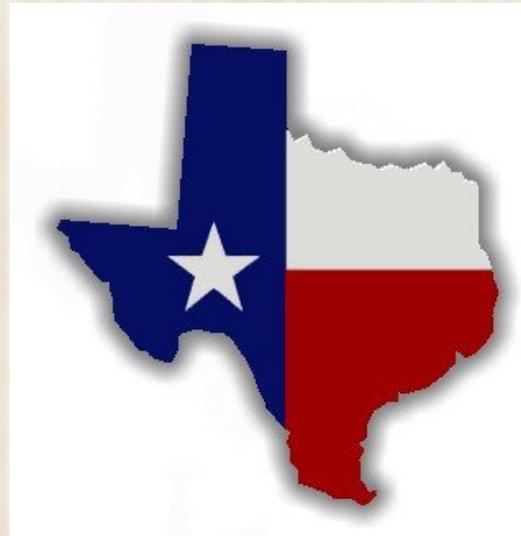
Texas Children's Hospital

**BCM**  
Baylor College of Medicine

\*ALS Vehicles



# EMS Agency Survey: Equipment



## Cardiovascular

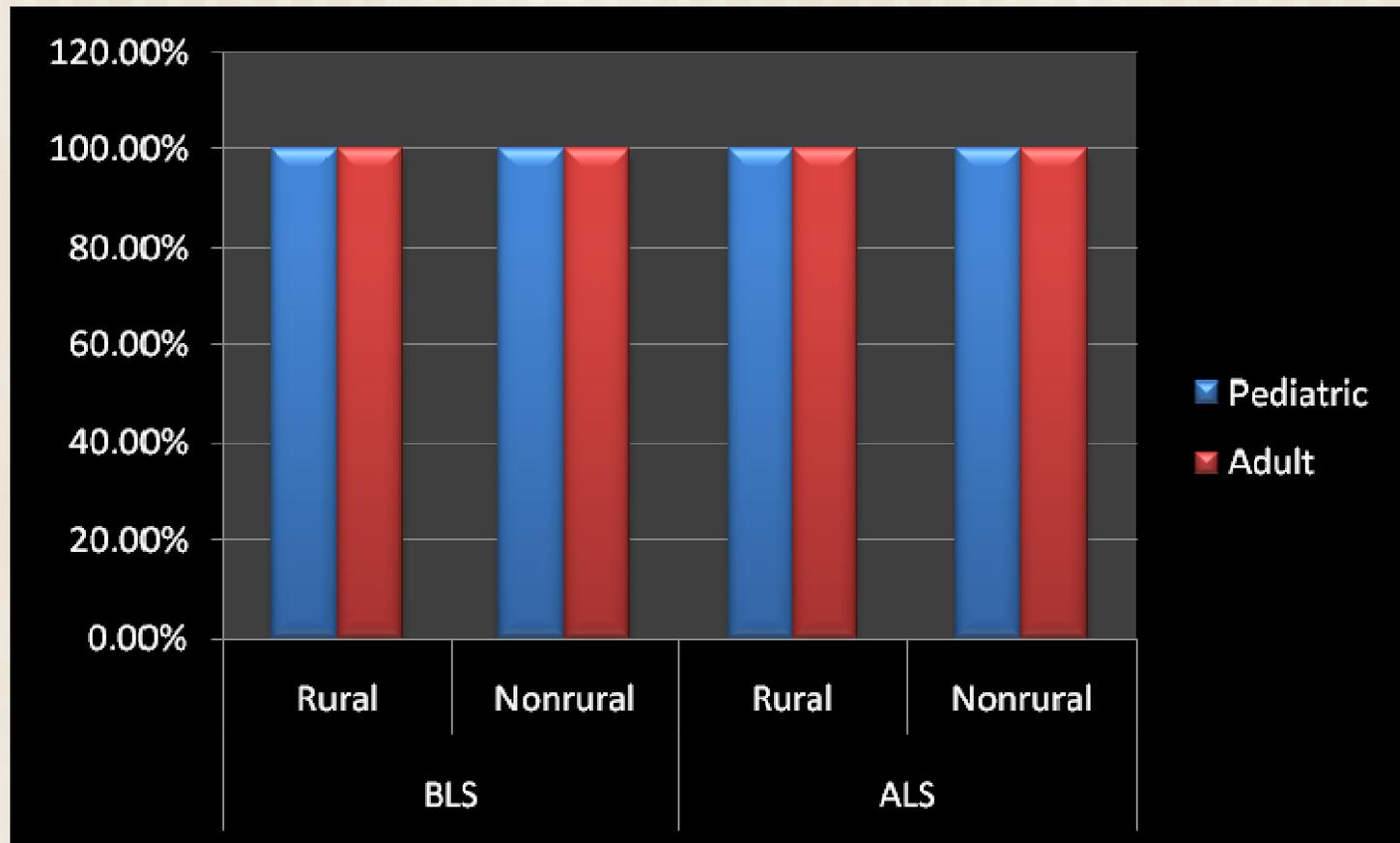


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

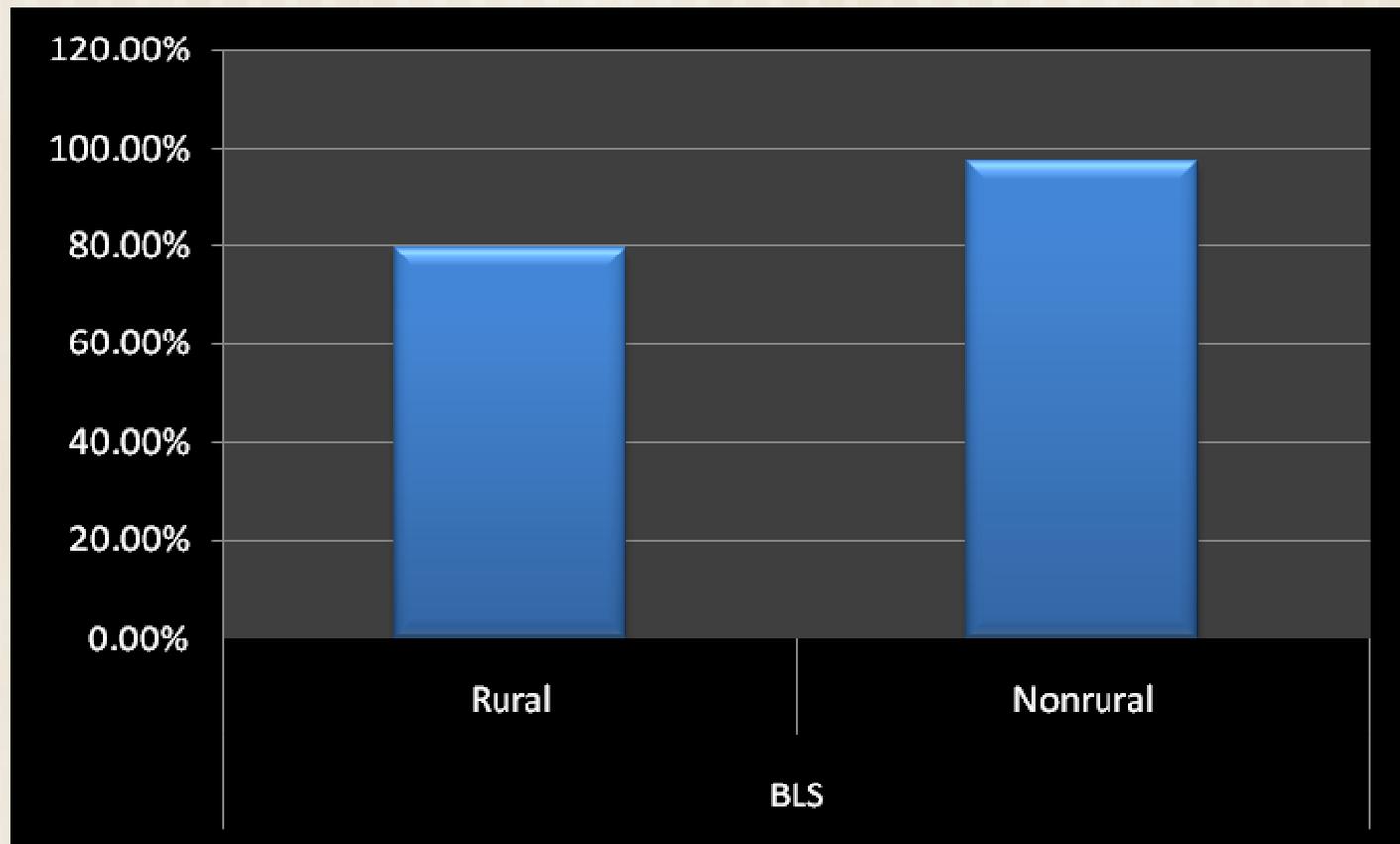


# Blood Pressure Cuff



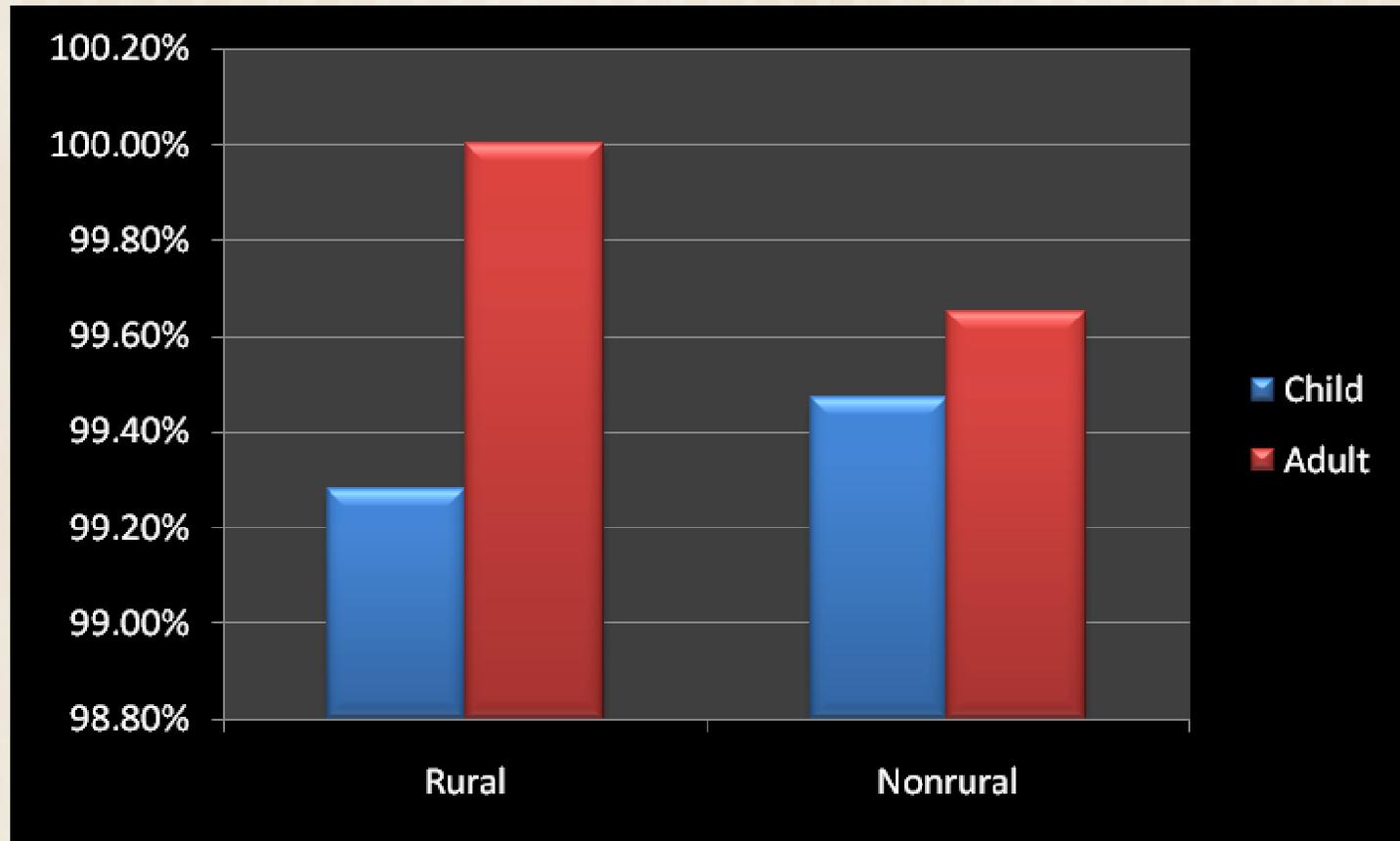


# Automated External Defibrillator





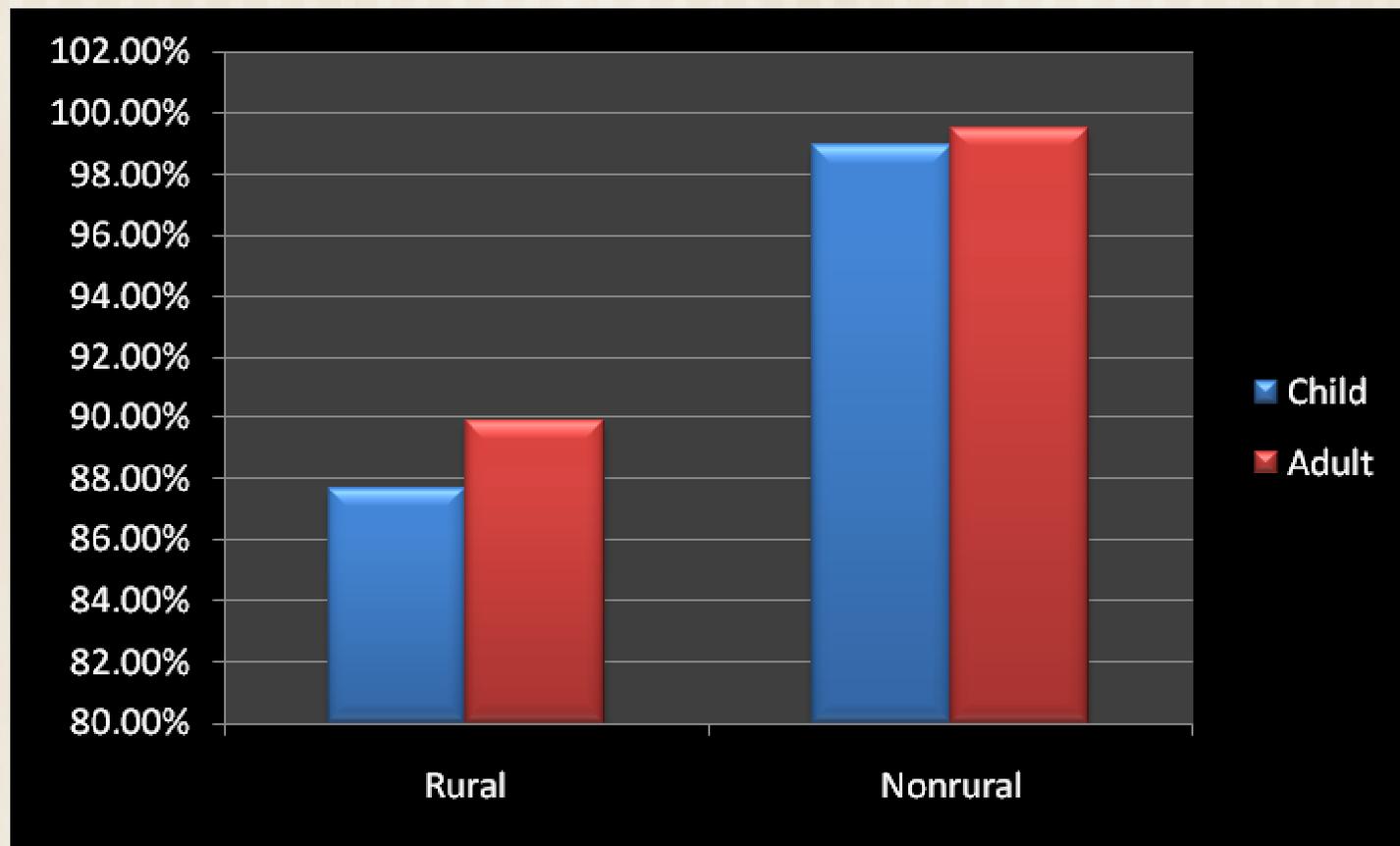
# Defibrillator with Pads\*



\*ALS Vehicles



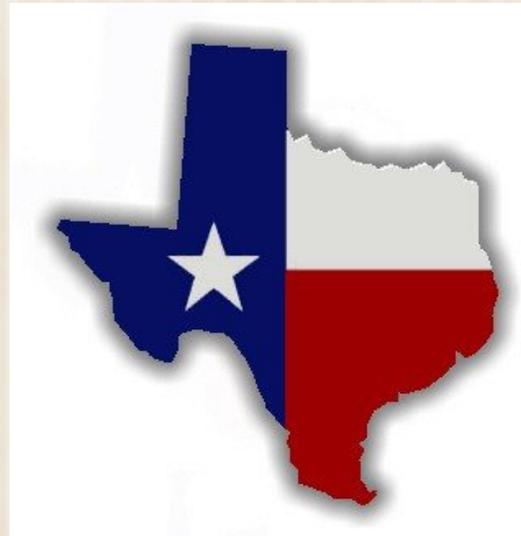
# Cardiac Pacing Pads/Cables\*



\*ALS Vehicles



# EMS Agency Survey: Equipment



**Trauma /  
Environmental**

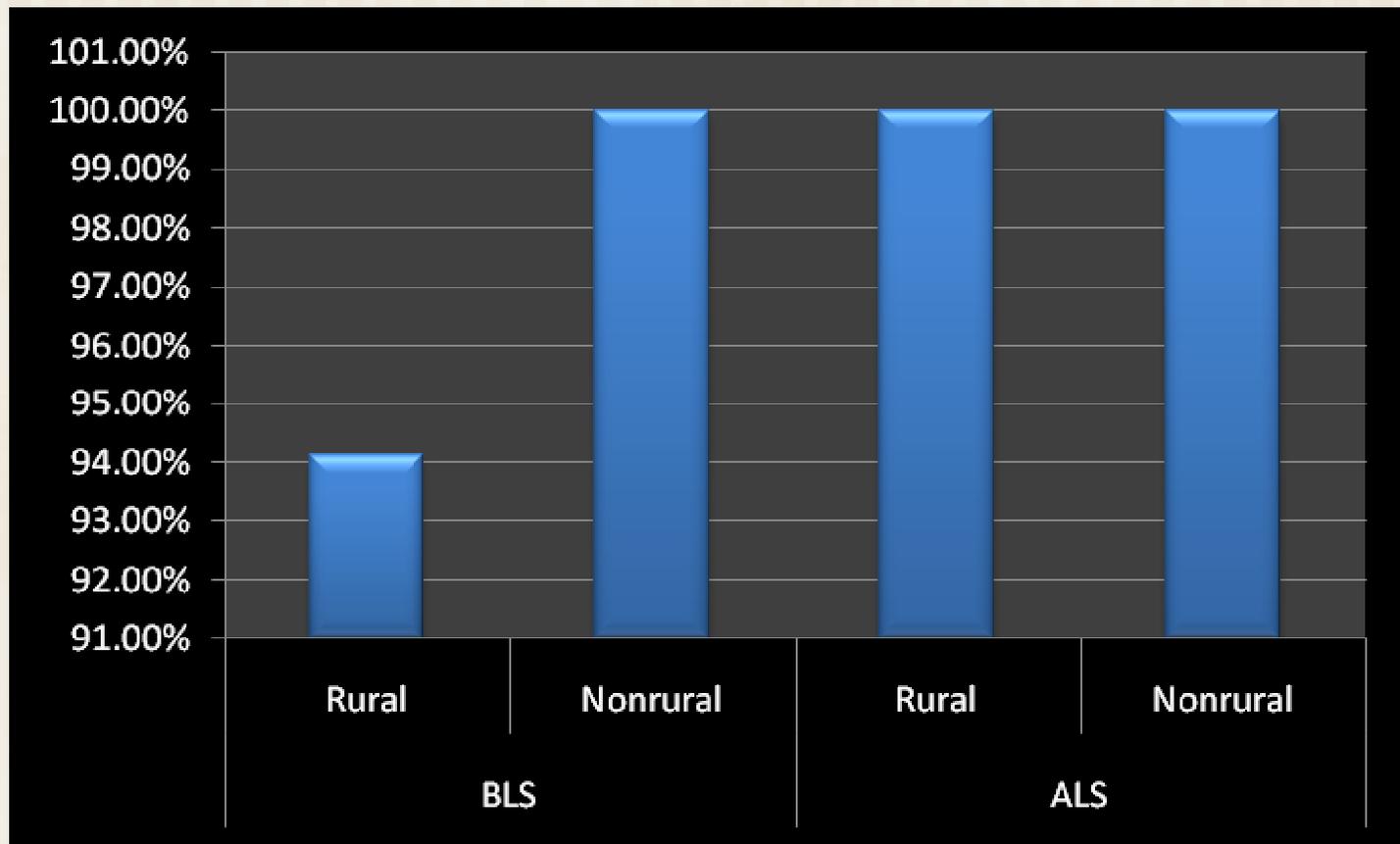


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

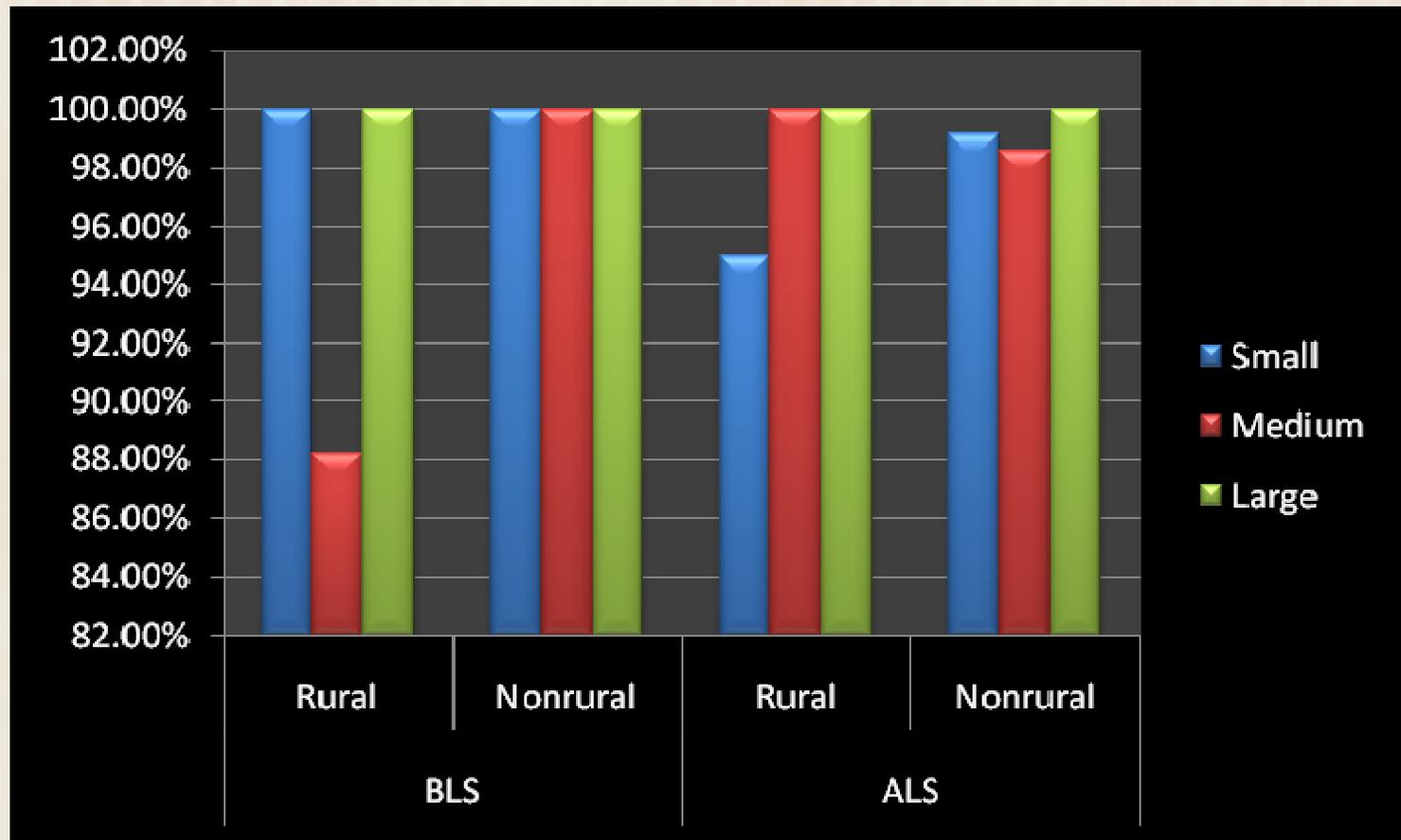


# Thermal Blanket and Head Cover





# Rigid Cervical Collar

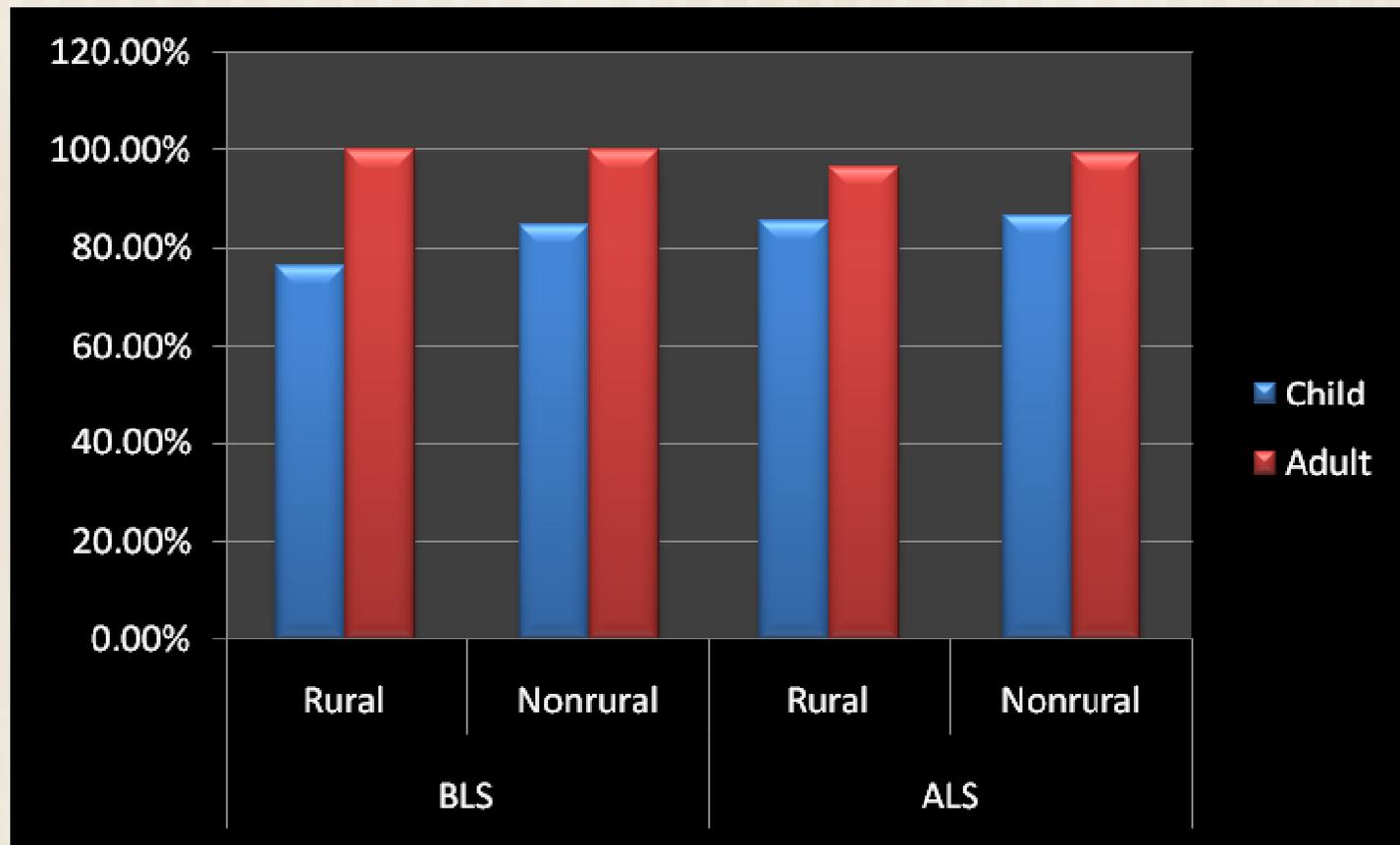


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# Lower Extremity Traction Device

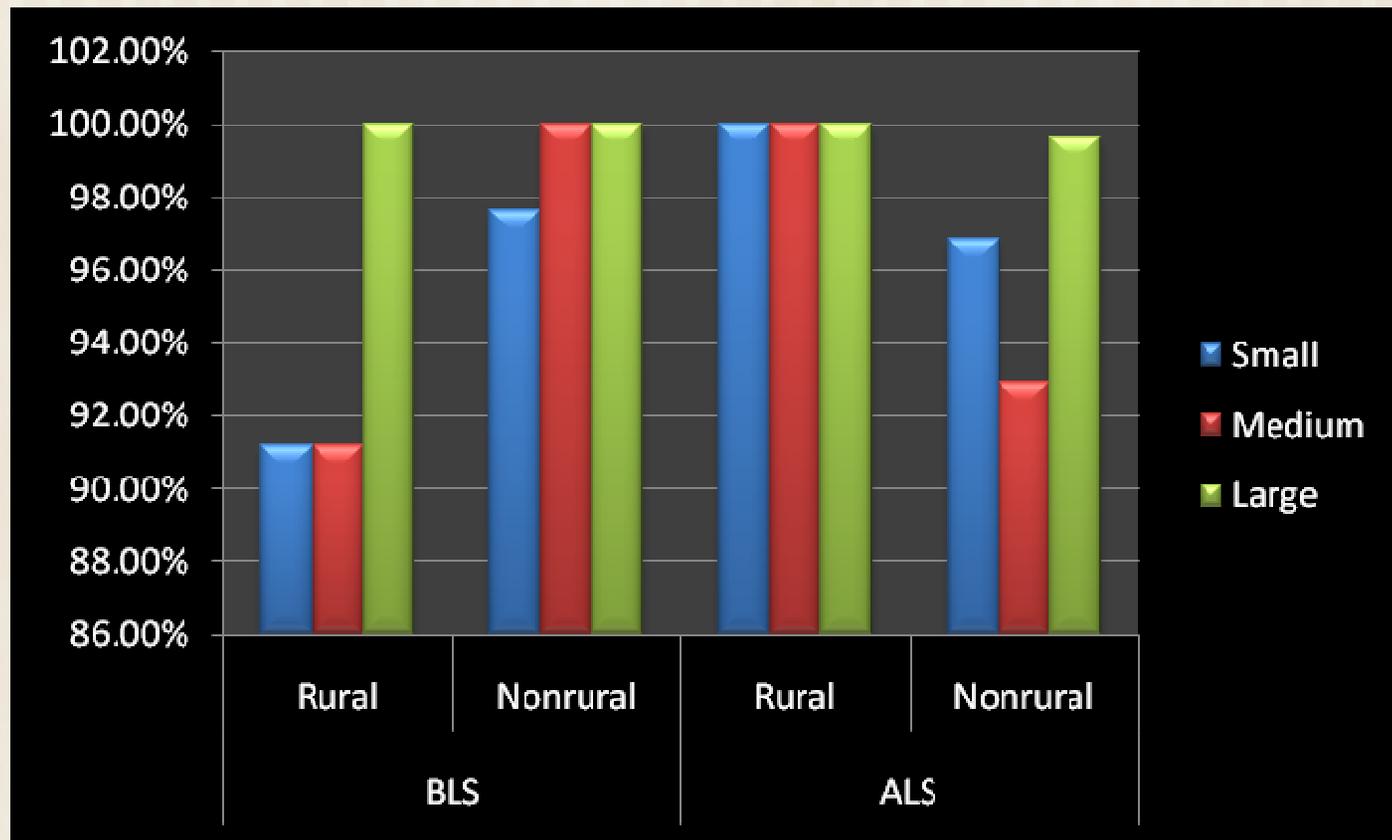


Texas Children's Hospital

**BCM**  
Baylor College of Medicine



# Extremity Immobilization Device

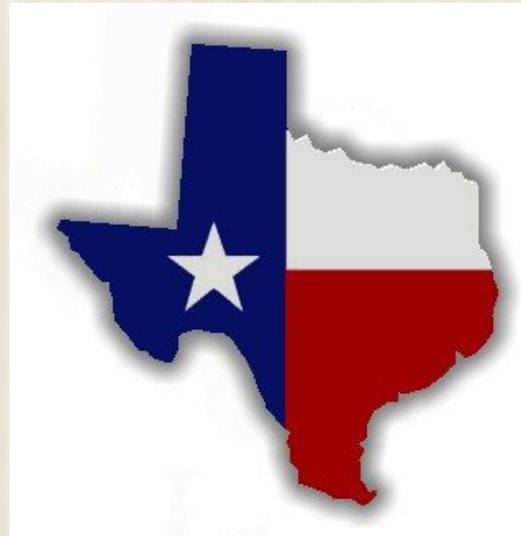


Texas Children's Hospital

**BCM**  
Baylor College of Medicine



# EMS Agency Survey: Equipment



**Obstetrics /  
Neonatal**

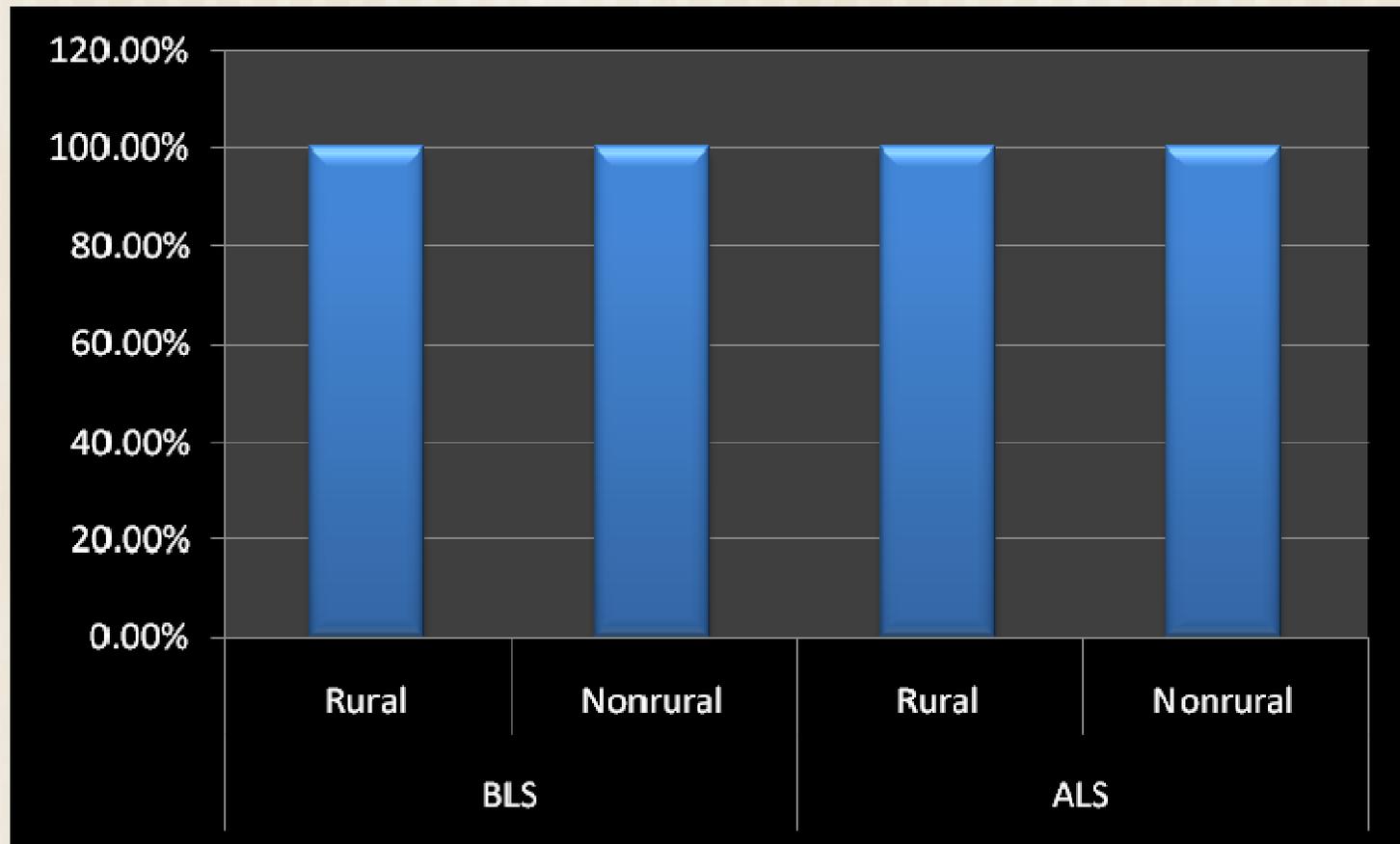


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

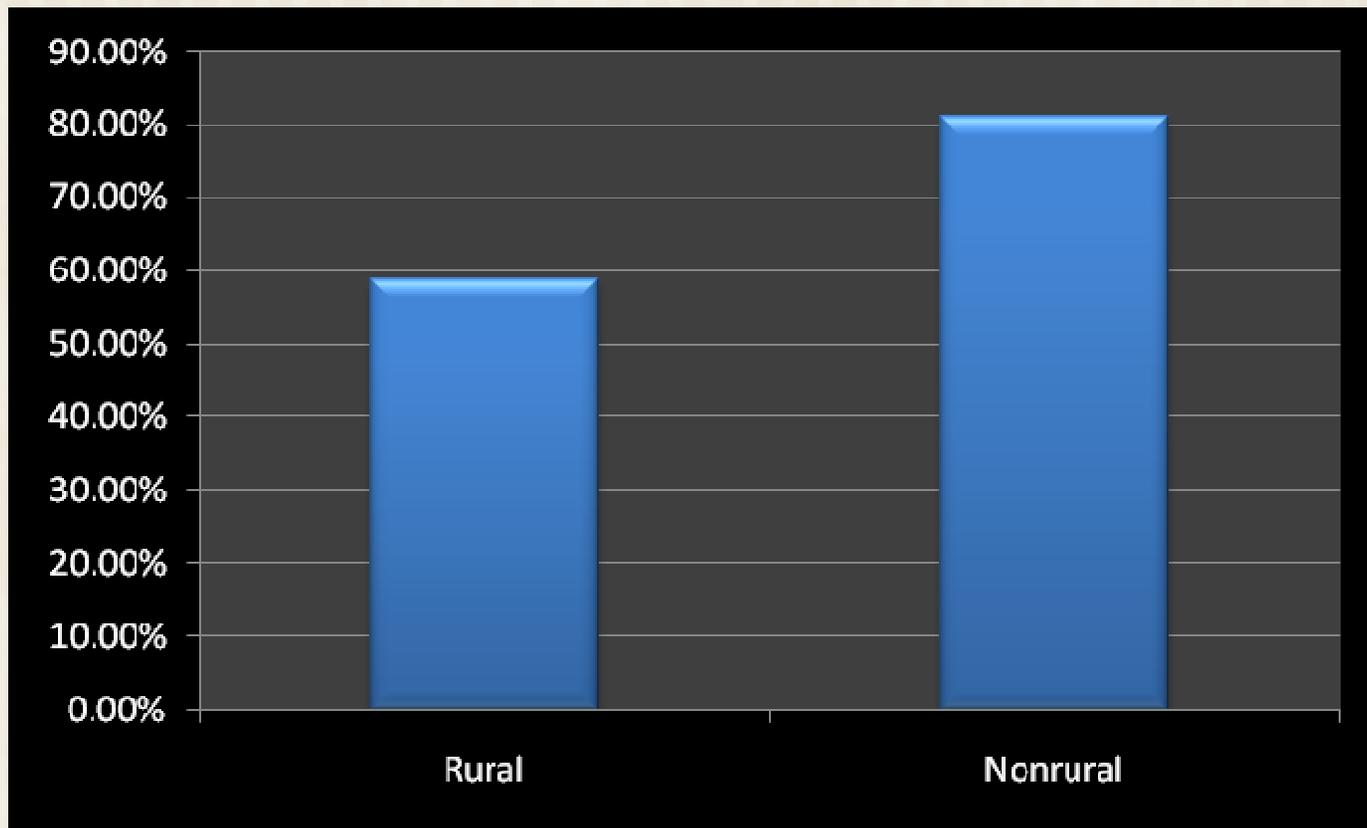


# Obstetrical Kit





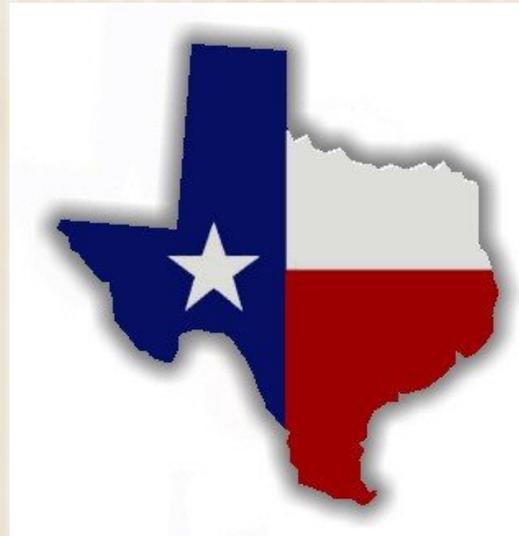
# Meconium Aspirator Adaptor\*



\*ALS Vehicles



# EMS Agency Survey: Equipment



**Other**

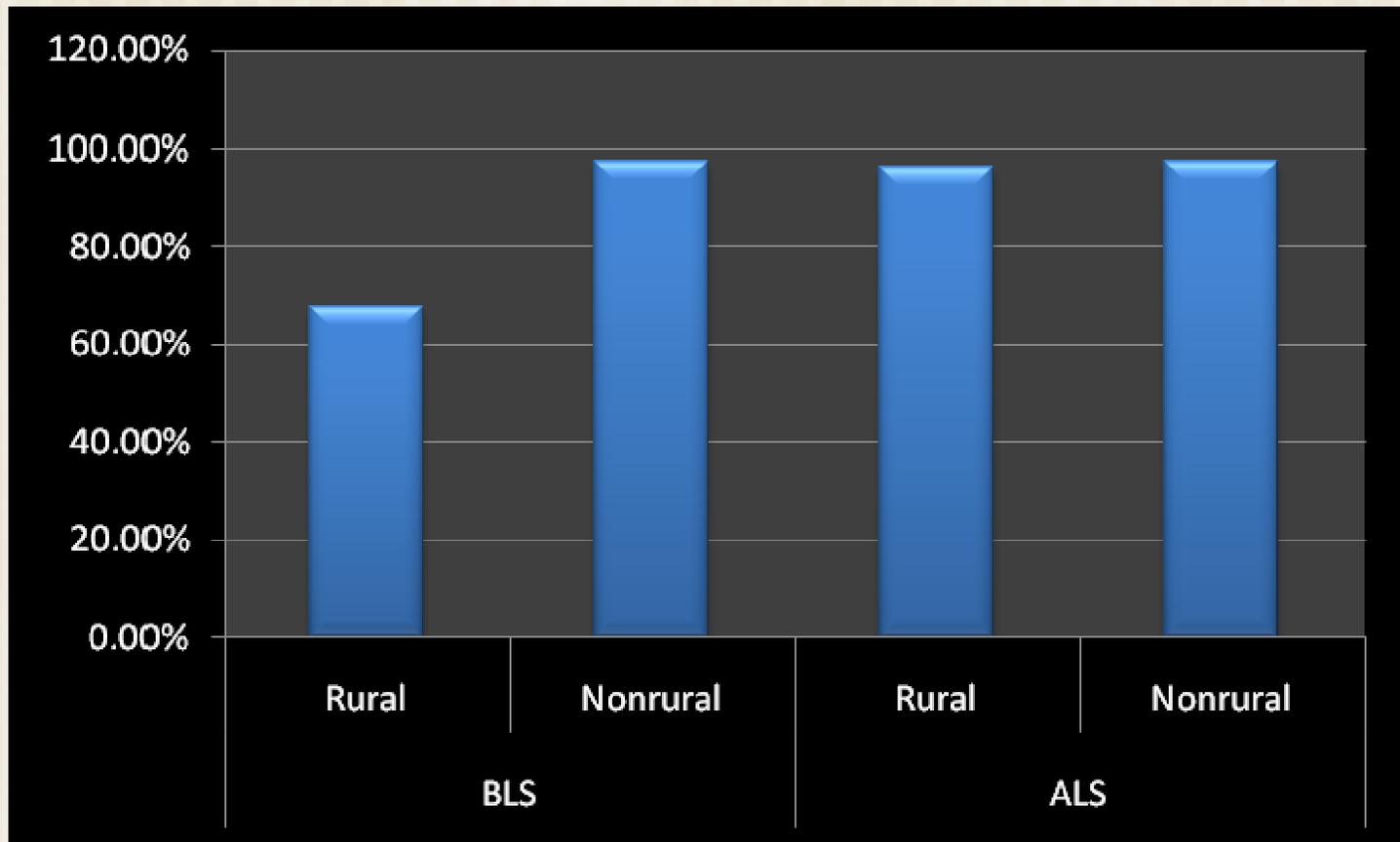


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

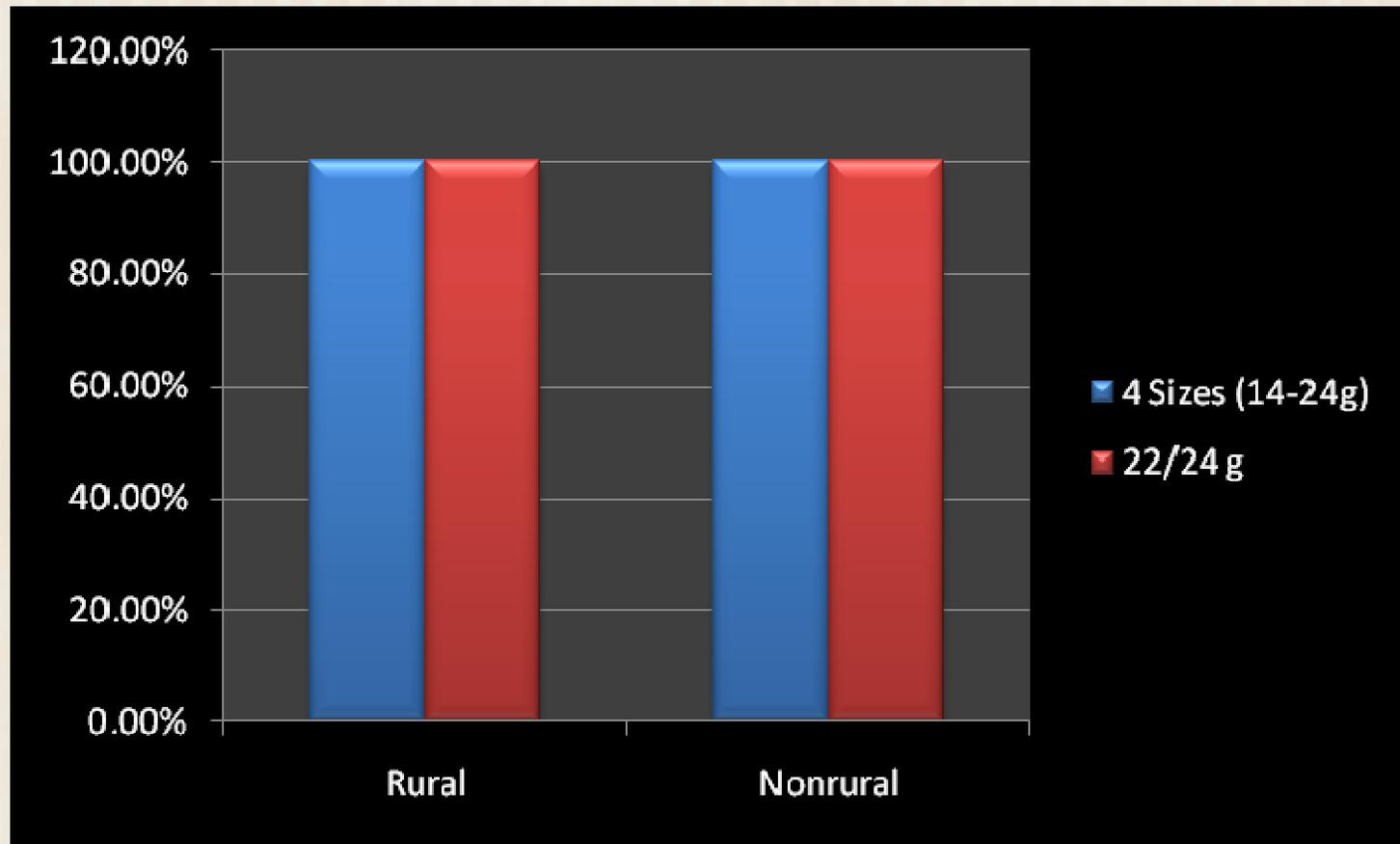


# Length Based Tape





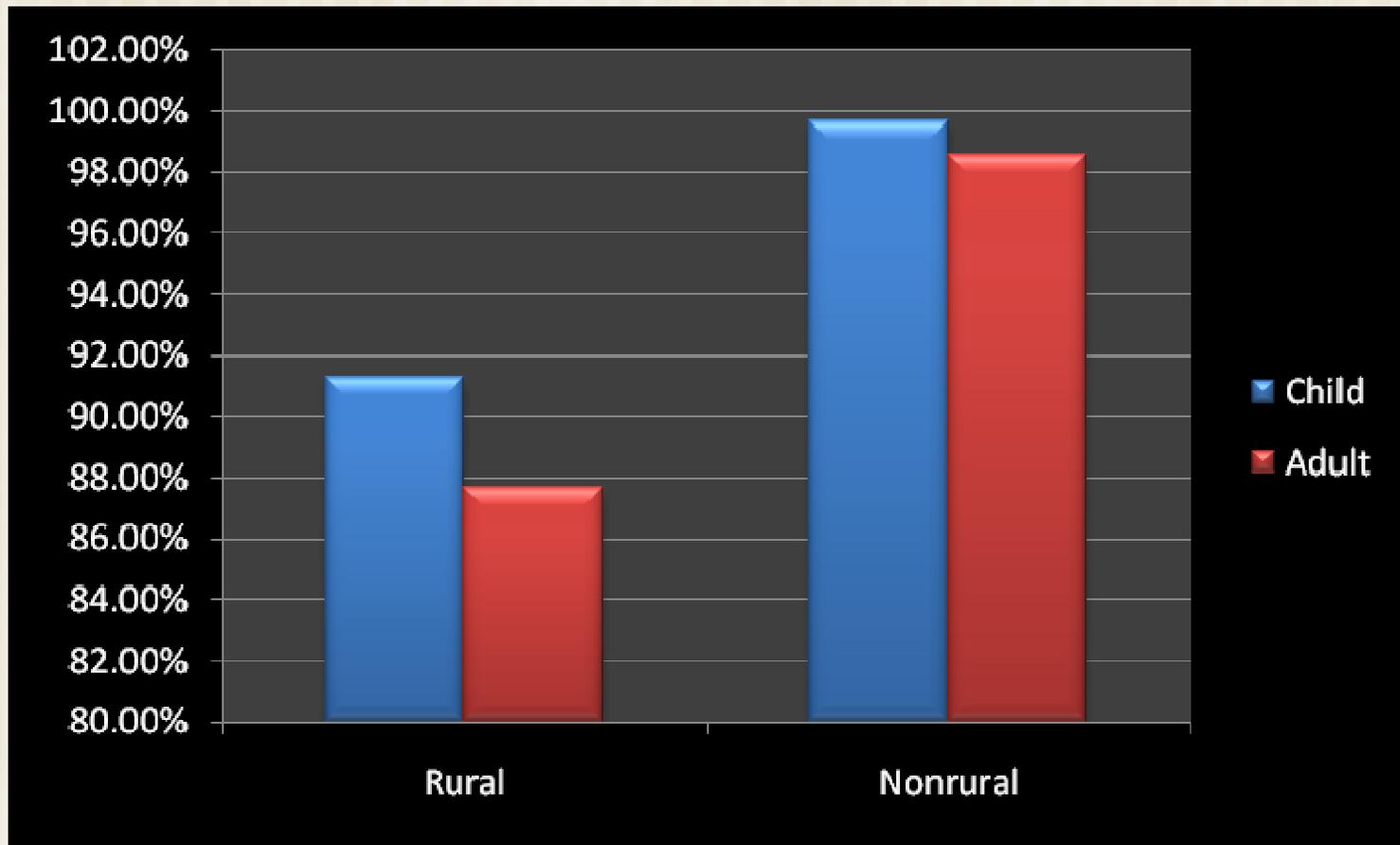
# Intravenous Catheter\*



\*ALS Vehicles



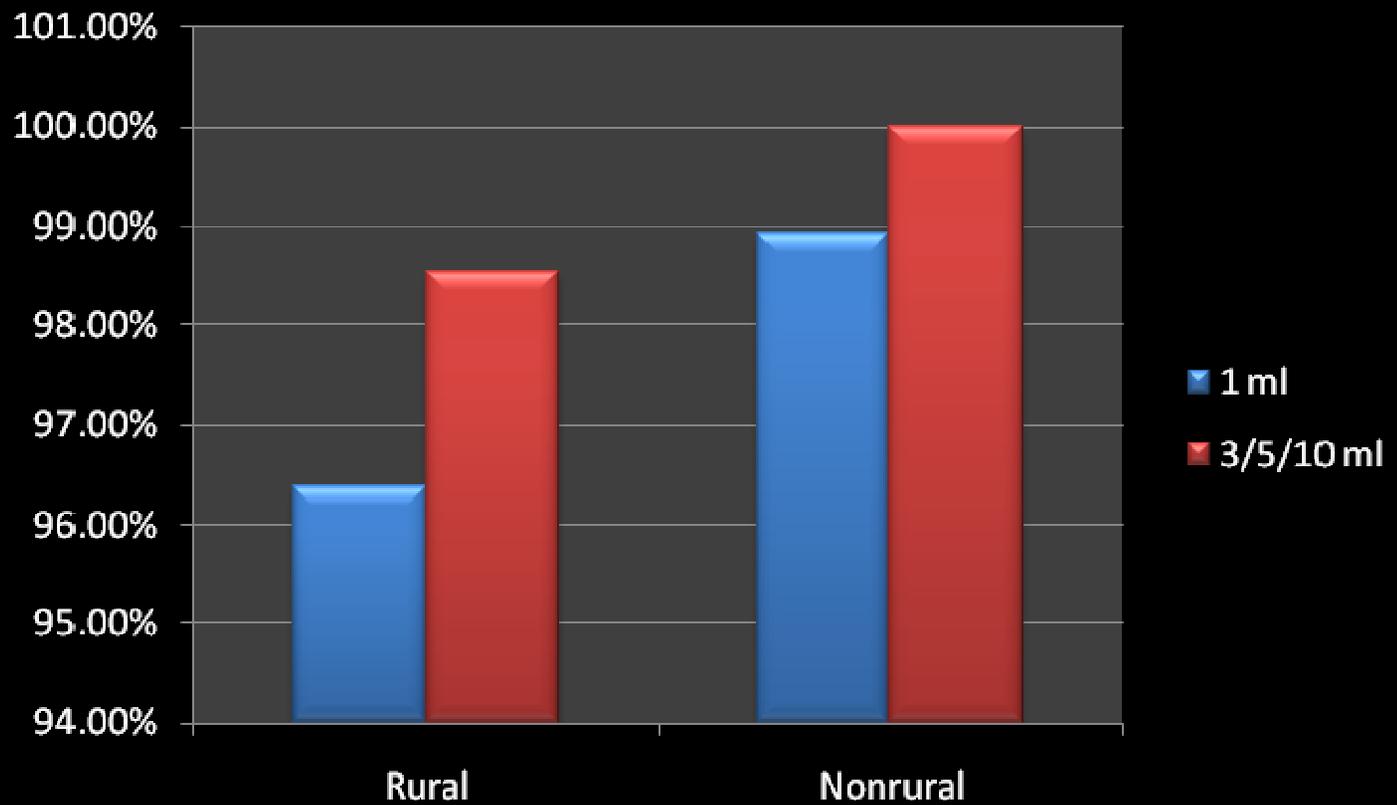
# Intraosseous Catheter\*



\*ALS Vehicles



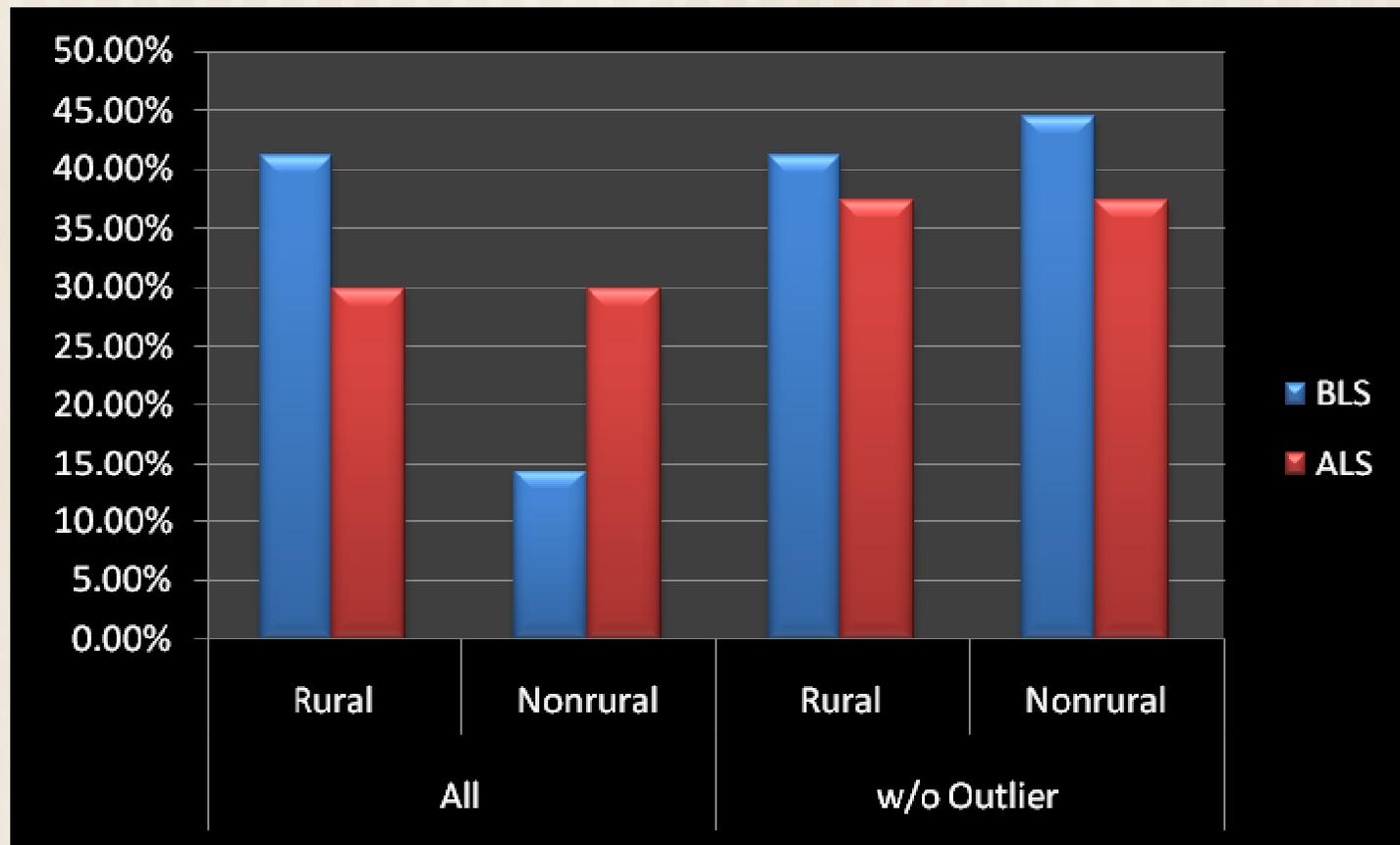
# Syringes\*



\*ALS Vehicles

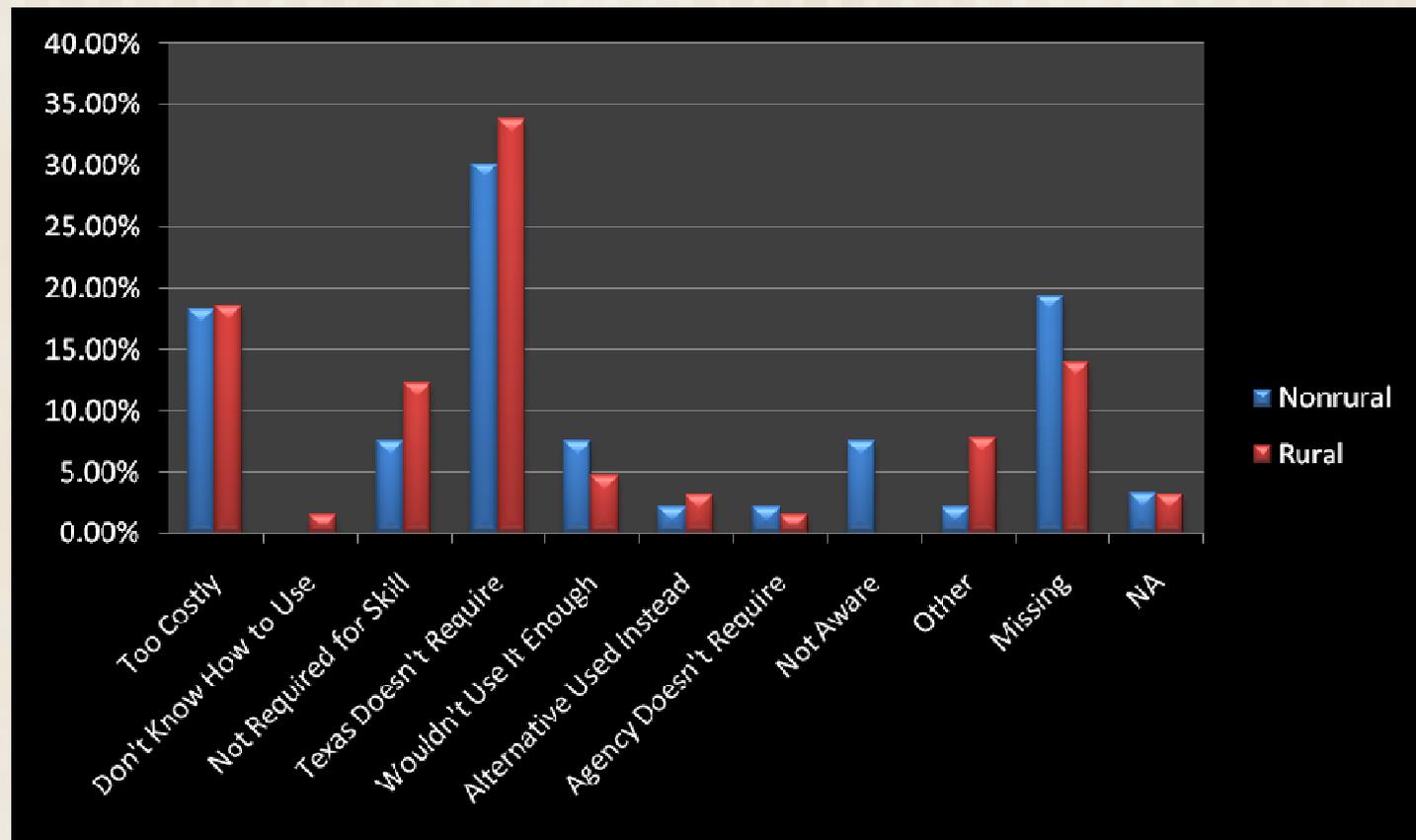


# All Equipment





## Most Common Reason For Not Carrying Recommended Equipment\*



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine

\*For transporting agencies only



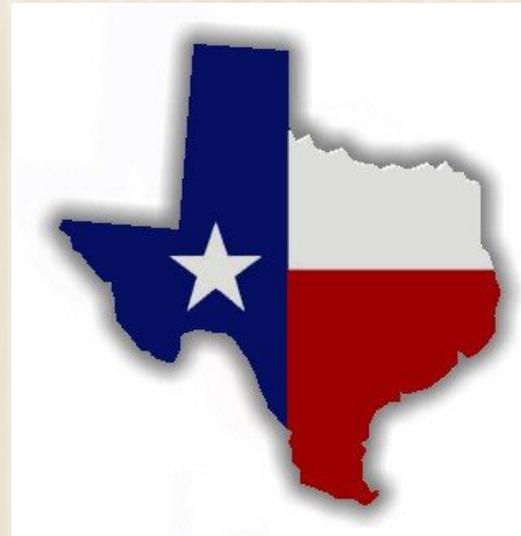
## “Other” Reasons for Not Carrying Equipment

- All of the above
- We carry the majority
- Equipment not readily available for purchase
- Not sure
- Slipped past our equipment list
- We would like to carry all as appropriate





# Hospital Survey



## Inter-facility Transfer Guidelines and Agreements

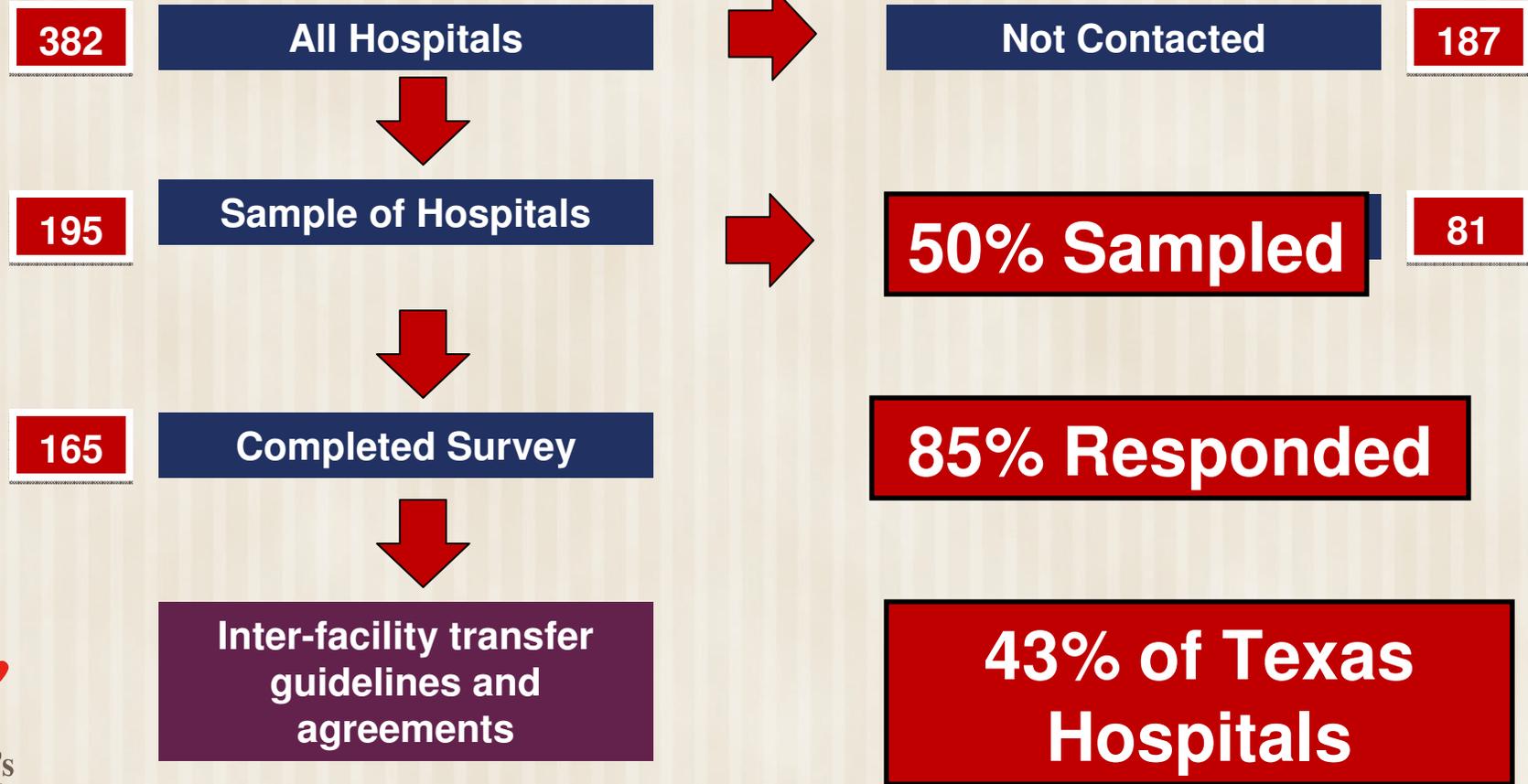


Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# Results: Hospital Survey



# Guidelines / Agreements

Component Present	% Present
<b>GUIDELINES</b>	<b>83%</b>
Process for initiation	<b>78%</b>
Process for selecting facility	<b>59%</b>
Process for selecting transport service	<b>64%</b>
Process for transfer, including consent	<b>83%</b>
Plan for transfer of the medical record	<b>78%</b>
Plans for transfer of copy of signed transport consent	<b>78%</b>
Plan for transfer of personal belongings of the patient	<b>58%</b>
Plan for provision of directions and referral institution information to family	<b>52%</b>
<b>AGREEMENTS</b>	<b>67%</b>



# SUMMARY: Medical Direction

## ■ Online

- Absent 32% of the time
- Source is often local ED in rural areas
- Children's hospital-based for <30%, but highly desired

## ■ Offline

- Written protocols often available (95%)
- 75% would use EMSC-created evidence-based protocols



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# SUMMARY:

## Basic Airway Equipment

- Rural BLS agencies likely to be missing
  - Suction catheters in smaller sizes
  - Pediatric nasal cannulae
  - Neonatal masks that attach to the bag-valve
- Nasal airways were absent in 10-20% of vehicles (all settings/providers)
- Pediatric pulse oximetry probes are absent, especially in the rural setting





# SUMMARY:

## Advanced Airway Equipment

- Miller 0 laryngoscopes absent 5-15% of the time
- Pediatric Magill forceps absent 13% of the time
- End-tidal CO<sub>2</sub> detection absent in 15%
- Smallest endotracheal tubes (<6.0 mm) absent 10-20% of the time in rural settings



Texas  
Children's  
Hospital

**BCM**  
Baylor College of Medicine



# SUMMARY:

## Equipment and Supplies

### ■ Cardiovascular

- Absence of an AED on rural BLS units 20% of the time

### ■ Trauma/environmental

- Small and medium cervical collars are at times absent
- Lower extremity traction devices sometimes be absent





# SUMMARY:

## Equipment and Supplies

- **Obstetrics/neonatal**
  - 30% missing meconium aspirator adaptors
- **Other**
  - 30 of BLS units missing length-based tape
  - Only 35-45% of vehicles had all equipment items
  - Lack of a State mandate is the most common reason why equipment is absent

