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An Assessment of Emergency Care for Children in Nebraska

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EXECUTIVE SUMMARY

STUDY OVERVIEW

In the fall of 2006, researchers from the Nebraska Center for Rural Health Research, under contract with the Nebraska Health and Human Services System Emergency Medical Services (EMS)/Trauma program, conducted a three-part study designed to assess the structures and processes in place to deliver emergency health care to the pediatric population in Nebraska. The Dillman method was used to survey 78% of Nebraska hospital emergency departments (EDs) that treat children, 68% of EMS services in Nebraska that are likely to treat children, and 72% of EMS training agencies involved in emergency medical education. We developed three different surveys, using guidelines recommended by the American Academy of Pediatrics, performance measures developed by HRSA for the Emergency Medical Services for Children (EMSC) program, and recommendations from the National EMSC Data Analysis Resource Center and the Nebraska EMSC project. The findings from this study will be used to identify areas of importance to be included in a five-year strategic plan to be developed by the Nebraska EMSC project.

KEY FINDINGS FROM THE HOSPITAL SURVEY

- Pediatric visits make up about one-fourth of the total visits to Nebraska EDs.
- Sixty-six percent of respondents reported that their hospital had written care protocols addressing the appropriate stabilization measures in response to critically ill or injured pediatric patients. (Figure 14)
- Nearly all (98%) of respondents reported that they transferred pediatric patients to other facilities for specialized care. The majority (88%) of respondents reported that their hospital *did not* admit pediatric patients from other hospitals for specialty care. (Figure 19)
- More than half of the respondents reported that their hospital had a written inter-facility transfer agreement that specified inter-facility communication between their hospital and the alternate care site (69%); transfer of patient materials (65%); and transport of patients, staff, and equipment to the alternate care site (59%). (Figure 16)
- Few of the responding hospitals had any pediatric specialties/units/services. The highest percentage of respondents reported that their hospital had a pediatric resuscitation area (38%). (Figure 20)
- Only two respondents reported that their hospital had a child life specialist. (Figure 25)

KEY FINDINGS FROM THE EMS SERVICES SURVEY

- Seventy-nine percent of respondents reported that their service currently used/followed the Nebraska State Model Protocol developed by the EMS Board for pediatric emergencies. (Figure 28) The majority of respondents (over 70%) reported that their service did not have separate written protocols regarding children with special needs (83%), disaster preparedness (72%), or sudden infant death syndrome (81%). (Figure 29)
- Forty-eight percent of respondents reported that their service had access to written protocols while at the scene of an emergency. The same percentage of respondents (48%) reported not having access to protocols while at the scene of an emergency. (Figure 30)
- Three-fourths (77%) of the respondents reported that their service did not utilize *on-line* pediatric medical direction (i.e., prehospital medical direction by designated medical personnel, which may include authorization for advanced life support (ALS) procedures, triage, destination assignment, and management of patients who receive care)¹ at the scene of an emergency. (Figure 31)
- Forty-six respondents (16%) reported that their service had *all* of the recommended pediatric-specific BLS equipment readily available to treat infants and children Sixty percent of the 46 services with all of the recommended equipment are located in rural areas. Nine of the 53 respondents (17%) from Advanced services reported that their service had *all* of the recommended pediatric-specific ALS equipment readily available to treat infants and children.
- Less than 20% of respondents reported that pediatric-specific courses were an education requirement for providers at their service. (Figure 41) Ninety-three percent of respondents reported that providers at their service would benefit from additional training in pediatric emergencies. (Figure 45)

KEY FINDINGS FROM THE EMS TRAINING AGENCY SURVEY

- The highest percentage of respondents (44%) reported that their training agency offered pediatric education for prehospital professionals (PEPP) courses. No respondents reported offering pediatric prehospital care (PPC), the emergency nurse pediatric course (ENPC), or advanced pediatric life support (APLS). (Figure 54)
- Nearly all (94%) responding training agencies reported offering continuing emergency medical education. (Figure 56) The majority (82%) of respondents reported that their training agency offered continuing education specific to pediatrics. (Figure 57)
- The majority of respondents (89%) reported that their training agency had on-site classrooms available. Less than half of the training agencies had on-site computer stations (44%) and/or web-based courses (33%) available to their students. (Figure 59) Training agencies were least likely to have access to telemedicine (29%). (Figure 61)

¹ Institute of Medicine. 1993. *Emergency Medical Services for Children*. Washington, DC: National Academy Press.

BACKGROUND AND PURPOSE

The process of providing health care to children requires the use of pediatric-specific equipment and training/education; without this, health care providers are not able to deliver safe and effective treatment to pediatric patients. The need for specialized resources is even more critical when delivering emergency treatment to this population, due the intense nature of the situation. Many emergency providers feel stress and anxiety when caring for pediatric patients. Emergency medical providers in prehospital and hospital settings must be prepared to deliver adequate, effective, and timely treatment to children 24 hours a day, seven days a week. In order to ensure the best possible care for children, all hospital EDs and all EMS services must have access to the appropriate equipment, staff, and policies.

Several studies have identified shortcomings in pediatric emergency care throughout the United States.^{2,3,4} Attempts are being made by state and national organizations to develop and implement guidelines for delivering emergency health care to children in prehospital and hospital settings. However, due to the complexity of the emergency health care system many states continue to have difficulty obtaining proper resources for emergency health care providers.

According to recent reports from the Institute of Medicine, many EMS services and hospital EDs are not prepared to provide emergency treatment to children. Many providers, especially in rural areas, lack the proper equipment and knowledge needed to treat pediatric patients. “Only about 6% of the EDs in the United States have all the supplies deemed essential for managing pediatric emergencies; only half of hospitals have at least 85% of those supplies.”⁵ Because there are few incidents involving children in prehospital settings and in many rural EDs, emergency providers may lose their pediatric skills. In spite of this potential skill loss, continuing education in pediatric care is not required or is extremely limited for many prehospital and hospital providers.

In the fall of 2006, the Nebraska Health and Human Services System (NHHSS) Emergency Medical Services (EMS)/Trauma program contracted with researchers from the Nebraska Center for Rural Health Research to conduct a study that would inform state policy makers and health care leaders about the structures and processes that exist within Nebraska’s emergency health care system to deliver emergency treatment to children and about the availability of pediatric-specific emergency medical education/training resources to emergency health care providers in Nebraska.

² Institute of Medicine. *The Future of Emergency Care in the United States Health System*. Report Brief, June 2006. Washington, DC: National Academy Press.

³ Middleton, K, Burt, C. 2006. *Availability of Pediatric Services and Equipment in Emergency Departments: United States, 2002-03*. U.S. Department of Health and Human Services, National Center for Health Statistics.

⁴ American Academy of Pediatrics. 2005. *The Role of the Pediatrician in Rural Emergency Medical Services for Children*. Pediatrics. Vol. 116 No.6.

⁵ Institute of Medicine. 2006. *Emergency Care for Children: Growing Pains*. Washington, DC: National Academy Press.

HOSPITAL EMERGENCY DEPARTMENT SURVEY (n = 66)

STUDY DESIGN

Using data collected by the Nebraska Hospital Association, we compiled a list of 85 acute care hospitals in Nebraska that provide emergency treatment to pediatric patients. (See Appendix A for the location of acute care hospitals in Nebraska.) Of these 85 hospitals, 65 were Critical Access Hospitals (CAHs) with 25 or fewer licensed beds. After review of the literature, a survey instrument was developed and organized into domains reflecting guidelines recommended by the American Academy of Pediatrics,⁶ performance measures developed by HRSA for the EMSC program,⁷ and recommendations from the National EMSC Data Analysis Resource Center⁸ and the Nebraska EMSC project. The hospital survey included questions regarding patient census/tracking, emergency department staffing/coverage, emergency department staff education, staff services, policies and procedures, transport and transfer of patients, inpatient care, quality improvement, patient services, and public education. (See Appendix B for a copy of the ED survey.) The survey was pilot-tested by contacts from hospitals of various sizes and was estimated to take 10 minutes to complete. Using the Dillman⁹ method developed for survey research, we made five contacts with the hospitals surveyed. Surveys were sent to the person most knowledgeable about the process of emergency pediatric treatment within each hospital.

STUDY POPULATION

We received completed surveys from 66 (78%) of the 85 hospitals surveyed. Fifty-nine percent of the responding hospitals were CAHs.

⁶ American Academy of Pediatrics. 2001. *Care of Children in the Emergency Department: Guidelines for Preparedness*. Pediatrics. Vol. 107 No.4.

⁷ <http://bolivia.hrsa.gov/emsc/PerformanceMeasures.aspx>

⁸ <http://nedarc.med.utah.edu/nedarc/resourceLibrary/performanceMeasures.html>

⁹ Dillman, D.A. (2000). *Mail and internet surveys: The tailored design method*. New York: John Wiley & Sons.

FINDINGS FROM RESPONDING HOSPITALS

CENSUS/TRACKING

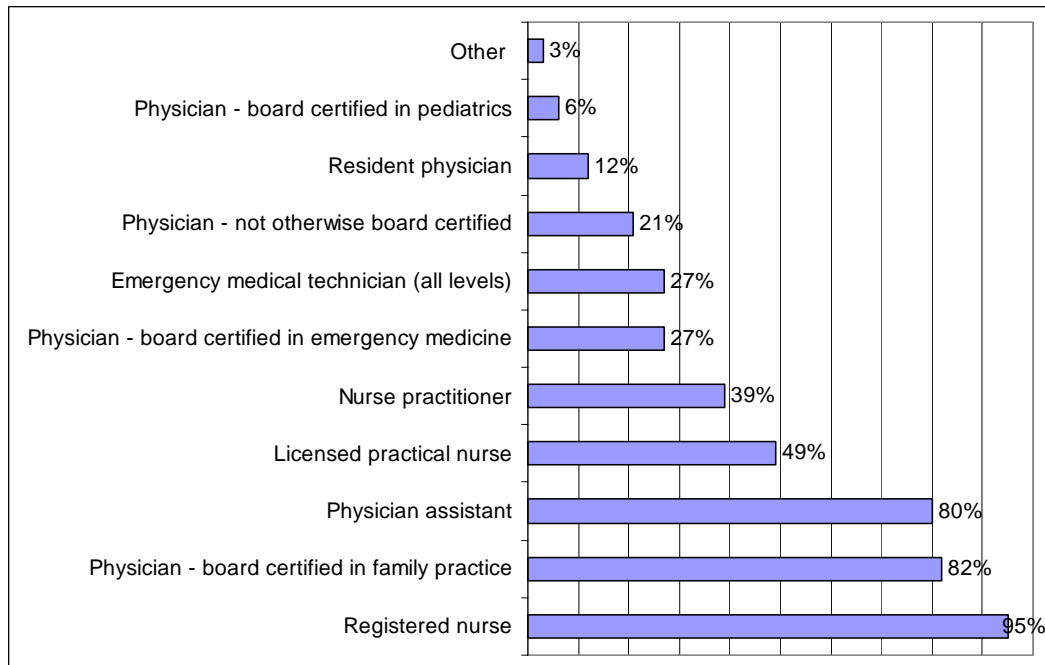
Pediatric visits make up about one-fourth of the total visits to Nebraska emergency departments.

- Respondents reported that the median number of visits to the ED in 2005 was 1,823 (ranging from 250 to 90,000), while the median number of *pediatric* visits was 411 (ranging from 51 to 23,800).

EMERGENCY DEPARTMENT STAFFING/COVERAGE

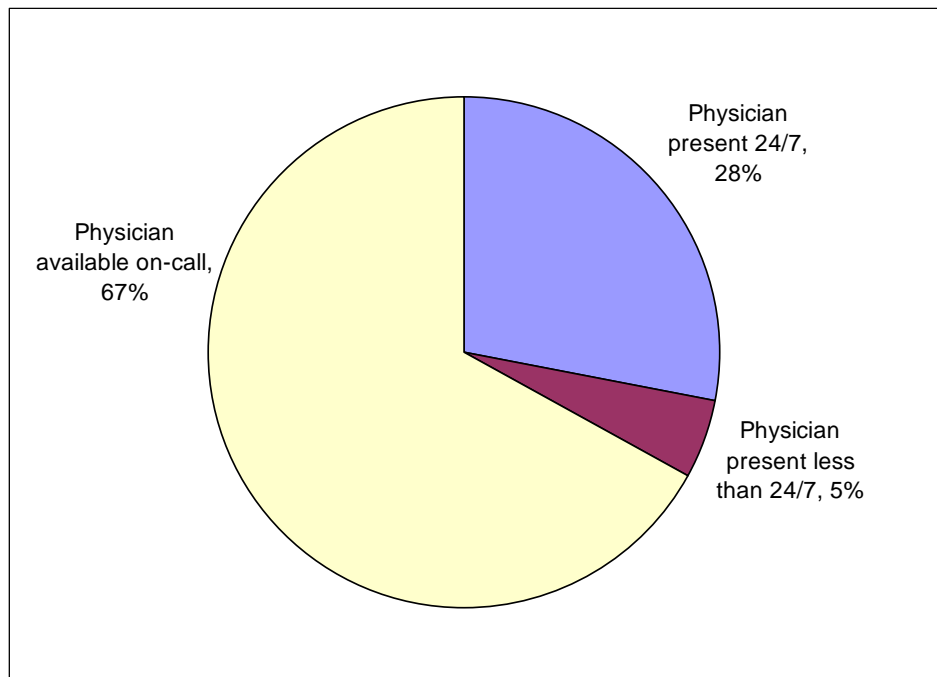
- Nearly all respondents reported that registered nurses (RNs) were involved in evaluation and treatment of pediatric patients in their ED, followed by physicians board certified in family practice (82%) and physician assistants (80%). (Figure 1)
- Twenty-seven percent of respondents reported that emergency medical technicians (EMTs) were involved in the evaluation and treatment of pediatric patients in their ED. (Figure 1)
- Only 6% of the respondents reported that a physician board certified in pediatrics was involved in evaluation and treatment of pediatric patients in their ED. (Figure 1)

Figure 1: Providers Involved in Evaluation and Treatment of Pediatric Patients in the ED (n = 66)



- The majority of respondents (67%) reported that the physician coverage for their ED was typically provided by on-call physicians, as opposed to having a physician present 24/7 (28%) or having a physician present less than 24/7 (5%). (Figure 2)
- Ninety-four percent of hospital EDs that have *physician coverage 24/7* are located in a metropolitan or micropolitan area. Ninety-one percent of the hospital EDs typically covered by an *on-call physician only* are located in a rural area.¹⁰
- Ninety-six percent of respondents reported that their hospital had a written policy/procedure that defines *when a physician is to be consulted or called to the ED*.
- Ninety-eight percent of the respondents reported that their hospital had a written policy/procedure that defines *the maximum response time for on-call physicians*.

Figure 2: Typical Physician Coverage for Hospital ED (n = 64)

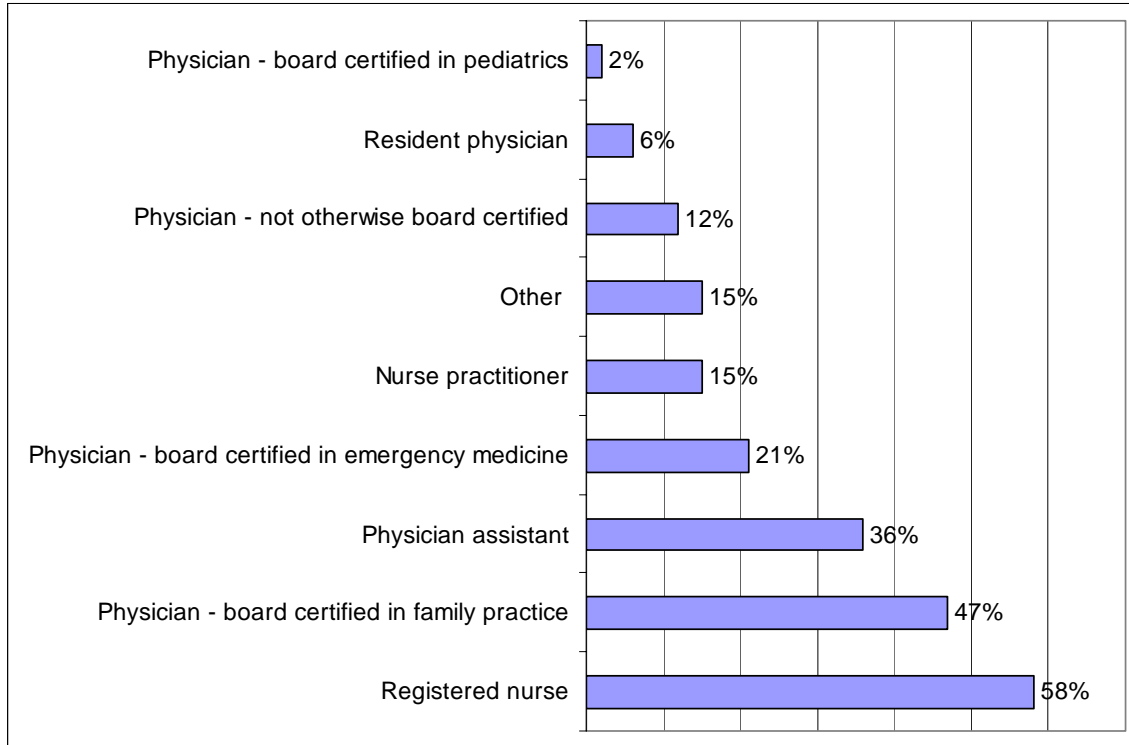


- Fifty-eight percent of the respondents reported they had at least one RN assigned to cover *only* the ED, 24/7, in their hospital. (Figure 3)
- Less than half of the respondents reported that they had a physician assigned *only* to the ED, 24/7. (Figure 3)

¹⁰ For the purposes of this study, Metropolitan, Micropolitan, and Rural definitions are based upon a modification of the ZIP code RUCA codes system which can be found at: <http://depts.washington.edu/uwruca/uses.html>.

- Several hospitals reported that their hospital staff covered areas other than the ED and that no staff members were assigned *only* to the ED. Extra help was called to the ED as needed.

Figure 3: Providers Assigned to Cover Only the ED, 24/7 (n = 66)



ED STAFF EDUCATION

RNs that work in the ED are more likely than other ED staff to have pediatric education requirements.

- Forty-seven percent of the respondents reported that their hospitals required physicians who work in the ED to have pediatric advanced life support (PALS) training. (Figure 4)
- Twenty-one percent of respondents reported that physicians who work in the ED were not required to have any pediatric-specific education/training. (Figure 4)
- A higher percentage (38%) of respondents reported that their hospital did not require physicians who work in the ED to obtain continuing medical education (CME) in pediatrics. However, 28% of respondents reported that they did not know. (Figure 5)

Figure 4: Education/Training Required for Physicians Who Work in the ED (n = 66)

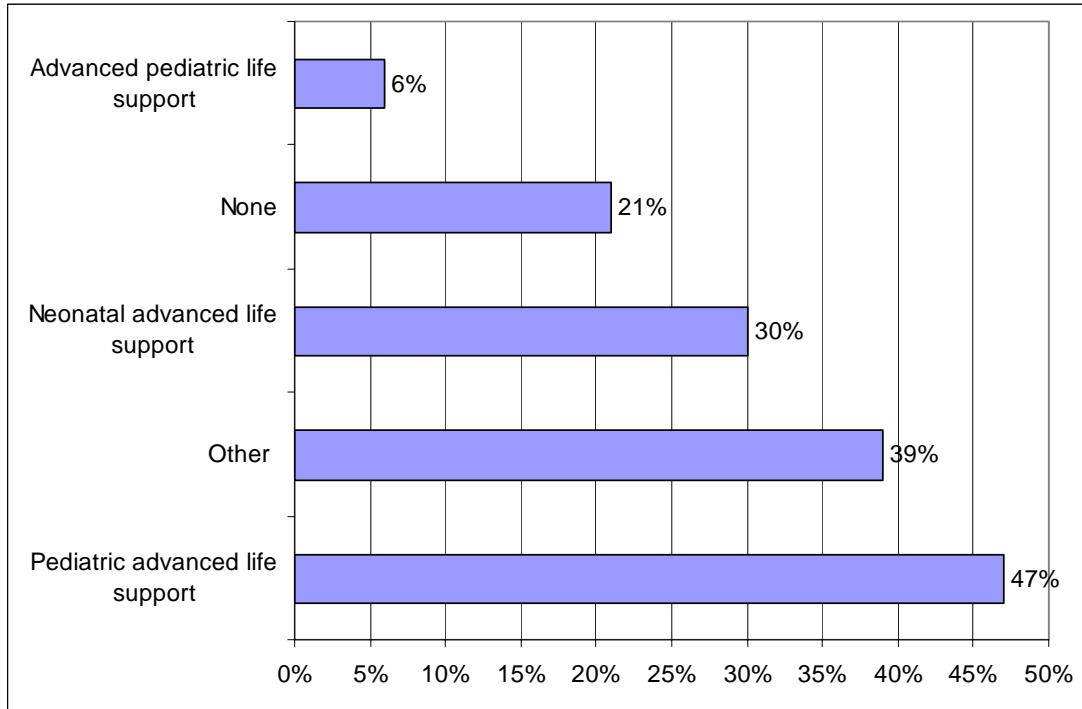
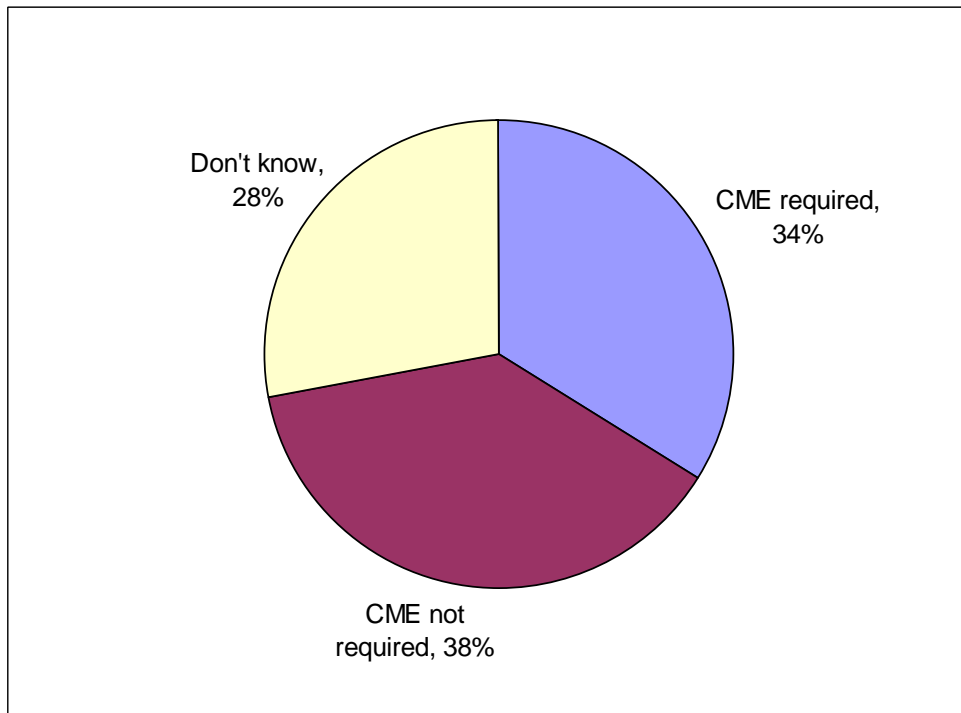


Figure 5: Hospital Requirement for Continuing Medical Education in Pediatrics for Physicians Who Work in the ED (n = 64)



- Forty-two percent of the respondents reported that their hospitals required nurse practitioners (NPs) and physician assistants (PAs) who work in the ED to have PALS training. (Figure 6)
- Twenty-four percent of respondents reported that NPs and PAs who work in the ED were not required to have any pediatric-specific education/training. (Figure 6)
- A higher percentage (40%) of respondents reported that their hospital did not require RNs and PAs who work in the ED to obtain CME in pediatrics. However, 26% of respondents reported that they did not know. (Figure 7)

Figure 6: Education/Training Required for NPs and PAs Who Work in the ED (n = 66)

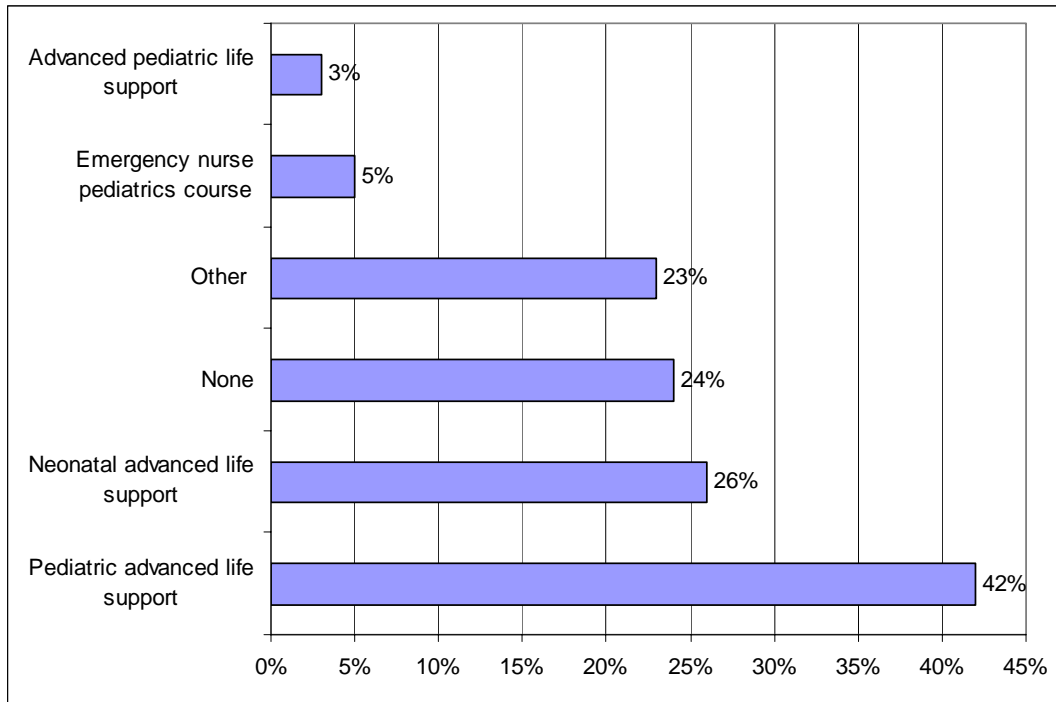
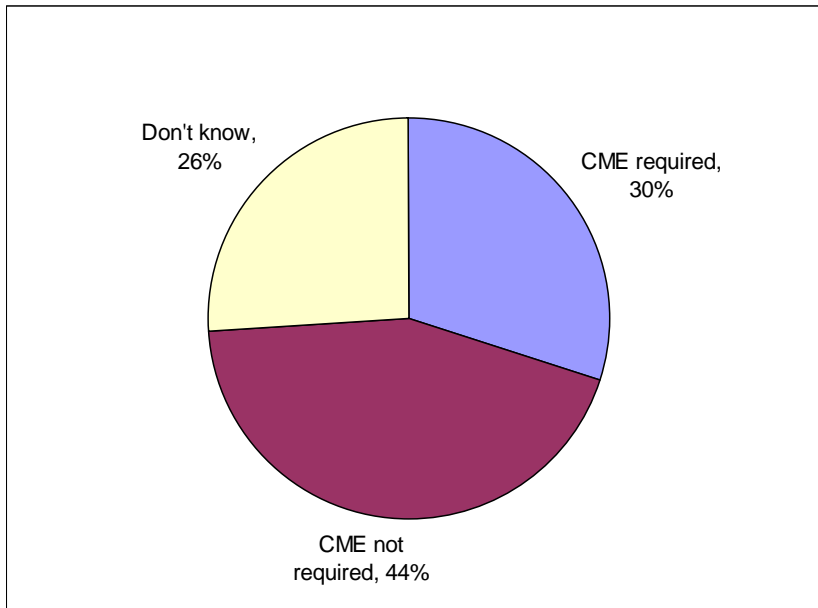


Figure 7: Hospital Requirement for Continuing Medical Education in Pediatrics for NPs and PAs Who Work in the ED (n = 61)



- Over half of the respondents (56%) reported that their hospitals required RNs who work in the ED to have PALS training. Forty-four percent of the respondents indicated that their hospitals required RNs to have neonatal advanced life support (NALS) training. (Figure 8)
- Half of the respondents reported that RNs who work in the ED were required to have education/training other than NALS, APLS, PALS, or ENPC. (Figure 8)
- About half (52%) of respondents reported that their hospital required RNs who work in the ED to obtain CME in pediatrics; 45% of the hospitals did not require this. (Figure 9)

Figure 8: Education/Training Required for RNs Who Work in the ED (n = 66)

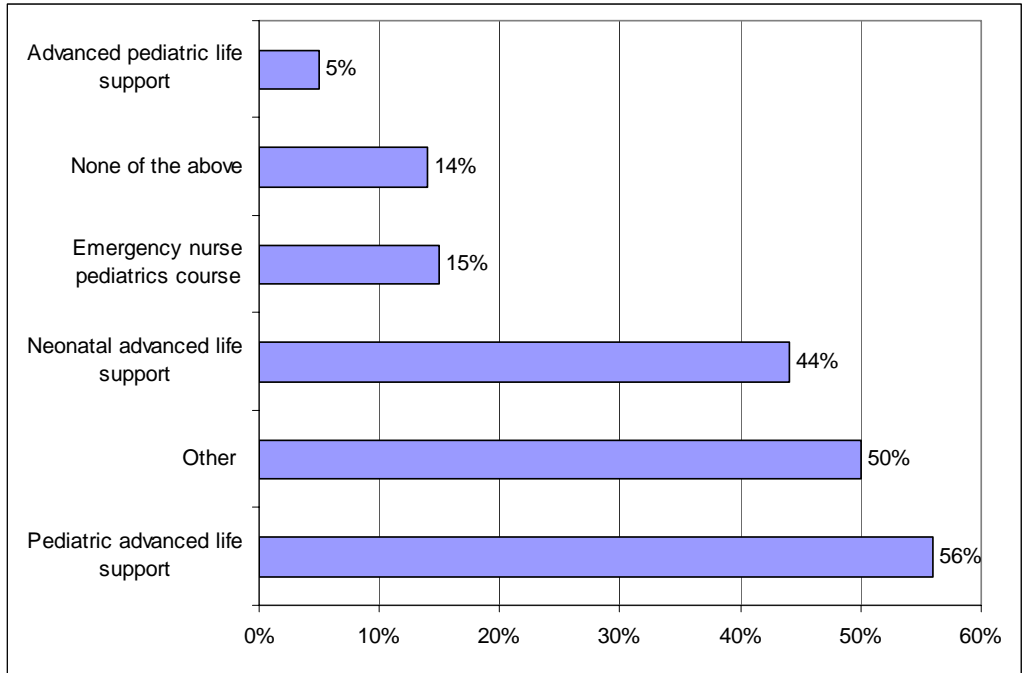
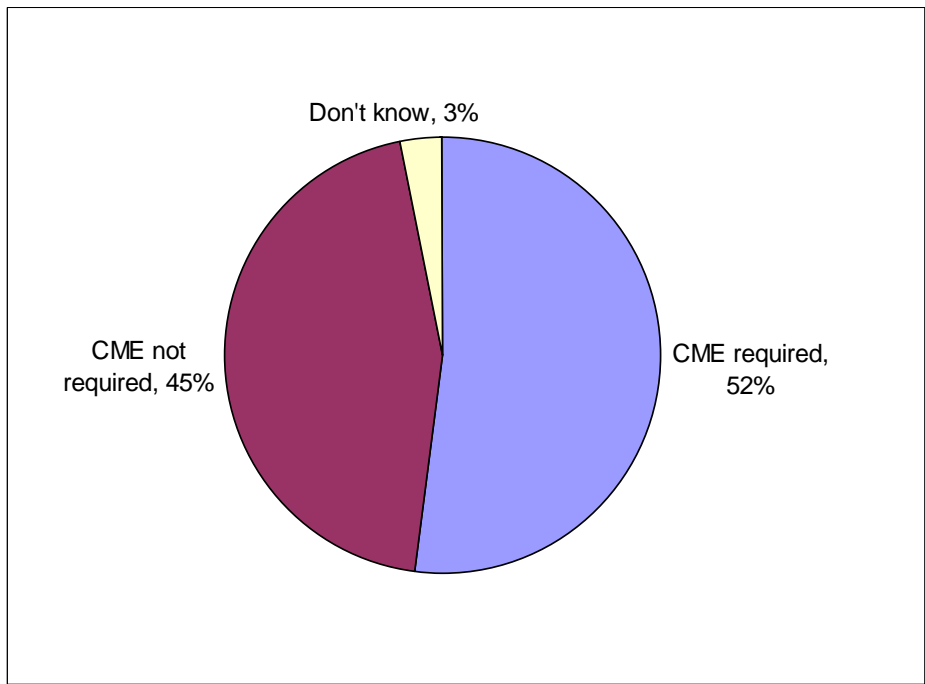


Figure 9: Hospital Requirement for Continuing Medical Education in Pediatrics for RNs Who Work in the ED (n = 66)



STAFF SERVICES

- The majority (71%) of respondents reported that their hospital offered education and training to in-hospital and out-of-hospital emergency health care providers. (Figure 10)
- Of the hospitals that offered education to emergency health care providers, 74% reported that they offered education/training on disaster preparedness, followed by PALS (55%) and NALS (45%). (Figure 11)

Figure 10: Education and Training to In-hospital and Out-of-hospital Emergency Health Care Providers Offered by Hospitals (n = 66)

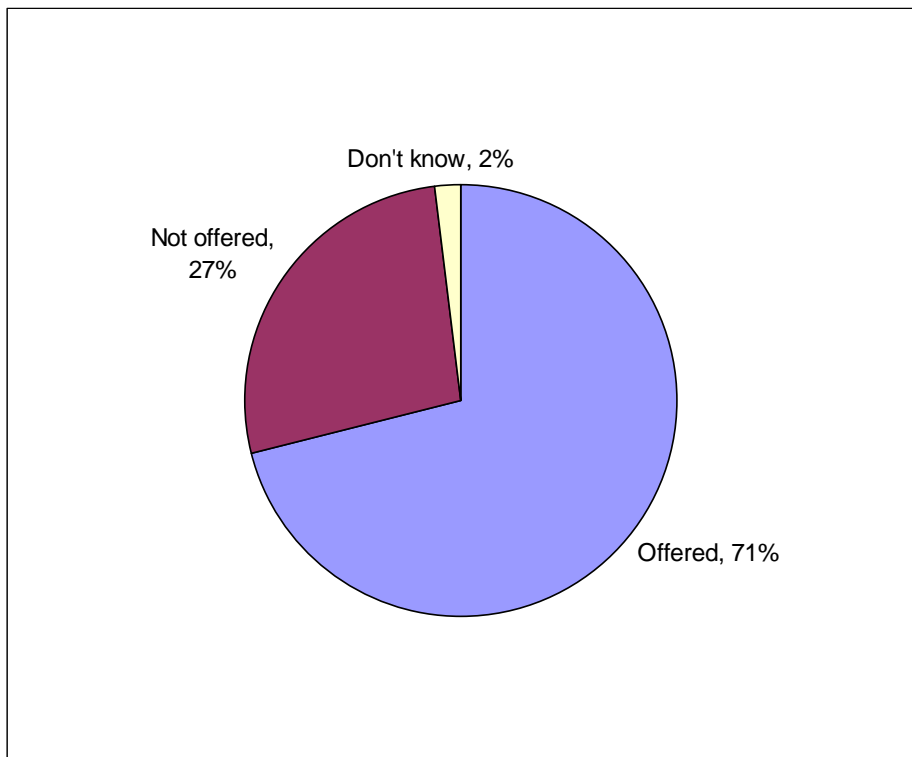
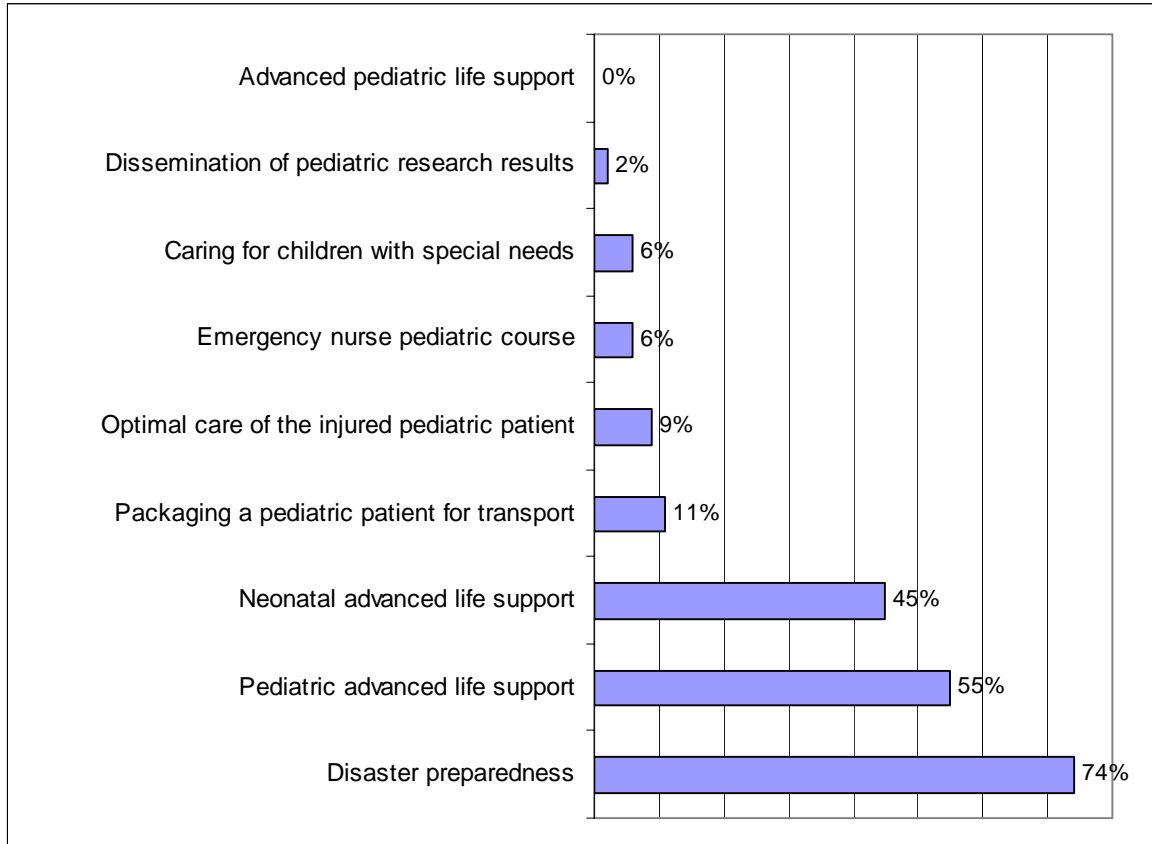


Figure 11: Education/Training Offered to In-hospital and Out-of-hospital Emergency Health Care Providers (n = 47)



- Sixty-eight percent of respondents reported that their hospital utilized the Critical Incident Stress Management (CISM) program offered by the Nebraska Health and Human Services Systems. (Figure 12)
- Of the 21% percent of respondents who reported not utilizing the CISM program, about half (53%) reported that they were interested in receiving information regarding this program. (Figure 13)

Figure 12: Hospital Utilization of the State CISM Program (n =66)

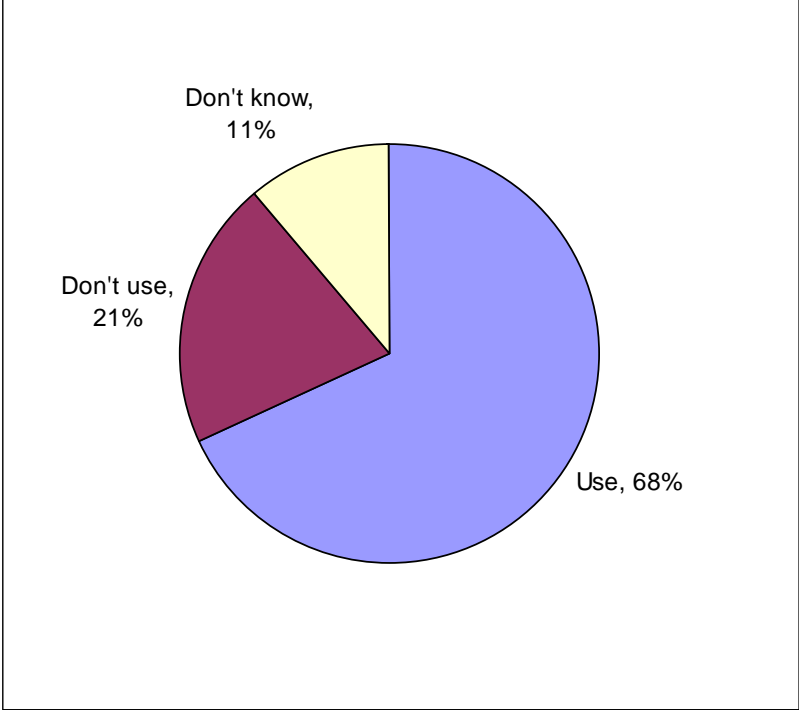
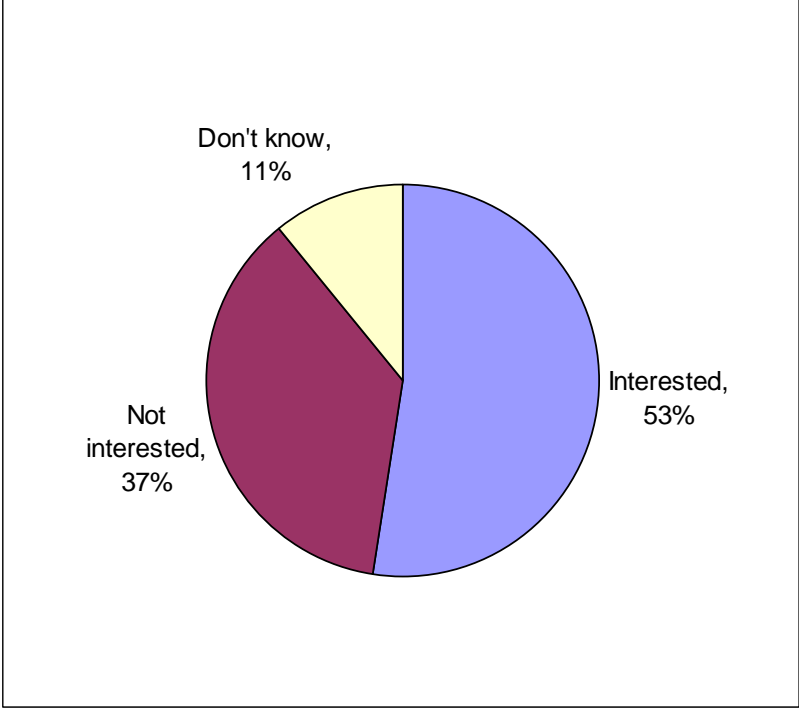


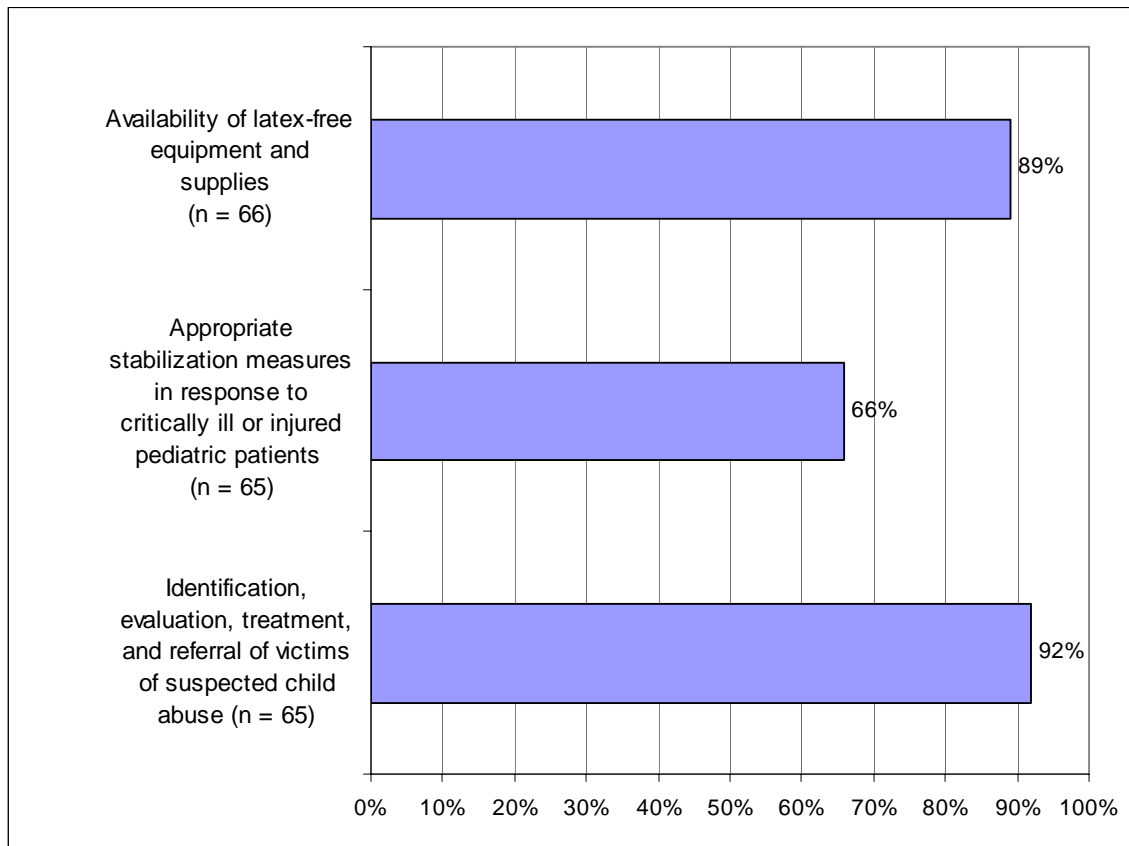
Figure 13: Hospital Interest in Additional Information Regarding the State CISM Program (n = 19)



POLICIES AND PROCEDURES

- Ninety-two percent of respondents reported that their hospital had a written policy/procedure in accordance with state law addressing the identification, evaluation, treatment, and referral of victims of suspected child abuse. (Figure 14)
- The lowest percentage (66%) of respondents reported that their hospital had written care protocols addressing the appropriate stabilization measures in response to critically ill or injured pediatric patients. (Figure 14)

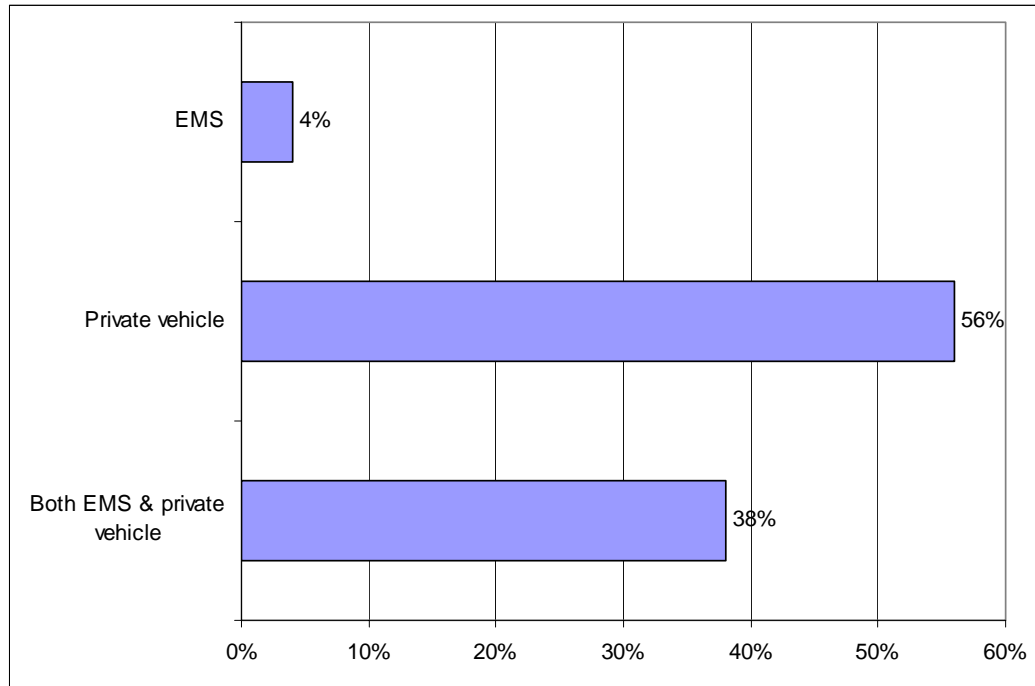
Figure 14: Written Policies/Procedures



TRANSPORT & TRANSFER OF PATIENTS

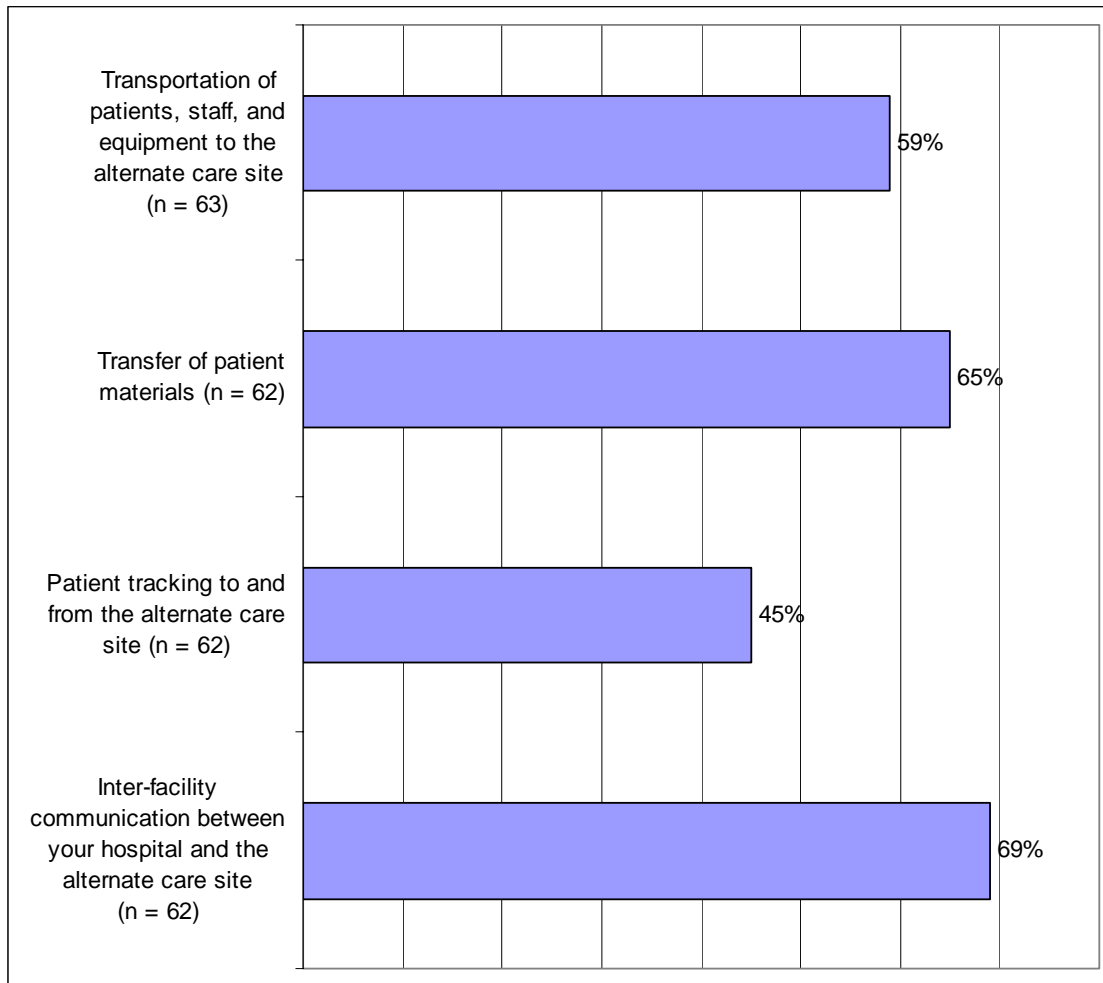
- Just over half (56%) of the respondents reported that the majority of pediatric patients were brought into their hospital ED by private vehicle. Only 4% of the respondents reported that EMS brought in the majority of their pediatric patients. (Figure 15)

Figure 15: Transport Method for Majority of Pediatric Patients Brought into the ED (n = 66)



- Nearly all (98%) of the respondents reported that they transferred pediatric patients to other facilities for specialized care. (See Appendix C for locations of hospitals to which pediatric patients are most likely to be transferred.)
- The median number of pediatric patients transferred in 2005 from the ED to other hospitals for specialized care was 9, ranging from 0 to 180.
- More than half of the respondents reported that their hospital had a written inter-facility transfer agreement that specified inter-facility communication between their hospital and the alternate care site (69%); transfer of patient materials (65%); and transport of patients, staff, and equipment to the alternate care site (59%). (Figure 16)
- Ninety-two percent of the respondents reported that their hospital had a written policy/procedure that defined the process of transfer for all patients, including a critically ill child, to specialized care at a different hospital.

Figure 16: Written Inter-facility Agreement for Specific Situations



- Six percent of respondents reported that they had difficulty coordinating transfers for pediatric patients to other facilities. (Figure 17)
- Eighty percent of the respondents reported that their hospital had used air ambulance services within the last five years for inter-facility transfer of pediatric patients. (Figure 18)
- The median number of times hospitals had used the air ambulance services in 2005 to transfer pediatric patients was 9, ranging from 0 to 1,025.
- The majority (88%) of respondents reported that their hospital did not admit pediatric patients from other hospitals for specialty care. (Figure 19)

Figure 17: Hospital Coordination of Transfers for Pediatric Patients to Other Facilities (n = 63)

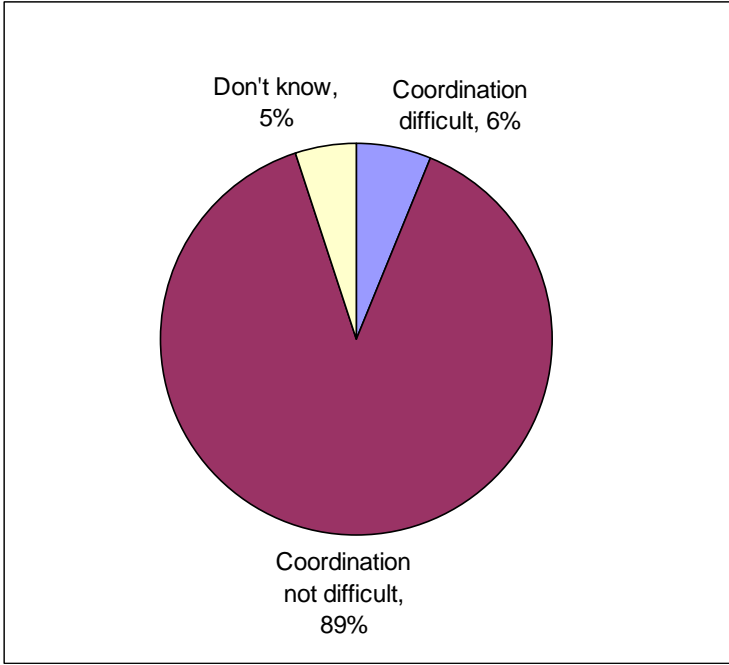


Figure 18: Use of Air Ambulance Services for Inter-facility Transfers of Pediatric Patients Within the Last Five Years (n = 65)

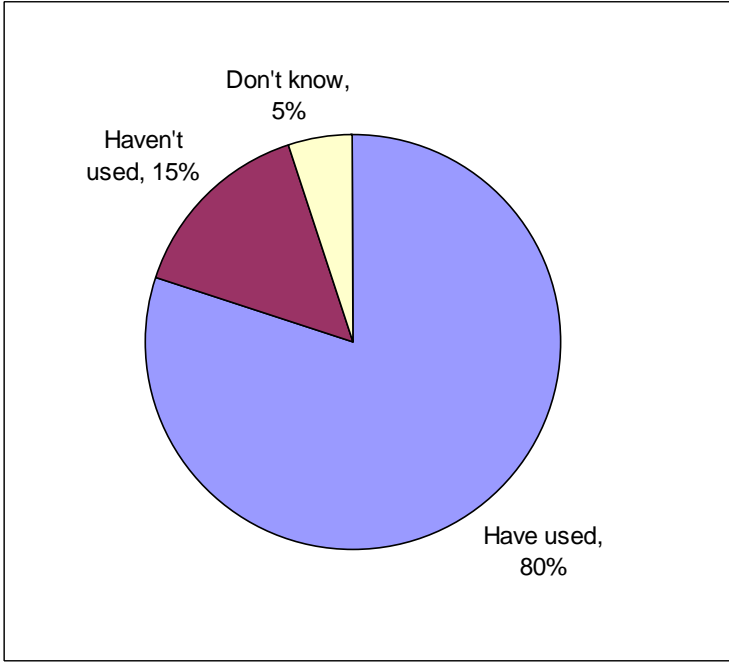
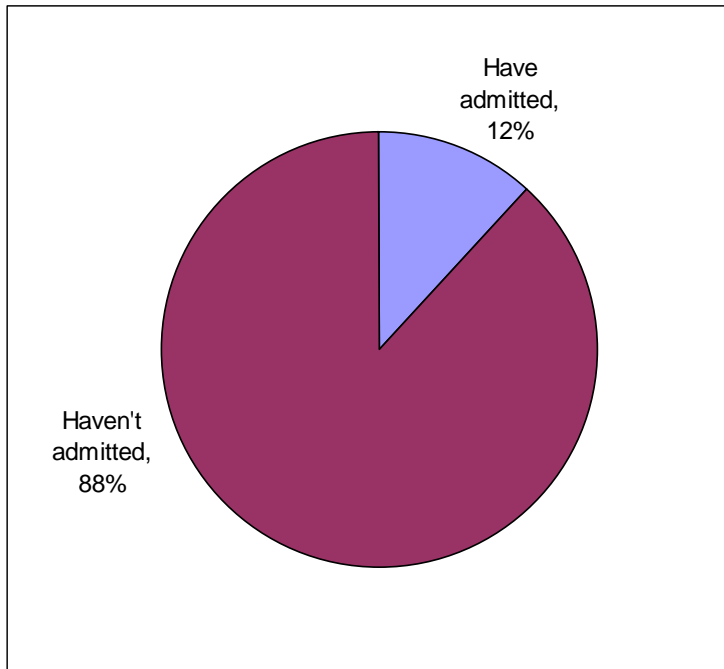


Figure 19: Admission of Pediatric Patients from Other Hospitals for Specialty Care (n = 66)

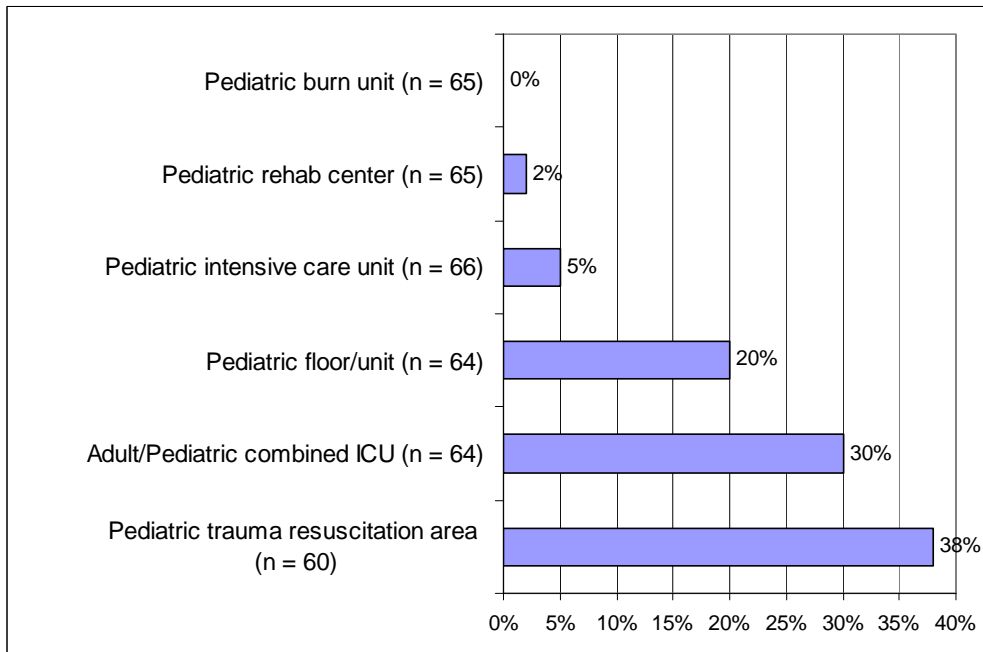


INPATIENT CARE

Few of the responding hospitals had any pediatric specialties/units/services.

- The highest percentage (38%) of respondents reported that their hospital had a pediatric resuscitation area. (Figure 20)

Figure 20: Pediatric Specialties/Units/Services



QUALITY IMPROVEMENT

- Sixty-one percent of respondents reported that their hospital included pediatric emergency medical care in the ED quality improvement program. (Figure 21)
- Only 32% of respondents reported that their hospital had conducted a pediatric-related quality improvement project within the last year. (Figure 22)
- About two-thirds of the respondents reported that their hospital annually reviewed pediatric ED deaths (63%) and pediatric ED resuscitations (60%). However, only about one-third of the responding hospitals reviewed the number of pediatric patients treated (32%) and assessment of pediatric outcomes (33%). (Figure 23)

Figure 21: Inclusion of Pediatric Emergency Medical Care in Hospital QI Program (n = 66)

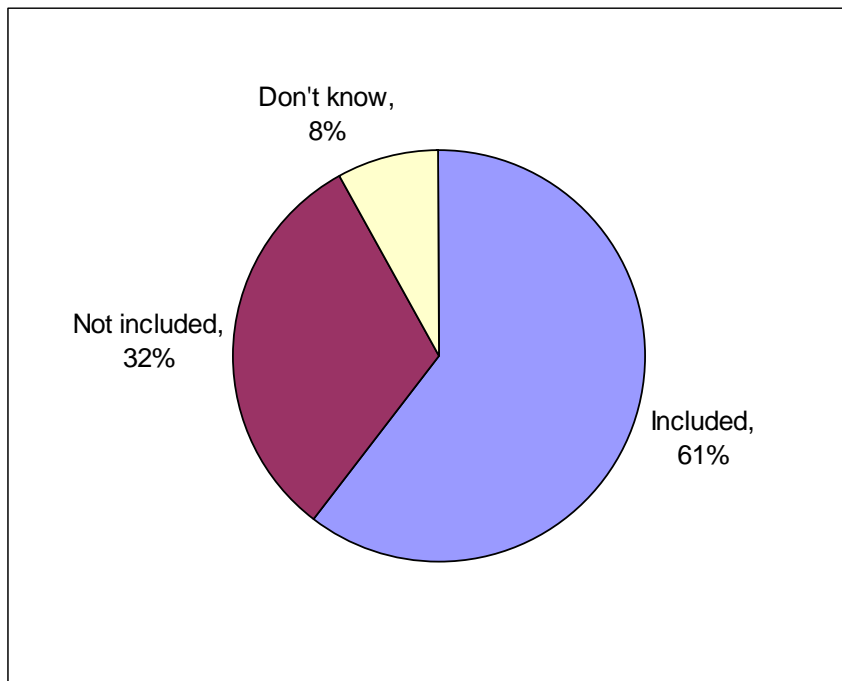


Figure 22: Conducting of Quality Improvement Project Within the Last Year (n = 66)

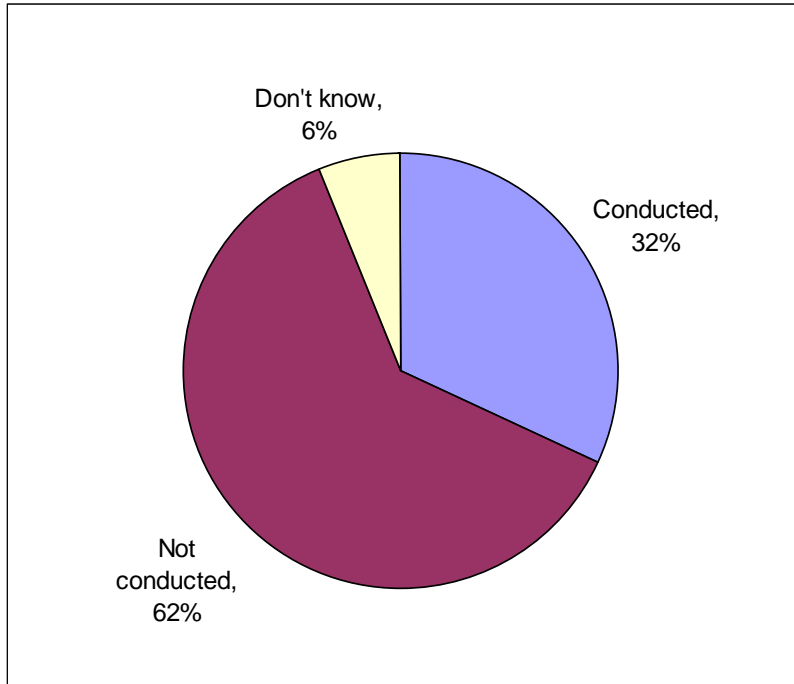
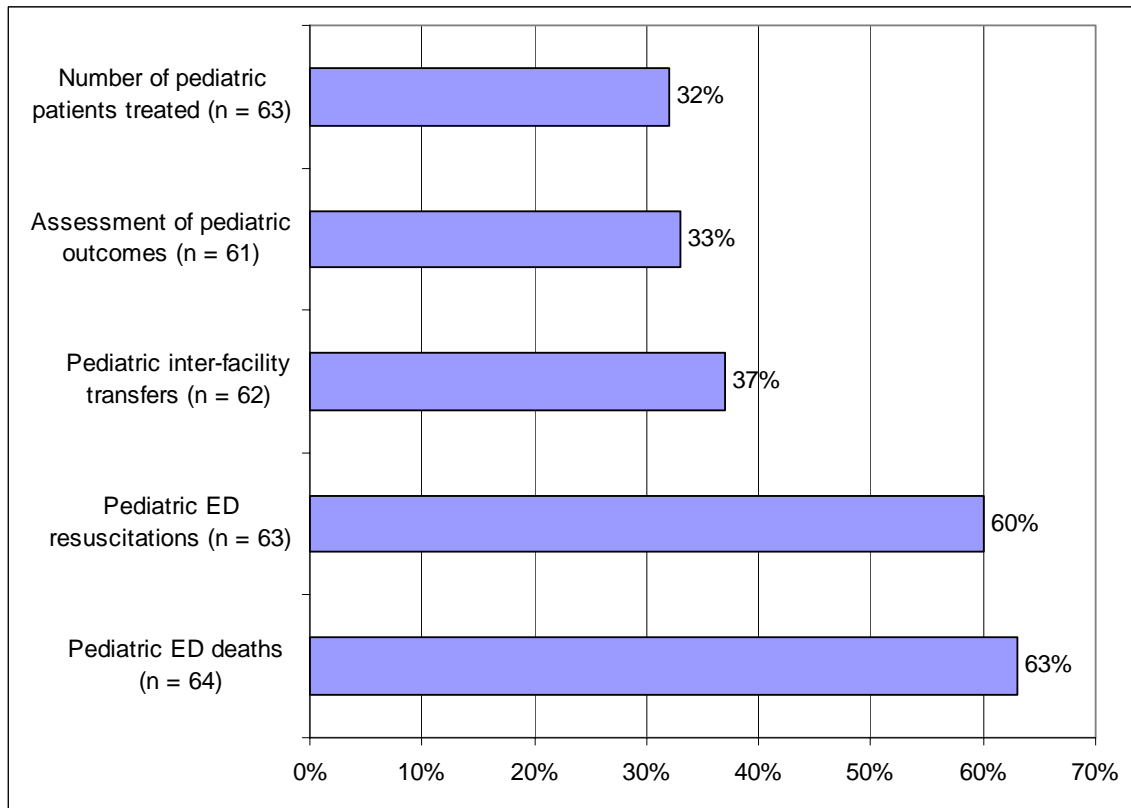


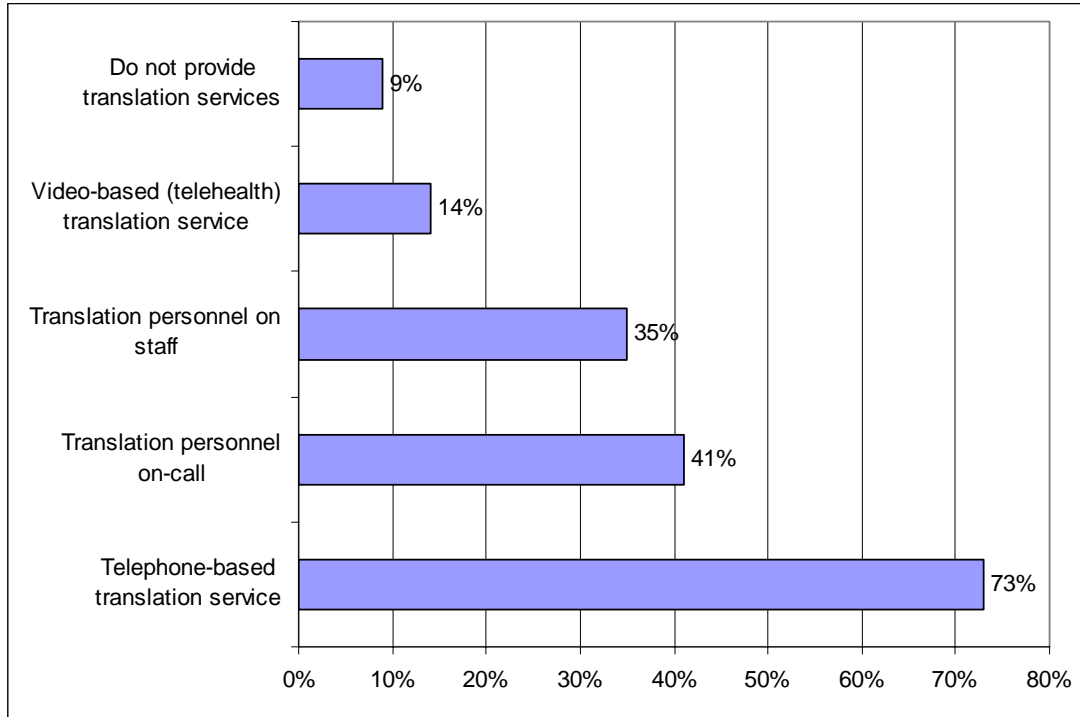
Figure 23: Annual Review of Information about Pediatric Patients Treated in the ED



PATIENT SERVICES

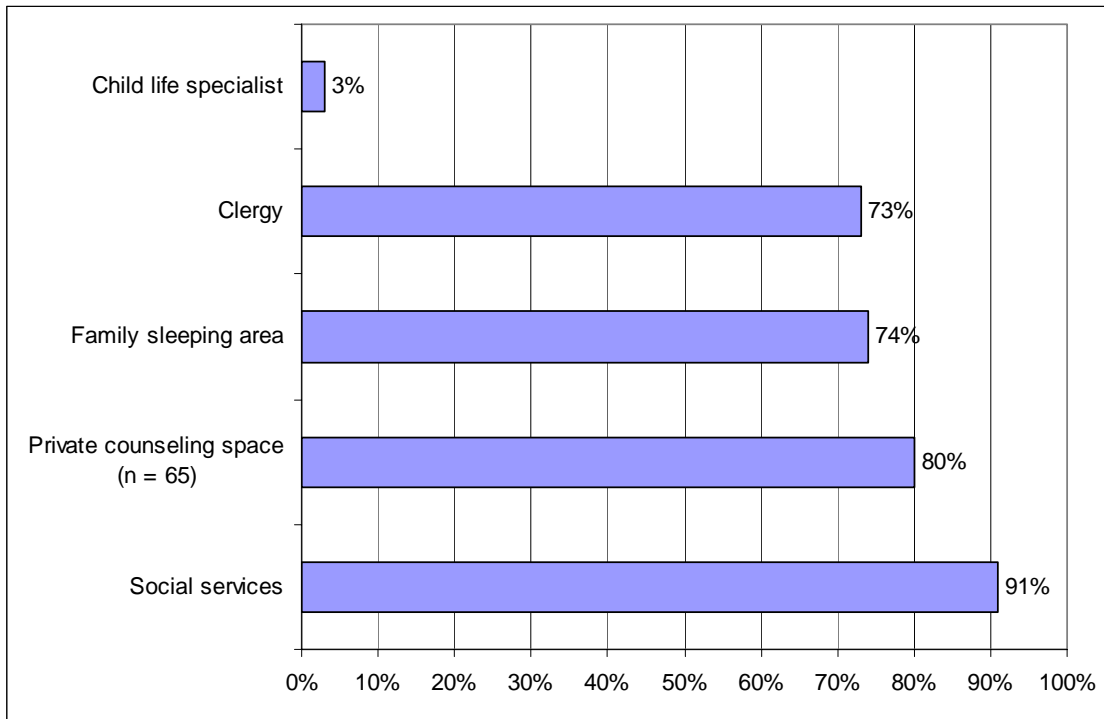
- Seventy-three percent of respondents reported that their hospitals provided a telephone-based translation service to non-English-speaking patients. Six (9%) of the responding hospitals did not offer any translation services to patients. (Figure 24)

Figure 24: Translation Services for Non-English-Speaking Patients (n = 66)



- Ninety-one percent of respondents reported that social services were available at their hospital, as well as private counseling space (80%), family sleeping areas (74%), and clergy (73%). (Figure 25)
- Only two respondents reported that their hospital had a child life specialist. (Figure 25)

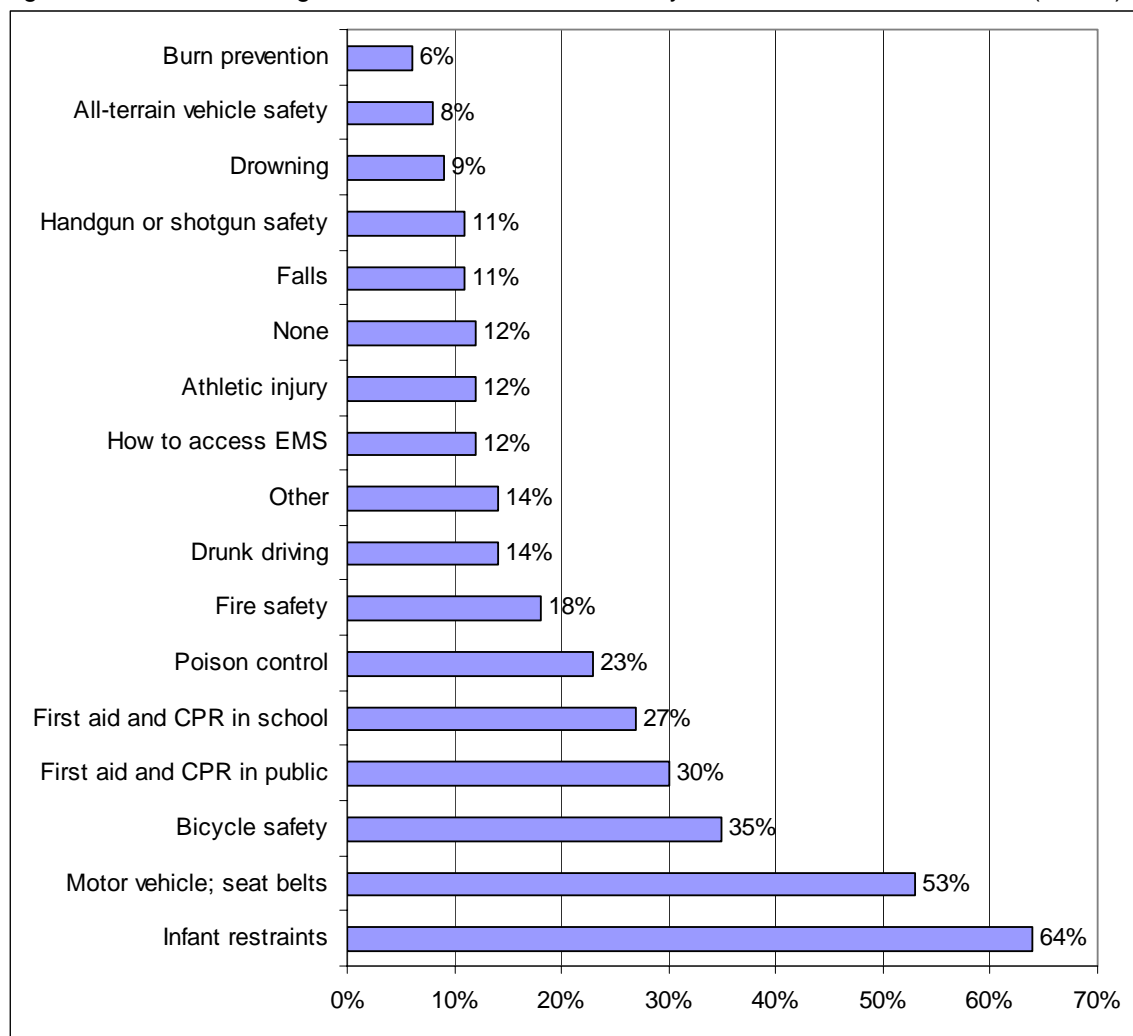
Figure 25: Services Offered (n = 66)



PUBLIC EDUCATION

- Over half of the respondents reported that their hospital offered community education programs regarding infant restraints (73%) and motor vehicle (seat belt) safety (53%) within the last three years. (Figure 26)

Figure 26: Education Programs Offered to the Community Within the Past Three Years (n = 66)



What we heard from some responding hospitals . . .

“We would welcome the availability of funds for our RNs to obtain PALS certification so that we can make this standard training at our facility.”

“I would like to see some standardized policy and procedure regarding specific pediatric issues that we might encounter in the ER made available to our CAHs, because pediatric patients are low in volume but high risk. I would like to see us become better at making sure our staff is always prepared for the peds patients.”

“Ped ICU patients are difficult to place at times. We have had trouble two times with [a particular hospital] not wanting to accept patients. We are trying to get the acute pediatric patient to a higher level of care, and sometimes it is difficult to get them to accept the transfer.”

EMS SERVICES SURVEY

(n = 292)

STUDY DESIGN

Using data provided by the Nebraska EMS program at NHHSS, we surveyed 432 EMS services (27 First Responder services, 336 Basic services, and 69 Advanced services). (See Appendix D for locations of EMS Services in Nebraska.) After review of the literature, a survey instrument was developed and organized into domains reflecting performance measures developed by HRSA for the EMSC program¹¹ and recommendations from the National EMSC Data Analysis Resource Center¹² and the Nebraska EMSC project. The EMS services survey included questions regarding structures and processes, census/tracking, patient transport/transfer, EMT education, services for providers, and public education. (See Appendix E for a copy of the EMS services survey.) The survey was pilot-tested by contacts from EMS services of various levels and geographic locations and was estimated to take about 10 minutes to complete. Using the Dillman¹³ method developed for survey research, we made five contacts with the services surveyed. Surveys were sent to the current liaison from each EMS service.

STUDY POPULATION

Three EMS services sent documentation stating that they were no longer operating; this reduced the sample population to 429 services. One service sent documentation of refusal to participate in the survey. We received completed surveys from 292 (68%) of the 429 services surveyed.

¹¹ <http://bolivia.hrsa.gov/emsc/PerformanceMeasures.aspx>

¹² <http://nedarc.med.utah.edu/nedarc/resourceLibrary/performanceMeasures.html>

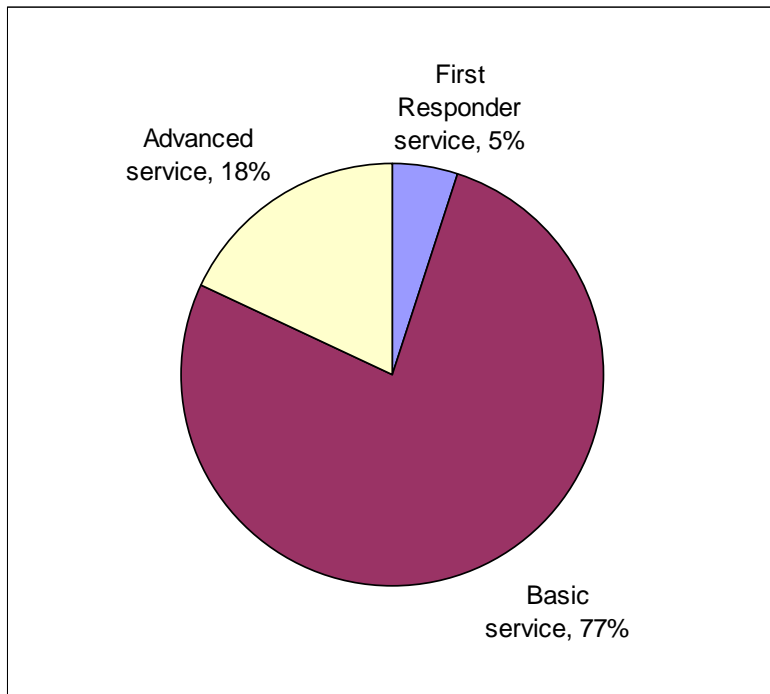
¹³ Dillman, D.A. (2000). *Mail and internet surveys: The tailored design method*. New York: John Wiley & Sons.

FINDINGS FROM RESPONDING EMS SERVICES

STRUCTURES AND PROCESSES

- Of the 292 responding services, 13 (5%) were First Responder services, 226 (77%) were Basic services, and 53 (18%) were Advanced services. (Figure 27)
- Fifty-seven percent of the Advanced services are located in metropolitan or micropolitan areas, while the majority of Basic services (70%) and First Responder services (54%) are located in rural areas.¹⁴

Figure 27: Highest Level of Emergency Care Provided (n = 292)

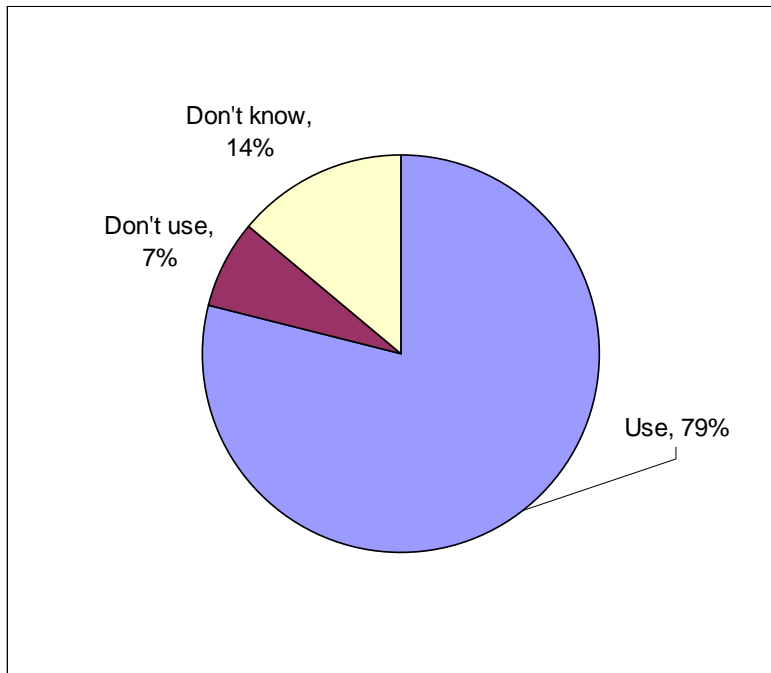


- Respondents from First Responder services reported having a median of 7 First Responder providers (ranging from 1 to 79) and a median of 3 basic emergency medical technicians (EMTs) (ranging from 0 to 11).
- Respondents from Basic services reported having a median of 11 basic EMTs (ranging from 1 to 37) and a median of 2 First Responder providers (ranging from 0 to 35).

¹⁴ For the purposes of this study, Metropolitan, Micropolitan, and Rural definitions are based upon a modification of the ZIP code RUCA codes system which can be found at: <http://depts.washington.edu/uwruca/uses.html>.

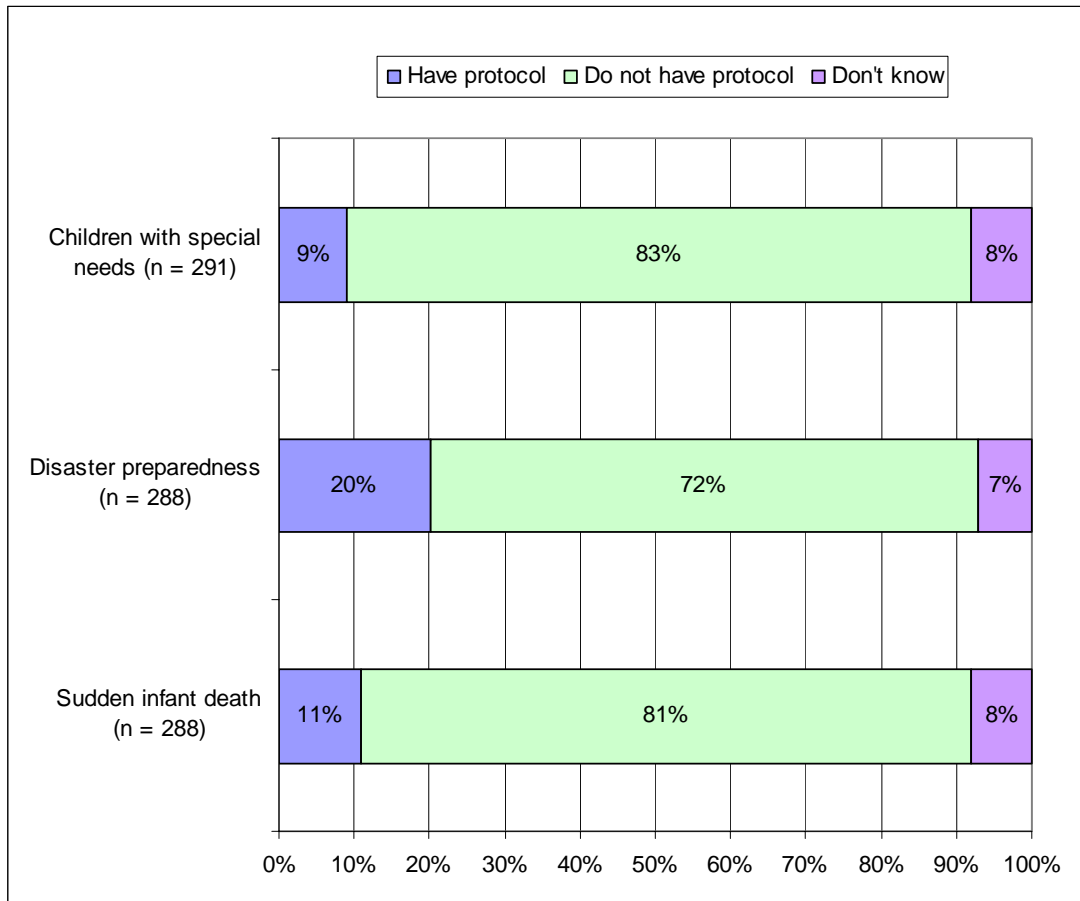
- Respondents from Advanced services reported having a median of 13 basic EMTs (ranging from 0 to 394), a median of 5 EMT-Paramedics (ranging from 0 to 196), and a median of 1 EMT-Intermediates (ranging from 0 to 68).
- The majority of respondents (87%) reported that their service had no bilingual providers.
- Seventy-nine percent of respondents reported that their service currently used/followed the Nebraska State Model Protocol developed by the EMS Board for pediatric emergencies. (Figure 28)

Figure 28: EMS Services Use of the Nebraska State Model Protocol Developed by the EMS Board for Pediatric Emergencies (n = 289)



- The majority of respondents (over 70%) reported that their service did not have separate written protocols regarding children with special needs (83%), disaster preparedness (72%), or sudden infant death syndrome (81%). (Figure 29)
- Of the services that had separate written protocols, the highest percentage (20%) had a protocol addressing disaster preparedness. (Figure 29)

Figure 29: EMS Services With Separate Written Protocols for Specific Pediatric Emergencies



- Forty-eight percent of respondents reported that their service had access to written protocols, either in paper or electronic form, while at the scene of an emergency. The same percentage of respondents (48%) reported not having access to protocols while at the scene of an emergency. (Figure 30)
- Three-fourths (77%) of the respondents reported that their service did not utilize *on-line* pediatric medical direction (i.e., prehospital medical direction by designated medical personnel, which may include authorization for advanced life support (ALS) procedures, triage, destination assignment, and management of patients who receive care)¹⁵ at the scene of an emergency. (Figure 31)

¹⁵ Institute of Medicine. 1993. *Emergency Medical Services for Children*. Washington, DC: National Academy Press.

Figure 30: Access to Written Protocols While at the Scene of an Emergency (n = 287)

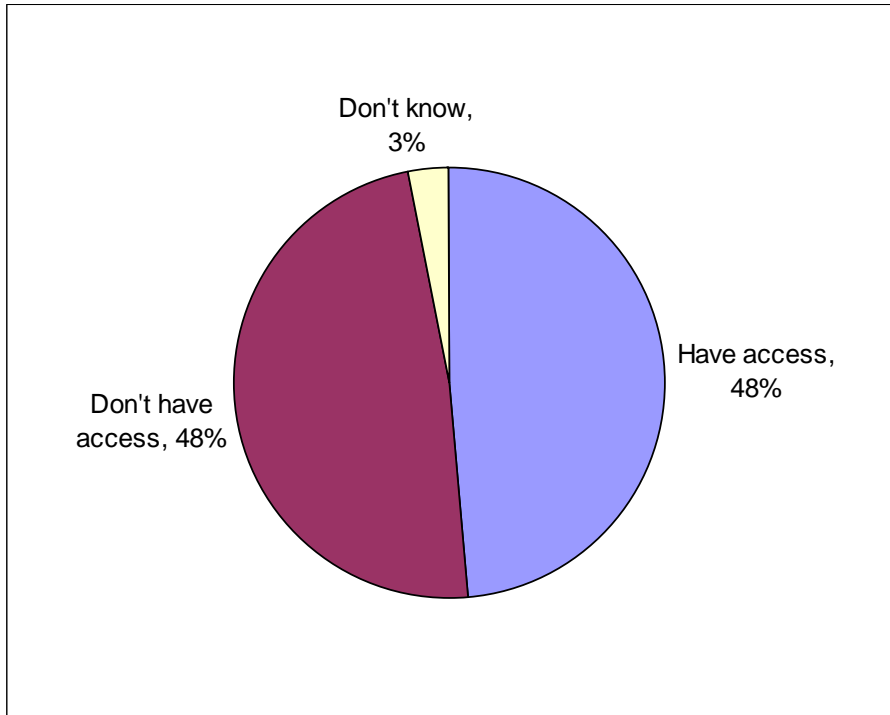
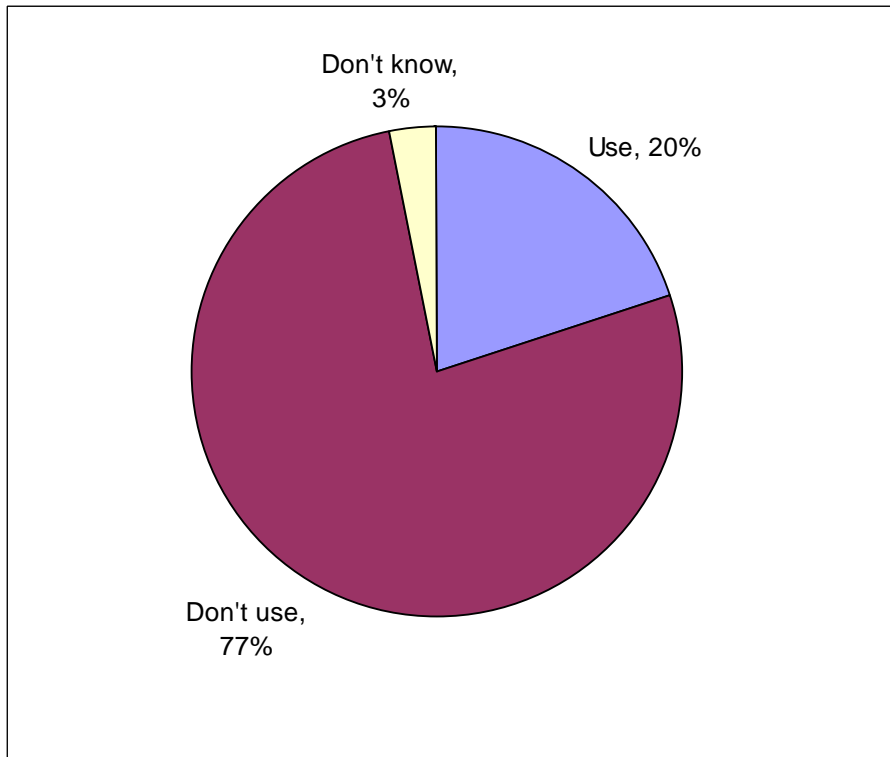
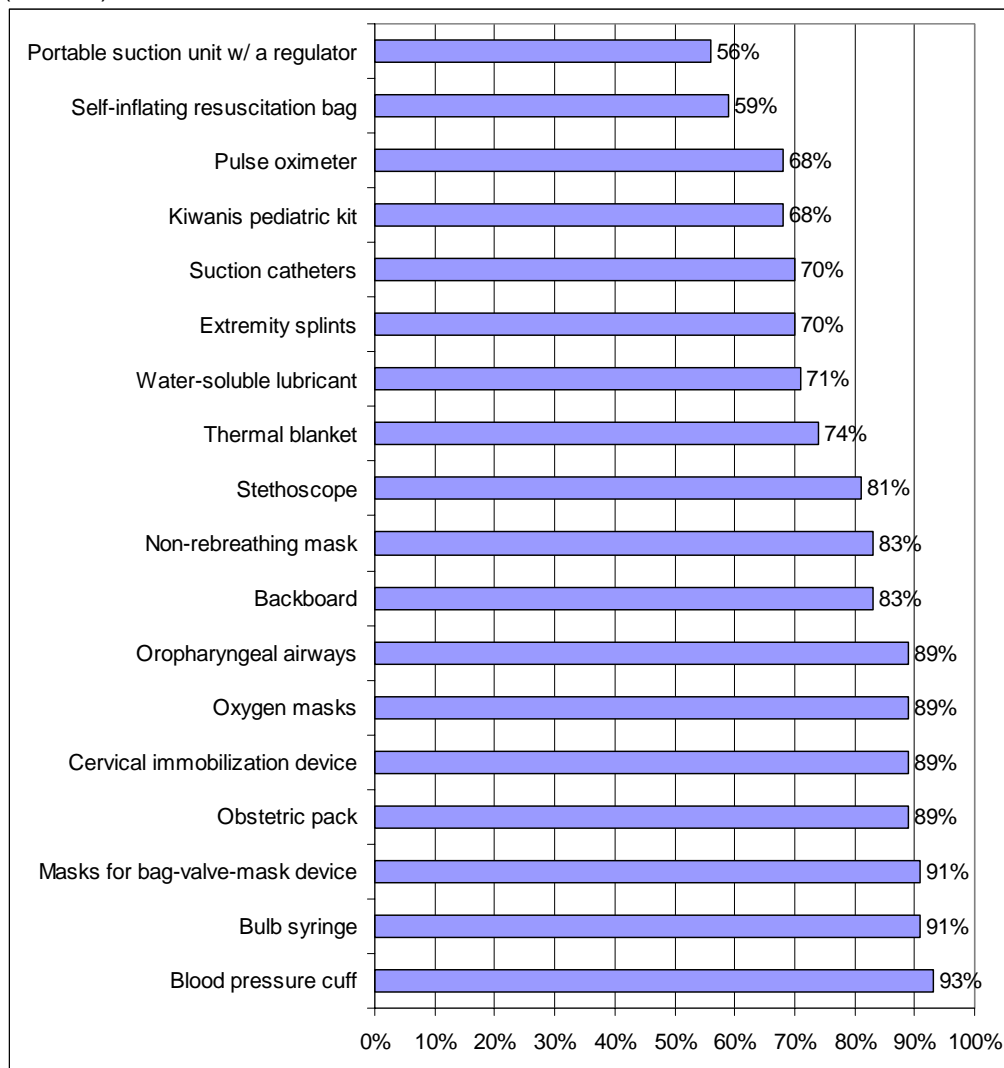


Figure 31: Use of On-line Pediatric Medical Direction at the Scene of an Emergency (n = 286)



- Forty-six respondents (16%) reported that their service had *all* of the recommended pediatric-specific BLS equipment readily available to treat infants and children. Sixty percent of these services are located in rural areas.¹⁶
- Respondents were most likely to report that their service had pediatric blood pressure cuffs readily available to treat infants and children (93%), followed by pediatric bulb syringes (91%), pediatric masks for bag-valve-mask device (91%), obstetric packs (89%), and a cervical immobilization device (89%). (Figure 32)
- Respondents were least likely to report having a portable suction unit with a regulator readily available (56%). (Figure 32)

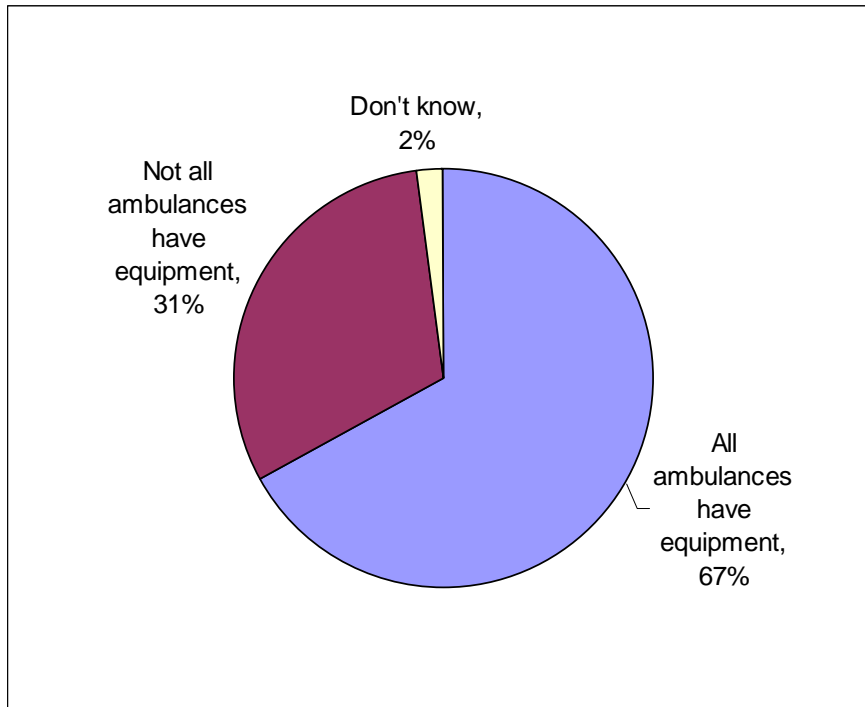
Figure 32: Percentage of EMS Services With Pediatric-specific BLS Equipment Readily Available (n = 292)



¹⁶ For the purposes of this study, Metropolitan, Micropolitan, and Rural definitions are based upon a modification of the ZIP code RUCA codes system which can be found at: <http://depts.washington.edu/uwruca/uses.html>.

- Two-thirds of respondents (67%) reported that *each* ambulance contains all of the pediatric-specific BLS equipment *possessed* by the service. (Figure 33)

Figure 33: Transporting Services with Pediatric-specific BLS Equipment by Ambulance (n = 249)



- Nine of the 53 respondents (17%) from Advanced services reported that their service had *all* of the recommended pediatric-specific ALS equipment readily available to treat infants and children.
- Respondents from Advanced services were most likely to report that their service had intravenous (IV) fluids readily available to treat infants and children (85%), followed by laryngoscope with straight and curved blades (81%), endotracheal tube stylets (81%), endotracheal tubes (81%), and IV catheters (79%). (Figure 34)
- Respondents were least likely (56%) to report having a cricothyrotomy catheter device/kit (38%) or nasogastric tubes (38%) readily available. (Figure 34)
- The majority of respondents from Advanced services (87%) reported that *each* ambulance contains all of the pediatric-specific ALS equipment *possessed* by the service. (Figure 35)

Figure 34: Percentage of Advanced Services With Pediatric-specific ALS Equipment Readily Available (n = 53)

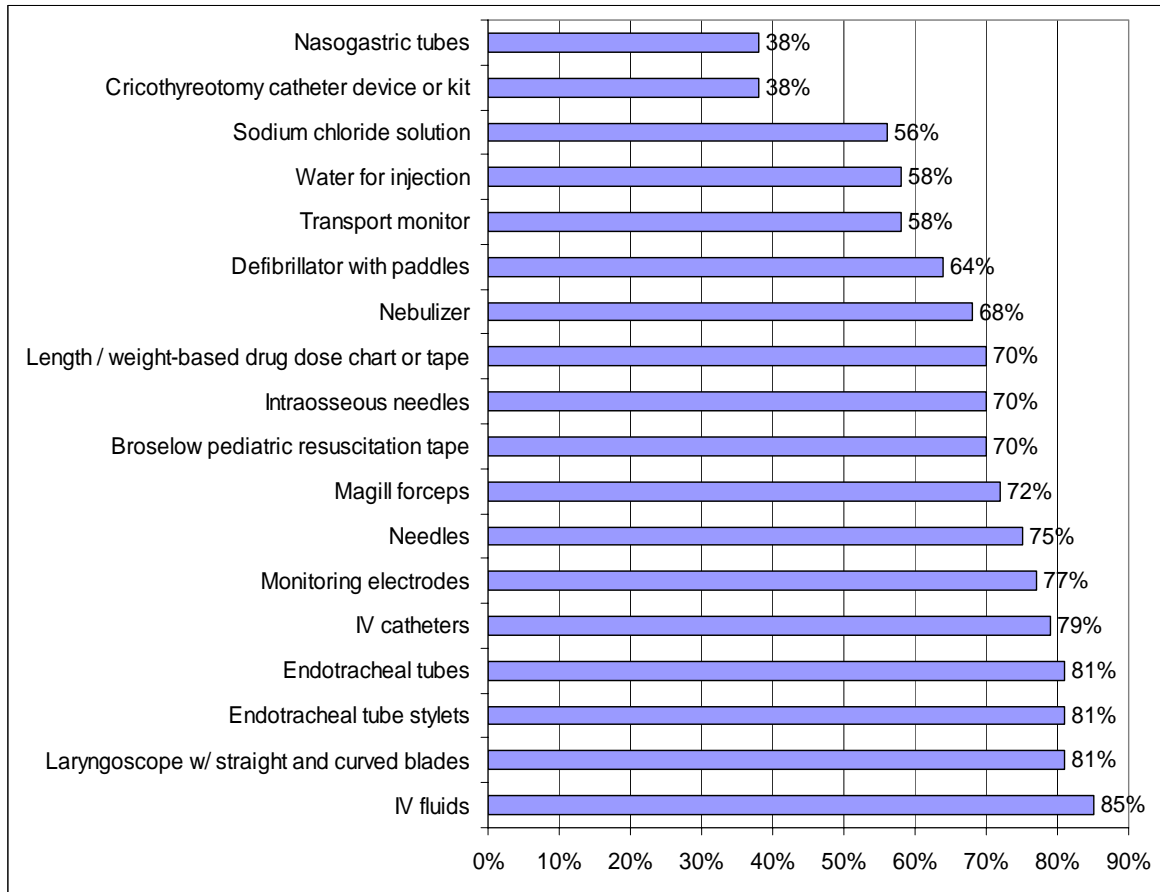
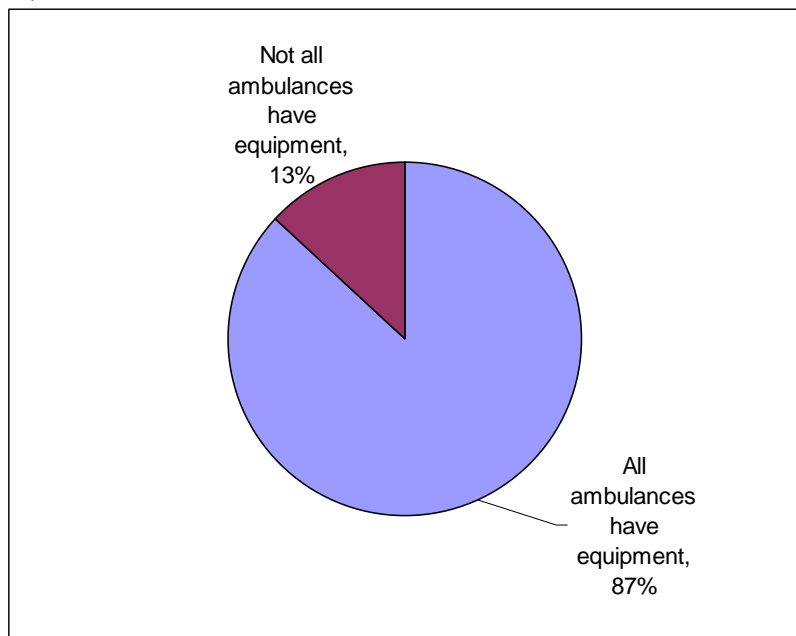


Figure 35: Transporting Advanced Services With Pediatric-specific ALS Equipment by Ambulance (n = 53)



CENSUS/TRACKING

- The median number of emergency calls made by responding services in 2005 was 60, ranging from 0 to 30,000.
- The median number of emergency calls made in 2005 that involved pediatric patients was 4, ranging from 0 to 4,469.
- Based on median percentage, the age range most likely to be included in the total number of pediatric calls was adolescents aged 14 to 18 years.

PATIENT TRANSPORT/TRANSFER

- The majority of respondents (81%) reported that their service was licensed to transport patients. (Figure 36)
- Seventy-nine percent of respondents from non-transport services reported that their service had an agreement established with a service that was licensed to transport patients. (Figure 37)

Figure 36: Transport Status of Responding EMS Services (n = 290)

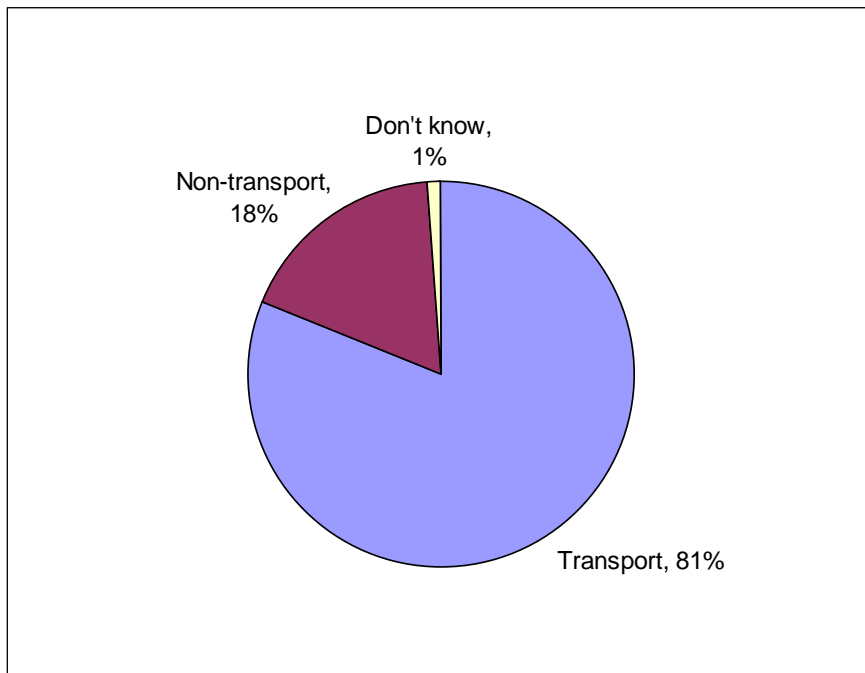
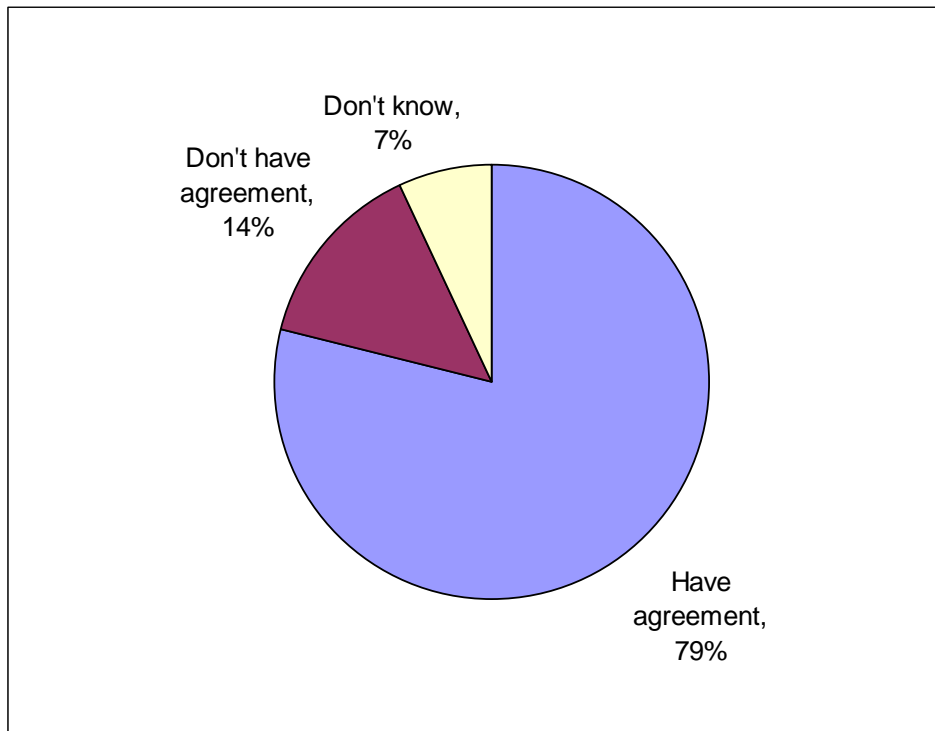
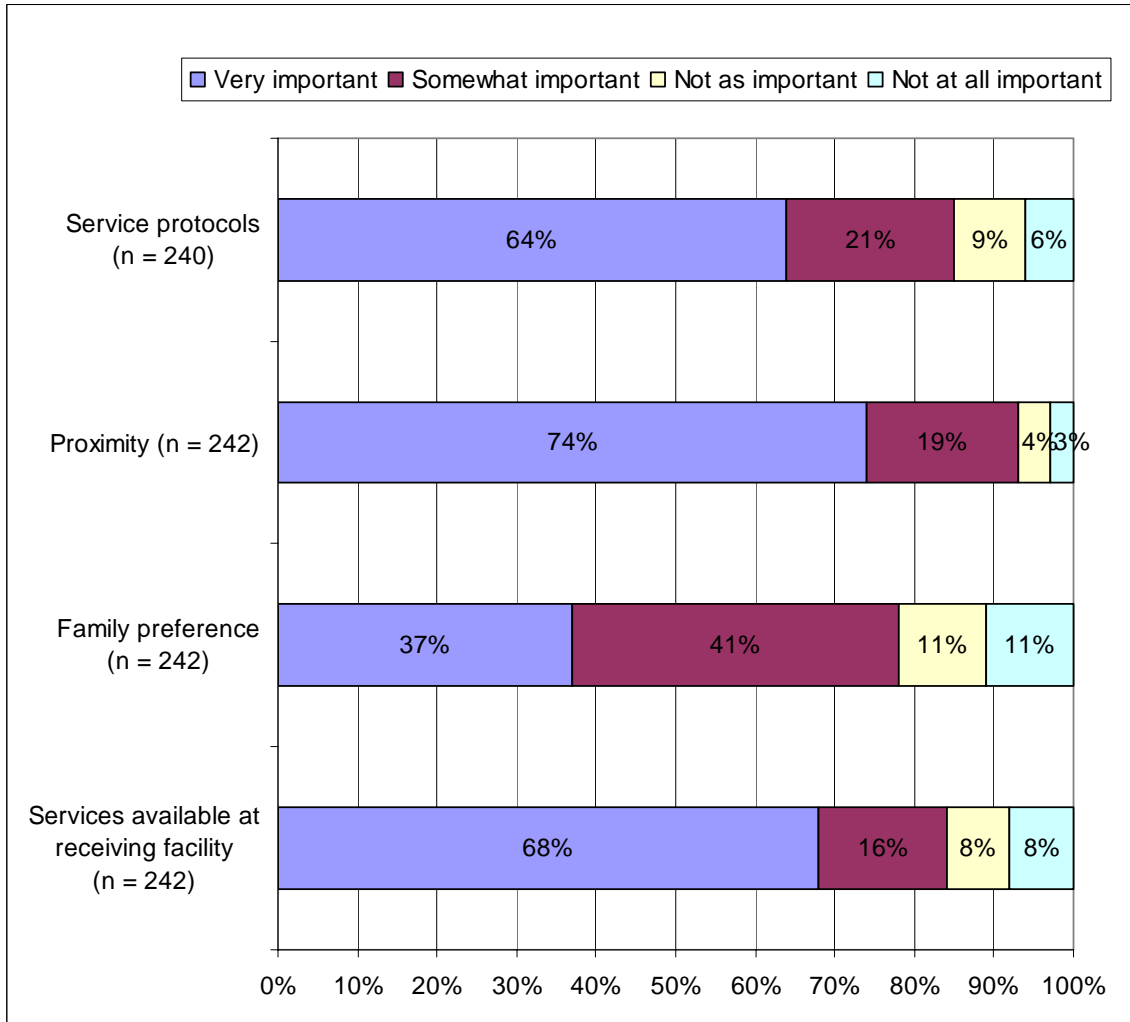


Figure 37: Establishment of Written Agreement With Transporting Services to Transport Patients for Non-transporting Services (n = 56)



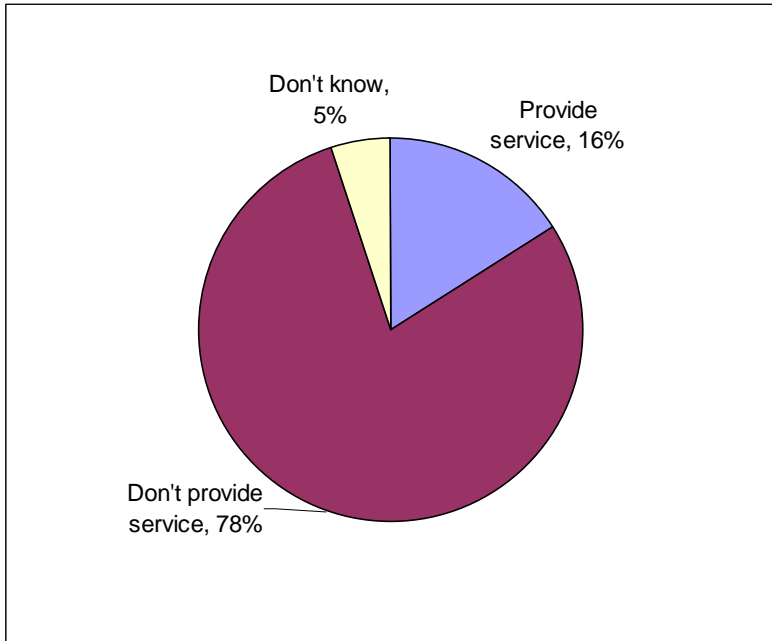
- Ninety-three percent of respondents reported that proximity was at least somewhat important when determining to which hospital patients will be transported. Seventy-four percent of respondents reported that proximity was very important when making this decision. (Figure 38)
- Family preference was reported to be the least important determinate (11%) of where patients will be transported. (Figure 38)

Figure 38: Importance of Factors in Determining to Which Hospitals Patients Will Be Transported



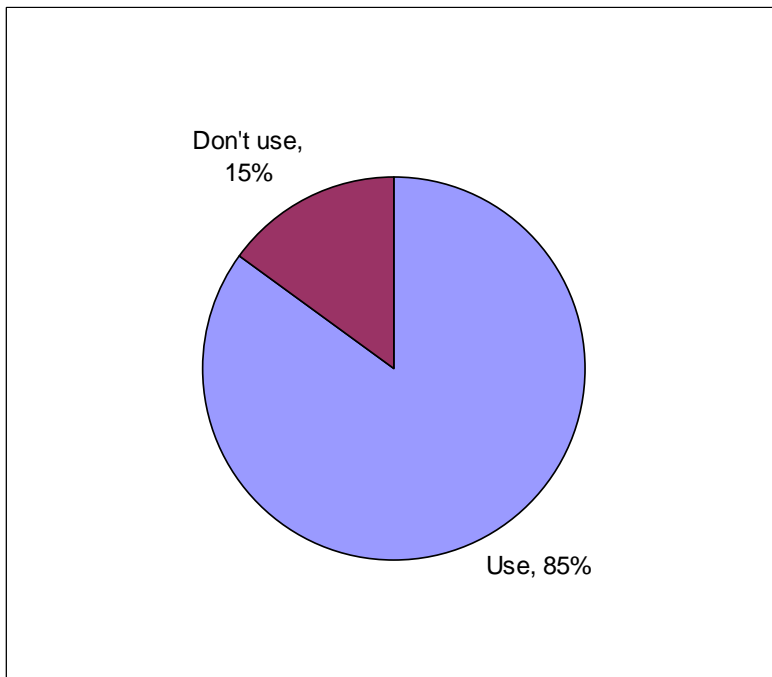
- About three-fourths of the respondents (78%) reported that their service did not provide inter-facility transfer of pediatric patients as a non-emergency service for area hospitals. (Figure 39)

Figure 39: Services That Provide Inter-facility Transfer of Pediatric Patients as a Non-emergency Service to Area Hospitals (n = 257)



- The majority of respondents (85%) reported that their service used helicopter services for scene rescues. (Figure 40)
- The median number of times the helicopter services were used was 1 time, however the range was from 0 to 300.

Figure 40: Service Utilization of Helicopter Services for Scene Rescues (n = 290)

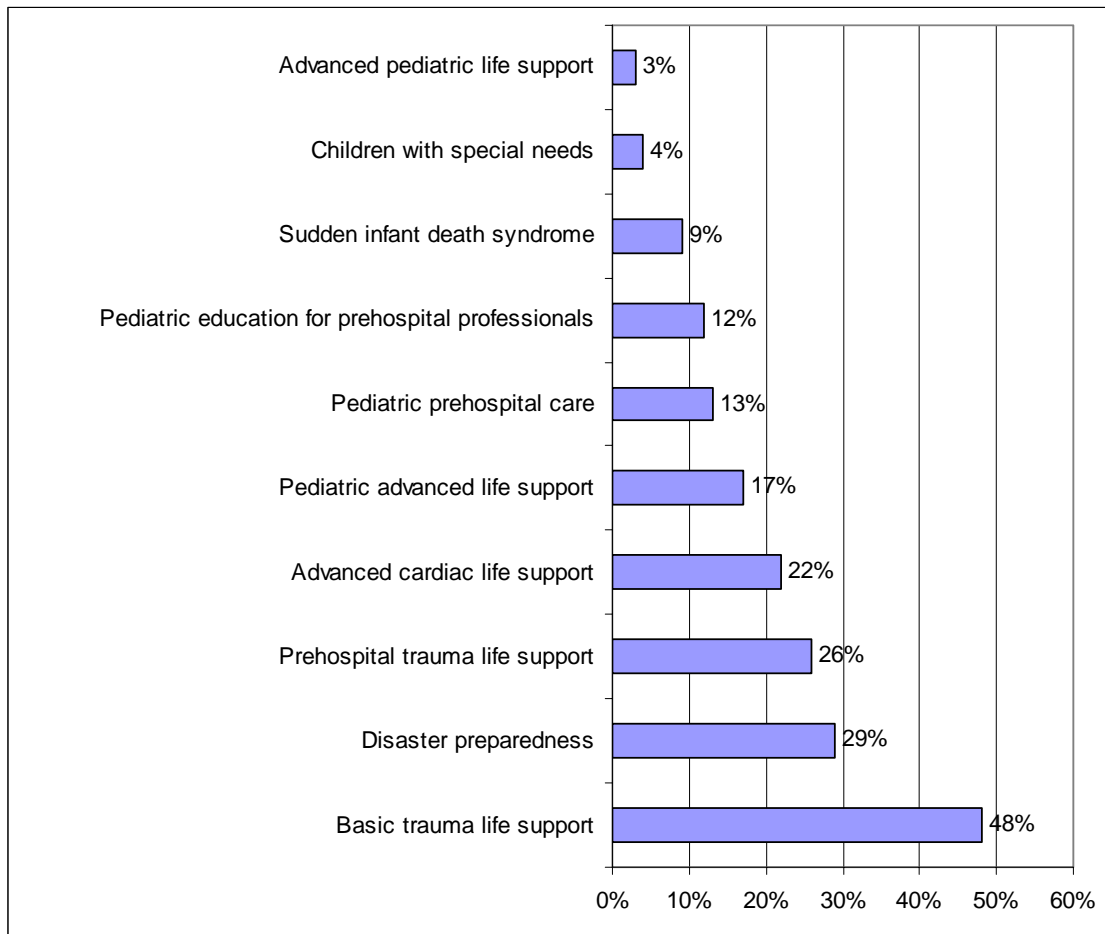


EMT EDUCATION REQUIREMENTS

Pediatric-specific courses were least likely to be a requirement for EMTs.

- Nearly half of respondents (48%) reported that basic trauma life support (BTLS) was an education requirement for providers affiliated with their service. (Figure 41)
- Less than 20% of respondents reported that pediatric-specific courses were an education requirement for providers at their service. (Figure 41)

Figure 41: Service Education Requirements for Providers (n = 292)



- Eighty-four percent of respondents reported that time was the biggest barrier for providers seeking *basic* education/training, followed by course availability (71%), and proximity (70%). These factors were the same top three reported barriers for accessing both *advanced* education/training and *continuing* education/training, with time being the greatest barrier for providers. (Figures 42 – 44)

Figure 42: Barriers to Accessing *Basic* Education/Training for Service Providers

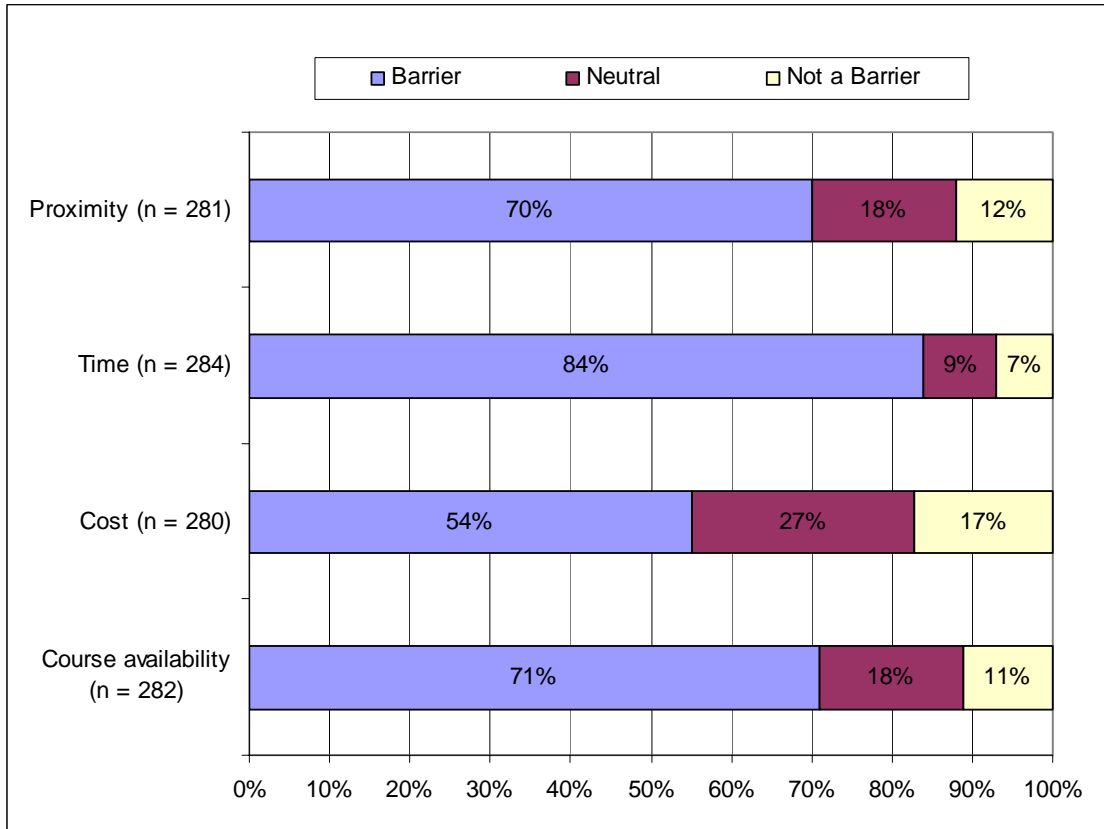


Figure 43: Barriers to Accessing *Advanced* Education/Training for Service Providers

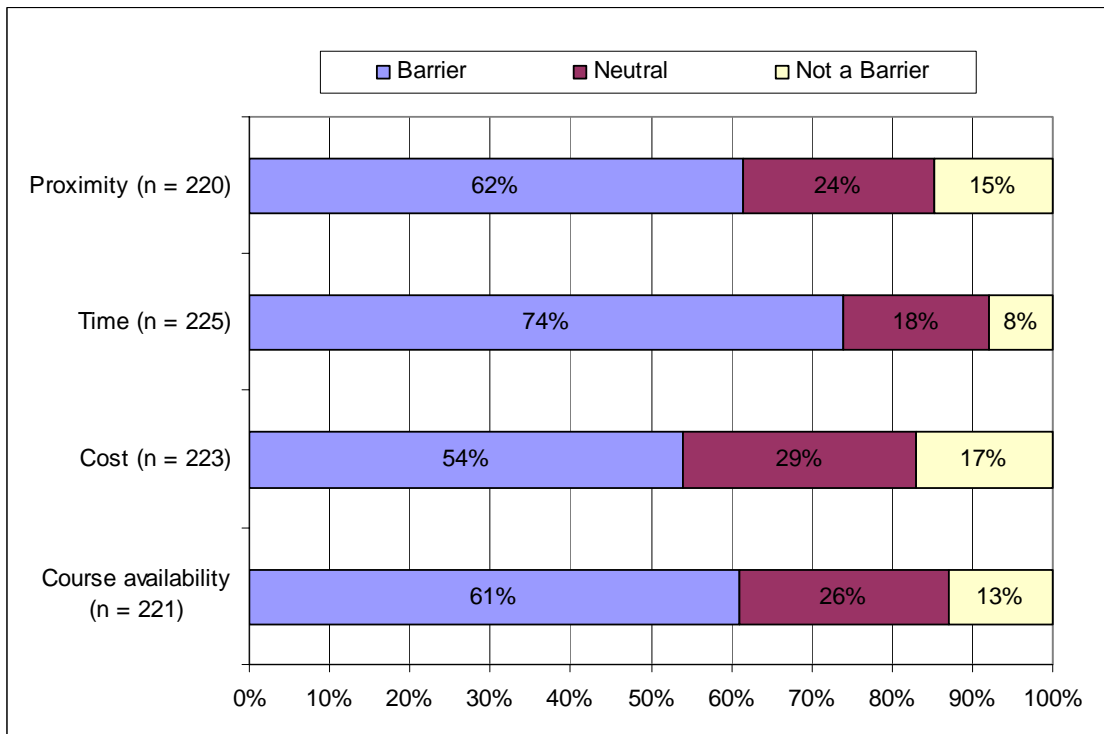
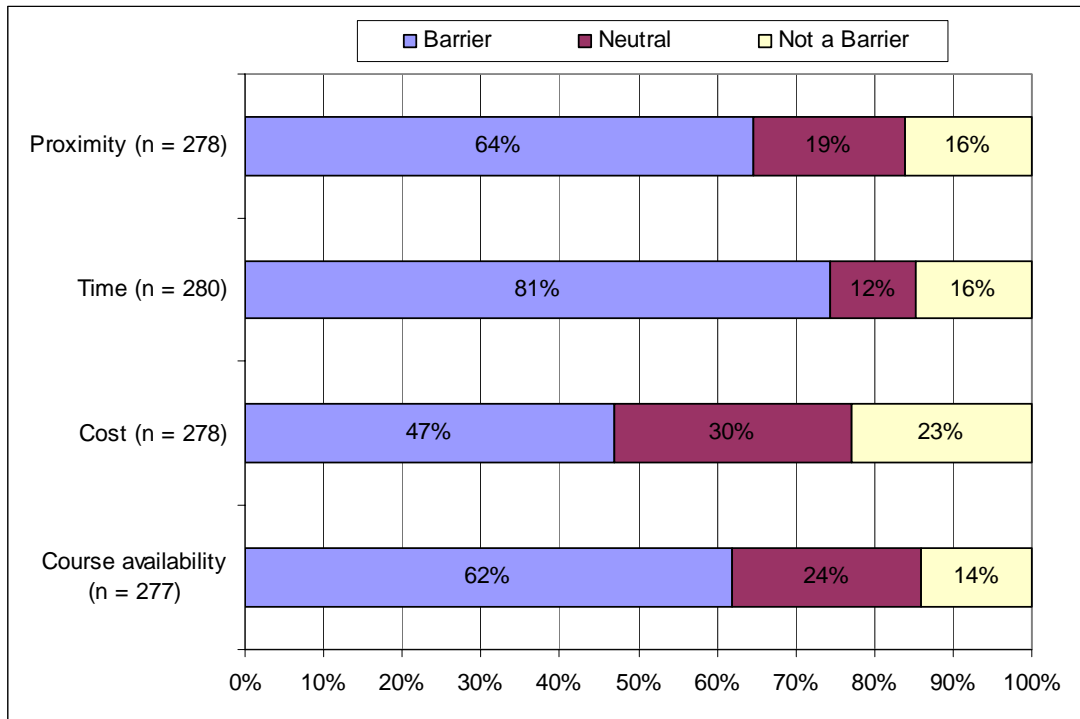
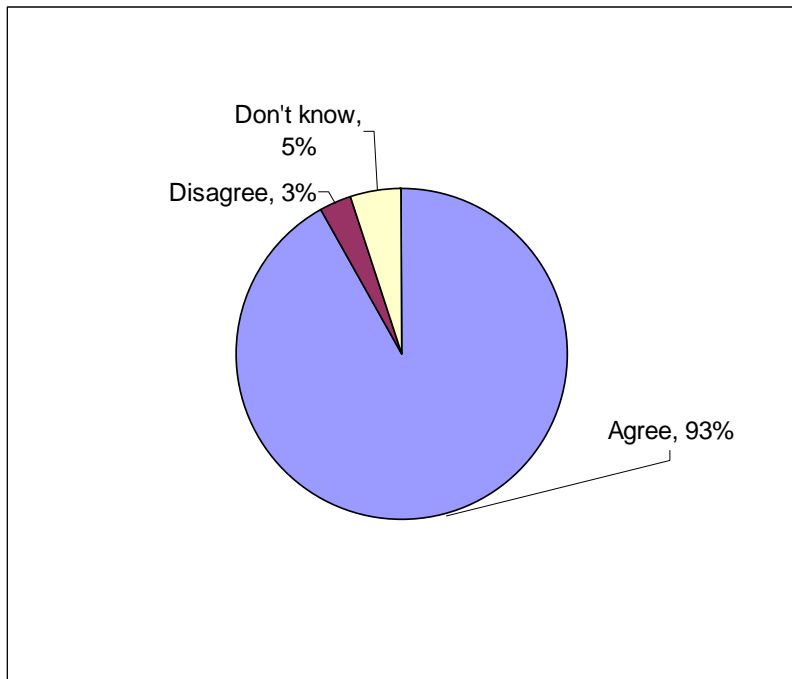


Figure 44: Barriers to Accessing *Continuing Education/Training* for Service Providers



- Ninety-three percent of respondents reported that providers at their service would benefit from additional training in pediatric emergencies. (Figure 45)

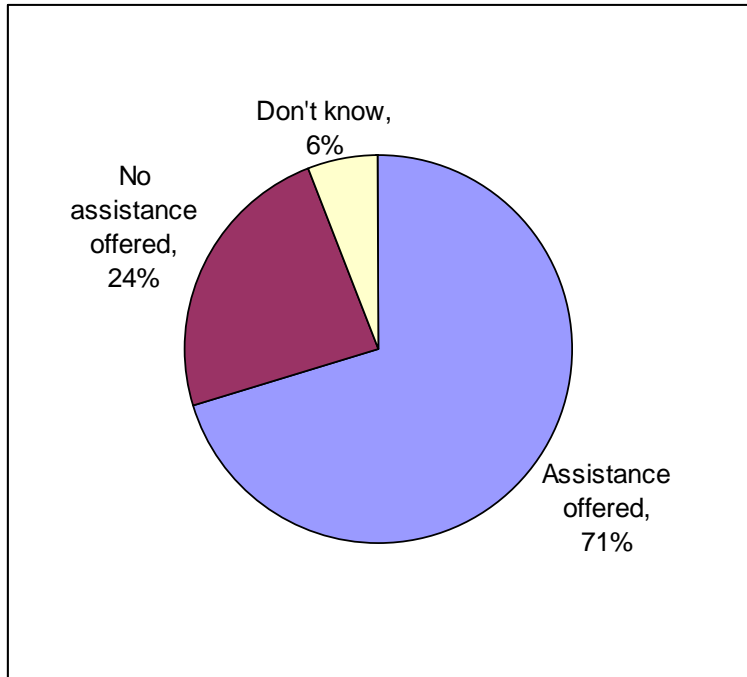
Figure 45: EMS Service Providers Would Benefit From Additional Training in Pediatric Emergencies (n = 288)



EDUCATIONAL RESOURCES

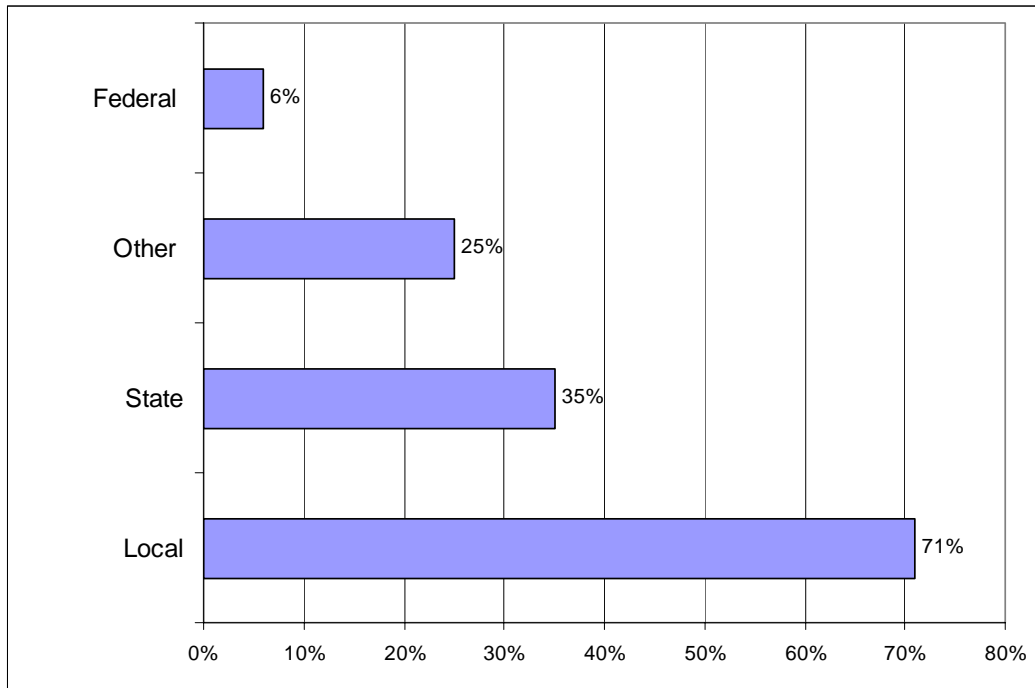
- Seventy-one percent of respondents reported that their service offered assistance to its providers to help cover the cost of pediatric education. (Figure 46)

Figure 46: Financial Assistance Available to Providers for Pediatric Education (n = 285)



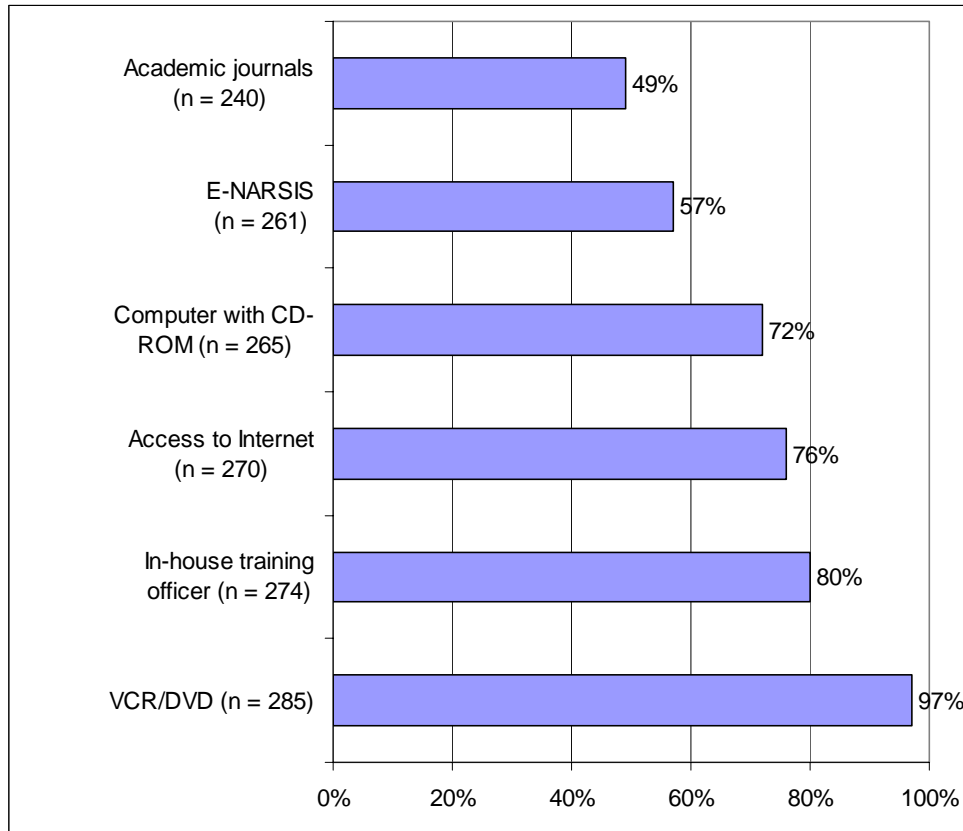
- The majority of respondents (71%) reported that their service received funding for pediatric education, training, and equipment from local sources, followed by state funding (35%). (Figure 47)
- Only 6% of the respondents reported that their services received federal funding. (Figure 47)

Figure 47: Sources of Funding for Pediatric Education/Training and Equipment (n = 292)



- Nearly all of the respondents (97%) reported that their service had a VCR/DVD available for education/training purposes, followed by an in-house training officer (80%), and access to the Internet (76%). (Figure 48)
- Services were least likely to have academic journals available for education/training (49%). (Figure 48)

Figure 48: Services' Available Resources for Education and Training



SERVICES FOR PROVIDERS

- Eighty-seven percent of the respondents reported that their service utilized the state CISM program. (Figure 49)
- Over half of the respondents reported that they were interested in receiving some information regarding the state CISM program. (Figure 50)

Figure 49: Service Utilization of State CISM Program (n = 290)

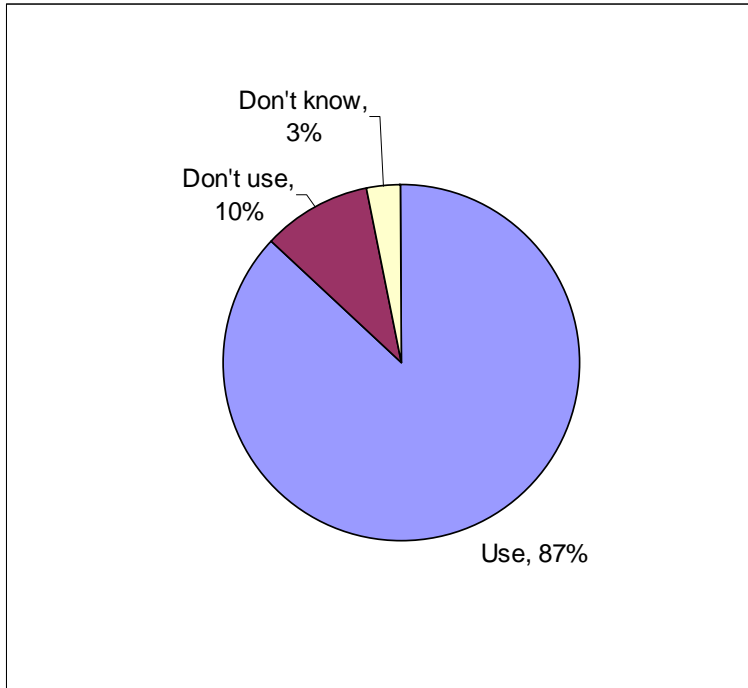
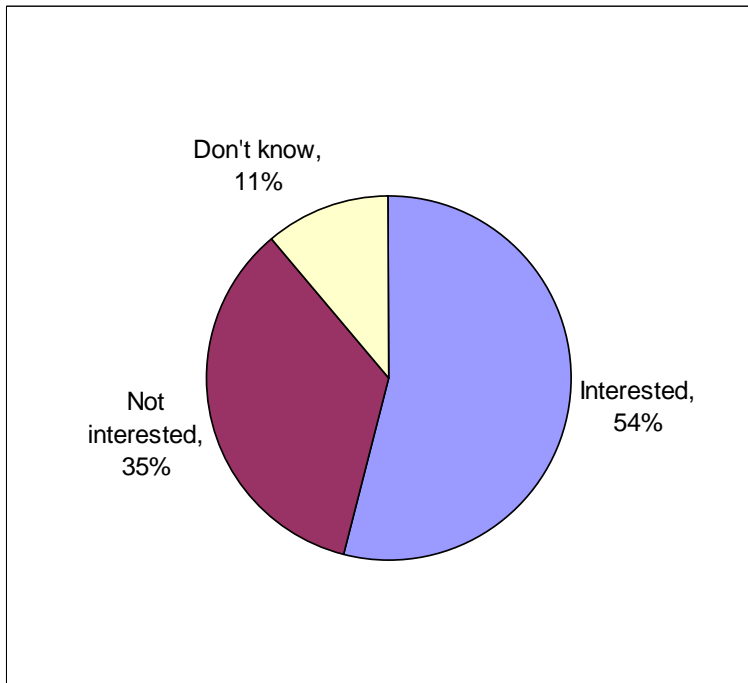


Figure 50: Service Interest in Additional Information Regarding the State CISM Program (n = 57)



PUBLIC EDUCATION

- Half of the respondents (51%) reported that their service did not participate in pediatric injury-prevention programs for the community. (Figure 51)
- Of the 47% percent of services that participated in community programs, over 70% reported that their service participated in programs regarding how to access EMS (75%) and fire safety (71%). (Figure 52)

Figure 51: Service Participation in Pediatric Injury-prevention Programs for the Community (n = 288)

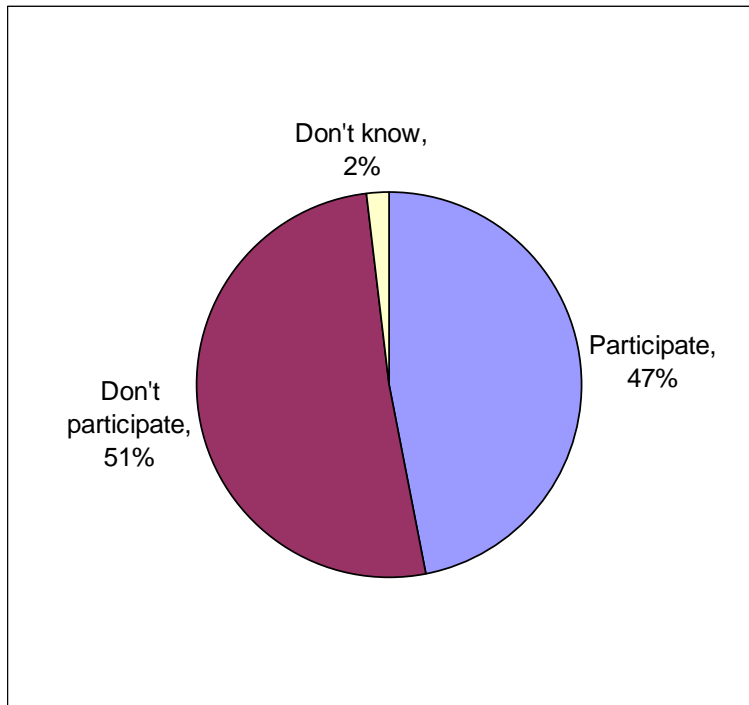
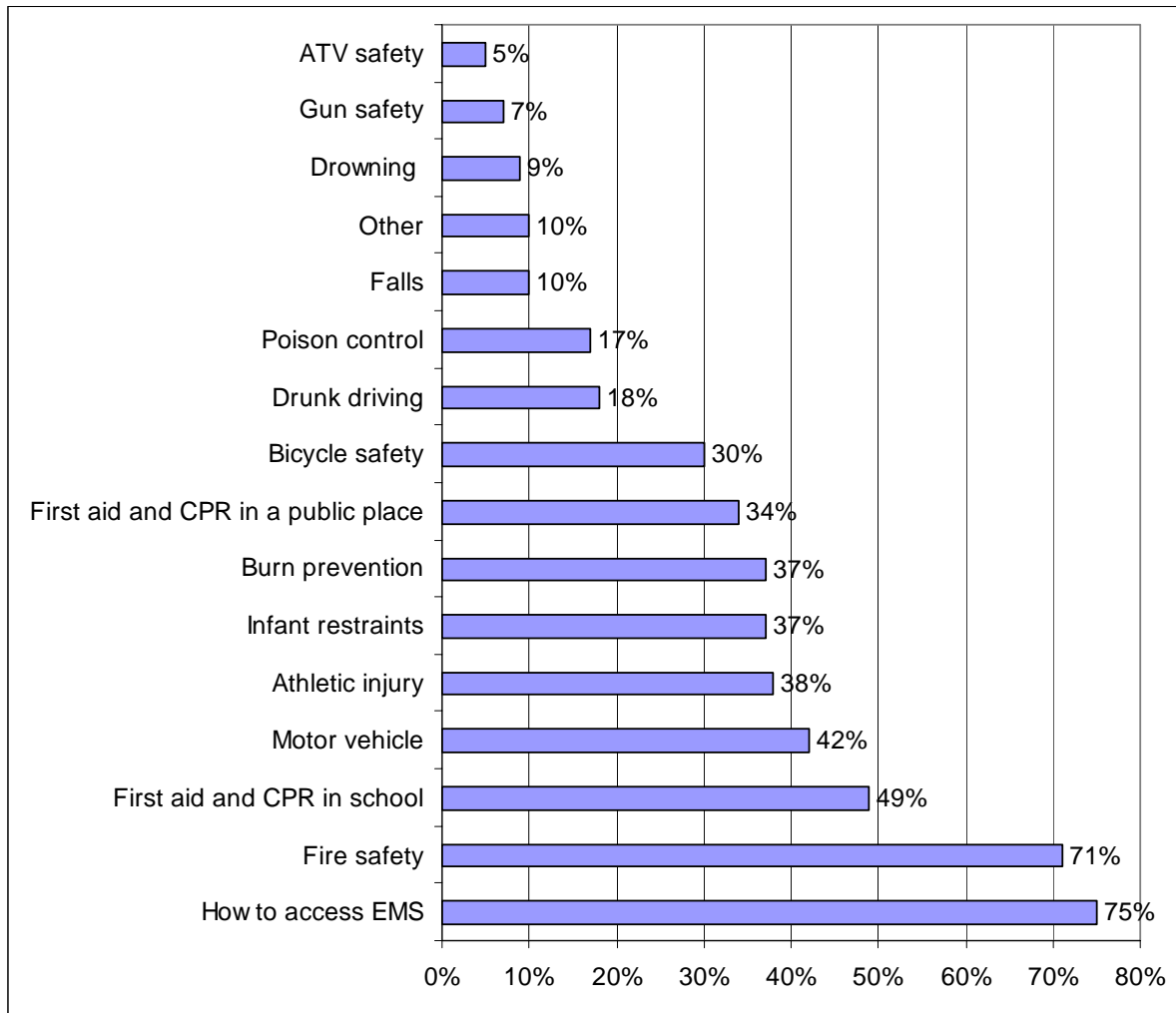


Figure 52: Community Education With Participating EMS Services (n = 134)



What we heard from some responding EMS services . . .

“With the natural anxiety that comes with a young patient and (thankfully) the paucity of calls, we feel undertrained when they do happen.”

“As we don’t get pediatric calls very often, it causes us to lose some of the skills we have acquired during training. We have to rely more on information sheets that we carry for pediatric emergencies.”

“Lack of funding and area training on pediatric cases for rural areas limits resources available to treat pediatrics.”

“I believe having training closer to our area would help. We have to travel long distances to go to most classes.”

EMS Training Agency Survey (n = 18)

STUDY DESIGN

Using data provided by the Nebraska EMS program at NHHSS, we surveyed 25 active EMS training agencies. (See Appendix F for locations of EMS Training Agencies in Nebraska.) After review of the literature, a survey instrument was developed and organized into domains reflecting performance measures developed by HRSA for the EMSC program¹⁷ and recommendations from the National EMSC Data Analysis Resource Center¹⁸ and the Nebraska EMSC project. The training agency survey included questions regarding educational/training services, continuing education, and educational resources. (See Appendix G for a copy of the EMS training agency survey.) The survey was pilot-tested by contacts from EMS training agencies and was estimated to take about 5 minutes to complete. Using the Dillman¹⁹ method developed for survey research, we made five contacts with the training agencies surveyed. Surveys were sent to the director of each training agency.

STUDY POPULATION

We received completed surveys from 18 (72%) of the 25 training agencies surveyed.

¹⁷ <http://bolivia.hrsa.gov/emsc/PerformanceMeasures.aspx>

¹⁸ <http://nedarc.med.utah.edu/nedarc/resourceLibrary/performanceMeasures.html>

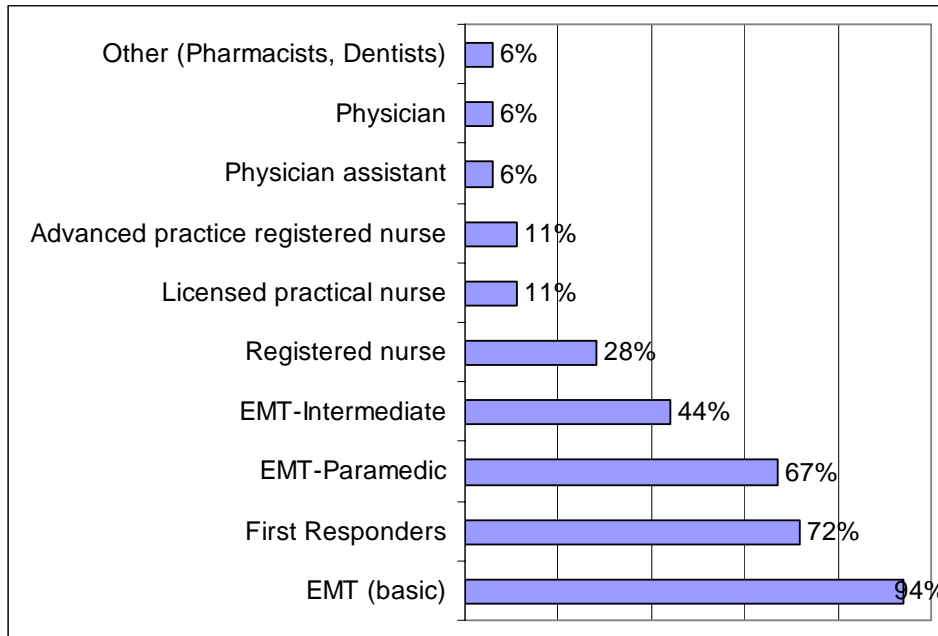
¹⁹ Dillman, D.A. (2000). *Mail and internet surveys: The tailored design method*. New York: John Wiley & Sons.

FINDINGS FROM RESPONDING EMS TRAINING AGENCIES

EDUCATIONAL/TRAINING SERVICES

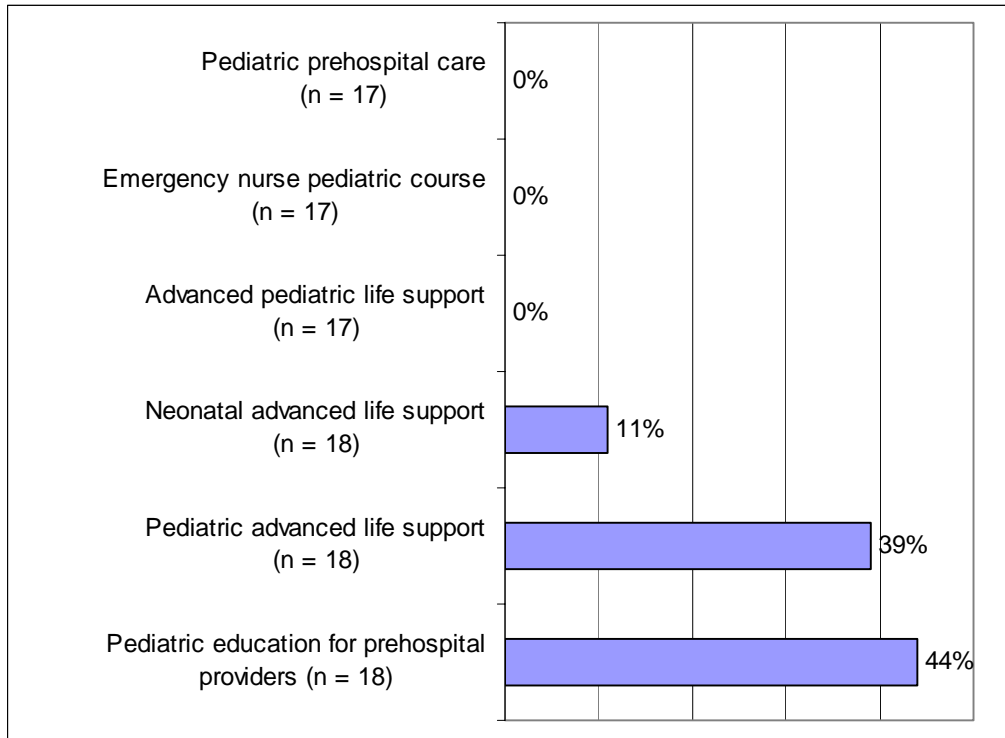
- The majority (94%) of respondents identified basic EMTs as their clientele, followed by First Responders (72%) and EMT-Paramedics (67%). (Figure 53)

Figure 53: Training Agency Clientele for General Emergency Medical Education (n = 18)



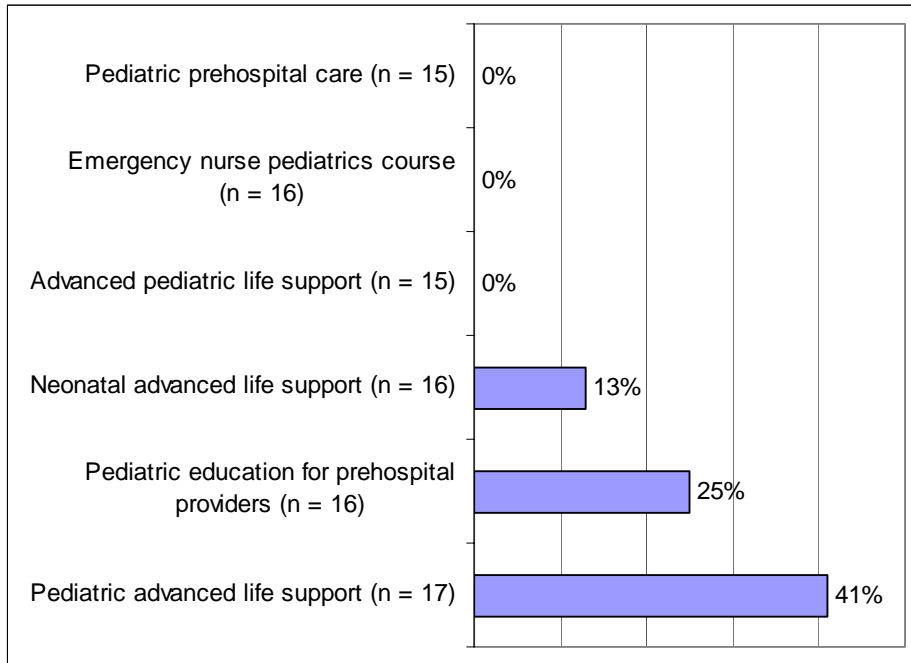
- The highest percentage of respondents (44%) reported that their training agency offered pediatric education for prehospital professionals (PEPP) courses. No respondents reported offering pediatric prehospital care (PPC), the emergency nurse pediatric course (ENPC), or advanced pediatric life support (APLS). (Figure 54)

Figure 54: National Curricula for Pediatrics Offered by Training Agency



- The highest percentage of respondents (41%) reported that their training agency offered pediatric advanced life support (PALS) at least once a year. (Figure 55)
- Respondents reported that the two courses most frequently offered (PALS and PEPP) are most likely to have between 11 and 20 students per class.

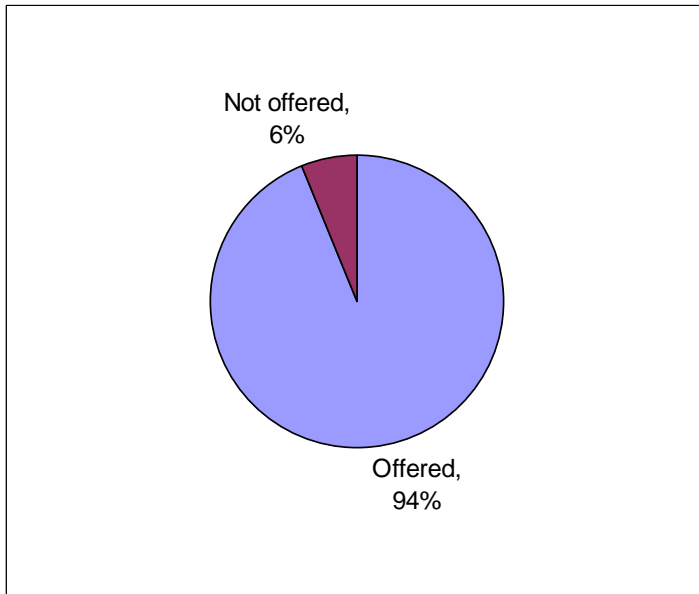
Figure 55: National Curricula for Pediatrics Offered at Least Once Per Year



CONTINUING EDUCATION

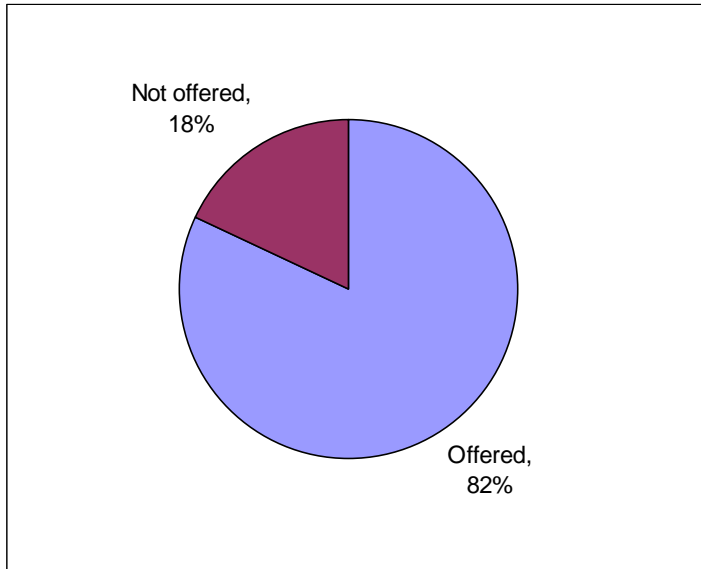
- Nearly all (94%) responding training agencies reported offering continuing emergency medical education. (Figure 56)

Figure 56: Continuing Medical Education Offered by Training Agency (n = 18)



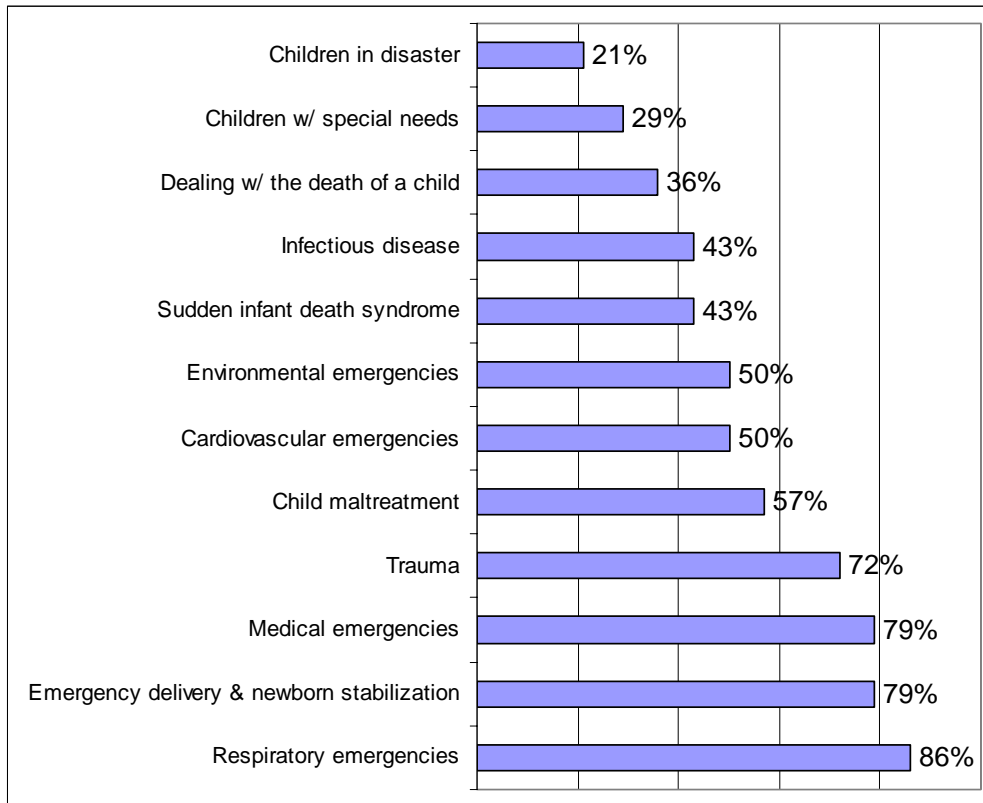
- EMS providers were reported to be the primary clients for continuing emergency medical education by training agencies that offer these services.
- The majority (82%) of respondents reported that their training agency offered continuing education specific to pediatrics. (Figure 57)

Figure 57: Continuing Emergency Medical Education Specific to Pediatrics Offered by Training Agency (n = 17)



- The majority of respondents (86%) reported that their training agency offered continuing education on respiratory emergencies. Continuing education regarding children in disaster was least likely to be offered by the responding training agencies (21%). (Figure 58)

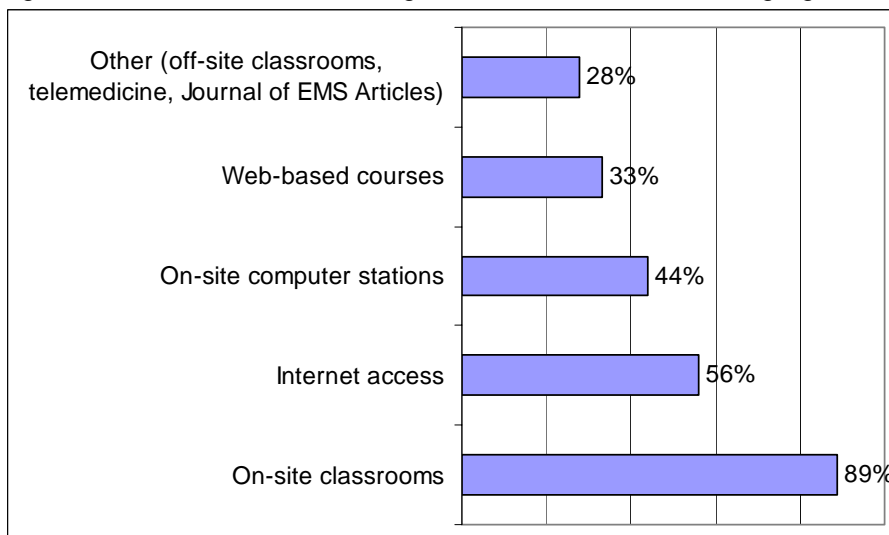
Figure 58: Continuing Education Topics Offered at Least Once in the Past Year (n = 14)



EDUCATIONAL RESOURCES

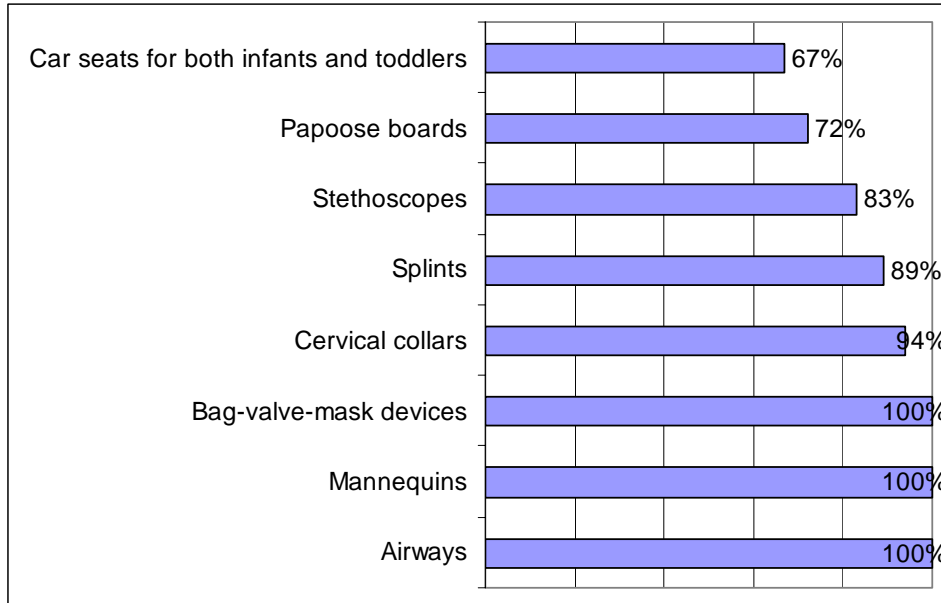
- The majority of respondents (89%) reported that their training agency had on-site classrooms available. Less than half of the training agencies had on-site computer stations (44%) and/or web-based courses (33%) available to their students. (Figure 59)

Figure 59: Facilities and/or Training Methods Available at Training Agencies (n = 18)



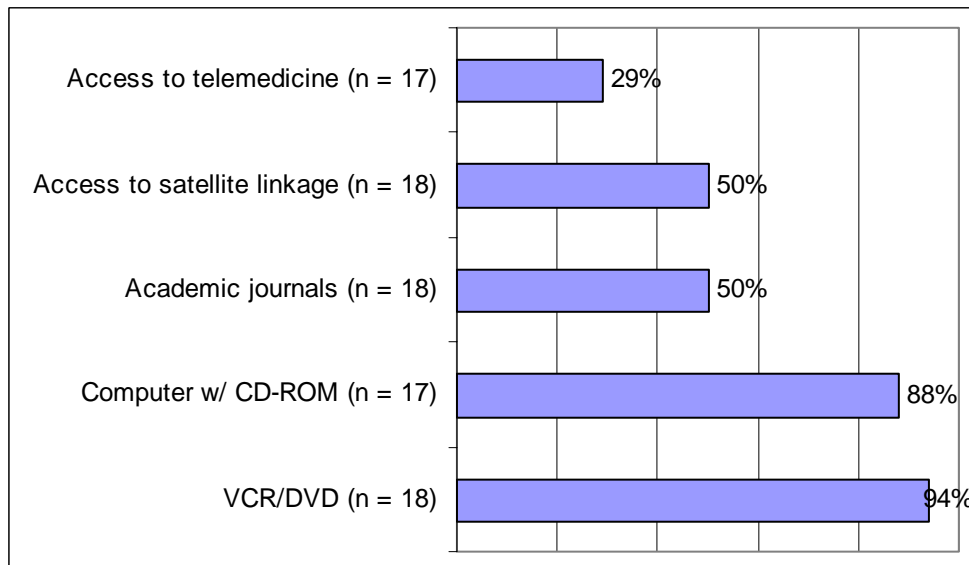
- All responding training agencies (100%) reported maintaining bag-valve-mask devices, mannequins, and airways for pediatric training. Over half of the respondents reported maintaining all other items. (Figure 60)

Figure 60: Pediatric Equipment for Training Maintained by Training Agencies (n = 18)



- Nearly all respondents (94%) reported that their training agency possessed a VCR/DVD for education and training. Training agencies were least likely to have access to telemedicine (29%). (Figure 61)

Figure 61: Resources for Education and Training



- Twenty-two percent of the respondents reported that their training agency had training courses available in Spanish. (Figure 62) Thirty-one percent of respondents were interested in Spanish materials, while a higher percentage “don’t know” (44%). (Figure 63)

Figure 62: Training Agency Materials That Are Offered in Spanish

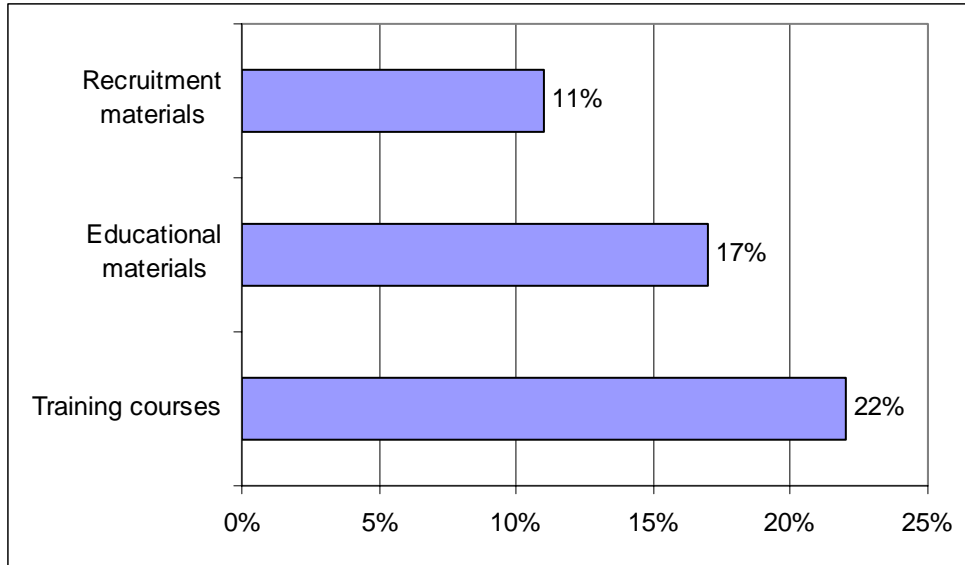
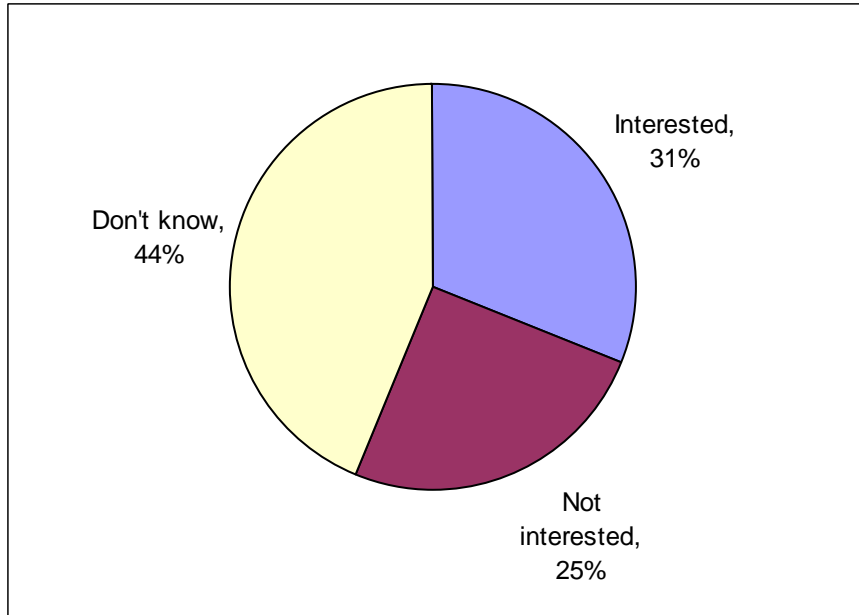


Figure 63: Training Agency Desire for Materials in Spanish (n = 16)



CONCLUSIONS

Emergency health care providers in rural areas are most likely to lack the necessary experience and equipment for treating pediatric patients due to limited resources and the low volume of emergencies involving children. The majority of EMS services in Nebraska lack the essential equipment needed to treat children in the prehospital setting. Because CAHs are not likely to offer specialized pediatric care, they often transfer children to other facilities, increasing the need for written inter-facility agreements. Most rural areas in Nebraska have limited access to ALS levels of care in the prehospital setting due to the high concentration of Basic services and dependence on volunteer EMTs. Pediatric-specific education and increased resources would benefit both prehospital and in-hospital providers. More efforts must be made to standardize care through the use of written protocols and regular assessment of children's outcomes in order to serve this population safely and effectively.

NEXT STEPS

Policy makers in rural states must assess the infrastructure of emergency pediatric care with a goal of maximizing access to high-quality emergency care through coordination at the state and local level. This assessment must include the locations of facilities capable of treating children according to evidence-based guidelines. Integrated systems of emergency care for children are necessary in rural states, where EMS services licensed to provide only BLS treatment and CAHs serve significant proportions of the population.