NC Rural Health Research & Policy Analysis Center

Issues in Staffing Emergency Medical Services: A National Survey of Local Rural and Urban EMS Directors

Final Report No. 93

May, 2008

725 Martin Luther King Jr. Blvd. CB 7590
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-7590

RHRC
Rural Health Research & Policy Centers
Funded by the Federal Office of Rural Health Policy

WWW.SHEPSCENTER.UNC.EDU/RESEARCH_PROGRAMS/RURAL_PROGRAM/

Issues in Staffing Emergency Medical Services: Results from a National Survey of Local Rural and Urban EMS Directors

Final Report No. 93

Victoria A. Freeman, RN, DrPH

Daniel Patterson, PhD

Rebecca T. Slifkin, PhD

This project was funded by the federal Office of Rural Health Policy, Health Resources and Services Administration, U.S. Department of Health and Human Services through cooperative agreement #5-U1CRH03714-03-00. The authors thank Bryan Ayars, MS for his help in development of the survey and Indira Richardson, MPA and StephaniePoley, BA for their help in the production of this report.

Table of Contents

Executive Summary

All EMS agencies face challenges in maintaining a professional workforce and infrastructure as they seek to meet the needs of their community. The inherent differences in urban and rural areas suggest that there may be additional challenges faced by rural EMS providers. This report explores rural-urban differences in medical oversight and the recruitment and retention of emergency medical technicians (EMTs) and paramedics as reported by a survey of 1,425 local EMS directors.

Organizational characteristics varied by geographic location. Rural EMS agencies were more likely to be freestanding or affiliated with a hospital while urban agencies were more likely to be affiliated with other public services such as fire or police departments. As expected, rural EMS agencies served fewer persons but covered larger geographic areas than their urban counterparts. They were also significantly more likely than those in urban counties to be staffed entirely by volunteers. Within rural areas, reliance on a volunteer workforce was greatest in the more rural areas. Finally, one-half of the agencies located in urban counties were fully staffed compared with only 43% in rural areas.

EMS medical oversight refers to the guidance or authority that supports the EMT and paramedic in the provision of prehospital care, and it encompasses advice provided to EMS personnel for medical care in the field or during transport of a patient (on-line medical direction) and administrative activity which serves to define and enforce standards of care, training, and operational policies for an EMS agency (off-line medical direction). Most states require EMS agencies to have a designated medical director (DMD) who typically is responsible for such oversight. Our study found important rural-urban differences regarding DMDs as follows:

- The percentage of DMDs with emergency medicine training decreased with increasing rurality.
- Rural EMS directors were more likely than their urban counterparts to report DMD recruitment problems, but specific barriers did not differ significantly across geographic areas. Almost two-thirds (62%) of all directors reported that local physicians did not want to serve as DMD.
- Agencies that relied on volunteers, the type of service most common in rural areas, were significantly more likely to have problems recruiting a DMD.
- Rural respondents were less likely to report that their DMD developed or implemented quality improvement programs or provided continuing education for EMTs and paramedics.

A series of questions focused on on-line and off-line medical direction. The most frequent source of on-line support was emergency department (ED) staff at the receiving hospital for both rural and urban respondents. Rural respondents were significantly more likely than urban ones to report receiving on-line support from their DMD and from their home hospital. Rural EMS agencies were less likely to report that they could always get the on-line support they needed and among rural respondents, the more rural the area, the less likely they were to report that they always received on-line support. Reported problems included difficulty getting a radio frequency or cell phone signal.

Recruitment and retention of EMS personnel continues to be a challenge for many EMS agencies. In this survey, EMS directors were asked if they had problems recruiting or retaining personnel and why. Responses included the following:

- Recruiting EMTs and paramedics was always a problem for 37% of all respondents. Rural respondents, particularly those located in the most rural areas, reported a significantly greater problem with recruiting staff than their urban counterparts.
- Regardless of location, a lack of persons available to serve as EMTs or paramedics was a major cause of recruitment problems.
- Rural respondents reported that there were no certified EMTs available and that citizens did not have the time nor the interest to volunteer.
- Rural directors were more likely to report that they were volunteer agencies and could not pay their staff. They also reported that local employers were not supportive when their employees volunteered. Another area of constraint for rural areas was that training programs for EMTs were too far away, too long, and too expensive.

While recruiting EMTs and paramedics is a significant problem, retaining them is equally challenging. Fifty-five percent (55%) of all respondents reported that retaining EMTs and paramedics was sometimes a problem, but rural directors, particularly those in the most rural areas, were more likely than those in urban areas to report always having retention problems. Sixty-five percent (65%) of all respondents, regardless of geographic location, reported time and scheduling conflicts as contributing to retention problems. However, rural agencies were more likely than urban agencies to lose staff due to burnout or difficulty meeting continuing education requirements.

Freestanding EMS agencies and those affiliated with hospitals tended to have a greater problem with recruitment than agencies affiliated with fire departments. Pay structure also plays an important role in recruitment and retention of EMTs. EMS agencies that were staffed entirely by volunteers, an organizational structure that is more common in rural areas, were significantly more likely to have difficulty with recruitment and retention of EMTs than agencies that had only paid staff or a combination of paid and volunteer personnel.

Discussion

Rural EMS agencies are different from urban EMS agencies in important ways that affect the availability of medical direction and recruitment and retention of EMTs and paramedics. Further, these differences are often more pronounced in the most rural areas. The observed differences in organizational affiliation and the likelihood of being staffed by volunteers have implications for the financial and resource support received by the EMS agency.

Maintaining adequate staffing is more of a problem in rural areas. The predominant barrier to recruiting a designated medical director is not physician supply but the unwillingness of local physicians to assume this role. Although there were no significant differences between rural and urban areas in any of the barriers reported, other findings suggest reasons why staffing the rural DMD position might be more difficult. Rural DMDs are less likely to be emergency medicine specialists. It is possible that family and general medicine physicians are less comfortable

serving in a role for which they were not specifically trained. Physicians may also be more reluctant to direct volunteers whose competencies may require more frequent review and reinforcement. Finally, rural DMDs are significantly more likely to be relied upon for on-line medical direction and the added on-call time of serving as a DMD, particularly in a volunteer capacity, may be more than many rural physicians are willing to take on.

The organizational structure typical of rural EMS agencies, i.e., freestanding services that rely on volunteers, plays an important role in recruitment and retention of EMTs. It is not surprising that freestanding EMS agencies tended to have a greater problem with recruitment than those agencies affiliated with fire departments. Agencies affiliated with fire departments may be able to pay their staff, may have greater resources for training, and they have an identified career ladder, an employment incentive.

Lack of pay contributes to EMS staff recruitment and retention problems. All-volunteer agencies were the most likely to report problems, and many of these agencies are in what might be described as a Catch-22 situation. In order to raise the revenues to pay staff, maintain and improve equipment, and ensure a full range of services, full-time paid personnel are needed. Full-time administration requires the funds to pay such a staff. Running an EMS service in a rural area is an increasingly complex venture and reliance on the community spirit of volunteers appears to be stretched to its limits.

Providing health care services in rural areas is complex and problems are not subject to simple solutions. EMS is no different and the challenges identified by rural EMS directors demonstrate that complexity. Population demographics, employment opportunities and economic challenges, distances between population centers and their health care infrastructure, communication barriers related to distance and isolation, and access to specialized education in rural America are all factors that must be considered when discussing how to improve the rural EMS system. The evolution of EMS organizational structures is a critical consideration. There are barriers to transitioning rural agencies from volunteer services to paid services and these barriers are not just simple economics. Also, turf issues and the loss of organizational identity that results from moving freestanding EMS agencies to hospitals or fire departments must be considered.

Exploring and field-testing new ways to support rural EMS agencies needs to occur sooner rather than later in order to address rural difficulties in recruiting and retaining DMDs. A single strategy, such as the provision of pay alone will not likely solve the problem in all areas. Other strategies that might be considered include finding ways to change the scope of work for local DMDs. Functions such as the provision of on-line medical direction could be performed, at least in part, by regionally based staff, but funding would be needed to support such an initiative.

In many rural areas, the EMT staff recruitment and retention challenges faced by volunteer EMS must be addressed to assure viability of local EMS agencies. The time that local citizens have to volunteer is likely to decrease rather than increase. With adequate funding, EMS as a paid profession, or at least a part-time one, may make a difference in maintaining rural EMS services and, in a limited way, provide employment opportunities in areas where unemployment is increasing. Also worth consideration is partnering with other organizations such as the local hospital for infrastructure and training support.

Introduction

Prehospital emergency medical services (EMS) are an essential part of the health care system. Once the domain of funeral homes that provided transport but little in the way of medical care, EMS has changed markedly in the past 40 years. The Emergency Medical Services Systems Act of 1973 is regarded as marking the beginning of the modern EMS system. In the years since that legislation was passed, the complexity of services provided under the rubric of EMS and the challenges facing communities in maintaining a modern EMS agency have grown. The capabilities and credentials of persons providing prehospital emergency care have expanded as has the equipment at their disposal to provide emergency care.

All EMS agencies face challenges in maintaining a professional workforce and infrastructure as they seek to meet the needs of their community as one component of a seamless system of health care. The inherent differences in urban and rural areas suggest that there may be additional or unique challenges faced by rural EMS providers. The recent National Rural Health Association (NRHA) publication entitled "Rural and Frontier Emergency Medical Services: Agenda for the Future" identifies 14 attributes of an EMS system, highlighting the complexity of these health care services (Agenda). These attributes are comprehensive and range from those that enable and support EMS systems, e.g., legislation and regulation and system finance; to those that support the EMS workforce, e.g., human resources and education systems; to those that assure state of the art, evidence-based services, e.g. EMS research and evaluation.

Surveys of state EMS directors as well as anecdotal evidence indicate that local EMS agencies in rural areas face many challenges in maintaining an adequate workforce and in obtaining medical direction to support that workforce. There have been no reports of systematic national studies of local EMS directors that have examined the differences in the problems faced by rural EMS agencies compared to their urban counterparts. Such information could inform the development of programs and policies to support rural EMS systems. This report presents rural-urban differences in two of the attributes in the Agenda document: medical oversight and human resources, as reported by local EMS directors. The report contains five sections. The first section explains the study methods. The second describes the characteristics of the EMS agencies represented by the respondents. Background and findings regarding medical direction are in section three and background and findings regarding recruitment and retention of EMTs and paramedics are in section four. Finally, the report concludes with a discussion in section five.

Methods

Local EMS directors were surveyed by mail to better understand the challenges they face in receiving medical oversight and in recruitment and retention of EMTs. The medical oversight portion of the survey had questions regarding whether the local service has a Designated Medical Director (DMD) and any difficulties recruiting an individual for that position, from whom on-line and off-line medical direction is obtained. It also had questions regarding the credentials and role of the DMD and medical oversight functions that are not currently being met. The EMT recruitment and retention section of the survey included questions regarding problems recruiting and retaining EMTs and paramedics, and the factors that contributed to reported difficulties. In

addition to the substantive areas of interest, the survey included questions to allow characterization of respondents by organizational affiliation, services provided, certification level of staff, pay structure, population served and area of service.

The study used the National Association of State EMS Directors' (now the National Association of State EMS Officials) list of licensed EMS agencies as a sample frame. Because the goal of the survey was to examine issues facing community-based EMS agencies, the sample frame was modified to remove those organizations that were not community-based or whose experiences would not be typical of community-based services. Examples of such ineligible services included EMS agencies based at airports or manufacturing plants, those associated with entertainment venues, and those that were part of military installations.

The study sample was stratified by rural and urban areas with rural areas defined as nonmetropolitan counties and urban areas defined as metropolitan counties, as characterized by the Office of Management and Budget (OMB). Within rural areas, counties were further stratified to capture degree of rurality by using OMB's characterization of nonmetropolitan counties as micropolitan (those with a core-based population area of 10,000 to 49,999) or as non-core based statistical areas (those with a core-based population less than 10,000 or no core-based population). The latter group is referred to in this report as "non-CBSA". A random sample of 1,250 EMS agencies was chosen from metropolitan counties based on the ZIP code of the organization. An additional 1,250 were sampled randomly from nonmetropolitan counties divided equally between micropolitan and non-CBSA counties.

Data were collected by means of a mailed survey addressed to the EMS director. Nonrespondents were resurveyed twice to encourage their participation. As incentive, survey respondents were entered into a drawing to receive one of several EMS-specific gifts. The study design was reviewed and approved by the University of North Carolina School of Medicine Committee for the Protection of the Rights of Human Subjects.

Descriptive statistics were used to characterize respondents. Differences in responses between metropolitan and nonmetropolitan respondents were tested for statistical significance using the chi-square test. Within nonmetropolitan areas, similar tests were conducted to assess the difference between responses from directors in micropolitan areas and those in non-CBSAs. Questions that allowed multiple responses are noted in the data tables that follow. All such questions included an "other" option for respondents to add their own responses.

Surveys were received from 57.2% of the sample (n=1,425) with a higher rate of response from those in nonmetropolitan areas (59.5%, n=741) compared to metropolitan areas (54.9%, n=684). Surveys were received from metropolitan EMS directors in 48 states and nonmetropolitan EMS directors in 47 states.

Characteristics of Respondents

EMS agencies can be freestanding with no financial or structural ties to other organizations. They can also be affiliated with or owned by hospitals or located within fire or police departments. Survey questions were included to allow description of the organizational structure of and services provided by each EMS agency. These data not only illustrate the variety of EMS agencies across the nation but also provide assurance that a wide variety of organizations are represented in the survey responses.

Nonmetropolitan EMS agencies were more likely to be freestanding or affiliated with a hospital while metropolitan agencies were more likely to be affiliated with other public services such as fire or police departments (Table 1). Similar differences were also noted within the nonmetropolitan category. EMS agencies in the most rural areas, i.e., those in non-CBSAs, were the most likely of the three groups to be freestanding and twice as likely as other nonmetropolitan services to be affiliated with a hospital.

Table 1: Organizational Structure and Service Area of Local EMS Agencies

	Metro v. Nonmetro			Within Nonmetro		
	Metro N=684 %	Nonmetro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Affiliation:						
Freestanding	34.5	49.8	<.0001	43.1	56.2	<.0001
Part of fire department	55.9	38.0		48.6	27.9	
Part of hospital	4.6	10.0		6.4	13.5	
Part of police department, public safety or other	5.0	2.2		1.9	2.4	
Not for profit	88.1	89.4	.4565	89.6	89.3	.6196
Median square miles covered	47 miles	150 miles		108 miles	210 miles	
Median population served	15,500 people	4,992 people		6,500 people	3,600 people	

More than 88% of all EMS agencies were not-for-profit, and there was not a significant difference between rural and urban services. As expected, nonmetropolitan EMS agencies serve fewer persons but cover larger geographic areas than their metropolitan counterparts.

The type and number of services provided by EMS agencies can vary from one agency to the next. Most people associate EMS with 911 emergency response and in this study the majority of survey respondents (95%) provide this service. Some EMS agencies are considered first responder services, i.e., they are the first to respond to an emergency call. First responders may also transport the patient to the hospital or, in some cases, assess and treat the patient and then transfer care to another EMS agency that will transport the patient to the hospital. First

responders without transport service are often part of fire or police department-based services. Overall, only 14% of all respondents reported that they were non-transporting first responders, and the most rural agencies were the least likely to provide these limited services. Nonmetropolitan agencies were more likely to provide other transport services, as well, including nonemergency transport and interfacility transfer. In addition, the more rural the area served, the more likely the agency provided each type of transport (Table 2).

Table 2: Services Provided and Equipment Used by Local EMS Agencies

	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Services Provided *(multiple responses allowed)*						
911 emergency response	94.8	96.1	.2564	95.3	96.8	.2860
Non-emergency transport	36.7	53.9	<.0001	47.2	60.4	.0003
Interfacility transfer	25.6	46.3	<.0001	40.6	51.9	.0021
First responder and nontransporting	14.6	13.5	.5482	16.9	10.1	.0066
Other	5.8	6.1	.8005	6.9	5.3	.3576
Vehicles Used *(multiple responses allowed)*						
Ambulance	81.5	89.2	<.0001	83.9	94.2	<.0001
Quick Response Vehicle	33.1	21.6	<.0001	26.0	17.4	.0044
Helicopter	6.8	4.5	.0583	4.7	4.2	.7481
Fixed-wing aircraft	0.9	1.1	.7050	1.4	0.8	.4352
Off road/all terrain vehicle	9.4	12.2	.0959	13.0	11.4	.4862
Boat	11.5	9.2	.1574	9.7	8.7	.6418
Other	19.9	11.1	<.0001	15.0	7.4	.0010

Agencies use a variety of vehicles and equipment to support the services they provide. The types of vehicles used by the agencies also differed across geographic areas, likely reflecting the differences in affiliation and scope of services. While the vast majority of agencies had ambulances, those in rural areas were significantly more likely to have these vehicles. Metropolitan agencies were more likely to use quick response vehicles (QRVs), more typical among fire department-based organizations. The more rural the area, the less likely agencies were to have a QRV. The use of fire trucks accounts for much of the urban-rural difference in the use of "other" vehicles.

How EMS agencies are staffed is an important consideration in any examination of the issues facing these organizations. Specific survey questions asked about the types of EMTs used, whether they were regularly paid and how they were paid, and if the agency was currently fully

staffed. Volunteers were considered to be those personnel that were not paid a regular salary or hourly wage but who may receive some form of periodic monetary compensation.

Nonmetropolitan EMS agencies were significantly more likely than those in metropolitan counties to be staffed entirely by volunteers. Within nonmetropolitan areas, the reliance on a volunteer workforce was greater in the more rural areas (Table 3).

Table 3: Staffing of Local EMS agencies

	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Certification of EMTs:						
Have only basic-level EMTs	15.1	21.5	.0029	20.4	22.4	.5163
Have paramedics or intermediate-level EMTs (with or without basics)	84.9	78.5		79.6	77.6	
Currently fully staffed	50.2	43.5	.0125	43.9	43.2	.8471
Payment of staff:						
All staff are volunteers	30.0	48.6	<.0001	46.3	50.8	.0029
All staff are paid a regular salary or hourly wage	37.0	25.3		30.8	20.1	
Both volunteer and paid staff	33.0	26.1		23.0	29.1	
For those who use only volunteers:						
	Metro N=204 %	Non Metro N=359 %	p value	Micro N=167 %	Non-CBSA N=192 %	p value
Compensation for volunteers: *(multiple responses allowed)*						
Paid by hour when on run	7.6	14.0	.0257	12.2	15.6	.3608
Paid a flat rate per run	15.2	22.9	.0326	16.5	28.5	.0075
Paid using a point system	6.6	3.4	.0883	4.9	2.2	.1617
Other payment scheme	4.6	6.3	.4044	3.1	9.1	.0191
Never paid	69.5	58.3	.0091	65.2	52.2	.0132

Among respondents whose agencies used only volunteers, more than one-half reported that volunteers were never compensated monetarily and volunteers at metropolitan-based agencies were less likely to be paid compared to their nonmetropolitan counterparts. Nonmetropolitan agencies, on the other hand, were more likely to pay their volunteer EMTs and paramedics when on a run, paying them either by the hour or by the run. Various point systems were also used to

determine compensation. For example, an EMT could earn points based on the number of shifts or transports worked in a given month.

Categories of EMS certification and/or licensure vary by state. Preparation for certification for the three most common levels of EMT (EMT-Basic, EMT-Intermediate, and EMT-Paramedic) can range from as few as 110 hours for EMT-B certification to over 1000 hours for EMT-P. The skills and capabilities of different levels of EMT certification vary as well. While EMT-Bs are trained to support respiratory and circulatory function of patients, they do so using noninvasive techniques. EMT-Ps are trained and permitted to use a variety of invasive techniques, such as administering intravenous fluids or airway intubation, and they may also administer medications. The training and capabilities of EMT-Is fall between that of the other two levels.

EMS services with only EMT-Basics were more common in rural areas. However, 75% of agencies, regardless of location, had some staff with a higher level of training, mostly paramedics. There were significant differences between urban and rural agencies regarding whether the EMS director reported that the agency was fully staffed. Staffing levels were poor in both geographic areas, with half of the agencies located in metropolitan counties fully staffed compared to only 43% in rural areas.

Medical Oversight

EMS agencies rely on guidance from physicians and other health care professionals in the course of patient care, during transport, and as part of ongoing oversight of all activities. EMS personnel are required to operate under a physician's orders, which is particularly important for paramedics as their scope of practice can be extensive and include intensive and invasive procedures (IOM, 2007). EMS medical oversight refers to the guidance or authority that supports the EMT and paramedic in the provision of prehospital care, and it encompasses both on-line and off-line medical direction. On-line medical direction is the advice provided to EMS personnel for medical care in the field or during transport of a patient. Off-line medical direction is the administrative activity which serves to define and enforce standards of care, training, and operational policies for an EMS system.

Medical oversight is not required by statute in all states; however, most states require EMS agencies to have a designated medical director (DMD) who typically is responsible for such oversight[1]. The National Association of EMS Physicians (NAEMSP) and the American College of Emergency Physicians (ACEP) are organizations that strive to ensure standards in EMS medical direction and emphasize leadership for EMS systems. These entities offer recommendations for the qualifications, responsibilities, activities, and authority of EMS medical directors (Benitez; Polsky).

Experience or training in prehospital and emergency department care is regarded by ACEP as essential for an EMS designated medical director and board certification in emergency medicine is desirable (Polsky). However, almost two-thirds of state EMS directors surveyed by researchers at the University of Minnesota in 2001 believed medical direction was a challenge for rural EMS providers in their state and some specifically cited problems with medical director qualifications (Knott). In addition, difficulty obtaining a rural DMD is likely to be exacerbated for volunteer EMS agencies that may not have sufficient resources to compensate a physician for DMD services. In fact, many qualifications and responsibilities deemed important for an EMS medical director are difficult for some EMS systems to achieve.

This section of the report describes responses to survey questions designed to examine medical oversight in our study. Questions regarding medical direction were asked to specifically explore the availability of a DMD, the role s/he plays in the operation of respondent EMS agencies, services provided by the local DMD, and services that are not provided but that are desired. EMS directors were also asked from whom they got both on-line and off-line medical direction and problems they encountered in obtaining on-line direction specifically.

[1] Medical oversight may also be provided by regional consortia with oversight responsibility for multiple EMS entities (Agenda), or by hospital staff not specifically designated as a DMD.

Findings: Medical Oversight

Availability and Role of the Medical Director

Detailed questions about a designated medical director were included in the survey. The medical director's EMS training was queried as was his or her level of involvement with the respondent agency (Table 4).

Table 4: Description of Designated Medical Director

	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Has DMD (other than EMS Director)	93.5	96.1	.1728	95.3	96.8	.5751
EMS Director is DMD	3.4	2.0		2.5	1.6	
No DMD	2.7	1.8		2.0	1.6	
Doesn't know	0.4	0.1		0.3	0.0	
For those who have a Designated Medical Director:						
	Metro N=659 %	Non Metro N=720 %	p value	Micro N=350 %	Non-CBSA N=370 %	p value
DMD Specialty:						
Emergency Medicine	82.4	56.5	<.0001	72.2	41.6	<.0001
Family or General Medicine	8.9	30.8		17.2	43.8	
Other or unknown	8.7	12.7		10.6	14.7	
DMD has taken EMS DMD training course:						
Yes	36.7	30.8	.0196	31.5	30.2	.0157
No	10.1	13.8		10.0	17.4	
Unknown	53.2	55.4		58.5	52.5	
DMD meets with EMS Director regularly	18.5	17.6	.0894	18.1	17.1	.3015
DMD meets with EMS Director and staff regularly	29.8	26.1		24.4	27.7	
DMD meets as needed	40.0	47.1		46.0	48.1	
EMS Director is DMD and meets with staff	0.8	0.4		0.6	0.3	
Never meet	11.0	8.8		10.9	6.8	

Almost all respondents (97%) reported that they had a designated medical director (DMD) with a small percentage of EMS directors reporting that they themselves were the designated medical director for their agency. Reported DMD specialty was most likely to be emergency medicine. However, the percentage of DMDs with this training decreased with increasing rurality, and in the most rural areas, DMDs were equally likely to be family medicine or general medicine physicians.

More than half of respondents, regardless of location, did not know if their DMD had taken an EMS medical director course. Of those who did know, EMS directors in nonmetropolitan areas, particularly those in the most rural areas, were more likely to report that their DMD had not.

There were no significant differences across geographic areas in whether the DMD met with EMS staff. The vast majority of both metropolitan and nonmetropolitan respondents reported that their DMD met with them alone or with their staff either on a regular basis or as needed.

Respondents were asked if they were having a problem obtaining a medical director at the time of the survey or if there had been problems in the past. Nonmetropolitan EMS directors were more likely than their metropolitan counterparts to report DMD recruitment problems (Table 5).

Table 5: Medical Director Recruitment

	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Has had a problem getting a medical director	10.2	19.4	<.0001	16.8	21.8	.0863
For those who now have or who have had problems:						
	Metro N=68 %	Non Metro N=141 %	p value	Micro N=60 %	Non-CBSA N=81 %	p value
Barriers to recruiting a DMD: *(multiple responses allowed)*						
Local/nearby physicians or mid-levels not willing	67.2	59.9	.3266	60.7	59.2	.8617
Cannot pay a medical director	39.3	40.9	.8368	39.3	42.1	.7447
No physicians or mid-levels in local area	1.6	9.1	.0548	3.6	13.2	.0583
Available physicians or mid-levels are not qualified	11.5	18.2	.2381	17.9	18.4	.9338
Other	18.0	11.4	.2071	17.9	6.6	.0436

Recruitment barriers, however, did not differ significantly across geographic areas; almost two-thirds of all respondents (62%) reported that local physicians did not want to serve as medical

director but only 7% reported that there were no physicians available. Forty percent of respondents, regardless of location, reported that not being able to pay a medical director was a barrier. Liability concerns, low pay, and physician turnover were barriers reported under "other".

To further understand rural-urban differences in the ability to recruit a DMD, the relationship between organizational structure and recruitment problems was considered for agencies in nonmetropolitan areas (Table 6). Agencies that relied on volunteers, the type of service most common in rural areas, were significantly more likely to have problems recruiting a DMD. Those affiliated with hospitals were less likely than others to report problems but the difference was not statistically significant.

Table 6: Problem Getting a Medical Director, by Organizational Affiliation and Pay Structure, for Nonmetropolitan Agencies

	Have a problem getting a medical director %	p value
Organizational Affiliation:		
Freestanding (N=359)	19.8	.2950
Fire Department (N=277)	19.9	
Hospital (N=72)	12.5	
Police, public safety, other (N=16)	31.3	
Pay structure:		
All paid (N=184)	13.6	.0059
All volunteer (N=354)	24.0	.
Some paid, Some volunteer (N=188)	16.0	

Ideally, designated medical directors provide many different functions for EMS agencies. EMS directors were asked about various functions outlined in *Rural and Frontier Emergency Medical Services: Agenda for the Future* (Agenda) as being within the purview of the medical director. Respondents could indicate if their DMD performed each function, if others did, or if no one did.

One group of DMD functions concerned EMT education and quality control activities (Table 7). Over three-quarters of EMS directors reported that their DMD developed protocols or standing orders and a similar percentage reported that s/he adopted existing documents for local use. Nonmetropolitan EMS directors were less likely to report that their medical director provided other educational support, such as developing or implementing quality improvement programs or providing continuing education for EMTs and paramedics.

Table 7: Designated Medical Director Functions – EMT Education and Quality Control						
	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Develop medical protocols and standing orders	78.3	78.3	.9743	78.8	77.9	.7514
Adapt existing protocols or standing orders for local use	75.5	77.6	.3568	78.7	76.6	.5049
Develop or implement quality improvement programs	53.2	46.7	.0136	49.4	44.0	.1409
Provide continuing education for EMTs and paramedics	42.9	32.8	<.0001	34.7	31.1	.2880
Regularly review EMS run reports for quality control	39.3	43.4	.1203	42.6	44.1	.6922
Review patient EMS run reports in response to complaint	44.5	54.7	.0001	50.6	58.6	.0285

Less than one-half of all DMDs provide continuing education for EMTs and paramedics with DMDs in nonmetro areas significantly less likely to do so than their metropolitan counterparts. Less than one-half of all DMDs review run reports routinely, regardless of location. A slightly higher percentage of DMDs review run reports in response to a complaint with rural DMDs more likely to serve this function than their urban counterparts.

A second series of questions regarding the function of the DMD focused on administration and community involvement (Table 8). Rural DMDs were less likely to be involved with activities such as staying up-to-date on state, regional, or local information and staying in touch with the local health care community.

Table 8: Medical Director Functions – Administration & Community Involvement						
	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Stay up-to-date on state, regional or local information, changes in procedure, etc.	59.3	50.5	.0010	54.2	47.1	.0544
Stay in touch with local health care community, e.g. hospital staff, long-term care, etc.	51.5	44.4	.0074	46.4	42.4	.2839
Develop and/or implement mutual aid agreements or protocols for disaster management, hazardous material or mass casualty response	21.0	19.8	.5885	21.1	18.6	.3865

Respondents were also asked if there were functions they wanted from their DMD but were not getting, or for the few respondents who are both the EMS director and the DMD, functions they would like from someone else in that position (Table 9).

Table 9: Support EMS Directors Want from a Medical Director That They Do Not Get						
	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Support expanding staff scope of practice	34.9	36.0	.6820	36.5	35.5	.7924
NOTHING	30.4	28.5	.4512	27.7	29.2	.6404
Regular or more timely review of run reports	27.8	28.5	.5094	30.3	28.7	.6401
Provide continuing education for staff	25.6	27.1	.5542	27.4	26.8	.8631
Develop / implement quality improvement programs	24.4	23.9	.8530	25.6	22.4	.3219
Support decisions staff make in field	16.4	20.4	.0566	19.1	21.6	.4163
Develop or implement mutual aid agreements, etc.	8.0	9.8	.2607	9.4	10.1	.7552
Review run reports in response to complaints	8.0	8.6	.6811	8.2	9.0	.7121

Most important to this study, metropolitan and nonmetropolitan EMS directors did not differ in what they wanted from a medical director for these commonly reported DMD functions. Overall, 29% of EMS directors wanted nothing more from their medical director. For those who did express a desire for additional involvement of their DMD, the most commonly reported need among all agencies, regardless of location, was support for expanding the scope of practice of EMTs and paramedics in special circumstances (35% overall). About one-quarter of respondents wanted more involvement of their medical director in providing continuing education or quality improvement programs and 18% overall wanted support for decisions that EMTs make in the field.

On-Line and Off-Line Medical Direction

EMTs and paramedics need medical direction during the course of an emergency response or patient transport (on-line) and as part of ongoing oversight of service activities (off-line). The survey included a series of questions regarding on-line and off-line medical direction, focusing on who provided those services and any problems receiving such oversight. There were significant differences between metropolitan and nonmetropolitan areas in the sources of on-line medical direction (Table 10). The most frequent source of on-line support was emergency department (ED) staff at the receiving hospital for both metro and nonmetro respondents. However, nonmetropolitan respondents were significantly more likely to report receiving on-line support from their DMD and from their home hospital.

Table 10: On-line Medical Direction for Local EMS Agencies						
	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Get **on-line** med direction from: *(multiple responses allowed)*						
Designated medical director	38.8	45.7	.0089	45.4	46.0	.8636
Home hospital	23.7	33.4	<.0001	32.8	34.0	.7157
ED staff at receiving hospital	54.7	50.9	.1508	49.9	51.9	.5879
ED staff at nonreceiving hosp	11.2	6.1	.0007	5.3	6.9	.3692
Other	5.3	2.2	.0019	1.7	2.7	.3646
No on-line med direction	7.1	6.0	.4214	6.2	5.9	.8592
For those who receive on-line medical direction:						
	Metro N=621 %	Non Metro N=708 %	p value	Micro N=343 %	Non-CBSA N=365 %	p value
Can get on-line direction:						
Always	66.0	56.6	.0021	64.5	49.2	.0008
Most of the time	28.1	33.4		27.2	39.3	
Some of the time	3.9	6.1		4.8	7.3	
Rarely	2.0	3.9		3.6	4.2	
Ongoing on-line problems: *(multiple responses allowed)*						
Radio frequency / cell phone signal	14.0	23.9	<.0001	20.4	27.3	.0382
No answer on radio or telephone	17.6	16.2	.5015	14.6	17.7	.2835
Getting physician who can authorize care	9.5	11.6	.2190	11.0	12.2	.6274
Getting physician who knows about EMS capabilities	5.8	7.0	.3953	7.6	6.4	.5264
No ongoing problems	63.0	54.7	.0027	59.8	49.9	.0099

Among the respondent agencies that receive any on-line medical direction, there were significant differences between metropolitan and nonmetropolitan areas (and between the nonmetropolitan categories) in the percent of time such direction could be obtained. Respondents from nonmetropolitan EMS agencies were less likely to report that they could always get the on-line support they needed and the more rural the area, the less likely they were to report that they always received on-line support. The reasons rural agencies could not get on-line support are

typical of communication barriers in rural areas, i.e., difficulty getting a radio frequency or cell phone signal.

The majority of EMS directors, regardless of geographic location, reported that they get off-line medical direction from their DMD (Table 11). To a lesser extent, both metropolitan and nonmetropolitan EMS agencies get off-line direction from other sources such as state EMS agencies or from emergency department staff at their local hospital. Nonmetropolitan agencies are more likely to get off-line direction from another hospital in their service area but the percentage of all agencies that rely on this source of support is small. Other sources of off-line direction mentioned most frequently were county or local EMS agencies.

Table 11: Sources of Off-line Medical Direction for Local EMS Agencies

	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Non-CBSA N=380 %	p value
Get **off-line** med direction from: *(multiple responses allowed)*						
Designated medical director	78.6	79.1	.8023	77.5	80.6	.3007
State EMS office or board	44.0	40.1	.1374	39.9	40.3	.9054
ED staff at local hospital	11.4	14.6	.0726	13.8	15.4	.5346
ED staff at another hospital in service area	11.4	15.0	.0445	13.2	16.7	.1837
Other	10.6	7.6	.0505	8.2	7.2	.6161
No off-line med direction	3.4	3.6	.8781	3.7	3.5	.8817

Recruitment and Retention of EMTs and Paramedics

In 2005, state licensure lists identified approximately 775,000 EMS providers serving our nation's EMS systems, including both volunteer and professional personnel (IOM report, Emergency Care at Crossroads, Table 4-1 pp. 104). EMS providers are commonly classified by skills and training into four levels of competency including first responder, EMT-B(asic), EMT-I(ntermediate), and EMT-P(aramedic). Data from the National Registry of EMTs shows that EMT-Bs represent the largest group of EMS providers, comprising approximately 62% of all registered EMS personnel, 31% are EMT-Ps, and 7% are EMT-I certified (IOM report Figure 4-3, pp.100).

According to the Bureau of Labor Statistics (BLS), the potential for job growth in EMS professions is strong due to demographic and social changes in the U.S. (BLS 2006). Continuing growth and aging of the population is increasing the potential volume and intensity of emergency calls and need for emergency personnel. At the same time, popular media and EMS trade publications suggest that the pool of EMS volunteers is shrinking and EMS systems are being forced to replace volunteer positions with paid ones. Despite projections of extensive job opportunities, recruitment and retention of EMS personnel continues to be a challenge for many EMS systems and the adequacy of the existing supply and distribution of the EMS workforce is currently being examined.[2]

The literature on EMS workforce issues is limited with only a handful of studies that have identified factors that inhibit recruitment and retention for EMS systems. EMS work is physically and emotionally stressful (Cydulka et al, 1997; Boudreaux, 1996), the hours and schedules are undesirable (Boudreaux, 1998), injury and disease exposure are an ever-present risk (Maguire, 2005), compensation and benefits are unexceptional (Patterson, 2005; Beaton, 1993), and training and continuing education requirements are extensive (Patterson, 2005). These realities of the EMS profession can deter new recruits and lead to high levels of burnout among emergency response personnel (Grigsby, 1988).

EMS agencies that depend on volunteers must also cope with the difficulties of relying on staff with competing interests and pressures. Unpaid EMS personnel are typically employed in other occupations and their employers may not always be supportive of an employee who is obligated to be on call 24 hours a day and take time off to respond to emergencies (University of North Dakota, 2000). This concern is especially relevant for rural EMS agencies, which rely heavily on volunteers (NCSL, 2000). Additionally, a study by Patterson et al (2007) found that reasons for entering and staying in an EMS position are different for rural and volunteer EMS agencies, suggesting different incentives and approaches may be necessary for recruitment and retention of personnel in those settings. Still, little empirical knowledge is available regarding the differences between rural and urban EMS agencies regarding recruitment and retention from the perspective of the local EMS director.

[2] HRSA and NHTSA are currently funding the University of California-San Francisco to conduct an EMS Workforce for the 21st Century project.

The second section of the EMS director survey focused on recruitment and retention of EMTs and paramedics, an issue critical to the functioning of community-based EMS agencies. In separate questions, EMS directors were asked if they had problems recruiting or retaining personnel and why.

Findings: Recruitment and Retention

Thirty-seven percent (37%) of all respondents stated that recruiting EMTs and paramedics was always a problem. However, those from nonmetropolitan areas, particularly those located in the most rural areas, reported a significantly greater problem with recruiting necessary staff than did their metropolitan counterparts (Table 12).

For all EMS agencies, regardless of location, a lack of persons willing to become EMTs or paramedics was a major cause of recruitment problems. This unwillingness was related to lack of time and/or interest on the part of community members. Lack of availability was also reported in terms of lack of certified personnel with more than one-half of all EMS agencies, regardless of geographic location, citing this as a barrier. However, in rural areas there were other factors that contributed more significantly to recruitment problems than they did in urban areas. Rural directors were more likely to report that they were volunteer agencies and could not pay their staff and that local employers were not supportive when employees volunteered. A second area of constraint for rural areas involved EMT training programs. Rural directors were more likely to report that training programs for EMTs were too far away, too long, and too expensive.

Table 12: Recruiting EMTs and Paramedics						
	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Neither N=380 %	p value
No problems recruiting	24.3	12.6	<.0001	15.3	10.0	.0004
No, recruit firefighters & train	5.5	4.2		6.1	2.4	
Yes, sometimes a problem	40.9	39.2		41.2	37.2	
Yes, always a problem	29.4	44.0		37.3	50.4	
For those sometimes or always have problems recruiting, why?						
Barriers include: *(multiple responses allowed)*						
Community members have no time to volunteer	57.3	60.1	.3522	60.7	59.6	.7866
Lack of certified EMTs/paramedics in the area	54.4	57.7	.2739	55.0	59.9	.2179
Community members not interested in volunteering	49.9	52.9	.3198	53.6	52.4	.7742
Training programs are too long	36.3	44.1	.0095	44.3	44.0	.9387
Training programs are too far away	13.0	32.0	<.0001	26.1	37.1	.0037
Training programs are too expensive	16.8	25.0	.0011	22.1	27.4	.1339
Community is too isolated	9.3	25.0	<.0001	17.9	31.0	.0002
Pay is not competitive	26.5	23.0	.1847	19.6	25.9	.0669
Volunteer system - cannot pay	17.4	23.4	.0166	23.9	22.9	.7626
Local employers don't support employee volunteers	13.4	19.6	.0067	18.9	20.2	.6975
Benefits are not competitive	18.7	18.1	.8180	13.2	22.3	.0037
Community lifestyle barriers	19.3	15.5	.1004	15.4	15.7	.9172
Too <u>few</u> runs or transports	13.2	12.9	.9016	12.1	13.6	.6039
Fear of disease	3.4	6.4	.0270	7.5	5.4	.2943
Too <u>many</u> runs or transports	7.4	5.1	.1067	6.8	3.6	.0747
Other	8.9	6.4	.1145	7.1	5.7	.4737

While recruiting EMTs and paramedics is a significant problem, retaining them is equally challenging. Fifty-five percent (55%) of all respondents, regardless of location, reported that retaining EMTs and paramedics was sometimes a problem, but rural directors, particularly those in the most rural areas, were more likely to report always having retention problems.

Table 13: Retaining EMTs and Paramedics						
	Metro v. Non Metro			Within Non Metro		
	Metro N=684 %	Non Metro N=741 %	p value	Micro N=361 %	Neither N=380 %	p value
No problems retaining	31.2	23.2	<.0001	26.7	19.8	.0563
Yes, sometimes	55.2	55.2		54.0	56.4	
Yes, always	13.6	21.6		19.2	23.8	
For those who sometimes or always have problems retaining EMTs and paramedics, why:						
Barriers include: *(multiple responses allowed)*						
Time or scheduling conflicts	63.8	65.8	.5084	60.7	70.2	.0174
Burnout, job too stressful	33.6	42.4	.0040	41.6	43.1	.7126
Difficulty meeting continuing education requirements	32.9	40.8	.0096	40.8	40.8	.9929
Inadequate pay	40.0	36.9	.3133	34.7	38.8	.3197
Lack of advancement opportunities	28.4	24.2	.1306	24.4	24.1	.9237
Inadequate benefits	23.1	23.7	.8239	17.9	28.8	.0026
Lack of recognition	21.1	22.5	.6061	19.1	25.4	.0729
Community is too isolated	7.8	21.4	<.0001	15.3	26.8	.0009
Dissatisfaction with other staff	24.7	18.9	.0263	19.1	18.7	.9147
Community lifestyle barriers	18.0	18.4	.8828	19.1	17.7	.6785
Too few runs	15.1	16.0	.6852	14.9	17.1	.4845
Dissatisfaction with administration/management	23.1	13.7	.0001	15.3	12.4	.3206
Dissatisfaction with job duties	12.9	8.6	.0254	8.4	8.7	.8996
Fear of disease	2.0	4.6	.0228	4.2	5.0	.6456
Other	10.2	7.1	.0799	8.4	6.0	.2751

The largest contributors to EMT retention problems, regardless of where an EMS service is located, are time and scheduling conflicts. Sixty-five percent (65%) of all respondents reported these factors as contributing to retention problems. Rural agencies, however, were more likely than urban agencies to lose staff due to burnout or difficulty meeting continuing education requirements.

While pay and benefits are factors that contribute to loss of staff, these problems do not appear to be more prevalent in rural areas. Respondents from rural areas were less likely to report retention difficulties stemming from other organizational characteristics such as dissatisfaction with job duties, with fellow EMTs, or with administration.

In order to better understand the factors associated with recruitment and retention problems in rural areas, two different aspects of nonmetropolitan EMS agencies, affiliation and pay status, are considered (Table 14). Freestanding EMS agencies and those affiliated with hospitals tended to have a greater problem with recruitment than those agencies affiliated with fire departments. However, retention problems did not vary across organizational affiliation types. Pay structure also plays an important role in recruitment and retention. EMS agencies that were staffed entirely by volunteers, a pay structure more common in rural areas, were significantly more likely to have difficulty with recruitment and retention than agencies that had paid staff or a combination of paid and volunteer personnel (Table 14).

Table 14: Problems with Recruitment and Retention of EMTs and Paramedics, by Affiliation of Service and Pay Structure, for Nonmetropolitan Agencies

	Have problem with recruitment %	p value	Have problem with retention %	p value
Affiliation of Service:				
Freestanding (N=367)	88.0	.0002	76.7	.3170
Fire Department (N=280)	75.3		74.8	
Hospital (N=74)	86.5		79.7	
Police, public safety, other (N=16)	93.3		93.8	
Pay structure:				
All paid (N=187)	74.3	.0001	64.5	<.0001
All volunteer (N=359)	88.5		83.0	
Some paid, some volunteer (N=193)	82.3		77.5	

Summary and Discussion

This study finds that rural EMS agencies are different from urban EMS agencies in important ways that affect medical direction and recruitment and retention of EMTs and paramedics. These differences are often more pronounced in the most rural areas. The predominant organizational model in urban areas is fire department-based EMS. In rural areas, EMS agencies are more likely to be freestanding, i.e., not affiliated with another public organization, particularly a fire department. Although EMS agencies that are affiliated with hospitals represent only small portion of all EMS agencies, they are twice as common in rural areas and even more so in the most rural areas. The differences in organizational affiliation have implications for the financial and resource support received by the EMS agency. Other important organizational differences observed pertain to staffing and services provided. Rural agencies are more likely to be staffed by volunteers. They are also more likely to provide transport services, both non-emergency and inter-facility.

Maintaining adequate staffing, in terms of both a Designated Medical Director and EMTs and paramedics, is more of a problem in rural areas. For DMDs, contrary to what one might expect, the predominant barrier is not physician supply but the unwillingness of local physicians to assume this role. Among EMS directors who reported problems recruiting and retaining a DMD, there were no significant differences between urban and rural areas in the barriers reported, but other findings from the study suggest reasons why staffing the rural DMD position might be more difficult. Rural DMDs are less likely to be emergency medicine specialists, which is not surprising as physicians with this specialized training are not likely to be found in smaller communities. A possible implication of this finding, however, is that family medicine and general medicine physicians may be less comfortable serving in a role for which they were not specifically trained. In addition, physicians may be more reluctant to be Designated Medical Directors for volunteers who may work infrequently and whose competencies may require more frequent review and reinforcement.

Our data also suggest that rural physicians serving as DMDs have more demands on their time than their urban counterparts, as they are significantly more likely to be relied upon for on-line medical direction. Coupled with the fact that rural medical practices, without benefit of peer back-up, typically make substantial demands on physicians' time, the added on-call time of serving as a DMD, particularly in a volunteer capacity, may be more than many rural physicians are willing to take on. An important question not specifically addressed by our survey is whether regional programs for on-line support that decrease the demands on local DMDs would make recruiting and retaining these DMDs easier.

Rural EMS agencies also have significantly greater problems recruiting EMTs and paramedics. While some problems, such as lack of persons certified as or willing to become EMTs or paramedics, were reported across all geographic locations, there were other factors that contributed more significantly to recruitment problems in rural areas. Volunteer agencies depend on individuals who may have other paid employment, sometimes at a significant distance from their home, and rural EMS directors were more likely to report that local employers were not supportive of their employees who volunteer. Rural directors were also more likely to cite

problems accessing training for EMTs, noting that training programs are not only too far away but also too long and too expensive.

The percentage of respondents reporting problems retaining staff increased with the level of rurality. While the most frequently cited reason for retention problems, i.e., time and scheduling conflicts, was the same across all geographic regions, rural agencies were more likely to lose staff due to burnout or inability to meet continuing education requirements. Training barriers not only hinder recruitment but also have a similar effect on retention as EMTs must be recertified to maintain their skills and stay up-to-date on changes in clinical practice. One possible solution to the training needs, i.e., continuing education provided by the Designated Medical Director, was noted to be less common in rural areas and was among those DMD functions that both urban and rural EMS directors want but are not getting.

The organizational structure typical of rural EMS agencies, i.e., freestanding services that rely on volunteers, plays an important role in recruitment and retention of EMTs. It is not surprising that freestanding EMS agencies tended to have a greater problem with recruitment than those agencies affiliated with fire departments. Agencies affiliated with fire departments may be able to pay their staff, have an identified career ladder, and have greater resources for training. In our survey, EMS services affiliated with hospitals were also more likely to report problems recruiting and retaining EMTs. While many of the benefits of fire department employment should also apply to hospitals, fire departments have traditionally been the home of EMS. EMTs, particularly those with previous fire department experience, may be reluctant to move to an employment situation where the use of their skills, particularly when not on a run, varies considerably from previous experience.

Lack of pay contributes to recruitment and retention problems for both DMDs and EMTs and paramedics. All-volunteer agencies were the most likely to report problems followed by those that had a combination of paid and volunteer staff. Agencies that paid all their staff were the least likely to report problems. Many volunteer agencies are in what might be described as a Catch-22 situation. In order to raise the revenues to pay staff, maintain and improve equipment, and ensure a full range of services, full-time paid personnel are needed. Full-time administration requires the funds to pay such a staff. Running an EMS service in a rural area is an increasingly complex venture and reliance on the community spirit of volunteers appears to be stretched to its limits.

This study provides valuable information about rural EMS agencies nationally and how they do and do not differ from urban ones. Until now, what was known about recruitment, retention, and medical oversight at the local level was based solely on anecdotal evidence or surveys of state level officials. Our study answers some questions but raises others.

Providing health care services of any kind in rural areas is complex and problems are not subject to simple solutions. EMS is no different and the challenges and barriers identified by rural EMS directors demonstrate that complexity. Population demographics, employment opportunities and economic challenges, distances between population centers and their health care infrastructure, communication barriers related to distance and isolation, and access to specialized education in rural America are all factors that must be considered when discussing how to improve the rural

EMS system. The evolution of EMS organizational structure is a critical consideration. There are barriers to transitioning rural agencies from volunteer services to paid services and these barriers are not just simple economics. Turf issues and the loss of organizational identity that results from moving freestanding EMS agencies to hospitals or fire departments must be considered.

Exploring and field-testing new ways to support rural EMS agencies needs to occur sooner rather than later in order to address rural difficulties in recruiting and retaining DMDs. A single strategy, such as the provision of pay alone will not likely solve the problem in all areas. Other strategies that might be considered include finding ways to change the scope of work for local DMDs. Functions such as the provision of on-line medical direction could be performed, at least in part, by regionally based staff, but funding would be needed to support such an initiative.

In many rural areas, the EMT staff recruitment and retention challenges faced by volunteer EMS must be addressed to assure viability of local EMS agencies. The time that local citizens have to volunteer is likely to decrease rather than increase. With adequate funding, EMS as a paid profession, or at least a part-time one, may make a difference in maintaining rural EMS services and, in a limited way, provide employment opportunities in areas where unemployment is increasing. Also worth consideration is partnering with other organizations such as the local hospital for infrastructure and training support.

Quality EMS as part of a seamless continuum of health care is especially important for rural residents who may have limited health care resources and significant geographic barriers to care. Research in the business and nursing literature finds that there are consequences associated with inadequate staffing include medical errors, adverse events, and significant costs. Access to EMS care is a national Healthy People 2010 priority. Inadequate staffing and medical oversight likely puts the health and safety of rural residents at risk and shifts the burden of providing care to other rural EMS agencies that may also struggle to fill open slots and respond to community need and demand. Limited research in EMS prevents us from knowing the prevalence, causes, and impacts of such problems.

Prior to undertaking wide scale, national initiatives to address these challenges, additional research focused on further defining the problems is needed. Important questions to be answered include the following:

1. What support do local rural physicians need to be able and willing to assume responsibility for medical direction for EMS?
2. What happens when volunteer agencies move toward being paid agencies? What supports need to be in place? How can EMS agencies partner with other organizations to facilitate this change?
3. How can EMS education be brought to rural areas? What is the role of distance learning? Is EMS being integrated with other educational support for rural health care providers?
4. What aspects of affiliation with other organizations impede or enhance the recruitment and retention of EMTs?

References

Beaton, R.D. and Murphy, S.A. (1993). Sources of occupational stress among firefighter/EMTs and firefighter/paramedics and correlations with job-related outcomes. *Prehospital and Disaster Medicine*, 8(2): 140-150.

Benitez, F.L., and Pepe, P.E. (2002). Role of the physician in prehospital management of trauma: North American perspective. *Current Opinion in Critical Care*, 8(6): 551-558.

Boudreaux, E, Jones, G.N., Mandry, C., and Brantly, P.J. (1996). Patient care and daily stress among emergency medical technicians. *Prehospital and Disaster Medicine*, 11(3): 188-93.

Boudreaux, E., Mandry, C., and Brantley, P. (1998). Emergency Medical Technician schedule modification: impact and implications during short- and long-term follow up. *Academic Emergency Medicine*, 5(2): 128-133.

Bureau of Labor Statistics. (2006). *Occupational Outlook Handbook, 2006-2007 Edition: Emergency Medical Technicians and Paramedics.* Available at http://www.bls.gov/oco/ocos101.htm [accessed November 9, 2007].

Cydulka, R.K., Emerman, C.L. Shade, Bl, and Kubincanek, J. (1997). Stress levels in EMS personnel: A national survey. *Prehospital and Disaster Medicine*, 12(2): 136-140.

Grigsby, D.W., and McKnew, M.A. (1988). Work stress burnout among paramedics. *Psychological Reports*, 63(1): 55-64.

Institute of Medicine. (2007). *Emergency Medical Services at the Crossroads.* Washington, DC: The National Academies Press.

Knott, A. (2002). *Access to Emergency Medical Services in Rural Areas: The Supporting Role of State EMS Agencies*. Working Paper No. 38. Minneapolis, MN: University of Minnesota Rural Health Research Center. http://www.hpm.umn.edu/rhrc/pdfs/wpaper/working%20paper%20038.pdf [Accessed online November 27, 2007].

Maguire, B.J., Hunting, K.L., Guidotti, T.L., and Smith, G.S. (2005). Occupational injuries among emergency medical services personnel. *Prehospital Emergency Care*, 9(4): 405-411.

McGinnis KK. Rural and Frontier Emergency Medical Services: Agenda for the Future. National Rural Health Association, 2004.

National Association of Emergency Medical Technicians. *EMS Fast Facts.* www.naemt.org/aboutEMSAndCareers/ems_statistics.htm. [Accessed November 19, 2007].

National Conference of State Legislatures. (2000). *Emergency medical services in rural areas: how can states ensure their effectiveness?* www.ncsl.org/programs/health/Forum/ruralems.htm [Accessed online November 27, 2007].

Patterson, P.D., Probst, J.C., and Moore, C.G. (2005). Recruitment and retention of emergency medical technicians. *The Journal of Allied Health*, 34(3): 153-162.

Patterson, P.D., Freeman, V.A., Moore, C.G., and Slifkin, R.T. (2007). *Becoming an Emergency Technician: Urban-Rural Differences in Motivation and Job Satisfaction.* Working Paper No. 89. Chapel Hill, NC: North Carolina Rural Health Research and Policy Analysis Center. http://www.shepscenter.unc.edu/research_programs/rural_program/WP89.pdf [Accessed November 27, 2007].

Polsky, S., Krohmer, J., Maningas, P., McDowell, R., Benson, N., and Pons, M.P. (2005). Guidelines for medical direction of prehospital EMS. *Annals of Emergency Medicine*, 22(4): 742-744.

University of North Dakota. (2000). *Recruitment and Retention Issues Among North Dakota EMS Personnel.* Rural EMS Initiative Fact Sheet, Number 3. http://ruralhealth.und.edu/pdf/remsifs3.pdf [Accessed online November 27, 2007].