

**Access to Emergency Medical Services in Rural Areas:
The Supporting Role of State EMS Agencies**

Working Paper Series

Astrid Knott, Ph.D.

Rural Health Research Center
Division of Health Services Research and Policy
School of Public Health
University of Minnesota

February 2002

Working Paper #38

Acknowledgments: Support for this paper was provided by the Office of Rural Health Policy, Health Resources and Services Administration, PHS Grant No. CSURC0002-04. The author gratefully acknowledges the support of Mary Hedges, Tim Wiedrich, Mark E. King and the National Association of State EMS Directors (NASEMSD). The author would also like to acknowledge the work of Michelle Brasure in the early stages of this project.

Table of Contents

EXECUTIVE SUMMARY	iii
INTRODUCTION	1
STUDY DESIGN AND DATA	2
RESULTS	3
State EMS Agencies: Funding, Roles, and Regulations	3
Relationship of State EMS Agencies with Federal and State DOT	5
Support of EMS Providers by State EMS Agencies	7
Medical Direction	7
Integration	10
Potential Effects of the New Medicare Ambulance Fee Schedule	13
DISCUSSION	14
REFERENCES	18

EXECUTIVE SUMMARY

The purpose of this study is to improve the limited knowledge about rural EMS and the support of rural EMS by state EMS agencies. A telephone survey of state EMS directors was completed in early 2001 and collected information regarding access to rural EMS, programs and initiatives by state EMS agencies that target rural and volunteer EMS providers, integration initiatives by rural EMS providers, issues in medical direction for rural EMS, and anticipated effects of the new Medicare fee schedule on rural EMS providers.

State EMS agencies are to a large part state-funded and have mainly regulatory and policy-making obligations. A variety of state agencies are responsible for EMS issues which illustrates substantial state-by-state variation in the approach to EMS issues. The range of approaches to EMS at the state level will need to be taken into account in formulating national EMS policy.

EMS system development has not been a priority in state efforts. Less than a third of the states in the study have a statewide EMS plan. The absence of an EMS plan indicates either a low state priority for development and maintenance of the EMS system or a lack of funds to address the issue. A key issue is who will take on the planning responsibility for this critical part of the health care system.

State EMS agencies address rural EMS provider needs in a limited manner. Twenty-nine percent of state EMS agencies provide services and/or programs that specifically address the needs of rural EMS providers in their state. In concordance with their regulatory and policy-making charges, EMS state agencies focus on regulation and funding of EMS providers, with approximately a third providing technical assistance to EMS providers. This raises the question of who will fill the technical assistance void. In some states other agencies and organizations may attempt to address issues such as medical direction.

Medical direction in rural EMS has been identified as a major issue for a majority of states. However, few states place high priority on medical direction in their efforts to support EMS providers.

Integration – between EMS agencies, between EMS and hospitals, and between EMS and other health services – is sometimes seen as a panacea to the problems inherent in rural EMS. Our study suggests that EMS integration is not readily accomplished. While integration between EMS providers occurs more frequently, more innovative approaches – such as integration between EMS and public health or the use of EMTs in emergency rooms – are not common.

The limited availability of local data on EMS hinders the evaluation of the impact of changes in federal and state policy on EMS. Data issues have been identified as a major obstacle and a number of initiatives are underway to attempt to improve the situation, including a survey by the National Association of State EMS Directors on the feasibility of a national EMS database.

The development of the EMS system in the 1970s was fueled by federal funds. In the absence of major federal funding initiatives, the development of EMS has become a state and local issue, which has resulted in a fragmented system. There are currently three sources of federal funds for EMS: the Highway Safety Program administered by the National Highway Traffic Safety

Administration, the EMS for children (EMS-C) program administered by the Maternal and Child Health Bureau (HRSA), and the Preventive Health and Health Services Block Grant. These programs are restricted to certain problems (motor vehicle crashes), populations (children), or state priorities and are limited in their ability to address EMS system issues. The time is right for a new national initiative to address EMS issues and to stimulate the development of EMS as a system, beyond its current fragmented state.

INTRODUCTION

On average, U.S. residents need emergency medical services (EMS) twice in their lifetime (Office of Technology Assessment, 1989). EMS is an integral part of the health care system and is especially important in less densely populated areas where access to health care services often involves traveling longer distances.

The emergence of the EMS system as we know it today was facilitated by federal support. The EMS Act of 1973 (P.L. 93-154) and the resulting federal categorical grant program were designed to facilitate regional emergency medical services planning with EMS regions designated throughout the U.S. However, as a result of cutbacks in federal funding in the 1980s, the EMS system remains fragmented and states approach emergency medical services with a range of strategies.

More recently, the role and vision for emergency medical services has been changing, presenting new challenges for the system. The “EMS Agenda for the Future” envisions an EMS system that is integrated with the health care system, improves community health, and has an efficient communication and operation infrastructure (Martinez, 1998; National Highway Traffic Safety Administration, 1996).

Despite these efforts, the available research and policy analysis on rural EMS systems consists primarily of case studies of local pre-hospital EMS systems or descriptive studies of multi-county areas or single states. The limited research on EMS is primarily due to the fragmentation of the system and only rudimentary data collection efforts.

The problems faced by emergency services providers have begun to receive renewed national attention stemming from the Balanced Budget Act (BBA) of 1997 which includes two important provisions specific to EMS. First, the BBA changes reimbursement policies for

providers of ambulance services by introducing a new Medicare ambulance fee schedule. Second, the Medicare Rural Hospital Flexibility Program encourages small rural hospitals to become Critical Access Hospitals (CAHs). One of the requirements for a CAH is the existence of a 24-hour emergency room.

These policy changes in combination with market-based developments (e.g. continued recruitment and retention issues for rural health personnel) will affect the provision of EMS to rural populations and have the potential to reduce access to EMS services.

STUDY DESIGN AND DATA

In January and February 2001, we completed a telephone survey of state EMS directors asking questions regarding access to rural EMS, issues in medical direction for rural EMS, programs and initiatives by state EMS agencies that target rural and volunteer EMS providers, integration initiatives by rural EMS providers, and anticipated effects of the new Medicare fee schedule on rural EMS providers. Initial contact with the state EMS directors was made through an informational letter that included an endorsement of the study by the National Association of State EMS Directors (NASEMSD). We chose to collect information from state agencies responsible for EMS, rather than from local EMS entities, because of the large expense and time required to collect data at the local level.

Connecticut, New Jersey, and Rhode Island were excluded from the survey because these states do not have rural counties according to the MSA/non-MSA standard. 45 of the remaining 47 states answered the survey, a response rate of 95.7 percent.

RESULTS

This section explores the roles and funding of state EMS agencies and their working relationship with the other main agency responsible for EMS, the Department of Transportation. It focuses on the activities of state EMS agencies that assist rural EMS providers and the issue of medical direction. Finally, EMS integration activities are discussed as well as the potential impact of the new Medicare ambulance fee schedule.

State EMS Agencies: Funding, Roles, and Regulations

Most (71%) state EMS agencies report to state health departments. Twenty-four percent report to other state agencies (e.g. governor, public safety, EMS advisory council), and four percent report to their own board. In addition, in 3 states (7%) the Department of Transportation has responsibilities for rural EMS. There are a range of approaches to EMS at the state level which will need to be taken into account in formulating national EMS policy.

State appropriations are the most important source of funds for state agencies. On average, agencies that receive funds from state appropriations receive 65 percent of their budget from this source. Fees and federal grants are the second and third largest sources of funds. Federal grants contribute about one fifth of the budget (but are considerably larger in some cases) and fees account for approximately 12 percent of the budget.

The vast majority of state EMS agencies describe the charge of their agency as regulatory and policy-making. The rest are charged with regulatory and policy-making duties but also provide direct service, technical assistance, or services/support for providers. The focus on regulation and policy-making raises the issue of who provides support, such as technical assistance, training courses, and funding, to local EMS agencies.

TABLE 1
Funding Sources for State EMS Agencies
(n=44)

Funding Source	% of Total Budget	% of Total Budget for Agencies Receiving Funds from this Source	Number of State Agencies that Receive Funds from this Source
State appropriations	60.8	65.2	41
Fees	11.8	36.9	14
Federal grants	20.8	30.7	30
Private grants	0.2	10.0	1
Other (e.g., special education trust fund, tobacco settlement trust fund, \$2 surcharge on all vehicle registrations dedicated to EMS, safety belt violation fund, a small attachment from moving violations fund, Medicaid administrative fund)	6.4	46.7	6

Less than a third (31%) of the states in the study have a statewide EMS plan. Slightly less than half of the states without a plan are developing one. The limited number of states with an EMS plan is likely related to state EMS agencies having primarily regulatory responsibilities rather than responsibilities for the development of the statewide EMS system.

Ninety-eight percent of the states have statewide minimum requirements regarding staff, equipment and/or other issues. When asked which parts of the state had stricter than minimum requirements, 71 percent of states said that urban areas had stricter requirements, 41 percent said rural areas, and 14 percent said ambulance districts. All of the areas with stricter requirements had stricter staffing requirements.

Relationship of State EMS Agencies With Federal and State DOT

Almost half of the state EMS agencies have little or no contact with the federal Department of Transportation (DOT). Close to a third had contact with the federal DOT because they received support from the State and Community Highway Safety Grant Program (i.e. section 402 funds) or used the training materials and curricula developed by the DOT. Only two states described the DOT as an important partner.

A large majority of state EMS agencies work closer with the state DOT (87%). Approximately half of the agencies work with the DOT on injury prevention and highway safety which are traditional areas of cooperation, 13 percent collaborated on data collection and IT systems issues and 11 percent administered 402 funds and/or grants.

TABLE 2

**Parts of the State that Have Stricter than Minimum Requirements for the
Operation and Maintenance of Ambulance Squads
(n=44)**

Stricter Requirements In	Percent	Stricter Requirements		
		Training (%)	Staffing (%)	Equipment (%)
Urban areas	71.1	59.4	100.0	71.9
Rural areas	40.9	61.1	100.0	72.2
Ambulance districts	14.0	66.7	100.0	66.6

Support of EMS Providers by State EMS Agencies

The survey elicited information on the support for EMS providers in general and rural and volunteer EMS providers specifically. When asked about the three most important areas in which state EMS agencies provide help to EMS providers, frequent responses were regulatory (81%), followed by providing and/or administering funds (64%), and technical assistance (38%). Also mentioned were training and testing (24%), data collection/interpretation/QA (13%), and coordination/communication (11%). Medical direction was identified by only two states. Twenty-nine percent of state EMS agencies provide services and/or programs that specifically address the needs of *rural* EMS providers in their state.¹ These programs include training and testing, recruitment and retention, provision and/or administration of grants, and information technology.

Forty percent of states provide services that specifically address the needs of *volunteer* EMS providers. The programs provided are similar to those that address rural EMS and include recruitment/retention, training, and funding. There is little overlap between agencies that provide programs for rural EMS and those with programs for volunteer EMS. Four agencies provide services to address both rural and volunteer EMS needs, nine focus on rural EMS needs exclusively and fourteen on volunteer EMS needs exclusively.

Medical Direction

Only two state agencies identified medical direction as one of the three most important areas in which they provide support to local EMS providers. The low priority of both medical direction and data collection and QA issues is surprising since medical direction was identified as an important issue for rural EMS in a survey by the NASEMSD (Bailey, 2000) and the lack of

¹ The average percentage of the population that is rural is 28.6% in states that provide specific programs and 34.5% in states that do not (t-test not statistically significant).

uniform data and quality monitoring systems has been identified repeatedly. The EMS Agenda for the Future lists the lack of integrated information systems as a major impediment to quality EMS research (National Highway Traffic Safety Administration, 1996).

Almost two thirds of state EMS directors perceived medical direction to be a significant problem for rural EMS providers in their state. Mirroring problems for rural EMS in general, recruitment was the most frequently mentioned issue with regard to medical direction followed by concerns regarding the qualifications of the medical directors, especially the lack of training in emergency medicine (Table 3). Medical directors are likely to be local primary care physicians for whom medical direction of one or more EMS squads is an additional responsibility after providing office based care, covering call and/or the hospital ER. Primary care physicians generally have only limited experience with emergency medicine during their training.

The third issue is the lack of involvement of the medical director in the operations of the squad which raises questions about the quality of care provided. The lack of involvement may be related to the large number of other demands placed on the physician in a rural community or unfamiliarity with EMS operations.

The issues in medical control are manifold. Rural areas face a general shortage of physicians and residency-trained emergency medicine physicians are no exception. They tend to practice in urban areas (Anwar, 1983), leaving primary care physicians to cover rural ERs (Haskins & Kallail, 1994; McGirr et al., 1998) and provide medical oversight for ambulance services. Studies have found discomfort with trauma management among recent family practice graduates (Hall & Nowels, 2000; Norris et al., 1996) suggesting that this topic is not adequately addressed in residency training for family practitioners.

TABLE 3
Medical Direction Issues and Problems*
(n=28)

	%
• Recruiting difficulties	32.3
• Qualifications of the medical director (educational background, lack of training in emergency medicine)	17.6
• Lack of involvement in the squad by the medical director (“rubber stamp” positions)	16.2
• QA/QI concerns (sporadic medical director training, lack of QA data, systems, and protocols)	11.8
• Training concerns (lack of funds, have to train individually, no central training model, volunteer positions)	7.4
• Issues with off-line direction and education because of geographic isolation	2.9

*Respondents were asked to identify up to three items.

In summary, the problems in medical direction are concentrated on issues of off-line medical direction such as the recruitment and suitability of the medical director and the involvement of the medical director in the operation of the squad.

State EMS agencies undertake a number of different efforts to address medical direction issues. The most common activity is training (80%). Agencies regulate, develop, and/or directly provide training for medical directors. In a number of states, training courses or conferences for medical directors are provided annually. Three states mentioned developing an internet-based training course, a fourth state already had such a course.

Approximately one quarter of states have developed or are developing protocols. Some of these states have statewide protocols that are developed specifically to support medical directors. Others have developed regional protocols or protocols for first responders. The development of protocols at the state level reduces the work for medical directors. In addition, it encourages uniform statewide practices, making it easier for personnel to work for different services and supporting QA efforts.

In more than half of the states, other organizations were involved in improving medical direction. These organizations include advisory councils and boards (8), state offices of rural health (6), physician associations (6), EMS and ambulance associations (3), medical and other boards (2), hospitals and health care providers (2), and other organizations (3). These organizations and institutions focus their efforts on programs that are similar to those pursued by state EMS agencies including training, developing protocols, funding, and recruiting.

Integration

Integration has been described as the “horizontal and vertical linkage of health care providers to achieve a higher degree of continuity of services and ... greater efficiency.”

(National Rural Health Association, 1997) In the survey, integration was defined as the coordination and sharing of resources and personnel, and/or the linkage with other community health resources to ensure that care does not occur in isolation and to enhance outcomes.

Integration has been heralded as a potential solution to the recruitment, retention and other problems of rural EMS. However, the survey results indicate that integration is hard to accomplish. The most common form of integration is between different EMS providers and includes mutual aid in training and personnel sharing, EMTs working and volunteering for different providers, county-wide EMS councils, development of a network model that encourages the sharing of training resources and billing and administrative functions and expertise (Table 4).

Integration between pre-hospital providers and hospital ERs is the second most common form of integration. A third of the state EMS directors report that this form of integration occurs frequently or occasionally in their state. In six of these fifteen states, integration was related to medical direction, primarily through links between medical direction and training or medical direction being provided by hospitals. Three states specifically mentioned integration at or between Critical Access Hospitals (CAHs), via the sharing of staff and training responsibilities. Two states mentioned the use of EMS personnel from hospital-based EMS in ERs. One state introduced new legislation that allows EMTs to train and work in ERs.

One fifth of state directors reported that cross-training of EMS personnel for ER skills occurs frequently or occasionally. Some states mentioned that rural hospitals are integrating for efficiency and continuity reasons and integration appears to be increasing because of the nursing shortage.

TABLE 4
The Use of Integration to Address Barriers and Issues Facing Rural EMS
(n=45)

Approach	Never (%)	Rarely (%)	Occasionally (%)	Frequently (%)
Integration between EMS providers	6.7	46.7	33.3	13.3
Integration between pre-hospital providers and hospital emergency departments	4.4	62.2	22.2	11.1
Expanded scope of practice for EMTs by				
• Cross-training for ER Skills	4.4	75.6	15.6	4.4
• Rotations through Hospital ER	2.2	53.3	33.3	11.1
• Public Health	20.0	77.8	2.2	0.0

Potential Effects of the New Medicare Ambulance Fee Schedule

Three quarters of state EMS directors expect that the new Medicare ambulance fee schedule will affect rural and urban EMS providers differently. Sixty percent of those EMS directors expect that rural providers will benefit, mainly because of anticipated improvements over current billing practices. Five states anticipate a detrimental impact of the fee schedule on ALS providers with a high likelihood for cutbacks from ALS to BLS service.

Twenty-eight state directors were able/willing to provide an estimate of the percentage of EMS providers currently accepting Medicare assignment (average 77.5%, range 10-100%). Only three states do not allow all-volunteer services to bill or collect fees. Of the remaining 42 states, three have a cap on fees that all-volunteer services are allowed to collect.

The assessment of the financial situation of rural EMS providers is limited since only three state EMS agencies collect financial data on the EMS providers in their state. No state EMS agency was aware of other agencies collecting this type of data. This severely restricts the ability to describe the operations of EMS providers and evaluate the impact of proposed or implemented policies such as the new Medicare ambulance fee schedule.

The lack of data on EMS providers at the state and national level is well documented. The complexities of collecting financial data for the universe of EMS providers are described by Mohr and Good (1999) in their efforts to inform the rule-making process for the new Medicare ambulance fee schedule. The lack of EMS data also was the subject of a recent survey which assessed the feasibility of establishing a national EMS database (National Association of State EMS Directors, 2000).

Although state agencies do not collect financial data, 38 responded to a question on the fiscal stability of rural EMS providers in their state. On average, 45 percent of rural EMS

providers were classified as financially unstable with extreme variability in the responses (i.e. Hawaii and Vermont 0%, Illinois and Iowa 97% and Massachusetts 100%).

DISCUSSION

State EMS agencies are to a large part state-funded and have mainly regulatory and policy-making obligations. In concordance with these obligations, the support provided to EMS agencies focuses on regulation and funding of EMS providers, with only a little more than a third of state agencies providing technical assistance to EMS providers. Surprisingly, only 13 percent of state EMS agencies provided support in the area of data collection, data interpretation, and quality issues. Data issues have been identified as major obstacles to the development of EMS research (National Highway Traffic Safety Administration, 1996) and NASEMSD recently conducted a study on the feasibility of a national EMS database (National Association of State EMS Directors, 2000). Less than half of the state EMS agencies provide services that specifically address volunteer and/or rural EMS issues, such as special training programs for skill maintenance, management support, and funding or grants.

Given their position in state bureaucracies, their dependence on state funding, and their missions, the focus of state EMS agencies on regulation and funding rather than technical assistance is understandable. However, this raises the question of who fills the technical assistance void. As mentioned earlier, there are other agencies and organizations in some states that may attempt to address issues such as medical direction. However, only about half the states benefited from having other agencies that worked on improving medical direction and this approach may not work for other issues.

Medical direction has been consistently identified as a problem issue for rural EMS. A 2000 survey of state EMS directors ranked medical oversight as the second most important issue

in rural EMS behind recruitment and retention (Bailey, 2000). Although almost two thirds of respondents perceived medical direction as a major issue for rural EMS providers in their state, only two state agencies mentioned medical direction as one of the top three areas in which they provided help to EMS providers.

The need for adequate preparation of medical directors for their duties has been recognized. The National Highway Traffic Safety Administration (NHTSA) and the Maternal and Child Health Bureau (MCHB) recently commissioned a guide on how to prepare medical directors from the National Association of EMS Physicians (NAEMSP) and the American College of Emergency Physicians (ACEP) (National Association of EMS Physicians & American College of Emergency Physicians, 2001). One of the stated goals of the “EMS Agenda for the Future” is to ensure that each state has a designated state EMS medical director (National Highway Traffic Safety Administration, 1999). NHTSA also noted that medical direction is often volunteered or compensated by hospitals with limited incentives to continue this support (National Highway Traffic Safety Administration, 1996).

Most states do not have a statewide EMS plan, most likely because of the focus of state EMS agencies on regulatory and policy-making roles rather than on the development of the EMS system. The absence of an EMS plan indicates that a state does not see the development and maintenance of the EMS system as a state priority or lacks the funds to address the issue. A key issue is who will take on the planning responsibility for this critical part of the health care system.

Integration – between EMS agencies, between EMS and hospitals, and between EMS and other health services – is sometimes seen as a panacea to the problems inherent in rural EMS. However, our results suggest that integration is not readily accomplished. While integration

between EMS providers occurs more frequently, more innovative approaches – such as integration between EMS and public health or the use of EMTs in emergency rooms – are not common. Recent trends in the health care sector, such as the nursing shortage and efficiency concerns, may stimulate new integration approaches.

Two caveats should be mentioned when considering our data on EMS integration. First, the use of EMTs in emergency departments may face legal barriers as well as opposition from other health care providers, such as nurses. Second, state EMS agencies may not be aware of every innovative integration strategy being used at the local level.

A large proportion of rural EMS providers are considered to be financially unstable, with substantial variation across states. This represents a considerable threat to rural EMS and to access to emergency health care in rural areas. More detailed information on financial issues is hard to obtain since few state agencies collect financial information from their EMS providers. However, a large number of states anticipate that the implementation of the new Medicare fee schedule will benefit rural EMS providers.

The beneficial impact primarily is due to current poor billing and collection practices and the lower costs of a substantial number of rural EMS providers that use volunteers. The impact of the fee schedule will vary from state to state depending on current reimbursement rates. EMS services that have been heavily subsidized by states or localities, have billed at low levels or not at all or have an unpaid volunteer workforce are likely to benefit, while services with paid personnel and those that have billed at full cost in the past are likely to face reduced reimbursement. The impact of the fee schedule is a state by state issue rather than an urban vs. rural issue. State EMS directors anticipate cutbacks in ALS services in states that project a negative impact of the fee schedule. The current structure of the new fee schedule provides

disincentives to move to paid EMS squads in rural areas, which is one way of addressing the dwindling number of EMS volunteers.

The importance of EMS to the rural health care system and the precarious situation rural EMS finds itself in have been recognized. Both the National Conference of State Legislatures and the National Rural Health Association have outlined these issues in briefs (National Conference of State Legislatures, 2000; National Rural Health Association, 1997).

There are currently three programs that provide federal funds for EMS: the Highway Traffic Safety Program (section 402) administered by NHTSA, the EMS for Children Program (EMS-C) originating with the Maternal and Child Health Bureau (MCHB) at HRSA, and the Preventive Health and Health Services Block Grant. These programs address major issues in emergency medical care, but are limited by their focus on specific problems (e.g., motor vehicle crash injuries and fatalities), populations (e.g., emergencies involving children) or state priorities.

Given the lack of success in developing an integrated EMS system over the last two decades and the variability of state approaches and priorities placed on EMS, it is time to consider a new national initiative to stimulate the development of EMS as a system, beyond its current fragmented state.

REFERENCES

- Anwar, R. “A Longitudinal Study Of Residency-Trained Emergency Physicians.” *Annals of Emergency Medicine* 12:20-24, 1983.
- Bailey, B. “NASEMSD Rural EMS Survey.” Paper presented at the 23rd Annual Conference on Rural Health, New Orleans, LA, May 24-26, 2000.
- Hall, W. and Nowels, D. “Colorado Family Practice Graduates' Preparation for and Practice of Emergency Medicine.” *Journal of the American Board of Family Practice* 13:246-250, 2000.
- Haskins, R. and Kallail, K. “Staffing in Small Rural Hospital Emergency Rooms: Dependence on Community Family Physicians.” *Family Practice Research Journal* 14:67-75, 1994.
- Martinez, R. “New Vision for the Role of Emergency Medical Services.” *Annals of Emergency Medicine* 32:594-599, 1998.
- McGirr, J., Williams, J., and Prescott, J. “Physicians in Rural West Virginia Emergency Departments: Residency Training and Board Certification Status.” *Academic Emergency Medicine* 5:333-336, 1998.
- Mohr, P. and Good, C. “Design of a National Survey of the Cost of Providing Ambulance Services: Phase I Report.” Bethesda, MD: Project HOPE Center for Health Affairs, 1999.
- National Association of EMS Physicians, & American College of Emergency Physicians. *Guide for Preparing Medical Directors*, 2001.
- National Association of State EMS Directors. *National EMS Database Feasibility Survey*. Falls Church, VA, 2000.
- National Conference of State Legislatures. *Emergency Medical Services in Rural Areas: How Can States Ensure Their Effectiveness?*, National Conference of State Legislatures. Available: [wysiwig://88/http://www.ncsl.org/programs/health/Forum/ruralems.htm](http://www.ncsl.org/programs/health/Forum/ruralems.htm) [2001, April 23].
- National Highway Traffic Safety Administration. *Emergency Medical Services. Agenda for the Future*. Washington, DC, 1996.
- National Highway Traffic Safety Administration. *Emergency Medical Services. Agenda for the Future. Implementation Guide*. Washington, DC, 1999.
- National Rural Health Association. *Rural and Frontier Emergency Medical Services Toward the Year 2000. Analysis and Policy Recommendations. An Issue Paper*. Washington, DC: National Rural Health Association, 1997.

Norris, T., Coombs, J., and Carline, J. “An Educational Needs Assessment of Rural Family Physicians.” *Journal of the American Board of Family Practice* 9:86-93, 1996.

Office of Technology Assessment. *Rural Emergency Medical Services - Special Report*. Washington, DC: U.S. Government Printing Office, 1989.

Previous Working Papers

1. Moscovice, I., Wellever, A., Sales, A., Chen, M., and Christianson, J., *Service Limitation Options for Limited Service Rural Hospitals*, March 1993.
2. Christianson, J., Moscovice, I., Hartley, D., Chen, M., and Nelson, D., *The Structure of Rural Hospital Medical Staffs*, March 1993.
3. Christianson, J. and Moscovice, I., *Health Care Reform: Issues for Rural Areas*, May 1993.
4. Wellever, A., Moscovice, I., Chen, M., *A DRG-based Service Limitation System for Rural Primary Care Hospitals*, December 1993.
5. Hartley, D. and Moscovice, I., *The Mobile Hospital Technology Industry: Focus on the CT Scanner*, March 1994.
6. Moscovice, I., Christianson, J., Wellever, A., *Measuring and Evaluating the Performance of Vertically Integrated Rural Health Networks*, May 1994.
7. Wellever, A., *Hospital Labor Market Area Definitions Under PPS*, October 1994.
8. Casey, M., Wellever, A., Moscovice, I., *Public Policy Issues and Rural Health Network Development*, December 1994.
9. Yawn, B., Krein, S., Christianson, J., Hartley, D., Moscovice, I., *Rural Radiology: Who is Producing Images and Who is Reading Them?*, February 1995.
10. Casey, M., *Integrated Networks and Health Care Provider Cooperatives: New Models for Rural Health Care Delivery and Financing*, November 1995.
11. Krein, S., *The Employment and Use of Nurse Practitioners and Physician Assistants by Rural Hospitals*, December 1995.
12. Christianson, J. and Hart, J. *Employer-Based Managed Care Initiatives in Rural Areas: The Experience of the South Dakota State Employees Group*, February 1996.
13. Manning, W., Christianson, J., and Chen, M. *The Effect of Change in PPS Payment Status on Rural Hospital Performance*, March 1996.
14. Yawn, B. and Krein, S. *Rural Enrollment in State Health Insurance Programs: The Minnesota Experience*, March 1996.
15. Wellever, A., Hill, G., Casey, M., Kauley, M., and Hart, P. *State Health Care and Medicaid Reform Issues Affecting the Indian Health Care System*, April 1996.
16. Krein, S., and Christianson, J. *The Composition of Rural Hospital Medical Staffs: The Influence of Hospital Neighbors*, June 1996.
17. Wellever, A., Casey, M., Krein, S., Yawn, B., and Moscovice, I. *Rural Physicians and HMOs: An Uneasy Partnership*, December 1996.
18. Motenko, N., Moscovice, I., and Wellever, A. *Rural Health Network Evolution in the New Antitrust Environment*, May 1997.
19. Casey, M. *Serving Rural Medicare Risk Enrollees: HMOs' Decisions, Experiences, and Future Plans*, November 1997.
20. Yawn, B., Casey, M., and Hebert, P. *Will Guideline Implementation Increase Rural Health Care Work Force Demand? The Case of Diabetes Mellitus*, December 1997.
21. Wellever, A., Radcliff, T., and Moscovice, I. *Local Control of Rural Health Services: Evaluating Community Options*, February 1998.
22. Hebert, P., Yawn, B., and McBean, A. *Identifying Rural Elderly Individuals with Diabetes Mellitus Using Medicare Claims Data*, March 1998
23. Call, K. *Rural Beneficiaries with Chronic Conditions: Assessing the Risk to Medicare Managed Care*, May 1998.

24. Christianson, J., Wellever, A., Radcliff, T., and Knutson, D. *Implications for Rural Health Care of Linkages with Urban Health Service Delivery Systems*, June 1998.
25. Wellever, A. and Radcliff, T. *The Contribution of Local Government Financing to Rural Hospitals and Health Systems: Marginal Benefit or Safety Net?* November 1998.
26. Casey, M. and Brasure, M. *The NCQA Accreditation Process: Do HMOs Serving Rural Areas Apply for and Obtain Accreditation?* December 1998.
27. Casey, M. *State HMO Accreditation and External Quality Review Requirements: Implications for HMOs Serving Rural Areas*, January 1999.
28. Brasure, M., Moscovice, I., and Yawn, B. *Rural Primary Care Practices and Managed Care Organizations: Relationships and Risk Sharing*, February 1999.
29. Casey, M. and Klingner, J. *HMOs Serving Rural Areas: Experiences with HMO Accreditation and HEDIS Reporting*, May 1999.
30. Brasure, M., Stensland, J., and Wellever, A. *Quality Oversight: Why Are Rural Hospitals Less Likely To Be JCAHO Accredited?* September 1999.
31. Wellever, A., Wholey, D., and Radcliff, T. *Strategic Choices of Rural Health Networks: Implications for Goals and Performance Measurement*, January 2000.
32. Stensland, J., Brasure, M., and Moscovice, I. *Why Do Rural Primary-Care Physicians Sell Their Practices?* June 2000.
33. Stensland, J., Moscovice, I., Christianson, J. *The Financial Viability of Rural Hospitals in a Post-BBA Environment*, October 2000.
34. Casey, M., Call, K., Klingner, J. *The Influence of Rural Residence on the Use of Preventive Health Care Services*, November 2000.
35. Knott, A. and Christianson, J. *A Rural Government Role in Medicaid Managed Care: The Development of County-based Purchasing in Minnesota*, January 2001.
36. Casey, M., Klingner, J., and Moscovice, I. *Access to Rural Pharmacy Services in Minnesota, North Dakota, and South Dakota*, July 2001.
37. Stensland, J. and Moscovice, I. *Rural Hospital's Ability to Finance Inpatient, Skilled Nursing and Home Health Care*, October 2001.
38. Knott, A. *Access to Emergency Medical Services in Rural Areas: The Supporting Role of State EMS Agencies*, February 2002.

Monographs

1. Wellever, A., Moscovice, I., Hill, T., and Casey, M., *Reimbursement and the Use of Mid-Level Practitioners in Rural Minnesota*, January 1993.
2. Yawn, B., Wellever, A., Hartley, D., Moscovice, I., and Casey, M., *Access to Obstetrical Services in Rural Minnesota*, February 1993.
3. Hartley, D., Wellever, A., and Yawn, B., *Health Care Reform in Minnesota: Initial Impacts on a Rural Community*, December 1993.
4. Yawn, B., Hartley, D., Krein, S., Wellever, A., and Moscovice, I., *Obstetrical Services in Rural Minnesota, 1993*, January 1994.
5. Hartley, D., *American Indian Health Services and State Health Reform*, October 1994.
6. Moscovice, I., Wellever, A., Christianson, J., Casey, M., Yawn, B., and Hartley, D. *Rural Health Networks: Concepts, Cases and Public Policy*, April 1996.
7. Moscovice, I., Casey, M., and Krein, S. *Rural Managed Care: Patterns and Prospects*, April 1997.

8. Moscovice, I., Wellever, A., and Krein, S. *Rural Health Networks: Forms and Functions*, September 1997.
9. Moscovice, I., Brasure, M., and Yawn, B. *Rural Physician Risk-Sharing: Insights and Issues*, April 1998.
10. Moscovice, I., Casey, M., Wellever, A., and Yawn, B. *Local Public Health Agencies & Managed Care Organizations in Rural Areas: Opportunities & Challenges*, June 1998.
11. Christianson, J., Wellever, A., Casey, M., Krein, S., Moscovice, I., and Yawn, B. The Growing Presence of Managed Care in Rural Areas. *The Journal of Rural Health* (Special Issue), 14(3):166-278 Summer, 1998.
12. Moscovice, I. and Rosenblatt, R. *Quality of Care Challenges for Rural Health*, January 1999.
13. Yawn, B. *Telemedicine: A New Framework for Quality Assessment*, June 1999.
14. Moscovice, I., Wellever, A., and Stensland, J. *Rural Hospitals: Accomplishments & Present Challenges*, July 1999.
15. Gregg, W. and Moscovice, I. *Rural Health Network Development Grant Program - Monitoring Report Fiscal Year 2000*, January 2001.
16. Casey, M., Knott, A., and Moscovice, I. *Medicare Minus Choice: How HMO Withdrawals Affect Rural Beneficiaries*, October 2001.

Single copies are available from:

Jane Raasch
Rural Health Research Center
Division of Health Services Research & Policy
School of Public Health, University of Minnesota
420 Delaware Street SE, MMC 729
Minneapolis, MN 55455
Phone: 612-625-0955 Fax: 612-624-2196
<http://www.hsr.umn.edu/centers/rhrc/rhrc.html>