

Traffic Safety Facts

Traffic Tech – Technology Transfer Series

Configurations of EMS Systems: A Pilot Study

Background

Emergency medical services (EMS) are configured differently depending on factors such as size, demographics, geography, and politics of the local communities they serve. Information exists about the EMS configurations in the Nation's largest cities, but information is lacking with regard to less populated areas, which comprise 75% of the Nation's population. What evidence does exist indicates wide variability in system structure with little evidence to support alternative configurations in terms of their service delivery. The aim of this project was to pilot a survey that could document the presence and structural characteristics of local EMS systems. Such a survey is needed to create a typology of EMS configurations so they may be evaluated on a common basis.

Methods

The Mid-Atlantic region chosen for this pilot study included Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia, and the District of Columbia. This region was chosen because of expected variability of EMS systems and organization and because of diverse geographic and demographic composition. Counties were classified into five rurality levels, ranging from large metropolitan to completely rural.

An EMS system was defined as, "an identifiable local entity within a State EMS system's administrative hierarchy below the State level and immediately above the level of an individual provider agency." This definition allowed evaluation at a level close to localities served by care workers and measurement of features that went beyond the limits of single agencies. Most systems identified were at a county level, with a handful of systems representing multi-jurisdictional areas, independent cities, or miscellaneous systems. The map on the next page depicts how system and non-system counties varied across the study region.

System directors completed surveys designed to gather data about system size, 911 access, agency types, response configurations, operating procedures, mutual aid agreements, medical control, and funding. Certain localities were defined as non-systems. Such counties were sent an abbreviated survey.

Results

System Size. Two hundred seventy-three systems and 82 non-system counties were identified across the survey region. No

systems were identified in New Jersey. The response rate of regions with systems was higher (86.1%) than non-systems (56%). System size was characterized by information on: (1) number of EMS care workers (at all levels, including volunteers); (2) annual number of EMS responses; and (3) annual number of EMS transports.

911 Access. Most respondents (94%) report availability of E-911, but only 59% report that access is available through wireless. Access through wireless E-911 varies by State and rurality. As expected, wireless E-911 is less available in more rural systems and in smaller systems.

Dispatch, Response, and Transport. Most respondents (60%) report that multiple agencies are involved in first response and transport activities. Most respondents (70%) indicate that a fire department provides these services and 52% report that the fire service is the primary group responsible for first response. Large systems are significantly more likely to use fire-based first response than smaller locales. Dispatch was reported to be handled primarily by communications departments for 48% of systems, with an additional 22% served by a public safety department. The agency that provided first response, transport, and dispatch varied across the sample. Nearly all systems (98%) use first responders, and 80% of respondents said that advanced life support transport was most frequently dispatched to 911 calls.

The majority of respondents (86%) reported using volunteers, with fewer serving in larger systems. Two-thirds of respondents noted that call coverage is a major concern due to staffing shortages, and this is more prevalent among less urban systems.

Mutual Aid. Most respondents (94%) report the presence of mutual aid agreements, but the specific components varied widely across the sample. Most agreements (88%) addressed service coverage; one-half addressed communication linkages; and one-third addressed licensure or certification, financial reimbursement, or liability issues.

Control and Funding. Nearly all respondents (96%) indicate medical direction is present at the system level. In 40% of these systems, this leadership is provided by in-house directors who are physicians hired by the system's coordinating organization. Half of the systems receive oversight from external directors from organizations such as local hospitals.

Multiple funding sources finance EMS systems. Tax subsidies and fees for services were the most common funding sources. There was a strong relationship between funding source and the rural-urban continuum, with more urban areas depending more extensively on tax subsidies.

Discussion

Nationwide, EMS systems are heterogeneous. With considerable variance in regulations, rurality, demographics, geography, and the different needs that result, it is not surprising that such heterogeneity exists. Regions must select elements based on needs and available resources. As a result, EMS systems incorporate multiple agency types, response configurations, and funding streams while striving to best integrate these into a cohesive whole.

Our data verified many of the expected distinctions across various categories of system size and rurality. Despite varia-

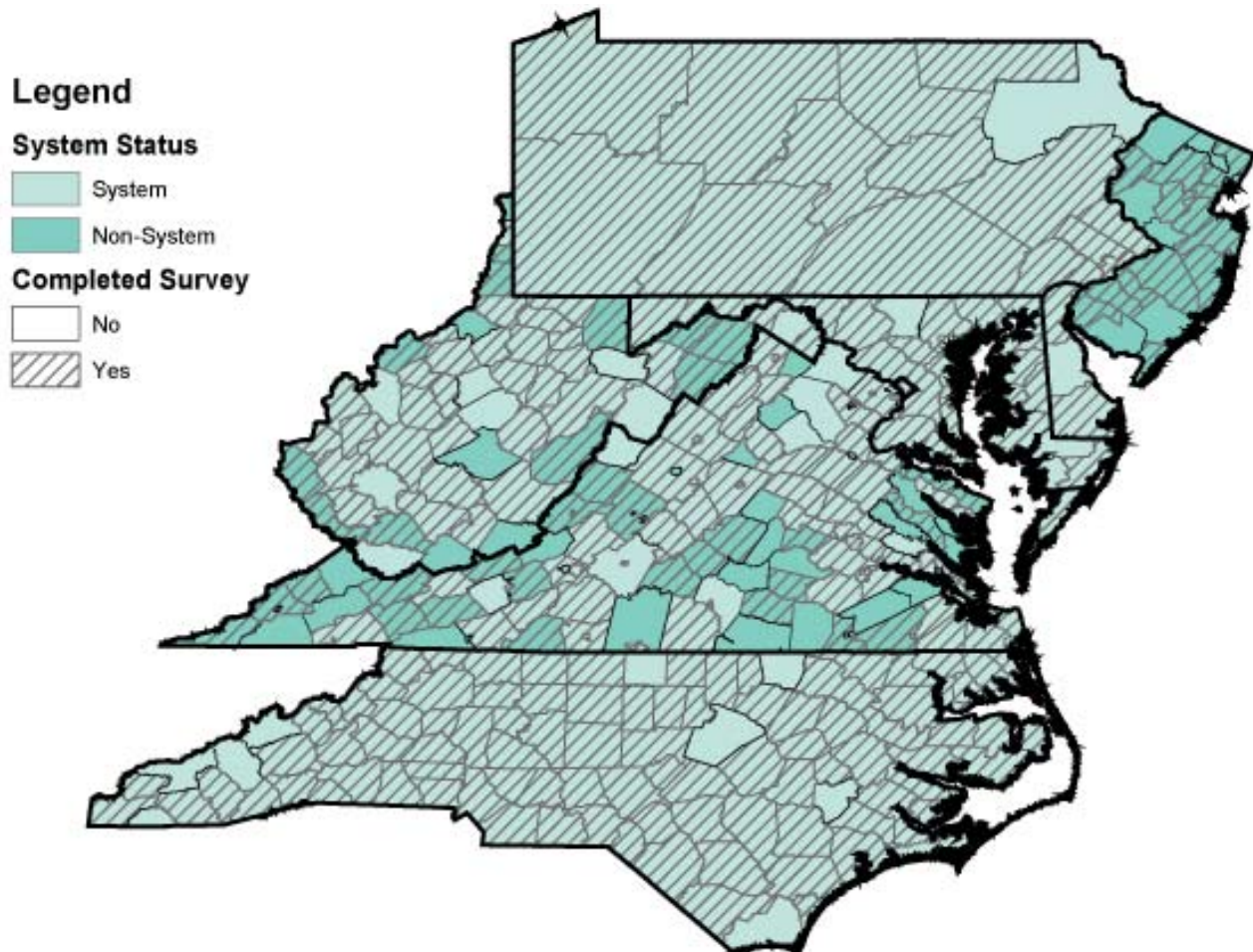
tion observed in the structural elements assessed, answers to questions that assessed subjective opinions about EMS working environments indicated pervasive system change, positive environments, and adequate support structures. However, funding and staffing were concerns for a majority of directors.

The high response rate suggests that a similar process could be executed on a national scale.

How to Order

To order *Configurations of EMS Systems: A Pilot Study* (89 pages), write to the Office of Behavioral Safety Research, NHTSA, NTI-130, 1200 New Jersey Avenue SE., Washington, DC 20590, fax 202-366-7394, or download from www.nhtsa.dot.gov. Ian Reagan was the Contracting Officer's Technical Representative for this project.

Figure 1. System vs. Non-System Counties



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