

---

# Public Health and Emergency Medical Services:

---

*Intersections, Overlaps and Opportunities*



National Association of EMS Physicians™



NACCHO  
NATIONAL  
ASSOCIATION OF  
COUNTY & CITY  
HEALTH OFFICIALS

*This document was supported by a grant from the National Highway Traffic Safety Administration (NHTSA). DTNH Grant # 22-05-H-05222*

*EMS Medical Director & Public Health Integration  
Task Force Committee Members*

*Dr. Joseph Sabato Jr., MD, FACEP, Chair  
University of Florida, Jacksonville*

*Pat Libbey - Co-chair  
National Association of County and City Health Officials (NACCHO)*

*List of Committee:*

*Bob W. Bailey, MA  
Center for Disease Control and Prevention (CDC)*

*Will Chapleau, EMT-T, RN, TNS  
Chicago Heights Fire Department*

*Eileen Coulombe  
Washoe County District Health Department*

*Drew Dawson  
National Highway Traffic Safety Administration (NHTSA)*

*Michael P. Flanagan, CAE  
National Association of Emergency Medical Services Physicians (NAEMSP)*

*Jennifer Frenette  
National Association of Emergency Medical Technicians (NAEMT)*

*Don Hunt  
Springfield Department of Public Health*

*Bill Jermyn, DO, FACEP  
Missouri Department of Health and Senior Services*

*Christopher Kahn, M.D.  
NHTSA*

*David Kingdon, MPH, NREMT-P  
Maine Emergency Medical Services*

*Julie Krueger  
NHTSA*

*Kurt Krumperman  
American Ambulance Association (AAA)*

*Angela Marr  
CDC*

*Susan McHenry  
NHTSA*

*Barry Moore  
Memphis and Shelby County Health Departments*

*Lori Moore, DrPH, MPH, EMT-P  
International Association of Fire Fighters (IAFF)*

*John Sinclair  
International Association of Fire Chiefs (IAFC) – EMS Section*

*Arthur H. Yancey, MD, MPH  
Emory University School of Medicine*

*List of Consultants:*

*Gail F. Cooper  
Technical Consultant  
Public Health, EMS & Trauma  
Palmer Lake, CO 80133*

*Nels D. Sanddal, MS, REMT-B  
President  
Critical Illness and Trauma Foundation  
Bozeman, MT 59715*

---

# Table of Contents

---

Introduction.....	1
Purpose.....	1
Case Study for Integrating EMS and Public Health .....	3
Strategic Comparisons .....	4
Monitor health status.....	6
Protect people from health problems .....	7
Give people information for healthy choices.....	8
Engage the community on health problems.....	9
Develop public health policies and plan .....	10
Enforce public health laws and regulation.....	11
Help people receive health services .....	12
Maintain a competent public health workforce .....	13
Evaluate and improve programs and interventions.....	14
Contribute to and apply facts of public health .....	15
References.....	16

EMS of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. Patients are assured that their care is considered part of a complete health care program, connected to sources for continuous and/or follow-up care, and linked to potentially beneficial health resources. EMS maintains liaisons, including systems for communication with other community resources, such as other public safety agencies, departments of public health... EMS is a community resource, able to initiate important follow-up care for patients, whether or not they are transported to a health care facility.<sup>1</sup>

## **INTRODUCTION:**

The nation's Public Health and emergency medical services (EMS) systems face similar challenges on a daily basis. Both systems are expected to respond in an efficient and effective manner to catastrophes (large and small) that threaten the health, welfare and survival of the populations they serve.

There are many intersections between Emergency Medical Services (EMS) and Public Health. This guide demonstrates these intersections and linkages between the two professions and identifies ways in which public health and EMS can work more closely to identify health risks and improve community well being. While the roles of each may be different they are linked through service to at risk populations who may be in need of public health services (immunizations) or the emergency medical services system (heart attack).

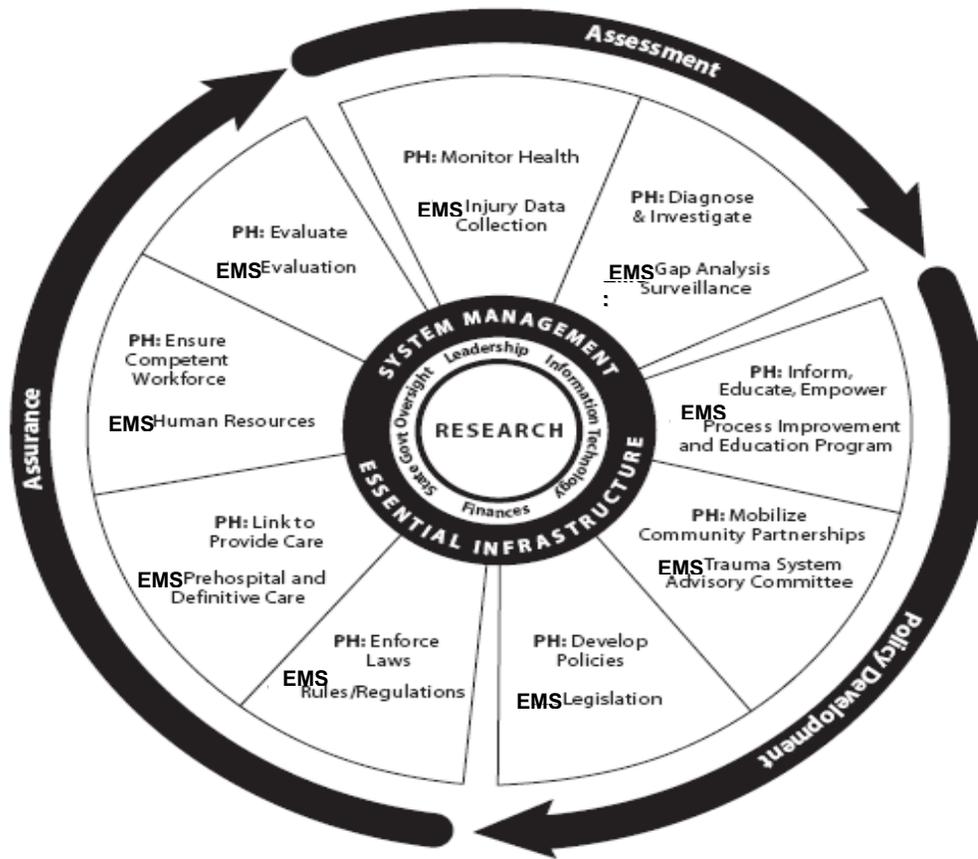
## **PURPOSE:**

This guide is intended to serve as a brief orientation for both public health and EMS professionals alike. This brief overview can assist both EMS and public health professionals in developing and sustaining open and ongoing dialogue regarding the health of the community and in this way more quickly identify persons at risk for disease or injury while implementing steps to promote and improve health.

The Public Health /EMS wheel below represents the continuum of services, programs and processes where EMS and Public Health are connected. The wheel follows the three core functions and ten essential services of Public Health and adds an EMS component that demonstrates how the two professions are linked. Figure 1: Illustrates the core functions of public health and overlapping EMS activities.<sup>3</sup>

Emergency care providers could benefit from the resources and experiences of public health agencies and experts in establishing injury prevention activities.<sup>2</sup>

Figure 1: From HRSA's Model Trauma System Planning and Evaluation, 2006



The tables on the following pages are designed to stimulate thinking and help identify opportunities for collaboration between EMS and public health. They reflect overall operations of both EMS and public health in a way that allows the reader to apply the statements to their own setting. We encourage those who read this overview to increase collaboration between these professional disciplines.

The National Association of County and City Health Officials (NACCHO) and the National Emergency Medical Service Physicians (NAEMSP) are committed to the ongoing support and development of key relationships between EMS and Public Health at national, state and local levels.

### *Case Study for Integrating EMS and Public Health*

In 2004, a small New England community experienced a potential mass Hepatitis A exposure from a vendor serving smoothies at a well attended health fair. Potentially, 2500 persons were exposed, needing screening and prophylaxis in a community with a small local health department. As detailed in the local Public Health plan the local Health Department sought assistance from the State Health Department to secure additional resources from around the state should additional human resources be needed. The local Health Department sought assistance from surrounding communities to assist with emergency mass inoculations. The local Health Department worked through the local EMS units to provide logistical support for the massive undertaking. This included coordinating sites, local set up communications and coverage for medical emergencies at each site. In four days, 2500 people were treated with immunoglobulin by local public health nurses, nurses from surrounding communities and the local Paramedics.

Fortunately because of the close working relationship between the local Public Health Department, surrounding public health agencies and the local EMS agencies there was no need for additional state resources. If this outbreak would have impacted more than one community the state was ready to provide the necessary resources. Because of prior planning, updated EMS regulations allowing prehospital personnel to assist in mass vaccination and inoculation programs, and up-to-date prehospital protocols the local EMS agency's more than 50 paramedics were able to assist with injections at each of the local sites along with the public health nurses.

A prior experience in this community had moved the local Health Department to engage the surrounding communities in assessing health needs, and the formation of a joint response team to cover infectious disease outbreaks throughout the region. Further as the community assessed its ability to respond to infectious disease outbreaks they recognized the need to involve the local EMS system whose medics were trained to provide intramuscular injections and could be used as an additional resource in responding to infectious emergencies from either terrorism or naturally occurring threats. The active surveillance and assessment process engaged in by the community allowed them to meet the needs of their constituents during this Hepatitis A outbreak.

**ASSESSMENT**

As a result of prior experiences, the State's Department of Health and state EMS agency partnered on the development of the EMS Vaccine program. The EMS agency changed the administrative code to include vaccinations within the scope of practice for paramedics. The program was designed to use influenza and pneumococcal vaccinations as opportunities for paramedics to develop practice and expertise in immunization. Paramedics were given a 2 hour training based upon the CDC immunization recommendations in Epidemiology and Prevention of Vaccine-Preventable Diseases.

Further, because of the uniqueness of some of the rural areas the local Health Departments were encouraged and supported in their efforts to consolidate plans and services, form broader regional response systems, and develop joint community planning areas for threats and emergencies that may arise in their respective areas. These pre-planning efforts made the response to this Hepatitis outbreak much more manageable with no untoward outcomes among the 2500 people receiving an immunoglobulin injection.

**POLICY DEVELOPMENT**

Clinical opportunities for EMT's to practice immunization skills were supported through the provision of free vaccines to local EMS agencies which were then distributed to the community. A follow-up evaluation noted no adverse outcomes.

The program combined EMS and Public Health assets and expertise to expand the capability to respond to local as well as statewide threats. These new capabilities can help reach new populations and utilize influenza clinics as opportunities to practice for mass vaccinations.

**ASSURANCE**

**STRATEGIC COMPARISONS:**

<i>Public Health and EMS Intersections and linkages</i>	
Public Health – What is it?	EMS – What is it?
<ul style="list-style-type: none"> <li>• Public Health focuses on promoting and protecting the health of the community. Public Health deals with population based health and addresses the prevention of disease, illness and injury among the overall population while working at both a community and individual patient level.</li> <li>• While the Public Health system is broadly encompassing of the collective efforts of all sectors, the “backbone” of this broad system is the governmental local health department at the community level. This overview will concentrate on the governmental public health role rather than the broader whole system perspective.</li> <li>• Public Health works in both long-term and immediate or short-term time frames often concurrently. Long term preventive efforts to promote specific population wide health status improvement may take many years for the benefits to be realized. While emergent response, especially to threats to the population’s health must be acted on immediately.</li> <li>• Understanding the community’s health including the ongoing monitoring of health status and conditions underpins all Public Health work.<sup>4</sup></li> </ul>	<ul style="list-style-type: none"> <li>• EMS is individual health, physical health, and urgent/emergent treatment for illness or injury. EMS deals with individuals during times where their health care needs are outside their ability to manage.</li> <li>• EMS is provided by both public and private providers serving the out-of-hospital needs of communities through first responders and ambulance services and in-hospital emergency medical needs of communities through licensed acute care hospitals with emergency departments staffed with trained emergency medicine physicians.</li> <li>• EMS responses are immediate and usually of short duration (disasters being the exception). EMS responses are critical to time and place.<sup>1</sup></li> </ul>

Emergency responders can recognize the diagnostic clues that may indicate an unusual infectious disease outbreak so that the public health authorities can respond quickly. However, a partnership that allows for improved communication of information between emergency providers and public health officials must first be in place.<sup>2</sup>

***Public Health and EMS intersections and linkages***

<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• <b>Mission of Public Health:</b> Fulfilling society's interest in assuring conditions in which people can be healthy.<sup>5</sup></li> <li>• <b>Vision:</b> Prevent disease and promote health.</li> <li>• <b>Core functions:</b> Assessment, regular, systematic collection and analysis of data/information on the health of the community; policy development, development of comprehensive public health policies and strategic planning; assurance, through regulation and assuring services to achieve agreed upon goals promoting personal and communitywide health services.<sup>5</sup></li> <li>• Public Health has ten essential services that guide the practice of public health. These ten essential services include:             <ul style="list-style-type: none"> <li>○ Monitor health status to identify community health problems.</li> <li>○ Diagnose and investigate health problems and health hazards in the community.</li> <li>○ Inform and educate and empower people about health issues.</li> <li>○ Mobilize community health partners to identify and solve</li> <li>○ Develop policies and plans that support individual and community health efforts.</li> <li>○ Enforce laws and regulations that protect health and ensure safety.</li> <li>○ Link people to needed personal health services and assure the provision of health care when otherwise available.</li> <li>○ Assure a competent public health and personal health care workforce.</li> <li>○ Evaluate effectiveness, accessibility and quality of personal and population – based health services.</li> <li>○ Research for new insights and innovative solutions to health problems.<sup>6</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Mission of Emergency Medical Services:</b> To provide out-of-facility care to those with perceived urgent needs, treating all injuries, illnesses as they present themselves.<sup>1</sup></li> <li>• <b>Vision:</b> To provide acute illness and injury care and follow up, contribute to the treatment of chronic conditions and community health monitoring.<sup>1</sup></li> <li>• <b>Core Functions:</b> Triage, making sure the right patient is taken to the right facility that is equipped and staffed to meet the patient's needs; Treatment, providing out-of-facility care and treatment to stabilize, and monitor the patient through transport to a receiving facility; and, Transport of the ill or injured to an appropriate facility to provide further definitive care.</li> <li>• EMS, within the context of a broad system, is guided by key components in delivering services including:             <ul style="list-style-type: none"> <li>○ Integration of Health Services</li> <li>○ EMS Research</li> <li>○ Legislation and Regulation</li> <li>○ System Finance</li> <li>○ Human Resources</li> <li>○ Medical Direction</li> <li>○ Education Systems</li> <li>○ Public Education</li> <li>○ Prevention</li> <li>○ Public Access</li> <li>○ Communication Systems</li> <li>○ Clinical Care</li> <li>○ Information Systems</li> <li>○ Evaluation.<sup>1</sup></li> </ul> </li> </ul>

***Public Health Essential Service: Monitor health status and understand health issues facing the community.***

***EMS Component: Information systems, Evaluation***

<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Obtain and maintain data that provide information on the community’s health (e.g., provider immunization rates; hospital discharge data; environmental health hazard, risk, and exposure data; community-specific data; number of uninsured; and indicators of health disparities such as high levels of poverty, lack of affordable housing, limited or no access to transportation, etc.).</li> <li>• Develop relationships with local providers and others in the community who have information on reportable diseases and other conditions of public health interest and facilitate information exchange.</li> <li>• Conduct or contribute expertise to periodic community health assessments.</li> <li>• Integrate data with health assessment and data collection efforts conducted by others in the public health system.</li> <li>• Analyze data to identify trends, health problems, environmental health hazards, and social and economic conditions that adversely affect the public’s health.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Uses prehospital data in conjunction with Public Health to design illness and injury prevention strategies. Working relationship with Public Health vital records, and epidemiology as well as community based injury prevention organizations has been established.</li> <li>• Create linkages between Public Health and EMS including programs with an emphasis on population-based public health surveillance, and evaluation for acute injury/illness prevention</li> <li>• Participates in a system data collection and information data sharing network, collects pertinent out-of-hospital EMSS data from field providers on each episode of care, and uses data for EMS and Public Health assessments and system improvements.</li> <li>• Analyze data for routine EMSS and public health surveillance. Ensure data can be accessed by individual users as well as management for system oversight and community health assessments. Contribute standard data sets to the National EMS Information System repertory at state and national levels.</li> <li>• Uses the linked information system to assess system and provider performance, measure compliance with applicable standards/rules and to identify trends, environmental health hazards and other conditions that may impact the public’s health.<sup>8</sup></li> </ul>

Effective EMS research necessitates creating working relationships between EMS researchers and social scientists, economists, health services researchers, epidemiologists, operations experts, clinical scientists, basic scientists, and researchers from other disciplines. Building these relationships requires a dedicated and committed core research group with access to reliable funding sources.<sup>9</sup>

<b>Public Health Essential Service: Protect people from health problems and health hazards.</b>	
<b>EMS Component: Integration of Health Services, Public Information, Legislation &amp; Regulation, Communication Systems</b>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Investigate health problems and environmental health hazards.</li> <li>• Prevent, minimize, and contain adverse health events and conditions resulting from communicable diseases; food-, water-, and vector-borne outbreaks; chronic diseases; environmental hazards; injuries; and health disparities.</li> <li>• Coordinate with other governmental agencies that investigate and respond to health problems, health disparities, or environmental health hazards.</li> <li>• Lead public health emergency planning, exercises, and response activities in the community in accordance with the National Incident Management System, and coordinate with other local, state, and federal agencies.</li> <li>• Fully participate in planning, exercises, and response activities for other emergencies in the community that have public health implications, within the context of state and regional plans and in a manner consistent with the community's best public health interest.</li> <li>• Maintain access to laboratory and bio-statistical expertise and capacity to help monitor community health status and diagnose and investigate public health problems and hazards.</li> <li>• Maintain policies and technology required for urgent communications and electronic data exchange.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Investigate, as part of a community based public health team, and report on health hazards or observed adverse health effects.</li> <li>• Maintain, a multidisciplinary, multi-agency committee (including Public Health), multi-jurisdiction committee to provide oversight to all-hazard response planning, including a communications plan that provides for intra-agency, inter-agency, regional and state communications of voice and electronic data regarding changes in health status or other emergent events.</li> <li>• Evaluates and tests the communication system to ensure its reliability, robustness, redundancy and interoperability during routine applications and all-hazards events involving multiple patients and multiple agency responses.</li> <li>• Establish operational plans including an ongoing cooperative working relationship with other public safety and public health agencies to assure Emergency Medical Services System (EMSS) system readiness to "all-hazard" multiple patient events.</li> <li>• Maintain preplanned formal mechanisms to activate an optimal response to all-hazard events in accordance with Emergency Medical Services System (EMSS) and disaster response plans and consistent with system resources and capabilities.<sup>8</sup></li> </ul>

<b>All – Hazards Response – Example</b>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Participate in all-hazards planning and exercises</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in all-hazards planning and exercises</li> </ul>
<ul style="list-style-type: none"> <li>• Ongoing monitoring of health surveillance information and systems</li> </ul>	<ul style="list-style-type: none"> <li>• Provide data to surveillance system</li> </ul>
<ul style="list-style-type: none"> <li>• Participate in incident command structure in the face of an event</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in incident command structure in the face of an event</li> </ul>
<ul style="list-style-type: none"> <li>• Monitor and health care assets</li> </ul>	<ul style="list-style-type: none"> <li>• Expand system status management systems for all-hazards event</li> </ul>
<ul style="list-style-type: none"> <li>• Assign health care assets</li> </ul>	<ul style="list-style-type: none"> <li>• Deploy health care assets</li> </ul>
<ul style="list-style-type: none"> <li>• Monitor health impact</li> </ul>	<ul style="list-style-type: none"> <li>• Provide outcome data</li> </ul>

***Public Health Essential Service: Give people information they need to make healthy choices.***

***EMS Component: Public Education***

<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Develop relationships with the media to convey information of public health significance, correct misinformation about public health issues, and serve as an essential resource.</li> <li>• Exchange information and data with individuals, community groups, other agencies, and the general public about physical, behavioral, environmental, social, economic, and other issues affecting the public’s health.</li> <li>• Provide targeted, culturally appropriate information to help individuals understand what decisions they can make to be healthy.</li> <li>• Provide health promotion programs to address identified health problems.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Provide a public information and education program that heightens public awareness of the need for an Emergency Medical Services System (EMSS) and the preventability of injury and/or illness.</li> <li>• Inform the public about issues related to EMS and Public Health.</li> <li>• Provide data to injury/illness prevention programs to assist in the development of intervention strategies that are culturally appropriate and targeted to person’s at risk.<sup>8</sup></li> </ul>

***Elderly Fall Prevention - Example***

<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Identify increasing trend of elderly falls</li> </ul>	<ul style="list-style-type: none"> <li>• Provide data on falls from same height transported to hospital</li> </ul>
<ul style="list-style-type: none"> <li>• Link EMS and other records (vital records, trauma registry) to further describe the problem and identify population vulnerability</li> </ul>	<ul style="list-style-type: none"> <li>• Gathering data on falls not transported to hospital</li> </ul>
<ul style="list-style-type: none"> <li>• Identify/develop and facilitate or implement fall prevention interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Identify at risk seniors for fall-prevention education/intervention</li> </ul>
<ul style="list-style-type: none"> <li>• Evaluate policy, program or other intervention</li> </ul>	<ul style="list-style-type: none"> <li>• Assist in implementation as appropriate</li> </ul>
<ul style="list-style-type: none"> <li>• Monitor incidence/prevalence of elderly falls</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to gather real-time data on transported and non-transported falls and report to PH</li> </ul>

The lack of public health departments may require rural/frontier EMS personnel to take on leadership roles in more traditional public health department tasks...<sup>10</sup>

***Public Health Essential Service: Engage the community to identify and solve health problems.***

***EMS Component: Integration of Health Services, Public Education***

<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Engage the local public health system in an ongoing, strategic, community-driven, comprehensive planning process to identify, prioritize, and solve public health problems; establish public health goals; and evaluate success in meeting the goals.</li> <li>• Promote the community’s understanding of, and advocacy for, policies and activities that will improve the public’s health.</li> <li>• Support, implement, and evaluate strategies that address public health goals in partnership with public and private organizations.</li> <li>• Develop partnerships to generate interest in and support for improved community health status, including new and emerging public health issues.</li> <li>• Inform the community, governing bodies, and elected officials about governmental public health services that are being provided, improvements being made in those services, and priority health issues not yet being adequately addressed.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Actively participate in a multidisciplinary planning process that describes the role of the agency within the health care and public safety systems serving the community and the region.</li> <li>• Base operational decisions on the EMS system plan and provide for ongoing engagement with multidisciplinary stakeholders and partners to ensure integration of the Emergency Medical Services System (EMSS) within the community and the region.</li> <li>• Measure the Emergency Medical Services System’s (EMSS) progress in meeting goals and objectives in the system plan.</li> <li>• Inform the community and its partner agencies regarding system performance and system improvements.<sup>8</sup></li> </ul>

State EMS leaders should meet with their public health counterparts to consider local EMS roles public health functions such as administering immunizations, conducting screenings, and offering public health education.<sup>11</sup>

Develop partnerships that include community members to determine the public's educational needs regarding its role in prevention and as EMS system clients, bystanders at emergency scenes, and EMS consumers.<sup>12</sup>

<b><i>Public Health Essential Service: Develop public health policies and plans.</i></b>	
<b><i>EMS Component: Legislation &amp; Regulation, System Finance</i></b>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Serve as a primary resource to governing bodies and policymakers to establish and maintain public health policies, practices, and capacity based on current science and best practices.</li> <li>• Advocate for policies that lessen health disparities and improve physical, behavioral, environmental, social, and economic conditions in the community that affect the public’s health.</li> <li>• Engage in local health department (LHD) strategic planning to develop a vision, mission, and guiding principles that reflect the community’s public health needs, and to prioritize services and programs.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Link with Public Health and Public Safety serve as the resource and information conduit about emergency medical services policies, procedures, protocols and best practices.</li> <li>• Inform its partners when access to care is compromised or when health policies conflict with EMS policies for triage and treatment of the ill and injured.</li> <li>• Advocate on behalf of potential emergency patients.</li> <li>• Engage in local health department (LHD) strategic planning to develop a vision, mission, and guiding principles that reflect the community’s public health needs, and to prioritize services and programs.<sup>8</sup></li> </ul>

<b><i>Public Policy - Example</i></b>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Identifies need for a public policy change impacting newly arriving immigrants ability to access medical care and how to use the EMS system</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies an increase use of EMS by newly arriving refugees who are unfamiliar with how to access medical care or use the EMS system</li> </ul>
<ul style="list-style-type: none"> <li>• Gather data from a variety of sources concerning at-risk populations especially EMS for newly arriving immigrants and refugee populations</li> </ul>	<ul style="list-style-type: none"> <li>• Assist in the data collection efforts to identify newly arriving immigrants using the EMS system</li> </ul>
<ul style="list-style-type: none"> <li>• Notify community leaders regarding newly arriving refugee populations and use of the medical care system</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to monitor response and provide data to public health</li> </ul>
<ul style="list-style-type: none"> <li>• Convene stakeholders to develop a new policy on providing guidance to newly arriving immigrants on how to access medical care including EMS</li> </ul>	<ul style="list-style-type: none"> <li>• Assist in developing a policy and training program for newly arriving immigrants on how to access medical care including emergency medical services in their new community</li> </ul>
<ul style="list-style-type: none"> <li>• Develop and implement a training program for refugee assistance center staff on how immigrants can access medical care</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to provide data to Public Health on refugee populations using EMS to determine if the training program is effective in reducing inappropriate use of the system</li> </ul>

<i>Public Health Essential Service: Enforce public health laws and regulations.</i>	
<i>EMS Component: Legislation and Regulation, Education Systems, Medical Direction</i>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Review existing laws and regulations and work with governing bodies and policymakers to update them as needed.</li> <li>• Understand existing laws, ordinances, and regulations that protect the public’s health.</li> <li>• Educate individuals and organizations on the meaning, purpose, and benefit of public health laws, regulations, and ordinances and how to comply.</li> <li>• Monitor, and analyze over time, the compliance of regulated organizations, entities, and individuals.</li> <li>• Conduct enforcement activities.</li> <li>• Coordinate notification of violations among other governmental agencies that enforce laws and regulations that protect the public’s health.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Inform policy makers and others regarding the need for updated laws and regulations.</li> <li>• Ensure that Public Health is knowledgeable about EMS practices and rules governing EMS operations.</li> <li>• Train EMS personnel on Public Health laws, regulations and ensure compliance and participation in Public Health issues.</li> <li>• Monitor its performance and participation in Public Health and report on issues impacting its service.<sup>8</sup></li> </ul>

<i>Childhood Head Injury - Example</i>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Routine surveillance indicates an increase in morbidity and mortality related to bicycle vs. motor vehicle crashes</li> </ul>	<ul style="list-style-type: none"> <li>• Trauma registry notes increase in childhood head injury incidence and mortality</li> </ul>
<ul style="list-style-type: none"> <li>• Form a community coalition that includes EMS and trauma care providers to further assess the problem and need for intervention</li> </ul>	<ul style="list-style-type: none"> <li>• Root cause analysis indicates most frequently associated with bicycle vs. motor vehicle collisions</li> </ul>
<ul style="list-style-type: none"> <li>• Research existing prevention/intervention programs related to bicycle injuries in children</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in community coalition</li> </ul>
<ul style="list-style-type: none"> <li>• Based on community preference and proven effectiveness, advocate for, and ensure passage of, ordinance requiring helmet use in children</li> </ul>	<ul style="list-style-type: none"> <li>• Provide expert testimony to legislative bodies concerning need for ordinance</li> </ul>
<ul style="list-style-type: none"> <li>• Develop or acquire program materials targeting childhood bicycle safety</li> </ul>	<ul style="list-style-type: none"> <li>• Issue “citations” to children who are wearing helmets that can be redeemed for “treats”, e.g. ice cream cone</li> </ul>
<ul style="list-style-type: none"> <li>• Evaluate program effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to provide data on transported and non-transported bicycle vs. motor vehicle crashes including notations on helmet use</li> </ul>

<i>Public Health Essential Service: Help people receive health services.</i>	
<i>EMS Component: Clinical Care, Public Access</i>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>Engage the community to identify gaps in culturally competent, appropriate, and equitable personal health services, including preventive and health promotion services, and develop strategies to close the gaps.</li> <li>Support and implement strategies to increase access to care and establish systems of personal health services, including preventive and health promotion services, in partnership with the community.</li> <li>Link individuals to available, accessible personal healthcare providers (i.e., a medical home).<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>Assess the needs of the general public and their ability to access the system and the results integrated into the EMS system plan.</li> <li>Ensure unique populations (e.g., language, socially disadvantaged, migrant/transient, remote, rural, and others) are able to access the Emergency Medical Services System (EMSS) agency system.</li> <li>Provide access to a universal number (9-1-1) for citizens to access the system, with dispatch of appropriate medical resources in accordance with a written plan. Provide 211 (or similar number) for non-emergency health resource information.<sup>8</sup></li> </ul>

<i>Clinical Care - Example</i>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>Notes an outbreak of non-influenza “cold” like symptoms</li> </ul>	<ul style="list-style-type: none"> <li>Identifies an increase in non-urgent transports to the emergency department for “cold” like symptoms</li> </ul>
<ul style="list-style-type: none"> <li>Assists in the development of a “available status” call in number for persons requesting medical attention for “cold” like symptoms</li> </ul>	<ul style="list-style-type: none"> <li>EMS medical director drafts a non-transport, assess and refer protocol to connect “cold” patients with health clinics, urgent care centers, and primary care providers</li> </ul>
<ul style="list-style-type: none"> <li>Implements and staffs “available status” call in line</li> </ul>	<ul style="list-style-type: none"> <li>Monitors sensitivity and specificity of “cold” referral protocol using the available status call-in number</li> </ul>
<ul style="list-style-type: none"> <li>Provides public education</li> </ul>	<ul style="list-style-type: none"> <li>Monitors non-urgent transports to the emergency department</li> </ul>
<ul style="list-style-type: none"> <li>Determines end point of “cold” like symptom outbreak and discontinues hotline staffing</li> </ul>	<ul style="list-style-type: none"> <li>Reverts back to a “transport all” protocol</li> </ul>
<ul style="list-style-type: none"> <li>Evaluates effectiveness of hotline referral program</li> </ul>	<ul style="list-style-type: none"> <li>Participates in QI activities to determine effectiveness of referral protocol noting over or under-triage</li> </ul>
<ul style="list-style-type: none"> <li>Plans for subsequent refinement and identification of trigger points for reinstatement of referral hotline</li> </ul>	<ul style="list-style-type: none"> <li>Refines protocol for subsequent implementation and use</li> </ul>

***Public Health Essential Service: Maintain a competent public health workforce.***

***EMS Component: Human Resources, Education Systems, Evaluation, Clinical Care***

<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"><li>• Recruit, train, develop, and retain a diverse staff.</li><li>• Evaluate local health department (LHD) staff members' public health competencies, and address deficiencies through continuing education, training, and leadership development activities.</li><li>• Provide practice and competency based educational experiences for the future public health workforce, and provide expertise in developing and teaching public health curricula, through partnerships with academia.</li><li>• Promote the use of effective public health practices among other practitioners and agencies engaged in public health interventions.</li><li>• Provide the public health workforce with adequate resources to do their jobs.<sup>7</sup></li></ul>	<ul style="list-style-type: none"><li>• Recruit, train, develop, and retain a diverse staff.</li><li>• Maintain adequate numbers of trained and licensed personnel (paid and/or volunteer) to meet performance standards for level of care and response times.</li><li>• Provide access to required and advanced training, leadership opportunities, and have access to stress management services as needed.</li><li>• Ensure written educational requirements are consistent with state and nationally recognized levels of training and that a structure is in place to provide education and maintenance of clinical skills.</li><li>• Provide initial and continuing education programs including periodic testing, consistent with state and nationally recognized levels of care.<sup>8</sup></li></ul>

<i>Public Health Essential Service: Evaluate and improve programs and interventions.</i>	
<i>EMS Component: Evaluation, EMS Research, Medical Direction</i>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Develop evaluation efforts to assess health outcomes to the extent possible.</li> <li>• Apply evidence-based criteria to evaluation activities where possible.</li> <li>• Evaluate the effectiveness and quality of all local health department (LHD) programs and activities and use the information to improve local health department (LHD) performance and community health outcomes.</li> <li>• Review the effectiveness of public health interventions provided by other practitioners and agencies for prevention, containment, and/or remediation of problems affecting the public’s health, and provide expertise to those interventions that need improvement.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Adopt computer technology and analytical tools for monitoring system performance.</li> <li>• Engage the medical community and Public Health in assessing and evaluating Emergency Medical Services System.</li> <li>• Translate findings from research or other quality improvement into improved service.</li> <li>• Document clinical care in a manner that enables agency and system wide information to be used for performance improvement, patient outcomes and quality of care.</li> <li>• Provide for periodic external review by objective, third-party experts, reviewers, or regulators.<sup>8</sup></li> </ul>

<i>Emergent and Routine Real Time and Ongoing Surveillance - Example</i>	
<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• Establish and/or communicate required reporting elements and the mechanisms for reporting (ranging from routine reportable disease to real time and extraordinary episodic information needs)</li> </ul>	<ul style="list-style-type: none"> <li>• Contribute “real-time” data on incident types and locations</li> </ul>
<ul style="list-style-type: none"> <li>• Monitor all data, including EMS data, to identify disease clusters, outbreaks and other health conditions outside the norm</li> </ul>	<ul style="list-style-type: none"> <li>• Report any workforce exposures or effects</li> </ul>
<ul style="list-style-type: none"> <li>• Communicate routine and extraordinary surveillance information (along with advice and/or direction as needed) with the community’s health care system, including EMS</li> </ul>	<ul style="list-style-type: none"> <li>• Communicate/coordinate with PH regarding treatment approaches and guidelines, especially as relates to extraordinary issues and events</li> </ul>

***Public Health Essential Service: Contribute to and apply the evidence base of public health.***

***EMS Component: EMS Research, Evaluation, Information Systems, Medical Direction and Public Health Essential Service Contribute to and apply the evidence of public health***

<b>Public Health</b>	<b>EMS</b>
<ul style="list-style-type: none"> <li>• When researchers approach the local health department (LHD) to engage in research activities that benefit the health of the community,               <ul style="list-style-type: none"> <li>○ Identify appropriate populations, geographic areas, and partners;</li> <li>○ Work with them to actively involve the community in all phases of research;</li> <li>○ Provide data and expertise to support research; and,</li> <li>○ Facilitate their efforts to share research findings with the community, governing bodies, and policymakers.</li> </ul> </li> <li>• Share results of research, program evaluations, and best practices with other public health practitioners and academics.</li> <li>• Apply evidence-based programs and best practices where possible.<sup>7</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Establish sufficient policies to conduct and participate in system research efforts.</li> <li>• Collaborate with social scientists, economists, health services researchers, epidemiologists, operations researchers, and other clinical scientists.</li> <li>• Integrate with external stakeholders to apply and publish system design, patient care and specific intervention research.<sup>8</sup></li> </ul>

In this new system, dispatchers, EMS personnel, medical providers, public safety officers, and public health officials will be fully interconnected and united in an effort to ensure that each patient receives the most appropriate care, at the optimal location, with the minimum delay.<sup>2</sup>

Effective EMS research necessitates creating working relationships between EMS researchers and social scientists, economists, health services researchers, epidemiologists, operations experts, clinical scientists, basic scientists, and researchers from other disciplines. Building these relationships requires a dedicated and committed core research group with access to reliable funding sources.<sup>9</sup>

## REFERENCES

1. National Highway Traffic Safety Administration. *Emergency Medical Services Agenda for the Future*. Delbridge, T.R., (Ed). NTS-42, Item No. 808-441. Washington, DC: U.S. Department of Transportation; 1996.
2. Institute of Medicine. *Emergency care at the crossroads: Future of emergency care series*. Washington, DC: National Academies Press; 2006.
3. Health Resources and Services Administration. *Model Trauma System Planning and Evaluation*. Washington, DC: U.S. Department of Health and Human Services; 2006.
4. Institute of Medicine. *The Future of the Public's Health in the 21st Century*. Washington, DC: National Academies Press; 2002.
5. Institute of Medicine. *Future of Public Health*. Washington, DC: National Academies Press; 1988.
6. Public Health Functions Steering Committee. *Public Health in America: Vision, Mission, and Essential Services*. Washington, DC: Office of Disease Prevention and Health Promotion; 1994.
7. National Association of City and County Hospital Officials. *Operational definition of a functional local health department*. Washington, DC: National Association of City and County Hospital Officials; 2005.
8. Critical Illness and Trauma Foundation. *Regional EMS assessment tool: Benchmarks, indicators and scoring*. Bozeman, MT: CIT Foundation; 2006.
9. National Highway Traffic Safety Administration. *National EMS Research Agenda*. Washington, DC: U.S. Department of Transportation; 2001.
10. Pollock, D.A. Barriers to health care access: What counts and who's counting? *Academic Emergency Medicine*. 2001; 8(11): 1016-1018.
11. McGinnis, K.K. *Rural and Frontier Emergency Medical Services Agenda for the Future*. Kansas City, MO: National Rural Health Association; 2004.
12. National Highway Traffic Safety Administration. *Emergency Medical Services Agenda for the Future: Implementation guide*. Delbridge, T.R., (Ed). Washington, DC: U.S. Department of Transportation (DOT HS 808711); 1998.
13. Institute of Medicine. *Quality Through Collaboration: The Future of Rural Health*. Washington, DC: National Academies Press; 2005.
14. Spaite, D.W., Maio, R., Garrison, H.G., Desmond, J.S., Gregor, M.A., Stiell, I.G., et al. Emergency medical services outcomes project (EMSOP) II: Developing the foundation and conceptual models for out-of-hospital outcomes research. *Annals of Emergency Medicine*. 2001; 37(6): 657-663.

Rural communities should focus greater attention on improving population health in addition to meeting personal healthcare needs...health care workers should share with other groups the responsibility to work together to achieve population health outcomes.... A core set of health care services (primary care, dental care, basic mental health care, and emergency medical services) should be available within the communities.<sup>13</sup>

Finally, the lack of capacity of rural public health department and a limited rural public safety infrastructure creates a greater reliance on rural EMS personnel to participate in rural disaster preparedness at a broader level than their urban counterparts.<sup>14</sup>