# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>3</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>7</td>
</tr>
<tr>
<td>Evaluation Purpose</td>
<td>10</td>
</tr>
<tr>
<td>Methods</td>
<td>11</td>
</tr>
<tr>
<td>Data Analysis &amp; Synthesis</td>
<td>14</td>
</tr>
<tr>
<td>Results</td>
<td></td>
</tr>
<tr>
<td>Context</td>
<td>15</td>
</tr>
<tr>
<td>Action plans</td>
<td>19</td>
</tr>
<tr>
<td>Facilitators and barriers</td>
<td>24</td>
</tr>
<tr>
<td>Sustainability</td>
<td>30</td>
</tr>
<tr>
<td>National organizations</td>
<td>32</td>
</tr>
<tr>
<td>Conclusions and considerations for future efforts</td>
<td>36</td>
</tr>
<tr>
<td>References</td>
<td>40</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

Every day, Emergency Medical Services (EMS) providers make on-the-scene decisions to determine the nearest and most appropriate medical facility for the transport of injured patients. The complex decision-making process that these EMS providers engage in is referred to as “field triage”. There are approximately 800,000 EMS providers within 15,000 different EMS systems in the United States that follow a variety of formal and informal field triage protocols designed to guide this decision-making process. If EMS providers default to a high resource trauma center (e.g., Level I, Level II) too frequently when this level of care is not an appropriate match for the patient’s condition, resources may be depleted and unavailable to the most severely injured patients—a situation known as “overtriage.” In contrast, if EMS providers decide to transport a patient to a lower level trauma center or non-trauma center when their injuries are severe enough to warrant treatment at a higher-level trauma center, their likelihood of survival may decrease—such a situation is recognized as “undertriage” (CDC, 2009).

In an effort to minimize both undertriage and overtriage and to standardize decision-making, the American College of Surgeons developed the first Field Triage Decision Scheme in 1986. Since then, the Decision Scheme has been revised four times and the most recent version was published in 2006 by the Centers for Disease Control and Prevention with support from the American College of Surgeons Committee on Trauma and the National Highway Traffic Safety Administration.

In 2010, the Safe States Alliance, with financial and technical support from the Centers for Disease Control and Prevention’s (CDC) National Center for Injury Prevention and Control (NCIPC), selected three states through a competitive application process to learn more about facilitators and barriers states face in adopting and implementing the 2006 Field Triage Decision Scheme.

The selected states - Kansas, Massachusetts, and Michigan – assembled a multi-disciplinary team of decision-makers from within their state to attend a kick-off meeting in Atlanta, GA in May 2010. These teams worked together for one-and-a-half days to begin crafting an action plan for implementing the Field Triage Decision Scheme in at least two regions or local areas of their state. State teams then submitted an action plan including a description of what they planned to accomplish over a six month time period towards adopting and implementing the Decision Scheme in their state. States received up to $18,000 for their adoption and implementation efforts as well as technical support from CDC and the Safe States Alliance.

The CDC and Safe States also engaged a group of national organizations to promote support among their members for adoption and implementation of the Decision Scheme. To facilitate this effort, the Safe States Alliance and the CDC hosted a meeting of national organizations in November 2009. Attendees included representatives from the American Association for the Surgery of Trauma (AAST), the American College of Surgeons (ACS), the American College of Emergency Physicians (ACEP), the National Association of State Emergency Medical Services Officials (NASEMSO), the National Association of Emergency Medical Services Physicians (NAEMSP), and the National Highway Traffic Safety Administration (NHTSA). Following the meeting, each national organization was asked to create, and to commit themselves to, an action
plan for adopting, disseminating, and assisting their members in implementing the Decision Scheme over the course of one year.

The primary purpose of the evaluation described in this report was to systematically gather information that would be useful for gaining a better understanding of the barriers and facilitators associated with implementing the 2006 Field Triage Decision Scheme. In addition, efforts were taken to explore the role of the national organizations engaged in this effort. Specifically, this evaluation was designed to provide information helpful for answering the following five questions:

1. What is the context in which the 2006 Field Triage Decision Scheme is being implemented in each state?

2. To what extent did states adhere to their action plans as determined during the May 2010 meeting? After 6 months, did they accomplish the goals they set for themselves?

3. To what extent do factors identified by the national organizations (e.g. local politics, overtriage/undertriage, linked data, definition of successful implementation, time, distance, resources, and other factors that emerge from the national organization surveys) facilitate or inhibit the adoption and implementation of the 2006 Field Triage Decision Scheme in each state? What other factors emerge?

4. To what extent do the states anticipate continuing work and expanding their action plans? To what extent do they perceive that the changes they made according to the action plans will be sustainable in their state?

5. What is the role of the national organizations in assisting states to adopt and implement the 2006 Field Triage Decision Scheme? To what extent did the November 2009 and 2010 meetings reinvigorate their efforts in promoting the Decision Scheme?

Data was collected using multiple methods including surveys, telephone surveys and document reviews to generate answers to these overarching evaluation questions. This report describes the findings of this multi-site evaluation. Key findings include:

- The contexts within which the three state teams conducted their work varied greatly. Kansas implemented the 2006 Field Triage Decision Scheme in a predominantly rural area (southeastern Kansas), Massachusetts implemented the Decision Scheme statewide, and Michigan in two large urban areas of their state.

- Many of the goals and objectives the states and national organizations set out to accomplish in their action plans were achieved within even the short implementation timeframe.

- Although strong relationships and communication networks among medical practitioners existed in most of these states at the beginning of the mini-grant cycle, these relationships appear to have grown even stronger and the networks even broader.

- Existing relationships and communication networks, as well as new partnerships and collaborations, among medical practitioners were developed, strengthened and expanded.

- A focus on patient outcomes was useful in setting the stage for productive conversations and bringing providers to the table to participate in implementation process.
• The dedicated funds, time, and attention that were provided through this grant allowed states to detect areas where additional attention was needed to successfully implement and sustain the use of the Decision Scheme in EMS systems.

Some of the primary areas where additional or continued attention appears to be needed to successfully implement and sustain the use of the Decision Scheme in EMS systems include: clarifying aspects of the existing Decision Scheme, establishing data systems that provide valuable information for monitoring implementation of the Decision Scheme, continuing to build the evidence base for the Decision Scheme, and providing training materials.

Overall, it appears from this evaluation that the time and energy spent by the states of Kansas, Michigan, and Massachusetts through these mini-grants was helpful in moving the adoption and implementation of the Decision Scheme forward. This dedicated and collaborative effort, and the associated funding, appears to have elevated the Field Triage Decision Scheme as a priority among many national organizations and states and allowed time for thoughtful conversations to take place and many lessons to be learned.
INTRODUCTION

Injuries represent a significant public health problem in the United States. Between 1999 and 2007, injuries were the leading cause of death among individuals 1-44 years of age. More than 180,000 individuals die each year as a result of injuries in the U.S., translating into 1 death every three minutes (CDC WISQARS, 2011). Annually, more than 29 million people are treated for injuries in U.S. emergency departments (CDC WISQARS, 2011).

Although the preferred method for addressing injuries within the United States is primary prevention, it is recognized that many injuries occur on a day-to-day basis. As a result, the public health and broader medical community has engaged in various activities that aim to improve secondary and tertiary prevention related to injuries. One way this is done is through the appropriate transport of injured patients to medical facilities that have the best “match” of resources to meet a specific injured patient’s needs. Emergency Medical Services (EMS) providers play a major role in this process, which requires complex decision-making at the scene of an injury.

This decision-making process is referred to as “field triage” and involves a determination of the severity of the injury, initiation of medical management, and identification of the facility to transport a patient. The facility to which the EMS provider transports a patient must have resources (e.g., trained staff, medical equipment, available beds) that provide the greatest chance of survival for the patient. However, resources must be allocated appropriately to patients depending on the severity of injuries, so that resources remain available to those with life-threatening injuries.

There are two broad classifications of medical facilities to which an injured patient could be transported—trauma and non-trauma. Trauma centers are medical facilities that are uniquely prepared to provide care to severely injured patients transported by EMS providers. As defined by the Centers for Disease Control and Prevention (CDC) (2009) a trauma center is “an acute-care facility that has made preparations and achieved certain resources and personnel standards to provide care for severely injured patients.” Trauma centers range from Level I to Level IV and are differentiated by the amount of resources and personnel available to care for an injured patient—with Level I having the highest level of resources and personnel available. Designations of level are made by a regulatory authority within states or localities and are based upon criteria outlined by the American College of Surgeons Committee on Trauma (ACS-COT). The level of a trauma center is not indicative of the quality of care a patient receives (CDC, 2009).

When responding to a scene with an injured patient, EMS providers must rapidly decide which facility to transport the patient. If EMS providers default to a high resource trauma center (e.g., Level I, Level II) too frequently when this level of care is not an appropriate match for the patient’s condition, resources may be depleted and unavailable to the most severely injured patients. This is known as “overtriage.” In contrast, if EMS providers decide to transport a patient to a lower level trauma center or non-trauma center when their injuries are severe enough to warrant treatment at a higher-level trauma center, their likelihood of survival may decrease—such a situation is recognized as “undertriage” (CDC, 2009). Recent studies indicate that adult patients presenting to a Level I trauma center versus a non-trauma center in urban or suburban areas that have Abbreviated Injury Scale scores of four or above may reduce the risk of
subsequent death for these individuals (MacKenzie et al., 2006).

There are approximately 800,000 EMS providers within 15,000 different EMS systems in the United States that follow a variety of formal and informal field triage protocols. These field triage protocols are designed to guide decision-making when EMS professionals must choose which medical facility to transport the patient. In an effort to minimize both undertriage and overtriage and to standardize decision-making, the American College of Surgeons developed the first Field Triage Decision Scheme in 1986. Since then, the Decision Scheme has been revised four times and the most recent version was published in 2006 by the Centers for Disease Control and Prevention with support from the American College of Surgeons Committee on Trauma and the National Highway Traffic Safety Administration. Revisions to the Decision Scheme are made by the National Expert Panel on Field Triage to ensure that the Decision Scheme remains current with scientific evidence and technological advances.

Recognizing that variation exists in current field triage protocols and the structure of EMS systems (including the existence and availability of different levels of trauma centers) across the U.S. as well as within states, the CDC made funds available to pilot the adoption and implementation of the 2006 CDC Field Triage Decision Scheme. With financial and technical support from the CDC’s National Center for Injury Prevention and Control (NCIPC), the Safe States Alliance provided up to $18,000 to three states in 2010 to move forward with adopting and implementing the 2006 CDC Field Triage Decision Scheme. Kansas, Massachusetts, and Michigan were selected to receive these funds through a competitive application process.

States applying for funds were asked to assemble a team of up to six decision-makers in their state to attend a kick-off meeting in Atlanta, GA during which time they worked together to begin crafting an action plan for adopting and implementing the Field Triage Decision Scheme in at least two regions or local areas of their state. States were asked to draw their team members from the following list of candidates:

- State EMS Director
- State Trauma Systems Manager
- State EMS Medical Director
- State Injury/Violence Prevention Program Director
- Trauma Centers/Acute Care Hospitals
- Regional Trauma Coordinating Committees
- Air Transport Providers
- State Hospital Association
- EMS Providers
- Medical Directors
- Emergency Medicine Physicians
- Emergency Medicine Nurses

The kick-off meeting took place over the course of one-and-a-half days in May 2010. This meeting was specifically designed to provide state teams with time to concentrate on planning for their state. The meeting began with a CDC presentation of the 2006 Field Triage Decision Scheme and presentations from each funded state to share information about their respective trauma and EMS systems, including protocols used within the state. Following these presentations, state teams were led through a series of five breakout sessions to help facilitate their work towards developing an action plan for the adoption and implementation of the
Decision Scheme in their state. The discussions and products of each breakout session were designed to build upon the one that came before, and took place as follows:

- **Breakout session 1- Getting started:** This session was designed to provide time for state team members to discuss how they would work together as they moved forward—identifying the leader for the effort, how decisions would be arrived at, how to address barriers to working together, the level of resources that could be contributed and might be needed for this effort, and the extent to which they have the necessary involvement and commitment needed from stakeholders.

- **Breakout session 2- Getting to know your counterparts:** During this time individuals from similar professions/organizations from different state teams came together to learn about each other. In addition, they shared information about the potential issues and opportunities to successfully adopting and/or implementing the 2006 Field Triage Decision Scheme within their own state.

- **Breakout 3-The push-pull factor:** The exercise team members engaged in during this session included individual and group brainstorming about potential strengths, weaknesses, opportunities, and threats that are present within the state that could affect the adoption and/or implementation of the 2006 Field Triage Decision Scheme. These discussions were designed to help identify internal and external forces in the state that were pushing for or resisting the adoption and/or implementation of the Decision Scheme.

- **Breakout 4- Identifying strategies:** Drawing upon the information discussed in the first three breakout sessions, state teams were asked to brainstorm and prioritize strategies that could be used within their states to successfully adopt and/or implement the 2006 Field Triage Decision Scheme. State teams were encouraged to examine the obstacles that might get in the way of implementing the proposed strategy as well as in overcoming such obstacles.

- **Breakout 5- Putting it all together:** During the final breakout session, state teams worked together to identify critical steps involved in accomplishing the strategies prioritized during Breakout 4 as well as who would be responsible for the action, additional information and resources needed to carry out the action, and how the team would know if the action was completed successfully.

Using the products generated from this meeting, state teams were asked to submit a final action plan 30 days after the kick-off meeting. The action plan was to include a description of what they planned to accomplish over a six-month time period to adopt and implement the Decision Scheme in their state.

Recognizing that the successful adoption and implementation of the 2006 Field Triage Decision Scheme across the U.S. could only be accomplished if multiple partners were involved, the CDC and Safe States also engaged a group of national organizations to encourage enhanced and focused promotion of the Field Triage Decision Scheme to their membership. To facilitate this effort, the Safe States Alliance and the CDC hosted a meeting of national organizations in November 2009. Attendees included representatives from the American Association for the Surgery of Trauma (AAST), the American College of Surgeons (ACS), the American College of
Emergency Physicians (ACEP), the National Association of State Emergency Medical Services Officials (NASEMSO), the National Association of Emergency Medical Services Physicians (NAEMSP), and the National Highway Traffic Safety Administration (NHTSA). Following the meeting, each national organization was asked to create and commit to an action plan for adopting, disseminating, and assisting their members to implement the Decision Scheme. Unlike the three states selected to implement the Decision Scheme, the national organizations were not provided funding to support the implementation of their action plans, but were given one year to accomplish them.

PURPOSE OF THE EVALUATION

The primary purpose of the evaluation described in this report was to systematically gather information that would be useful for gaining a better understanding of the barriers and facilitators associated with implementing the 2006 Field Triage Decision Scheme. In addition, efforts were taken to explore the role of the national organizations engaged in this effort. It is anticipated that the Safe States Alliance, the CDC’s NCIPC, states currently receiving funds for implementation, and states interested in implementing the 2006 Field Triage Decision Scheme will find the evaluation results helpful in planning future efforts to successfully adopt and implement the Decision Scheme.

This evaluation was designed to provide information helpful for answering the following five questions:

1. What is the context in which the 2006 Field Triage Decision Scheme is being implemented in each state?
2. To what extent did states adhere to their action plans as determined during the May 2010 meeting? After 6 months, did they accomplish the goals they set for themselves?
3. To what extent do factors identified by the national organizations (e.g. local politics, overtriage/undertriage, linked data, definition of successful implementation, time, distance, resources, and other factors that emerge from the national organization surveys) facilitate or inhibit the adoption and implementation of the 2006 Field Triage Decision Scheme in each state? What other factors emerge?
4. To what extent do the states anticipate continuing work and expanding their action plans? To what extent do they perceive that the changes they made according to the action plans will be sustainable in their state?
5. What is the role of the national organizations in assisting states to adopt and implement the 2006 Field Triage Decision Scheme? To what extent did the November 2009 and 2010 meetings reinvigorate their efforts in promoting the Decision Scheme?

The report includes a discussion of the methods that were used to answer these questions, the results of the evaluation, and a set of conclusions and considerations for future efforts. The report is organized to describe evaluation findings by the evaluation questions above—beginning with
the context within which each of the states conducted their activities and ending with suggestions about what might be helpful to consider in future implementation efforts.

**METHODS**

**Samples & Data Collection Methods**

Data was collected using multiple methods to generate answers to the overarching evaluation questions posed. Three data collection methods were used—surveys, telephone interviews, and document reviews—with a heavy reliance on the data obtained through telephone interviews. Table 1 summarizes the data collection methods used in this evaluation. The table also links each data collection method to the evaluation questions. Staff from the Safe States Alliance and independent evaluation consultants from Fierro Consulting collaborated on developing data collection instruments and collecting data from participants.

*Evaluation Question 1 - What is the context in which the 2006 Field Triage Decision Scheme is being implemented in each state?*

Data from document reviews and an online survey requesting information about the context within which these projects were being conducted were utilized for the first evaluation question. Specifically, these data collection activities included reviewing state applications, reviewing state-specific PowerPoint presentations from the May 2010 meeting (where available), and analyzing data from an online survey.

In order to increase the potential applicability of the evaluation’s findings to other geographic areas of the U.S., detailed information was requested about the EMS systems within the geographic areas where state teams were implementing their project through an online survey. The survey was based on a detailed survey developed by MacKenzie and Carlini (2008)\(^1\) as part of a pilot study they conducted to develop a “typology of system configurations” using the Mid-Atlantic region of the United States as their sample. To ensure the applicability of the questions asked in this survey, a Safe States Alliance staff member reviewed the original survey and hosted a series of discussions with one member of each state team to identify where changes were needed. After making some small additions to the survey to make it possible to determine which areas had provided responses, the online survey was distributed to representatives of EMS systems by a state team representative. State team representatives determined what constituted a system within their project area and who within these systems should receive the online survey.

Unfortunately, the data acquired through the online survey was found by the evaluation team to be unusable for the purpose of this report since the number and type of responses from various geographic regions where these projects took place appear to overlap significantly. It was not possible to determine the extent to which the responses received were representative of the areas of interest, thus the information was not included in the evaluation report.

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\(^1\) Please refer to original evaluation plan for a copy of the MacKenzie and Carlini survey instrument.
Evaluation Question 2 - To what extent did states adhere to their action plans as determined during the May 2010 meeting? After 6 months, did they accomplish the goals they set for themselves?

Interim and final reports submitted by states to the Safe States Alliance were used to examine the extent to which states adhered to their action plans and attained the goals outlined in these plans. Three reports were submitted to Safe States—two “interim” reports (October 2010 and January 2011) and a final report (May 2011).

Evaluation Question 3 - To what extent do factors identified by the national organizations (e.g. local politics, overtriage/undertriage, linked data, definition of successful implementation, time, distance, resources, and other factors that emerge from the national organization surveys) facilitate or inhibit the adoption and implementation of the 2006 Field Triage Decision Scheme in each state? What other factors emerge? AND Evaluation Question 4 - To what extent do the states anticipate continuing work and expanding their action plans? To what extent do they perceive that the changes they made according to the action plans will be sustainable in their state?

A total of 20 semi-structured telephone interviews were conducted for this evaluation. The purpose of these interviews was to garner a better understanding of the factors that facilitated or inhibited the adoption and implementation of the Decision Scheme in each state as well as the extent to which states might sustain or expand their efforts.

To identify state team members to interview, the primary point of contact on each state team provided recommendations as to team members that were strongly involved in the execution of the state plan. State team members that participated in telephone interviews were also asked to recommend individuals who were not on the state team but could speak to the larger, structural barriers and facilitators (i.e., local politics, lack of data, distance issues) that the state had experienced in trying to implement the Decision Scheme.

Fierro Consulting staff worked collaboratively with Safe States Alliance to develop an interview protocol. Eleven interviews were conducted with state team members2 (four team members from Kansas, three team members from Massachusetts, and four team members from Michigan). Safe States Alliance staff conducted all but one of these interviews. The final nine interviews were conducted with individuals who were not members of the state team. The protocol used in these interviews was informed by a preliminary thematic analysis of the transcripts from the state team member interviews, as well as the interim reports. The non-state team member interviews (and one team member interview) were conducted by Fierro Consulting.

Data obtained through interim and final reports submitted by states to the Safe States Alliance were used in responding to the third evaluation question. Data obtained through the final report were used to respond to the fourth evaluation question.

Evaluation Question 5 - What is the role of the national organizations in assisting states to adopt

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2 One of the “non-team members” recommended to participate were later found to be part of the state team. Their interview was still included in the analysis.
and implement the 2006 Field Triage Decision Scheme? To what extent did the November 2009 and 2010 meetings reinvigorate their efforts in promoting the Decision Scheme?

Safe States Alliance and Fierro Consulting collaboratively developed tailored interview protocols and subsequently conducted four semi-structured telephone interviews with representatives from national organizations. Individuals interviewed represented the national organizations that created action plans or took actions over the course of a year to support the adoption or implementation of the Decision Scheme within states.

Table 1. Summary of Evaluation Questions and Associated Data Collection Methods

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Data Collection Method</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the context in which the 2006 Field Triage decision scheme is being implemented in each state?</td>
<td>Context Survey Document review</td>
<td>Representatives from EMS systems in the targeted regions of each state team Applications from states</td>
</tr>
<tr>
<td>2. To what extent did states adhere to their action plans as determined during the May meeting? After 6 months, did they accomplish the goals they set for themselves?</td>
<td>Document review Document review</td>
<td>Interim &amp; final reports submitted by states to the Safe States Alliance</td>
</tr>
<tr>
<td>3. To what extent do factors identified by the National Organizations (i.e., local politics, over triage/under triage, linked data, definition of successful implementation, time, distance, resources, and other factors that emerge from the National Organization surveys) facilitate or inhibit the adoption and implementation of the 2006 Decision Scheme in each state? What other factors emerge?</td>
<td>Telephone interviews Document review</td>
<td>Purposive sample of state team members Purposive snowball sample of individuals not on state team Interim &amp; final reports submitted by states to the Safe States Alliance</td>
</tr>
<tr>
<td>4. To what extent do the states anticipate continuing work and expanding their action plans? To what extent do they perceive that the changes they made according to the actions plans will be sustainable in their state?</td>
<td>Telephone interviews Document review</td>
<td>Purposive sample of state team members Purposive snowball sample of individuals not on state team Final reports submitted by states to the Safe States Alliance</td>
</tr>
</tbody>
</table>
5. What is the role of the National organizations in assisting states to adopt and implement the 2006 Field Triage decision scheme? To what extent did the November 2009 and 2010 meetings reinvigorate their efforts in promoting the decision scheme?

DATA ANALYSIS AND SYNTHESIS

As described above, qualitative and quantitative data were obtained for the purpose of this evaluation. Quantitative data primarily came from the context survey and was analyzed using descriptive statistics in SPSS v18.0.; however, initial analyses of this data demonstrated it was unsuitable for use in this evaluation.

Qualitative data was obtained from both the document reviews and the semi-structured telephone interviews. Analysis of data obtained from document reviews was systematic. The evaluation team reviewed each document for content that pertained to the evaluation question of interest. The PowerPoint presentations from each state at the May 2010 kick off meeting included requested specific data including a brief discussion about the context in which their project would take place. There were also response items present in the report templates specifically intended to gather data in support of answers to evaluation questions two, three, and four. Additionally, as the questions were nested within the larger report, the entire document was reviewed by the evaluators for information that was applicable to the evaluation question of interest.

Semi-structured telephone interviews with state team members and non-state team members were transcribed by a professional transcription service. Two evaluators from Fierro Consulting subsequently listened to digital recordings of all of the interviews conducted and revised the transcripts for accuracy prior to conducting qualitative data analysis. Sections of audio where the data analysts were unable to agree were omitted from the analysis.

All of the transcript data from one of the three states was selected for review to establish coder reliability. Each data analyst read and coded all the material independently of the other using high-level, emergent codes. The raters then met to compare coding and upon discussion reached complete consensus as to the salient themes present within the transcripts. This process was repeated for each remaining state with all of the transcripts as well as the reports.

As an intermediate step in the data reduction process three multi-page mini-cases were prepared, each of which highlighted themes present in the data. These three cases, as well as a cross case analysis, served to inform further discussion, and additional data reduction. The final case report
was prepared after the two data analysts and a senior evaluator from Fierro Consulting reviewed each case – returning to the source data as needed – and compiled the common relevant elements and unique instances into the final report.

The evaluation team transcribed semi-structured interviews conducted with representatives of the national organizations. Two evaluators from Fierro Consulting separately content analyzed these transcripts to identify themes relevant to the evaluation question pertaining to the national organizations. These two evaluators used the same process discussed earlier to collaborate on the synthesis and writing of the response to the fifth evaluation question.

Success in this report is defined as positive progress towards adopting or implementing the field triage decision scheme in the state. It is important to note that success is not necessarily viewed as synonymous with accomplishing the goals and objectives as outlined in the state action plans.

RESULTS

CONTEXT
The structure of EMS systems (including the availability and accessibility of trauma centers) varies between and within states. The contexts within which the three state teams conducted their work did vary—each state implemented this project in geographic regions that have fairly distinctive features.

Kansas
The Kansas team chose to implement the Decision Scheme in a predominantly rural area (southeastern Kansas). Their implementation presents a picture of the potential issues that arise in implementing the Decision Scheme in an area with limited access to trauma centers and out of state transport of patients.

The Kansas Department of Health and Environment (KDHE) was authorized by the Kansas Legislature to undertake development of a statewide trauma system in 1999. Kansas has established the Kansas Trauma Program (KTP) as a public/private partnership to develop and implement a statewide trauma system across the state to ensure that each patient is promptly and properly transported to the hospital with the most appropriate resources. The KTP is housed within the Bureau of Local and Rural Health at KDHE, and is overseen by the Advisory Committee on Trauma (ACT) whose members are nominated by their professional health organization and appointed by the Governor.

Kansas does not use a uniform set of field triage guidelines or protocols statewide, nor are there plans to legislate compliance with the 2006 CDC Field Triage Decision Scheme at the state or regional level. Rather, the Kansas Trauma System plan empowers the six regional trauma councils (RTC) to work collaboratively with local stakeholder organizations to develop and implement suitable guidelines substantially informed by the 2006 CDC Field Triage Decision Scheme. As participation is voluntary, individual ambulance services, hospitals, and trauma centers are free to determine if they will implement the Decision Scheme within their catchment areas.
The southeastern region in which this project was implemented did not utilize a formal triage guideline system at the time this project funding was awarded. The region is comprised of 12 counties within which 188,900 persons reside. This is a large geographic region, covering over 7,500 square miles. None of these 12 counties are recognized as urban, and all have a population of less than 50,000. The area is served by two ACS Verified Level III Trauma Centers (see map in Figure 1), and 14 hospitals in this region offer emergency care. Trauma patients in the southeastern region requiring higher levels of care are often taken across state lines, primarily to Missouri and to Oklahoma.

Figure 1. Kansas Trauma Centers

Massachusetts
Unlike Kansas and Michigan, Massachusetts’ implementation was statewide. Furthermore, the implementation of the Decision Scheme was essentially simultaneous in the five regions of the state. This implementation effort offers a unique view into a setting where uniform statewide treatment protocols already exist for medical and trauma care and regions have state-approved trauma point-of-entry plans. As such, the focus in this state is clearly on implementation, not adoption of the Field Triage Decision Scheme.

Emergency medical response within the State of Massachusetts is coordinated at the state level by the Office of Emergency Medical Services (OEMS), a division of the Massachusetts Department of Public Health (MDPH). OEMS works collaboratively with the State Trauma Committee (STC), a volunteer staffed non-regulatory group composed of representatives from various levels within the trauma care system (e.g., physicians, nurses, EMTs) that provides

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3 Information obtained from Kansas’ application.
4 Map obtained from the KTP within KDHE: [http://www.ktrauma.org/locations.htm](http://www.ktrauma.org/locations.htm)
guidance regarding best practices. OEMS also provides regulatory oversight of EMS services. Each EMS service is required to have a designated medical director who is responsible for medical control on a day-to-day basis. In addition to OEMS, five regional councils provide coordination within the trauma system. The members of these regional councils act as liaisons between OEMS and EMS services within their region and provide education as well as support for the rollout of statewide programs.

The five EMS regions (see Figure 2) formed organically as a result of local communities agreeing to work together, however a culture of local autonomy remains a predominant factor within Massachusetts’ politics and this is reflected within the Massachusetts EMS community where regions exert a strong voice in state level planning. In addition to statewide regulations, local county and township governments retain the right to legislate additional requirements. Out of respect for this culture of local autonomy and out of recognition of the substantial demographic differences among the five regions, OEMS mandated the adoption of the 2006 CDC Field Triage Decision Scheme, and empowered each of the five EMS regions to engage collaboratively with its internal stakeholders to develop a suitable regional point-of-entry plan for trauma patients and to submit it to the STC for approval.

The state has a total of 17 ACS Verified Trauma Centers across the five regions (see Figure 2). The five regions range from predominately rural to predominantly urban. One region is comprised of the cape islands. Trauma resources vary widely from region to region.

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Figure 2. Massachusetts Trauma Centers

5 Map obtained from Massachusetts Office of Health & Human Services at: [http://www.mass.gov/?pageID=eohhs2terminal&L=3&L0=Home&L1=Government&L2=Local+Govern](http://www.mass.gov/?pageID=eohhs2terminal&L=3&L0=Home&L1=Government&L2=Local+Govern)
Michigan’s implementation focused on two large urban areas of the state and built upon legislation passed in 2011 to develop and fund an “All-Inclusive Trauma System”. This project focused on implementing the 2006 Field Triage Decision Scheme in an environment simultaneously engaged in a broad-based and mandated effort to put into place a larger trauma system.

Under state law, the Michigan Department of Community Health’s (MDCH) Crime Victims and EMS section oversees and administers the state’s EMS system through 65 Medical Control Authorities that operate at a local level. The EMS section of MDCH provides “administrative direction of the statewide trauma system” with input from a Statewide Trauma Advisory Subcommittee that is comprised of workgroups reflective of an all inclusive trauma system—triage and transport, designation and verification of trauma centers, data and evaluation, education and injury prevention, and funding. The trauma system infrastructure in Michigan is arranged into eight regional trauma networks (see Figure 3). Each of these regional trauma networks has a Board that includes each of the medical control authorities that resides in the region. In addition, each of these regions has other entities—Regional Trauma Advisory Councils (RTAC) and Regional Professional Standards Review Organizations (RPSRO). The RTAC is primarily responsible for providing leadership and direction with respect to the trauma system’s development including the development of a regional trauma plan that is based on the larger state’s trauma plan. Since these plans concern the creation of an all-inclusive trauma system, considerations regarding triage/transport are included.

The two regions asked to participate in this project were invited because of their population size, the number of large venues in the area and variety of hospitals with ACS Verified Trauma Centers. The two areas of Michigan within which this pilot was implemented include:

- **Region 1-** This region consists of nine counties whose population is roughly over one million and includes the state capital, Michigan State University, and Michigan International Speedway. Fourteen hospitals serve this region, including three tertiary care centers and one Level I ACS Verified Trauma Center. There are 7 MCAs that oversee 85 EMS Life Support Agencies.

- **Region 2 South-** This area is made up of four counties, is largely urban, and has a large population density. The city of Detroit, General Motors, and four large venues are located in this area. Approximately 25% of Michigan is located in the southeastern portion and it comprises the largest populace of the eight trauma regions in the state. The region includes 35 licensed hospitals with 27 Emergency Departments. Nine of these hospitals are ACS Verified Trauma Centers (Level I or Level II).

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6 See: [http://www.michigan.gov/mdch/0,1607,7-132-2946_5093_28508-132262--,00.html](http://www.michigan.gov/mdch/0,1607,7-132-2946_5093_28508-132262--,00.html) for additional information on the Statewide Trauma Advisory Subcommittee

7 Information obtained directly from Michigan’s application.
Figure 3. Michigan Regional Trauma Networks

**ACTION PLANS**

As noted in the introduction, state teams were tasked with developing and submitting an action plan for adopting and/or implementing the 2006 CDC Field Triage Decision Scheme in their state. State teams were asked to submit this final action plan describing what they planned to accomplish over a six-month time frame to adopt and/or implement the Decision Scheme in their state within 30 days following the kick-off meeting. For this evaluation, we posed the following questions regarding state action plans: *To what extent did states adhere to their action plans as determined during the May 2010 meeting? After 6 months, did they accomplish the goals they set for themselves?*

Tables 2-4 provide the goals and objectives that each state intended to attain through their action plans. Although states were able to accomplish many of the goals and objectives they set forth in their action plan, it is important to note that they all received a no-cost extension to conduct their efforts. This no-cost extension extended the plan by three months.

**Kansas**

The Kansas team was able to effectively leverage its resources to accomplish three of the four goals noted in Table 2. The first goal, *recruit hospitals and EMS agencies in SE trauma region to participate in field triage pilot project*, was accomplished by holding informational workshops. In September of 2010, the Field Triage Project Team and the Southeast Kansas Regional Trauma Council (SEKRTC) conducted three field triage workshops. These were intended to recruit hospitals and Emergency Medical Service (EMS) agencies in the Southeast (SE) trauma region to participate in the pilot implementation of the 2006 Field Triage Decision Scheme. The EMS personnel were given continuing education credits for attending and a representative from CMS

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8 Figure 3 was obtained from the Michigan Trauma Coalition website at: [http://mitrauma.com/newsite/?page_id=542](http://mitrauma.com/newsite/?page_id=542)
was there to discuss issues related to the Emergency Medical Treatment and Active Labor Act (EMTALA), a statute which governs when and how a patient may be (1) refused treatment or (2) transferred from one hospital to another when he is in an unstable medical condition. The workshops were attended by 80 participants, representing 12 of the 13 hospitals in the region and 17 of the 19 EMS agencies. The workshops were viewed as successful as ultimately all of the hospitals in the region chose to participate, in addition to all but one EMS agency.

The second goal, to have 75% of the SE trauma region EMS service agencies adopt the field triage scheme, was also met. The state team accomplished this goal by identifying EMS agencies in the areas that were either already using the Field Triage Decision Scheme or were not currently using it but there was interest in adopting it. There were 19 ground EMS providers in the area and 18 of them chose to adopt the Decision Scheme. Additionally, four air ambulance services chose to participate and agreed to provide transport logs to cross-verify data reports with ground services.

Several issues arose that have temporarily delayed full completion of the third goal, describe transport decision making for patients injured in SE region and transported from the scene of injury by EMS. To accomplish the objectives that would help to meet this goal (see Table 2), state trauma program staff considered different methods to obtain data needed from out-of-state trauma centers. However, it became clear that accomplishing this goal would be severely constrained as a result of out-of-state trauma centers’ database software being incompatible with that used in Kansas. The out-of-state trauma centers would have to re-enter data into the Kansas system and the resources were not available to do this.

The final goal was to evaluate project implementation and outcomes. This goal was not fully attained as of the final report to Safe States, however, primary data collection efforts performed by EMS and hospital staff occurred between October 1, 2010 and March 31, 2011. At the time of the final report, data analysis was underway but not yet complete.

Table 2. Kansas’ goals and objectives from action plan

<table>
<thead>
<tr>
<th>Kansas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal 1</strong>: Recruit hospitals and EMS agencies in SE trauma region to participate in field triage pilot project.</td>
</tr>
<tr>
<td>• Objective 1.1: Promote benefits of CDC field triage scheme.</td>
</tr>
<tr>
<td><strong>Goal 2</strong>: 75% of SE trauma region EMS service agencies will adopt CDC field triage guidelines.</td>
</tr>
<tr>
<td>• Objective 2.1: Identify the EMS agencies that are currently using the CDC field triage guidelines and/or would be interested in implementing CDC field triage guidelines as part of the project.</td>
</tr>
<tr>
<td><strong>Goal 3</strong>: Describe transport decision making for patients injured in SE region and transported from the scene of injury by EMS.</td>
</tr>
<tr>
<td>• Objective 3.1: Describe transport patterns of patients who sustain injuries in SE region with State Trauma Registry data.</td>
</tr>
</tbody>
</table>
Objective 3.2: Develop methodology to describe the use of field triage scheme.

Objective 3.3: Develop methodology and partnerships for obtaining out-of-state trauma registry data to describe field triage decision-making, time to definitive care, and outcomes.

Goal 4: Evaluate project implementation and outcomes.

Massachusetts
The state team identified one goal and a set of associated objectives (see Table 3) as key to the successful statewide rollout and implementation of the 2006 CDC Field Triage Decision Scheme. Through collaborative efforts, the state team made great progress towards accomplishing this goal—Prepare MA EMS and hospital systems personnel to use the 2006 Field Triage Decision Scheme.

Implementation began with the official adoption of the CDC’s 2006 Field Triage Decision Scheme by the Office of Emergency Medical Services (OEMS). In preparation for this, the relevant research literature was reviewed and provided to the State Trauma Committee (STC), along with a copy of the proposed revisions to the existing decision scheme. Upon consideration, the STC passed a recommendation on to the Emergency Medical Care Advisory Board (EMCAB)—the group within the Massachusetts Department of Public Health (MDPH) that houses OEMS. After deliberation, MDPH adopted the revised criteria as the new state guidelines.

The rollout team succeeded in working collaboratively with key stakeholders to engender support for the development of regional point-of-entry plans that effectively utilized local resources in a manner OEMS judged to be in alignment with the newly adopted statewide decision scheme. As of their final report under this grant, OEMS reported that four of the five regions have point-of-entry plans that have been approved by MDPH.

MDPH also noted in their final grant report that they have succeeded in developing a training slideshow suitable for use in Massachusetts. Following completion and adoption of regional point-of-entry plans by four of the five regions, MDPH began moving forward with their train-the-trainer workshops. Following these, those trained were able to move forward with structured trainings for EMS personnel. At the time of this writing, various EMS services continue to train their staff and the last of the five regions nears completion on its point-of-entry plan.

The state team, however, has encountered some difficulties in finalizing an evaluation tool (the fourth objective in support of the team’s goal) due to the similarity between the old state criteria and the new Field Triage Decision Scheme. Since certain variables designed to capture particular criteria referenced in the Field Triage Decision Scheme are not available, MDPH is limited in the nature of pre–post type comparisons that may be made.
Table 3. Massachusetts’ goal and objectives from action plan

Massachusetts

Goal:
 Prepare MA EMS and hospital systems personnel to use the 2006 Field Triage Decision Scheme.

Objectives:
  1) Secure key stakeholders’ support.
  2) Update statewide treatment protocols.
  3) Develop MA-specific training material.
  4) Develop an evaluation tool.

Michigan

As outlined in Table 4, the state team in Michigan set three goals for the project—two of which were met, and one of which was only partially attained. The first goal—to provide an overview of the roles and responsibilities to health care partners participating in the project—was achieved, although some of the objectives associated with this goal were difficult to accomplish. The challenges associated with accomplishing these objectives concerned obtaining and installing project management computer software programs (due to state restrictions), delays due to the summer start time, and controversies related to defining the highest level of care.

The second goal of the project—coordinate implementation and ongoing monitoring of the field triage project for the six-month timeline—was met. Similar to the first goal, there were challenges associated with implementing the objectives associated with this second goal. Issues encountered included the burden associated with regularly notifying participants (e.g., hospitals, medical control authorities, life support agencies including air medical service agencies) on the progress of the project, the inability of hospitals to submit data on a monthly basis to the State Trauma Registry, concerns about sharing data in the absence of specific hospital IRB approval, and the non-existence of electronic records within some life support agencies.

The final goal—write an executive summary of the results of the field triage project in Region 1 and Region 2 South for the six-month timeline—was partially attained. While the Decision Scheme has been implemented in the regions, the results of analyses using this data are not yet complete. This is the result of a variety of factors including staff shortages and turnover, a large number of hard-copy patient care records for data entry by a one-person staff, and the need to complete appropriate data cleaning procedures prior to conducting the analyses that would be included in this executive summary.

Table 4. Michigan’s goal and objectives from action plan

Michigan

Goal 1: Provide an overview, including roles and responsibilities, to all health care partners participating in the Field Trauma Triage Grant Project.
  - Objective #1: Prepare six month timeline for the implementation of field triage grant project in Region 1 and 2 South using Micro-soft Project Manager.
Michigan

- Objective #2: Identify Hospitals, Medical Control Authorities, Life Support Agencies including Air Medical Services that will participate in the Region 1 and 2 South Field Triage Project.
- Objective #3: Discuss letter from Department notifying Hospitals, Medical Control Authorities, Life Support Agencies including Air Medical Services of the upcoming filed triage grant project in Region 1 and 2 South at the May 21, 2010 EMSCC meeting.
- Objective #4: Identify date and time to meet with State Data Manager to discuss integration of the EMSIS and Trauma Registry into the field triage project for the six month timeline.
- Objective #5: Identify date and time for conference call to ImageTrend to discuss implementation of Trauma Registry for the field triage project.
- Objective #6: Notify Hospitals, Medical Control Authorities, Life Support Agencies including Air Medical Service Agencies with a letter from the Department describing the project as well as an invitation for July 12, 2010, 2pm, at the Health Emergency Medical Services, Inc. (HEMS)
- Objective #7: Prepare field triage criteria protocol under the department as a special study to accommodate the Medical Control Authorities, Life Support Agencies including Air Medical Service Agencies with proper destination of critically injured patients for the purpose of the six month timeline of the project.
- Objective #8: Describe field triage project including specific roles and responsibilities to Hospitals, Medical Control Authorities, Life Support Agencies including Air Medical Services at the July 12, 2010 meeting allowing for questions, answers and discussion of the project.

Goal 2: Coordinate implementation and ongoing monitoring of the field triage project for the six-month timeline.

- Objective #1: Demonstrate administrative oversight by the department of the field triage project to the field triage state team by providing brief progress updates with bi-weekly e-mails, monthly conference calls and bi-monthly face-to-face meetings.
- Objective #2: Notify Hospitals, Medical Control Authorities, Life Support Agencies including Air Medical Service Agencies by e-mail on a bi-weekly basis to update on progress of project and answer any questions/ concerns relating to the roles/responsibilities with the project.
- Objective #3: Demonstrate the use of the state trauma registry by hospitals participating in the pilot project by submitting data on a monthly basis in the NTDB format of all injured patients admitted and/or transferred to their facility for the six month timeline.
- Objective #4: Demonstrate the use of the MI-EMSIS by Medical Control Authorities and Life Support Agencies including Air Medical Services participating in the pilot project by submitting data on a monthly basis of all injured patients.
Michigan

Goal 3: Write an executive summary of the results of the field triage project in Region 1 and Region 2 South for the six-month timeline.

- Objective #1: Review and analyze the specific report of the field triage project from the trauma registry and MI-EMSIS on a monthly basis.
- Objective #2: Describe the status of the field triage project to Safe States Alliance by providing a final report of activities accomplished within the six month timeline on or before January 10, 2010.
- Objective #3: Identify Quality Improvement plan based on evaluation of the pilot project for the six month timeline and develop best practices for implementation in other regions within Michigan as well as for national implementation.

Facilitators and Barriers

The third set of questions that structured the data collection efforts for this evaluation relate to the barriers and facilitators encountered in the state projects. Specifically, we asked: To what extent do factors identified by the national organizations (e.g. local politics, overtriage/undertriage, linked data, definition of successful implementation, time, distance, resources, and other factors that emerge from the national organization surveys) facilitate or inhibit the adoption and implementation of the 2006 Field Triage Decision Scheme in each state? What other factors emerge?

Facilitators

As one air ambulance pilot stated, “We don’t know how to say ‘no’y.” More than anything else, this evaluation has shown that these state teams succeeded as a result of the hard work and dedication of a number of exceptionally motivated individuals serving in a volunteer capacity to bring best practice guidelines to practitioners. In addition to the crucial support of state and national organizations, these volunteers were also substantially supported by their own organizations – hospitals and ambulance services – that were willing to allow these women and men the flexibility to participate in numerous offsite face-to-face meetings, presentations, conference calls, and in some cases, trainings. Throughout the course of the project a number of successful strategies were developed and implemented and some key features of these successful projects emerged. Key facilitators included: existing infrastructure, broad based leadership teams, personal contacts and securing stakeholder buy-in, focusing on patient care as a common goal and support from partner agencies.

Existing infrastructure. A variety of resources already existed within states that helped support the adoption and implementation of the Decision Scheme. Examples of these existing resources included but were not limited to strong communication networks among medical practitioners, existing triage protocols that are in or near alignment with the 2006 Field Triage Decision Scheme, and previous experiences with collaborative endeavors related to implementing medical guidelines (e.g., STEMI). For example, in both Kansas and Massachusetts relationships developed during the implementation of the STEMI and stroke criteria informed planning and
facilitated communication during the rollout of the Field Triage Decision Scheme. Team members in the southeast region of Kansas reported that established communication networks with strong leadership existed among health care entities and personnel such as EMS, hospitals, physicians, and nurses. States also noted that the current project helped to expand these existing networks and strengthen existing relationships.

**Team composition.** Across all three states, implementation teams had a broad based composition that represented each level of the trauma care system—EMS, Nurses, Physicians, and Medical Directors. Some teams reported that working together across levels of trauma care was particularly important. For example, having an EMT and an ED physician together to present the case for the 2006 Field Triage Decision Scheme was perceived as particularly effective. In some cases, it was helpful to have a trauma surgeon located in a Level I trauma center whose catchment did not overlap with that of the Level II, III, or IV trauma center she/he was trying to engage. One particularly effective physician was reported as beginning her/his pitch by stating “I am not here to try and take your patients.”

**Personal contact.** Some teams found it advantageous to precede formal presentations with personal outreach to key individuals. These conversations were designed to garner the support of these individuals and to develop a better understanding of their particular perspective on the matter. These stakeholders appeared to appreciate, and in some cases expect, that implementation team members would devote the time required to discussing the proposed change and its potential impact with them on an individual basis. Implementation teams found that the demand for such contact was greater than expected.

In general, all three states reported that face-to-face contact was particularly effective in gaining support. Although this was time consuming, implementation teams judged it as having been worth the effort. It is important to note that in some cases the official point of contact within medical organizations was not always the most advantageous place to start—rather making use of personal networks that span organizational boundaries greatly facilitated access to key decision-makers within organizations (see “existing infrastructure” above).

**Securing stakeholder buy-in.** Numerous individuals reported the importance of effectively engaging with stakeholders across multiple organizations involved in pre-hospital and hospital care. Even in locales where compliance is mandatory, securing stakeholder buy-in was a key factor to the success of the implementation effort. State teams found it important to engage all levels of trauma centers (verified and non-verified), community hospitals, and to reach out to potential dissenting voices early in the process. Although this may appear counter-productive, if the support of these individuals is critical then any consensus negotiated without their involvement may need to be renegotiated later resulting in substantial delays.

To the extent possible, it was helpful to draw on data from the field to support or explain the potential impact of the proposed change. Producing and sharing local estimates of the predicted change in volume as a result of a reduction in overtriage and undertriage provided a practical basis for discussions with stakeholders. The evaluation data also suggests that it is important to acknowledge as part of these discussions that many localities are severely underserved by ambulances and hospitals. In these cases the loss of an ambulance for a two-hour round trip, or the loss of the revenue from a single trauma case are important considerations. Arguing the issue
for adopting and implementing the Decision Scheme without attention to these local contextual factors has the potential to lead to well-intentioned persons and organizations, who are important in developing collaborative solutions, not becoming involved in the effort.

**Tone/focus of conversations.** Overall, implementation teams reported that a communication strategy focused on patient care was effective in that it offered all parties a common goal from which they could structure their conversations and facilitated mutual acknowledgement of all parties’ best intentions. It was important to diffuse concerns that individual hospitals are merely squabbling over patients or demeaning the other’s provision of patient care and services. A focus on patient care tended to change the framing of discussions for the better.

**Support of partner agencies.** Although the grant funds and other support offered by the Safe States Alliance and the CDC are crucial to implementing the Decision Scheme in states, numerous other partner agencies also played an important role. For example, the support of agencies that employ implementation team members was critical to the success of the project. Few individuals are in a position to publically advocate for a policy change their employer disagrees with—however agreement is not sufficient. Team members are often called upon to work on the project during work hours. Although most team members reported that they were still responsible for their regular job duties, their mere absence or lack of availability at various times posed a burden, especially in light of recent downsizing in the healthcare sector.

Implementation team members acknowledged the importance of having the active support of various national organizations, as well as the organization’s state and local chapters. In particular, some professional organizations have the ability to actively educate their membership about the reasons for the Decision Scheme as well as its importance. Additionally, state/local chapters are in a unique position to contribute their support to these types of projects. In some cases, associations (e.g., Massachusetts Hospital Association) were able to provide much needed support including webinar and conference call hosting. State team members hope that this will become more common moving forward.

In addition to providing funds through Safe States and training materials to grantees, the CDC’s presence through visits to the states by Dr. Hunt served to shift the focus of the discussion from local professional disagreements surrounding best practices to an acknowledgment that local practice was, in some ways, out of alignment with nationally recognized best practices. A number of physicians acknowledged the importance of having an outside voice at the table and some individuals expressed that the CDC’s involvement signaled the importance of this effort to the local policy community.

**Barriers**

As with any substantial change intervention, there were a number of challenges faced by the states in carrying out their action plans. Many of these obstacles were successfully overcome as highly motivated teams developed and implemented strategies based on the facilitators already mentioned. Some of the factors that presented challenges during the course of this project included: short project timeframe, lack of clarity of the Decision Scheme criteria, local contextual factors, data and training factors.
The initial timeline allotted for the project was very short. All states received a no-cost extension to continue their work towards accomplishing the goals and objectives outlined in their action plans. It was apparent from this implementation period that the timeframe allotted for this project was long enough to make headway towards adopting and implementing the Decision Scheme in all three states and sufficient to identify areas that would require more attention. Although many original goals and objectives proposed in the action plans were accomplished, there were many factors that naturally occur in these implementation contexts that made the project timelines longer than originally anticipated.

Hindsight suggests that considering up front the extent to which various stakeholders’ agencies meeting schedules overlap may have suggested that a longer timeline for project activities was necessary. Additionally, the need to seek approval from multiple IRBs has the potential to result in substantial delay. It is noteworthy going forward that not all IRBs can be counted on to offer an expedited approval process, and that document preparation prior to submission is itself a time consuming task.

It is helpful to recognize that the medical community is chronically understaffed. Considering that much of the work that was done by providers to accomplish the project goals was uncompensated, it may be important in future projects to build more time in to the schedule to allow for unforeseen personnel needs as it is rarely the case that sufficient person-power exists to cover for a team member with a scheduling conflict.

The abbreviated timelines may have encouraged implementation teams to move forward quickly at the beginning stages. However, rushing the process has the potential to result in the exclusion of key stakeholders. Such exclusions can result in substantial setbacks for the project, given that existing agreements may need to be renegotiated.

The 2006 field triage decision criteria are perceived by some stakeholders as lacking in clarity that is needed for ease of implementation. One of the potential barriers identified by the National Organizations in the December 2009 meeting was ‘Successful Implementation’. This issue relates to implementing the Decision Scheme as written or adapting it with an eye to local resources. We found evidence that there was confusion among many of the stakeholders about how to interpret various elements of the Decision Scheme. Although states were able to make local-level decisions about these interpretations, there often remained uncertainty as to whether this was what was intended by the authors of the 2006 Decision Scheme.

Multiple individuals involved with the project reported that it was not clear what is intended by the use of the term “trauma system.” Grantees therefore developed definitions that were useful in their particular local contexts, however it remains unclear the extent to which this is appropriate.

Numerous grantees reported that the Decision Scheme also failed to adequately distinguish between various levels of trauma centers and the variability that exists within a given trauma center level. Respondents across multiple states suggested that this issue could be settled at the national level and then regions and communities would not have to spend time arguing the point. For example, in Michigan extensive efforts to engage with a variety of stakeholders in deciding how to treat Level I and Level II trauma centers took place. Ultimately a decision was made to treat Level I and Level II trauma centers as the same level of care. In an effort to create an
evidence base to inform future decision-making, Michigan is creating their state trauma registry under the “All-Inclusive Trauma System.” The hope is that this trauma registry will house data that can be used to see if differences emerge in patient outcomes between trauma patients treated at a Level I or Level II trauma center.

The Field Triage Decision Scheme itself may be prone to misinterpretation. Some individuals we interviewed suggested that a literal interpretation of the Decision Scheme has the potential to underutilize local resources and further suggested that this may result in the detriment of patient care. More than one interviewee noted that based upon their interpretation of the Decision Scheme, an individual injured across the street from a Level III trauma center or community hospital may face prolonged transport time to a higher level trauma center. Many individuals we spoke with thought that this delay in being seen by an ED physician is unnecessary and that patients in this situation ought to be stabilized at the Level III trauma center or community hospital prior to transport.

**The local climate or context may not favor implementation of the Decision Scheme.** Statewide mandated compliance to implement the Decision Scheme may fail to prevent systematic overtriage or undertriage for a number of reasons, making challenges related to local-level implementation exceedingly complicated. Interviewees noted a number of local-level nuances that can make it difficult to implement the Decision Scheme.

It was suggested that in some rural contexts, there are persons of authority who do not allow EMS personnel to transport patients outside the borders of the local geographic area. Furthermore, some local ambulance services serving rural areas were portrayed as having concerns that the communities they serve will be without access to EMS care as a result of the extended transit time to a higher-level trauma center. Additionally, EMS personnel without more advanced skills may feel that transporting a patient for a long period of time may be too risky.

It was recognized that it is important to be sensitive to the idea that some medical facilities may be concerned about the loss of revenue as a result of changes in patient flow. In some instances ambulance services may be wholly owned by local hospitals that may not be inclined to participate. Alternately, some medical directors of independent ambulance services are employed by local hospitals and such a role could subject these individuals to adverse levels of pressure not to adopt the Decision Scheme.

In some cases, interviewees noted that physicians at local hospitals believe that it is in the patient’s best interest to be stabilized there prior to transport, or that the appropriate resources to care for the patient are available. Similarly, these hospitals believe they have something to offer a trauma patient and that they have been doing quite well to date. It was explained that such beliefs may result in either systematic undertriage or a delay in transfer as additional tests are run after the patient is stabilized.

**Data issues.** As might be expected, each state had a different starting point with regard to data collection. Data was an important issue in every state, and there was a desire to use data to better understand the use of the Decision Scheme in the field as well as the implications for using it on patient outcomes. As such, each state is currently engaged in developing a monitoring system to gather data helpful to future decision-making. As states embarked upon the development of such
systems, unanticipated challenges continued to arise and ultimately the lesson learned was that this is a very time consuming and resource intensive task which requires additional attention.

One issue that arose with respect to data was simply the existence of data. Within states, existing data collection systems for pre-hospital and hospital based care did not always include variables that capture the criteria associated with use of the Decision Scheme. For example, both Massachusetts and Michigan provided crosswalks between the variables that exist in their pre-hospital care data and those that are needed to help evaluate the Decision Scheme implementation efforts. In many instances missing variables were uncovered and in the case of Massachusetts, there is a need to add approximately 18 new variables to the Massachusetts Ambulance Trip Report Information System (MATRIS) (e.g., fall >20 feet in adult; fall >10 feet in child; flail chest; partial or complete ejection from vehicle).

The second issue is that the data that is present may not be available in a compatible format for linking data about patients between the various points in the patient care system—including those points of care that exist within a single state as well as between states. The same vendor within Kansas developed their data systems, thus compatibility between in-state hospitals was not an issue. A greater challenge for this state was the inability to link data with out-of-state systems. Southeast Kansas does not have any Level I or II trauma centers and so trauma patients are routinely taken across state lines.

The final issue is that even if data is present, it may be difficult to share for a variety of reasons that go beyond compatibility issues between data systems. These include but are not limited to receiving approval from multiple IRBs, compliance with HIPPA, a need to train existing staff to facilitate data quality, and limited resources—such as staff availability and turnover and the existence of paper-based record keeping. In Michigan where the state trauma registry was in its infancy, the training burden for verified and non-verified trauma centers was substantial. Additionally, similar to some other states, there was a desire to capture data about the trauma patient in the field. A challenge here was that while most of the EMS agencies maintained electronic records for patients there were still some that used paper-based records. As a result, Michigan chose to use two methods to capture data for their project, electronic and non-electronic. Agencies with paper-based record systems were asked to send hard copies to a designated data entry person, who became overwhelmed with the number of hard-copy patient-care records and was not able to process these on a monthly basis.

Training Issues. One lesson learned from the state projects is that there are a number of different individuals within the system that need to be trained for implementation of the Decision Scheme to be successful (e.g., EMTs, persons within verified and non-verified trauma center who work with data, Medical Directors). The time and resources associated with activities created to educate these stakeholders was sometimes seen as a challenge to implementing the decision scheme.

Although training on the Field Triage Decision Scheme appears to be progressing in many areas, there are some things worth keeping in mind when moving forward with implementation efforts. For example, some EMS personnel are contractually entitled to compensation for the time they spend in training. As a result of these contractual statements, the provision of training to these individuals (whether on or off-site) can be particularly resource intensive.
Additionally, although it is recognized that electronic media can greatly ease materials cost, there is still a need for paper copies of training materials. In at least one state’s project, materials ordered from CDC were not received in a timely fashion. It should also be acknowledged that many public health and EMS agencies are operating under severe fiscal constraints. As such, their agencies should not be relied upon to have the capacity to produce these paper copies. Also, although email provides a powerful vehicle for disseminating training materials, notifying individuals of training opportunities, or sharing other mass communications related to training efforts about the Field Triage Decision Scheme; concerns for protecting the privacy of EMTs and others may make access to email distribution lists difficult or impossible to obtain.

**Sustainability**

Another question for which we collected data through this evaluation concerned the likely sustainability of the progress that was made through the implementation of state action plans as part of this project. The specific questions that structured our inquiry around sustainability were:

*To what extent do the states anticipate continuing work and expanding their action plans? To what extent do they perceive that the changes they made according to the action plans will be sustainable in their state?*

All states funded through this project intend to sustain and expand their efforts with implementing the 2006 CDC Field Triage Decision Scheme. In all three states, there are high-level (statewide) policies in place that provide momentum for sustaining and expanding the efforts that took place under the currently funded projects. In 1999, the Kansas Legislature authorized the Kansas Department of Health and Environment to undertake development of a statewide trauma system. As part of this effort, the six regional trauma councils are empowered to work collaboratively with local stakeholder organizations to develop and implement suitable guidelines substantially informed by the 2006 Field Triage Decision Scheme. In Massachusetts, state legislation mandates EMS practitioners to comply with regional point of entry plans that are to use the 2006 Field Triage Decision Scheme. In 2007, the state of Michigan passed legislation to implement a State Trauma System, specifically an “All-Inclusive Trauma System,” that includes triage and transport decision-making. Although previously unfunded, a recent bill was passed that now provides funding for implementation. Such statewide policies have the potential to create an environment in which implementation and institutionalization of the use of the Decision Scheme is more likely to be supported.

**Kansas**

Although Kansas does not use a uniform set of field triage guidelines or protocols statewide and does not have plans to legislate compliance with the 2006 Field Triage Decision Scheme at the state or regional level, there is significant interest among the six regional trauma councils to adopt the 2006 Field Triage Decision Scheme for implementation in their regions. There was a tremendous amount of interest in the pilot implementation in SE Kansas among individuals in the other regions of the state. Interviewees noted the extreme interest on the part of other regions to learn from the project in SE Kansas, and explained the state team’s efforts to date to engage these regions in the interest of eventually implementing the Decision Scheme statewide. Within the timeframe of the current project, the state team also made efforts to gain the support of the Kansas EMS Medical Directors for implementation of the Decision Scheme across the state.
The other five regions in Kansas are making updates to their system plans this year and they have all included a specific goal in the plan to implement the Decision Scheme in their region. At the end of the current project there were specific plans to support the implementation of the Decision Scheme in at least two other regions of the state. Examples of specific future endeavors to continue promoting the adoption and implementation of the Decision Scheme among regional trauma councils includes presentations at all six regions’ annual meetings in 2011 as well as presentations at the Kansas Emergency Medical Technician Association and Kansas Emergency Medical Service Association.

As participation in the project is voluntary, not every EMS service and hospital is immediately ready to engage in this type of effort and some interviewees thought a state mandate would help to eliminate some of the politics related to implementing the Decision Scheme, because it would provide resources and regulatory oversight. Issues related to data, both within the state and between states, will likely continue to be a challenge. However, it does not appear that this will present a significant barrier (at least in the near-term) to spreading the adoption and implementation of the Decision Scheme in more regions of the state. Continuing to educate stakeholders about the Decision Scheme, and having the resources to do so is seen as important to institutionalization in Kansas.

**Massachusetts**

As the State of Massachusetts has elected to implement the Decision Scheme statewide, and considering that the last regional point-of-entry plan is expected to be approved soon, it seems reasonable to expect that the successes experienced during the current project will be sustained. Train the trainer workshops have been accomplished, and the various regions are moving forward with the training for EMS personnel. Although this will not occur instantly, the existence of a state mandate implies that it will be accomplished. Other efforts underway in the state that are supportive of sustaining the current efforts include the submission of EMS data\(^9\) to the state and the development of new EMT curriculum guidelines that include the Decision Scheme.

Looking towards longer-term sustainability, the state notes that follow-up training for ambulance services and EMTs who are required to comply with regional point of entry plans, will be important to sustaining these efforts. They specifically noted that these efforts could benefit from additional funding. In addition to instituting these periodic trainings, future efforts to sustain the implementation of the Decision Scheme statewide could benefit greatly from high-quality information regarding the state of trauma triage practice within the Commonwealth.

**Michigan**

Michigan does have clear plans to extend the current project and recent legislative actions that supply funds for the State Trauma System will likely be helpful in doing so. As noted in the barriers and facilitators section, this project illuminated the difficulties of establishing how precisely to interpret the “highest level of care within the trauma system” statement that exists within the Decision Scheme. This lack of clarity within the Decision Scheme resulted in

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\(^9\) We presume that this data is submitted to the state’s Office of Emergency Medical Services, however this is not clear from the evaluation data obtained.
decisions to regard Level I and Level II trauma centers as both being the highest level of care in the state, although this decision was not without debate. As such, moving forward, the state is placing emphasis on garnering the data that they feel is necessary to examine the extent to which differences exist in outcomes for trauma patients (if any) between Level I and Level II trauma centers. Such an evidence base is considered to be very important in implementing the Decision Scheme in this state.

It appears that a few items need to be addressed in order to truly establish this evidence base. Obtaining this information assumes that quality data can be gathered from the numerous entities involved in trauma care. As discovered through this project there is work that remains to educate verified and non-verified trauma centers about how to collect and submit data to the state trauma registry and challenges with respect to linking data between in-state systems. During this project, efforts were taken to educate verified and non-verified hospitals about how to collect and input data into the state trauma registry. It appears that the lessons learned in conducting these educational sessions within the two regions where this project was implemented will be used in subsequent educational efforts throughout the state (e.g., having separate trainings for verified and non-verified trauma centers with different content.) Another focus for the future concerns linking pre-hospital data electronically with hospital trauma registry data. Currently, this is not possible and as a result labor intensive efforts such as manual modification of existing data has to be conducted in order to “follow” a patient from the time an injury occurs in the field to the time they are discharged from the hospital. The state team noted in the final report that future efforts will focus on data collection and analysis, and it is assumed from these lessons learned that these will be some of the areas of focus.

NATIONAL ORGANIZATIONS

The final question we set out to answer through this evaluation concerned the role of the national organizations in supporting states to adopt and implement the Decision Scheme as well as the extent to which this project reinvigorated their efforts in promoting the Decision Scheme. Specifically, we posed the following questions: What is the role of the national organizations in assisting states to adopt and implement the 2006 Field Triage Decision Scheme? To what extent did the November 2009 and 2010 meetings reinvigorate their efforts in promoting the Decision Scheme?

On November 2, 2009, in Washington D.C., the Safe States Alliance and CDC’s NCIPC hosted a meeting attended by a variety of national organizations. The purpose of this meeting was to encourage the national and state-level implementation of the Decision Scheme. Semi-structured telephone interviews were conducted with four of the organizations present that day including the American College of Emergency Physicians (ACEP), the National Association of State Emergency Medical Services Officials (NASEMSO), the National Association of Emergency Medical Services Physicians (NAEMSP), and the National Highway Traffic Safety Administration (NHTSA).

Following the meeting in Washington, D.C., three of these national organizations, ACEP, NASEMSO, and NAEMSP were able to develop and move forward with the implementation of
their own action plans to support the implementation of the Decision Scheme. NHTSA did not submit a formal action plan document, but did move forward with efforts in support of adoption and implementation of the Decision Scheme. In general, participation in the 2009 workshop was viewed as elevating the importance of the Decision Scheme and was perceived as helpful to engaging the organizations. Involvement by the CDC and seeing a need for this program helped to push many of these national organizations to spread information about the Decision Scheme.

The four national organizations played different roles with respect to promoting the adoption and implementation of the Decision Scheme. ACEP and NASEMSO were similarly engaged in increasing awareness and understanding of the 2006 CDC Field Triage Decision Scheme and in supporting their utilization among their membership. Target audiences for their dissemination of information efforts were slightly different as ACEP targets EMS Medical Directors while NASEMSO targets EMS personnel. The role of the NAEMSP lies in the strength of its association membership (who are EMS physicians) and their resources to write and implement position statements to make a case for change. Finally, while NHTSA did not participate in action planning, they are engaged in projects that promote the Field Triage Decision Scheme. Each of the three National Organizations that submitted action plans saw their role at the end of this project being the same as it was in the beginning and planned to sustain their current efforts.

**American College of Emergency Physicians**

In order to increase awareness and utilization of the 2006 CDC Field Triage Decision Scheme, ACEP made available information about the Decision Scheme at exhibition booths located at a variety of national conferences that target many of the groups who need this information. For example, they attended two national EMS conferences—EMS Expo and EMS Today, the national conference for educators of EMS professionals—the National Association of EMS Educators (NAEMSE), and then their own annual meeting in Las Vegas. Although a few different types of materials about the Decision Scheme were made available at the ACEP booths, the primary item available was the pocket guide. As described by the interviewee from ACEP, through this strategy they were able to “hit the end users through a couple of different avenues—directly to them, through their instructors, and through the physicians who write their protocols.”

In addition to the promotional efforts just mentioned, ACEP also took advantage of the opportunities that 2010 National EMS Week provided to inform their membership about the Decision Scheme. An EMS kit was distributed to 30,000 people across the country, including Fire EMS and emergency departments. Included was a newsletter containing a full-page advertisement. Additionally, a Facebook page that was created for EMS Week had 10,000 friends sign up. ACEP did not anticipate the large response to this page as these numbers exceed the membership of ACEP. They posted a few statements about the Decision Scheme to this Facebook page and provided a link to the CDC’s site. In reflecting on this experience, ACEP noted that they believe this approach reached a new audience—individuals who had previously heard of the Decision Scheme but may not have been aware of where they could find specific information about them and individuals who were hearing about the Decision Scheme for the first time as a result of postings to this page. This represents a unique approach of the use of social media for increasing the awareness of the Decision Scheme.

The sense from engaging with physicians at some of these conferences is that the word about the Decision Scheme appears to be out with the emergency physician community. However, there is
additional need to disseminate materials about the Decision Scheme to the individuals who will be implementing them in the field (e.g., EMTs). Physicians at these conferences often requested enough handouts for entire squads, which could run in the 100-count range. Since ACEP only had a limited number of materials to disseminate in these forums, individuals with requests for a large number of materials were referred to the CDC website. In retrospect, ACEP mentioned that they would have liked to have displayed a broader range of the materials that CDC has available. They mostly had the pocket guides, and it may have been helpful to have some of the other materials that are available (e.g., poster) for attendees to see. Instead, individuals were told about these materials and directed to CDC’s website for more information.

ACEP feels they were able to get information out to the intended end-users through the various efforts they employed. They noted that they did not experience any obstacles during the year in getting this accomplished and plan to continue their efforts to support the implementation of the Decision Scheme after this pilot implementation phase. Specifically, they mentioned plans to continue to provide updates in their newsletters and on Facebook. The promotion of the Decision Scheme falls in line with the priorities of the EMS department within ACEP. It was noted that the promotion of the Decision Scheme is a particularly important issue for this organization since they are based upon a consensus recommendation procedure. Given that there are few evidence-based procedures in this arena, and this is a step toward that end, promotion of the Decision Scheme is recognized as a high priority.

With respect to the extent to which their promotion of the Decision Scheme was “reinvigorated” by this effort, it is difficult to tell. Multiple physicians within ACEP were involved with developing the Decision Scheme, so there will naturally be a desire to promote this work. However, the representative we interviewed did sense that the invitation to be engaged in this project and CDC’s emphasis on the importance and need for enhanced dissemination and support of the adoption and implementation of the Decision Scheme likely increased their organization’s attention towards their plan to disseminate this information.

**National Association of State Emergency Medical Services Officials**

In order to increase awareness and utilization of the 2006 CDC Field Triage Decision Scheme, NASEMSO provided a permanent reference to the Decision Scheme on their website and used a Listserv for trauma managers to remind them of the available resources from CDC. In response to feedback from these initial awareness efforts, a Field Triage Decision Scheme panel discussion was conducted at the NASEMSO Annual Meeting. This feedback included some concerns from the Medical Directors and Trauma Managers regarding the details of the Decision Scheme and the ability to deviate from it. The panel discussion was viewed as successful as it brought attention to the Decision Scheme and provided an open forum for comment and participation. Some issues were clarified that day, while others are ongoing. Additionally, the session resulted in requests for the free materials available from the CDC.

On top of promoting awareness, NASEMSO also collected information from their membership by disseminating surveys. One of these surveys requested detailed information about how states have implemented the Decision Scheme and what, if any, modifications were made during implementation efforts. The survey was perceived as highly informative. Two Medical Directors are conducting a study based on the survey and hope to publish the results. Additional survey data will continue to be collected by NASEMSO on the status of trauma system development
and the implementation of the Decision Scheme.

When asked what the NASEMSO membership finds most interesting at the current time, the interviewee mentioned “establishing benchmarks and performance measures for trauma systems” and the “opportunity to have standardized measures to evaluate the effectiveness of the guidelines in their own states.” Emphasis on the desire to find a way to evaluate the effectiveness of the Decision Scheme within states and across the nation was reiterated in other points in the conversation. Support from CDC for data collection efforts that could help with creating this type of evidence base, and support for implementation in more states were suggested as potential positive paths forward should additional funds be available.

The representative from NASEMSO anticipates maintaining efforts to gather information from states on a regular basis about how their trauma system efforts are moving forward as well as about the implementation of the 2006 CDC Field Triage Decision Scheme. The pilot implementation effort appears to have elevated the importance of the Decision Scheme within this organization however specific examples as to how this elevation came about were unfortunately not solicited. Such efforts are in line with the mission and vision of the organization and there was support from leadership for engaging in this pilot implementation effort. Suggestions for efforts that go beyond maintaining the current level of involvement include having a panel presentation at the next NASEMSO annual meeting comprised of members of the three funded states so that they can share the successes and challenges they experienced during their pilot implementation efforts.

**National Association of Emergency Medical Services Physicians**

As outlined in their action plan, the NAESMP wrote a position statement on the Field Triage Decision Scheme. Creating, passing, and disseminating position statements are major functions of this organization. Dissemination involves placing the position statements on the organization’s website and publishing it in the organization’s journal, *Prehospital Emergency Care*. The position statement was crafted by a member of NAESMP in collaboration with an individual from the American College of Surgeons, and was subsequently approved by the board of NAESMP.

Similar to NASEMSO, NAEMSP collected data about the use of the Field Triage Decision Scheme from their membership by survey. Results of this survey were forwarded from the NAEMSP president to CDC and discussed with Dr. Rick Hunt. The NAEMSP continues to see its role as formally supporting the Field Triage Decision Scheme through the position paper that was written, distributed and used to persuade agencies considering implementation.

**National Highway Traffic Safety Association**

While this organization did not submit a formal action plan as part of this effort, NHTSA is clearly implementing efforts to promote the use of the Field Triage Decision Scheme. Some of these activities include: 1. A project to evaluate state implementations of the Field Triage Decision Scheme, 2. Coordinating with CDC on issues related to advanced automatic crash notification (Step III), and 3. Using Field Triage protocol as a starting point to provide an evidence-based guide for helicopters transporting injured patients. NHTSA has four over-arching strategic goals, the first of which is to improve health outcomes from motor vehicle crashes and
other health emergencies, both natural and man made. This is where many of their activities that support Field Triage reside.

NHTSA is committed to promoting evidence-based guidelines for pre-hospital care and is committed to working Dr. Rick Hunt and his team. They can see collaboration with NASEMSO’s Medical Director group as they already sit in on their semi-annual and annual meetings. Additionally, they can share with CDC the findings of their ongoing evaluation of states implementation of Field Triage Decision Scheme. They continue to support development and promotion of evidence-based guidelines for pre-hospital care and as such will continue to support Field Triage projects, as it is part of their Strategic Plan.

Other considerations regarding national organization involvement. Understanding that there may be an interest in continuing to engage national organizations in supporting future implementation efforts, we also asked states what other national organizations, associations, or agencies (other than those already involved) might be helpful to involve in moving the adoption and implementation of the Decision Scheme forward. Suggestions included the National Association of Emergency Medical Technicians, a national hospital association (unspecified), a national medical society (unspecified), and American College of Surgeons Committee on Trauma. One state specifically mentioned that continued support from CDC and other national organizations/agencies would be helpful to scaling up the implementation of the Decision Scheme in their state. Additionally, it was suggested that collaborating with the National Trauma Data Bank would help support the collection of critical data elements that can help to evaluate outcomes associated with implementing the Decision Scheme.

CONCLUSIONS AND CONSIDERATIONS FOR FUTURE EFFORTS

Although the timeline for creating and implementing the action plans under this mini-grant was short, there were many valuable lessons learned about what it takes to make progress on adopting and implementing the 2006 Field Triage Decision Scheme in states operating in diverse contexts. Based upon the findings articulated in the previous section, some of the lessons learned may be important to consider in future implementation efforts. Readers are also encouraged to draw their own conclusions from the findings previously articulated in light of the inherent strengths and weaknesses of the methodologies used for this evaluation.

It is clear that the time and energy spent through these mini-grants was helpful in moving the adoption and implementation of the Decision Scheme forward. This dedicated effort and associated funding appears to have elevated the Field Triage Decision Scheme as a priority among many national organizations and states. Other key facilitators included:

- New partnerships and collaborations were forged and individual providers viewed themselves as part of a broader network.
- Existing relationships and communication networks among medical practitioners were strengthened and expanded.
- Despite the short time period, many of the goals and objectives the states and national
organizations set out to accomplish were achieved.

- A focus on patient outcomes was useful in setting the stage for productive conversations and bringing providers to the table to participate in implementation process.

Some of the primary areas where additional or continued attention appears to be needed to successfully implement and sustain the use of the Decision Scheme in EMS systems include:

- Clarifying aspects of the existing Decision Scheme,
- Establishing data systems that provide valuable information for monitoring implementation of the Decision Scheme,
- Continuing to build the evidence base for the Decision Scheme, and
- The provision of training materials.

A recurrent theme across states and stakeholders was that more information was needed to describe the intention behind certain aspects of the Decision Scheme. Specifically, states felt clarification about what constitutes the “highest level of care” within a “trauma system” would be helpful. Neither of these terms is clearly defined and substantial local-level interpretations were required to make use of the Decision Scheme. This also made it challenging to determine the extent to which these local-level decisions preserve the fidelity of the Decision Scheme as written.

Although state teams felt clarification is needed, it should also be noted that many valued the ability to adapt the Decision Scheme to their local context. It may be that the ability to make these adaptations resulted in greater implementation success than would have otherwise occurred. As a result, it is suggested that efforts to clarify these terms be made collaboratively—using the experience and expertise that resides at the national level while also drawing upon the lessons learned implementing the Decision Scheme in these local contexts.

Acquiring and developing systems within and between states that capture data about trauma patients along the continuum of their care (i.e., pre-hospital to hospital discharge) presented challenges in all three states. It is important to note that these challenges did not prevent states from moving forward with the implementation of the Decision Scheme, however, many resources were spent attempting to deal with this issue so that data would be available to monitor the implementation and outcomes of using the Decision Scheme as adopted. The amount of time and energy spent on trying to get this data in place is a testament to the desire to have this type of information readily available.

As such, it seems that additional attention is needed to address the data challenges that were evidenced through this project. This attention might focus on the provision of specific resources dedicated to developing these data flows and decoupling these efforts from projects to adopt and implement the Decision Scheme. Furthermore, there is evidence that some of these data issues concerned the development of proprietary systems by private vendors. National leadership of collaborative discussions that result in a clear listing of data elements needed to depict the key elements of the Decision Scheme would be valuable. Additionally, this discussion should include the development of open standards that specify the formatting of these variables so that sharing data between systems within and across states is possible. Further, greater discussion within the community about contractual language that can be used to ensure that vendors develop systems that are inclusive of variables depicting key elements of the Decision Scheme and systems that
implement these open standards is warranted. Multiple individuals noted the appeal of using the Decision Scheme because it is derived from expert panel discussions and information presented in the existing literature. Despite this, there is a strong desire among national organizations and states to have additional information about the effectiveness of the Decision Scheme in improving health outcomes among the trauma patients they serve. As such, further evaluative efforts are needed, but the focus of these evaluations should be clearly stated, as there are numerous evaluative questions at the process and outcome levels that can be explored in such studies. We suggest the use of the procedures outlined in the CDC Framework for Program Evaluation in Public Health (CDC, 1999) to guide these efforts, as doing so is likely to lead to evaluations that are inclusive of multiple stakeholder’s concerns yet provide a method for generating a clear focus of inquiry for any single evaluation that is undertaken. Furthermore, the use of the CDC Evaluation Framework, when used appropriately, is likely to generate information that is credible to multiple audiences and actionable. As was the case in Kansas, a process evaluation might focus on examining the extent to which the Decision Scheme is actually implemented as intended in the field. Such evaluative efforts might go further to explore questions about why the Decision Scheme is not implemented as intended. Other evaluations might hone in on exploring medical outcomes for trauma patients of a given severity treated at different levels of trauma centers—for example, exploring differences between Level I and Level II trauma centers, as was desired in the case of Michigan.

Additionally, it may be helpful to consider how the promotional efforts of national organizations can be evaluated. Although many activities were conducted by these organizations as part of this project, multiple organizational representatives noted that the extent to which these activities changed the thinking of their members or their follow up actions is unclear. Providing funds to these organizations to conduct and evaluate their activities may be beneficial in the future.

Training is also an important factor in changing and maintaining new practice patterns. As a result, future endeavors should place specific emphasis on supporting the training efforts in the field. There are multiple ways in which this might be done given respondent’s comments. First, the materials developed and made available by the CDC should be maintained and perhaps expanded upon. States specifically noted that the MMWR (Guidelines for Field Triage of Injured Patients) and the PowerPoint presentation provided by the CDC that describes the information in this MMWR were helpful. One state noted that the Decision Scheme poster had been distributed to all EMS services in the state and another specifically mentioned the utility of the EMS pocket cards because of their portability. Suggested improvements include making large quantities of these materials available in a timely manner and adding hypothetical scenarios that demonstrate the use of the Decision Scheme in practice. One interviewee also noted that some figures included in the CDC PowerPoint presentation demonstrate medical procedures that are out of alignment with best practices. The concern was that such depictions may mislead EMTs or result in reduced credibility of this effort among practitioners.10

With respect to future training efforts, it was suggested by one respondent that states might wish to consider leveraging their available training resources by simultaneously presenting refresher

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10 This comment is in reference to an image where paramedics start an IV in the field rather than in route to the hospital (as depicted in slides 6 and 25).
trainings on trauma care. In some cases this may facilitate compliance with the Decision Scheme by addressing EMT confidence and skills in relation to longer transit times to higher level of care facilities.

Other materials or information that the states felt would be helpful to have going forward included: information about various items including EMTALA, insurance regarding transportation to closest versus the appropriate facility, and the differences between disaster and field triage; and evidence about the financial impact of implementing the Decision Scheme, patient outcomes associated with going to different levels of trauma centers or non-trauma centers, and the impact on EMS systems (e.g., time differences in transport, mutual aid).

Overall, it appears from this evaluation that the time and energy spent by the states of Kansas, Michigan, and Massachusetts through these mini-grants was helpful in moving the adoption and implementation of the Decision Scheme forward. This dedicated and collaborative effort, and the associated funding, appears to have elevated the Field Triage Decision Scheme as a priority among many national organizations and states and allowed time for thoughtful conversations to take place and many lessons to be learned.
REFERENCES


