



SEPTEMBER 2023

Year 3 Evaluation Report: Evaluation of the EMS Supplemental Funding Grants

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KEY FINDINGS

- All EMS supplemental funding grantees were impacted by the COVID-19 Public Health Emergency but were able to adapt their projects to cope with COVID-19 travel and resource limitations and, as appropriate, reflect the changing needs of their EMS agencies and communities.
- Capacity building activities to support improvements in data collection and reporting are essential to sustainability and the ability to use data for quality and performance improvement.
- Outcome measurement and development of evidence-based theories of change remain an issue for grantees and further technical assistance in this area is recommended.

INTRODUCTION

Rural EMS and ambulance agencies face challenges in providing sustainable pre-hospital care due to low call volumes, long transport distances, lack of resources, decreased financial reimbursement, reliance on part-time and volunteer staff, an aging workforce, and difficulty meeting increased educational standards.¹ In addition, studies show that rural EMS agencies struggle with data reporting and the use of data for performance improvement—two activities necessary to improve quality and sustainability.²⁻⁵

In recognition of these challenges, the Federal Office of Rural Health Policy (FORHP) issued a notice of funding opportunity in 2019 to support the: *(1) development of sustainable models of care* or *(2) identification of rural-relevant EMS quality metrics and improvement of EMS data reporting*.⁶ Eight State Medicare Rural Hospital Flexibility (Flex) Program grantees received supplemental funding to implement projects with four grantees in each focus area. FORHP's goal is to build an evidence base for rural EMS activities in the Flex Program by funding demonstration projects and sharing the results of those projects with rural EMS stakeholders (See Appendix Table of Grantee Information).

The supplement was an investment in improving rural EMS services with each grantee receiving up to \$250,000 annually for each of the three years of the funding cycle. This brief reviews the status and accomplishment of the eight projects, identifies promising models that can be adopted by State Flex Programs (SFPs), and explores lessons learned regarding EMS program management and outcome measurement from this funding supplement.



EVALUATION METHODOLOGY

In Year 3, Flex Monitoring Team (FMT) staff conducted two sets of interviews with each of the eight grantee teams, the first in the spring and the second in the fall of 2022. We further asked the project director to submit a project tracking log on a biannual basis which provided updated information on project activities and outcomes. These tracking reports guided our interviews with the project teams. We conducted interviews via zoom using semi-structured protocols. Each interview was recorded and transcribed for analysis. We also reviewed the final project reports submitted by the grantees to FORHP in November 2022 for those projects that completed their projects by the end of the funding cycle (August 31, 2022). Three states (Florida, Kentucky, and Washington) received no-cost extensions for their projects through August 31, 2023. Their final reports will be due in November 2023. These interviews and related documents were reviewed for key themes by the project team and informed the preparation of this brief.

Our first set of interviews focused on the final year of the funding cycle, any challenges that impacted their interventions, and their progress towards achieving project goals. We asked grantees to describe how they planned to evaluate the success of their projects, the criteria used to assess their success, and the evidence to support this assessment. In our final interviews, we asked grantees to describe their progress towards their outcome measures, the data collected, and how these data support the evidence base for rural EMS activities within the Flex programs.

PROJECT SUMMARIES

Our evaluation reports for the first two project years focused on issues related to project implementation, management, and monitoring (See textbox at end of document).^{7, 8} This brief provides a detailed discussion of project accomplishments, outcome measures, lessons learned, and sustainability strategies for each grantee based on the FMT's interviews, tracking tools, and the final project reports submitted in the fall of

2022. We also provide a summary of the project goals, partners, outcome measures, and sustainability plans for the eight projects in the attached Appendix.

Focus Area 1: Sustainable Models (Arizona, Ohio, South Carolina, and Washington)

Arizona: The grantee established a telehealth program to connect basic life support (BLS) providers in two small rural EMS agencies to board-certified emergency medicine physicians for real-time 24/7 medical direction. Sonoita-Elgin Fire District focused on providing medical direction to patients with chest pain. Their goal was to provide consultative support to enable BLS units to transport chest pain patients to the hospital, thereby reducing the burden on the agency's single advanced life support (ALS) unit and minimizing the time that it is out of service for other EMS calls. Rio-Rico Fire and Medical District focused on patients deemed safe to stay at home or be referred to an alternative treatment destination such as primary care or urgent care centers. Both programs used the e-Bridge platform in the field for 15 months. The activity and outcome measures for the two sites are summarized in Table 1.

Lessons learned included:

- Regular and ongoing training and engagement of EMS personnel is necessary to maintain regular use of the technology as is the presence of an internal champion
- Consistency of physician availability in answering e-Bridge calls within the two-minute call back window specified in the protocols is critical to maintaining confidence in and use of the system
- Cost is a concern as the start-up costs for e-Bridge (the application that facilitates communications between first responders and healthcare providers), AT&T's FirstNet wireless network (a nationwide wireless network built for first responders and the extended public safety community), and a team of 24/7 on-call emergency medicine physicians are expensive (\$65,000 per year)



TABLE 1: Arizona’s Telemedicine Outcome Measures

EMS Agency	Calls	Outcome measures
Sonoita-Elgin Medical District	45 patients with chest pain	<ul style="list-style-type: none"> • 40 patients received a 12-lead EKG on scene • 50% received consultation through e-Bridge • ALS ground transports decreased by 6.6%, BLS ground transports increased by 5.4%, and air ambulance transports increased by 9% • On scene time did not change
Rio-Rico Fire and Medical District	38 patients	<ul style="list-style-type: none"> • No patients were transported to an ED (data were not available on the extent to which patients were transported to other sites or treated on scene) • Estimated savings: \$31,616 (38 calls at \$832 per call) • Revenues could not be captured due to challenges with the reimbursement system (Arizona Medicaid has reimbursed for HCPCS code A0998 (Response, No Transport) since October 2021) • Out of service times increased by 24% • Scene time increased by 8 minutes

- Agencies would benefit from improved capacity to bill for allowable services
- Carefully consider options of wireless service providers to support telehealth: balance costs against coverage, particularly in rural areas

Proposed sustainability strategies included collaborating with hospital systems seeking to capture urgent care visits or reduce unnecessary emergency department (ED) use through the alternative destination model; working with third party payers to develop reimbursement for non-transport services; or developing a critical mass of participating agencies to generate sufficient volume to support the system. The grantee plans to continue this work by pursuing one or more of these strategies.

Ohio: The grantee implemented a community paramedicine (CP) program in three rural EMS agencies with each site implementing a program that best met local needs. Each program was required to partner with a local hospital to allow each program to determine whether specific measures, such as reductions in hospital readmissions, were impacted by the CP

programs. As reported in Ohio’s March 1 - August 31, 2022 biannual tracking report, all three CP programs were operational. The first became operational during the September 1, 2020 - February 28, 2021 tracking period, the remaining two became operational shortly thereafter. A challenge to understanding the impact of this program was the lack of specificity on the differences between the models, the number of contacts with patients, and the content of the interaction with patients.

Ohio’s outcome measures (Table 2) were drawn from the Mobile Integrated Healthcare Program’s Measurement Strategy Overview as developed by MIH-CP Measures Group.⁹ Each site was responsible for collecting and reporting their own data. Due to data challenges, including the use of local hospital data to calculate the utilization and cost of care measures, each site reported a different subset of measures. Given these issues, it is not possible to compare the measures across sites. We therefore provided the measure descriptions without site level data.



TABLE 2: Ohio’s Community Paramedicine Project Outcome Measures

Quality of Care & Patient Safety Measures
<ul style="list-style-type: none"> • Increased # and % of: <ul style="list-style-type: none"> • Patients utilizing a Primary Care Provider (PCP) (if none upon enrollment) • Medication inventories conducted with issues communicated to PCP • Patients with a plan of care with outcome goals established by physician and facilitated by CP • Elimination of deviations in care plans without specific medical direction supporting deviation • Reduced rate of patients requiring unplanned acute care within 24 hours after CP intervention • Reduced adverse effects from a medication or other treatment related to CP intervention within 24 hours of the CP intervention • Increased # of: <ul style="list-style-type: none"> • Referrals to community resources for social, transportation, and environmental hazards/risks • Patients with established therapeutic relationship with behavioral health resources • Patients referred to case management services
Utilization Measures
<ul style="list-style-type: none"> • Reduced: <ul style="list-style-type: none"> • # of unplanned ambulance transports to ED by enrolled patients • Rate of ED visits by enrolled patients • # of hours of potentially avoidable ED bed utilization by enrolled patients • Rate of all-cause hospital admissions by enrolled patients • Rate of all-cause, unplanned 30-day hospital readmission by enrolled patients • Average length of stay by enrolled patients by diagnostic review group
Cost of Care Measures
<ul style="list-style-type: none"> • Reduced expenditures for: <ul style="list-style-type: none"> • Unplanned ambulance transports to ED • ED visits • All-cause hospital admissions • All-cause, unplanned, 30- day hospital readmissions • All-cause, unplanned, skilled nursing and/or assisted living facility admissions • Reduced: <ul style="list-style-type: none"> • Total expenditures • Total cost of care



Lessons learned included:

- CP Programs need financial partners to be sustainable, underscoring the grantee's requirement that participating CP sites partner with a local hospital or other potential community providers
- It is important to be conservative in estimating implementation timelines due to the complexity of obtaining approval from internal review boards or accountable care organizations
- Program flexibility is necessary to allow agencies and grantees to cope with and adapt to unexpected circumstances (e.g., COVID-19)

The individual CP sites were encouraged to collaborate with their partner hospitals to sustain their programs past the conclusion of the supplemental grant funding and all three have either entered into agreements with their hospitals or are in final negotiations. The grantee plans to actively encourage other rural EMS agencies and hospitals to develop their own CP programs and will support new sites with technical assistance, frameworks, and toolkits developed for this project as well as ongoing quarterly CP technical assistance calls.

South Carolina: The grantee sought to demonstrate sustainable alternative models of EMS care including community paramedicine (CP), alternative destination, telehealth, and treat-no-transport targeting vulnerable rural counties without hospitals and with deteriorating safety nets. Five rural EMS agencies initially participated in the supplement project. Four implemented a CP program, three were operational during the funding cycle. The fourth agency has received referrals but was waiting to accept those patients pending the approval of its CP protocols by the EMS medical director. The fifth explored but did not implement a CP program. Rather than implement separate projects as originally planned, the alternative destination, telehealth, and treat-no-transport programs were rolled into three of the four existing CP programs.

The grantee provided participating agencies with a CP program evaluation measures tool which provided agencies with evaluation and output measures to capture data on their programs. According to the grantee, participants are required to complete a run report for every CP encounter that lists assessments conducted and/or services provided. Data from these run reports were used to prepare a report on CP to support efforts to secure Medicaid reimbursement for CP programs. This report was submitted to the Duke Endowment, a philanthropic organization covering North and South Carolina.¹⁰ The grantee developed protocols, guidance, and policies for the alternative destination and treatment-in-place models that will be distributed statewide after final review and approval by the state EMS authority. South Carolina collected the following outcome measures for the four active participants (Table 3):



TABLE 3: South Carolina’s Outcome Measures by Participating EMS Agency

EMS Agency	Training to Improve the Accuracy of Run Report Data in NMEMSTARS
1	<ul style="list-style-type: none"> • 45 total CP referrals: 22 from hospital, 13 from resource assistance, and 10 from ambulance crew • 22 patients enrolled, 20 refused service, 13 could not be contacted • Patients received a home safety assessment, home health assessment, in-home education, fall risk screening, medication utilization and compliance assessment, screening for community service and resource needs • 20 care plans developed • 55% received community and other resources • Completed 153 CP/Mobile Integrated Health (CP/MIH) calls • 12 patients saw a primary care physician (PCP) within 14 days of enrollment • Reduced 169 EMS calls
2	<ul style="list-style-type: none"> • Received 41 referrals (referrals were for high EMS utilizers, diabetes management, and/or hypertension management) • 33 patients identified for program, eight dropped from the program due to death or SNF placement • Patients received a home safety assessment, medical home assignment, home health assessment, in-home education, fall risk screening, A1C monitoring, medication utilization and compliance assessment, screening for community service and resource needs, blood pressure readings for hypertension • 37 care plans developed • 51% received referrals to local resources • 56.1% reduction of 911 use cumulatively for enrolled patients • 42.4% reduction in non-emergent ambulance transports
3	<ul style="list-style-type: none"> • 18 patients identified for CP program (focused on fall risk, high EMS utilizers, congestive heart failure, and diabetes management) • Patients received a home safety assessment, home health assessment, in-home education, fall risk screening, medication utilization and compliance assessment, screening for community service and resource needs • 10 care plans developed • 77% received one or more community resources • Completed 153 CP/MIH calls • 9 patients saw a PCP within 14 days of enrollment • Reduced 106 EMS calls • 88% reduction in return to service times • 27% reduction in non-emergent ambulance transports
4	<ul style="list-style-type: none"> • 75 patients identified for program; conditions of focus included overdose/opioid use disorders • Program was not seeing patients as the program was awaiting approval from EMS Medical Director on CP protocols prior to accepting patients • Six internal/external trainings completed • One community meeting held



As with other supplemental funding projects, South Carolina's project was impacted by the COVID-19 Public Health Emergency (PHE) which significantly delayed project implementation. The grantee noted that the state and federal flexibility provided during the PHE accelerated the development of the alternative destination and treatment-in-place models. The key lessons learned included:

- Hospital policies restricted the ability of outside personnel, such as community paramedics, to interact with patients in the hospital, thus limiting CPs from completing clinical rotations
- Collaboration with other CP programs resolved the above limitation on hospital training opportunities by allowing paramedics to ride along on calls and review CP patient case examples
- Program materials, protocols, and guidelines must be succinct and digestible, yet still comprehensive given the demands on agency personnel

All four active CP programs have secured additional grant funding to support their programs. The South Carolina Office of Rural Health will continue to support CP development as an activity within Flex as well as work with the state Medicaid program to secure reimbursement for CP services.

Washington: The primary purpose of Washington's supplement project was to improve the sustainability of rural EMS agencies through a focus on workforce recruitment and retention as well as leadership planning for succession. The project used baseline data from the Washington State 2019 Rural EMS Service Survey¹¹ to identify opportunities for improvement among rural agencies and to select measures to prioritize outcomes. The survey was based on the *Attributes of a Successful Rural Ambulance Service* tool developed by the Wisconsin Office of Rural Health in collaboration with the National Organization of State Offices of Rural Health.¹² The tool was also used to assess progress among the participating agencies during the project. Twelve agencies were recruited to participate in the project. Two resigned from the project in Fiscal Year

2020 as they did not have the resources, personnel, or time to participate.

Originally, the grantee planned to provide scholarships for training and to create bridge curriculums to enable EMS personnel to advance in their field, and cross-training opportunities to enable EMS personnel to train as medical assistants and community health workers. As the project was implemented, the grantee found that these training opportunities were of limited benefit for the enrolled agencies. While the curricula were not particularly useful for the agencies, the scholarships were helpful as participating EMS agencies had few resources to support training for personnel or sites. Thus, participating agencies were provided with funding and guidance for training development. A second element involved conducting community engagement assessments of participating agencies. These assessments explored issues related to the integration of community members on the board, potential for increased community involvement, and enhanced public relations efforts. During the assessments, education was provided to agency staff on the costs of operating an EMS agency (including the use of volunteers) with support for facilitated decision-making about the desired level of services. Participating agencies received funding to support the development of action plans, attend trainings, improve technology, and participate in meetings. Participants also received one-on-one consultation and technical assistance to assist with developing action plans and improving performance. In addition, the grantee established a rural EMS learning action network to support participating agencies.

Given the changes to the program due to the shifting needs of participants, several of the proposed outcome measures were no longer appropriate. As recommended during our evaluation calls and in our Year 2 evaluation report (see text box below), the grantee revised its scope of work and outcome measures to reflect the revised focus on recruitment, retention, and training. The following revised outcomes, primarily focused on capacity building, were reported in the grantee's final report (Table 4):



TABLE 4: Washington’s Outcome Measures

Outcome Measures	Target	Actual
Increased Attribute Survey scores	10% aggregate improvement	Scores on 15 attributes improved by more than 10%
Increased Attribute Survey scores	Increase of 10% (providers/level) in all enrolled EMS agencies	27 new EMS providers recruited across all participating agencies (data not provided to determine changes by measure)
Improved recruitment and retention rates	Increase of 10% in enrolled agencies	
Increased number of EMS instructors within the agency	10% increase	14 new EMS instructors
Satisfaction with subject matter experts and the overall project	Not applicable	96% reported increased knowledge, 88% believed the project benefited to their agencies, 84% believed their agencies would implement changes, 100% stated the project was valuable

Lessons learned from this project included:

- Recognition that some agencies were too vulnerable to participate
- Leadership training is a key to success
- The lack of technological resources (e.g., video cameras and poor audio capacity) limited some agencies participation in virtual activities (grants were provided to address this issue)
- A high dependence on volunteer staff limited the ability of participants to attend meetings during regular working hours

In terms of sustainability, continued support for the EMS workgroups and training provided under this round of supplement funding will be provided by the Washington State Department of Health and the Washington State Flex Program.

Focus Area 2: Identification of Rural-Relevant EMS Quality Metrics and Improvement of EMS Data Reporting (Florida, Kentucky, New Mexico, and North Dakota)

Florida: The Florida Feasible, Actionable, and Relevant (F.A.I.R.) project had two primary goals. The first was to identify a core set of validated, rural-relevant EMS quality measures using an expert panel of state and national experts. The second was to increase the percentage of rural EMS agencies submitting run data to Florida’s EMS Tracking and Reporting System (FL EMSTARS) from 54% to 100% and increase the percentage of rural EMS agencies participating in state-wide performance improvement from 12% to 100% by project completion using an EMS quality improvement (QI) data tool called Biospatial. Florida recognized the need to improve the capacity of rural EMS agencies to submit and utilize accurate data to support the testing and validation of identified measures. With 29 measures in Biospatial, all of Florida’s rural EMS agencies can use these measures for performance improvement and benchmarking against the other 38 states participating in Biospatial. Florida’s outcome measures are summarized in Table 5:



TABLE 5: Florida’s F.A.I.R. Outcome Measures

F.A.I.R. Outcome Measures	Baseline	Target/Goal	Actual
Identification and testing of rural-relevant quality measures			
Number of potential measures identified	NA	NA	54
Number of measures in Biospatial to support testing	NA	NA	29
Increase in data reporting and participation in Biospatial			
Increase in % of rural EMS agencies submitting run data to FL EMSTARS	54%	100%	97%
Increase in % of rural EMS agencies registered in Biospatial QI platform (all 29 rural agencies participating)	12%	100%	100%

Final products for this project include a formal report to be submitted to the National EMS Quality Alliance (NEMSQA) for review and approval as well as a select set of final quality measures to be submitted to the National Qualify Forum (NQF) for review and endorsement. These products were projected to be completed after the formal end of the funding cycle.

Lessons learned from the F.A.I.R. project included:

- The importance of accurate data to support the testing of rural-relevant measures
- Building the capacity of rural EMS agencies to submit accurate data and to provide a platform to enable rural EMS agencies to use the measures for QI
- Encourage participating EMS agencies to start small by selecting one or two measures for performance improvement

In terms of sustainability, the project is primarily complete with just the final report to NEMSQA and the submission of the selected set of measures to NQF remaining. Without additional funding there may be some challenges to maintaining and updating the measures over time. The grantee is also considering the option of incorporating some of these measures into its state EMS plan to promote wider use. The development of the Quality First EMS agency recognition program, which incorporates F.A.I.R. and other quality

metrics, will assist with the ongoing identification and dissemination of clinical performance measures required for EMS accreditation, thus helping to build capacity at the agency level. Quality First is an internal recognition and coaching program for EMS agencies developed by the EMS authority within the Florida Department of Health.

Kentucky: The grantee proposed a two-part project. The first was to support statewide implementation of the Cardiac Arrest Registry to Enhance Survival (CARES) by focusing on increasing CARES registration in 27 CAH communities. The goal of CARES is to improve survival from sudden cardiac arrest by helping local EMS administrators and medical directors identify who is affected, when and where cardiac arrest events occur, which elements of the system are functioning properly and which are not, and how changes can be made to improve cardiac arrest outcomes. The second part of the project was to identify how many public automated external defibrillators (AEDs) in Kentucky are listed in the National AED registry, assist with registering unlisted AEDs, and offer AED instruction in those locations.

The grantee experienced significant challenges to their project due to COVID-19. The first involved a delay in hiring a state CARES coordinator (which did not occur until the September 2020 - February 2021 reporting



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period). The second involved a transition in 2021 of the Kentucky Board of Emergency Medical Services (KBEMS) from an independent agency to a state-based organization which involved significant turnover in leadership. A third involved travel restrictions due to COVID-19 which prevented the assessment of AED locations in the 27 CAH communities.

As an alternative to conducting an inventory of AEDs in CAH communities, the grantee engaged with the Resuscitation Academy (based in Seattle, Washington) to conduct a training to help rural EMS services improve their performance on out-of-hospital cardiac arrests. The Academy was held in April 2022 with 45 EMS and hospital personnel in attendance. The grantee also used an app from the PulsePoint Foundation to begin to identify the location of public AEDs and conducted a two-day virtual training to improve community awareness of cardiac issues with 25 to 30 participants attending both days. Additionally, the grantee used savings incurred from delays in hiring the CARES coordinator and limitations on travel to provide EMS agencies in CAH communities with grant funding to promote cardiac awareness and AED use.

Due to the delays in hiring the CARES coordinator and the small number of cardiac events in rural communities, KBEMS is reluctant to release data on individual cardiac events. Instead, the grantee is focusing on high-level outcomes related to project implementation in their final report (Table 6):

The primary lesson learned focused on the need for flexibility to redirect project activities when encountering significant barriers that are not easily overcome, such as the redirection of state priorities and resources due to the COVID-19 PHE.

The grantee plans to support the CARES project through its Flex Program and will hold another Resuscitation Academy using outside sponsorship support.

New Mexico: The grantee implemented a collaborative project to increase the quality of rural EMS care by improving the data collection and reporting capacity of rural EMS agencies. Its three primary thrusts included improving the accuracy and EMS run data reported to the state, the number of agencies submitting timely run reports, and the use of run data to support QI. A strength of this grantee’s approach was the ability to use New Mexico’s Emergency Medical Services Tracking

TABLE 6: Kentucky’s Outcome Measures

Project	Participants	Measures
Enroll CAHs and rural EMS agencies in CARES	18 hospitals and 25 EMS agencies	<ul style="list-style-type: none"> • 18 hospitals are enrolled in CARES and six are CAHs • 10 additional hospitals are awaiting approval with one being a CAH • Approximately 1/3 of enrolled EMS agencies are rural
Trainings	Resuscitation Academy	<ul style="list-style-type: none"> • One event held in April 2022 with 45 EMS and hospital participants • Kentucky received recognition through the Academy’s “Lighthouse Program” as one of four states or communities (including Florida, Hilton Head, SC, and Maryland) implementing 10 steps for out-of-hospital cardiac arrests and effective communication with the public
Local AED use and trainings through grants to communities	1 two-day webinar on cardiac awareness and 7 grants to CAH communities	<ul style="list-style-type: none"> • 25 to 30 participants in the webinar • Approximately 1,000 people received CPR trained through funded efforts of local EMS agencies.



and Reporting System (NMEMSTARS) to identify data quality issues, monitor improvements in the quality and timeliness of run data following training, and track the use of NMEMSTARS for QI purposes. A total of 13 trainings involving 60 EMS providers were conducted during the project as were 13 trainings for 32 EMS administrators and 10 trainings for 27 medical directors. The grantee also provided direct technical assistance to providers, administrators, medical directors, and agencies as needed.

The grantee reviewed 3,350 patient care reports which included a QI assessment. A total of 80 agencies participated in the project (40 each in two separate cohorts).

These cohorts included a mix of rural and urban agencies to allow for comparison. Over time, the grantee observed through reviews of the run reports improvements in the quality of data submitted as well as in the patient care provided. Over the funding cycle, there was a 25 percent increase in logins by rural administrators and a 15 percent increase by medical directors as well as a 43 percent improvement in data quality.

The grantee detailed the outcomes achieved by the project in its final project report (Table 7). The grantee exceeded its proposed outcome goals by the end of Year 3 by demonstrating increased administrator and medical director understanding of NMEMSTARS data,

TABLE 7: Ohio’s Community Paramedicine Project Outcome Measures

Training to Improve the Accuracy of Run Report Data in NMEMSTARS
<ul style="list-style-type: none"> • 13 trainings involving 60 EMS providers who were trained to properly input data into NMEMSTARS • 13 trainings involving 32 EMS service administrators who were trained to review run reports to ensure that they were properly entered • 3,350 patient care reports received QI review primarily focused on improvement of documentation • Annual data analyses of 20 commonly missed data elements were conducted and the results and feedback submitted to the 80 EMS services participating in the project • 2,831 calls for technical assistance were answered, primarily from rural agencies (estimated at 84%) • 95 stakeholder meetings attended where data quality was discussed
Trainings to Improve the Use of Run Report Data and NMEMSTARS for Quality Improvement
<ul style="list-style-type: none"> • 10 trainings/sessions involving 27 medical directors who were trained to generate reports and use NMEMSTARS data to conduct QI activities and review EMS provider competency • 13 trainings/sessions involving 32 service administrators who were trained to generate reports for QI activities and to use the reports to identify service and provider issues • 95 stakeholder meetings attended that included case reviews and issues impacting patient care • Performed audit tracking to identify which service administrators and medical directors were logging into NMEMSTARS to conduct QI activities • Performed QI review on 3,350 run reports in NMEMSTARS
Improvements in Data Quality and Use of NEMSTARS for Quality Improvement
<ul style="list-style-type: none"> • 25% increase in logins for rural administrators to review run reports for data quality • 15% increase in logins and use of NMEMSTARS by medical directors to review run reports • 43% improvement in overall data quality (based in reduction in errors in reviewed reports) • 129 of 206 (62%) rural services have administrators logging into NMEMSTARS and 144 (70%) have medical directors logging into NMEMSTARS to conduct QI activities and review patient care • Using NMEMSTARS, the evaluation of 3,350 EMS run reports revealed patient care problems in 0.006% of all calls reviewed



based on logins by administrators and medical directors and audits of the data reports. Specifically, the grantee demonstrated regular improvements in logins and data quality at six-month intervals and met the target goal that the medical directors for 60-70% of rural agencies were logging into the NMEMSTARS to conduct QI activities and review patient care. Table 7 details the measures used to assess improvements in the reporting of accurate run data and the use of run data and NM EMSTARS for QI.

Lessons learned from this project included:

- The importance of buy-in from EMS service administrators and medical directors
- Ensure that the grantee has the capacity to undertake the project prior to applying, rather than proposing a project that requires hiring staff after the project begins
- The ability to use and access state data to identify data quality and agency performance issues and monitor improvement is critical
- The awareness that not every agency has the personnel or technology to input electronic patient care reports
- The ability to explain the purposes for data collection and analysis, rather than citing regulatory requirements alone
- Interaction with service and medical directors is time consuming and requires dedicated personnel with an extensive EMS background to respond to a large variety of concerns
- Regular and timely review of run reports and data analysis as well as feedback is critical

Sustainability is a challenge both from the perspective of the continuity of personnel (the project director is retiring in two years and the data manager has been on medical leave) as well as funding to support the ongoing work. New Mexico received a second round of supplement funding to continue its work. Staff from the Emergency Medical Services Board and EMS Region III have experience and expertise with NMEMSTARS

and will continue to work with its members to collect and compile quality data. This includes running regular data reports for service administrators and medical directors to evaluate the quality of prehospital patient care reports as well as providing requisite training and technical assistance. EMS Region III staff will continue to attend quarterly stakeholder meetings of rural service administrators and medical directors, CAHs, and hospitals participating in the Small Hospital Improvement Program, contributing to capacity building and stakeholder engagement.

North Dakota: The goal of North Dakota's Rural EMS Counts project was to implement a demonstration project on data collection and reporting for a set of rural-relevant EMS quality measures. This involved identifying rural relevant EMS performance measures, seeking stakeholder consensus during the measure selection process, ascertaining the feasibility of collecting data to populate the measures, and evaluating the utility of the measures for quality improvement and reporting. The grantee convened a panel of subject matter experts, in conjunction with the North Dakota EMS Association, to participate in the measure selection process. Eighteen measures in five focus areas (cardiac, pain, safety, stroke, and vitals) were selected using a process that blended the Delphi method and a nominal group process. Thirty-nine rural EMS agencies were recruited to participate in the project. An abstract/poster for the project won first place at a National Association of EMS Officials abstract competition.

Thirty-nine agencies enrolled in and continue to use the Health Data Exchange which allows agencies to obtain outcome information from hospitals. During the project, the number of agencies using standardized measures increased from five in Year 1 to 23 at project end. Seven agencies signed an agreement to work together on one of the measures; all seven have chosen to focus on improving data elements related to vital signs. This includes in-person meetings which other agencies are free to attend without signing an agreement, of which five have done so.



TABLE 8: North Dakota’s Rural EMS Counts Outcome Measures

Outcome Measures	Baseline	Target/Goal	Actual
Number of agencies involved in project	0	36	39
Prioritized, consensus quality measures available in ESO Analytics	0	5	18
Percentage of EMS agencies running standard performance measure reports (NEMSQA, ESO Index, Rural EMS Counts Measures)	4%	30%	19%
Agency agreement to implement 1 of the 5 Rural EMS Counts prioritized measures by the end of Year 3	0%	36	7

The 18 measures are available to all North Dakota EMS agencies and have been entered into the ESO (an electronic patient care record) research data set. EMS agencies can benchmark against other North Dakota agencies and a national research dataset. The grantee seeks to create a community of practice to implement the measures using subject matter experts, regional advisors, town hall meetings, information provided through the basecamp platform, and a set of tools (including a toolkit, checklists, and an index of measures) developed for the project. The grantee further promoted the tools at town hall meetings and regional and national conferences to encourage use of the measures and related products for performance and quality improvement.

A significant challenge involved maintaining the engagement of rural EMS agencies as EMS personnel and subject matter experts’ time and availability were limited, particularly during the PHE. The grantee found it difficult to make this project a priority for rural EMS agencies. As a result, the grantee focused on marketing and outreach activities using a marketing subject matter expert. Another challenge has been obtaining access to run data reported to the state by EMS agencies. The state eventually provided de-identified data to the project team but has resisted efforts to obtain identified data by agency.

The outcome measures for this project are summarized in Table 8:

Lessons learned included:

- Dedicated staff are required to facilitate the project
- Volunteer stakeholders add depth of perspectives
- Flexibility in project design and implementation is necessary to accommodate the needs and availability of agency staff
- Starting with data already collected through patient care documentation is a logical place to begin, rather than asking for data above and beyond that already collected
- Obtaining direct access to the data from the agency or the state is best, and if unable to get direct access, consider establishing data use agreements

In terms of sustainability, the project received another EMS Supplement grant to build on this project and concentrate on rural EMS performance measurement using the developed quality measures. The measures have been built into the ESO analytics platform which agencies can access as long as the North Dakota Division of Emergency Medical Services continues to use the platform. Everything created through the project is available on the NDEMSEA website including the toolkits, checklists, Index, and infographic.



DISCUSSION

Despite the delays due to the COVID-19 PHE, all eight grantees made substantial progress in implementing their revised projects and providing useful examples of initiatives for other SFPs to consider when developing their own efforts to support rural EMS under the Flex Program. An important learning objective from these efforts included the need to build the capacity of EMS agencies to support their participation in new models of care (Focus Area 1) or to build their capacity to collect, report, and use data for service enhancement and quality improvement (Focus Area 2). The new models of care related to community paramedicine, alternative destinations, treat-no-transport, and telehealth provide important opportunities for EMS to improve their service capacity and for SFPs to work with rural EMS agencies to implement these models of care.

Similarly, we have seen that the initiatives of the grantees in Focus Area 2 are important capacity building exercises necessary to prepare rural EMS agencies to demonstrate their value and to succeed in the evolving system of care. These initiatives and efforts include identifying rural-relevant EMS quality measures, improving the ability of rural EMS agencies to collect and report accurate and timely run data, and training to use run data to improve the quality and performance of EMS providers. As with the new models of care focus area cohort, the examples provided by these grantees can be adapted by other SFP program areas.

Grantees reported that ongoing relationships with their partners and stakeholders were critical to the continuance of their projects. For those grantees, whose goals were to improve data quality and reporting, the relationships they built with the data vendors, such as ESO, Biospatial, and NEMSQA, as well as relationships with the state EMS data repositories provided a foundation for their success. All grantees stated that buy-in from their pilot projects needed to happen early in the funding cycle for the projects to be sustainable.

Along with the success of these grantees, we also identified implementation issues that challenged the grantees during this funding cycle. For example, some

grantees did not fully implement their projects until late in the second year of the funding cycle, leaving little time to generate outcomes from their project activities. Others modified their projects, with the approval of their project officers, by adding or deleted components of their programs that could not be implemented due to the shifting priorities and resources of state EMS authorities or did not meet the needs of rural EMS agencies in their states. Grantees, however, did not always update their project goals, outcome measures, or tracking reports to reflect the changed scope of project activities. Other grantees implemented their projects within the context of other state initiatives and tended to conflate the impact of the larger initiatives and their supplemental funding projects. As a result of these issues, it was difficult, at times, to understand the status of their projects and to monitor the short and intermediate-term outcome measures leading to the achievement of long-term goals.

While we worked closely with grantees on issues related to outcome measurement and observed some improvements, many grantees continued to struggle with documenting the impact of their projects, specifically with identifying a chain of outcome measures across the funding cycle to document progress towards long-term goals. As discussed in previous supplemental funding evaluation briefs, grantees focused more on output and long-term measures that are difficult to achieve within the funding cycle, rather than short and intermediate-term measures that link project activities to long-term goals and allow for measurement along an evidence-based outcomes pathway.

Outcome measurement for the development of new models of care such as community paramedicine, alternative destination, treat-no-transport, and telehealth is a particular challenge given the high emphasis on generating and documenting savings due to reductions in avoidable hospitalizations, ambulance runs, or ED use. It is difficult to demonstrate causality and clearly attribute these models to short-term changes in hospital, ambulance, and ED use. To do so requires a longer time frame, access to appropriate data sources (e.g., claims data) to capture all services



received by a patient, a complicated research methodology that accounts for the variety of factors that may or may not influence the use of more complex services, and a comparison to what might have happened in the absence of the intervention.^{13, 14} While some grantees used measures from the Mobile Integrated Healthcare Program's Measurement Strategy (developed by MIH-CP Measures Group)⁹ to estimate savings related to CP, alternative destination, or treat-no-transport models, the use of these measures without an appropriate research design and access to the full range of necessary data should be approached with caution, particularly in the short-term.^{15, 16} Obviously, it is beyond the scope of these grantees to conduct studies involving in-depth, experimental designs to determine the impact of these models on the costs and utilization of unnecessary hospital admissions or ED visits.

Instead, those interested in documenting the impact of these models should identify and track the:

- Enrollment of patients (e.g., healthcare referral, patient initiated, voluntary/recruited)
- Content of the interventions (e.g., functional assessment, medication assessment, chronic care management, development of a care plan)
- Interim measures that capture the impact of the changes in the care provided (e.g., improvements in issues identified during functional assessment, medication adherence, improvements in measures of specific chronic disease, adherence to elements of the care plan)
- Frequency of encounters
- Interventions provided at each encounter
- Changes in participant's condition
- New conditions and/or complications developed during term of engagement with the program

It is also important to understand that the use of data solely from local hospitals may not capture all services received by a patient from outside of the community.

CONCLUSIONS AND RECOMMENDATIONS

The eight supplement grantees were all impacted to varying degrees by the onset of COVID-19 and the PHE. State EMS authorities and local EMS agencies

were all challenged by the need to redirect personnel, priorities, and resources to deal with COVID-19 related issues. Despite this fact, all were able to implement their proposed projects or modify their project activities to reflect the changing needs of EMS agencies and the resources available to the grantees. Grantees appreciated the flexibility provided by FORHP under this supplemental funding to adapt their project as necessary and found that they were able to continue project meetings and activities using virtual technology in lieu of face to face meetings.

As discussed above, future grantees would benefit from technical assistance to assist them in employing a more strategic approach to developing and implementing their projects over the funding cycle. Examples of technical assistance that would be valuable include:

- Project planning, development, and implementation
- Developing evidence-based theories of change and related logic models
- Identifying a chain of short, intermediate, and long-term outcome measures reflecting the project's theory of change along with relevant data sources
- Updating theories of change, logic models, and outcome measures to reflect changing project activities
- Clearly documenting program implementation and progress
- Understanding issues related to causality to support their proposed outcome measures
- Developing the evidence base for EMS activities

Overall, grantees made considerable progress on their proposed activities despite the challenges imposed by the PHE. One critical lesson from these eight projects is the need to focus on capacity building activities related to data collection, reporting, and use. Enhanced data capacity can support the ability of rural EMS agencies to engage in new models of care as well as to demonstrate the quality of their services using standardized quality measures. The results of these projects provide a pathway for SFPs to develop their own initiatives to support rural EMS in their states.



EVALUATION SUMMARY: YEARS ONE AND TWO

Year 1 Review and Evaluation Recommendations: Our review showed a lack of clarity in the identification and sequencing of activities and more measures to achieved desired outcomes.⁷ We noted that it is important for grantees to implement interventions reflecting an evidence-based theory of change. Further, it is important for grantees to identify a chain of outcomes that rolls up process and output measures related to project implementation (year 1) as well as short and intermediate term outcome measures related to project activities (years 2 and 3). This chain of outcomes should support and document progress toward long term outcomes. They should also be tied to planned project activities and identify data sources to support the selected measures.

The outbreak of COVID-19 and the declaration of the PHE during the first year of the funding cycle created significant challenges for some grantees by delaying the implementation of their projects and redirecting staff and resources from supplement interventions to address state and regional COVID-19 issues. On a positive note, grantees quickly learned to use zoom and other group meeting tools to convene participants and conduct planned training during Year 1.

Year 2 Review and Evaluation Recommendations: We provided recommendations to help grantees to refine their outcome measurement strategies by focusing on their theories of change. We emphasized that an evidence-based theory of change provides a foundation for programs and drives outcome measurement. Grantees relied primarily on output and long-term outcome measures, rather than identifying interim outcome measures to document progress towards long-term goals over the course of the funding cycle. Several grantees had difficulty identifying appropriate data sources to inform measure selection and strengthen outcome measurement.⁸ We also provided advice to grantees on potential data sources or modifications to their outcome measures to reflect available data. Given the modifications to project activities due to the COVID-19 PHE and other extenuating circumstances, we recommended that grantees update their theories of change, logic models, and output and outcome measures to reflect revised project activities.

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This report was completed by the Flex Monitoring Team with funding from the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS), under PHS Grant No. U27RH01080. The information, conclusions and opinions expressed in this document are those of the authors and no endorsement by FORHP, HRSA, or HHS is intended or should be inferred.