



APRIL 2022

# Year Two Evaluation of the Flex EMS Supplemental Funding Projects: Building an Evidence Base through Outcome Measurement

JOHN GALE, MS

KAREN PEARSON, MLIS, MA

SARA KAHN-TROSTER, MPH

## KEY FINDINGS

- An evidence-based theory of change is the foundation for successful program development and outcome measurement.
- Outcome measurement is strengthened by use of established EMS measure sets, accepted survey tools, and existing data portals used by states to collect run data.
- Outcome measurement is hampered by a reliance on output and long-term outcome measures and a failure to connect project activities to long-term goals using interim measures.
- Measure selection must be informed by the availability of appropriate data. Good measures based on inappropriate data may insert measurement error or bias, thereby yielding misleading results.

## INTRODUCTION

In 2019, the Federal Office of Rural Health Policy (FORHP) awarded supplemental funding to eight Medicare Rural Hospital Flexibility (Flex) Program grantees to improve rural emergency medical services (EMS) in two focus areas: (1) development of sustainable models of care and (2) identification of rural-relevant EMS quality metrics and improvement of EMS data reporting. A cohort of four grantees received funding in each focus area. FORHP's goal for this funding stream is to build an evidence base for rural EMS activities in the Flex Program by funding the implementation of demonstration projects and sharing the results of those projects with rural EMS stakeholders.<sup>1</sup>

To support the development of a rural EMS evidence base, this brief focuses on the outcome measurement strategies of four grantees, two from each focus area. This brief builds on our earlier report<sup>2</sup> which described the eight grantees and their projects, their project planning and implementation activities during the first year of this funding initiative, and implementation challenges encountered. During the second year of this three-year evaluation, we examined grantees' outcome measurement strategies including the outcome measures selected, the timing of those measures (e.g., short, intermediate, and long-term), the data sources used to support their outcome measures, and any challenges encountered by the grantees in monitoring project outcomes. We also provided recommendations to refine the grantees' outcome measurement strategies.



### METHODOLOGY

To provide insight into the development of an evidence base for this funding stream, we assessed the outcome measurement strategies of two grantees from each cohort with selection based on the status of their projects and outcome measurement strategies and the diversity of activities across the eight grantees. From Cohort I: Sustainable Models of Care, we selected Ohio and Washington. From Cohort II: Data and Quality Reporting, we focused on Florida and New Mexico. Our assessment is based on interviews with the grantees as well as a review of their proposals, their twice-yearly tracking reports to the Flex Monitoring Team (FMT), and their End of Year Reports to FORHP.

The following questions framed our evaluation of the four grantees' outcome measurement strategies:

- How are grantees measuring success?
- What are their theories of change and chains of evidence to connect project activities to short, intermediate, and long-term outcome goals?
- What are their output and outcome measures? What are the sources of data sources for their measures?
- What were their outcome monitoring successes? What were their challenges?
- What outcome measurement and program monitoring strategies will help build an evidence base to inform future EMS programming?

### OUTCOME MEASUREMENT

The Notice of Funding Opportunity (NOFO) for the EMS Supplement program directed each applicant to develop a project logic model that clearly identified the goals and objectives of the project and described how the inputs and outputs of the project would lead to the intended short, intermediate, and long-term outcomes.<sup>1</sup> The logic model was expected to demonstrate

how the proposed activities would advance the goals of the project and provide evidence on the effectiveness of proposed interventions.

### Developing Sustainable Models of EMS Care

The two featured projects reflect efforts to develop sustainable models of EMS care. The Ohio Flex Program's project focuses on the development of three rural community paramedicine (CP) sites. The Washington Flex Program's project seeks to improve workforce recruitment and retention, leadership development, and community engagement to enhance the sustainability of rural EMS agencies.

#### *Ohio*

The Ohio Flex Program used its funding to support the implementation of CP programs by three rural EMS agencies, with the goal of creating a sustainable and replicable statewide model. The project's long-term outcomes include reducing 30-day hospital readmissions, unnecessary ambulance transports, and emergency department (ED) visits by enrolled patients. The project supports an expanded role for paramedics in community-based primary care and public health and focuses on patients who are frequent users of urgent and emergency care. Ohio's project director explained that each site is implementing a different CP model focused on the unique needs of its community.

Each site employs one full-time community paramedic, funded by the supplemental grant. One pilot site utilized an existing staff member and implemented its program more rapidly than the other two, which were delayed by the need to hire new staff and obtain approvals from the institutional review board of their participating hospital system. As of March 2021, all three sites were enrolling and serving patients.

The Ohio project team selected 22 measures that best reflected the needs of their program. The measures were developed by the Mobile Integrated Healthcare Community Paramedicine (MIH-CP) Outcome Measures Project to demonstrate CP program fidelity and



## Flex Monitoring Team

University of Minnesota | University of North Carolina at Chapel Hill | University of Southern Maine

impact (Table 1).<sup>3,4</sup> The selected measures include: nine quality of care and patient safety measures; six utilization measures; and seven cost of care measures.

The quality of care and patient safety measures were selected to demonstrate program impact within a relatively short timeframe. The utilization and cost of care

measures monitor enrolled patients' use of unplanned hospital and emergency care and related cost savings over a longer timeframe. The project director identified three utilization measures (reducing 30-day hospital readmissions, ambulance transports, and ED visits by enrolled patients) as the key metrics to demonstrate program impact. He expressed confidence that the

**TABLE 1: Ohio EMS Outcome Measures**

Quality of Care & Patient Safety Measures	Timeline
Increased # and % of patients utilizing a primary care provider (if none upon enrollment)	Quarterly
Increased # and % of medication inventories conducted with issues identified and communicated to PCP	Quarterly
Increased # and % of patients who have an identified and documented plan of care with outcome goals established by a physician and facilitated by the CP	Quarterly
Eliminate deviations in care plans without specific medical direction supporting deviation	Quarterly
Reduced rate of patients who require unplanned acute care (emergency ambulance response; urgent ED visit) within 24 hours after CP intervention	Quarterly
Reduced adverse effects (harmful or undesired effects) resulting from a medication or other treatment related to CP intervention within 24 hours of the CP intervention	Quarterly
Increased # of referrals to community resources for reconciliation of immediate social, transportation, and environmental hazards and risks	Quarterly
Increased # patients with established therapeutic relationship with behavioral health resources	Quarterly
Increased number of patients referred to case management services	Quarterly
Utilization Measures	Timeline
Reduced # unplanned ambulance transports to ED by enrolled patients (compared to 12 months pre-enrollment)	Quarterly
Reduced rate of ED visits by enrolled patients compared to 12 months pre-enrollment	Quarterly
Increased # hours avoided of ED bed utilization by enrolled patients	Quarterly
Reduced rate of all-cause hospital admissions by enrolled patients	Quarterly
Reduced rate of all-cause, unplanned 30-day hospital readmission by enrolled patients	Quarterly
Reduced average Length of Stay by enrolled patients by DRG	Quarterly
Cost of Care Measures	Timeline
Reduced expenditures for unplanned ambulance transports to ED	Quarterly
Reduced expenditures for ED visits	Quarterly
Reduce expenditures for all-cause hospital admissions pre/post enrollment or per event	Quarterly
Reduce expenditures for all-cause, unplanned, 30- day hospital readmissions pre/post enrollment or per event	Quarterly
Reduced expenditures for all-cause, unplanned, skilled nursing and/or assisted living facility admissions pre and post enrollment or per event	Quarterly
Reduced total expenditure savings	Quarterly
Reduced total cost of care	Quarterly



## Flex Monitoring Team

University of Minnesota | University of North Carolina at Chapel Hill | University of Southern Maine

project can document the desired reductions in utilization and costs during the grant period by comparing utilization and cost data collected during the intervention to baseline utilization and cost data for the 12 months prior to patient enrollment in the CP program.

For each CP site, baseline patient-level data for quality and patient safety measures are collected upon each patient's enrollment in the CP program. For utilization and cost of care measures, the sites collected the data for enrolled patients from their partnering hospitals for the 12 months prior to their enrollment. Quantitative data is submitted quarterly to the project director by each CP site using an Excel form to manually extract patient record data from the hospital electronic health records. Qualitative data describing updates, project delays, challenges overcome, and examples of program success are also submitted quarterly to the grantee.

The strength of the Ohio Flex Program's outcome measurement strategy is the use of an established set of MIH-CP measures developed by a team of EMS and CP experts.\* Missing from their outcome measurement strategy, however, is a discussion of the volume and size of the program (e.g., the number of patients engaged by the community paramedics, how often patients are engaged, and the types of engagement). This information is necessary to connect CP activities to longer-term reductions in utilization and costs of care as each of the three sites implemented their own models based on local needs. It is also necessary to understand how the activities implemented by the three different sites differ and the extent to which these differences may influence outcomes across the sites.

Two additional challenges complicate the ability to determine that reductions in utilization and costs can be directly attributed to the implementation of CP programs. The first involves the challenge of accessing

appropriate data sources that capture all costs related to hospital and ED utilization. The project director explained that they are using local data from the hospitals with which the three programs are engaged. Local hospital data, unfortunately, do not capture admissions or ED use that may occur at other hospitals. The second involves the reality that determining attribution/causation for a program intervention is complex and may be beyond the capacity of small programs. As a result, it is important to have a clear evidence-based theory of change for CP programs that monitors short and intermediate-term outcomes that are likely to lead to longer-term reductions in unnecessary utilization and costs. In the case of this CP example, it is important to understand not only what the community paramedics are doing on a day-to-day basis, how many patients are they seeing, how often are they seeing them, and what services are being provided to patients. It is also important that they understand the evidence base for specific interventions to realistically assess the extent to which these interventions can account for short-term changes in utilization and costs.

### Washington

The Washington Flex Program's project focused originally on workforce recruitment and retention, leadership development, and community engagement to help rural communities implement strategies to increase the sustainability of rural EMS agencies. Washington's project coordinator developed a Rural EMS Learning Action Network (LAN), with monthly subject matter expert (SME) presentations and support for participating agencies to develop agency action plans for performance improvement. For the LAN, the project coordinator recruited small rural agencies with low scores on the Attributes of a Successful Rural Ambulance Service (Attributes) assessment tool,<sup>5</sup> large service areas, low call volumes, and a dependence on volunteer staff. The LAN has slots for 12 agencies

---

\*The MIH-CP measures set contains 45 measures targeting different aspects of CP performance and reflecting short, intermediate, and long-term time frames: (1) structure/program design; (2) quality of care and patient safety; (3) experience of care (patient satisfaction and quality of life); (4) utilization (ambulance transports, ED visits, hospital admissions/re-admissions, length of stay); (5) cost of care; and (6) balancing measures (how CP activities impact payers, employees, or community partners).



## Flex Monitoring Team

University of Minnesota | University of North Carolina at Chapel Hill | University of Southern Maine

that meet these criteria, although stable membership has been a challenge due to turnover among participants. As of August 2021, eight transporting agencies representing the eight EMS regions in the state and four non-transporting agencies were enrolled in the LAN. Monthly SME presentations began in the summer of 2020. The project coordinator is also working with participating agencies on action plan development and implementation as well as workforce recruitment and retention initiatives.

The use of the Attributes Survey is a strength of the Washington Flex Program’s outcome management strategy for this project. The Washington State Department of Health administered the Attributes Survey to all rural EMS agencies in the spring of 2019 and the Washington Flex Program staff identified the focus areas of the grant based on those attributes with the lowest aggregate scores across all participants.<sup>6</sup> Upon entry in the LAN, the project coordinator repeated the Attributes survey with each participant to establish their baseline data. The survey will be completed by each agency at the end of each program year to monitor performance improvement. In January 2021, Washington’s project coordinator began to collect post-meeting survey data and qualitative feedback about the monthly SME sessions to learn more about change in knowledge and elements of the presentations that participants might implement with their

agencies. Washington’s outcome measures are summarized in Table 2.

Washington originally proposed to develop: (1) bridge training programs to train emergency medical technicians (EMTs) as Advanced EMTs, (2) programs to cross-train paramedics as community health workers and medical assistants, and (3) community-guidance teams. Due to infrastructure and resource constraints experienced by the participating EMS agencies, these three areas of proposed program activity were not implemented as they were not a good fit for their needs. Instead, the grantee shifted program emphasis and resources to improve recruitment by participating agencies.

Washington’s project coordinator has since revised the project’s outcome measures to reflect the changes in program activities and the reality of tracking workforce issues. For example, Washington’s proposal originally sought to reduce reliance on volunteer labor by 10 percent in participating agencies by increasing their use of paid staff but determined this goal was unrealistic for small agencies with limited call volumes and billings. The project coordinator subsequently dropped this outcome measure. Realizing that improving recruitment and retention rates is a longer-term goal, Washington proposed, as an alternative, to track increases in the number of new EMS volunteers enrolled in training.

**TABLE 2: Washington EMS Outcome Measures**

Outcome Measures	Target	Timeline
# EMS agencies participating in the Attributes scoring process	Determined by each agency’s scores	Annually
% Increase in new volunteers enrolled in EMT or AEMT training	Increase # of providers or skill level by 10% in all enrolled agencies	Annually
Improved recruitment and retention rates	Increase staff by 10% in enrolled agencies	Annually
Increase number of EMS instructors within agencies	Increase by 10% in enrolled agencies	Annually
Identify usefulness of monthly subject matter experts	Based on survey of participants	After each meeting
Identify usefulness of project format based on valuable use of time	Based on survey of participants	Annually





To that end, Washington's project coordinator is hosting multi-agency EMS training courses online and created "train the trainer" programs to help participants develop in-house capacity for training new recruits. The project is tracking increases in the number of new volunteers enrolled in training to document short-term impact and is working towards a longer-term goal of improved recruitment and retention rates.

Washington's continued use of the Attributes survey allows the program to monitor ongoing changes in participants' performance. Given the changes in its program activities, Washington would be well served by narrowing its focus to specific measures that directly align with the revised program emphasis and activities, rather than on the overall results based on all 18 Attributes, thereby providing more solid evidence on the impact of its program.

### Identification of Rural-Relevant EMS Quality Measures and Improvement of EMS Data Reporting

The two featured projects represent common sets of activities implemented by members of this cohort. The Florida Flex Program is developing a consensus set of rural-relevant EMS quality measures and improving the accuracy of data reporting and use by rural EMS agencies. The New Mexico Flex Program seeks to improve the accuracy of reporting to the state's EMS data system by rural EMS staff and medical directors as well as their use of the data to improve the quality of EMS services.

#### Florida

Florida's Feasible, Actionable, Impactful, and Relevant (F.A.I.R.) Rural EMS Measurement Project has established the following goals:

- Improve participation in Florida's EMS Tracking and Reporting System (FL EMSTARS) to 100 percent among rural EMS agencies.

- Engage 100 percent of rural EMS agencies in using FL EMSTARS data for quality improvement (QI) and benchmarking through its Biospatial platform, a tool that provides access to FL EMSTARS data.
- Identify and test 30 rural-relevant measures to support EMS QI and submit the final set of measures to the National Quality Forum (NQF) for endorsement.

To support this project, Florida's Flex Program recruited a Steering Committee of national EMS experts to identify rural-relevant measures and provide direction for measure development. Additionally, the Flex Program sought to hire a medical director to support the project. Florida's outcome measures are summarized in Table 3.

Baseline data on the QI efforts of rural EMS agencies were gathered in 2019 through an online survey of Florida's 40 rural EMS providers (38 responded). Respondents were asked to identify their quality reporting issues; which quality measures they use; and any challenges that limit their ability to collect, monitor, and report quality metrics. Half of rural EMS agencies reported that inadequate staffing and insufficient resources limited their ability to collect and report quality metrics.<sup>7</sup>

To meet their long-term goal of measure identification, testing, and validation, Florida's project team recognized the need to improve the percentage of rural EMS agencies submitting data to FL EMSTARS and the quality of the data submitted. To support this need, the Emergency Medical Services Section of the Florida Department of Health is transitioning the FL EMSTARS data repository to Biospatial, a data tool which aligns the submission of records and the ability to conduct QI and data analytics. The use of Biospatial as a data entry portal, repository, and reporting tool is a strength of Florida's outcome measurement strategy as it allows the Emergency Medical Services Section



**TABLE 3: Florida F.A.I.R. Rural EMS Outcome Measures**

Outcome Measures	Baseline	Target/Goal	Timeline
Increase in the percentage of rural EMS agencies submitting run data to FL EMSTARS	54%	100%	August 2021
Increase in the percent of rural EMS agencies registered in Biospatial QI platform	12%	100%	August 2021
Percent of rural EMS agencies participating in the online QI course	N/A	Not set	September 2021
Identification and validation of rural-relevant EMS performance measures		30	December 2022 (revised)
Rural EMS agencies are using the approved rural-relevant measures	0	100%	December 2022 (revised)
Rural-relevant EMS measures have been endorsed by NQF	0	20	Submission to NQF by December 2022

to monitor the submission of run data by rural EMS agencies, test and validate the rural-relevant measures developed through this project, facilitate the use of the data for QI by rural EMS agencies, and ultimately report state EMS data to NEMSIS.

To further support its efforts, the Flex Program hired a Rural EMS Coordinator to provide training and consultation to rural EMS agencies on the submission of run data to FL EMSTARS, the need for accurate data reporting, and the use of its Biospatial platform to support QI activities. In 2019, 54 percent of rural agencies were submitting data to FL EMSTARS. By August 2020, following training and consultation, 97 percent of rural agencies were submitting data to FL EMSTARS. The project team also noted similar success in encouraging rural agencies to use the Biospatial platform to support QI activities. At the start of the project, 12 percent of rural EMS agencies were registered in and using Biospatial. Currently, 97 percent are registered in Biospatial and being trained on its use for QI purposes. Florida’s project also used 2019 baseline survey data to inform the development of online QI courses. In addition to tracking participation in the course, Florida will compare the performance of the participants to the baseline data over time.

While these outcome measures reflect positive movement toward meeting their short-term project goals, the next challenge for Florida is to demonstrate improvements in the quality of rural EMS services once the measures are fully validated and incorporated into the Biospatial platform. To do so, it will be necessary to monitor the understanding and use of Biospatial for QI purposes by rural EMS agencies and continued monitoring of the accuracy of data submitted by these agencies to FL EMSTARS.

Florida’s project team has reported that they will not be able to complete the process of validating and testing the 30 rural-relevant outcome measures within the three-year funding cycle for two primary reasons. The first involves the onset of the COVID-19 pandemic which diverted the attention of the Steering Committee members from this project to the needs of their own organizations. Florida’s team noted that the pandemic negatively impacted the response to the initial public call for measures, requiring a second call for measures. The second involves the delay in hiring a project medical director to provide clinical guidance on measure selection and to represent rural EMS issues statewide. Florida’s team explained that this rural-focused clinical expertise is needed to support the final



selection, testing, and implementation of the measures. Florida has requested an extension of their deadline to December 2022 to complete live testing of the measures in Biospatial and submit final measures to NQF.

### *New Mexico*

The New Mexico Flex Program's project seeks to improve the quality and accuracy of data reported by EMS agencies to the state's EMS Tracking and Reporting System (NM EMSTARS) and encourage greater use of the system to improve the quality of services provided by rural EMS agencies, as part of a statewide initiative to improve reporting through NM EMSTARS. The project provides education, training, and technical assistance to EMS providers and medical directors on the process for accurately inputting data into NM EMSTARS as well as on the use of these data for QI. New Mexico's vision is to provide the tools to improve EMS performance and capacity while strengthening partnerships with the NM Department of Health, the state EMS Bureau, and the Eastern New Mexico EMS Corporation in Region III.

To achieve its project goals, New Mexico's project team conducts ten training sessions each year for EMS managers and staff and five sessions each year for EMS medical directors. New Mexico's project coordinator provides technical assistance to participating EMS agencies and prepared a QI report template in NM EMSTARS to identify areas that impact patient care. Additionally, New Mexico's project coordinator regularly reviews run reports generated by rural and urban services for quality and accuracy and conducts data accuracy checks for completed patient care reports. Trainings focus on how to accurately input data, generate meaningful reports, and use QI-relevant data to improve patient care. These reports are shared with EMS agency administrative personnel to encourage them to run similar reports to support their own performance improvement activities.

NM EMSTARS was used to provide baseline data on use of the system in late 2018 and identify opportunities to work with EMS staff and medical directors to

improve their use of NM EMSTARS data for QI. The baseline data identified the NM EMSTARS data elements that EMS service providers were having difficulty with as well as whether and how often EMS administrators and medical directors were accessing the system for QI purposes. Twenty data elements were identified as problematic due to missing data. The project coordinator uses NM EMSTARS data (Table 4) to monitor improvements in data quality and use of the system over time by examining when and how often EMS staff and medical directors log into the system and by running reports that allow for the identification of data reporting problems and QI opportunities. This information is shared with individual agencies.

Forty EMS services (20 each in Regions I and III) were selected in 2019 against which to run these 20 data elements. Eighty-five percent of these services were rural agencies and the remaining 15 percent were urban agencies. The urban agencies were included to allow comparison of data quality across rural and urban services. The resulting data reports highlight specific areas of concern for each service and provide a baseline for improvement. Updated versions of these reports are run at six-month intervals to identify improvements among the participants. An additional 40 agencies were chosen during Year 2 of the project, using the same 20 data elements as a baseline for review of the quality and accuracy of data input, with follow-up reports, training, and technical assistance provided by the New Mexico project coordinator. The project is part of a larger initiative involving all 352 ground ambulance services in New Mexico and all 25 air ambulance services. New Mexico's project coordinator reports improvement over the baseline data in the percentage of EMS administrators and medical directors logging into in NM EMSTARS and states that they are on track to meet their target goals of 90-100 percent participation by EMS administrators and 60-70 percent participation by medical directors.

New Mexico's use of NM EMSTARS is a strength of its outcome management strategy. NM EMSTARS is used to track changes in the extent and quality of EMS





**TABLE 4: New Mexico EMS Outcomes Measures**

<b>EMS Data Collection and Reporting</b>	<b>Target/Goal</b>	<b>Timeline</b>
Increased administrator and medical director understanding of NM EMSTARS data, based on login audits	90 -100% administrators; 60-70% medical directors, % increase every 6 months	Semi-annually
Increased understanding of the importance of and the ability to run regular QI reports	% increase every 6 months	Semi-annually
Increased quality of data input and QI reports based on baseline report of 20 data elements	% increase every 6 months	Semi-annually
Increased identification of issues in quality of care provided by rural EMS compared to urban EMS	% increase every 6 months	Semi-annually
Increased medical director use of NM EMSTARS to review patient care reports for completeness/accuracy	% increase every 6 months based on login/utilization data	Semi-annually
<b>Improved EMS Patient Care</b>	<b>Target/Goal</b>	<b>Timeline</b>
Increased medical director understanding of how to generate reports and read QI data	% increase every 6 months in login activity	Semi-annually
Increased identification of rural patient care issues based on # of participants trained to run QI reports, audits of login activity, and regional run report reviews	% increase every 6 months in NM EMSTARS QI activity	Semi-annually
Improvement in quality of data input and QI reports by EMS services	% increase every 6 months	Semi-annually
Increased QI activity by EMS providers, administrators, and medical directors	% increase in # of meaningful QI reports from NM EMSTARS	Semi-annually
Increased review by medical directors of patient care reports for completeness and accuracy	% increase every 6 months	Semi-annually

data reporting by highlighting missing data, rating each service on how well they are reporting specific data elements, and listing those that are poorly reported and in need of improvement. The biannual feedback report prepared by the project coordinator enables EMS managers to see areas of improvement within the 20 data elements as well as identify additional elements that may need adjustment in subsequent data reports. The project’s underlying premise is that increasing the use NM EMSTARS data by EMS medical directors and staff to examine episodes of patient care, produce reports to identify QI issues, and develop proficiency profiles on EMS providers will support local agency QI activities. The missing step in the chain of evidence is understanding how and to what extent agency staff and medical directors in the two cohorts

identified for this study are using the data to improve the quality of care provided.

The challenge for New Mexico’s project is maintaining the focus on the rural agencies that were engaged in project activities in Years 1 and 2. While comparing the performance of urban and rural ambulance services is important for the overall statewide initiative, it risks losing the focus on the impact of project interventions on the reporting capacity of the two cohorts of rural agencies engaged in this project. To provide the necessary evidence on the impact of the project on the performance of the rural agencies in the two cohorts over time, it is important that the grantee track their engagement in project interventions and performance throughout the funding cycle.



### DISCUSSION

These four projects highlight the complexity of collecting data to provide a chain of evidence linking EMS supplement activities to short, intermediate, and long-term goals and outcomes. Through our focus on the efforts of these four grantees, we identified several strengths and challenges to their outcome measurement strategies.

The strengths included the use of an established measures set to monitor program impact (e.g., the MIH-CP measures set by Ohio), use of an accepted survey tool to collect baseline data and monitor EMS performance improvement over time (e.g., the Attributes of a Successful Rural Ambulance Service survey by Washington), and the use of existing EMS data portals and tools to provide baseline data to identify data reporting challenges by rural EMS providers (e.g., FL EMSTARS and Biospatial by Florida and NM EMSTARS by New Mexico).

The primary challenge for grantees is a reliance on output and long-term, high-level outcome measures to monitor program performance rather than interim (e.g., short and intermediate-term) outcome measures. Interim measures are necessary to connect project activities, through an evidence base, to high-level outcomes by monitoring steps that reflect movement to long-term outcome goals. Another challenge is the need to update output and outcome measures as project activities evolve based on the changing circumstances and needs of participating rural EMS agencies and the challenges of implementing projects in a complex healthcare environment. A third challenge involves the monitoring the outcomes of projects for targeted rural EMS agencies that may be implemented within the context of larger statewide initiatives. The final challenge involves the availability of appropriate data to support chosen outcome measures. This is particularly difficult for outcomes with extended time horizons (e.g., ensuring the sustainability of rural EMS agencies); reflecting population-level changes in the quality

of EMS services; or monitoring high-level cost savings (e.g., the avoidance of unnecessary admissions, readmissions, ED use, or ambulance transports).

Given the three-year funding cycle for the EMS supplement grant, outcome measurement must be carefully considered during program planning and throughout the implementation and management of the project. During early program development, it may be difficult to clearly identify interim measures. Once program implementation is underway and timelines are established, however, it should be easier to identify appropriate short and intermediate measures. Grantees would be well served by selecting a discrete set of interim measures that captures the key changes in EMS operations or care provided to patients that will lead to the achievement of long-term goals and reflect the timeline of project activities over the course of the funding cycle.

Outcome measurement is an evolving process that should reflect changes that often occur during program implementation and operation as well as the changing needs of participating EMS agencies. Outcome measurement strategies should reflect the reality that data to populate long-term, high-level measures involving changes in EMS quality, workforce capacity, avoidable service utilization, or system-level cost savings may not be available or, if available, can be expensive to acquire and difficult to analyze. As such, the selection of outcome measures that require expensive, difficult to analyze data sets, such as claims data, may unnecessarily strain the resources and capacity of grantees to appropriately monitor program outcomes. The use of alternative data sources to monitor long-term, high-level outcomes must be carefully assessed to ensure that they accurately and appropriately measure the desired outcomes without inserting measurement error or bias. If data for outcome measurement are unavailable or beyond the resources and/or capacity of the grantees to use, grantees, as an alternative, should explore the use of interim measures that capture changes in EMS clinical and/or operational



performance, provider behavior, or patient care. The key is to select interim measures that logically can be expected, based on available evidence, to lead to the achievement of identified long-term goals, even if the achievement of those goals occurs outside of the funding cycle.

As part of their conditions of engagement in the grant program, it is critical for grantees to set clear expectations with participating EMS agencies regarding their reporting of outcome measures such as the specific measures to be used, the definition of those measures, the data to be used, the reporting cycle, and the reporting format. Given the resource limitations of small rural EMS agencies, setting those expectations for reporting obligations at the beginning of the grant cycle may help minimize data collection challenges throughout the grant cycle.

### CONCLUSION

The NOFO for the EMS supplement funding established expectations for grantees in terms of monitoring outcomes and developing an evidence base for the initiatives conducted under this funding program. To support these expectations, grantees received technical assistance on outcome measurement from the FMT and the Technical Assistance and Services Center (TASC). The evaluators from the FMT work closely with the TASC team, and members of both teams are encouraged to participate in regular meetings and interviews with grantees. Both sides freely share observations and resources to inform the development of technical assistance provided to grantees with this input used to identify subject matter experts (including evaluators from the FMT), program content, and resources materials for use by grantees. During biannual evaluation calls with grantees, the FMT provides direct feedback and advice on outcome measurement challenges experienced by grantees and reviews their project tracking reports to assess program implementation and progress.

Throughout this project, we observed that grantees struggled with various aspects of outcome measurement such as selecting appropriate short, intermediate, and long-term outcome measures to align with project activities, identifying and accessing appropriate data to support chosen outcome measures, and separating outcome data for targeted rural EMS agencies from data collected as part of larger statewide initiatives. We have observed similar outcome measurement issues in prior evaluation studies across the different Flex Program Areas.

From a program perspective, the projects implemented by the eight supplemental funding grantees vary substantially in terms of their activities and goals. The measurement of outcomes for a CP program will be very different from a project focused on improving the capacity of rural EMS agencies to collect, report, and use quality data. As a result, we focused on development of measurement strategies used by grantees to monitor the impact of their programs. While individual measures may vary from project to project, the process of developing a project and selecting appropriate outcome measures can be more consistent across programs. Programs and outcome measurement strategies should be informed by a clear, evidence-based theory of change that links project activities to short, intermediate, and long-term outcomes over the course of the project life cycle. The selection of measures should reflect the evidence-base, capture changes in performance over time, and reflect available data. EMS supplement grantees as well as other State Flex Program grantees would benefit from a greater emphasis on the development of an evidence-based outcome measurement strategy; consistent oversight and feedback from the Flex Program project officers, the technical assistance providers, and the evaluation team; and a more structured framework to assist State Flex Program grantees in developing measurement strategies based on their specific activities. With the guidance of an evidence-based theory of change and a focus on project activities over their projects' life cycles, Flex Coordinators will be better positioned to select outcome measures to reflect the impact of their projects.



### REFERENCES

1. Federal Office of Rural Health Policy. *Medicare Rural Hospital Flexibility Program--Emergency Medical Services Supplement. Notice of Funding Opportunity*. 2019. HRSA-19-095.
2. Pearson KB, Gale JA, Kahn-Troster S. *Implementation of Flex EMS supplemental funding projects: Year one activities*. University of Southern Maine, Flex Monitoring Team;2020. Briefing Paper #47.
3. Mobile Integrated Healthcare Program. *Measurement strategy overview*. MIH. 2020. Updated September 11, 2020. Accessed March 21, 2022. <http://naemt.org/docs/default-source/community-paramedicine/mih-metrics-for-community-health-interventions---updated-9-11-20.pdf>.
4. Zavadsky M, Staffan B, Swayze D. *MIH-CP outcome measures*. EMS World. 2015. Updated February. Accessed March 21, 2022. [http://www.naemt.org/docs/default-source/community-paramedicine/mih-cp-toolkit/ems\\_50-53\\_mihcpoutcome.pdf?sfvrsn=2](http://www.naemt.org/docs/default-source/community-paramedicine/mih-cp-toolkit/ems_50-53_mihcpoutcome.pdf?sfvrsn=2).
5. Wisconsin Office of Rural Health. *Attributes of a successful rural ambulance service: A workbook*. Accessed March 21, 2022. <http://worh.org/sites/default/files/EMS%20Attributes%20of%20Success%20Workbook.pdf>.
6. Washington State Department of Health. *Washington State 2019 rural EMS service survey*. WA DOH;2019. DOH 530-238. Accessed March 21, 2022. <https://www.ruralcenter.org/sites/default/files/2019%20Rural%20EMS%20Service%20Survey%20Questions.pdf>.
7. Florida Department of Health. *Florida, Feasible Actionable, Impactful, and Relevant (F.A.I.R) EMS measurement project: Rural QI assessment report*. 2019. Accessed March 21, 2022. [https://www.floridahealth.gov/licensing-and-regulation/ems-system/fair-project/\\_documents/qi-assessment.pdf](https://www.floridahealth.gov/licensing-and-regulation/ems-system/fair-project/_documents/qi-assessment.pdf).