Measuring the Emergency Medical Services Workforce

Report Compendium – 2023

www.nasemso.org

DISCLAIMER

This document was produced with support from the US Department of Transportation, National Highway Traffic Safety Administration (NHTSA), Office of Emergency Medical Services and the Health Resources and Services Administration (HRSA) Maternal and Child Health Bureau (MCHB) Emergency Medical Services for Children (EMSC) through cooperative agreement project 693JJ92050001-0001.

The contents of this document are solely the responsibility of the authors and do not necessarily represent the official views of NHTSA or HRSA.

INTRODUCTION

In June 2020, the National Association of State Emergency Medical Services Officials (NASEMSO) received funding from NHTSA's Office of EMS to evaluate the ability of state EMS offices to monitor and analyze the EMS workforce, examine any existing best practices through work already completed, and identify any new or emerging data sources or EMS workforce measures.

The project resulted in four separate reports:

1. Understanding State EMS Office Capability and Recommendations for the Future
2. Identifying Ideal Measures and Processes
3. State Profiles, Successes, and Challenges to Implementation
4. Strategies for Workforce Measurement Implementation

For the ease of the reader and to enable a comprehensive understanding of the project, these four reports are provided in this compendium as a single document.

Measuring the Emergency Medical Services Workforce

UNDERSTANDING STATE EMS OFFICE CAPABILITY AND RECOMMENDATIONS FOR THE FUTUREFE

FEBRUARY 2023

REPORT TABLE OF CONTENTS

BACKGROUND

In 2019, the National Highway Traffic Safety Administration (NHTSA) published *EMS Agenda 2050: A People-Centered Vision for the Future of Emergency Medical Services* (Agenda 2050). Achieving EMS Agenda 2050's vision of a people-centered emergency medical services (EMS) system requires EMS systems designed around six guiding principles:

- Adaptable and innovative,
- Inherently safe and effective,
- Sustainable and efficient,
- Integrated and seamless,
- Socially equitable; and
- Reliable and prepared.

To create a people-centered EMS system that is reliable and prepared, EMS Agenda 2050 envisions a future where adequate staffing for EMS exists across the nation. NASEMSO proposed to develop model state EMS workforce measurement and evaluation tools. To realize the full potential of this project the Federal Interagency Committee on EMS (FICEMS) and the National EMS Advisory Council (NEMSAC) would benefit from contemporaneous updates about this project work.

PURPOSE

The purpose of this effort is to develop model state EMS workforce measurement and evaluation tools. During this development process, NASEMSO, including its leadership and members at large, are working collaboratively with its staff, councils, committees, and other national EMS organizations, to facilitate sharing between state EMS offices of best practice tools for EMS workforce planning, identify types and methods of EMS workforce studies in progress (or recently concluded), and identify state gaps in conducting quantitative analysis of attrition in EMS personnel.

Through the support of the National Highway Transportation and Safety Administration's (NHTSA) Office of EMS (OEMS), two foundational documents were developed that pre-date this project: the *National Emergency Medical Services Workforce Data Definitions* (2013) followed shortly thereafter by *EMS Workforce Planning and Development: Guidelines for State Adoption* (2014).

As this project started in the Spring of 2021, NASEMSO staff circulated an abbreviated environmental scan to the individual state EMS offices[1] to determine the extent to which they were aware of these two documents and had adopted or implemented the recommendations from the two. In the Fall of 2022, a second scan of state EMS offices was sent to state EMS directors. These questions were focused on understanding what can be measured today based on some fundamental workforce questions and was largely informed by the suggested equations found in *EMS Workforce Planning and Development: Guidelines for State Adoption* (Guidelines).

This report is a summary of the responses from both of these scans and provides insight into the work completed by various states to understand the challenges facing the EMS workforce, and the ability of the individual state EMS offices to measure the EMS workforce using available data.

---

[1] Throughout this report, NASEMSO uses the word "state" to describe the United States, its five territories and the District of Columbia.

As a significant component of the entire project five state EMS offices were selected to act as pilot states: Alaska, Indiana, Maryland, Mississippi, and Vermont. In an effort to ensure diverse represention of the EMS workforce, these pilot states were selected based on their geographic locations, varying types of state and local EMS system design and populations.

With the assistance of NASEMSO and the Technical Expert Panel, the pilot states will work to implement recommendations from this report and other significant source documents. To that end, in specific portions of this report, we have particularly highlighted the pilot states' responses for consideration.

WORKFORCE DATA DEFINITIONS & ADOPTION GUIDELINES

Thirty-four states responded to the 2021 scan on awareness and utilization of the *National Emergency Medical Services Workforce Data Definitions* (Definitions) and Guidelines documents. As noted above, the purpose of this scan was to determine the extent to which states were aware of these two documents and had adopted or implemented the recommendations.

ARE YOU AWARE OF THE 2013 NATIONAL EMS WORKFORCE DATA DEFINITIONS AND THE 2014 EMS WORKFORCE PLANNING AND DEVELOPMENT: GUIDELINES FOR STATE ADOPTION DOCUMENTS?

Of the 34 respondents, 21 (62%) were aware of the *Definitions* and 13 (38%) replied that they were not aware of the document. What is striking is that only 15% (n=5) of the respondents who were aware of the Definitions reported that they had utilized the document (Figure 1). With regards to the Guidelines*,* the reports are similar with 71% (n=24) stating they were aware of the document, but only 18% (n=6) indicating usage (Figure 2).

There is little information as to why such a disparate number reported they were aware of but had not utilized the Definitions or Guidelines.

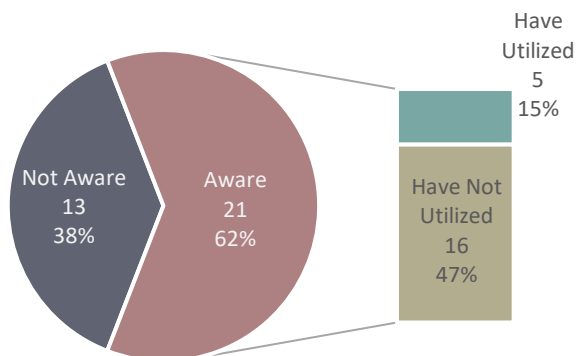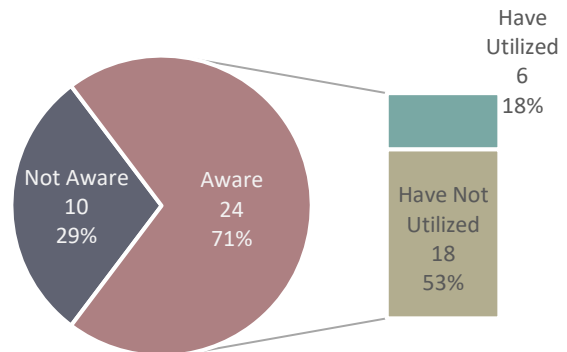FIGURE 1: DATA DEFINITIONS AWARENESS & UTILIZATION

FIGURE 2: WORKFORCE GUIDELINES AWARENESS & UTILIZATION

WORKFORCE SCAN QUESTIONS & ANALYSIS

A total of 44 states responded to the workforce scan conducted during the Fall of 2022. As noted above, these questions were focused on understanding what can be measured today based on some fundamental workforce questions and was largely informed by the suggested equations found in *EMS Workforce Planning and Development: Guidelines for State Adoption.*

WORKFORCE DATA COLLECTION

This section sought to determine the extent to which state EMS offices had performed analysis of the EMS workforce within their state.

WITHIN THE LAST FIVE YEARS, HAS YOUR STATE CONDUCTED ANY SURVEY, QUESTIONNAIRE, NEEDS ASSESSMENT, OR OTHER SPECIFIC ANALYSIS OF THE STATE OF THE EMS WORKFORCE?
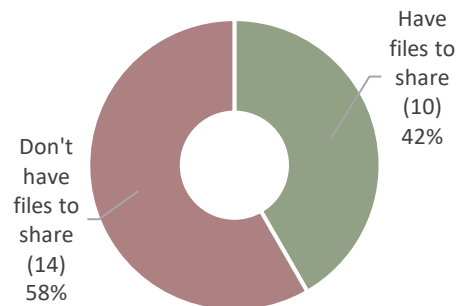
A number of respondents (45%, n=20) indicated that they had **not** performed any analysis of their state's EMS workforce in the last five years (Figure 3). While it is true that the COVID-19 pandemic required most state EMS offices to focus their efforts on pandemic response efforts, this percentage seems curiously high, since all indications are that the EMS workforce was experiencing challenges well in advance of the pandemic. This result also likely reflects that state EMS offices do not have the resources (time, funding, and personnel in particular) to conduct this work.

FIGURE 3

45% *of states (n=20) have **not** conducted an analysis of their EMS workforce*

This question also asked, of those who had conducted some analysis, whether or not they had files to share. Only 42% of those who responded "yes" (n=10, Figure 4) indicated that they had files or reports that they could share. NASEMSO did not gather any information regarding why any state did not have files they could share, but two likely reasons would be that the work is not yet complete or approval for release of the reports has not been received.

FIGURE 4

Have files to share (10) 42%

Don't have files to share (14) 58%

This result is fairly even in responses with 48% (n=21) reporting no, but 52% (n=23) indicating yes, they do collect some measures (Figure 5).

FIGURE 5

52% *of states (n=23) perform workforce-specific calculations and compare changes*

For the 23 states who perform EMS workforce-specific calculations, the most typical time frame of measurement appears to be annually (52% of respondents, n=12) with remaining percentage divided almost equally between the quarterly, monthly, and "other" choices (Figure 6).
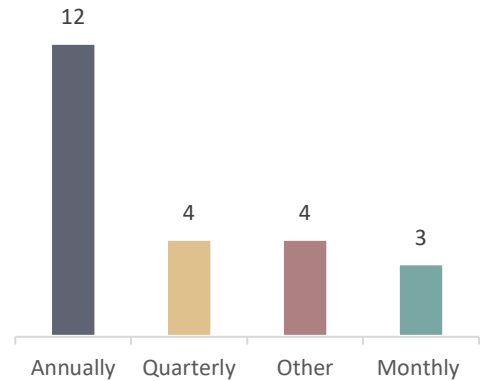
Respondents who indicated "Other" identified the following frequencies:

- Every 6 months
- Not on a formal schedule, however we do look at the numbers internally
- We just started (n=2)
  one respondent indicated they hope to do this annually

FIGURE 6

12	4	4	3
Annually	Quarterly	Other	Monthly

Respondents who indicated they did perform workforce calculations (Figure 5, n=23) were given a free text field in which they could describe what aspects of the workforce are being measured. The most common response described is measuring the counts of licensed individuals from year to year. This is an elementary calculation, and we would speculate that most states could perform this calculation even if they did not provide a response in this field.

A few states reported that they are doing some comparison between two data sets:
- licensing data and
- patient care reporting.

In comparison to measuring the counts, this type of measurement begins to touch the complexity of the issue, as it seeks to examine the level of participation by a licensee within the state system. As an example of how telling this type of comparison would be, one state reported that only 28% of their total licensees appear

within their patient care reporting system. This may indicate that the vast majority of their licensees are *not* providing care in the field, although further analysis would be needed to determine that affirmatively.

One state reported that they use a unique measure of latency; that is, using their combined data systems to determine if an individual has been active within the last 45 days. We would also speculate here that most states could do some similar comparison, as most states receive patient care data in some form.

> These responses point to two fundamental types of measurement that most states *should* have the data to perform:
> 1. Counts of licensees and growth or decline over time
> 2. Level of involvement within the out-of-hospital environment

WITHIN THE LAST FIVE YEARS, HAVE YOU COLLABORATED WITH YOUR STATE DEPARTMENT OF LABOR OR WORKFORCE SERVICES TO ANALYZE THE EMS WORKFORCE?
[IF "YES"]
DOES YOUR OFFICE ROUTINELY COLLABORATE WITH YOUR STATE'S DEPARTMENT OF LABOR OR STATE WORKFORCE AGENCIES TO MONITOR OR ADDRESS EMS WORKFORCE?

Of the respondents to the first part of this question, the vast majority (87%, n=38) reported no, they had not collaborated with the appropriate department within their state. Of the six (14%) states who indicated they do, only two (33%) indicated that this collaboration occurs on a routine basis (quarterly). (Figure 7)

FIGURE 7

6
Number of states who collaborate with department of labor/workforce services

2
Of the 6 represented above, number who do this regularly (quarterly)

The reasons for this lack of engagement may be many, but these questions may represent the single, biggest, missed opportunity regarding the EMS workforce. State departments of labor (or related state workforce agency) may have access to resources and expertise that a state EMS office does not. In addition, a state labor department would be able to combine EMS specific data sets with other data sets such as tax information for both individuals and businesses and worker's compensation. Some sensitivity may remain around sharing information collected through an EMS licensure process with an outside organization, but state EMS offices should be strongly encouraged to engage in this collaboration.

USING YOUR STATE PERSONNEL LICENSURE DATABASE WOULD YOU BE
ABLE TO DETERMINE HOW MANY **UNIQUE LICENSED INDIVIDUALS**
PRACTICE WITHIN YOUR STATE?

Only 10 respondents (23%) indicated the answer "no" to this question (Figure 8). It is possible that the respondents interpreted the question differently than intended, since it seems plausible that any modern software should be able to determine how many individuals are licensed within a state. Some consideration could be given to asking respondents why they answered in the manner that they did.

FIGURE 8

What we know to be true is that not every state collects information regarding whether an individual is licensed in more than one state. This is a crucial nuance in determining the actual number of licensees. Since most state licensure systems do not interface with any other state's system, most states would be unable to determine how many licensees are licensed in their state alone.

To our knowledge, the only methodology which exists to do this consistently and accurately is the unique identifier number issued through the coordinated database constructed for the Interstate Commission for EMS Personnel Practice.[2]
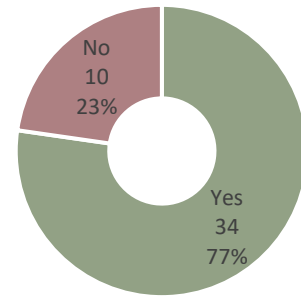
USING YOUR STATE PATIENT CARE DATA, WOULD YOU BE ABLE TO
DETERMINE WHETHER AN INDIVIDUAL LICENSEE HAS BEEN PART OF A
RESPONSE WITHIN THE LAST THREE YEARS?

To this question, 86% (n=38) of respondents indicated yes, with only six respondents (13%) indicating no (Figure 9), signifying that this may be an immediate opportunity for data analysis.

Definitions and methodologies for data comparison should be created and tested in the pilot states. Pilot state responses are shown below.

FIGURE 9

Yes: Alaska, Indiana, Maryland, Vermont

No: Mississippi

---
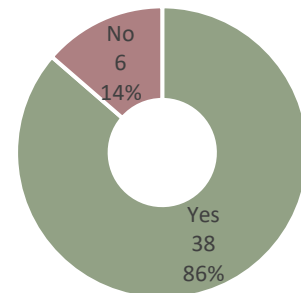
[2] At the writing of this report, 22 states have joined the EMS Compact. Retrieved from: https://www.emscompact.gov/, accessed January 12, 2023.

PERSONNEL CHARACTERISTICS

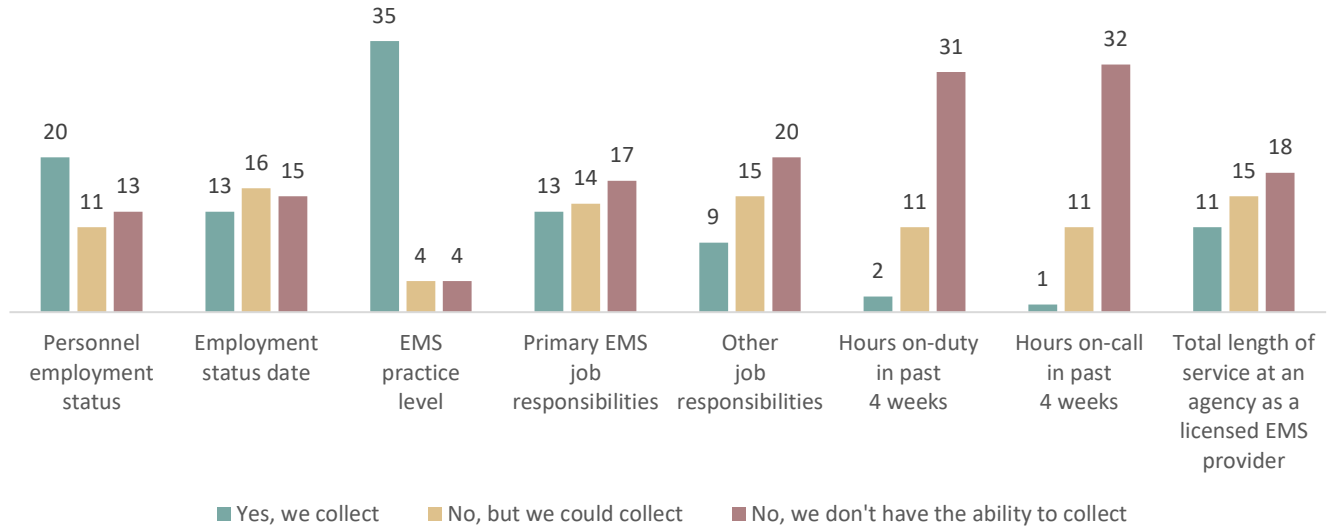This portion of the scan attempted to determine whether states collected information about individual licensees regarding some of the factors of employment which may influence their retention.

REGARDING EMS PERSONNEL AGENCY EMPLOYMENT, DO YOU COLLECT
THE FOLLOWING DATA ELEMENTS?
(LIST INCLUDED BELOW; DATA ELEMENT EXAMPLES/
TYPE SHOWN IN BRACKETS)

- Personnel employment status *[e.g., full-time paid, part-time paid, volunteer, not actively working in EMS]*
- Employment status date *[date]*
- EMS practice level *[e.g., none, EMR, EMT, EMT-other, AEMT, paramedic]*
- Primary EMS job responsibilities *[e.g., educator/preceptor, administrator/manager, first-line supervisor, patient care provider, other]*
- Other job responsibilities *[e.g., do they have dual responsibilities as an educator/preceptor, patient care provider, law enforcement (police), fire suppression, first-line supervisor, and/or other]*
- Hours on-duty in past four weeks *[number]*
- Hours on-call in past four weeks *[number]*
- Total length of service at an agency as a licensed EMS provider (at all levels) *[number]*

FIGURE 10

Legend: ■ Yes, we collect   ■ No, but we could collect   ■ No, we don't have the ability to collect

This question points to what may be the largest knowledge gap regarding the workforce; that is, information related to the "demand side" of the workforce chain. Eighty-two percent (n=36) of respondents reported that they **do not** collect this information (Figure 11). Without an accurate measure of the number of available positions which are vacant, it is impossible to report how extensive any workforce shortage is, let alone determining how many personnel will be needed in the future.

FIGURE 11

82%

*of states (n=36) **do not** capture information about staffing levels/workforce shortages (per agency)*
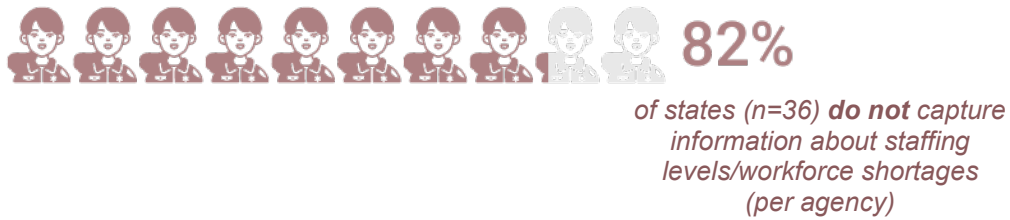
The eight respondents (18%) who reported that they did collect this information (EMS personnel staffing/ workforce shorages) stated that they collected it through a **survey instrument**, often on an annual basis.

Certainly, any collection of data would offer a better understanding, but a survey instrument seems inherently flawed and would not offer an accurate picture. Any existing survey instruments should be compared to each other to determine if questions are being asked in the same manner and with the same terminology. Additionally, the response rates should be examined to determine how reflective the responses are of the actual population. A far better option would be the collection of data regarding actual positions and vacancies, presumably through the ambulance service licensure process.

INDIVIDUAL CHARACTERISTICS

This portion of the scan attempted to quantify the states current status in collecting basic demographic information of licensees. Demographic information may provide insight between state populations of EMS providers.

Clinical practice level:
- State/territory EMS licensure level *[e.g., none, EMR, EMT, EMT-other, AEMT, paramedic]*
- State/territory licensure date–initial *[date]*
- State/territory EMS licensure–end date *[date]*
- National Registry certification level *[e.g., none, EMR, EMT, EMT-other, AEMT, paramedic]*
- National Registry certification date *[date]*

Demographics:
- Date of birth *[date]*
- Ethnicity *[Hispanic, Latino, or Spanish origin, not of Hispanic, Latino, or Spanish origin]*
- Race *[American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, white]*
- Sex *[male, female]*

Tenure in employment:
- Primary affiliation *[agency name]*
- Date of primary agency affiliation *[date]*
- Date of each secondary agency affiliation *[date]*

FIGURE 12

Legend: ■ Yes, we collect ■ No, but we could collect ■ No, we don't have the ability to collect
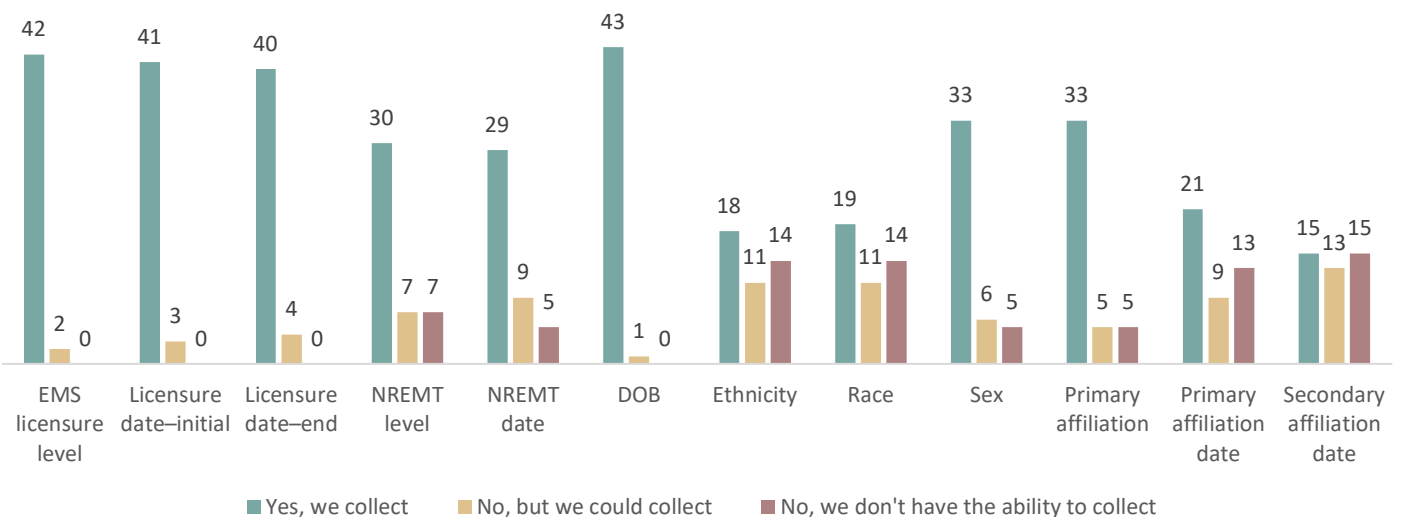
REGARDING EMS PROVIDER GENDER, CAN YOU TRACK NON-BINARY, TRANSGENDER, OR OTHER GENDER IDENTITIES?

Some clarification around the responses to this question should be sought since 57% (n=25) of respondents indicated that they do not have the ability to collect this information (Figure 13). Since most states utilize some type of software as their portal for licensure information, it would seem plausible that the software could simply be modified to collect the data. It is also possible that some states are prohibited by state laws from collecting this information.

FIGURE 13

4
Number of states who track non-binary, transgender, or other gender identities

15
Number of states who could collect other gender identities, but don't
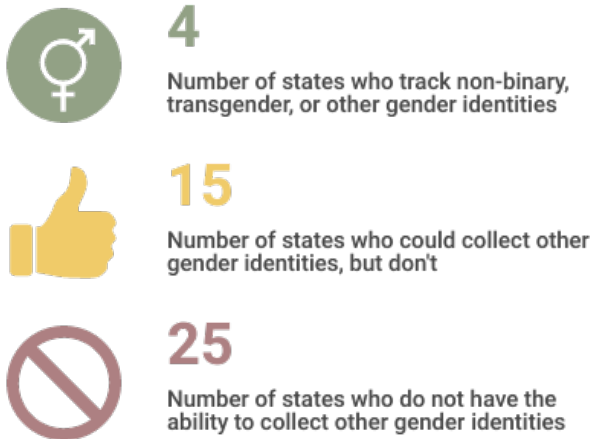
25
Number of states who do not have the ability to collect other gender identities

Any barriers to collecting this information through a state's licensing process should be explored, and if the barriers remain, then alternative means of gathering information should be developed. Understanding the complete demographics of the workforce is essential if EMS is to develop a truly equitable and diverse workforce.

DO YOU COLLECT DATA REGARDING PERSONNEL WITHIN YOUR EMS WORKFORCE WHO ARE NOT LICENSED/CERTIFIED THROUGH YOUR EMS LICENSURE PROCESS (E.G., DRIVER, NURSES, OTHER CLINICIANS)?

The finding that 70% (n=31) reported "no" to whether they collect data regarding the EMS workforce that are not licensed/certified (Figure 14), is crucial to understand. Many states have some provision allowing other clinicians (medical doctors, nurses, physician's assistants, etc.) to function as part of an EMS crew. Indeed, some EMS agencies are dependent on these people to fill staffing needs. In other cases, an ambulance crew is dependent or required by state statute to utilize these other professions in order to transport an acutely ill or injured patient. Since the state EMS office does not typically have licensing authority over these other professions, the lack of data is to be expected. It is worth noting here that states which have authority over the EMS agency or ambulance service may have a means to collect some data on other clinicians.

FIGURE 14

Yes
13
30%

No
31
70%
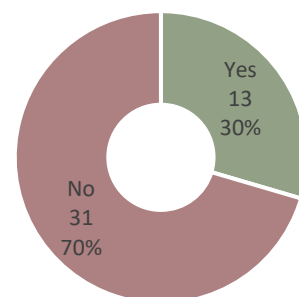
Multiple states have traditionally allowed a layperson to serve as a driver or provide some other accommodation for members of fire departments or law enforcement to take on the role of driver, and during the COVID-19 pandemic, many other states used emergency or temporary authority to allow similar changes in staffing requirements. It is unknown how many states have now made this a permanent change.

It is possible that states could better leverage their authority over the *agency* to collect relevant data.

Ninety-five percent (n=42) of respondents reported no, they do not collect this information (Figure 15).

FIGURE 15

*of states (n=42) <u>do not</u> collect salary
& compensation information as part of
the agency licensure process*

While many states could probably collect this information, this is a heavily nuanced area that would need significant discussion and consensus. Some potential needs or barriers include:

- Definitions around "compensation" and comparators (vacation time accrual, health insurance, longevity pay, overtime, etc.)
- Defining a volunteer;
- Clear definitions around business models; and
- Addressing proprietary concerns about benefit information among competitors.

As states work to develop this information, it is worth underscoring the importance of ***collaboration with a state department of labor***.

SUPPLY AND DEMAND EQUATIONS

The 2014 *EMS Workforce Planning and Development: Guidelines for Adoption* proposed several equations for measuring the workforce using a supply and demand side approach. Generally, the supply side of the workforce constitutes those steps and processes required to qualify a layperson to function in the EMS system (e.g., education, certification, licensure). The demand side of the workforce is created by the employers and the market.

Typically, a state EMS office exercises significant authority and influence over the supply side of the workforce but is usually a peripheral stakeholder on the demand side. This is reflected in the responses with respondents indicating high quantities of data related to the supply side, yet little data related to the demand side.

The scan presented both the supply and demand side equations from the *Guidelines*. For each equation, respondents were asked to indicate whether they collected the data required to perform the calculation, and then asked to indicate whether they felt that the equation was still relevant to measuring the EMS workforce.

At the end of both the supply and demand equations, respondents were given the opportunity to suggest other equations that may be relevant.

SUPPLY SIDE EQUATIONS

For each of the "supply side" equation questions, respondents were also asked if they agreed whether the equation was relevant to measure the EMS workforce. These responses are included in each of the figures below.

DOES YOUR STATE COLLECT THE DATA REQUIRED TO DETERMINE THE
CERTIFICATION RATE OF YOUR EMS GRADUATES?
[(TOTAL # CERTIFIED BY THE NREMT) / (TOTAL # COMPLETING THE CLASS)]

FIGURE 16

30

Number of states who collect data to determine the certification rate of EMS graduates

39

Number of states who agree that the equation is relevant

Here, 68% (n=30) of respondents indicated they collected the information and 89% (n=39) agreeing to the relevancy of the equation (Figure 16).

DOES YOUR STATE COLLECT THE DATA REQUIRED TO DETERMINE THE
LICENSURE RATE OF YOUR EMS GRADUATES?
[(TOTAL # OF NEW LICENSEES) / (TOTAL # CERTIFIED BY THE NREMT)]

OR

IF YOUR STATE DOES <u>NOT</u> REQUIRE NREMT CERTIFICATION FOR
LICENSURE: [(TOTAL # OF NEW LICENSEES) / (TOTAL # COMPLETING THE CLASS)]

For this equation, the responses begin to look different than others with only 66% (n=29) reporting that they had the necessary data. However, 82% (n=36) of respondents affirmed the relevancy of the equation (Figure 17).

FIGURE 17

29
Number of states who collect data to determine licensure rate of EMS graduates

36
Number of states who agree that the equation is relevant

DOES YOUR STATE COLLECT THE DATA REQUIRED TO DETERMINE THE
NEEDED NUMBER OF EMS EDUCATION ENROLLEES?
[(TOTAL DEMAND) / (MATRICULATION RATE X LICENSURE RATE)]

FIGURE 18

34
Number of states who *do not* collect data to determine EMS education enrollees

35
Number of states who agree that the equation is relevant

For this equation, 77% (n=34) of respondents reported that they did *not* collect the required data. The perceived relevancy remained high with 80% (n=35) agreeing that the equation was important to measuring the EMS workforce (Figure 18).

Included below is a summary of responses from states, grouped by theme.

Employment

- Turnover rates
- Employment type (i.e., movie set medic, warehouse medic, hospital, etc….)

Education

- Examination attempt (by number of attempts) success rates
- How many people complete in state training programs and then leave the state to work elsewhere
- Documented education in EMS or healthcare
- Number of enrollees in EMS education institutions that have no intention of working for an EMS agency (e.g., plan to work in hospitals or clinics, nurses who need to have intubation and other paramedic-related skills in order for them to qualify as flight and/or critical care transport nurses)
- Number of courses needed for each practitioner level (access to initial education courses (EMR, EMT, AEMT, and paramedic) is an essential to the supply side)

Staffing

- The number of licensed personnel that are providing EMS for an ambulance service. [(Total number working for an ambulance service) divided by (Total number of licensees)]
- Inflow/Outflow: Number of new providers working in the system for the first time minus the number of providers working in the system at the time their certification expired
- Measure ability developed based on previous call volume, area of responsibility, and amount of coverage required; to determine system need
- Supply needs to be evaluated beyond demand of matriculation (we need to know does the supply meet the actual demands of providing care)
- Data to determine the number of volunteers, questions that assess volunteer workforce satisfaction, challenges, recruitment, retention, incentives, etc.

DEMAND SIDE EQUATIONS

For each of the "demand side" equation questions, respondents were also asked if they agreed whether the equation was relevant to measure the EMS workforce. These responses are included in each of the figures below.

DOES YOUR STATE COLLECT THE DATA REQUIRED TO DETERMINE THE DEMAND FOR FTEs WITHIN THE NEXT YEAR?

[(TOTAL FTEs) – (TOTAL FTEs ON HAND) = TOTAL CURRENT VACANCIES]

AND

[(TOTAL PROJECTED VACANCIES) + (TOTAL CURRENT VACANCIES) + (TOTAL GROWTH VACANCIES) = TOTAL DEMAND]

The contrast here is striking with 93% (n=41) reporting they did not collect the necessary data but 80% (n=35) agreeing that the equation is relevant (Figure 19).

FIGURE 19

41
Number of states who *do not* collect data to determine determine the demand for FTEs within the next year

35
Number of states who agree that the equation is relevant

ARE THERE OTHER EQUATIONS YOU BELIEVE TO BE RELEVANT TO MEASURING THE DEMAND SIDE OF THE EMS WORKFORCE?

Included below is a summary of responses from states, grouped by theme.

Call Volume/Response Time

- Call volumes (n=2)
- Response times/time engaged in calls
- Projected increases/decreases in call volumes
- UHU/Call volume per FTE needed

Staffing

- Minimum staffing reporting requirement for ambulances (e.g., Service A has stated that, at a minimum, they will have 3 active ambulances in their system).
  This state indicated that they are working on this equation and would require servoces to report when they had to drop below that minimum, providing them with a better picture of how many personnel (at a minimum) they would need to have to staff all available ambulances on any given day.
- The equation and survey questions do not account for the full spectrum of EMS provider utilization. We suspect only a portion of EMS providers work in a traditional ambulance-centric response category - perhaps even only a minority. We support and encourage a variety of workforce options for EMS personnel including facilities, clinics, and other non-traditional employment opportunities.

- Measurements similar to pilots and truck drivers concerning hours of continuous work versus hours of rest
- Population served as well as the rate of departing certified EMS providers (death, retirement, exiting the profession, or employment as an EMS provider at a non-EMS agency).

Retention

- Reasons EMS providers leave the field
- Career satisfaction
- Salary
- An equation used to forecast future needs based upon positive and negative growth rates in the workforce

Rural/Urban

- # Licenses per RUCA or Rural/Urban population numbers
- Look at both rural and urban issues (demand is affected by location, they are not always the same related to supply or demand)

Area Needs

- System needs (do we really need 47 ALS ambulances in a county?)
- Population increases

OTHER COMMENTS

In the closing section of the scan, respondents were given an open text field to relay anything they deemed important to measuring the EMS workforce. Included below are the verbatim responses.

- The limitation is viewing the EMS workforce in traditional terms. Especially since COVID, our workforce has rapidly expanded into many non-traditional roles, and our statutes and rules permit/encourage/facilitate this.
- Definition of a volunteer
- Just a clarification on our affiliations. We have the capability and it is used, however, i do not believe it is fully accurate since it is encouraged but not enforced. Primarily we measure affiliation through the employer rosters rather than the individual certification records.
- We probably have more information that we could share outside of the 3 attachments. We've been working on staffing issues for a while and have been collecting data for a very, very long time.
- Our office does not have much oversight in demand calculations for both emergency and non-emergency EMS. Anecdotally, only about 50% of our certified workforce appears on a patient care report in a given year. [Our state] has many EMS education programs, the students of which may be in college or pursuing other healthcare education. Some portion of our active EMT's work in other areas of healthcare.
- Just as a point of reference, some of the data we collect/can report on, but there are significant issues with raw data. The clean versions are a picture. I couldn't upload any of our excel files.
- Most of our workforce data is gleaned from our ePCR system. This system is good but we do not capture complete workforce data from those agencies using third party software and importing to our system.   The best workforce data would come from the Department of Labor who licenses ECPs in [our state]. I believe if we were to ask for specific information regarding EMS workforce and attrition they would be willing and able to provide the information.

- In addition to the previously demonstrated low wages, it is not a traditional finding for EMS education institutions to provide, or be able to provide, scholarships. Additional considerations for recruitment and retention include, but are not limited to, tax-credits, structured pension and other benefits packages, subsidies to volunteer EMS providers and agencies to assist them in transitioning to a paid model.

- Regarding the data we collect, could collect, or can't collect; yes we collect some data, and we can collect some other data. But, the problems with this are: 1) Department support to do this, 2) we would collect a great deal of this information during our renewal season, and we are still using paper to do our renewals. It will take a significant amount of time to be able to enter this data into a program to be able to do something with it. Yes, SurveyMonkey would help, but emailing the link will be very time consuming.

- We need to look at retention. Currently we are able to supply EMS at an adequate level, however, lack of retention is harming the system. Many EMS personnel are obtaining the certification/license only to move on to more lucrative, less stressful employment opportunities.

- Our provider portal is robust in some respects (certification, length of service, affiliations, etc.), but needs some further development to be able to better answer some of the questions that were asked - especially in terms of paid/non-paid, gender, and others. We are in the planning stages to add those modules to our portal.

- Apart from the numbers, there are many other issues that impact the workforce such as working conditions, compensation, leadership, workforce development/glass ceiling, harassment, etc., that is relevant to this topic.

- We are interested in any efforts to participate in an EMS workforce study to better understand the issues and target funding/solutions to specific problems.

SUBMITTED DOCUMENTS

As part of the scan, respondents were asked to submit copies of, or links to, documents or reports produced related to measuring the workforce in their individual state. Ten states provided 13 separate documents, e.g., survey instruments, survey results, and graphical analyses. A complete synopsis of these documents is beyond the scope of this report, however some key observations about the documents and recommendations for future efforts are included below.

OBSERVATION

Surveys were most commonly used to measure the factors affecting the workforce. We presume this is due to the relative ease of producing surveys through modern software. The use of survey instruments is encouraging in that it shows that state EMS offices are keenly aware that influencers of the workforce in both recruitment and retention are multi-factorial and difficult to quantify. Questions on these surveys touch on topics such as generational considerations, behavioral health resiliency, physical exhaustion and injury, and life/work balance. While this is an important technique to quantify subjective influencers, it would be far more meaningful when combined with data analysis showing trends over time. What is clear from these documents, as well as the responses to other questions on the scan, is that states do have a lot of relevant data, but analysis of the data is not occurring on a routine basis.

Recommendations

- Support and encourage states to routinely monitor existing data and develop trends over time. Encouraging and incentivizing licensing software vendors to develop dashboards and reports based on common data definitions could be extremely beneficial.

- Develop one unified survey instrument for use by the states to ensure the same questions are asked and measured in the same manner. The results of such a survey, combined with a unified collective analysis of workforce data would be powerful.

OBSERVATION

The documents vary in the complexity and sophistication of approach and topics addressed. In all likelihood there are multiple factors affecting this to include resources immediately available to the state EMS office, assistance that may be available from other state agencies, a specific preferred approach to data collection, and political influences within a state.

Recommendation

- The *2014 EMS Workforce Planning and Development: Guidelines for Adoption* should be reviewed and updated to include a section describing best practices, resources, tactics, and options for state EMS offices to utilize in measuring their workforce. An interim step could be to develop a document supplementary to the Guidelines.

OBSERVATION

Inadequate pay and benefits are the most cited reasons for exiting the workforce.

Recommendations

- Understanding this issue will require a significant research effort due to the widely varied economic and geopolitical factors. The comments and responses in the state survey responses indicate that the perception exists that the EMS workforce is being drawn away by job fields which offer higher pay and better working conditions without the educational and training requirements of working in EMS, or that other healthcare entities (hospitals, clinics, etc.) are drawing the workforce away by offering wages and benefits beyond the capability of most EMS agencies. Completing this level of economic analysis will require the assistance of agencies and persons who are well qualified and trained in doing this type of research.
- A toolkit or guidelines which assist state EMS offices in performing at least an elementary economic comparison of the EMS workforce to other industries would be extremely useful.
- State workforce agencies or departments of labor should be engaged to leverage their resources and expertise that a state EMS office does not.

OBSERVATION

Ambulance services report inadequate reimbursement for services provided as severely limiting their ability to offer competitive pay and benefits. The issues surrounding reimbursement and the "fee-for-transport" model have existed for decades without significant change in policy. Several reports point to the lack of understanding of what is commonly known as "the cost of readiness" for EMS; that is that the fixed costs of operating an ambulance service are high, with only limited ability to generate revenue to offset or recover costs.

Recommendation

- Research should be directed at understanding the true gap between reimbursement and operating costs. National comparisons are likely of little value here as the economics of EMS can vary widely from county to county or even within a county. Included in this research should be a comparison of EMS' with other public safety entities which experience cost-of-readiness, primarily law enforcement

and fire suppression. Comparing the three by cost, level of public subsidy, and actual work performed could be telling and offer policy options.

OBSERVATION

Dissatisfaction with EMS leadership is frequently cited as a reason for exiting the EMS workforce. This is a particularly difficult area to quantify and weigh. Little information or data exists to help understand how significant this factor is, let alone what is to be done about it.

Recommendation

- This should be an individual area for research and analysis, as it would require specific definitions and targeted questioning. There may be similar work done in other professions which could help develop a tool specific to EMS.

OBSERVATION

There is a widening gap between the number of licensees in the state and the number of licensees appearing in patient care reporting systems, supporting the hypothesis that a significant portion of licensees are *not* serving in a transporting EMS agency.

Recommendation

- More information is needed to understand where licensees are working, what roles they fill and why they are not involved in a patient transport role. For example, a licensee who is in a primarily administrative role may not routinely complete patient care reports yet would still be considered part of the EMS workforce. Additionally, a better understanding of employment would allow a cross comparison of the factors drawing a licensee to those particular settings such as compensation and benefits.

OBSERVATION

States with areas which still rely on volunteers to provide EMS are dangerously at risk of losing services. Many services and individuals indicate doubt that a volunteer model for EMS is sustainable. It is possible that reliance on volunteers to provide healthcare is creating an area of inequity.

Recommendation

- Develop clear definitions around the concept of volunteerism (no compensation versus partial compensation). Develop agreement around how many volunteers are needed for sustainability. Develop clear pathways for service areas to use to transition away from reliance on volunteers.

OBSERVATION

A lack of state statute mandating EMS as an essential service inhibits the development of local systems.

Recommendation

- Several states have implemented legislation in an attempt to accomplish this, yet there is no common definition for the term "essential service". Agreement on this should be reached along with model legislative language. States in which legislation has been enacted should be interviewed to determine the effectiveness of existing legislation.

Measuring the Emergency Medical Services Workforce

IDENTIFYING IDEAL MEASURES AND PROCESSES

JUNE 2023

REPORT TABLE OF CONTENTS

EXECUTIVE SUMMARY

With support through a Cooperative Agreement with the NHTSA Office of EMS and additional support from the HRSA – EMS for Children Program, NASEMSO initiated a project to better understand the states' abilities to measure the EMS workforce.

In the first phase of the project, an environmental scan was conducted to determine which states had already conducted some analysis of the EMS workforce and to determine whether there was agreement around the validity of the measures first outlined in the 2014 *EMS Workforce Planning and Development: Guidelines for State Adoption* [*Guidelines*]. The report on this first phase (*Understanding State EMS Office Capability and Recommendations for the Future*) can be found at the start of this compendium.

In the second phase of the project, NASEMSO engaged five states (Alaska, Indiana, Maryland, Mississippi, and Vermont) to serve as pilot states to test the *Guidelines* workforce measures and explore what processes or systems are needed to replicate the pilot state experiences on a national level.

In this phase of the project, a few findings were glaringly obvious.

States remain very different in how, when, why, and what data that they collect regarding the workforce. In the instances where the states collect same or similar information, it is doubtful that licensing software systems use the same data definitions. While some work was done circa 2009 on developing workforce definitions, these are substantially out-of-date. Some, but not all, have corresponding definitions in the National EMS Information System (NEMSIS). The lack of a nationally recognized EMS workforce data dictionary prohibits any conclusive findings or in-depth analysis of aggregate state data.

Complicating the matter further, the vendors for licensing systems may be local/homegrown, commercial vendors with generic systems not designed specifically for EMS, or commercial products which are designed with EMS in mind. It seems apparent that the licensing software does not easily integrate with patient care reporting systems. This limits the ability of the state EMS office or other researchers from connecting the workforce to the work that they do.

Finally, the state EMS offices have limited personnel who can devote their time exclusively to data collection and monitoring and may not have the skill sets or resources to improve the system.

TESTING THE PILOT STATE'S ABILITY TO GENERATE DATA

The results of the environmental scan performed early in the project showed nearly universal consensus that the measures proposed in the *Guidelines* remain relevant and reasonable in 2023. Moreover, we are unaware of any work that *disproves* the utility of the *Guidelines.* Despite this consensus, the fact remains that states did not broadly or consistently implement or use the *Guidelines* to measure the EMS workforce between 2014 and 2023. As to why the *Guidelines* were not widely adopted, the respondents to the scan reported numerous reasons which can simply be stated as a lack of resources (see box on right).

> Primary among these reasons were:
>
> 1. Limited funding for sophisticated licensing software;
> 2. A lack of personnel who can be assigned to develop and maintain expertise with the electronic systems; and
> 3. The time required to generate and clean data and develop reporting tools.

This reveals that the immediate need at hand is not necessarily new or additional measures for the EMS workforce being generated solely within state EMS offices, but rather a consistent, affordable and easily adopted process for data collection and comparison. Further exploration reveals that data sharing or linkage with other sources is necessary to capture the entire "pipeline" of personnel emerging, existing, or transitioning out of the EMS workforce. This is addressed in the Workforce Continuum section below.

In determining what tools or processes need to exist in order to adequately collect and analyze data for the EMS Workforce, the logical starting point is to determine what can be done with current resources and understanding the limitations of what exists.

Building from the observations and information collected in the environmental scan, we asked the pilot states to generate reports on two primary factual points:

1. The counts of licensed personnel by level of licensure for each calendar year of a five-year period; and

2. For each of the same five years, the percentage of licensed providers who were recorded at least one time in the state's electronic patient care report (ePCR) system as being present or participating in an EMS response for the same five years.

The rationale for the first point is that quantifying currently licensed individuals is a core function of a licensing agency of any profession. All other relevant factors affecting the EMS workforce hinge on the state's ability to determine who is currently licensed to practice in their state.

The rationale for the second point is that multiple states in the scan either indicated that they were already using ePCR data around activity as a proxy measure for the workforce or were considering doing so in the near future. More importantly, the initial focus was to test the states' ability to generate and compare data to each of the other pilot states, rather than making determinations about the workforce.

THE PROCESS

There is no central repository collecting data from state EMS personnel licensing systems. Therefore, the only method that exists to compare data is for the pilot state EMS office to generate data or reports internally and then send the results to a third party for collating. The pilot states were provided a basic spreadsheet based on these two points and were then required to generate the reports from existing data sets and send the results to NASEMSO staff who collated the data.

The following tables and charts depict the pilot states' reported personnel by licensure level for calendar years 2019 through 2023.

MEASURE 1: TOTAL WORKFORCE BY LICENSURE LEVEL

Alaska Total Workforce*
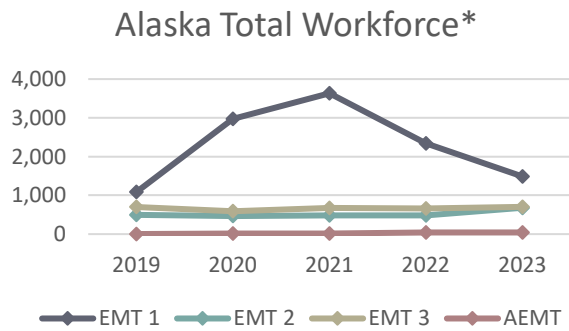
*The Alaska State EMS Office did not have licensing authority over paramedics until 2023. Alaska reports 524 paramedics currently licensed statewide. See the section specific to Alaska in the following "Pilot State Experiences" for further discussion.

Indiana Total Workforce

Mississippi Total Workforce

Maryland Total Workforce

Vermont Total Workforce
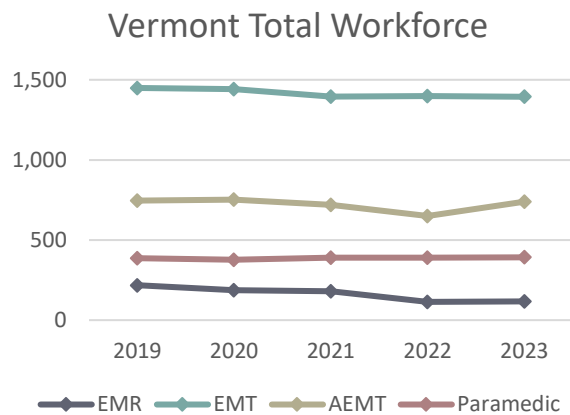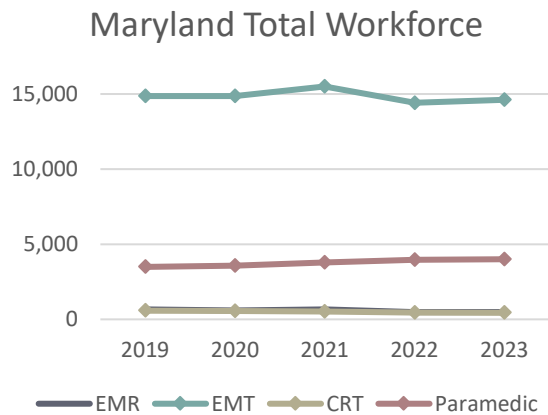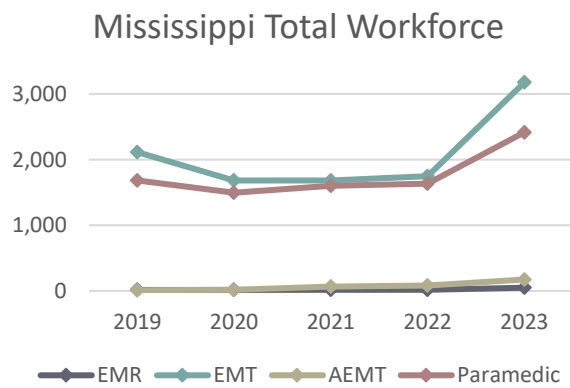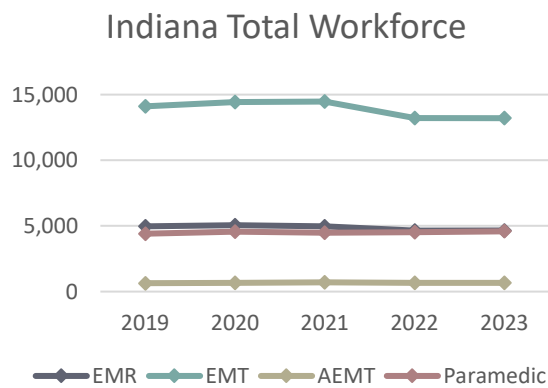
DISCUSSION

The results from this graphical analysis demonstrate the inherent difficulty in understanding the EMS workforce nationally and give an indication of what other factors must be explored and understood.

First, note that in all five states over the five-year period, the counts of licensed personnel remain relatively flat, with the exception of dramatic increases for Alaskan EMT 1s in 2021, followed by an immediate decrease over the next two years, and a fairly significant increase in Mississippi at the EMT and paramedic levels between the years 2022 and 2023; the waning years of the COVID pandemic.

With nearly all states (including the pilot states) reporting anecdotal EMS workforce shortages, the relatively consistent numbers of personnel indicate that the issue may not be tied as directly to the workforce *supply,* as it is to *where* the personnel are working. State EMS offices are most likely to hear of EMS workforce shortages from the licensed or authorized agencies that traditionally employ EMS personnel (ambulance services and non-transporting fire departments) rather than employers with non-ambulance settings (e.g., hospitals). If these agencies are indeed the ones experiencing the shortage, then it is logical to conclude that EMS personnel are leaving their traditional roles in favor of other employment or involvement while keeping their EMS license current.

Secondly, the importance of measuring over time is readily apparent as seen in the results from Alaska and Mississippi. By measuring results over time, states can identify specific periods where an unusual increase or decrease occurs or where a trend begins and ends. They can then explore the causative factors for the change.

Finally, the importance of standardized data labels and definitions are a major conclusion in this project, even at this early juncture. Two of the pilot states (Alaska and Maryland) maintain licensure levels that do not necessarily correspond to those defined in the *National EMS Scope of Practice Model.* This further complicates the comparison of these two states to others as the scopes of practice would need to be compared, and nationally, other states maintain varying levels of licensure as well. Indeed, even this one example is only a superficial commentary on the need for an EMS workforce data dictionary. All manner of detail would need to be articulated in the data dictionary to include:

- Initial licensure

- Defining volunteers

- Dual role/dual employment

- Length of service

- Upgrading and downgrading licensure and scope of practice

MEASURE 2: ACTIVE WORKFORCE

For this measure, we defined "active workforce" as the percentage of licensed providers who appeared at least one time in the state's ePCR system for the same five-year period used in Measure 1. To accomplish this, the states needed to first identify all license numbers appearing in their ePCR system for each year, remove any duplicates, and then using the number of active licensees in their licensing system as a denominator, calculate the active workforce percentage. Only three of the pilot states were able to perform this calculation. Only four years of data were used, since the data was generated early in 2023 and would only reflect a small portion of the total renewal activity for the year.

Alaska did not generate the data for this measure since the license number of the provider was not a required data point in the state's ePCR system. Mississippi did not provide a reason for why they were unable to generate the data.

Indiana Active Workforce

Vermont Active Workforce

Maryland Active Workforce
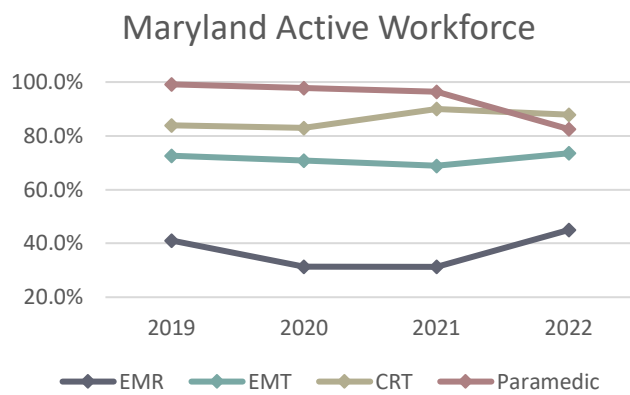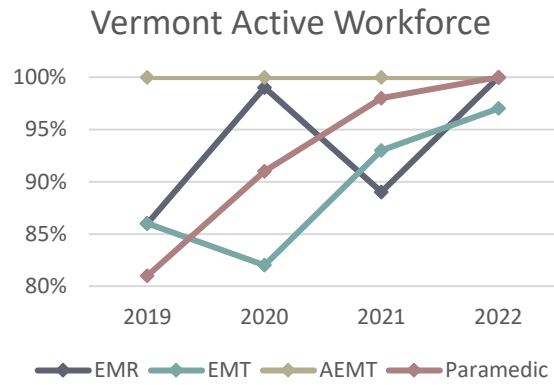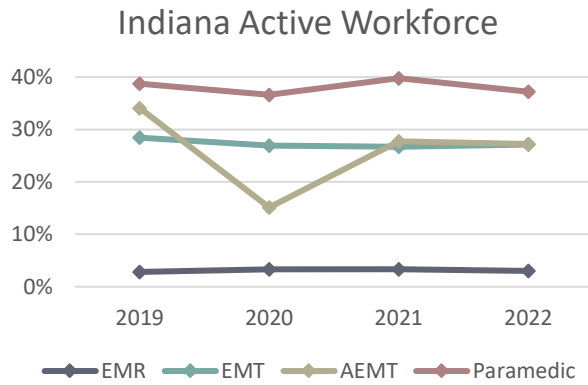
DISCUSSION

We offer two observations from this small comparison.

First, Indiana's active percentage more closely matches what other state EMS offices reported to NASEMSO through the environmental scan and other communications; that is, that less than half of the licensed providers are actively engaged in field EMS work. Some states have reported percentages as low as 25-30%. Maryland and Vermont would appear to have higher activity than most other states, although states would have to thoroughly examine and confirm this. But if this proved to be true, then the next question to explore is why is this the case? What are the factors of the EMS job market in these two states that differ from the others?

Secondly, for all three states, the level of activity for paramedics is consistently higher than other licensure levels. One possible explanation for this is that employers are more likely to retain paramedics than other levels due to the demand for the more expansive scope of practice, but additional research would be needed with one or more willing state EMS offices to test this and other hypotheses.

SUMMARY OF PILOT STATE AND NASEMSO STAFF LESSONS LEARNED

- The EMS industry needs a standardized, nationally recognized, data dictionary for personnel and workforce data. Without this, future attempts to compare aggregated nationwide data would be futile.

- Experienced staff are crucial to the work. As an example, Alaska (which uses the same vendor for both licensing and ePCR collection) had a vacant position which required them to seek assistance from their vendor. Conversely, Indiana was able to generate data quickly due to experienced available staff.

- States need to identify crucial data points for reporting (license numbers) and require submission of the data as routine practice.

- Data systems (both licensing software and patient care reporting) need standardized report generation functions. Ideally, these two types of reporting systems would be linked regardless of vendor.

- The less a reporting process relies on human input, the less chance there is for human error. As an example, the spreadsheets returned to NASEMSO staff from the pilot states had formatting changed, differing formulas, and differing value formats.

WORKFORCE CONTINUUM: THE NEED FOR MULTIPLE DATA SETS

A complete understanding of the EMS workforce in any state requires comparison between multiple data sets and should reflect the continuum of the workforce from entry into the educational programs to employment acceptance and retention. This continuum, first outlined in the *Guidelines,* remains relevant today. Despite this, the needed data continues to exist in disparate, unconnected systems, or has not been gathered at all.

THE EDUCATIONAL PIPELINE

The environmental scan indicated that the majority of states do not have all of the educational data elements suggested by the *Guidelines,* including the five pilot states. The reasons for this vary, but chief among these are the absence of statutorily delineated authority over educational programs and limited resources available to dedicate purely toward regulation of EMS education.

The data collected by the Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions (CoAEMSP) as part of the accreditation of paramedic education programs by the Commission on Accreditation of Allied Health Professions (CAAHEP), is the only national data set specific to initial EMS education. This is because in 2013, the NREMT adopted a policy requiring candidates for certification at the paramedic level to be graduates of a CAAHEP accredited program, and as part of their accreditation, paramedic education programs must report certain metrics annually to the CoAEMSP.

Researchers from the NREMT recently published a study comparing data from the CoAEMSP and NREMT certification data.[3] As a result of their analysis, the researchers determined that 21% of all paramedic students attrit from the educational program before attempting the certification process. The reasons for attrition vary,

---

[3] Ball M, Powell JR, Gage CB, et al., "Paramedic Educational Program Attrition Accounts for Significant Loss of Potential EMS Workforce." *JACEP Open.* 2023;4:e12917. https://doi.org/10.1002/emp2.12917

but there is a high degree of association of attrition with course length, student enrollment, and regional location.

In stark contrast, the NREMT team identified 61 programs which reported a 0% attrition rate.[4] The team observed that this would indicate that there are successful strategies to reduce attrition from EMS education.

Another significant finding from the NREMT work is the variability in success of educational programs from region to region with higher certification pass rates occurring in the West and Northeast. While the NREMT study utilized NASEMSO regions rather than states, the formula for calculation would remain the same. Indeed, publicly available data for the five pilot states demonstrates the NREMT finding.

Each of the five pilot states represents a different NASEMSO region and each requires successful completion of the certification exam offered by the National Registry of EMTs (NREMT) as a condition of initial licensure. The following graphic reflects successful completion of the exam on the first and third attempts by candidates in each of the five pilot states.[5]

Pilot States NREMT Success
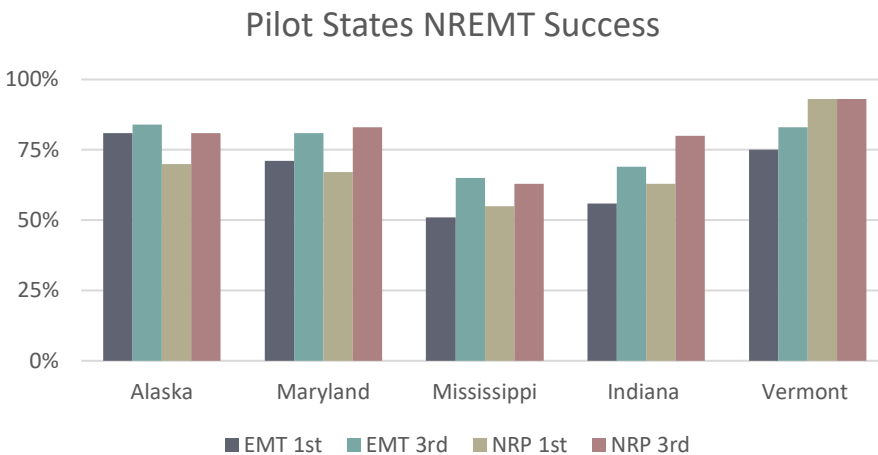
While this offers an interesting visual comparison of one state to another, far more information is needed to understand each state's educational system and their success with NREMT certification and ultimately licensure in each state. Important data that are not shown here include:

- The number of students who enrolled in each educational program initially;
- The number of students who completed the educational program and were eligible to take the NREMT exam;
- The number of students who were unsuccessful at the NREMT exam on their first attempt, but did not attempt again;
- The number of students who successfully completed the exam, but have not been licensed; and

---

[4] Ibid, 6.
[5] https://www.nremt.org/maps

- The number of students who successfully completed the exam and were subsequently licensed in their state of residence[6] or in any other state.

To further illustrate the need for comparison across data sets, the following graphic compares the number of individuals currently certified by the NREMT in each of the pilot states.

NREMT total vs State total: 2022
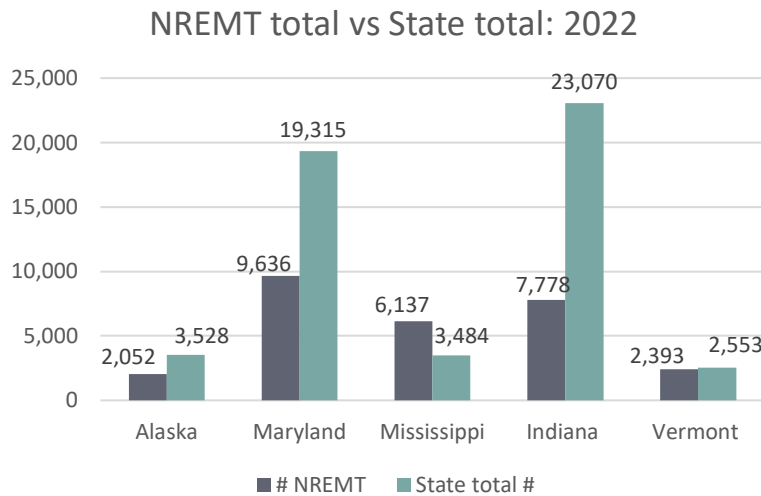
These results are expected, since most states[7] do not require EMS personnel to renew their NREMT certification as a condition of licensure; Vermont being the notable exception among the pilot states. The salient point is that the number of licensed EMS personnel far exceeds those who maintain NREMT certification. The NREMT data is needed as a measure of educational efficiency and personnel qualification, but they must be viewed in tandem with state licensure data.

The Mississippi comparison is intriguing though, as there are nearly double the number of NREMT certified individuals (6,137) as there are state licensees (3,484). For those states which have similar imbalances, it is important to understand why this occurs. For instance, military medical personnel often maintain NREMT certification, but may not have licensure from a state (Mississippi has several active and National Guard sites.) These individuals would be counted by the NREMT as certified personnel in Mississippi but are not typical participants in the state's EMS system.

It is also typical for EMS personnel to live in one state and practice in one or more states, in which case they would be considered participants in the EMS system, but not in the EMS system in which they reside. Other individuals may maintain NREMT certification regardless of their actual employment requirements or involvement in the EMS system. Thus, an accurate understanding of the EMS workforce necessitates having data from the employer to demonstrate where the individual is employed, and what role they fill in the EMS system.

---

[6] The NREMT tracks certified individuals by their state of residence and irrespective of the state in which they are licensed.
[7] https://www.nremt.org/resources/state-ems-offices

Further emphasizing the need to combine data sources with state licensing data is the fact that many personnel are licensed to practice in more than one state. Because the states' licensing software is not linked, the states have no expeditious means to de-duplicate personnel. The true number of the EMS workforce cannot be ascertained while this remains true.

DEVELOPING THE WORKFORCE DATA REPOSITORY

NASEMSO staff engaged industry subject matter experts to develop a high-level overview of the steps and elements needed in constructing such a repository. It seems reasonable that such a repository and process would require the application of resources and time equivalent to development of NEMSIS.

Based on NASEMSO's experience, some of the key attributes of such a repository include:

1. Uses standardized data definitions.
2. Accommodates varying licensure and renewal cycles.
3. Uses the National EMS ID Number issued by the NREMT as a unique identifier.
4. Able to receive information from any compatible software.
5. Provides canned reports.
6. Bi-directional transfer of elements with the NREMT
7. Capable of collecting and aggregating information from the three primary legs of the workforce:
   a. The educational pipeline and process
   b. The licensing warehouse and process (state licensing system)
   c. The end user (employer/EMS agency)

At a minimum, the steps required to develop such a system would include:

- **Determine sources of necessary data.**
  - (State personnel and ambulance service/agency licensing systems, EMS educational programs, etc.)
- **Define data dictionary.**
- **Define data validation strategy.**
  - (A data validation strategy is necessary to ensure that data files submitted by participant complies with the applicable version of the workforce data dictionary and is useful to the workforce project. Structural and elemental format validation may be performed, analogous to the validation used in NEMSIS. Rule-based validation language may applied for making assertions about the presence or absence of patterns in the submitted data, analogous to Schematron validation used in NEMSIS. Results of validation should be available to the system and to the submitting participant, with clear indication of specific validation issues for ease of troubleshooting and correction.)
- **Define data transfer protocol**s.
  - (The data transfer protocol (e.g., FTPS, HTTPS, SFTP) governs the secure transmission of participant workforce data files from the participant system to the aggregating recipient

system. Define the method of authentication to securely communicate between the two systems.

- **Identify certification and security requirements.**
  - o (These are the certifications that will be required of the workforce project system to store and serve workforce project data. For example, if Protected Health Information (PHI) data are stored then the system may be subject to Health Insurance Portability and Accountability Act (HIPAA). A security plan, including a plan for internal and third-party audits, must be defined to ensure that the system maintains compliance with all relevant laws, and regulations.

- **Define system architecture.**
  - o (Define where the system will be hosted (e.g., on local servers or in a commercial cloud). Define the system requirements and components for data extract, transform, and load (ETL), processing, storage, etc. with consideration for system scalability and high-availability. Define how these system components will securely communicate. Define components necessary for disaster recovery.)

- **Identify public documentation requirements.**

- **Define process and schedule for standard revision, including plan for backwards compatibility.**

- **Define website and communication needs.**

- **Define UI/UX workflows, public/private/administrative dashboards, and other products.**
  - o (Define the use cases and workflows of human interactions with the system (user experience - UX) via the user interface (UI))

- **Implementation and unit/system/regression testing.**
  - o (Define the system testing strategy. Implement testing at multiple levels to ensure the system is performing as designed and throughout the product development lifecycle. Unit tests shall be defined for system components. System tests shall be defined to ensure that the overall system meets requirements. Regression tests shall be defined to verify that a code change in the software does not impact the existing functionality of the product.)

NEW MEASURES FOR UNDERSTANDING ATTRITION

Even with an operational repository as described here, one question would remain unanswered: why does someone choose to exit the EMS workforce? Clearly, the answers here would be highly subjective and could only be collected after the person has left, complicating the collection of the information. While various efforts have been made by different groups and organizations to understand the compelling reasons for leaving the workforce, we are unaware of any unified or consistent collection of this information.

A few of the suggested themes for development of measures include:

- Pay and benefits
- Working conditions/safety
- Scheduling/workload
- Leadership/management
- Pursuit of another career/education
- Physical and behavioral health

The environmental scan showed that for those states which had made efforts to analyze their workforce, the most common instrument was a survey type. Of the documents collected it appears that only two states (Minnesota and Michigan) had a modicum of success at surveying licensees after exiting.

The methodologies used and results from these two states warrant further exploration and discussion though, as unique measures could be developed around the reasons an individual may have for leaving EMS employment. Additionally, the measures would have to account for the fact that an individual would potentially have more than one reason for leaving.

CONCLUSION

Our national EMS system needs a new vision for understanding the EMS workforce. This project to date has demonstrated the enormous challenge that exists in measuring and analyzing the EMS workforce, and without a concerted effort on multiple fronts, we will remain unable to answer the deepest questions regarding the factors impacting this vital resource.

The individual state variances regarding what data is collected and how it is defined and reported prohibit any accurate aggregation of data and in-depth analysis. Developing an EMS workforce data dictionary is the crucial first step.

Once the dictionary is completed, software vendors can begin the development process of products that not only capture the data, but are capable of generating routine reports for review greatly reducing the burdensome process of report generation.

This in turn creates the need for a central repository to compile aggregate licensing data from all states, and then overlay that data with other relevant data sets.

A concerted effort needs to be made around understanding reasons for exiting, presumably through a standardized survey instrument, with technical design from social and workforce scientists.

Only then will we be able to begin developing workable and sustainable solutions for recruiting, retaining and growing an EMS workforce for 2050.

Measuring the Emergency Medical Services Workforce

STATE PROFILES, SUCCESSES, AND CHALLENGES TO IMPLEMENTATION

AUGUST 2023

REPORT TABLE OF CONTENTS

EXECUTIVE SUMMARY

With support through a Cooperative Agreement with the NHTSA Office of EMS and additional support from the HRSA – EMS for Children Program, NASEMSO initiated a project to better understand the states' abilities to measure the EMS workforce.

In the first phase of the project, an environmental scan was conducted to determine which states had already conducted some analysis of the EMS workforce and to determine whether there was agreement around the validity of the measures first outlined in the 2013 EMS Workforce Planning and Development: Guidelines for State Adoption [Guidelines]. The report on this phase can be found here: https://nasemso.org/wp-content/uploads/Measuring-the-EMS-Workforce_NASEMSO_2023.pdf.

In the second phase of the project, NASEMSO engaged five states (Alaska, Indiana, Maryland, Mississippi, and Vermont) to serve as pilot states to test the Guidelines workforce measures and explore what processes or systems are needed to replicate the pilot state experiences on a national level.

The pilot states generated three different reports:

1. A count of their licensed personnel over a five-year period (2019 -2023)
2. The percentage of licensed personnel appearing at least one time in a patient care report in the state's ePCR reporting system over the same five-year period;
3. A state profile document describing some of the most relevant factors in each state which may impact their ability to measure the workforce and compare findings.

STATE SUCCESSES

- The state EMS offices have the most fundamental data set and best opportunity for collecting data by virtue of their licensing authority.
- All of the pilot states use relatively modern licensing software and are generally able to generate reports from those systems.
- The state EMS offices have deep institutional knowledge regarding EMS delivery within that state allowing them to quickly detect accommodations for reporting that need to be made (ie. adjusting time frames to account for continuous renewal periods vs. a single calendar date)
- Experienced personnel, dedicated to the state's licensing functions, and knowledgeable regarding the software itself, greatly increases the ability of the state to generate reports and analyze data.

CHALLENGES TO IMPLEMENTATION AND ABILITY TO COMPARE FINDINGS

- Data definitions are needed to accurately describe both EMS personnel and the structure and governance of ambulance services. The lack of a nationally recognized EMS workforce data dictionary prohibits any conclusive findings or in-depth analysis of aggregate state data.
  - Two of the pilot states use different nomenclature for certain levels of licensure.

- o The profiles show that not all of the five states use similar or comparable terms to categorize ambulance services.
- States remain very different in how, when, why, and what data that they collect regarding the workforce.
  - o None of the pilot states were able to "de-duplicate" personnel; that is, identify personnel only licensed in their state. Adoption of the Universal EMS Identification number within state personnel licensure systems would resolve this.
  - o The potential areas for the analysis of factors impacting the EMS workforce are vast and complex. Critical data points should be identified and uniformly adopted.
  - o Key stakeholder organizations which collect relevant data regarding the educational system, certification process and employment should be encouraged to identify gaps in data and collect additional information if they are able.
- None of the pilot states have the information required to perform all of the calculations found in the Guidelines document.
  - o Implementing the Guidelines fully will require a significant amount of time and resources. Some states may not have statutory authority to collect some of the information and state EMS offices will need to balance significant change with concerns about creating onerous reporting requirements.
- Licensing software does not easily integrate with patient care reporting systems. This limits the ability of the state EMS office or other researchers to connect the workforce to the work that they actually do or to an individual employment type.
  - o Three of the pilot states had to perform manual processes to determine activity level and two states were unable to make any activity determination for different reasons. Given the volume of providers and ePCRs reported to any state EMS office, this introduces a significant opportunity for error to occur.
- The state EMS offices have limited personnel who can devote their time exclusively to data collection and monitoring and may not have the skill sets or resources to improve the system.
  - o Employee vacancies or inexperience with software systems delays the ability to generate data.
- The only method that exists to compare data is for the pilot state EMS office to generate data or reports internally and then send the results to a third party for collating. This introduces another opportunity for error.
  - o Automation will provide significantly more reliable standardized comparisons and would provide easily updated dashboards of state data.
- Data systems (both licensing software and patient care reporting) need standardized report generation functions.
  - o Four of the pilot states use a common vendor and one state uses a separate provider and NASEMSO is aware of multiple software vendors in the other states. Incentivizing all software vendors to adopt common definitions and reporting mechanisms will require a lengthy and concerted effort.

APPENDIX A: STATE PROFILES

Profiles on each pilot state (Alaska, Indiana, Maryland, Mississippi, and Vermont) are included on the following pages.

EMS Workforce

The Alaska Office of EMS started licensing paramedics in 2023 (n=524) after legislation passed to transition this authority out of the State Medical Board. Also, Alaska has an emergency trauma technician (ETT) level that is similar to EMR however they are certified at the regional level and accurate counts are unavailable.

EMT 1

Year	Total
2019	1,086
2020	2,968
2021	3,633
2022	2,342
2023	1,490

EMT 2

Year	Total
2019	494
2020	466
2021	479
2022	486
2023	680

EMT 3

Year	Total
2019	699
2020	590
2021	675
2022	659
2023	697

AEMT

Year	Total
2019	2
2020	13
2021	19
2022	41
2023	43
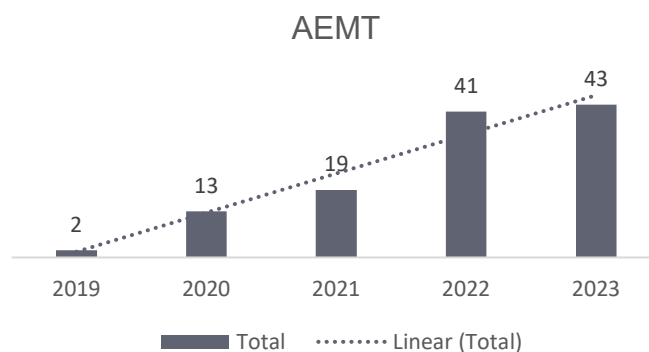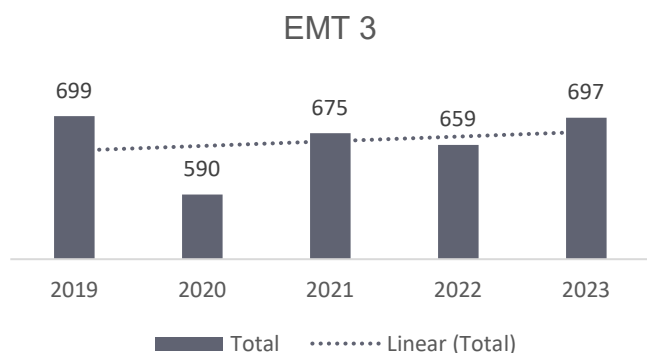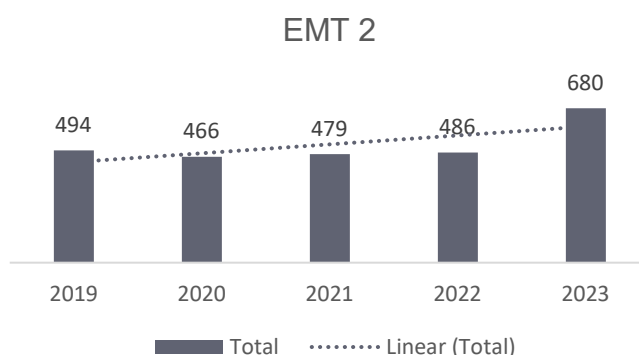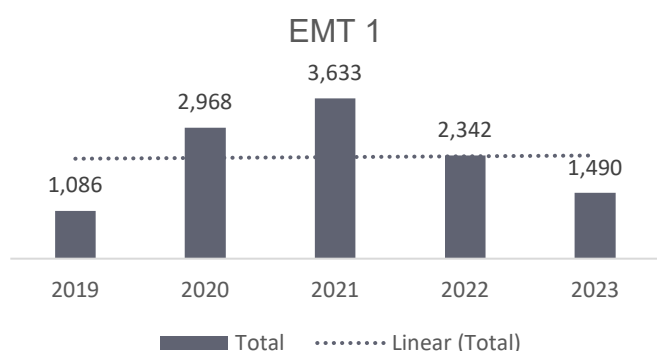
Total = Number of personnel currently authorized to function in Alaska.
Unable to identify "active" workforce.

Transporting Services Business Model

Total Licensed Agencies
(n=242)

Volunteer: 27
Paid: 40
Professional/volunteer hybrid: 39
Independent non-profit: 49
Private for-profit: 23

Government owned, third-service: 4
Government owned, fire department based: 48
Air ambulance: 11

Hospital owned: 1

Statewide Volume Demand

Total EMS call volume annually in ePCR system

ALS	33,868
Rural	*(not identified)*
Suburban	*(not identified)*
Urban	*(not identified)*
BLS	**48,379**
Rural	*(not identified)*
Suburban	*(not identified)*
Urban	*(not identified)*

State EMS Office

of personnel assigned to manage/perform personnel licensing

(n=1)

FTE 1

State Personnel License Requirements

NREMT required for initial license?	Only at the paramedic level
NREMT required for renewal?	Optional
Reciprocity offered?	Yes
Fingerprint based background check required?	No
Affiliation with an ambulance service required?	No, must have a medical director above the EMT-1 level otherwise individual is issued an "inactive" license and allowed to practice at the EMT-1 level only

Agency Licensing Requirements

Who is your licensing software vendor?	ImageTrend
Require a roster submission by ambulance or agency?	Yes, rosters are required
Minimum crew staffing configuration?	One EMT-1 and a driver for a BLS ambulance

State ePCR System/Policies

Mandatory use of state ePCR?	No, but data submission required to be a licensed service
First response agencies required to report to ePCR?	Non-licensed services are not required to submit data

Personnel Licensing Software

Vendor?	ImageTrend
Same vendor as ePCR?	Yes
If same vendor, do the two systems connect seamlessly?	Yes
Can initial licensure be completed online?	Yes
Can licensure renewal be conducted online?	Yes
What renewal cycle is required?	Ever 2 years

Education

# of education programs by level?	2 Paramedic Programs, 7 Regional EMS Offices, Fire departments, and individual instructors are allowed to hold courses
Continuing education requirements?	We follow NCCP
Distance from education?	Not sure what the question is with remote learning and hybrid EMT courses it can be a long way
Instructor credentialing?	Instructors must be licensed as an instructor, Instructor/Coordinator, or Paramedic Program Coordinator
Monitoring success of EMS instructors through data/reports?	Currently in development

Indiana Workforce Profile

EMS Workforce

EMR

Year	Total	Active
2019	4,975	140
2020	5,055	167
2021	4,989	166
2022	4,658	140
2023	4,654	34

Total · Active · ·····Linear (Total) · ·····Linear (Active)

EMT

Year	Total	Active
2019	14,122	4,016
2020	14,448	3,887
2021	14,471	3,864
2022	13,210	3,590
2023	13,205	2,277

Total · Active · ·····Linear (Total) · ·····Linear (Active)

AEMT

Year	Total	Active
2019	640	218
2020	668	101
2021	704	195
2022	660	180
2023	660	101

Total · Active · ·····Linear (Total) · ·····Linear (Active)

Paramedic

Year	Total	Active
2019	4,408	1,709
2020	4,546	1,665
2021	4,463	1,776
2022	4,542	1,689
2023	4,587	1,176

Total · Active · ·····Linear (Total) · ·····Linear (Active)

Total = Number of personnel currently authorized to function in Indiana.

Active = Licensed providers appearing as a crewmember on at least one ePCR.

Transporting Services Business Model

Total Licensed Agencies
(n=841)

Volunteer: 523

Professional/volunteer hybrid: *No response*

Independent non-profit: *(tracked as either "government" or "other")*

Private for-profit: 57

Hospital owned: *(not tracked separately—use "for-profit" or "non-profit")*

Government owned, third-service: 79

Government owned, fire department based: 118

Air ambulance: *(tracked as "other" provider type)*

Statewide Volume Demand

Total EMS call volume annually in ePCR system*

ALS	33,868
Rural	*(not identified)*
Suburban	*(not identified)*
Urban	*(not identified)*
BLS	48,379
Rural	*(not identified)*
Suburban	*(not identified)*
Urban	*(not identified)*

* We do not have a report writer so this is challenging. We have ALS v. BLS but would be a challenge to do breakdowns and would need better definitions of rural, suburban and urban. We do not have epidemiologists on staff to help with this.

State EMS Office

of personnel assigned to manage/perform personnel licensing
(n=3)

Contractors 1

FTE 2
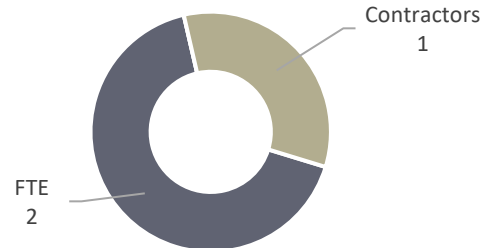
State Personnel License Requirements

NREMT required for initial license?	Yes—EMT, Advanced EMT and Paramedic
NREMT required for renewal?	No
Reciprocity offered?	Yes
Fingerprint based background check required?	No
Affiliation with an ambulance service required?	EMR and EMT = No AEMT and Paramedic = Yes

Agency Licensing Requirements

Who is your licensing software vendor?	ACADIS
Require a roster submission by ambulance or agency?	Yes, with provider renewals
Minimum crew staffing configuration?	<u>EMT</u> = EMT in the back of the ambulance with a driver <u>AEMT and paramedic</u> = ALS provider in patient compartment with an EMT or above on the ambulance

State ePCR System/Policies

Mandatory use of state ePCR?	Mandatory data linkage into state ePCR (ImageTrend)
First response agencies required to report to ePCR?	No—there is an optional free worksheet on ImageTrend that allows departments to do run sheets but not counted into state data.

Personnel Licensing Software

Vendor?	ACADIS
Same vendor as ePCR?	No
If same vendor, do the two systems connect seamlessly?	No
Can initial licensure be completed online?	Partially—Indiana EMS educated is on-line Reciprocity is not on-line
Can licensure renewal be conducted online?	Yes
What renewal cycle is required?	Two year cycles; cycles are staggered into quarters

Education

# of education programs by level?	90: EMR approved courses (4 cancelled) 244: EMT approved courses (8 cancelled) 7: Advanced EMT approved courses (0 cancelled) 29: Paramedic approved courses (0 cancelled) 86: EVOC (7 cancelled) 16: PI (2 cancelled)
Continuing education requirements?	Indiana has specific rule designated categories by level; pending rule re-write would adopt the NCCP model
Distance from education?	Cannot currently track this
Instructor credentialing?	Primary Instructor certification; must have Indiana PI course or other instructor credentials such as NAEMSE
Monitoring success of EMS instructors through data/reports?	Yes, but primarily through their local training institution affiliation

EMS Workforce

EMR

662 603 652 482 488
272 189 204 217

2019 2020 2021 2022 2023

Total Active
Linear (Total) Linear (Active)

EMT

14,853 14,875 15,501 14,417 14,605
10,793 10,544 10,679 10,600

2019 2020 2021 2022 2023

Total Active
Linear (Total) Linear (Active)

CRT

575 546 509 437 435
483 453 458 384

2019 2020 2021 2022 2023

Total Active
Linear (Total) Linear (Active)

Paramedic

3,491 3,573 3,787 3,979 4,001
3,461 3,492 3,651 3,282

2019 2020 2021 2022 2023

Total Active
Linear (Total) Linear (Active)
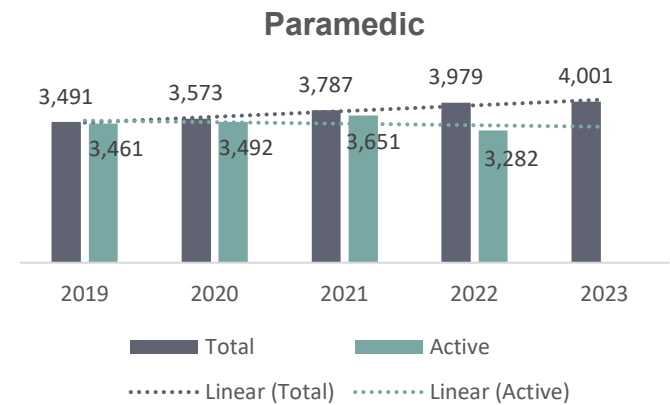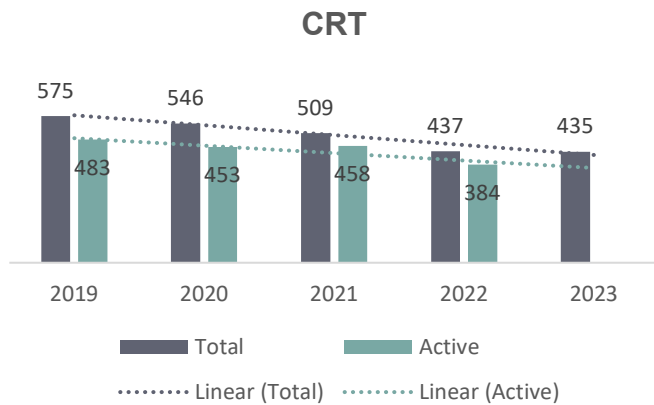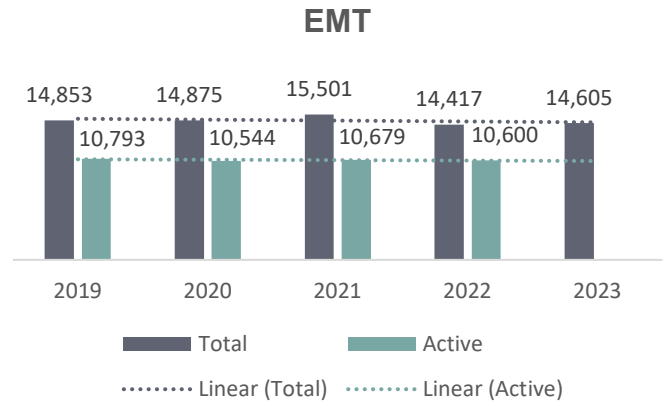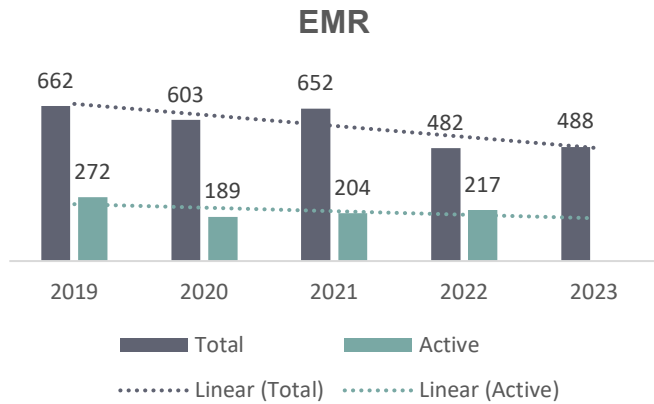
Total = Number of personnel currently authorized to function in Maryland.
Active = Licensed providers appearing as a crewmember on at least one ePCR.

Transporting Services Business Model*

* Maryland does not "license" public safety agencies. The State designates jurisdictional EMS operational programs (JEMSOP) that are responsible for administering EMS within their areas. There are 28 JEMSOPs.

Total Licensed Agencies
(n=35)

Volunteer: *n/a*	**Hospital owned:** *0*
Professional/volunteer hybrid: *n/a*	**Government owned, third-service:** *n/a*
Independent non-profit: *n/a*	**Government owned, fire department based:** *n/a*
Private for-profit: *29 (commercial ambulance services)*	**Air ambulance:** *6 (in addition to MD State Police)*

Statewide Volume Demand

Total EMS call volume annually in ePCR system
(n=1,046,370)

ALS	640,914 (157,050 missing RSU)
Rural	10,188
Suburban	13,848
Urban	455,621
BLS	405,456 (100,948 missing RSU)
Rural	2,195
Suburban	750
Urban	300,748

State EMS Office

\# of personnel assigned to manage/perform
personnel licensing
(n=9)

Contractors
2

FTE
7
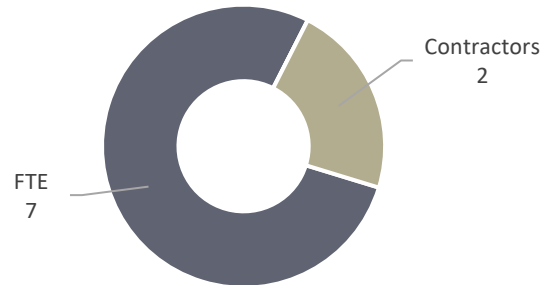
State Personnel License Requirements

NREMT required for initial license?	Yes, for both EMT and Paramedic
NREMT required for renewal?	Paramedic only
Reciprocity offered?	Yes
Fingerprint based background check required?	No
Affiliation with an ambulance service required?	Yes, for EMT, CRT, Paramedic No, for EMR

Agency Licensing Requirements

Who is your licensing software vendor?	ImageTrend
Require a roster submission by ambulance or agency?	No, but agency must "affiliate" each EMS clinician to enable ePCR entry
Minimum crew staffing configuration?	BLS: EMR, EMT ALS: EMT, CRT/Paramedic

State ePCR System/Policies

Mandatory use of state ePCR?	Yes
First response agencies required to report to ePCR?	In theory; in practice they do only if they provide meaningful interventions (otherwise it is documented by primary patient caregiving unit)

Personnel Licensing Software

Vendor?	ImageTrend
Same vendor as ePCR?	Yes
If same vendor, do the two systems connect seamlessly?	Yes
Can initial licensure be completed online?	Yes, the application is completed online
Can licensure renewal be conducted online?	Yes, the application is completed online
What renewal cycle is required?	2 years ALS 3 years BLS

Education

# of education programs by level?	50 BLS and 41 ALS (17/41 ALS are CoAEMSP accredited for initial paramedic the rest offer ALS Con Ed)
Continuing education requirements?	NREMT for ALS 24hrs EMT 12 EMR
Distance from education?	18/23 counties have at least one education program
Instructor credentialing?	BLS requires state certification ALS requires SME (Maryland Instructor Certification Review Board is responsible for administering state emergency services instructor certification under the Maryland Higher Education Commission)
Monitoring success of EMS instructors through data/ reports?	Work in progress (pass rate data is collected for the Education Program level and the Program is asked to provide more granular data at site visits)

Mississippi Workforce Profile

EMS Workforce*

* We do not have a way to pull "active workforce" accurately.

EMR

	2019	2020	2021	2022	2023
Total	15	15	18	20	49

Total — Linear (Total)

EMT

	2019	2020	2021	2022	2023
Total	2,113	1,682	1,686	1,749	3,177

Total — Linear (Total)

AEMT

	2019	2020	2021	2022	2023
Total	11	21	68	83	174

Total — Linear (Total)

Paramedic

	2019	2020	2021	2022	2023
Total	1,679	1,496	1,602	1,632	2,417

Total — Linear (Total)
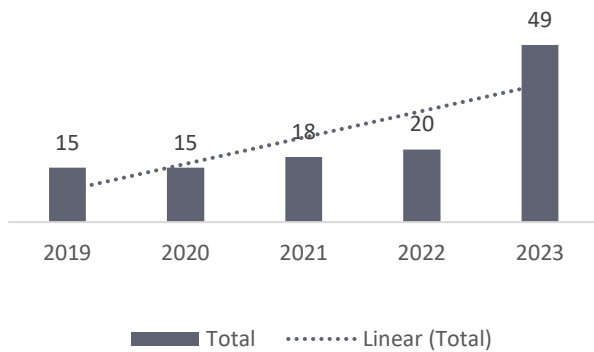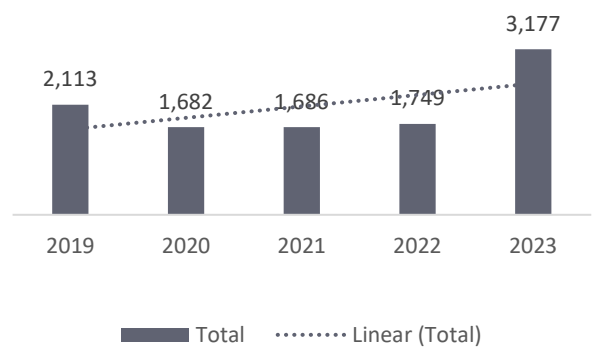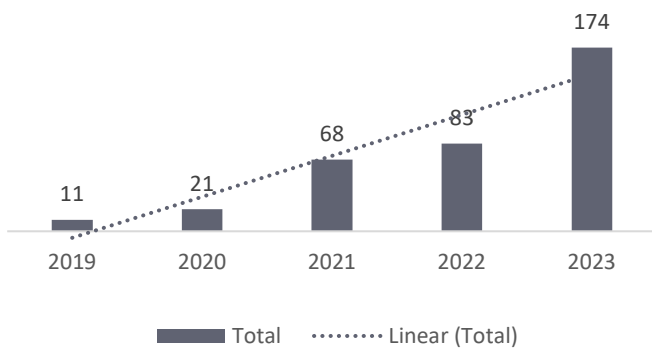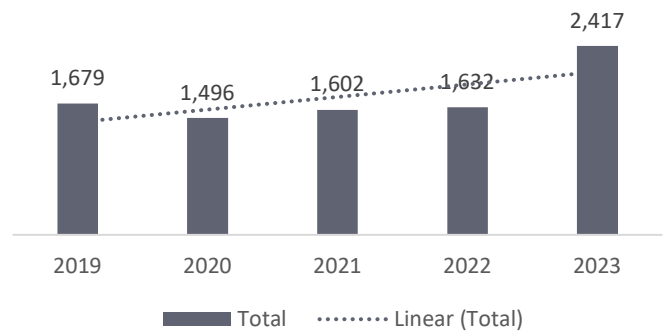
Total = Number of personnel currently authorized to function in Mississippi.

Transporting Services Business Model

Total Licensed Agencies

(n=56)

Volunteer: 0	**Hospital owned:** 13
Professional/volunteer hybrid: 0	**Government owned, third-service:** 3
Independent non-profit: 0	**Government owned, fire department based:** 6
Private for-profit: 26	**Air ambulance:** 8

Statewide Volume Demand

Total EMS call volume annually in ePCR system

ALS	387,769
Rural	*(not identified)*
Suburban	*(not identified)*
Urban	*(not identified)*
BLS	46,704
Rural	*(not identified)*
Suburban	*(not identified)*
Urban	*(not identified)*

State EMS Office

Total # of personnel assigned to manage/perform personnel licensing

(n=4)

Contractors 4

FTE 4

State Personnel License Requirements

NREMT required for initial license?	Yes
NREMT required for renewal?	Yes
Reciprocity offered?	Yes
Fingerprint based background check required?	No
Affiliation with an ambulance service required?	Yes

Agency Licensing Requirements

Who is your licensing software vendor?	ImageTrend
Require a roster submission by ambulance or agency?	Yes
Minimum crew staffing configuration	Yes

State ePCR System/Policies

Mandatory use of state ePCR?	No
First response agencies required to report to ePCR?	Not at this time

Personnel Licensing software

Vendor?	ImageTrend
Same vendor as ePCR?	Yes
If same vendor, do the two systems connect seamlessly?	Yes
Can initial licensure be completed online?	Yes
Can licensure renewal be conducted online?	Yes
What renewal cycle is required?	2 years with NREMT

Education

# of education programs by level?	EMR: Varies
	EMT: 20
	AEMT: Varies
	NRP: 10
Continuing education requirements?	NCCP with NREMT
Distance from education?	*(no response)*
Instructor credentialing?	Level teaching or above for EMS Districts, CoA and Community College requirements for colleges
Monitoring success of EMS instructors through data/reports?	We look at the EMS Districts and the Community Colleges look at colleges

Vermont Workforce Profile

EMS Workforce

EMR

	2019	2020	2021	2022	2023
Total	218	187	180	114	116
Active	86	99	89	100	59

Legend: Total, Active, Linear (Total), Linear (Active)

EMT

	2019	2020	2021	2022	2023
Total	1,449	1,442	1,396	1,399	1,394
Active	86	82	93	97	56

Legend: Total, Active, Linear (Total), Linear (Active)

AEMT

	2019	2020	2021	2022	2023
Total	746	752	718	650	740
Active	100	100	100	100	77

Legend: Total, Active, Linear (Total), Linear (Active)

Paramedic

	2019	2020	2021	2022	2023
Total	388	377	389	390	392
Active	81	91	98	100	68

Legend: Total, Active, Linear (Total), Linear (Active)

Total = Number of personnel currently authorized to function in Vermont.

Active = Licensed providers appearing as a crewmember on at least one ePCR.

Transporting Services Business Model

Total Licensed Agencies
(n=79)

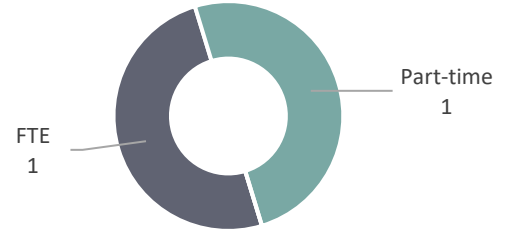|	
Volunteer: n/a	**Hospital owned:** 2
Professional/volunteer hybrid: n/a	**Government owned, third-service:** 11
Independent non-profit: 50	**Government owned, fire department based:** 11
Private for-profit: 11	**Air ambulance:** 1 (hospital owned)

Statewide Volume Demand

Total EMS call volume annually in ePCR system
(n=117,338)

ALS	*(not identified)*
Rural	
Suburban	
Urban	
BLS	*(not identified)*
Rural	
Suburban	
Urban	

State EMS Office

Total # of personnel assigned to manage/perform personnel licensing
(n=2)

FTE 1

Part-time 1

State Personnel License Requirements

NREMT required for initial license?	Yes
NREMT required for renewal?	Yes
Reciprocity offered?	Yes
Fingerprint based background check required?	No
Affiliation with an ambulance service required?	Yes

Agency Licensing Requirements

Who is your licensing software vendor?	ImageTrend
Require a roster submission by ambulance or agency?	Yes
Minimum crew staffing configuration	Yes

State ePCR System/Policies

Mandatory use of state ePCR?	No, however agencies are required to report their data
First response agencies required to report to ePCR?	Yes

Personnel Licensing Software

Vendor?	ImageTrend
Same vendor as ePCR?	Yes
If same vendor, do the two systems connect seamlessly?	Not yet, working towards that
Can initial licensure be completed online?	Yes
Can licensure renewal be conducted online?	Yes
What renewal cycle is required?	2 years

Education

# of education programs by level	*(no response)*
Continuing education requirements	Defined by NREMT
Distance from education	Unknown
Instructor credentialing	Yes
Monitoring success of EMS instructors through data/ reports	Yes

Measuring the Emergency Medical Services Workforce

STRATEGIES FOR WORKFORCE MEASUREMENT IMPLEMENTATION

SEPTEMBER 2023

REPORT TABLE OF CONTENTS

NASEMSO

EXECUTIVE SUMMARY

Through a cooperative agreement with the National Highway Traffic Safety Administration's (NHTSA) Office of EMS (OEMS) and additional support from the Health Resources & Services Administration's (HRSA) Emergency Medical Services for Children (EMSC) Program, the National Association of State Emergency Medical Services Officials (NASEMSO) initiated a project to better understand states ability to measure the nation's emergency medical services (EMS) workforce.

In the first phase of the project (fall of 2022), an environmental scan was conducted to determine both which states[8] had already performed some analysis of their EMS workforce and whether there was agreement around the validity of the measures first outlined in the 2013 *EMS Workforce Planning and Development: Guidelines for State Adoption [Guidelines]* document. The report on this phase can be found at https://bit.ly/emsWorkforce.

In the second phase of the project (spring of 2023), NASEMSO engaged five states (Alaska, Indiana, Maryland, Mississippi, and Vermont) to participate in a pilot of *Guidelines*. These states tested the *Guidelines* and explored what processes or systems are needed to replicate their experiences on a national level.

The experiences from this pilot generated three different reports:

1. A count of their licensed personnel over a five-year period (2019 -2023),

2. The percentage of licensed personnel appearing at least one time in a patient care report (PCR) in the state's electronic PCR (ePCR) system over the same five-year period, and

3. A state profile document describing some of the most relevant factors in each state which may impact their ability to measure the workforce and compare findings.

With the input of the pilot states, this fourth report discusses how a state EMS office should evaluate its current data and sources and develop a methodical approach to implementing the *Guidelines*.

---

[8] In the context of this document, the word "states" is used to refer to the 50 states, five U.S. Territories, and the District of Columbia.

WHY SHOULD A STATE BEGIN?

Concerns about a sustainable EMS workforce are not new, yet today there is little more understanding of the EMS workforce than when some states documented concerns in the 1980's.

What the EMS industry has instead are nearly three decades of visionary documents warning of an impending workforce crisis, beginning with the 1996 *EMS: Agenda for the Future* which lamented the "paucity of literature describing systematic approaches intended to further understand the spectrum of workforce stressors."[9]

Another 15 years elapsed between the publication of the 1996 *EMS: Agenda for the Future* and *The Emergency Medical Services Workforce Agenda for the Future,* which highlighted the need for comprehensive data regarding all aspects of the EMS workforce, pointing out that workforce planning and development should be solidly rooted in evidence and is therefore predicated on the existence of unified, comparable data.[10]

A mere two years later, the EMS community saw publication of the 2013 National Emergency Medical Services Workforce Data Definitions, which was followed in short order by the 2014 EMS Workforce Planning and Development: Guidelines for State Adoption. These documents formed the starting point for this current project.

The environmental scan conducted during the early stages of this project (spring 2021) revealed that while state EMS offices were aware of the 2013 *Guidelines*, they were largely not operationalized into the state's routine activities, or at least not to the extent envisioned at the time the document was published. Responses indicated a lack of resources as a significant limiting factor in using the *Guidelines*.

This is not to say that states have made no progress over the past 40 years. Indeed, this project has underscored some fundamental truths about what the future of EMS workforce measurement could and should be:

- All the pilot states use relatively modern licensing software and are generally able to generate reports from those systems. Anecdotally, we have reason to believe that *most* states have similar capabilities to the pilot states.

- The state EMS offices have the most fundamental data set and best opportunity for collecting personnel data by virtue of their licensing authority.

- The state EMS offices have deep institutional knowledge regarding EMS delivery within their individual states. This allows them to quickly detect needed accommodations for reporting (e.g, adjusting time frames to account for continuous renewal periods vs. set calendar date[s]).

- Experienced state EMS personnel dedicated to the state's licensing functions, and knowledgeable regarding the software itself, greatly increases the ability of the state to generate reports and analyze data.

Despite all of this, we know little more about the EMS workforce today than we did 40 years ago. States lack data regarding the educational pipeline and its efficacy. Additionally, there is even less clarity regarding the employment environment regarding where EMS personnel are working, what compensation is received, and

---

[9] https://www.ems.gov/assets/1996_EMS_Agenda_For_The_Future.pdf (page 23)
[10] https://www.ems.gov/assets/EMS_Workforce_Agenda.pdf (page 4)

what market competition exists. Without this information, efforts to develop targeted and effective recruitment and retention strategies will remain largely uninformed and ineffective.

Many states have workforce data that spans *decades* and they could immediately realize the benefit of identifying workforce trends, just by performing analysis of this existing data.

Ultimately, the true power of this data will not be realized until comparative analysis between states is possible. While the pilot states were able to provide some comparisons, there were numerous variances and nuances particular to each state that limits the comparison. This, together with large data gaps and understanding regarding the educational systems and the demand from employers, prohibits the type of comparison envisioned in the *Guidelines*.

CHALLENGES TO GUIDELINE IMPLEMENTATION AND COMPARING DATA

This project highlighted some glaring truths that continue to plague not just the pilot states, but all states to one extent or another.

DATA DEFINITIONS NEEDED

Data definitions are needed to accurately describe both EMS personnel and the structure and governance of ambulance services. The lack of a nationally recognized EMS workforce data dictionary prohibits any conclusive findings or in-depth analysis of aggregate state data.

- Two of the pilot states use different nomenclature for certain levels of licensure.
- The profiles show that not all of the five states use similar or comparable terms to categorize ambulance services.

DATA COLLECTION INCONSISTENT

States remain very different in how, when, why, and what data that they collect regarding the workforce.

- None of the pilot states were able to "de-duplicate" personnel; that is, identify personnel only licensed in their state. Adoption of the Universal EMS Identification number within state personnel licensure systems would resolve this.
- Because the potential areas for the analysis of factors impacting the EMS workforce are vast and complex, critical data points should be identified and uniformly adopted.
- Key stakeholder organizations which collect relevant data regarding the educational system, certification process, and employment should be encouraged to identify gaps in data and collect additional information if they are able.

LACK OF DATA

None of the pilot states have the information required to perform all the calculations found in the *Guidelines*.

- Implementing the *Guidelines* fully will require a significant amount of time and resources. Some states may not have statutory authority to collect some of the information and state EMS offices

will need to balance significant change with concerns about creating onerous reporting requirements.

LICENSING SOFTWARE INTEGRATION WITH EPCRS

Licensing software does not easily integrate with patient care reporting systems. This limits the ability of the state EMS office or other researchers to connect the workforce to the work that they actually do or to an individual employment type.

- Three of the pilot states had to perform manual processes to determine activity level and two states were unable to make any activity determination for different reasons. Given the volume of providers and ePCRs reported to any state EMS office, this introduces a significant opportunity for error to occur.

LIMITED STAFF

The state EMS offices have limited personnel who can devote their time exclusively to data collection and monitoring and may not have the skill sets or resources to improve the system.

- Employee vacancies or inexperience with software systems hinders the ability to generate data.

For the pilot states, the only method that exists to compare data is for the pilot state EMS office to generate data or reports internally and then send the results to a third party for collating. This introduces another opportunity for error.

- Automation will provide significantly more reliable standardized comparisons and would provide easily updated dashboards of state data.

STANDARDIZED REPORTS

Data systems (both licensing software and patient care reporting) need standardized report generation functions.

- Four pilot states use a common vendor and there are multiple software vendors providing these services in the other states. All of the pilot states were required to perform manual report generation and varied significantly in the information they were able to generate. Incentivizing all software vendors to adopt common definitions and reporting mechanisms will require a lengthy and concerted effort.

WHICH GUIDELINE SHOULD A STATE IMPLEMENT FIRST?

There may be no single correct answer to this question. Each state faces its own challenges and advantages related to understanding its EMS workforce. Available resources, specific statutory authority, legislative sessions, and economic factors are just a few of the considerations which a state EMS office must balance in its allocation of time and resources.

The work of this project indicates that the *Guidelines* are still largely relevant today and more strikingly, we are unaware of any work proving otherwise. While it is true that there may be more contemporary measures which could be developed or additional guidelines may be needed, in the absence of anything to the contrary, the *Guidelines* are a reasonable and achievable starting point.

In an ideal setting, work on all ten of the *Guidelines* would begin simultaneously. In practicality, this seems unreasonable for any state EMS office. In essence, each guideline either speaks to the collection of data, or is best implemented when informed by data, some of which may not be collected by a state EMS office. Moreover, while the state EMS office should lead and coordinate efforts, successful implementation is dependent on broad and consistent support from the entirety of the state's EMS system, as well as other national EMS organizations and advocacy groups.

Therefore, a crucial first step is for the state EMS office to undergo a thorough gap analysis of the *Guidelines*. This will bring a common operating picture of which guideline(s) should be prioritized over others. It is also important for stakeholders to consider that the *Guidelines* should not be viewed as a linear progression. While some guidelines are linked to or dependent on others, none of them require full implementation of another before work can begin. There may be many acceptable approaches to performing this work, but what is key for stakeholders to understand is that a state needs to take a systematic and strategic approach to EMS workforce measurement.

DEVELOPING AN IMPLEMENTATION PLAN

The scope of work involved with implementing the *Guidelines* is significant and not to be undertaken lightly. Full implementation will require multiple steps and stages with a significant investment of time and resources. Managing the implementation work and all of the other responsibilities within a state EMS office dictates the need for an implementation plan centered on this single effort. If resources are available, a state EMS office should consider retaining the services of objective third parties to help develop the plan and map for implementation.

Regardless of whether the plan is developed internally or with the assistance of outside facilitators, there are some essential considerations for plan development. Our recommendations are listed below.

- Any implementation planning group should include representation from the EMS education system (supply) as well as the employers (demand). Implementation will require decisions which impact both of these groups and their input early in the process is crucial.

- An honest and transparent gap analysis should be one of the first tasks. Key questions to answer for each of the *Guidelines* include:
    o What data are already available?
    o What can we measure immediately?
    o What data are still needed?
    o What level of effort is required to collect this missing data?

- It may be possible to initiate implementation on more than one guideline simultaneously, but even if this is the case, prioritization of the ten recommended guidelines is beneficial as it will concentrate efforts early on. In prioritizing one guideline over another, states should consider:
    o Is this within control of the state EMS office?
    o Does the state already have the ability to implement the guideline, or is it already partly or fully implemented?
    o What key stakeholders could help with implementation?
    o What resources are currently available?
    o What additional resources are needed?
    o Are there linkages between the guidelines which would dictate that one must be implemented before the other or that is so closely tied to another that they can be simultaneously managed?

DISCUSSION AND ONE STRATEGIC APPROACH

During the project, the pilot states were presented with a suggested prioritization of the *Guidelines,* along with a brief rationale for that prioritization. The pilot states were asked to describe whether they concurred or not and to provide their own rationalization for their stance.

This section reviews this initial strawman consideration of the *Guidelines*. This represents one suggested approach and may not be ideal for every state. Alternative rationale from the pilot states is provided to demonstrate how the particular environment or factors influencing prioritization can vary from state to state. The goal in presenting this information is not to restate that which was already said in the 2013 document, but to provide a simple and realistic approach to developing strategies for implementation.

PRIORITY #1

GUIDELINE 2. WORKFORCE PLANNING & DEVELOPMENT—
ENGAGE LOCAL EMS AGENCIES

Local EMS agencies need support and guidance to be able to recruit and maintain a sufficient number of well educated, adequately prepared, and appropriately credentialed EMS workers who are valued, well compensated, healthy, and safe.

Implementing the *Guidelines* represents an enormous effort by all stakeholders. Developing effective recruitment and retention strategies should be informed by the data and analysis in the other guidelines, but garnering the support from EMS agencies at the outset is crucial to the entire effort.

> ### *Alternative Prioritization:*
> One pilot state ranked Guideline 2 toward the bottom of the prioritization list citing a lack of statutory authority and limited resources to enable action in recruitment and retention.

PRIORITY #2

GUIDELINE 1. DATA & RESEARCH—ACQUIRE ESSENTIAL WORKFORCE DATA

Collect a core set of workforce data elements to address workforce assessment, planning and policy issues.

All measurements are dependent on data, the core set of which is housed in the state EMS licensing system. This core data offers the most fundamental of measures: a trend line of the number of licensed individuals over time. However, none of the pilot states were able to de-duplicate their licensees, as doing so would require unique identifiers for individuals (personnel) as well as the ability to aggregate data from multiple states.

It is a common practice for EMS personnel to hold a license to practice in more than one state either because they are employed in multiple states, or they have a single employer who operates in multiple states. While not uncommon, not all states have the ability to, or choose to, keep records of personnel with other state licenses. This means that these individuals would be counted as part of the workforce by *each state in which they hold a license*. More troubling is the fact that if an individual is both licensed and employed full-time in two states and decides to leave the EMS workforce, than one individual has created two separate vacancies. If the EMS industry is at risk due to attrition, then we remain unable to quantify the risk until states can de-duplicate the count. In 2020 the National Registry of EMTs began issuing a national EMS identification number to individuals they certify. This *unique* number offers the chance to rapidly de-duplicate licensees between states, if states were to begin collecting this number as part of their licensing process.

> ### How many EMS personnel are in the United States?
>
> The answer to this question as written is unknown. Preliminary work by the EMS Compact Commission, which maintains a coordinated database for the states in the compact, suggests that 8–10% of all licensees hold multiple licenses. It is reasonable to presume that this percentage could vary greatly from state to state.

PRIORITY #3

GUIDELINE 7. WORKFORCE PLANNING & DEVELOPMENT—QUANTIFY POPULATION ACTIVELY FUNCTIONING IN A PAID OR VOLUNTEER CAPACITY (WORKFORCE SUPPLY)

States should use data collected to quantify the population entering and continuing to function in the EMS workforce.

Anecdotally, many EMS stakeholders report that EMS workers are drawn away to non-EMS positions with hospitals and other facilities, presumably for better wages, benefits and working conditions. While this seems likely, it remains unproven.

Perspective on Data Definitions and Comparisons

This project affirmed the need for industry-wide standardized data definitions. These are vital for the long-term analysis and comparison of data between states. However, the lack of definitions should *not* be seen as a roadblock to beginning immediate measurement of the EMS workforce, or even comparing data between states. There are at least two key arguments in favor of this:

1. The primary concern regarding the EMS workforce is *internal* to the individual state. As long as a state EMS office has a common operational definition and applies that same definition consistently, they will be able to understand their workforce over time.
2. Even though states vary in their EMS system design, they are more likely to be comparable to their border states than states from which they have a larger geographical separation. This means that a regional comparison may be more readily achievable and relevant in the short term.

The environmental scan suggested that many states were attempting to use their ePCR systems to determine the level of activity by an EMS clinician within the state's EMS system of care.

This project tested the veracity of this theoretical proxy measure; at least to the extent of whether this type of measurement was worth pursuing. The pilot states were asked to determine the percentage of licensed providers whose name or license number appeared at least one time in the state's ePCR system over the preceding five years. Two of the pilot states were unable to make this determination, but the other three's results are worthy of consideration.

Only one pilot state had results similar to other anecdotal reports; that is, that less than half of the state's available licensed personnel are involved in prehospital work. The other two pilot states showed a significantly higher percentage of their workforce as active in their prehospital environment.

What was not known in any pilot state is exactly *where* licensed personnel are employed, let alone why one state may have a higher percentage of personnel engaged in prehospital work than another.

Some states may find it easier to implement this guideline than others as they already require ambulance services to submit personnel rosters as part of agency licensure, or their licensing systems are robust enough to start collecting the data almost immediately.

In implementing this guideline, it is highly likely that a state's department of labor (DOL) may be able to help determine licensed personnel employment locations.

> ### *Alternative Prioritization:*
>
> One pilot state prioritized Guideline 10 (Health, Safety and Wellness— Maintain a Healthy EMS Workforce) over Guideline 7, suggesting that behavioral health concerns were a significant contributing factor to attrition.

PRIORITY #4

GUIDELINE 3. WORKFORCE PLANNING & DEVELOPMENT—ENGAGE STATE WORKFORCE AGENCIES

The State Workforce Agency develops and maintains a statewide comprehensive system of services that prepares, supports, and enhances the economic health of the workforce.

This guideline is closely linked to #7 and it may be beneficial to initiate discussions and planning earlier in the process as a state workforce agency or department of labor may have resources and personnel available to assist with the entirety of the work.

> ### *Alternative Prioritization:*
>
> One pilot state prioritized Guideline 6 (Education & Certification— Understand the EMS Education Pipeline) over Guideline 3, based on the observation that the state was experiencing high attrition rates in newer licensees.

PRIORITY #5

GUIDELINE 5. EDUCATION & CERTIFICATION— OBTAIN EDUCATIONAL AND INSTITUTIONAL DATA (WORKFORCE SUPPLY)

States should be able to track the number of individuals at each interval of the education, certification, and licensure process for each personnel level.

There are significant knowledge gaps regarding the supply side of the EMS workforce or educational pipeline. Monitoring an entire EMS educational system within a state is a monumental task, and not every state EMS office has the capacity, or even the authority, to collect information and regulate this process. Therefore, this particular guideline will likely represent a significant level of effort in most states and could take several years to reach maturity.

Several of the key equations needed to measure the state's EMS workforce are tied to data produced by the educational system. These include:

1. Completion rate/percentage:[11] The number of those persons *completing* (Completers) a training program divided by the number who *enrolled* (Enrollees) in the program.[12]
2. Certification rate: The number of Completers who achieve certification[13] (Licensure Eligible) divided by the total number of Completers.
3. Licensure rate: The number of persons issued a license (Licensees) divided by the total of Licensure Eligible.

Collecting the needed data and performing these calculations will show initial gaps in education production and begin to establish a benchmarking scheme for the efficacy of educational programs. This information will guide how the state proceeds with *Guideline #6*.

---

[11] The *Guidelines* refer to this as "matriculation rate". Here we use the term "completion rate" as a more accurate description.

[12] Note that performing this calculation also provides a program attrition rate. Although not specifically mentioned in the *Guidelines* this could be a starting measure for educational program efficacy.

[13] Most states utilize the National Registry of EMTs (NREMT) certification process to establish eligibility for licensure. The number of Licensure Eligible is provided to the appropriate state EMS office routinely. Those states which do not use the NREMT process or maintain licensure levels not addressed by the NREMT should divide Licensees by the number of Completers.

PRIORITY #6

GUIDELINE 6. EDUCATION & CERTIFICATION— UNDERSTAND THE EMS EDUCATION PIPELINE (WORKFORCE SUPPLY)

Utilize available information to analyze and address needs in and performance of the state EMS education system.

States need absolute granularity in their view of their educational system. Examples of what must be understood include:

- Equitable access to education for all geographic areas and populations
- Efficacy of one program compared to other programs (peer-to-peer)
- Innovative and successful education delivery methods
- Enrollment versus attrition
- Current educational capacity and performance versus workforce demand in both the short and long term

The need for performance measures

This may be one of the largest needs regarding the EMS workforce. How does an EMS instructor know what their performance should be or gauge their own effectiveness? If an EMT program loses 50% of their enrollees before program completion is the program under-performing or is this to be expected? If an EMT program successfully graduates 100% of their enrollees, is it an unusually high-performing program or is the program not demanding enough academically? There may be no single standard for education programs, but the ability to do at least some comparison across a state and within comparable demographic areas would help a state understand what changes would be beneficial to an educational system.

In addition to the insight gained through *Guideline #5,* accurate reporting from employers through *Guideline #8* is needed to determine whether the educational system has the capacity to produce new EMS personnel. To evaluate this, a state needs to know how many current vacancies exist as well as the number of anticipated vacancies from the employers. Once this is known, states will be able to determine need by dividing the total vacancies by the completion rate times licensure rate. The result is the estimated number of students who are needed to enroll in the state's educational programs.

PRIORITY #7

GUIDELINE 4. EDUCATION & CERTIFICATION—CREDENTIAL EMS EDUCATORS

States should credential EMS educators <u>based upon their ability to successfully prepare students for competency-based testing.</u>
[emphasis added]

This guideline is predicated on the implementation of *Guideline #6* and the development of performance measures. Caution should be exercised in comparing one educator's performance to another, as there are factors beyond the control of the educator which influence success such as demographics of the population served, academic rigor, and support from institutions of secondary education.

These are highly nuanced questions which EMS stakeholders need to consider. They are raised here to emphasize the level of thought needed to help determine what data are to be collected and how they should be viewed.

PRIORITY #8

GUIDELINE 8. WORKFORCE PLANNING & DEVELOPMENT—UNDERSTAND EMS WORKFORCE DEMAND

Utilize available information to analyze and understand the number of EMS jobs available for various types of personnel.

It is unlikely that most state EMS offices are collecting this information and less likely that the data is aggregated across a state. Presumably, the EMS agencies have the information, and could report it voluntarily, possibly as part of the state's agency licensing process. If the state EMS office does not have the information, then it would be beneficial to prioritize *Guideline #2* over *#8* to achieve buy-in and support for data collection.

The importance of filling this knowledge gap regarding workforce demand cannot be overstated and can only be supplied by EMS agencies. Closing this gap will bring much needed perspective on the extent to which any workforce shortage exists and is fundamental to understanding the efficacy of the EMS education system under Guidelines #5 and #6. The minimum needed data points from an employer are:

1. The number of persons employed by level of licensure;
2. The number of vacant positions; and
3. The number of projected positions.

This data can be used in tandem with the educational system equations to determine whether the educational system is keeping pace with demand.

Where has everyone gone??

It is a common assertion that there is a national EMS workforce shortage, but data provided by the pilot states show that their number of licensees remains relatively constant and, in some instances, shows growth in total numbers of personnel.

One hypothesis to explain this disparity between perception and data is that there is greater opportunity for EMS licensed personnel to work in non-ambulance settings such as hospitals or clinics. Even so, most states are unable to validate this idea and in order to do so, would need information from the licensees themselves, as state EMS offices do not typically have regulatory authority over agencies other than those performing prehospital work.

How many volunteers are needed?

Many EMS systems (particularly in rural areas) remain heavily dependent on a volunteer workforce to one degree or another and there is little consensus or science available to help answer this question. What may be more important to understand is the degree of *risk of service loss* which may require measuring factors unique to volunteer EMS models such as:

- The level of effort or activity by individual volunteers.
- The percentage of ambulance dispatches unanswered by the volunteer EMS and necessitating a response by another agency.
- "Chute times" defined as the amount of time between receipt of the 911 call and the ambulance service initiating a response.

These are powerful indicators of the viability of a volunteer ambulance service.

PRIORITY #9

GUIDELINE 10. HEALTH, SAFETY & WELLNESS—MAINTAIN A HEALTHY EMS WORKFORCE

The State EMS Office is encouraged to collect data relating to EMS worker illness and injuries.

This may represent an entirely new effort for a state EMS office requiring additional resources. Other concerns may need to be resolved such as Health Information and Portability and Accountability Act (HIPAA) constraints or similar regulatory issues. A state EMS office should explore the possibility of collaboration with other state agencies who may be have at least partial information to inform this guideline. As an example, the state workforce compensation office may be able to provide de-identified aggregate information. Additionally, all fifty states, three of the U.S. Territories, and the District of Columbia provide data to the CDC's Behavioral Risk Factor Surveillance System (BRFSS), and there is some latitude to modify the information which is collected. The BRFSS may be an indicator of prevalence of injury and illness among the EMS workforce.

PRIORITY #10

GUIDELINE 9. WORKFORCE PLANNING & DEVELOPMENT— SUPPORT MILITARY & SPOUSES TRANSITIONING TO THE EMS WORKFORCE AFTER MILITARY SERVICE

States should support separating service members, veterans and their spouses who seek to obtain EMS certification and/or licensure through necessary policy, education and legislation.

We are aware that many states have made significant progress in supporting the transition of veterans and their spouses into the civilian EMS workforce. While more could certainly be done, this guideline requires the assistance of other state and Federal agencies; the state's military department and the Department of Defense, and the National Guard Bureau to name three. Other veteran groups should be engaged as well to ensure early outreach to Reserve component service members. This is a long-term effort.