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BRIEF RESEARCH REPORT

Emergency Medical Services

Emergency medical services clinicians in the United States are increasingly exposed to death

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Abstract

Introduction: Exposure to patient death places healthcare workers at increased risk for burnout and traumatic stress, yet limited data exist exploring exposure to death among emergency medical services (EMS) clinicians. Our objective was to describe changes in EMS encounters involving on-scene death from 2018 to 2021.

Methods: We retrospectively analyzed deidentified EMS records for 9-1-1 responses from the ESO Data Collaborative from 2018 to 2021. We identified cases where patient dispositions of death on scene, with or without attempted resuscitation, and without EMS transport. A non-parametric test of trend was used to assess for monotonic increase in agency-level encounters involving on-scene death and the proportion of EMS clinicians exposed to ≥1 on-scene death.

Results: We analyzed records from 1109 EMS agencies. These agencies responded to 4,286,976 calls in 2018, 5,097,920 calls in 2019, 4,939,651 calls in 2020, and 5,347,340 calls in 2021.The total number of encounters with death on scene rose from 49,802 in 2018 to 60,542 in 2019 to 76,535 in 2020 and 80,388 in 2021. Agency-level annual counts of encounters involving death on scene rose from a median of 14 (interquartile range [IQR], 4–40) in 2018 to 2023 (IQR, 6–63) in 2021 (P-trend < 0.001). In 2018, 56% of EMS clinicians responded to a call with death on scene, and this number rose to 63% of EMS clinicians in 2021 (P-trend < 0.001).

Conclusion: From 2018 to 2021, EMS clinicians were increasingly exposed to death. This trend may be driven by COVID-19 and its effects on the healthcare system and reinforces the need for evidence-based death notification training to support EMS clinicians.

KEYWORDS
communication training, death notification, emergency medical services, out-of-hospital cardiac arrest, on-scene death, termination of resuscitation

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1 | INTRODUCTION

1.1 | Background

Emergency medical services (EMS) on-scene termination of resuscitation (TOR) is important to reduce the transport of patients that is not medically indicated because of the high likelihood of a clinically poor prognosis. TOR criteria have been externally validated and adopted by the American Heart Association and National Association of EMS Physicians for use by EMS clinicians (eg, emergency medical technicians [EMTs], advanced EMTs, paramedics).[1,2] During the COVID-19 pandemic, surges in out-of-hospital cardiac arrest and strained healthcare resources resulted in many EMS agencies newly adopting or updating protocols for TOR.[3,4] These updates included avoiding initiation of resuscitation and allowing TOR for COVID-19 patients with risk factors for a poor prognosis.[4,5] A major consequence of increased out-of-hospital deaths and increased adoption and use of TOR protocols is that EMS clinicians are not only routinely exposed to death but also likely tasked with communication of death notification when family is present on scene.[6]

1.2 | Importance

Exposure to patient death is linked to higher rates of secondary traumatic stress and burnout in healthcare workers. Frequent direct exposure to patients' physical pain, psychological suffering, and death can increase secondary traumatization.[7] Particularly for EMS clinicians, where training on the topic is limited, delivering death notification is associated with higher rates of burnout.[6] Limited data exist on how frequently EMS clinicians are exposed to death in the field and how this exposure may have changed during the COVID-19 pandemic.

1.3 | Goals of this investigation

Our objective was to describe changes in EMS encounters involving on-scene death from 2018 to 2021.

The Bottom Line

Emergency medical services (EMS) encounters that have a death on scene rose significantly from 2018 through 2021. In 2018, 56% of EMS clinicians responded to a call with death on scene, and this number rose to 63% of EMS clinicians in 2021. This increased exposure to patient death may place our EMS clinicians at an increased risk for burnout.

2 | METHODS

2.1 | Design and setting

We retrospectively analyzed deidentified EMS records for 9-1-1 responses from the ESO Data Collaborative from 2018 to 2021. This study was deemed exempt from review and informed consent by St. David's Institutional Review Board. The Strengthening and Reporting of Observational Epidemiology guidelines were applied in reporting the findings of this work.[8]

ESO is a large EMS electronic health record provider in the United States. The electronic health record software facilitates the collection of information related to the scene of the EMS encounter, times, assessments performed, and clinical care provided in compliance with the National EMS Information System version 3.4 standard. The ESO Data Collaborative consists of >2000 participating EMS agencies who have agreed to allow their deidentified records to be used for the purposes of research. These EMS encounters span the United States and represent a variety of practice and geographic settings. For example, as categorized by the US Census, in 2019, most included EMS responses occurred in urbanized areas (76%) or urban clusters (18%) and were in the South (58%), Midwest (22%), West (16%), and Northeast (5%) regions.[9]

2.2 | Inclusion criteria

The study was limited to agencies that contributed records for all 4 study years. We included primary 9-1-1 scene responses and excluded records for interfacility transports. We also excluded calls that were cancelled en route and where no patient was found.

2.3 | Measures

To identify cases where EMS clinicians were exposed to death, we identified patient dispositions (National Emergency Medical Services Information System (NEMSIS) data element: eDisposition.12) of death on scene, with or without attempted resuscitation, and without EMS transport. We calculated agency-level exposure to on-scene death by counting the number of encounters with on-scene death associated with each unique agency identification (ID). We calculated the number of exposures to on-scene death per crew member by summing up all encounters with on-scene death where the clinician ID was listed on the electronic health record (EHR) (as a lead clinician or other attending clinician). We collected patient age among records with on-scene death from the EHR as entered by the EMS clinician. We also tallied the total number of 9-1-1 EMS responses per study year using the run type data element.

2.4 | Data analysis

We report descriptive statistics at the agency and clinician levels. A non-parametric test of trend was used to assess for monotonic

TABLE 1 EMS clinician encounters with on-scene patient death (2018–2021)

	2018	2019	2020	2021	Test of trend *P* value
9-1-1 encounters, n	4,286,976	5,097,920	4,939,651	5,347,340	0.174
Encounters with on-scene patient death, % (n)	1.16 (49,802)	1.19 (60,542)	1.55 (76,535)	1.50 (80,388)	<0.001
Patient age among encounters with on-scene death, years, median (IQR)	64 (51–77)	66 (53–79)	65 (50–77)	64 (49–77)	<0.001
9-1-1 calls per agency, median (IQR)	1236 (390–3424)	1498 (485–4069)	1459 (470–3984)	1562 (498–4538)	0.005
Encounters with on-scene death per agency, median (IQR)	14 (4–40)	18 (5–46)	22 (6–60)	23 (6–63)	<0.001
Number of EMS clinicians, n	70,092	75,552	79,795	81,727	0.0415
Encounters with on-scene death exposure per crew member, median (IQR)	1 (0–3)	1 (0–3)	1 (0–4)	1 (0–4)	<0.001
Crew members with ≥1 exposure to on-scene death, % (n)	55.8 (39,116)	58.0 (43,803)	62.6 (49,973)	63.0 (51,518)	<0.001

Abbreviations: EMS, emergency medical services; IQR, interquartile range.

changes in agency-level encounters involving on-scene death and the proportion of EMS clinicians exposed to ≥1 on-scene deaths annually from 2018 to 2021.

3 | RESULTS

We analyzed records from 1109 EMS agencies. These agencies responded to 4,286,976 calls in 2018, 5,097,920 calls in 2019, 4,939,651 calls in 2020, and 5,347,340 calls in 2021 (Table 1). The total number of encounters with death on scene rose from 49,802 in 2018 to 60,542 in 2019 to 76,535 in 2020 and 80,388 in 2021.

The median number of calls per agency rose from 1236 (interquartile range [IQR], 390–3424) to 1562 (IQR, 498–4538). Meanwhile, agency-level annual counts of encounters involving death on scene rose from a median of 14 (IQR, 4–40) in 2018 to 23 (IQR, 6–63) in 2021 (*P*-trend < 0.001). In 2018, 55.8% of EMS clinicians responded to a call with death on scene, and this number rose to 63% of EMS clinicians in 2021 (*P*-trend < 0.001).

3.1 | Limitations

This study was unable to determine the ultimate cause of patient death, whether it be related to COVID-19, overdose, or cardiovascular disease, and so on. Moreover, this study is limited by the retrospective nature of the records. Although this is a large national sample, these records remain a sample of convenience and do not capture all EMS encounters in the United States. As an ecological study, this analysis does not capture the individual experience of each agency or EMS clinician. We used exposure to on-scene death as a proxy for death notification, but we were unable to determine if a death notification was in fact completed (eg, no family or other known person on scene, only police/coroner), or which EMS clinician performed the death notification when one did occur. In the framework of the present study, we were also unable to capture the effects of on-scene death on EMS clinicians' mental health and the impact on burnout.

3.2 | Discussion

From 2018 to 2021, EMS clinicians were increasingly exposed to death and opportunities to deliver death notification. Notably, the number of unique EMS clinicians included in the study gradually increased during the study period, whereas the proportion of 9-1-1 calls involving patient death dramatically increased.

Our findings are consistent with the increased out-of-hospital cardiac arrest observed during peaks of COVID-19, and the increased EMS protocols allowing TOR on scene may contribute to this overall trend.[10,11] In addition, the indirect effects that the pandemic has had on the health system may be contributory to the increased number of 9-1-1 calls involving patient death. For example, during the COVID-19 pandemic, there was a national increase in overdose-related cardiac arrests and an increase in death from noncommunicable diseases, such as cardiovascular disease, as essential health services were reduced or disrupted.[12–14] Thus, the trend toward increasing number of deaths since 2018 is likely multifactorial and attributable to both the direct effects of COVID-19 as well as the indirect sequelae of COVID-19 on the healthcare system.

Although exposure to death is a routine part of EMS clinicians' job, death communications training is not routinely part of EMS clinician education. Surveys of EMTs and paramedics have demonstrated that only half of them have received formal training in death notification.[6] Many EMS clinicians report learning about death notification from colleagues through on-the-job training.[15] The current National EMS Education Standards do not specifically comment on death notification, but do recommend that all EMS clinicians (emergency medical responders, EMTs, advanced EMTs, and paramedics) are able to communicate information with an awareness of cultural differences and demonstrate empathy.[16] Although there are several structured methods for death

notification designed for clinicians working in hospital settings, there are only a few that have been adapted for EMS clinicians. Structured methods for death notification can improve EMS clinician confidence, competency, and communication skills.[17,18]

From an occupational health perspective, death communication training has previously demonstrated a protective effect against burnout.[6] Routinely encountering death and being tasked with death notification can be a stressful event, particularly if EMS clinicians are not equipped with the communication skills and training to do so. In 1 study, the majority of EMS clinicians reported feeling uncomfortable and threatened with possible family reaction as a result of death notification.[15] Because EMS clinicians are increasingly facing death in the field, death notification communication training may represent a focused area of intervention that can potentially mitigate burnout by equipping EMS clinicians with the confidence and competency to deliver death notifications.

In summary, this study of >1000 EMS agencies identified increases in the number of EMS encounters involving on-scene death and the number of EMS clinicians exposed to on-scene death between 2018 and 2021. Collectively, these findings suggest an area of opportunity for EMS agencies to focus targeted education initiatives related to death communication to provide EMS clinicians with the knowledge, skills, and confidence to perform the task. Future areas of investigation include additional research into the effectiveness of different types of training formats (eg, simulation based, synchronous vs asynchronous), frequency and timing of training (eg, EMT–paramedic standard curriculum vs continuing education). Moreover, communication training should consider the effect on emotional and psychological EMS clinician well-being as well as the impact on the decedent's family.

AUTHOR CONTRIBUTIONS

Amelia Breyre, Remle P. Crowe, Antonio R. Fernandez, Alexandra Jabr, J. Brent Myers, and Douglas F. Kupas made substantial contributions. Remle P. Crowe, Amelia Breyre, and J. Brent Myers were responsible for conceptualization and the original draft. Remle P. Crowe was responsible for the formal analysis. Alexandra Jabr and Douglas F. Kupas were responsible for writing review and editing.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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