Death by Suicide: The EMS Profession Compared to the General Public

Ben Bobrow, MD
University of Arizona College of Medicine
Arizona Emergency Medicine Research Center
Arizona Department of Health Services – Bureau of EMS & Trauma System

STUDY CO-AUTHORS

• Micah Panczyk, MS
• Paula Brazil, MS
• Taylor A. George, PhD
• Robyn Blust, MPH
• Vatsal Chikani, MPH
• Chengcheng Hu, PhD
• Daniel W. Spaite, MD

NO RELEVANT DISCLOSURES
Suicide

- In 2012, ~40,000 suicides were reported in the US, making suicide the 10th overall reported cause of death.\(^1\)

- From 2000 to 2012, the national suicide rate increased 21.1%, from 13.3 per 100,000 to 16.1 per 100,000.\(^2\)

- Suicide analyzed by occupation in 17 states showed the highest female suicide rates occurred in LE officers, firefighters, and EMTs.\(^2\)

1. CDC MMWR 2011
2. National Violent Death Reporting System 2012

Suicide and EMTs

- EMTs are exposed to high levels of occupational stress.\(^1\)

- Chronic stress is linked to substance abuse, depression, anxiety, burnout, and suicide.\(^2\)

- EMTs are involved in critical incidents associated with overwhelming emotional reactions.\(^3\)

- National survey data suggest EMTs have a 10-fold higher incidence of suicidal thoughts and attempts.\(^4\)

1. Donnelly, PEC 2012
2. Feskanich, JECH 2002
3. Essex, PEC 2008
4. NAEMT Mental Health Survey 2016
Mortality Odds Ratio (MOR)

- MOR is a statistic used to approximate the Standardized Mortality Ratio when death data are available but the population denominator is not known.¹

- A MOR greater than 1.0 indicates that a specified occupation (EMT) is associated with a higher odds of dying from a specific cause (Suicide) compared to another population.²

1. American Journal of Industrial Medicine 1988
2. Centers for Disease Control/The National Institute for Occupational Safety and Health (NIOSH)

Suicide Data by Occupation

- Law Enforcement Officers have a significantly higher suicide PMR = 1.69, 95% CI = 150-191, p < 0.01.¹

- VA has reported a 21 percent higher odds of death for Veterans.

- EMT suicide MOR/PMR have not been published.

1. Violanti, IEMH 2013
2. US Dept of Veteran's Affairs

STUDY AIM

To determine the statewide MOR of suicide completions among EMTs compared to the general public (GP) in Arizona.
Methods

Observational Study Design

Data Source:
Arizona Vital Statistics Information Management System-Electronic Death Registry

Study Population:
Adults (18+)
January 1, 2009-December 31, 2015

EMT vs Non-EMT Cohorts:
Manual review of decedent occupation free text field
EMT Cohort: any occupation related to Firefighter, Emergency Medical Technician (EMT), or Paramedic
Non-EMT Cohort: Aggregate of all other occupations

Outcome: Underlying Cause of Death
Suicide or other cause based on ICD-10 Code

STATISTICAL METHODS

The MOR for suicide was compared between EMTs vs. GP
— Logistic Regression Model: Adjusted for age, sex, race, and ethnicity.

Results: Patient Population

Total Deaths 2009-2015: 365,919

<table>
<thead>
<tr>
<th></th>
<th>GP</th>
<th>EMT</th>
<th>Other Causes</th>
<th>Suicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide</td>
<td>7,775 (2.2%)</td>
<td>1,342 (1.2%)</td>
<td>542,018</td>
<td>63 (0.2%)</td>
</tr>
</tbody>
</table>
Results: Demographics

<table>
<thead>
<tr>
<th>Total deaths from 2009 to 2015</th>
<th>GP</th>
<th>%</th>
<th>EMT</th>
<th>%</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-34</td>
<td>12,234</td>
<td>3.5%</td>
<td>102</td>
<td>8.4%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>35-54</td>
<td>16,194</td>
<td>46.8%</td>
<td>161</td>
<td>12.4%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>55-74</td>
<td>150,080</td>
<td>48.3%</td>
<td>531</td>
<td>44.0%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>184,987</td>
<td>52.8%</td>
<td>1,127</td>
<td>93.5%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>164,806</td>
<td>47.2%</td>
<td>76</td>
<td>6.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White non-Hispanic</td>
<td>200,766</td>
<td>80.2%</td>
<td>872</td>
<td>80.6%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>51,193</td>
<td>20.8%</td>
<td>62</td>
<td>19.4%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>10,131</td>
<td>4.0%</td>
<td>25</td>
<td>2.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian/PI</td>
<td>1,351</td>
<td>0.5%</td>
<td>148</td>
<td>13.9%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Cause of death</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suicide</td>
<td>342,018</td>
<td>97.7%</td>
<td>1,142</td>
<td>94.7%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Results: EMT Suicides by Year in Arizona

Results: Method of Suicide

<table>
<thead>
<tr>
<th>Method of Suicide</th>
<th>EMT</th>
<th>GP</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firearm</td>
<td>66.7%</td>
<td>57.6%</td>
<td>0.1472</td>
<td></td>
</tr>
<tr>
<td>Suffocation</td>
<td>23.8%</td>
<td>20.6%</td>
<td>0.5312</td>
<td></td>
</tr>
<tr>
<td>Poisoning</td>
<td>9.5%</td>
<td>16.7%</td>
<td>0.1274</td>
<td></td>
</tr>
</tbody>
</table>
Results: MOR of Suicide

<table>
<thead>
<tr>
<th></th>
<th>Crude Rate</th>
<th>95% CI</th>
<th>Adjusted* Rate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMT vs. GP</td>
<td>2.43</td>
<td>(1.88-3.13)</td>
<td>1.39</td>
<td>(1.06-1.82)</td>
</tr>
</tbody>
</table>

* Adjusted for age, sex, race, and ethnicity

DISCUSSION

• Suicide is a leading cause of death in the US, is increasing, and EMTs may be at particularly high risk.

• Using AZ Vital Statistics - Electronic Death Registry we found a significantly higher suicide MOR for EMTs in Arizona compared to the general public, even after risk-adjustment.

• The reasons behind this finding require further investigation.

LIMITATIONS

• Reliance on determination of death as suicide
  — Suicides of EMTs may often be misclassified as “accidental” or “undetermined” in order to protect survivors from the stigma of suicide

• Reliance on text fields to determine decedent occupation

• Unknown if decedent was active field EMT

• Unknown if decedent was retired

• Unknown if decedent had comorbid suicide risk factors (e.g., previous attempts, substance abuse disorder, LE/VETERANS, or mental health issues)
CONCLUSIONS

- In a statewide evaluation, we found significantly higher crude and adjusted Mortality Odds Ratios for suicide among EMTs compared to the general public.
- Increased awareness is urgently needed to prevent EMT suicide.
- Further research is necessary to identify the underlying causes of EMT suicide and to develop effective prevention strategies.

We are grateful to all of the EMTs in Arizona for their selfless dedication.