

**Title:** Calls of Despair: An EMS Perspective on Suicide and Overdose in RI during COVID-19

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**Introduction:** In 2020, life expectancy in the United States declined by 1.8 years compared to 2019.<sup>1</sup> Although much of this decrease was directly attributable to SARS-CoV-2 (COVID-19) infection,<sup>1</sup> the indirect effects of COVID-19-related psychosocial stressors on suicide and drug overdose, two of the “deaths of despair”,<sup>2</sup> remain unknown.

**Objective:** This study aims to understand the acute mental health impacts associated with the COVID-19 pandemic through analysis of suicide and opioid overdose 911 calls to emergency medical services (EMS) in Rhode Island (RI) during the first 12 months of the COVID-19 pandemic, as compared to the prior 12 months. It seeks to examine changes in patient demographics, potential driving stressors, and the severity of the emergency. Furthermore, it demonstrates the utility of EMS syndromic analysis as a public health surveillance tool.

**Methods:** Suicide and drug-related 911 calls were selected from the RI state EMS database using syndromic analysis software by Biospatial, Inc. (Durham, NC). Syndromic analysis uses natural language processing of EMS patient care reports to classify calls into syndromes, or categories based on the nature of the emergency.<sup>3,4</sup> This study utilized four syndromes: “opioid” (opioid-specific overdoses), “overdose” (all drug overdoses), “suicide ideation”, and “suicide attempt”. Syndromic analysis was also used to identify presumed suicide or overdose fatalities occurring prior to or during EMS care. Call totals were collected for each of the four syndromes across two time periods: 1) March 2019 to February 2020 or the “pre-pandemic year” (Pre-PY) and 2) March 2020 to February 2021 or “pandemic year 1” (PY1). The mean percent change in

monthly calls for each syndrome and related presumed fatalities were compared between Pre-PY and PY1 in total as well as by gender, age, and season. All syndromes were validated using chart review of a random sample of 120 calls (5 per month, March 2019 to February 2021).

**Results:** Call volume for opioid, overdose, and suicide ideation syndromes declined significantly from Pre-PY to PY1. Calls for suicide attempt, presumed suicide fatality, and presumed overdose fatality did not significantly change, although an increase in overdose fatalities did trend toward significance, particularly for men. Both suicide and drug related calls decreased to the greatest extent in younger age groups. Suicidal ideation calls significantly decreased in PY1 for female patients but did not change for male patients. Calls for suicide attempt increased in males and individuals over age 50. Compared to Pre-PY spring (March-May 2020), suicide ideation calls significantly decreased in spring PY1; this was the only season where suicide calls significantly changed between years. The validation sub-study of the four syndromes showed strong positive and negative predictive values.

**Conclusion:** This study found that RI EMS calls for opioid, all-drug overdose, and suicidal ideation decreased in the first 12 months of the COVID-19 pandemic. Calls for suicide attempt as well as presumed suicide and overdose fatality remained unchanged. Thus, the first year of the pandemic may have been associated with decreased frequency but increased severity of drug and suicide emergencies. Suicide risk may have decreased most profoundly in female and younger age groups. The observed decrease in suicide ideation calls during the first spring of the pandemic could potentially have resulted from a societal pulling together effect or “honeymoon phase” often seen in the initial phase of disasters.<sup>5,6</sup> Last, this study exhibits the application and promising accuracy of EMS syndromic analysis for real-time public health surveillance and secondary prevention of suicide and drug-use.

## References

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