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Monitoring suicide-related events using National Syndromic Surveillance Program data

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Objective

To describe epidemiological characteristics of emergency department (ED) visits related to suicidal ideation (SI) or suicidal attempt (SA) using syndromic surveillance data.

Introduction

Suicide is a growing public health problem in the United States [1]. From 2001 to 2016, ED visit rates for nonfatal self-harm, a common risk factor for suicide, increased 42% [2-4]. To improve public health surveillance of suicide-related problems, including SI and SA, the Data and Surveillance Task Force within the National Action Alliance for Suicide Prevention recommended the use of real-time data from hospital ED visits [5]. The collection and use of real-time ED visit data on SI and SA could support a more targeted and timely public health response to prevent suicide [5]. Therefore, this investigation aimed to monitor ED visits for SI or SA and to identify temporal, demographic, and geographic patterns using data from CDC's National Syndromic Surveillance Program (NSSP).

Methods

CDC's NSSP data were used to monitor ED visits related to SI or SA among individuals aged 10 years and older from January 1, 2016 through July 31, 2018. A syndrome definition for SI or SA, developed by the International Society for Disease Surveillance's syndrome definition committee in collaboration with CDC, was used to assess SI or SA-related ED visits. The syndrome definition was based on querying the chief complaint history, discharge diagnosis, and admission reason code and description fields for a combination of symptoms and Boolean operators (for example, hang, laceration, or overdose), as well as ICD-9- CM, ICD-10-CM, and SNOMED diagnostic codes associated with SI or SA. The definition was also developed to include common misspellings of self-harm- related terms and to exclude ED visits in which a patient "denied SI or SA."

The percentage of ED visits involving SI or SA were analyzed by month and stratified by sex, age group, and U.S. region. This was calculated by dividing the number of SI or SA-related ED visits by the total number of ED visits in each month. The average monthly percentage change of SI or SA overall and for each U.S. region was also calculated using the Joinpoint regression software (Surveillance Research Program, National Cancer Institute) [6].

Results

Among approximately 259 million ED visits assessed in NSSP from January 2016 to July 2018, a total of 2,301,215 SI or SA-related visits were identified. Over this period, males accounted for 51.2% of ED visits related to SI or SA, and approximately 42.1% of SI or SA-related visits were comprised of patients who were 20-39 years, followed by 40-59 years (29.7%), 10-19 years (20.5%), and ≥60 years (7.7%).

During this period, the average monthly percentage of ED visits involving SI or SA significantly increased 1.1%. As shown in Figure 1, all U.S. regions, except for the Southwest region, experienced significant increases in SI or SA ED visits from January 2016 to July 2018. The average monthly increase of SI or SA-related ED visits was 1.9% for the Midwest, 1.5% for the West (1.5%), 1.1% for the Northeast, 0.9% for the Southeast, and 0.5% for the Southwest.

Conclusions

ED visits for SI or SA increased from January 2016 to June 2018 and varied by U.S. region. In contrast to previous findings reporting data from the National Electronic Injury Surveillance Program – All-Injury Program, we observed different trends in SI or SA by sex, where more ED visits were comprised of patients who were male in our investigation [2]. Syndromic surveillance data can fill an existing gap in the national surveillance of suicide-related problems by providing close to real-time information

on SI or SA-related ED visits [5]. However, our investigation is subject to some limitations. NSSP data is not nationally representative and therefore, these findings are not generalizable to areas not participating in NSSP. The syndrome definition may under-or over-estimate SI or SA based on coding differences and differences in chief complaint or discharge diagnosis data between jurisdictions. Finally, hospital participation in NSSP can vary across months, which could potentially contribute to trends observed in NSSP data. Despite these limitations, states and communities could use this type of surveillance data to detect abnormal patterns at more detailed geographic levels and facilitate rapid response efforts. States and communities can also use resources such as *CDC's Preventing Suicide: A Technical Package of Policy, Programs, and Practices* to guide prevention decision-making and implement comprehensive suicide prevention approaches based on the best available evidence [7].

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References

1. Stone DM, Simon TR, Fowler KA, et al. 2018. Vital Signs: Trends in State Suicide Rates — United States, 1999–2016 and Circumstances Contributing to Suicide — 27 States, 2015. *MMWR Morb Mortal Wkly Rep*. 67(22), 617-24. PubMed https://doi.org/10.15585/mmwr.mm6722a1
2. CDCs National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS). https://www.cdc.gov/injury/wisqars/index.html. Published 2018. Accessed September 1, 2018.
3. Mercado MC, Holland K, Leemis R, Stone D, Wang J. 2017. Trends in emergency department visits for nonfatal self-inflicted injuries among youth aged 10 to 24 years in the United States, 2005-2015. *JAMA*. 318(19), 1931-33. doi:https://doi.org/10.1001/jama.2017.13317. PubMed
4. Olfson M, Blanco C, Wall M, et al. 2017. National Trends in Suicide Attempts Among Adults in the United States. *JAMA Psychiatry*. 74(11), 1095-103. doi:https://doi.org/10.1001/jamapsychiatry.2017.2582. PubMed
5. Ikeda R, Hedegaard H, Bossarte R, et al. 2014. Improving national data systems for surveillance of suicide-related events. *Am J Prev Med*. 47(3) (SUPPL. 2), S122-29. doi:https://doi.org/10.1016/j.amepre.2014.05.026. PubMed
6. National Cancer Institute. Joinpoint Regression Software. https://surveillance.cancer.gov/joinpoint/. Published 2018. Accessed September 1, 2018.
7. Centers for Disease Control and Prevention. Preventing Suicide: A Technical Package of Policy, Programs, and Practices.