Using the Centers for Disease Control and Prevention's National Syndromic Surveillance Program Data to Monitor Trends in US Emergency Department Visits for Firearm Injuries, 2018 to 2019

Marissa L. Zwald, PhD, MPH[*],

Kristin M. Holland, PhD, MPH,

Daniel A. Bowen, MPH,

Thomas R. Simon, PhD,

Linda L. Dahlberg, PhD,

Zachary Stein, MPH,

Nimi Idaikkadar, MPH,

James A. Mercy, PhD

Division of Violence Prevention (Zwald, Bowen, Simon, Dahlberg, Mercy), the Division of Overdose Prevention (Holland), and the Division of Injury Prevention (Idaikkadar), National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA; the Division of Health Informatics and Surveillance (Stein), Center for Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention, Atlanta, GA; and the United States Public Health Service (Zwald), Rockville, MD.

Abstract

Study objective: We describe trends in emergency department (ED) visits for initial firearm injury encounters in the United States.

Methods: Using data from the Centers for Disease Control and Prevention's National Syndromic Surveillance Program, we analyzed monthly and yearly trends in ED visit rates involving a firearm injury (calculated as the number of firearm injury–related ED visits divided by the total number of ED visits for each month and multiplied by 100,000) by sex-specific age group and US region from 2018 to 2019 and conducted Joinpoint regression to detect trend significance.

Results: Among approximately 215 million ED visits captured in the National Syndromic Surveillance Program from January 2018 to December 2019, 132,767 involved a firearm injury

(61.6 per 100,000 ED visits). Among males, rates of firearm injury–related ED visits significantly increased for all age groups between 15 and 64 years during the study period. Among females, rates of firearm injury–related ED visits significantly increased for all age groups between 15 and 54 years during the study period. By region, rates significantly changed in the northeast, southeast, and southwest for males and females during the study period.

Conclusion: These analyses highlight a novel data source for monitoring trends in ED visits for firearm injuries. With increased and effective use of state and local syndromic surveillance data, in addition to improvements to firearm injury syndrome definitions by intent, public health professionals could better detect unusual patterns of firearm injuries across the United States for improved prevention and tailored response efforts. [Ann Emerg Med. 2022;79:465–473.]

INTRODUCTION

Background

Firearm-related deaths and injuries represent a significant public health problem in the United States. Recent epidemiologic studies examining national trends in firearm mortality show that after remaining relatively stable from 1999 to 2014, firearm-related death rates increased between 2015 and 2018, with considerable geographic and sociodemographic variation.[1–3] Furthermore, according to the most recent national data from 2019, suicide and homicide by firearm were the fourth and fifth leading causes of injury deaths, respectively.[4] Many more Americans are nonfatally injured by a firearm each year; indeed, nonfatal firearm injuries are more than twice as prevalent as firearm-related deaths in the United States.[3]

Emergency departments (EDs) are a critical setting for timely monitoring of such injuries; monitoring national trends in ED visits involving a firearm injury can be difficult because of lengthy time lags for reporting traditional surveillance system data, such as those from the National Electronic Injury Surveillance System and Healthcare Cost and Utilization Project's Nationwide ED Sample.[5]

Near real-time syndromic surveillance systems, originally implemented for the early detection of intentional disease outbreaks, such as bioterrorism attacks, have evolved in their ability to identify and monitor trends, clusters, and outbreaks, in infectious and chronic diseases, injuries, and violence, including sexual violence, intimate partner violence, and suspected child abuse and neglect.[6–9] ED syndromic surveillance data could be a valuable data source for monitoring nonfatal firearm injuries at the national level. However, to our knowledge, no study to date has documented national trends of nonfatal firearm injuries using ED syndromic surveillance data.

Goals of This Investigation

We analyzed data from the National Syndromic Surveillance Program (NSSP) by the Centers for Disease Control and Prevention (CDC), which captures near real-time electronic health record data, to examine national and regional trends in ED visits involving a firearm injury in the United States from 2018 to 2019.

MATERIALS AND METHODS

Study Design and Setting

Available aggregated ED data from January 1, 2018, to December 31, 2019, from the CDC's NSSP were analyzed. The NSSP is a collaboration between the CDC, local and state health departments, and health care facilities to collect, analyze, and share electronic patient encounter data received from EDs, urgent and ambulatory care centers, inpatient health care settings, and laboratories. Electronic health data are transmitted to a shared platform called BioSense, and public health agencies, including the CDC and local and state health departments, can use analytic tools on the platform to analyze data received as early as 24 hours after a patient's visit for detection, characterization, monitoring, and response to events of public health concern. Visit information captured by the NSSP includes free-text chief complaint, discharge diagnosis codes, and some patient demographic information, such as age and sex. Diagnostic information is collected using the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM), *International Classification of Diseases, 10th Revision, Clinical Modification* (ICD-10-CM), and Systematized Nomenclature of Medicine codes.[6,10]

As of December 2019, the NSSP received deidentified data from health care facilities representing portions of 47 states and Washington, DC. Additional information on facility participation in the NSSP can be found at https://www.cdc.gov/nssp/overview.html. The present study includes only data from active EDs, where the NSSP coverage was 53.9% of ED visits in the United States in 2018 and 62.4% in 2019.[11] Weighting by facility characteristics was not possible for this study.

Measurements

In collaboration with several health departments, the CDC developed a syndrome definition to query patient discharge diagnosis and chief complaint information from ED visits to identify initial firearm injury encounters (including those classified as unintentional, intentional self-harm, assault, legal intervention, terrorism, and undetermined intent) and to exclude subsequent visits or sequelae from an initial firearm injury (Table). The syndrome definition includes relevant ICD-9-CM, ICD-10-CM, and Systematized Nomenclature of Medicine diagnosis codes.[12] Of note, the definition includes discharge diagnosis codes from both ICD-9-CM and ICD-10-CM despite the transition of codes on October 1, 2015, to account for any facilities or hospital systems that continued to use ICD-9-CM codes. In addition to discharge diagnosis codes, the definition relies on the chief complaint inclusion (eg, GSW or gunshot wound) and exclusion terms (eg, pistol whip, paintball, nail, or staple gun) to further identify firearm injury–related ED visits and decrease false positives.

Analysis

Data on sex, age group (0 to 14 years, 15 to 24 years, 25 to 34 years, 35 to 44 years, 45 to 54 years, 55 to 64 years, and 65 years and older), and US region* (northeast,

---

*States listed are within the Health and Human Services (HHS) regions that shared data with NSSP and had data available for the study period at the time of data analysis. Additionally, some states listed do not provide data for the entire state (https://www.cdc.gov/nssp/participation-coverage-map.html). The northeast region includes HHS region 1 (Maine, Massachusetts, New Hampshire, Rhode

southeast, southwest, midwest, and west) were also captured. Monthly rates of firearm injury–related ED visits (ED visits involving a firearm injury divided by the total ED visits per month and multiplied by 100,000) were calculated by age group and US region, separately for males and females. Using methods similar to the previously published studies that analyzed the NSSP data, we ran regression models to examine the significance of trends by each stratum using the Joinpoint Regression Program, which calculated average monthly percentage change (AMPC) and 95% confidence intervals (CIs).[7,13–17] Because this study used deidentified information from an existing surveillance system, it did not require review by the CDC's Institutional Review Board.

RESULTS

From January 2018 to December 2019, among approximately 215 million ED visits captured in the NSSP, 132,767 visits involved a firearm injury (61.6 per 100,000 ED visits), with rates for males exceeding those of females by approximately 7.7 times. As shown in Figure 1, among males, those aged 15 to 24 years had consistently higher firearm injury–related ED visit rates than those in other age groups. Overall, males experienced a significant positive trend in firearm injury–related ED visits over the study period, with an observed increase of 0.8% per month (95% CI 0.2 to 1.3), on average. We also identified significant increases during the study period in ED visit rates involving a firearm injury across most age groups among males, including those aged 15 to 24 years (AMPC = 0.7; 95% CI 0.1 to 1.3), 25 to 34 years (AMPC = 0.8; 95% CI 0.3 to 1.2), 35 to 44 years (AMPC = 0.8; 95% CI 0.5 to 1.1), 45 to 54 years (AMPC = 0.9; 95% CI 0.5 to 1.3), and 55 to 64 years (AMPC = 1.0; 95% CI 0.5 to 1.6).

Similar to males, ED visit rates involving a firearm injury for females were also consistently highest among those aged 15 to 24 years compared with other age groups. Female firearm injury–related ED visits showed a significant positive trend during the study period, with an average monthly increase of 1.2% (95% CI 0.4 to 2.0). By age group, significant increases were observed for females aged 15 to 24 years (AMPC = 1.6; 95% CI 0.6 to 2.6), 25 to 34 years (AMPC = 1.1; 95% CI 0.2 to 2.1), 35 to 44 years (AMPC = 1.3; 95% CI 0.6 to 2.0), and 45 to 54 years (AMPC = 1.2; 95% CI 0.4 to 2.1).

By US region (Figure 2), among males, significant increases in rates of ED visits related to a firearm injury occurred in the northeast (AMPC = 1.3; 95% CI 0.5 to 2.0), southeast (AMPC = 0.8; 95% CI 0.5 to 1.2), and southwest (AMPC = 0.7; 95% CI 0.2 to 1.3) regions. Among females, rates of firearm injury–related ED visits significantly decreased in the northeast (AMPC = 1.7; 95% CI 0.4 to 3.0) and significantly increased in the southeast (AMPC = 1.4; 95% CI 0.6 to 2.2), and southwest (AMPC = 1.1; 95% CI 0.0 to 2.1) regions. Neither sex showed significant increases in the midwest or west regions.

Island, and Vermont), HHS region 2 (New Jersey and New York), and HHS region 3 (District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia); the southeast region includes HHS region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee); the southwest region includes HHS region 6 (Arkansas, Louisiana, New Mexico, and Texas); the midwest region includes HHS region 5 (Indiana, Illinois, Michigan, Minnesota, Ohio, and Wisconsin) and HHS region 7 (Iowa, Kansas, Missouri, and Nebraska); and the west region includes HHS region 8 (Colorado, Montana, North Dakota, and Utah), HHS region 9 (Arizona, California, and Nevada), and HHS region 10 (Alaska, Idaho, Oregon, and Washington).

LIMITATIONS

There are several limitations to consider. First, our results are neither generalizable to facilities not participating in the NSSP nor nationally or regionally representative. Second, facility participation and data completeness in the NSSP varied across the study period. We accounted for these potential fluctuations by assessing monthly trends in ED visits for firearm injuries as a percentage of the total number of ED visits each month, but this indicator could be influenced by changes in the denominator overall or characteristics of the populations commonly served by participating facilities. Facility participation and data completeness in the NSSP also varies by region, and thus, calculating rates per 100,000 residents was not possible for this study. Third, firearm injuries could comprise a greater proportion of ED visits over time if visits for other conditions decline or if some participating facilities (eg, level I trauma centers) treat more firearm injuries than others; therefore, our findings could reflect an increase in the proportion of firearm injuries treated as opposed to a true increase in firearm injury burden. Increased and consistent facility participation in the NSSP may support future opportunities to calculate rates per population at finer geographic levels.[18] Future analyses using more syndromic data over time could help identify the stability of trends and examine the role of seasonal variation and other factors associated with firearm injury–related ED visits. Fourth, the syndrome definition used might underestimate or overestimate ED visits related to firearm injuries because of the variation in coding, reporting, and availability of visit-level data between facilities or over time. The definition, which is designed to query both patient discharge diagnosis and chief complaint information, also does not distinguish the injury intent. Further collaborations between the CDC and local and state health departments to parse the syndrome definition used in this study into more specific intent types may support enhanced research and surveillance of firearm injuries by intent. Finally, detailed facility and visit information in the NSSP is not available or incomplete at the aggregated national and regional levels and could not be examined for this study, including facility size and location, and some patient information, such as discharge disposition and race/ethnicity. The ability to examine trends in firearm injury–related ED visits by specific facility characteristics or patient sociodemographic factors may be possible with future improvements to the system at state and local levels. It could support additional research of firearm injuries by patient outcomes and certain health disparities.

DISCUSSION

Using national syndromic surveillance data, our findings suggest that ED visits associated with an initial encounter of a firearm injury gradually increased among males and females across most age groups and US regions from 2018 to 2019. To date, few studies have used this near real-time surveillance data source to track firearm injuries. In 2015, 2 local health departments, the New York City Department of Health and Mental Hygiene and the Houston Department of Health and Human Services, developed their firearm injury syndrome definitions, which primarily relied on the chief complaint information, to identify associated ED visits in their local syndromic surveillance systems.[19,20] Consistent with our results, higher rates of ED visits for a firearm injury were observed in males than in females and among those aged 18 to 24 years compared with those in other age groups.[19,20]

The present study describes the more recent information on trends of ED visits involving a firearm injury at national and regional levels than the abovementioned investigations.\[19,20] This data source has the potential to address a >2-year data lag experienced by surveillance systems traditionally used to monitor firearm injury ED visits. Still, more timely and granular information at the state and local levels is needed to track these trends and help detect unusual patterns or potential clusters of firearm injuries.[21] To address this gap, the CDC launched the Firearm Injury Surveillance Through Emergency Rooms program in 2020 and provided funding to 10 state health departments to share more detailed and timelier state and local syndromic data with the CDC for routine monitoring of firearm injuries overall and by intent.[22] These data will allow public health practitioners to better track firearm injuries in their states and communities, identify high burden areas, and inform tailored community interventions to reduce and prevent firearm-related injuries and deaths. Furthermore, these data may support future public health research on the relationships between different intent types of nonfatal firearm injuries and health disparities and inform research comparing syndromic surveillance data to other data sources for validation purposes.

Our study highlights the potential utility of ED syndromic surveillance data to monitor national and regional trends of firearm injuries. With further validation and enhancement of the CDC firearm injury syndrome definition to classify injury intent and with additional support and resources, public health departments can use syndromic surveillance data as a potential source for timelier monitoring of state and local trends. In conjunction with violent crime and death data, syndromic surveillance can allow public health practitioners to better understand the nature and effect of firearm injuries and support more rapid and targeted public health prevention and response strategies.

Funding and support:

REFERENCES

1. Goldstick JE, Carter PM, Cunningham RM. Current epidemiological trends in firearm mortality in the United States. JAMA Psychiatry. 2021;78:241–242. [PubMed: 32965479]

2. Goldstick JE, Zeoli A, Mair C, et al. US Firearm-related mortality: national, state, and population trends, 1999–2017. Health Aff (Millwood). 2019;38:1646–1652. [PubMed: 31589525]

3. Kaufman EJ, Wiebe DJ, Xiong RA, et al. Epidemiologic trends in fatal and nonfatal firearm injuries in the US, 2009–2017. JAMA Intern Med. 2021;181:237–244. [PubMed: 33284327]

4. Web-based Injury Statistics Query and Reporting System (WISQARS). Centers for Disease Control and Prevention. Accessed September 1, 2018. https://www.cdc.gov/injury/wisqars/index.html

5. Allegrante JP, Mitchell RJ, Taylor JA, et al. Injury surveillance: the next generation. Inj Prev. 2016;22(Suppl 1):i63–i65. [PubMed: 27044497]

6. Yoon PW, Ising AI, Gunn JE. Using syndromic surveillance for all-hazards public health surveillance: successes, challenges, and the future. Public Health Rep. 2017;132(1 Suppl): 3S–6S.

7. D'Inverno AS, Idaikkadar N, Houry D. Monitoring sexual violence trends in emergency department visits using syndromic data from the national syndromic surveillance program - United States, January 2017-December 2019. Am J Public Health. 2021;111:485–493. [PubMed: 33476240]

8. Holland KM, Jones C, Vivolo-Kantor AM, et al. Trends in US emergency department visits for mental health, overdose, and violence outcomes before and during the COVID-19 pandemic. JAMA Psychiatry. 2021;78:372–379. [PubMed: 33533876]

9. Swedo E, Idaikkadar N, Leemis R, et al. Trends in US emergency department visits related to suspected or confirmed child abuse and neglect among children and adolescents aged <18 years before and during the COVID-19 pandemic — United States, January 2019–September 2020. MMWR Morb Mortal Wkly Rep. 2020;69:1841–1847. [PubMed: 33301436]

10. National Syndromic Surveillance Program. Centers for Disease Control and Prevention. Accessed August 1, 2021. https://www.cdc.gov/nssp/documents/NSSP-overview.pdf

11. National Syndromic Surveillance Program participation and coverage. Centers for Disease Control and Prevention. Accessed August 31, 2020. https://www.cdc.gov/nssp/participation-coverage-map.html

12. National Syndromic Surveillance Program - firearm injury syndrome definition added to ESSENCE. Centers for Disease Control and Prevention. Accessed August 31, 2020. https://www.cdc.gov/nssp/news/2019/12-december/index.html

13. Roehler DR, Olsen EO, Mustaquim D, et al. Suspected nonfatal drug-related overdoses among youth in the US: 2016–2019. Pediatrics. 2021;147:2016–2019.

14. Roehler DR, Hoots BE, Vivolo-Kantor AM. Regional trends in suspected synthetic cannabinoid exposure from January 2016 to September 2019 in the United States. Drug Alcohol Depend. 2020;207:107810. [PubMed: 31862557]

15. Zwald ML, Holland KM, Annor FB, et al. Syndromic surveillance of suicidal ideation and self-directed violence - United States, January 2017-December 2018. MMWR Morb Mortal Wkly Rep. 2020;69:103–108. [PubMed: 31999688]

16. Vivolo-Kantor AM, Seth P, Gladden RM, et al. Vital signs: trends in emergency department visits for suspected opioid overdoses — United States, July 2016–September 2017. MMWR Morb Mortal Wkly Rep. 2018;67:279–285. [PubMed: 29518069]

17. Joinpoint trend analysis software. National Cancer Institute. Accessed September 1, 2018. https://surveillance.cancer.gov/joinpoint/

18. Centers for Disease Control and Prevention (CDC). Nonfatal and fatal firearm-related injuries – United States, 1993–1997. MMWR Morb Mortal Wkly Rep. 1999;48:1029–1034. [PubMed: 10599587]

19. Arnold RM, McNeely W, Muhetaer K, et al. Application of syndromic surveillance to describe gunshot-related injuries in Houston. Online J Public Health Inform. 2015;7:2579.

20. Seil K, Marcum J, Lall R, Stayton C. Utility of a near real-time emergency department syndromic surveillance system to track injuries in New York City. Inj Epidemiol. 2015;2:11. [PubMed: 27747743]

21. A blueprint for a U.S. firearms data infrastructure. Roman JK. Accessed June 17, 2020. https://www.norc.org/PDFs/Firearm%20Data%20Infrastructure%20Expert%20Panel/A%20Blueprint%20for%20a%20U.S.%20Firearms%20Data%20Infrastructure_NORC%20Expert%20Panel%20Final%20Report_October%202020.pdf

22. Firearm Injury Surveillance Through Emergency Rooms (FASTER). Centers for Disease Control and Prevention. Accessed August 31, 2020. https://www.cdc.gov/violenceprevention/firearms/funded-surveillance.html

Editor's Capsule Summary

What is already known on this topic

Early detection of nonfatal firearm injury clusters is critical for directing limited public health prevention resources. Traditional surveillance data is not timely enough to respond to urgent needs.

What question this study addressed

This study examined near real-time data collected in CDC's National Syndromic Surveillance Program (NSSP), examining trends in emergency department visits for firearm injuries (2018–2019).

What this study adds to our knowledge

Among 215 million emergency department visits, firearm injuries accounted for 132,767 visits (61.6 per 100,000), with increases during the study period for males and females across all age groups between 15–54 years old. Regional differences were also observed.

How this is relevant to clinical practice

Emergency department firearm injury data captured within the NSSP may be an important source of near real-time data to inform community violence prevention responses.
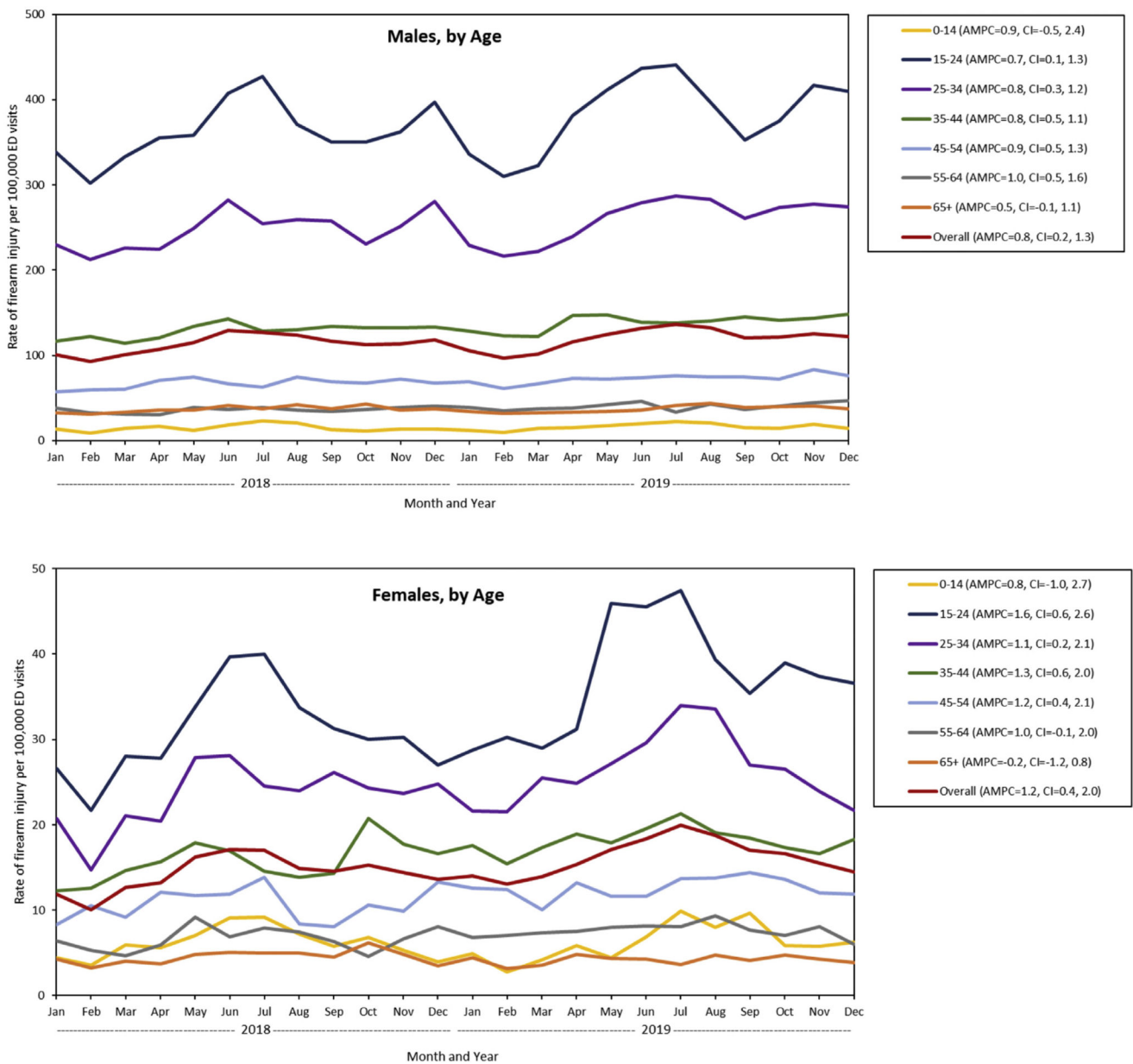
Figure 1.
Monthly rate of ED visits per 100,000 ED visits related to a firearm injury by sex and age group—NSSP, United States, between January 1, 2018, and December 31, 2019. The monthly rate is calculated as ED visits involving a firearm injury divided by the total ED visits, multiplied by 100,000. Joinpoint reports average annual percent change, but the unit of time for this analysis is 1 month; thus, this has been modified to average monthly percent change or AMPC. Data are current as of October 23, 2020, representing data from participating EDs in the NSSP, where the coverage was 53.9% and 62.4% of ED visits in 2018 in 2019, respectively, in the United States.
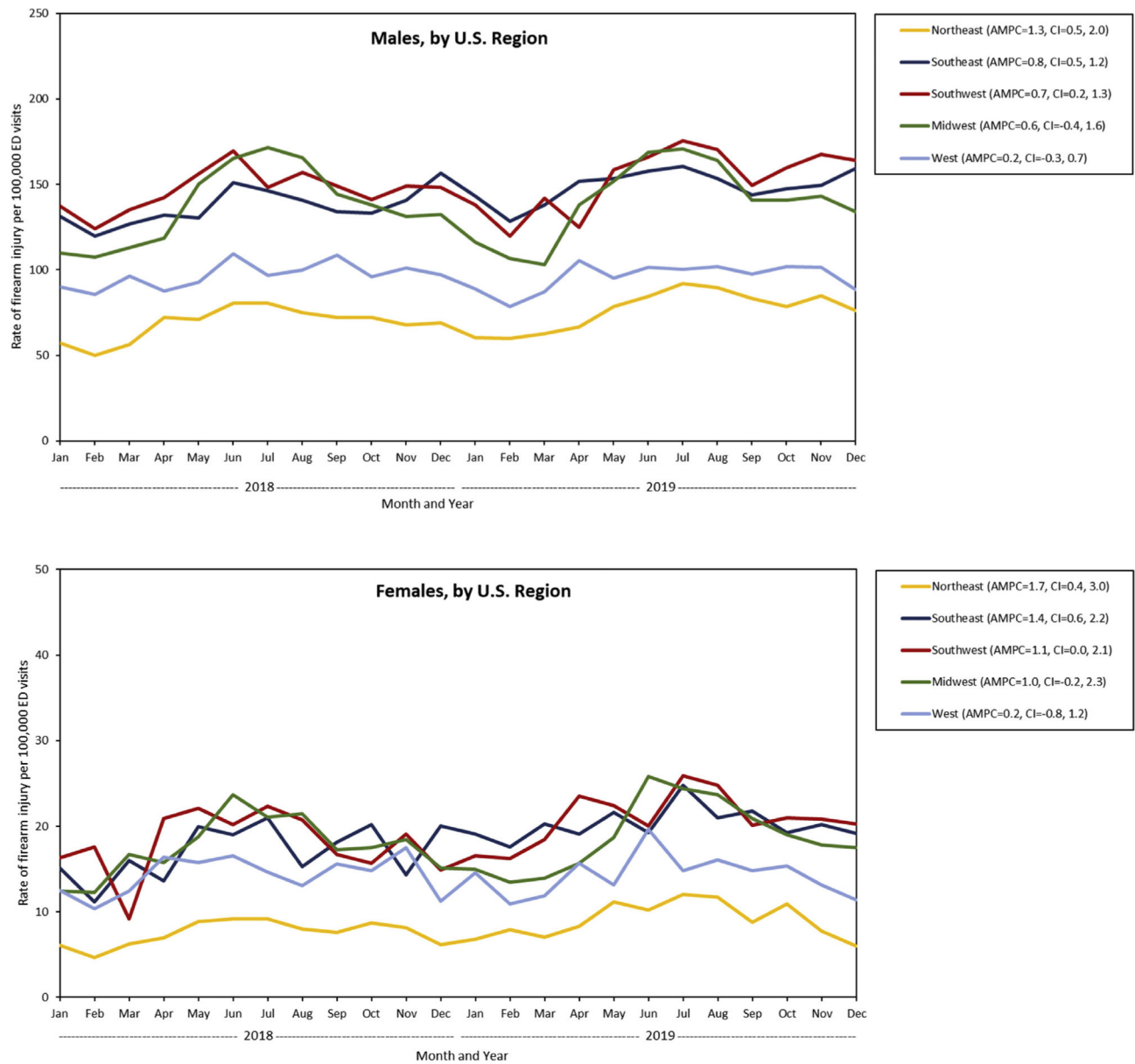
Figure 2.
Monthly rate of ED visits per 100,000 ED visits related to a firearm injury by sex and US region—NSSP, United States, between January 1, 2018, and December 31, 2019. The monthly rate is calculated as ED visits involving a firearm injury divided by the total ED visits, multiplied by 100,000. Joinpoint reports average annual percent change, but the unit of time for this analysis is 1 month; thus, this has been modified to average monthly percent change or AMPC. Data current as of October 23, 2020, representing data from participating EDs in the NSSP, where the coverage was 53.9% and 62.4% of ED visits in 2018 in 2019, respectively, in the United States.

Table.

Discharge diagnosis codes, chief complaint search terms, and negations included in the CDC's firearm injury syndrome definition.

Variable	Specific Codes or Terms
Inclusions	
Discharge diagnosis - ICD-9-CM[*]	E922 (.0-.3, .8-.9) Accident cause by firearm
	E955 (.0-.4, .9) Suicide and self-inflicted injury by firearms
	E965 (.0-.4) Assault by firearms
	E970 Injury due to legal intervention by firearms
	E979.4 Terrorism involving firearms
	E985 (.0-.4) Injury by firearms, undetermined intent
Discharge diagnosis - ICD-10-CM Unintentional firearm injuries	W32 Accidental handgun discharge and malfunction
	• W32.0 Accidental handgun discharge
	• W32.1 Accidental handgun malfunction
	W33 Accidental rifle, shotgun, and larger firearm discharge and malfunction
	W33.0 Accidental rifle, shotgun, and larger firearm discharge
	• W33.00 Accidental discharge of unspecified larger firearm
	• W33.01 Accidental discharge of shotgun
	• W33.02 Accidental discharge of hunting rifle
	• W33.03 Accidental discharge of machine gun
	• W33.09 Accidental discharge of other larger firearm
	W33.1 Accidental rifle, shotgun, and larger firearm malfunction
	• W33.10 Accidental malfunction of unspecified larger firearm
	• W33.11 Accidental malfunction of shotgun
	• W33.12 Accidental malfunction of hunting rifle
	• W33.13 Accidental malfunction of machine gun
	• W33.19 Accidental malfunction of other larger firearm
	W34 Accidental discharge and malfunction from other and unspecified firearms and guns
	• W34.0 Accidental discharge from other and unspecified firearms and guns
	• W34.00 Accidental discharge from unspecified firearms or gun

Variable	Specific Codes or Terms
	• W34.09 Accidental discharge from other specified firearms
	W34.1 Accidental malfunction from other and unspecified firearms and guns
	• W34.10 Accidental malfunction from unspecified firearms or gun
	• W34.19 Accidental malfunction from other specified firearms
Discharge diagnosis - ICD-10-CM Intentional firearm injury	X72 Intentional self-harm by handgun discharge
	X73 Intentional self-harm by rifle, shotgun, and larger firearm discharge
	• X73.0 Intentional self-harm by shotgun discharge
	• X73.1 Intentional self-harm by hunting rifle discharge
	• X73.2 Intentional self-harm by machine gun discharge
	• X73.8 Intentional self-harm by other larger firearm discharge
	• X73.9 Intentional self-harm by unspecified larger firearm discharge
	X74 Intentional self-harm by other and unspecified firearm and gun discharge
	• X74.8 Intentional self-harm by other firearm discharge
	• X74.9 Intentional self-harm by unspecified firearm discharge
Discharge diagnosis - ICD-10-CM Assault due to firearm injury	X93 Assault by handgun discharge
	X94 Assault by rifle, shotgun and larger firearm discharge
	• X94.0 Assault by shotgun
	• X94.1 Assault by hunting rifle
	• X94.2 Assault by machine gun
	• X94.8 Assault by other larger firearm discharge
	• X94.9 Assault by unspecified larger firearm discharge
	X95 Assault by other and unspecified firearm and gun discharge
	• X95.8 Assault by other firearm discharge
	• X95.9 Assault by unspecified firearm discharge
Discharge diagnosis - ICD-10-CM Undetermined intent	Y22 Handgun discharge, undetermined intent
	Y23 Rifle, shotgun, and larger firearm discharge, undetermined intent
	• Y23.0 Shotgun discharge, undetermined intent
	• Y23.1 Hunting rifle discharge, undetermined intent

Variable	Specific Codes or Terms
	• Y23.2 Military firearm discharge, undetermined intent
	• Y23.3 Machine gun discharge, undetermined intent
	• Y23.8 Other larger firearm discharge, undetermined intent
	• Y23.9 Unspecified larger firearm discharge, undetermined intent
	Y24 Other and unspecified firearm discharge, undetermined intent
	• Y24.8 Other firearm discharge, undetermined intent
	• Y24.9 Unspecified firearm discharge, undetermined intent
Discharge diagnosis - ICD-10-CM Legal intervention	Y35.0 Legal intervention involving firearm discharge
	Y35.00 Legal intervention involving unspecified firearm discharge
	• Y35.001 Legal intervention involving unspecified firearm discharge, law enforcement official injured
	• Y35.002 Legal intervention involving unspecified firearm discharge, bystander injured
	• Y35.003 Legal intervention involving unspecified firearm discharge, suspect injured
	Y35.01 Legal intervention involving injury by machine gun
	• Y35.011 Legal intervention involving injury by machine gun, law enforcement official injured
	• Y35.012 Legal intervention involving injury by machine gun, bystander injured
	• Y35.013 Legal intervention involving injury by machine gun, suspect injured
	Y35.02 Legal intervention involving injury by handgun
	• Y35.021 Legal intervention involving injury by handgun, law enforcement official injured
	• Y35.022 Legal intervention involving injury by handgun, bystander injured
	• Y35.023 Legal intervention involving injury by handgun, suspect injured
	Y35.09 Legal intervention involving other firearm discharge
	• Y35.091 Legal intervention involving other firearm discharge, law enforcement official injured
	• Y35.092 Legal intervention involving other firearm discharge, bystander injured
	• Y35.093 Legal intervention involving other firearm discharge, suspect injured
Discharge diagnosis - ICD-10-CM Terrorism	Y38.4 Terrorism involving firearms
	Y38.4X Terrorism involving firearms
	• Y38.4X1 Terrorism involving firearms, public safety official injured
	• Y38.4X2 Terrorism involving firearms, civilian injured

Variable	Specific Codes or Terms
SNOMED	• Y38.4X3 Terrorism involving firearms, terrorist injured
	41430008, 56768003, 63409001, 69861004, 77301004, 86122002, 111050005, 219257002, 283545005, 218081007, 218086002, 218082000, 218087006, 218088001, 269796009, 24289008, 219199009, 219200007, 219201006, 219204003, 219205002, 219203009, 219198001, 219142001, 219143006, 219144000, 219145004, 219146003, 287184008, 287193009
Chief complaint	GSW
	Gunshot (and common spellings and misspellings)
	Buckshot
	Revolver
	Rifle
	Shotgun
	Firearm
	Pistol
	Handgun
	Been shot
	I was shot
	I got shot
	Combination of hit, ricochet, graze with bullet
	Gun and wound
Exclusions	
Discharge diagnosis	Z51.89 or Z5189
	Encounter for other specified after care
Chief complaint	No gun
	Remove gun
	Heard or hearing gun
	Hit head
	Kickback
	Water gun
	Pellet
	BB gun (and common spellings and misspellings)
	Rubber bullet
	Paint ball gun
	Nerf gun

Variable	Specific Codes or Terms
	Air gun
	Spring gun
	Pistol whip
	Nail gun
	Staple gun
	Stun, laser, or Taser gun
	Struck or hit with, in combination with gun or pistol
	Bloodshot
	Scope
	Fake
	Allergy shot
	Injection
	Follow up Chronic
	Wound check, care, recheck, or infection
	Drainage
	Gswel or Gswol
	GSW, gunshot, or bullet and history, ago, past, prior, previous, or old

SNOMED, Systematized Nomenclature of Medicine.

*
The definition includes ICD-9-CM discharge diagnosis codes, despite the transition of codes on October 1, 2015, to account for any facilities or hospital systems that continued to utilize ICD-9-CM codes.