

CDC Firearm Injury v2
Definition Factsheet & Technical Brief

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Definition Description: The aim of this syndrome definition is to assist with rapid detection of potential initial visits for a firearm injury. The following injury intents due to firearms are included in this definition: unintentional, intentional self-directed, assault, undetermined intent, legal intervention, and terrorism. The definition aims to capture only initial encounters for a firearm injury and negate subsequent encounters or sequelae.

New or Revised Definition: Revision of CDC Firearm Injury v1

Date Added to ESSENCE: October 2020

Use-Cases for Definition:

Case-finding: Not Intended as Use Case

Trend monitoring: Primary

Early outbreak detection: Not Intended as Use Case

Emergent Condition: Not Intended as Use Case

Justification: Created and revised by partners in the CDC's National Center for Injury Prevention and Control (NCIPC) to support national, state, and jurisdiction-level querying of emergency department (ED) visits captured by the National Syndromic Surveillance Program to identify those visits related to an initial encounter of a firearm injury, including the following types: unintentional, intentional self-directed, assault, legal intervention, terrorism, and undetermined intent.

In this updated definition, Firearm Injury V2 has 1) updated ICD-9 and ICD-10 diagnosis codes (with and without decimals); 2) updated SNOMED diagnosis codes; and 3) added more free text terms (e.g. struck or hit). This definition was developed in part to support CDC's Firearm Injury Surveillance Through Emergency Rooms (FASTER) program, which encompasses two funding initiatives:

- The FASTER initiative was funded in 2020 and collected near real-time ED data on firearm injuries in 10 states and was funded 9/1/2020 – 8/31/2023.
- The FASTER: Advancing Violence Epidemiology in Real-Time (FASTER: AVERT) initiative was funded in 2023 to collect near real-time ED data on firearm injuries, other violence-related injuries, and mental health conditions in 12 states for 5 years from 9/1/2023 – 8/31/2028.

Data Source During Development: CDC staff utilized emergency room data included in the Chief Complaint Query Validation (CCQV) datasource to evaluate individual chief complaint text terms in the CCQV dataset.

Validation Methods: The query for this syndrome definition was developed in an iterative manner by CDC staff with backgrounds in violence and injury surveillance. Previous versions of the definition were developed in collaboration with local and state health departments who conducted manual visit-level reviews, and CDC also conducted systematic text mining and implemented machine learning approaches to identify inclusion and exclusion terms to query chief complaint text.

Limitations: This definition captures firearm injuries of all intents and does not differentiate firearm injuries by intent type. The definition 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.

Definition Fields and Structure: Both discharge diagnosis codes (ICD-9-CM, ICD-10-CM, and SNOMED codes) and chief complaint free text with exclusions are used in the definition. If discharge diagnosis codes indicate a firearm injury in the diagnosis field, the ED visit is automatically included in the query result. When discharge diagnosis code information is not available, the ED visit is only included if the chief complaint text has a firearm injury-related term. In addition, the exclusions are only applied to the chief complaint text when a discharge diagnosis code is not present.

Detailed Definition Components

Table 1. Inclusion and exclusion terms included in the CDC Firearm Injury v1 definition.

Terms	Description
<i>Inclusion</i>	
International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)	
E922.0	Accident caused by handgun
E922.1	Accident caused by shotgun (automatic)
E922.2	Accident caused by hunting rifle
E922.3	Accident caused by military firearms
E922.8	Accident caused by other specified firearm missile
E922.9	Accident caused by unspecified firearm missile
E955.0	Suicide and self-inflicted injury by handgun
E955.1	Suicide and self-inflicted injury by shotgun
E955.2	Suicide and self-inflicted injury by hunting rifle
E955.3	Suicide and self-inflicted injury by military firearms
E955.4	Suicide and self-inflicted injury by other and unspecified firearm
E955.9	Suicide and self-inflicted injury by firearms and explosives, unspecified
E965.0	Assault by handgun
E965.1	Assault by shotgun
E965.2	Assault by hunting rifle
E965.3	Assault by military firearms
E965.4	Assault by other and unspecified firearm
E970	Injury due to legal intervention by firearms
E979.4	Terrorism involving firearms
E985.0	Injury by handgun, undetermined whether accidentally or purposely inflicted
E985.1	Injury by shotgun, undetermined whether accidentally or purposely inflicted
E985.2	Injury by hunting rifle, undetermined whether accidentally or purposely inflicted
E985.3	Injury by military firearms, undetermined whether accidentally or purposely inflicted
E985.4	Injury by other and unspecified firearm, undetermined whether accidentally or purposely inflicted
International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM)	
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
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

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
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
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
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
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
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
Y38.4X3	Terrorism involving firearms, terrorist injured

SNOMED Concepts	
41430008	Shotgun slug, device
56768003	Blunt instrument, device
63409001	Large caliber firearm, device
69861004	Cutlass, device
77301004	Machine gun, device
86122002	Ballistic missile, device
111050005	Spinal manipulation, procedure
219257002	Burns, second degree, disorder
283545005	Rapid eye movement sleep abnormal, finding
218081007	Firearm discharge, finding
218086002	Firearm wound, finding
218082000	Intentional firearm discharge, finding
218087006	Self-inflicted firearm wound, finding
218088001	Accidental firearm wound, finding
269796009	Firearm-related death, finding
242869008	Small firearm, device
219199009	Assault by blunt instrument, event
219200007	Firearm wound, finding
219201006	Firearm wound, intentional self-harm, finding
219204003	Firearm wound, accidental, finding
219205002	Firearm wound, undetermined intent, finding
219203009	Firearm wound, discharge, finding
219198001	Firearm wound, discharge, finding
219142001	Shooting with firearm, event
219143006	Homicide by firearm, event
219144000	Attempted homicide by firearm, event
219145004	Suicide by firearm, event
219146003	Attempted suicide by firearm, event
287184008	Gunshot wound of head, disorder
287193009	Gunshot wound of chest, disorder
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	

Exclusion	
International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM)	
Z51.89	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	
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	

Table 2. ESSENCE syntax, CDC Firearm Injury v2.

(, (^;/]W3[23]^, andnot, (^;/]W3[23]___[DS]^, or, (^;/]W3[23]___[DS]^,), or, (^;/]W34[01][09]^, or, (^;/]W34.[01][09]^,), andnot, (^;/]W34[01][09]___[DS]^, or, (^;/]W34.[01][09]___[DS]^,), or, (^;/]X7[23]^, andnot, (^;/]X7[23]___[DS]^, or, (^;/]X7[23]___[DS]^,), or, (^;/]X74[89]^, or, (^;/]X74.[89]^,), andnot, (^;/]X74[89]___[DS]^, or, (^;/]X74.[89]___[DS]^,), or, (^;/]X9[34]^, andnot, (^;/]X9[34]___[DS]^, or, (^;/]X9[34]___[DS]^,), or, (^;/]X95[89]^, or, (^;/]X95.[89]^,), andnot, (^;/]X95[89]___[DS]^, or, (^;/]X95.[89]___[DS]^,), or, (^;/]Y2[2-3]^, andnot, (^;/]Y2[2-3]___[DS]^, or, (^;/]Y2[2-3]___[DS]^,), or, (^;/]Y24[89]^, or, (^;/]Y24.[89]^,), andnot, (^;/]Y24[89]___[DS]^, or, (^;/]Y24.[89]___[DS]^,), or, (^;/]Y350[0129]^, andnot, (^;/]Y350[0129]___[DS]^, or, (^;/]Y35.0[0129]^, andnot, (^;/]Y35.0[0129]___[DS]^,), or, (^;/]Y38.4^, andnot, (^;/]Y38.4___[DS]^, or, (^;/]Y384^, andnot, (^;/]Y384___[DS]^,), or, (^;/]E922.[012389]^, or, (^;/]E922[012389]^, or, (^;/]E955.[012349]^, or, (^;/]E955[012349]^, or, (^;/]E965.[01234]^, or, (^;/]E965[01234]^, or, (^;/]E970^, or, (^;/]E979.4^, or, (^;/]E9794^, or, (^;/]E985.[01234]^, or, (^;/]E985[01234]^, or, (^;/]41430008^, or, (^;/]56768003^, or, (^;/]63409001^, or, (^;/]69861004^, or, (^;/]77301004^, or, (^;/]86122002^, or, (^;/]111050005^, or, (^;/]219257002^, or, (^;/]283545005^, or, (^;/]218081007^, or, (^;/]218086002^, or, (^;/]218082000^, or, (^;/]218087006^, or, (^;/]218088001^, or, (^;/]269796009^, or, (^;/]242869008^, or, (^;/]219199009^, or, (^;/]219200007^, or, (^;/]219201006^, or, (^;/]219204003^, or, (^;/]219205002^, or, (^;/]219203009^, or, (^;/]219198001^, or, (^;/]219142001^, or, (^;/]219143006^, or, (^;/]219144000^, or, (^;/]219145004^, or, (^;/]219146003^, or, (^;/]287184008^, or, (^;/]287193009^,), or, (, (!gsw!, or, ^gunshot^, or, ^gunshot^, or, ^gunshout^, or, ^gunshoot^, or, ^buckshot^, or, ^buckshot^, or, ^revolver^, or, ^rifle^, or, ^rifle^, or, ^shotgun^, or, ^shotgun^, or, ^firearm^, or, ^firearm^, or, ^pistol^, or, ^handgun^, or, ^handgun^, or, ^been shot^, or, ^I was shot^, or, ^I got shot^, or, (, (^hit^, or, ^ricochet^, or, ^graze^,), and, (^bullet^,), or, (^gun^, and, ^wound^,), andnot, (^no gun^, or, ^remove gun^, or, ^heard gun^, or, ^hearing gun^, or, ^hit head^, or, ^hit my head^, or, ^kickback^, or, ^kickback^, or, ^kicked back^, or, ^water gun^, or, ^watergun^, or, ^pelle^, or, ^pellt^, or, ^bb ^, or, ^bebe gun^, or, ^bbgun^, or, ^bbgun^, or, ^b b gun^, or, ^bibi gun^, or, ^bi bi gun^, or, ^bb pellet^, or, ^bee bee^, or, ^beebe^, or, ^rubber bullet^, or, ^paint^, or, ^nerf^, or, ^nurf^, or, ^airgun^, or, ^airgun^, or, ^airsoft^, or, ^airsoft^, or, ^spring^, or, ^pistol whip^, or, ^pistol whipped^, or, ^pistol whipping^, or, (^nail^, andnot, ^damage to nail^,), or, ^nailgun^, or, ^nailgun^, or, ^staplegun^, or, ^staple gun^, or, ^stun^, or, ^ta[sz]er^, or, ^la[sz]er^, or, (^struck^, or, ^hit with^,), and, (^gun^, or, ^pistol^,), or, ^bloodshot^, or, ^blood shot^, or, ^scope^, or, ^fake^, or, ^allergy shot^, or, ^injection^, or, ^follow-up^, or, ^follow up^, or, ^followup^, or, ^chronic^, or, (^wound^, and, (^check^, or, ^care^, or, ^recheck^, or, ^infection^, or, ^infected^,),), or, ^drainage^, or, ^gswel^, or, ^gswol^, or, (, (!gsw!, or, ^gunshot^, or, ^gunshot^, or, ^bullet^,), and, (^hx^, or, ^history^, or, ^history of^, or, (^ago^, andnot, ^minutes ago^,), or, ^past^, or, ^prior^, or, ^previous^, or, ^old^,),), or, (^;/]Z51.89^, or, (^;/]Z5189^,),)