CSTE

Council of State
and Territorial
Epidemiologists

Guidance on Understanding Injury and Violence Topics in Syndromic Surveillance - Interim

Guidance on Understanding Injury and Violence Topics in Syndromic Surveillance

Table of Contents

Overview

This section covers suggested best practices, resources, and known limitations of using syndromic surveillance (SyS) data for injury and violence epidemiology in state, tribal, local, and territorial public health (STLT) settings. It is intended to support the analytic work of injury and violence epidemiologists who are not primarily SyS experts but who wish to learn more about how to incorporate SyS data into their work. While more complete information is available in other document sections about the basics of SyS data, this section adds context specific to querying injury and violence-related syndromic data, based on lessons learned to date from applied epidemiologists.

Background

Syndromic data are routinely used by STLT departments to monitor for early signals of communicable disease outbreaks, and over the last decade strong interest has emerged in using syndromic data to detect unusual changes in levels of injury and violence-related emergency department (ED) and urgent care (UC) visits in near real time. Syndromic systems' ability to rapidly provide information about emerging health issues offers significant opportunities for community-level injury prevention and control. However, it is crucial for injury and violence epidemiologists to understand the strengths and limitations of this data to effectively use and share it with both internal and external partners.

While SyS data can provide rapid notice of emerging public health issues, these data systems may not be the best sources for some types of injury surveillance. Most STLT injury and violence epidemiologists have access to reliable, standardized methods of assessing injury incidence in their jurisdictions through multiple other sources, including death certificates, inpatient discharge data, and emergency department discharge data; however, there is substantial latency in most of these data as compared to near real-time SyS data. For example, in partnership with the Centers for Disease Control and Prevention (CDC), the Council of State and Territorial Epidemiologists (CSTE) hosts a core set of analytic methods resources for ICD 10-CM based injury surveillance in their online injury surveillance toolkit [https://injurytoolkit.cste.org/].

The current document specifically addresses potential information and guidance needs for injury and violence epidemiologists adapting to the use of SyS data in their injury and violence data monitoring workflows, and should be considered alongside other documentation from CDC, CSTE, and STLT health departments on best practices for SyS and injury and violence surveillance.

This section will exclude information on drug overdoses, as a separate guidance section dedicated to overdose surveillance using SyS data exists. Drug overdoses are episodes of injuries and violence, however, and STLT injury and violence epidemiologists may find that additional section particularly useful.

Terminology Note

Some sources use the term "injury" to encompass both unintentional and intentional injuries. Unintentional injuries are also called "accidents," while intentional injuries are called "violence." To ensure clarity in this document, "injuries and violence" will be used to collectively refer to both categories. Specific terms such as "violence," "suicide/self-harm," "homicide/assault," or "legal intervention" will be used to detail more specific categories of intentional injuries when needed, while "unintentional injury" will be used for accidental injuries.

Chief Complaints, Discharge Diagnoses and External Causes in SyS Data

SyS queries may search for the condition of interest in either the chief complaint field, other free text fields such as triage notes (if available), discharge diagnosis fields, or in all the above, depending on how the syndrome has been defined. Chief complaints are intended to be verbatim statements from the patient about the health concern for which they are seeking care, however in practice this is not always the case. For example, patients who present in the ED unconscious may have chief complaint documented by another party. It is thus less likely that these blocks of text will include medical jargon, or the standardized terms commonly used to describe injuries and violence by epidemiologists. For example, a query for a motor vehicle traffic injury might look for terms such as “wreck”, “crash”, “car”, or “accident” in this field. When testing the quality of an existing injury and violence chief complaint query in your jurisdiction, reviewing the text content of a sample of chief complaints identified as meeting the syndrome definition and a matched pool of those that do not, to look for additional words and phrases that the existing query misses, may help validate that query or suggest methods of amending it in partnership with your agency’s SyS staff.

In contrast, searching in discharge diagnosis fields for injuries and violence requires using ICD 10-CM or SNOMED codes based on existing injury definitions commonly used in analyses of ED discharge or inpatient discharge data. While those code definitions are familiar to STLT injury and violence epidemiologists, it is important to note that some of these definitions contain dozens or even hundreds of distinct ICD 10-CM or SNOMED codes. Additionally, injury and violence epidemiologists must consider both injury and violence diagnosis codes (ICD 10-CM chapters S and T, as well as some O and M codes) to define the body region and nature of injury (e.g. S82.252A: Displaced comminuted fracture of shaft of left tibia, initial encounter for closed fracture), as well as external cause codes (ICD 10-CM chapters V, W, X, and Y, as well as some T codes) to define injury intent and mechanism (e.g. W00.1XXA: Fall from stairs and steps due to ice and snow, initial encounter). This need for a more expansive set of codes to properly define injuries and violence stands apart from other disciplines in epidemiology utilizing discharge diagnoses in SyS queries.

Specific Considerations for SyS and Injury and Violence Epidemiology

When using SyS data for injury and violence surveillance, it is important to consider all data sources available to your program and align the use of SyS data with situations where it is most effective. These may include:

1. **Assessing SyS data during or after a known large event or disaster scenario**, such as a mass gathering, flood, or wildfire, to monitor for injuries/violence.
2. **Using SyS data for rapid situational responses,** where the imprecision of SyS data does not critically affect health outcomes because other resources and data sources are available to confirm cases and address resource needs, such as in an identified public health emergency.
3. **Sharing SyS data primarily with internal partners**, who are more likely to understand limitations of SyS and can appropriately interpret or use data to make public health decisions. This may involve different formats and communication methods than those used with external partners. For example, presentations of SyS data to community members may use simple visuals to highlight trends and patterns and downplay the use of specific case counts. Note that these presentation approaches are also good practice for internal partners, and epidemiologists should not assume that internal audiences fully understand SyS data or more complex presentations of epidemiologic data. Scaling the format, style, and content of data presentations to the audience is always recommended.
4. **Prioritizing the use of injury SyS data where your agency, locality and partners have sufficient resources** to respond or otherwise act. For example, if a well-established community coalition has an active initiative to address gun violence and the necessary resources and funding to act, offering the near real-time data from SyS on gun violence, even if it is more imprecise, may be valuable to the coalition.
5. **Responding to SyS alerts for injury and violence events conservatively**, to avoid 'alert fatigue' especially when there is no immediate action that can be taken to address a potential cluster. This is particularly relevant when available resources do not allow for immediate intervention or when no clear action is obvious. An example would be data from SyS on unintentional falls. While preventing unintentional falls is a high priority, particularly among community coalitions working with the elderly, it is not obvious that near real-time data from SyS would help identify solutions that more established sources, such as ED or inpatient discharge, could not.

SyS Data Sources and Limitations

While jurisdictions often substantially differ in the number and types of facilities reporting to the jurisdiction's SyS system, these systems include data from ED and UC centers, with most providing data at a near real-time cadence. Some jurisdictions may also have data from outpatient providers, clinical laboratories, and potentially mortality data provided by their state's vital records submissions to the National Association of Public Health Statistics and Information Systems (NAPHSIS). For more information on SyS data sources, please review [Section X] of this guide. For a more complete assessment of what your own jurisdiction's SyS data contains, please reach out to your main agency SyS epidemiology contact or site administrator.

Apart from what has already been documented elsewhere in this document, we note the following limitations of SyS data that are specific to epidemiology surveillance for injuries and violence:

- **Billable vs. Nonbillable Injury and Violence ICD 10-CM Codes –** While ICD 10-CM codes exist for a wide range of factors and circumstances to describe injuries and violence in clinical data, many of these codes may not be "billable", meaning that while their use may be encouraged, by themselves they could not be used to bill for care. In particular, clinical codes that are critical to understanding injuries and violence, specifically external cause codes, are not billable themselves and their inclusion in discharge data is known to vary by jurisdiction. While epidemiologists working with ICD 10-CM coded data need to understand that clinical codes present in surveillance data are often determined by facility billing and documentation practices, external cause coding issues are so critical to injury and violence epidemiology that we recommend familiarizing yourself with issues pertaining to how these codes are used to describe intent and mechanism of injury before proceeding with SyS query development and interpretation in this area.

- **Reporting Facility Type** – While all SyS data systems draw from similar pools of state and local data, each jurisdiction has its own mix of data sources reporting into the system, such as EMS, ED, UC, etc. This mix of data sources may influence the types of injuries reported, as severity of injury does strongly determine the level of care sought for injuries. For example, minor injuries often are not treated in a medical setting at all and only receive home care, while gunshot or knife wounds would be more frequently treated in an emergency department in all cases. Facilities with Level 1 Trauma Centers will also draw more complex and severe injury cases by design. Data completeness also may vary by facility type. While SyS systems have leveraged ED data for an extended period of time and ED record data is known to be more complete in SyS, UC data may be less complete in your jurisdiction's SyS feeds. You may wish to filter out UC record data if you can see large differences in data quality for injury and violence reporting.

- **Geographic Disparity** – Geographic differences in the location of ED and UC centers are important when assessing how well SyS data in your jurisdiction capture information about injuries and violence. If your jurisdiction borders one with more healthcare resources, an ED sits close to a jurisdictional border, or the closest Level 1 Trauma Center lies outside of your jurisdiction, then trends in frequency and types of injury and violence cases you can find may vary widely. If your jurisdiction has compacts with closely neighboring jurisdictions to report all resident cases back to your jurisdiction's SyS data, this issue may be partly or wholly mitigated. Another geographic consideration is the location of common injury and violence hazards (e.g., bodies of water, weather extremes, specific industries and/or recreational activities, dominant transportation forms, distance to work/home/care, tall bridges, etc.) in your area relative to others nearby. Applying what your injury and violence surveillance program already knows about such geographic hazards to SyS data as you begin to assess SyS data quality may help you interpret patterns and trends more effectively. Consider also whether you should present injury and violence SyS data by the locality of the reporting facility or by locality of residence, as choosing one method over another could change how the data are presented or interpreted.

There are also known issues related to completeness of medical coding specific to injuries and violence that also apply to SyS data. We list them here as a reminder, as STLT injury and violence epidemiologists may already be familiar with these issues from work with inpatient and ED discharge data:

- **Place of Occurrence Codes** – The ICD 10-CM allow for supplemental documentation of the place of injury occurrence using a special group of external cause codes beginning with the digits "Y92" and extending to six total digits (disregarding the decimal between third and fourth digits). ICD 10-CM standardized coding guidance notes: "The following category is for use, when relevant, to identify the place of occurrence of the external cause. Use in conjunction with an activity code. Place of occurrence should be recorded only at the initial encounter for treatment," (https://www.icd10data.com/ICD10CM/Codes/V00-Y99/Y90-Y99/Y92-). However, the use of these codes is not mandated by the coding standard, and it is expected that these codes may be absent or incomplete in SyS data.

- **Activity Codes** – ICD 10-CM codes beginning with "Y93" and extending to four total digits (disregarding the decimal) are designated for information about the activity the person was engaged in at the time of injury. Standard guidance notes the following about the usage of these codes: "Category Y93 is provided for use to indicate the activity of the person seeking healthcare for an injury or health condition, such as a heart attack while shoveling snow, which resulted from, or was contributed to, by the activity. These codes are appropriate for use for both acute injuries, such as those from chapter 19, and conditions that are due to the long-term, cumulative effects of an activity, such as those from chapter 13. They are also appropriate for use with external cause codes for cause and intent if identifying the activity provides additional information on the event. These codes should be used in conjunction with codes for external cause status Y99 and place of occurrence Y92," (https://www.icd10data.com/ICD10CM/Codes/V00-Y99/Y90-Y99/Y93-). As with place of occurrence codes, use of the activity codes is not mandated, and reporting of these codes in SyS data may be incomplete at best.

- **External Cause Status Codes** – Codes beginning with "V99", with a fourth digit extension excluding the decimal, are available in the ICD 10-CM guidance for recording whether the person injured was engaged in volunteer, military, or civilian activity for pay. Instructions for use stipulate that, "a single code from category Y99 should be used in conjunction with the external cause code(s) assigned to a record to indicate the status of the person at the time the event occurred," (https://www.icd10data.com/ICD10CM/Codes/V00-Y99/Y90-Y99/Y99-). As with activity codes and place of occurrence codes, we expect the use of these codes to be rare in SyS data.

- **Intent or Manner of Injury** – One critical area of injury and violence data reporting that may be harder to assess in SyS data is the intent or manner of injury. This information, specifically encoded in ICD 10-CM external cause codes, is central to the practice of injury and violence surveillance, as this data point indicates whether the injury was intentional or unintentional, allowing us to distinguish between, for example, unintentional falls and cases where someone fell because they were pushed intentionally (i.e. an assault). While this information may be available at time of discharge and

potentially coded in ED discharge data available in your jurisdiction's SyS data, it may be missing at time of admission from documentation such as the chief complaint as it was hard to determine in that care setting or incompletely coded in the record. While distinctive terms for interpersonal violence, such as "assault," "attack," and "fight" or the use of the term "accident" for unintentional injuries would stand out in chief complaints and appear more definitive, the complexity of determining injury intent in UC and ED care settings mean that SyS data on injury intent should be interpreted and presented with caution. In a more complex example, chief complaint text and external cause codes often do flag records indicating self-harm injuries, but we cannot assume that this is the same as having suicidal intent.

- **Perpetrator Codes** – ICD 10-CM makes the external cause codes beginning with "Y07" and extending out to six total potential digits (disregarding the decimal) available for use to describe in more detail the perpetrator of the violent injury. However, the standardized coding guidance also notes that, "Codes from this category are for use only in cases of confirmed abuse (T74.-). Selection of the correct perpetrator code is based on the relationship between the perpetrator and the victim," (https://www.icd10data.com/ICD10CM/Codes/V00-Y99/X92-Y09/Y07-). While external partners may be interested in having real-time data about trends in violent victimization by perpetrator (e.g., child abuse perpetrated by parents or legal guardians, sexual violence perpetrated by intimate partners), these codes are known to be used inconsistently in discharge data. In ED and UC settings particularly, the perpetrator may be unknown or undisclosed for many violence-related injuries. Stigma around reporting specific types of injuries does suppress case reporting in hospital data, and therefore also may in SyS data. Identifying perpetrator types by leveraging these ICD 10-CM codes is not recommended with SyS data.

- **Injury Severity** – While multiple methods exist for categorizing injury and violence severity using clinical injury diagnosis codes, this is not an area where SyS data would be useful, given the other limitations noted above.

Potential Methods of Judging SyS Data Quality for Injuries and Violence

The list below contains suggested methods of reviewing injury and violence data quality issues that may impact your jurisdiction's SyS data. This list is not exhaustive, and we encourage jurisdictions to collaborate on approaches to SyS data quality assessment and share them with the CSTE Injury Surveillance Workgroup so that approaches can be further validated and refined over time.

1. **Work from what you already know** to be true about ED and inpatient discharge data quality issues in your area and build onto that knowledge through small analyses and comparisons.
2. **Review the Wisconsin evaluation report** comparing ED discharge and SyS data (https://cdn.ymaws.com/www.cste.org/resource/resmgr/injury/Wisconsin_Evaluation_of_the_.pdf) and replicate some or all these data quality assessments with your own jurisdiction's data.
3. **Cross-compare SyS query results** with ED discharge data and other established sources of information about selected types of injuries and violence that you expect to be highly accurate in this care setting (e.g., gunshot wounds, motor vehicle crashes).

4. **Work with your agency's SyS experts** to find out what they have already learned about limitations and quality of SyS data in your jurisdiction and any routines they have for assessing and mitigating these. Knowledge and experience they have already documented can shorten the amount of time it takes for injury and violence epidemiology staff to become proficient in the use of SyS data.
5. **Routinely assess how queries are performing and adjust as needed** to add new keywords or clinical codes that have emerged and remove old keywords or clinical codes that appear to not yield robust data.
6. **Keep in active contact with agency SyS data experts** to learn about potential facility onboarding or access issues as quickly as possible. Also consider whether you can attend any training or recurring SyS methods meetings your jurisdiction may have. Even if the content focuses mostly on communicable disease, the cross-collaboration may generate innovative ideas about working with SyS that you can apply to your own work in injury and violence.
7. **For specific topics of high interest**, consider whether a local ED or trauma center may wish to partner on a comparison of SyS data to medical chart data from their facility for the same period using standardized case definitions to try to isolate data reporting differences and better understand them.
8. **Document what you learn** as you assess SyS data quality for injuries and violence and look for opportunities to share this information through workgroup calls, multi-jurisdictional partnerships, and CSTE conference sessions so that every jurisdiction does not have to start at the beginning.

Common SyS Injury and Violence Syndrome Definitions

For each syndrome definition below, we also provide suggestions on key populations or other meaningful considerations that potentially affect your surveillance work, as well as any major caveats unique to the type of injury. As many of the syndrome definitions are too complex to list in this text, we have linked to available resources online for previously developed and validated queries.

STLT monitoring of injury-related data and trends should be tied closely to any jurisdictional requirements for case reporting, as well as metrics routinely collected for federal, state, and local funders. For example, some states may list gun violence among its "reportable conditions" in state code.

Cross-cutting Areas

The following topics are relevant to injury and violence epidemiologists but are more thoroughly covered in other sections of this guide:

- **Adverse Childhood Experiences (ACEs):** refer to guidance in ACEs section of this document.
- **Weather-related Injuries and Natural Disasters:** refer to guidance in disaster epidemiology section of this document.
- **Heat and Cold Injuries:** refer to guidance in environmental epidemiology section of this document.
- **Toxic Substance Exposures/Poisoning (i.e., Non-drug Poisoning):** refer to guidance in the environmental epidemiology section of this document.

Notes on Syndrome Definitions Currently Available

All syndrome definitions and guidance linked to below come from the National Syndromic Surveillance Program Community of Practice Knowledge Repository (NSSP CoP KR) https://knowledgerepository.syndromicsurveillance.org/). These materials have been submitted to the repository by STLT SyS practitioners, as well as CDC. Updates to existing queries as well as new queries for injuries and violence are expected over time, and programs should read the accompanying guidance and work to validate the query on their jurisdiction's SyS data before fully implementing.

Transportation-Related Notes

The NSSP CoP KR contains five transportation-related SyS queries, including one specific to motor vehicle traffic (MVT) occupant injuries (https://knowledgerepository.syndromicsurveillance.org/cdc-motor-vehicle-crash-occupant-injury-v1), one for MVT pedestrian injuries (https://knowledgerepository.syndromicsurveillance.org/cdc-pedestrian-motor-vehicle-traffic-injury-v1), two versions of a query that captures all MVT-related injuries (https://knowledgerepository.syndromicsurveillance.org/all-traffic-related-washington-state-department-health-2018, https://knowledgerepository.syndromicsurveillance.org/all-traffic-related-washington-state-department-health-2019) regardless of person type, and one for recreational boating incidents (https://knowledgerepository.syndromicsurveillance.org/recreational-boating-incidents-v1).

Capturing complete estimates of pedestrian or pedal-cyclist injuries would require combining both the MVT and non-MVT categories of each class. MVT injuries are limited in their definition to injuries occurring due to contact with a motor vehicle operating on a public road. However, pedestrian and pedal-cyclist injuries also occur that do not involve MVT. Furthermore, while all-terrain vehicles (ATV) are sometimes involved in traffic accidents and are captured in the MVT category, a larger number of these injuries include in the primary setting for ATV use, which is in offroad, non-traffic settings. There are other transportation methods that are not represented here as well, mostly involving non-MVT, a potential avenue for future query development and validation. MVT injuries are also tracked by the CORE SIPP Injury Indicators.

Drowning and Submersion

The NSSP CoP KR contains one query specific to drowning and submersion-related injuries (https://knowledgerepository.syndromicsurveillance.org/drowning-and-submersion-cdc).

- Special Populations and Considerations: youth (0-24 years), populations lacking access to swimming lessons and/or safe areas to swim, geographic areas with many natural water hazards, coastal areas. areas impacted by hurricanes, tropical storms, and floods. When analyzing data on youth, consider breaking out trends in smaller age bands, as the types of relevant drowning/submersion risks fluctuate as children age. Drowning and submersion injuries are also tracked by the CORE SIPP Injury Indicators.

Falls: The NSSP CoP KR contains one query specific to fall injuries:

- https://knowledgerepository.syndromicsurveillance.org/falls-wisconsin-department-health-services

Special Populations and Considerations: older adults (65+ years of age) are at highest risk of severe injury or death from unintentional falls. Fall injuries are also tracked by the CORE SIPP Injury Indicators.

Firearms: The NSSP CoP KR contains two queries specific to firearms injuries:

1) https://knowledgerepository.syndromicsurveillance.org/firearm-injury-maricopa-county-department-public-health
2) https://knowledgerepository.syndromicsurveillance.org/gunshot-injuries-kansas-department-health-and-environment

Special Populations and Considerations: youth (0-24 years), rural vs. urban settings. Firearms injuries are also tracked by the CORE SIPP Injury Indicators. We also recommend referring to the SyS evaluation report prepared by the Wisconsin (WI) Department of Health and linked in the "Additional Resources" section at the end of this document for a more thorough discussion of potential issues and limitations of firearms queries. There are also two firearms queries developed in that documentation by the WI team that may help your program more accurately capture firearms SyS records.

Fire/Burn: The NSSP CoP KR contains one query pertaining to a subcategory of fire/burn injuries related to fireworks

- https://knowledgerepository.syndromicsurveillance.org/firework-injuries-kansas-department-health-and-environment

Special Populations and Considerations: Note that this does not cover the full range of fire/burn injuries. It also may only be useful in your jurisdiction at certain times of the year or around specific local events. Findings will also likely vary based on state and local laws about use of fireworks. The larger category of fire/burn injuries are also tracked by the CORE SIPP Injury Indicators.

Suicide/Self-Harm: The NSSP CoP KR contains two queries for suicide/self-harm events:

1. https://knowledgerepository.syndromicsurveillance.org/cdc-suicide-attempt-v2
2. https://knowledgerepository.syndromicsurveillance.org/self-harm-and-suicide-related-syndrome-definition-committee

Special Populations and Considerations: youth (10-24 years), older adults (65+), LGBTQIA+, rural areas, racial and ethnic minorities. Suicide and self-harm injuries are also tracked by the CORE SIPP Injury Indicators. We also recommend reviewing the WI evaluation document, as it discusses known issues distinguishing between suicide and self-harm injury intent.

Homicide/Assault: The NSSP CoP KR contains queries for the following types of interpersonal violence:

1. Youth Violence: https://knowledgerepository.syndromicsurveillance.org/cdc-youth-violence-v1
2. Suspected Child Abuse and Neglect: https://knowledgerepository.syndromicsurveillance.org/cdc-suspected-child-abuse-and-neglect-v1
3. Intimate Partner Violence: https://knowledgerepository.syndromicsurveillance.org/intimate-partner-violence-v1-cdc
4. Sexual Violence: https://knowledgerepository.syndromicsurveillance.org/sexual-violence-v2-cdc
5. Suspected Sex Trafficking: https://knowledgerepository.syndromicsurveillance.org/cdc-suspected-sex-trafficking-v1

Special Populations and Considerations: LGBTQIA+, racial and ethnic minorities, groups isolated by language barriers, religion, or economic circumstances. While it is not possible to identify these subgroups reliably in SyS data, you may be able to use SyS data to supplement more accurate data on these populations from other sources to contextualize violent injury further. Note that when querying SyS data to ascertain information about violent victimization, please consider that it may not be possible to accurately account for perpetrator types using this data source, particularly if only ICD 10-CM codes are searched. Homicide/assault are also tracked by the CORE SIPP Injury Indicators.

Other Injury Topics

The NSSP CoP KR contains three queries specific to distinct types of occupational injuries and one pertaining to recreational boating incidents that may or may not be relevant for your jurisdiction:

- Agriculture-related occupational injuries: https://knowledgerepository.syndromicsurveillance.org/agriculture-related-injuries-kansas-department-health-and-environment
- General occupational injuries: https://knowledgerepository.syndromicsurveillance.org/occupational-related-injuries-new-jersey-department-health
- Occupational injuries pertaining to arborists and tree work: https://knowledgerepository.syndromicsurveillance.org/occupational-tree-related-injuries-new-jersey-department-health.
- Recreational boating-related incidents required to be reported to the US Coast Guard: https://knowledgerepository.syndromicsurveillance.org/recreational-boating-incidents-v1

Special Populations and Considerations:

- When developing queries for occupational injuries in your jurisdiction, consider whether there are specific industries or high-risk occupations overrepresented in your area and work to develop query terms that closely reflect these. Also consider racial and ethnic minorities and groups that may be isolated by language barriers, religion, or economic circumstances. Occupational injury episodes will be influenced as well by the size of the working-age population in your area and other factors that drive employment rates and differences in employment type by birth sex or gender identity.
- Boating-related incidents will be a factor in some geographic areas but not in others, and boating-related drowning/submersion injuries may have vastly different demographic, geographic, and socioeconomic determinants than other types of drowning/submersion injuries. Note that this query will only incompletely capture submersion and drowning injuries, as not all involve watercraft in recreational use. Furthermore, this query includes categories of injury that involve watercraft but do not involve submersion and drowning. Closely look at the query details and compare to those for other classes of drowning/submersion and watercraft injuries to determine whether this query is a good fit for your jurisdiction's use.

SyS Uses in Federal STLT Injury and Violence Funding Reporting

Most federal injury and violence prevention grants or cooperative agreements stipulate a minimum set of indicators to be reported by the awardee each quarter or year, such as the State Injury Indicators component of the State Injury Prevention Program (SIPP) cooperative agreement [reference]. We list a few known examples below by funder to help STLT epidemiologists consider where SyS data might supplement existing injury and violence surveillance required by these funding streams. Note that this list is not exhaustive, and funding streams change over time. Before you apply for new injury and violence federal funding streams requiring SyS data reporting, or prepare to add SyS queries to existing reporting metrics, please reach out to SyS experts at your agency to ensure you understand how to approach addressing the requirements in the application process as well as while the funded work is in progress through the life of the grant or cooperative agreement.

Centers for Disease Control and Prevention (CDC)

- **Core State Injury Prevention Program (CORE SIPP):** This cooperative agreement supports injury prevention capacity in data and partnership-building in a subset of states, with a core focus on the following areas: ACEs, traumatic brain injuries (TBIs), and MVT injuries. Portions of state funding are reserved for injury focus areas determined by the state. Though only some states are funded, each state is invited to submit a set of Core SIPP Injury Indicators to CDC annually, using CDC guidance made widely available (https://www.cdc.gov/injury-core-sipp/media/pdfs/2024/06/CORRECTED-2022-Injury-Indicator-Instructions.pdf).
- **Essentials for Childhood: Preventing Adverse Childhood Experiences through Data to Action (PACE:D2A):** This cooperative agreement aims to support expanded data collection on Adverse Childhood Experiences (ACEs) in funded jurisdictions and the connection of those data to public health prevention efforts. Note that a separate section of this document covers the use of SyS data for ACEs, and we recommend consulting that section for more details.
- **Firearm Injury Surveillance Through Emergency Rooms-Advancing Violence Epidemiology in Real-Time (FASTER-AVERT):** This federal funding stream is working to speed collection of firearms injury data, mental health, and violence data from EDs to inform injury prevention efforts. More information about the role of SyS data in this effort is described online (https://www.cdc.gov/firearm-violence/php/funded-surveillance/index.html).
- **Comprehensive Suicide Prevention (CSP):** Among the funded agencies, CDC notes that, "CSP programs also use funds to support emergency department syndromic surveillance of nonfatal suicide-related outcomes (e.g., suicide attempts and suicidal ideation). Collecting these near real-time data can help states rapidly track and respond to changing patterns in suicidal behavior," (https://www.cdc.gov/injury/budget-funding/suicide-prevention-funding.html). This funding stream builds on SyS query work for suicide and self-harm carried out under the previous Emergency Department Surveillance of Nonfatal Suicide-Related Outcomes (ED-SNSRO) cooperative agreement (https://www.cdc.gov/suicide/programs/ed-snsro.html). Key documents from this prior funding stream may help as you begin to monitor SyS suicide and self-harm trends in your jurisdiction.
- **Veteran Suicide Prevention:** This suicide prevention funding stream is specifically provided to Veteran Serving Organizations (VSOs). When partnering with VSOs who support this work in

your jurisdiction, providing SyS data that aligns with these areas of focus may help partners see trends in near real-time. Systematically identifying veterans in SyS data pertaining to suicide and self-harm is not possible currently. However, VSOs may be interested in learning about SyS data more generally.

- **Tribal Suicide Prevention:** This effort provides support for tribal entities working on comprehensive suicide prevention programming. When partnering with staff who support tribal suicide prevention work in your jurisdiction, providing SyS data that aligns with their areas of focus may help partners see trends in near real-time.
- **Rape Prevention and Education (RPE):** This federal funding stream allocates resources to all states to support sexual violence prevention programming. While there are no current RPE reporting requirements for SyS data, when partnering with staff who support this work in your jurisdiction, providing data that aligns with their work may help partners see trends in near real time.
- **Preventive Health and Health Services Block Grant (PHHS):** This block grant supports a wide range of public health prevention work at STLT health departments nationwide (https://www.cdc.gov/phhs-block-grant/index.html). While focus areas for PHHS efforts vary by jurisdiction, each awardee receives a dedicated funding "set-aside" to support sexual violence prevention from PHHS funds. They also each receive a block of support funds that are allocated according to the recipient's own priority areas, which are reported to CDC. While focus areas for this injury and violence prevention support funding vary across awardees, you should evaluate whether SyS data on injuries and violence can support this work. When partnering with staff who support PHHS Block Grant work in your jurisdiction, providing SyS data that aligns with their areas of focus may help partners see trends in near real-time.

Substance Abuse and Mental Health Services Administration (SAMHSA)

- **Garrett Lee Smith State/Tribal Youth Suicide Prevention and Early Intervention Program (GLS):** While this program more often awards funding to state/tribal mental health agencies, some STLT injury and violence prevention programs may provide data support to their jurisdictional programs or otherwise partner with them (https://www.samhsa.gov/grants/grant-announcements/sm-24-005). There are no known reporting indicators for this cooperative agreement that require the use of SyS data, but established queries for suicide, self-harm and suicidal ideation events can be useful in engaging these partners. When partnering with staff who support GLS work in your jurisdiction, providing SyS data that aligns with these areas of focus may help partners see trends in near real-time.
- SAMHSA has many other existing initiatives that cover aspects of violent injury in various populations (https://www.samhsa.gov/programs). While your agency may not receive this funding directly, you may partner with other agencies or entities that do. Consider whether SyS violent injury indicators could help support these partners and how you might prepare to provide SyS data if asked.

Health Resources and Services Administration (HRSA)

- **Maternal and Child Health Block Grant ("Title V"):** Some injury and violence prevention and surveillance programs may have close ties to agency maternal and child health (MCH) work carried out under this funding stream (https://mchb.hrsa.gov/programs-impact/title-v-maternal-child-health-mch-services-block-grant). While the scope of work covered under the MCH Block Grant is large, some jurisdictions support injury and violence prevention initiatives with this funding. Examples include youth violence prevention, intimate partner violence during pregnancy, child abuse, etc. While there are no known MCH Block Grant reporting indicators for SyS data specifically, HRSA maintains an online dashboard of required and state-optional performance measures (https://mchb.tvisdata.hrsa.gov/). When partnering with staff who support MCH Block Grant work in your jurisdiction, providing SyS data that aligns with these areas of focus may help partners see trends in near real-time.

SyS Cluster Detection in the Injury/Violence Context

While the most complete data on SyS cluster detection methods is available in [Section X] of this guide, there are a handful of special considerations that injury and violence epidemiologists should be aware of, particularly when addressing cluster detection for suicide and self-harm.

A SyS "cluster" is defined as a signal set according to a predetermined statistical threshold indicating there are more events of a specific SyS syndrome than would be expected in a specific location over a specific time. When a potential cluster is detected by SyS, further review of the cases is required to establish that a cluster of cases exists and to determine the appropriate public health action. In the case of communicable disease outbreaks, these cases are linked causally by a transmitted pathogen (e.g., hepatitis A, norovirus, legionella).

The term "cluster" has different meanings for community members, media, and public health epidemiologists. When analyzing and presenting SyS data, injury epidemiologists should be clear about how they describe health events of concern and look for opportunities to help educate the public on appropriate ways to describe concerning trends or spikes in injury events of high public concern, such as suicide or self-harm. In these cases, we recommend avoiding use of the term "cluster" as it may be a barrier to clear communication. As noted by O'Carroll and Mercy in the American Journal of Epidemiology, "The perception of suicide clustering, and the highly charged emotional atmosphere associated with that perception, may dramatically heighten the potentially 'contagious' effect of suicide. That the perception of clustering may itself be a risk factor for suicide distinguishes suicide clusters from all other clusters of fatal disease or illness, " (1990). Even well-intended media reporting on suicide, public statements by schools or public health entities about cases, and community-led messaging may contribute to a sense of panic that drives increased community anxiety levels.

If you are using SyS data on trends, spikes or distinctive groups or patterns in self-harm or suicide-related medical care events, it is a good practice to talk over in advance with your injury and violence prevention partners and agency leadership how you would present the data with external partners, including how you would frame the SyS detection methods and their limitations, and consider how your agency would respond if a community became concerned that social contagion of self-harm behaviors was occurring.

A full review of cluster identification and response best practices for these specific issues is outside of the scope of this section of the document, but please review the resources linked at the end of this section for further reading and review the guidance document section covering general SyS best practices for detecting and responding to clusters.

Presenting SyS Injury and Violence Data to Partners

When considering approaches to presenting estimates of injury and violence encounters from SyS data in your jurisdiction, your best resource will likely be your jurisdiction's SyS staff, who work with the data daily and have gained valuable experience in how to report it. Some guiding principles should also be considered:

1. Consider the audience when presenting the data.
2. Acknowledge uncertainty in the information about health visits or events extracted from SyS data.
3. Communicate the utility of near real-time data and tradeoff of reduced precision/certainty.
4. Be prepared to highlight examples of how the data is used for injury prevention and control planning in your local area or with key populations.
5. Communicate in terms of patterns, trends, and spikes in data, and focus less on exact counts, percentages, or rates.

Additional Resources

Other resources that may be helpful as you develop your SyS injury and violence epidemiology work are listed below by topic area. This list is not exhaustive.

Suicide contagion resources:

- https://reportingonsuicide.org/
- https://afsp.org/safereporting/
- https://www.cdc.gov/suicide/prevention/cluster.html
- https://www.cdc.gov/mmwr/volumes/73/su/su7302a2.htm
- O'Carroll & Mercy, 1990 (noted above in list of references)

Other injury and violence surveillance toolkits and guides:

- CSTE ICD 10-CM Injury Surveillance Toolkit: https://injurytoolkit.cste.org/
- National Center for Health Statistics Injury Tools and Resources: https://www.cdc.gov/nchs/injury/injury_tools.htm
- National Center for Health Statistics Injury Data, Reports, and Other Resources: https://www.cdc.gov/nchs/injury/index.htm
- National Center for Injury Prevention and Control: https://www.cdc.gov/injury/index.html

References

O'Carroll, P. W., & Mercy, J. A. (1990). Responding to community-identified suicide clusters: statistical verification of the cluster is not the primary issue. *American Journal of Epidemiology*, *132*(1 Supplement), S196–S202.

Note that this article can be challenging to find in print. Reach out to a reference librarian at an academic institution if possible.

Authorship Attribution

The content for this section was developed in collaboration with the CSTE Injury Surveillance Workgroup, NSSP Community of Practice, J. Michael Consulting, and Zehner Epidemiology Consulting.