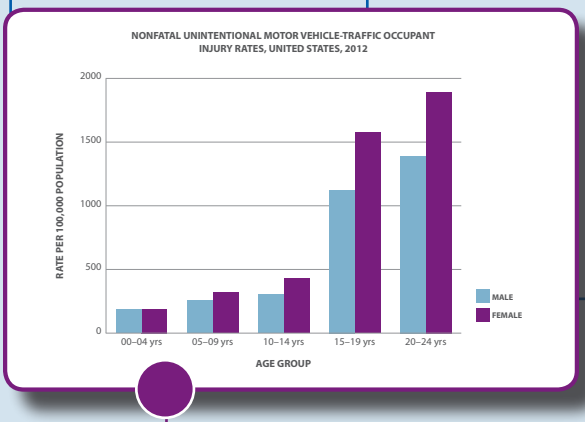
PROPOSED FRAMEWORK
for Presenting Injury Data using ICD-10-CM External Cause of Injury Codes



V43.52x Car driver injured in collision with other type car in traffic accident

V43.53x Car driver injured in collision with pick-up truck in traffic accident

V43.54x Car driver injured in collision with van in traffic accident

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Proposed Framework for Presenting Injury Data using ICD-10-CM External Cause of Injury Codes

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Executive Summary

External cause of injury frameworks based on the International Classification of Diseases (ICD) have served the injury field in providing standards for presenting and analyzing state, national and international injury mortality and morbidity data. The external cause of injury framework, commonly called the external cause matrix, categorizes ICD codes into major mechanism (e.g., motor vehicle-traffic, cut/pierce, drowning, fall, firearm, fire/burn, natural/environmental, poisoning) by intent of injury (i.e., unintentional, self-harm, assault, legal intervention/war, undetermined) categories.

In the United States, morbidity coding is currently based on ICD-9-CM, and is proposed to transition to ICD-10-CM on October 1, 2014. In preparation for the use of ICD-10-CM-coded morbidity data for injury surveillance and analytic research, the National Center for Injury Prevention and Control and the National Center for Health Statistics at the Centers for Disease Control and Prevention (CDC) have proposed an ICD-10-CM External Cause of Injury Framework or Matrix. This report provides background information on ICD-10-CM, a comparison between ICD-9-CM and ICD-10-CM external cause code sets, an overview of the proposed framework and the guiding principles used to construct it, and a list of major issues and recommended resolutions based on feedback from CDC's health information specialists and subject matter experts in injury data and surveillance systems.

I. Introduction

Since the early 1990s, the National Center for Injury Prevention and Control (NCIPC) and the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC) have worked together with colleagues from the International Collaborative Effort (ICE) on Injury Statistics and the American Public Health Association (APHA)-Injury Control and Emergency Health Services (ICEHS) Section to improve the analysis and use of fatal and nonfatal injury data in the United States and internationally. One aspect of this collaboration has been the development of frameworks, or matrices, based on standard groupings of International Classification of Diseases (ICD) codes for presenting fatal and nonfatal injury data by external causes of injury (mechanism and intent of injury) and by injury diagnosis (body region and nature of injury). Since 1979, the Clinical Modification to the 9th Revision of ICD (ICD-9-CM) has been used in the United States to code morbidity data; and since 1999, the 10th Revision of ICD (ICD-10) has been used in the United States for coding mortality data.[1] Frameworks have been developed for injury mortality data based on ICD-9 and ICD-10 codes and for injury morbidity data based on ICD-9-CM codes.[2-4] These frameworks are used extensively to generate county, state, regional, national, and international comparisons of fatal and nonfatal injury data by external causes of injury and by injury diagnoses (e.g., WISQARS, CDC WONDER, CDC Injury Indicators Project, and ICE on Injury Statistics).[5-8]

The Clinical Modification of ICD-10 (ICD-10-CM), similar to ICD-9-CM, was developed by NCHS for use in morbidity coding in the United States. The ICD-10-CM coding structure, based on ICD-10 published by the World Health Organization,[9] has been in the public domain for more than a decade. Proposed changes are evaluated each year through the Coordination and Maintenance Committee headed by NCHS and the Centers for Medicare and Medicaid Services (CMS). Compared to the ICD-9-CM, the ICD-10-CM is greatly expanded, including nearly five times the number of codes (approximately 70,000 codes in ICD-10-CM compared to 14,000 codes in ICD-9-CM).[10] ICD-10-CM codes provide much more detail about the injury diagnosis and external cause of injury than ICD-9-CM codes, making this classification system useful for capturing extensive information for documenting clinical care, billing, and public health surveillance and practice. More specifically, the updated medical terminology and classification of diseases, injuries, and procedures in ICD-10-CM can potentially provide better data for measuring quality of care provided to patients, tracking injuries and health conditions, conducting epidemiologic research, and assessing the economic costs of diseases and injuries.

Recently, the Department of Health and Human Services released a ruling that ICD-10-CM will replace ICD-9-CM in the United States for coding of morbidity data beginning on October 1, 2014. On that date, the transition to ICD-10-CM will be effective for all Medicare and Medicaid claims by hospitals and other health care providers covered by the Health Insurance Portability and Accountability Act (HIPAA).[11] Shortly thereafter, injury morbidity data coded using ICD-10-CM will be available in state-based hospital discharge and emergency department data systems for injury surveillance and prevention program planning. This report describes a proposed framework for presenting injury morbidity data by external causes of injury based on ICD-10-CM codes, and includes a discussion of differences between ICD-9-CM and ICD-10-CM classification systems, methods used to construct the proposed framework, the framework structure, major issues regarding placement of codes in the framework, and next steps for pilot testing and ultimate release. The final ICD-10-CM external cause framework will facilitate injury surveillance and epidemiologic

research activities that examine trends and patterns in nonfatal injuries and injury rates in the United States and internationally.

II. ICD External Cause Coding: Differences between ICD-9-CM and ICD-10-CM

The external cause codes and coding structure in ICD-10-CM differ in a number of ways from those in ICD-9-CM (Table 1). In ICD-9-CM, external cause codes are supplemental codes, begin with the letter "E," and are usually referred to as "E codes." In ICD-10-CM, external cause codes have been incorporated into a single alpha-numeric code set and begin with V, W, X, or Y as described in Chapter 20 (External causes of morbidity (V00-Y99)) of the ICD-10-CM tabular listing.[10] The number of characters in the external cause code is also different: 3-5 characters in ICD-9-CM and 3-7 characters in ICD-10-CM. One common factor is that both classification systems use a decimal in the code followed by numbers or characters to specify more detail. Some ICD-10-CM codes have an "x" or several "x's" either embedded in the code or at the end of the code. The "x's" are placeholders for additional characters that may be needed to accommodate specific diagnosis and external cause categories created in the future.

In ICD-10-CM, the 7th character of the code is a letter that specifies whether the external cause code is related to the initial [medical care] encounter (A), subsequent encounter (D), or a sequela (S) of the injury incident. The ICD-10-CM "sequela" designation is equivalent to what was coded as a "late effect" in ICD-9-CM. In ICD-9-CM, there were only eight E codes related to late effects (E929.0-5, .8, .9); whereas in ICD-10-CM, all external cause codes (V, W, X, or Y) have sequela codes.

External cause codes for intentional self-inflicted injury are referred to as Suicide and Self-inflicted in ICD-9-CM, but are called Intentional Self-harm in ICD-10-CM. Also, a specific diagnosis code for *suicide attempt* (T14.91) was added to ICD-10-CM. External cause codes for intentional harm by other persons are referred to as Homicide and Injury Purposely Inflicted by Other Persons in ICD-9-CM, but are called Assault in ICD-10-CM.

In ICD-9-CM and ICD-10, poisonings/toxic effects of substances and suffocation/asphyxiation are each coded with two codes – one for diagnosis and one for external cause of injury. In ICD-10-CM, these conditions are coded using a single code that combines information on both diagnosis and intent. These combination codes are found among the injury diagnosis codes in Chapter 19 (Injury, poisoning, and certain other consequences of external causes (S00-T88)) of the ICD-10-CM tabular listing; no corresponding external cause code is found in Chapter 20. For these mechanisms, intent is designated by the last character of the diagnosis code as 1-unintentional, 2-intentional self-harm, 3-assault, and 4-undetermined intent. The specific code sets in ICD-10-CM affected by these combination codes include:

1. Poisoning by drugs, medicaments and biological substances (T36-T50) (Note: In addition to coding the intent categories as listed above, the 6th character is also used to code 5-adverse effects and 6-underdosing).

2. Non-drug, toxic effects of substances chiefly non-medicinal as to source (T51-T65) (Note: The 6th character is used to classify intent for most of these codes; however, when the 4th character of the code is 9, then the 5th character is used to classify intent).

3. Asphyxiation (T71) (Note: The 6th character is used to classify intent for most of these codes; however, asphyxiation codes with unspecified cause or not otherwise specified (T71.20, T71.21, T71.29, and T71.9) are not classified by intent).

ICD-9-CM, ICD-10, and ICD-10-CM also differ in the use of external cause and diagnosis codes involving various other mechanisms. Foreign Body external cause codes (E914, E915) in ICD-9-CM are coded as Foreign Body diagnosis codes (T15-T19) in ICD-10-CM. The Hunger, Thirst, and Exposure external cause code (E904) in ICD-9-CM is coded as the Effects of Other Deprivation diagnosis code (T73), including starvation, lack of water, exhaustion from exposure, exhaustion from overexertion, and other and unspecified, in ICD-10-CM. The Lightning external cause code (E907) and Effects of Lightning diagnosis code (994.0) in ICD-9-CM are coded as the Effects of [being struck by] Lightning diagnosis code (T75.0) in ICD-10-CM. The Vibration external cause code (E928.2) in ICD-9-CM is coded as the Effects of Vibration diagnosis code (T75.2) in ICD-10-CM. The Travel and Motion external cause code (X51) in ICD-10 was deactivated in ICD-10-CM; however, Motion Sickness is coded as a diagnosis code in all three classification systems (994.6 in ICD-9-CM and T75.3 in ICD-10 and ICD-10-CM). None of these codes has a specific intent designation.

Overexertion codes in ICD-10-CM are very limited compared to those in ICD-9-CM. In ICD-9-CM, seven codes (E927.0-.4, .8, .9) are used to classify overexertion associated with strenuous movement, prolonged static position, excessive physical exertion from prolonged activity, and cumulative trauma from repetitive motion. Currently in ICD-10-CM, only two types of codes are considered to be conceptually equivalent to the ICD-9-CM overexertion codes: one for slipping, tripping, and stumbling with and without falling (W18.4); and one for exhaustion due to excessive exertion (T73.3).

The assault-related external cause codes in ICD-9-CM for perpetrators of child and adult abuse (E967) were expanded in ICD-10-CM to include codes for perpetrators of assault, maltreatment and neglect (Y07). Two T code categories with numerous sub-codes were also added to specify adult and child abuse, neglect, and other maltreatment, confirmed (T74) and suspected (T76).

III. Methods: Constructing the ICD-10-CM External Cause of Injury Matrix

The process of developing the proposed ICD-10-CM External Cause Matrix was initiated using classification tools known as the General Equivalence Mappings (GEMs).[10] NCHS and CMS developed GEMs based on conceptual links between ICD-9-CM and ICD-10-CM codes: one set of GEMs has ICD-9-CM as the source system and ICD-10-CM as the target; and another set of GEMs has ICD-10-CM as the source system and ICD-9-CM as the target. The GEMs do not represent a crosswalk from ICD-9-CM to ICD-10-CM or vice versa, but are designed to assist in developing crosswalks. In the GEMs, one ICD-9-CM code can represent one or more ICD-10-CM codes, and one ICD-10-CM code can represent one or more ICD-9-CM codes. Some ICD-10-CM codes have no predecessors in ICD-9-CM. Similarly, not all ICD-9-CM codes are used in ICD-10-CM. Nevertheless, the GEMs served as a useful starting point for determining where to place codes in the proposed ICD-10-CM external cause matrix.

Using the bidirectional GEMs, a spreadsheet was generated using the major categories as originally defined by mechanism and intent of injury in the ICD-9-CM matrix (Figure 1). Then, equivalence codes for ICD-9-CM and ICD-10-CM external causes were placed in the matrix. Next, equivalence

codes were evaluated using SAS computer programs to compare the codes in the spreadsheet with independent files of all ICD-9-CM and ICD-10-CM external cause codes and selected T codes to check for any missing codes in either direction. Finally, ICD-10-CM codes were reviewed individually for each major mechanism by intent category to determine comparability with codes in the ICD-9-CM external cause matrix as well as with codes in the ICD-10 external cause matrix.

Because ICD-10-CM contains codes not found in either ICD-9-CM or ICD-10, a set of Guiding Principles was developed to determine where an individual code should be placed in the ICD-10-CM matrix (Appendix A). These Guiding Principles took into consideration the differences between ICD-10-CM codes and ICD-9-CM and ICD-10 codes. Using the Guiding Principles, NCIPC and NCHS staff independently reviewed and assigned the codes to major mechanism by intent categories, then discussed discrepancies to reach consensus on placement of the codes. In many instances, compatibility with the ICD-10 matrix took precedence over that for the ICD-9-CM matrix (e.g., transportation-related incidents) because of the importance in using ICD-10 and ICD-10-CM for international comparisons of trends in fatal and nonfatal injury rates. While most codes were placed using these methods, some codes needed further review and discussion by the injury surveillance community. Therefore, the proposed ICD-10-CM External Cause Matrix was shared with injury surveillance, data, and subject matter experts from the American Public Health Association's Injury Control and Emergency Health Services Section (APHA-ICEHS), NCIPC's State Grantees, the Safe States Alliance (Safe States), the Council of State and Territorial Epidemiologists (CSTE), the Society for Advancement of Violence and Injury Research (SAVIR), and the International Collaborative Effort (ICE) on Injury Statistics. Based on their feedback, final decisions were made for placement of codes in the matrix.

IV. Results: ICD-10-CM External Cause Matrix Structure and Code Sets

The proposed ICD-10-CM External Cause Matrix is structured by major mechanism and intent categories similar to those in the ICD-9-CM External Cause Matrix,[4] with modifications to adjust for the changes in coding structures and current and future data needs for national and state-based injury surveillance and prevention program planning activities (Table 2). Compared to the ICD-9-CM External Cause Matrix, the ICD-10-CM External Cause Matrix has ten additional mechanism categories (All Transportation; Motor Vehicle – Traffic (MVT)-Other; Motor Vehicle (MV) – Non-traffic; Other Land Transport; Bites and Stings, nonvenomous; Bites and Stings, venomous; Drug Poisoning; Non-drug Poisoning; Other Specified, Child and Adult Abuse; and Other Specified, Foreign Body), and two changes in the names of intent categories (Self-inflicted and Other categories in the ICD-9-CM External Cause Matrix have been changed to Intentional Self-harm and Legal Intervention/War, respectively. War includes all War Operations codes).

The proposed ICD-10-CM External Cause Matrix code sets are provided in two parts in the accompanying EXCEL files (**http://www.cdc.gov/injury/wisqars/dataandstats.html**). One EXCEL file includes all external cause codes other than those related to poisonings and most toxic effects (referred to as the proposed **ICD-10-CM External Cause Matrix for Causes other than Poisoning**). The other EXCEL file includes codes for poisoning and most toxic effects (referred to as the proposed **ICD-10-CM External Cause Matrix for Poisoning**). Each of these files includes five spreadsheets, one for each of the following intent categories: (1) Unintentional, (2) Intentional Self-harm,

(3) Assault, (4) Undetermined, and (5) Legal Intervention/War. For each intent category, the spreadsheet includes columns for Mechanism of Injury, ICD-10-CM Code (Unformatted and Formatted), and Description of the ICD-10-CM Code. The **ICD-10-CM External Cause Matrix for Causes other than Poisoning** includes all V, W, X, Y and selected T codes (e.g., Bites and Stings, venomous; Suffocation; and Foreign Body). The **ICD-10-CM External Cause Matrix for Poisoning** includes all poisoning and all other toxic effects divided into Drug Poisoning (T36-T50) and Non-drug Poisoning (T51-T62, T64-T65, except T54.1x-.9x and T65.82x). Codes for toxic effects of contact with venomous animals and plants have been placed under one of two subcategories under Natural/Environmental in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning**: Bites and Stings, venomous (animals (T63.0x-.6x, .8x, .9x)) or Other (plants (T63.7x, T65.82x)). [Note: The ICD-10-CM T63 codes are comparable to Natural/Environmental codes (X20-X29) in the ICD-10 matrix.] The Natural/Environmental mechanism also includes a third subcategory for Bites and Stings, non-venomous (W53.0xx-W61.9xx) which includes external cause codes that indicate animal bites and stings. In the **ICD-10-CM External Cause Matrix for Causes other than Poisoning,** codes for toxic effects of corrosive substances (T54.1x-.9x) have been placed in Fire/Burn-Hot Object/Substance, and codes for toxic effects of harmful algae and algae toxins (T65.82x) have been placed in Natural/Environmental, Other.

Some new transportation categories and subcategories have been added to the **ICD-10-CM External Cause Matrix for Causes other than Poisoning** to allow for compatibility with the ICD-10 external cause matrix. The new ICD-10-CM transportation categories include: All Transportation (V01-V99), Motor Vehicle – Traffic (MVT)-Other (numerous V codes), Motor Vehicle – Nontraffic (numerous V codes), Other Land Transport (V80-V89), and Other Transport (e.g., watercraft, ships, helicopter, fixed-wing aircraft, other air transport, parachute, ski lift, ice yacht, cable car [not on rails], other and unspecified) (V90-V99). V00 codes used for pedestrian conveyance-related injuries are not included with other transportation codes because they do not involve collisions with motor vehicles, pedal cycles, or other land transport vehicles.

Other ICD-10-CM matrix categories representing specific changes from the ICD-9-CM matrix categories include:

1. Water transportation-related drowning codes (V90, V92) have been placed in Other Transportation rather than Drowning/Submersion to be consistent with the ICD-10 matrix. In the ICD-9-CM matrix, comparable codes (E830, E832) were included as Drowning/Submersion.[4]

2. Other and unspecified transportation codes (V98, V99) have been placed in the Other Transportation (V90-V99) category. This change was also made for consistency with the ICD-10 matrix, where V98 and V99 are included in the All Transportation category (V01-V99). In ICD-9-CM, codes for Vehicle Accidents – Not Elsewhere Classifiable (E846-E848) were categorized into Other Specified and Classifiable.

In the **ICD-10-CM External Cause Matrix for Poisoning,** terrorism involving biological weapons (Y38.6x) and chemical weapons (Y38.7x) were grouped as Non-drug Poisoning, Assault. Legal intervention involving gas (Y35.2) and war operations involving biological weapons (Y36.6x) and chemical weapons (Y36.7x) were placed as Non-drug Poisoning, Legal Intervention/War.

V. Tabulation/Code Placement: Issues and Proposed Resolutions

While working on placement of codes and code sets in the ICD-10-CM External Cause Matrix, a number of major issues were identified for further examination and review by the injury research and practice community. Based on that input, preliminary resolutions have been incorporated into the proposed ICD-10-CM External Cause Matrix. Additional assessment and pilot testing using ICD-10-CM external cause-coded data from state and national morbidity data systems are needed before decisions can be finalized.

Issue 1. Tabulation of Data on Injury-related Hospitalizations and Emergency Department Visits

Background: Most ICD-10-CM external cause-related codes (V, W, X, Y, and T) have a 7th character that indicates whether the code is associated with the initial encounter (A), subsequent encounter (D), or a sequela (S). The initial encounter character (A) is used while the patient is receiving active treatment (e.g., emergency department encounter, surgery, evaluation and treatment by a new physician) for the condition. The subsequent encounter character (D) is used for encounters after the patient has received active treatment for the condition and is receiving routine care for the injury during the healing or recovery phase. The sequela character (S) is used with any report of a late effect or sequela resulting from a previous injury.

Question: In tabulating morbidity data for hospitalizations and emergency department visits using state-based administrative data, should counts and rates be based on the initial encounter codes only or on the initial encounter and subsequent encounter codes?

Proposed resolution: Tabulations using the ICD-10-CM External Cause Matrix will be based on the initial encounter (e.g., initial emergency department visit or initial hospitalization) for an injury incident. If the ICD-10-CM external cause code is unspecified for type of encounter, the case will default to initial encounter.

Issue 2. Tabulation of Injury-related Data using Sequela Codes

Background: In the ICD-9-CM External Cause Matrix, the few non-specific late effects codes (E929.0–.5, .8, .9) were placed in the Other Specified—Classifiable, Other Specified—Not Elsewhere Classifiable (NEC), and Unspecified categories rather than in the major mechanism-specific categories. In the ICD-10 External Cause Matrix, there were only a few late effects codes (Y85-Y87, Y89). Y85.0 was specific to motor-vehicle crash and was placed in Other Specified—Classifiable. The other late effects codes were nonspecific and were placed in Other Specified—NEC or Unspecified. In contrast, ICD-10-CM sequela (late effects) codes are numerous since most ICD-10-CM external cause codes have an associated sequela code, identified by an "S" in the 7th character of the code.

Question: Should the ICD-10-CM sequela codes be: (1) included in mechanism-specific categories of the ICD-10-CM External Cause Matrix; (2) placed in the Other Specified and Unspecified mechanism categories to be consistent with the ICD-9-CM and ICD-10 Matrices; or (3) excluded from the Matrix and tabulated separately?

Proposed resolution: Sequela codes will not be included in the proposed ICD-10-CM External Cause Matrix or in routine tabulations of injury-related hospitalizations and emergency department visits, but should be tabulated and analyzed separately.

Issue 3. Placement of ICD-10-CM W16 and W22 Drowning/Submersion Codes

Background: In ICD-10, W16 Diving or Jumping into Water Causing Injury other than Drowning or Submersion consists of a single code and is placed in Unintentional Fall in the ICD-10 External Cause Matrix. In ICD-10-CM, W16 includes multiple codes for falling, jumping or diving into a swimming pool or natural body of water, with separate codes that specify drowning/submersion or other injuries. Similarly, in ICD-10, W22 Striking against or Struck by Other Objects consists of a single code and is placed in Unintentional Struck by/against in the ICD-10 External Cause Matrix. In ICD-10-CM, W22 includes multiple codes for striking against or struck by other objects, including two codes specific to striking against the wall of swimming pool causing drowning and submersion (W22.041) and other injury (W22.042).

Questions: Should the ICD-10-CM W16 codes associated with drowning and submersion be placed in Unintentional Drowning/Submersion, or should they remain with the other W16 codes and placed in Unintentional Fall in the ICD-10-CM Matrix? Similarly, should the ICD-10-CM W22.041 code associated with drowning and submersion be placed in Unintentional Drowning/Submersion, or should it remain with the other W22 codes and placed in Unintentional Struck by/against in the ICD-10-CM Matrix?

Proposed resolution: ICD-10-CM W16 and W22 codes that specify drowning/submersion will be placed in Drowning/Submersion in the ICD-10-CM External Cause Matrix.

Issue 4. Placement of Transportation-related Codes involving Watercraft

Background: In ICD-10, transportation codes involving watercraft that resulted in drowning/submersion or other causes of injury (burn, crush, fall, struck by/against, other) are placed in Unintentional Other Transport in the ICD-10 External Cause Matrix.

Question: Should ICD-10-CM transportation codes (V90.xxx-V94.xxx) involving watercraft that result in drowning/submersion and other injuries be placed in Unintentional Other Transport in the ICD-10-CM External Cause Matrix (for consistency with the ICD-10 External Cause Matrix), or should they be placed with their respective mechanisms (Unintentional Drowning/Submersion, Unintentional Fall, Unintentional Struck by/against, etc.)?

Proposed resolution: Transportation codes involving watercraft that result in drowning/submersion or other mechanisms of injury (e.g., fire/burn, crush, fall, struck by/against) will be placed in Unintentional, Other Transport in the ICD-10-CM External Cause Matrix.

Issue 5. Placement of Toxic Effects of Phenol and Phenol Homologues Codes

Background: The codes for toxic effects of organic and inorganic corrosive compounds, other than phenols, have been placed in Fire/Burn–Hot Objects/Substances in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning.** However, phenols and phenol homologues can cause both chemical burns and poisoning (neurotoxin); therefore, these codes could be categorized either in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning** or in the **ICD-10-CM External Cause Matrix for Poisoning.**

Question: Should ICD-10-CM codes for toxic effects of phenol and phenol homologues (T54.0xx) be placed in the **ICD-10-CM External Cause Matrix for Poisoning** as a Non-drug Poisoning, or should they be placed with ICD-10-CM codes for toxic effects of other corrosive substances in Fire/Burn-Hot Objects/Substances in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning?**

Proposed resolution: Toxic Effects of Phenol and Phenol Homologues (T54.0xx) will be placed in the Non-drug Poisoning category of the **ICD-10-CM External Cause Matrix for Poisoning.**

Issue 6. Placement of Pedestrian Conveyance Codes

Background: Pedestrian conveyance codes (V00.xxx) are new to ICD-10-CM and are not in ICD-9-CM or ICD-10. These codes were designed to identify sports- and recreation-related (e.g., skateboarder, ice skater, snowboarder, scooter) and other conveyance-related (e.g., motorized mobility scooter, baby stroller, wheelchair) injuries. These codes do not involve collisions with traditional transportation vehicles. Pedestrian conveyance codes include external cause of injury descriptors consistent with other major mechanism categories (i.e., unintentional struck by/against, unintentional fall, unintentional other specified and classifiable).

Question: Should pedestrian conveyance (V00.xxx) codes be included in the Unintentional Transportation category, or should they be placed in other major external cause categories?

Proposed resolution: Pedestrian conveyance codes will not be included in the Unintentional Transportation category. They will be placed in other major mechanism categories consistent with their descriptors in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning.**

Issue 7. Placement of Foreign Body Codes

Background: In ICD-9-CM and ICD-10, foreign body is coded using external cause and diagnosis codes; foreign body external cause codes are included in Other Specified and Classifiable in the ICD-9-CM and ICD-10 External Cause Matrices. In ICD-10-CM, there are no foreign body external cause codes; effects of foreign body are coded using numerous T codes (T15.xxx-T19.xxx) that provide much more specificity than those in the ICD-9-CM or ICD-10.

Question: Should Foreign Body codes (T15.xxx-T19.xxx) be added to the matrix as a separate Unintentional mechanism category (i.e., Other Specified—Foreign Body) , or should Foreign Body codes be placed in Unintentional—Other Specified, Classifiable in the ICD-10-CM External Cause Matrix?

Proposed resolution: Foreign Body codes (T15.xxx-T19.xxx) will be placed in a separate Unintentional mechanism category called Other Specified—Foreign Body in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning.**

Issue 8. Placement of the Suicide Attempt Code

Background: In ICD-10-CM, there is a T code (T14.91) specifically for suicide attempt. The ICD-10-CM coding guidelines indicate that this code is only to be used when the nature and body region of injury and the mechanism of injury are unknown (e.g., the medical record only says "suicide attempt" with no additional information).

Question: Should the suicide attempt T code (T14.91) be placed in the matrix as Unspecified Self-harm, or should it be excluded from the matrix?

Proposed resolution: The suicide attempt (T14.91) code will be placed in the Unspecified Self-harm category in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning.**

Issue 9. Placement of Adult and Child Abuse/Neglect/Other Maltreatment Codes

Background: Adult and child abuse/neglect/other maltreatment codes were not included in a separate Assault category in the ICD-9-CM or ICD-10 External Cause Matrices. ICD-10-CM provides the opportunity to consider adding a separate Child/Adult Abuse category because of its enhanced specificity and detailed coding guidelines. In ICD-10-CM, Abuse codes (T74 (confirmed) and T76 (suspected)) can be used to classify adult and child abuse, neglect, and other maltreatment. T74.xx and T76.xx sub-codes specify neglect/abandonment, physical abuse, sexual abuse, psychological abuse, Shaken Infant Syndrome, and unspecified maltreatment. According to the ICD-10-CM child and adult abuse coding guidelines, if documentation in the medical record states abuse or neglect, the case is coded as confirmed (T74.xx). If documentation in the medical record states suspected abuse or neglect, the case is coded as suspected (T76.xx). The coding guidelines also indicate that adult and child abuse, neglect and maltreatment are classified as assault. For confirmed cases of abuse, neglect, and other maltreatment, an external cause code from the Assault section (X92-Y08) should be assigned to identify the cause of any physical injuries; also, a perpetrator code (Y07) should be assigned when the perpetrator of the abuse is known. For suspected cases of abuse, neglect and other maltreatment, the guidelines specify that external cause and perpetrator codes are not assigned.

Questions:

a. Should the T74 (confirmed) and T76 (suspected) codes for adult and child abuse, neglect and other maltreatment be placed in a separate mechanism category in the matrix?

b. Should both confirmed and suspected cases of abuse, neglect and other maltreatment be counted?

Proposed resolution: Confirmed (T74) and suspected (T76) Child/Adult Abuse codes will be placed in their own Assault category in the **ICD-10-CM External Cause Matrix for Causes other than Poisoning.** Both confirmed and suspected cases will be used to count abuse, neglect and other maltreatment. This should be pilot tested when ICD-10-CM coded data become available.

Issue 10. Recording of Poisoning/Toxic Effects and Asphyxiation Codes in Administrative Databases

Background: In ICD-10-CM, there are no external cause codes for Poisoning/Toxic Effects of substances and Asphyxiation (suffocation). Poisoning/Toxic Effects and Asphyxiation are classified using T codes with a character to designate intent of injury. These T codes are included in the ICD-10-CM External Cause Matrix.

Questions:

a. How should T codes for Poisoning/Toxic Effects and Asphyxiation be recorded in administrative databases (e.g., state-based emergency department and hospital discharge data sets)?

b. Should some or all of these T codes be captured only as diagnosis codes or should they be captured as both diagnosis and external cause of injury codes?

Proposed resolution: How ICD-10-CM combination codes will be recorded in administrative databases is currently under discussion by NCHS and CMS. Guidelines will be provided prior to October 1, 2014.

VI. Next Steps

The proposed ICD-10-CM External Cause of Injury Matrix can help the injury research and practice community prepare for ICD-10-CM external cause-coded data that will be available after October 1, 2014, when ICD-10-CM will be implemented in the United States for coding of morbidity data. Once ICD-10-CM coded data are available, the proposed ICD-10-CM External Cause of Injury Matrix will be pilot tested to identify any necessary changes. A revised version will be released to the injury research and practice community as a compressed summary matrix to show the mechanism by intent categories with their respective ICD-10-CM code sets, similar to the current ICD-9-CM External Cause Matrix.[4] SAS programs to group ICD-10-CM codes according to the matrix layout are being developed and will be made publicly available on the NCIPC and NCHS web sites.

While this effort has focused on developing a proposed ICD-10-CM External Cause of Injury Matrix, another effort is underway to develop a proposed ICD-10-CM Injury Diagnosis Matrix and to assess its compatibility with the ICD-9-CM injury morbidity matrix and ICD-10 injury mortality matrix. This ICD-10-CM Injury Diagnosis Matrix will include groupings of ICD-10-CM codes by nature of injury and body region, and will undergo a similar review process before it is released to the injury field for use in injury surveillance and reporting of injury morbidity data.

Figure 1. Methods for constructing the ICD-10-CM External Cause of Injury Matrix.

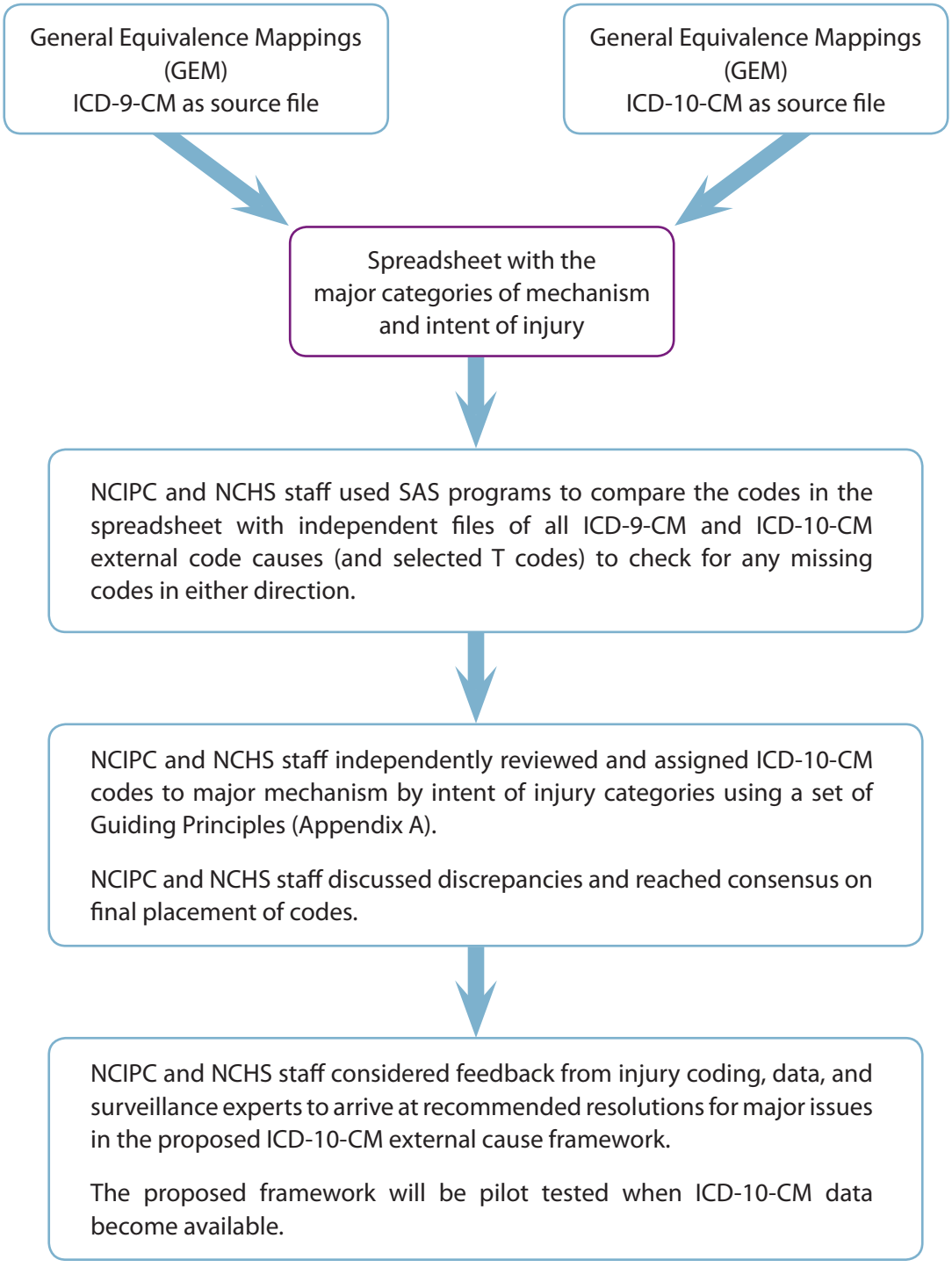

Table 1. Differences between ICD-9-CM and ICD-10-CM external cause codes.

Item	ICD-9-CM	ICD-10-CM
1.	External cause codes are supplemental codes and are preceded with E (commonly called E codes)	External cause codes are part of the single alpha-numeric code set and are preceded with V, W, X, and Y
2.	Code contains 3-5 characters	Code contains 3-7 characters
3.	Codes do not include a character to distinguish between initial or subsequent encounters	Most external cause and injury diagnosis codes have a 7th character to designate initial (A) or subsequent encounter (D)
4.	External cause late effects codes are limited to E929 (.0-.5,.8,.9)	All external cause and most injury diagnosis codes have a 7th character to designate sequela (late effect) (S)
5.	Intentional self-inflicted external cause codes are referred to as Suicide/Self-inflicted	Intentional self-inflicted external cause codes are referred to as Intentional Self-harm
6.	External cause codes for intentional harm by other persons are referred to as Homicide and Injury Purposely Inflicted by Other Persons	External cause codes for intentional harm by other persons are referred to as Assault
7.	Includes specific external cause codes for poisoning and toxic effects of substances	There are no external cause codes for poisoning and toxic effects of substances, other than a few assault (Y38.6, Y38.7) and legal intervention/war (Y35.2, Y36.6, Y36.7) non-drug poisoning codes; instead, these injuries are identified using diagnosis codes (T codes) with a character to designate intent
8.	Includes external cause codes for suffocation (E911-E913, E953, E963, E983, E995.3) and a diagnosis code for asphyxiation and strangulation (994.7)	There are no external cause codes for asphyxiation (suffocation); instead, these injuries are identified using diagnosis codes (T codes) with a character to designate intent
9.	Includes both external cause codes (E914, E915) and diagnosis codes (930-939) for injuries due to foreign body	There are no external cause codes for foreign body; includes detailed diagnosis codes for foreign body (T15-T19)
10.	Includes external cause codes for deprivation and neglect (E904) and specific diagnosis codes for effects of hunger, thirst, exhaustion from exposure, and exhaustion from excessive exertion (994.2-.5)	There are no external cause codes for deprivation; includes diagnosis codes for the effects of other deprivation, including starvation, lack of water, exhaustion from exposure, exhaustion from overexertion, other, and unspecified (T73)
11.	Includes external cause code for lightning (E907) and diagnosis code for effects of lightning (994.0)	There is no external cause code for lightning; includes diagnosis code for the effects of lightning (T75.0)
12.	Includes external cause code for vibration (E928.2); no diagnosis code for the effects of vibration	There is no external cause code for vibration; includes diagnosis code for the effects of vibration (T75.2)

Item	ICD-9-CM	ICD-10-CM
13.	There is no external cause code for motion sickness; motion sickness is coded using a diagnosis code (994.6)	There is no external cause code for motion sickness; motion sickness is coded using a diagnosis code (T75.3)
14.	Includes external cause codes for perpetrator of child and adult abuse (E967.0-.9); includes diagnosis codes for child maltreatment and abuse (995.50-995.59) and adult maltreatment and abuse (995.80-.85)	External cause codes for perpetrator of assault, maltreatment and neglect are expanded in Y07; includes diagnosis codes to specify adult and child abuse, neglect, and other maltreatment, confirmed (T74) and suspected (T76)

Table 2. Proposed ICD-10-CM External Cause of Injury Matrix by mechanism and intent of injury categories.

Mechanism	Intent of Injury				
	Unintentional	Self-Harm	Assault	Undetermined	Legal Intervention/ War
Cut/Pierce	X	X	X	X	X
Drowning/Submersion	X	X	X	X	…
Fall	X	X	X	X	…
Fire/Burn	X	X	X	X	X
Fire/Flame	X	X	X	X	X
Hot Object/Substance	X	X	X	X	…
Firearm	X	X	X	X	X
Machinery	X	…	…	…	…
All Transportation*	X	X	X	X	X
Motor Vehicle-Traffic (MVT)	X	X	X	X	…
MVT-Occupant	X	X	X	…	…
MVT-Motorcyclist	X	…	…	…	…
MVT-Pedal cyclist	X	…	…	…	…
MVT-Pedestrian	X	…	X	…	…
*MVT-Other**	X	…	…	…	…
MVT-Unspecified	X	…	…	X	…
Motor Vehicle-Nontraffic*	X	…	…	…	…
Pedal cyclist, other	X	…	…	…	…
Pedestrian, other	X	…	…	…	…
Other Land Transport*	X	X	X	…	…
Other Transport	X	X	X	…	X
Natural/Environmental	X	X	X	X	…
Bites and Stings, nonvenomous*	X	…	X	…	…
Bites and Stings, venomous*	X	X	X	X	…
Natural/Environmental, other	X	X	X	X	…
Overexertion	X	…	…	…	…
Poisoning	X	X	X	X	X
Drug*	X	X	X	X	…
Non-Drug*	X	X	X	X	X
Struck by/against	X	X	X	…	X
Suffocation	X	X	X	X	X

Mechanism	Intent of Injury				
	Unintentional	**Self-Harm**	**Assault**	**Undetermined**	**Legal Intervention/ War**
Other Specified	X	X	X	X	X
Other Specified, Child/ Adult Abuse*	…	…	X	…	…
Other Specified, Foreign Body*	X	…	…	…	…
Other Specified, Classifiable	X	X	X	X	X
Other Specified, Not Elsewhere Classifiable	…	X	X	X	X
Unspecified	…	X	X	…	X

*New mechanism categories for the ICD-10-CM External Cause Matrix.
Note: X indicates ICD-10-CM codes present; … indicates no relevant ICD-10-CM codes.

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Appendix A. Guiding Principles for Determining Placement in the ICD-10-CM External Cause of Injury Framework

Guiding principles for assigning ICD-10-CM codes to mechanism-by-intent categories in the external-cause-of-injury framework were developed to achieve, as much as possible, consistency with placement of the ICD-10 codes in the ICD-10 external cause framework. In the United States, the ICD-10 external cause framework is used as the standard for presenting injury mortality data. Consistency in these two frameworks will help provide reasonable comparability for presenting injury morbidity statistics based on ICD-10-CM external cause code sets and mortality statistics based on ICD-10 external cause code sets.

ICD-10-CM has substantially more external cause codes than ICD-10. In most cases, the first 3 digits, and sometimes the 4th digit, of the external cause code (for brevity called the *parent* code) are the same for ICD-10-CM and ICD-10. However, ICD-10-CM external cause codes have many more subcategories usually defined by the 4th through 7th digits of the external cause code. This extended code (for brevity called the *child* code) allows for more specificity in external cause classification in injury morbidity data systems than those in injury mortality data systems. Sometimes the definition of an ICD-10-CM *child* code warrants its placement in a different mechanism-by-intent category in the ICD-10-CM external cause framework than indicated by its ICD-10 *parent* code. Therefore, the following Guiding Principles were used to place individual codes in the ICD-10-CM external cause framework:

Principle 1. Each ICD-10-CM *child* code was initially assigned to the same mechanism-by-intent category in the ICD-10-CM external cause as the *parent* code in the ICD-10 external cause framework. Then, each c*hild* code was assessed to determine if it should remain with the *parent* code or be reassigned to a different mechanism-by-intent category.

a. The *child* code remained in the initially assigned mechanism-by-intent category if it was a subset of the *parent* code. For example:

   i. **ICD-10-CM code: W50.3xx. Accidental bite by another person.** In the ICD-10-CM external cause framework, the *parent* code W50. Hit, Struck, Kicked, Twisted, Bitten or Scratched by Another Person is assigned to Unintentional, Struck by/against. W50.3xx is a subset of W50 and remained with its *parent* code (Figure A1). (Note: Some ICD-10-CM codes have an "x" or several "x's" either embedded in the code or at the end of the code. The "x's" are placeholders for additional characters that may be needed to accommodate specific diagnosis and external cause categories that may be created in the future.)

b. The *child* code was reassigned if it provided greater detail or specificity that supported logical placement in a different mechanism-by-intent category. For example:

   i. **ICD-10-CM code: Y02.0xx. Assault by pushing or placing victim in front of motor vehicle.** In the ICD-10 external cause framework, the *parent* code Y02. Assault by Pushing or Placing Victim before Moving Object is assigned to Assault, Other Specified, Classifiable. Because of the additional detail provided in the *child* code (i.e., specific mention of motor vehicle), Y02.0xx was reassigned to Assault, Motor Vehicle Traffic (MVT)-Pedestrian in the ICD-10-CM external cause framework.

ii. **ICD-10-CM code: Y36.92x. War operations involving friendly fire.** In the ICD-10 external cause framework, based on the *parent* code Y36. War Operations, the *child* code Y36.9. War operations, unspecified would be assigned to Legal Intervention/War, Unspecified. However, because of the additional detail in the more specific *child* code Y36.92x (i.e., friendly fire), this specific code was reassigned to Legal Intervention/War, Firearm in the ICD-10-CM external cause framework (Figure A2).

c. The *child* code was reassigned if it represented a different mechanism from the *parent* code. For example:

i. **ICD-10-CM code: W16.511. Jumping or diving into swimming pool striking water surface causing drowning and submersion.** In the ICD-10 external cause framework, the *parent* code W16. Diving or Jumping into Water Causing Injury other than Drowning or Submersion is assigned to Unintentional, Fall. Because drowning and submersion is specified in the *child* code, W16.511 was reassigned to Unintentional, Drowning/Submersion in the ICD-10-CM external cause framework (Figure A3).

ii. **ICD-10-CM code: Y24.0xx. Air gun discharge, undetermined intent.** In the ICD-10 external cause framework, the *parent* code Y24. Other and Unspecified Firearm Discharge, Undetermined Intent is assigned to Undetermined, Firearm. Because an air gun (i.e., BB/pellet gun) is not considered to be a firearm, Y24.0xx was reassigned to Undetermined, Other Specified, Classifiable in the ICD-10-CM external cause framework.

Principle 2. ICD-10-CM codes that did not have a *parent* code in ICD-10 were placed in the ICD-10-CM external cause framework based on the injury description.

a. ICD-10-CM V00.xxx. Pedestrian Conveyance codes were not placed in transportation categories but in other relevant unintentional categories. For example:

i. **ICD-10-CM code: V00.01x. Pedestrian on foot injured in collision with roller skater.** There is no *parent* code in ICD-10. Based on the injury description (i.e., no mention of motor vehicle, no mention of traffic/non-traffic, but mention of the broad concept of one person being unintentionally struck by another), V00.01x was placed in Unintentional, Struck by/against.

Principle 3. ICD-10-CM T codes were included in the external cause framework if: (a) the T code was associated with an ICD-10 external-cause-of-injury code that had been deactivated in ICD-10-CM; or (b) the T code contained a digit or description that indicated the intent of injury (e.g., abuse, neglect).

a. T codes were initially placed in the ICD-10-CM external cause framework based on the assignment of the deactivated ICD-10 external-cause-of-injury code in the ICD-10 external cause framework. For example:

i. **ICD-10-CM code: T75.0xx. Effects of lightning.** The deactivated code from ICD-10 associated with this ICD-10-CM code is X33. Victim of lightning. In the ICD-10 external cause framework, X33 is assigned to Unintentional, Natural/Environmental. Therefore, T75.0xx was also assigned to Unintentional, Natural/Environmental, Other in the ICD-10-CM external cause framework.

b. Some T codes provide more specificity or include a different mechanism than the deactivated ICD-10 code. Using the same guideline as described in Principle 1b or 1c, these T codes were reassigned to a different category in the ICD-10-CM external cause framework. For example:

i. **ICD-10-CM code: T17.200. Unspecified foreign body in pharynx causing asphyxiation.** Using Principle 3a, this code was initially placed in Unintentional, Other Specified, Classifiable in the ICD-10-CM external cause framework consistent with placement of the deactivated ICD-10 code W44. Foreign Body Entering into or through Eye or Natural Orifice. However, because a different mechanism (i.e., asphyxiation) is specified, T17.200 was reassigned to Unintentional, Suffocation.

Figure A1. ICD-10-CM *child* code that is a subset of the ICD-10 *parent* code.

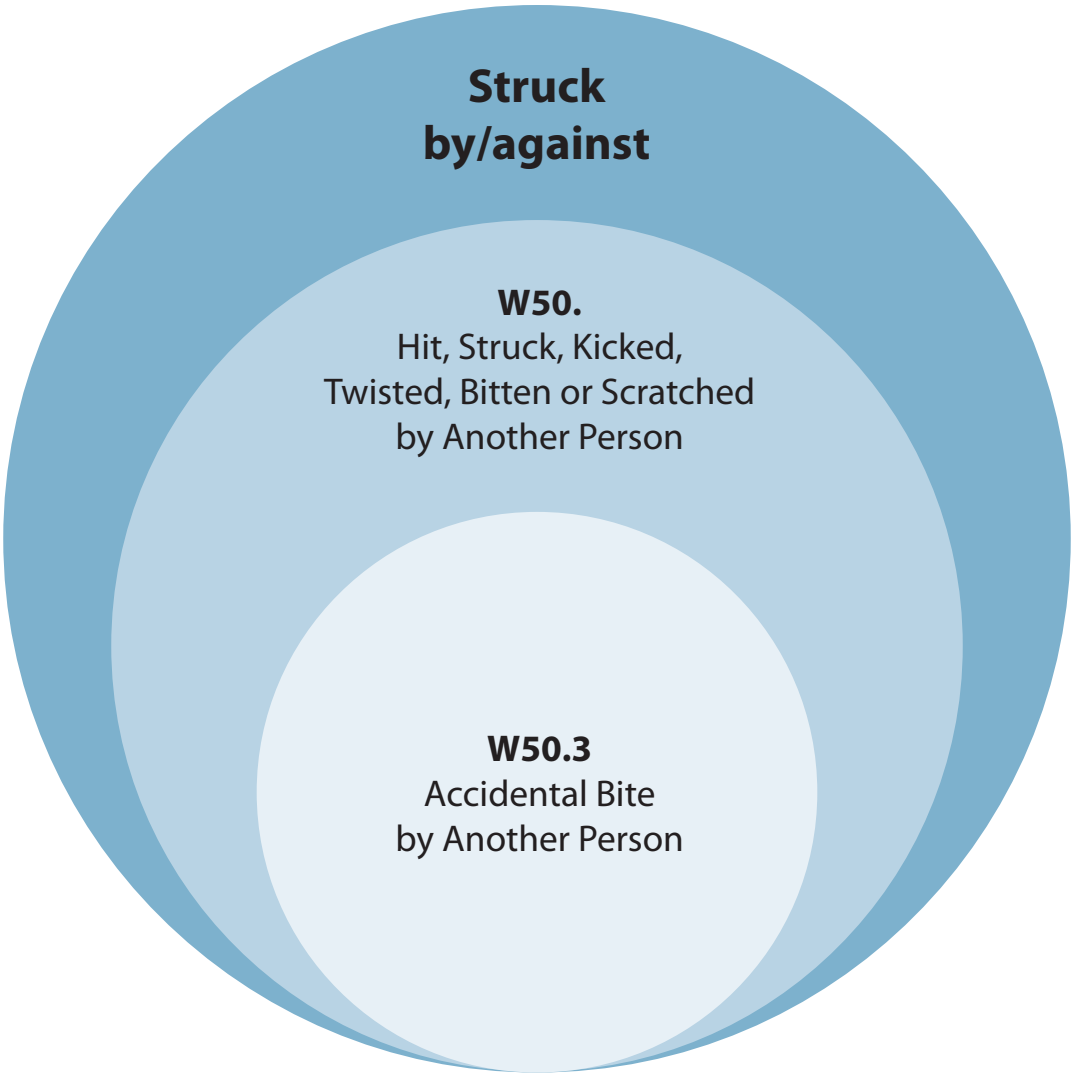


Figure A2. ICD-10-CM *child* code that has more detail than ICD-10 *parent* code.

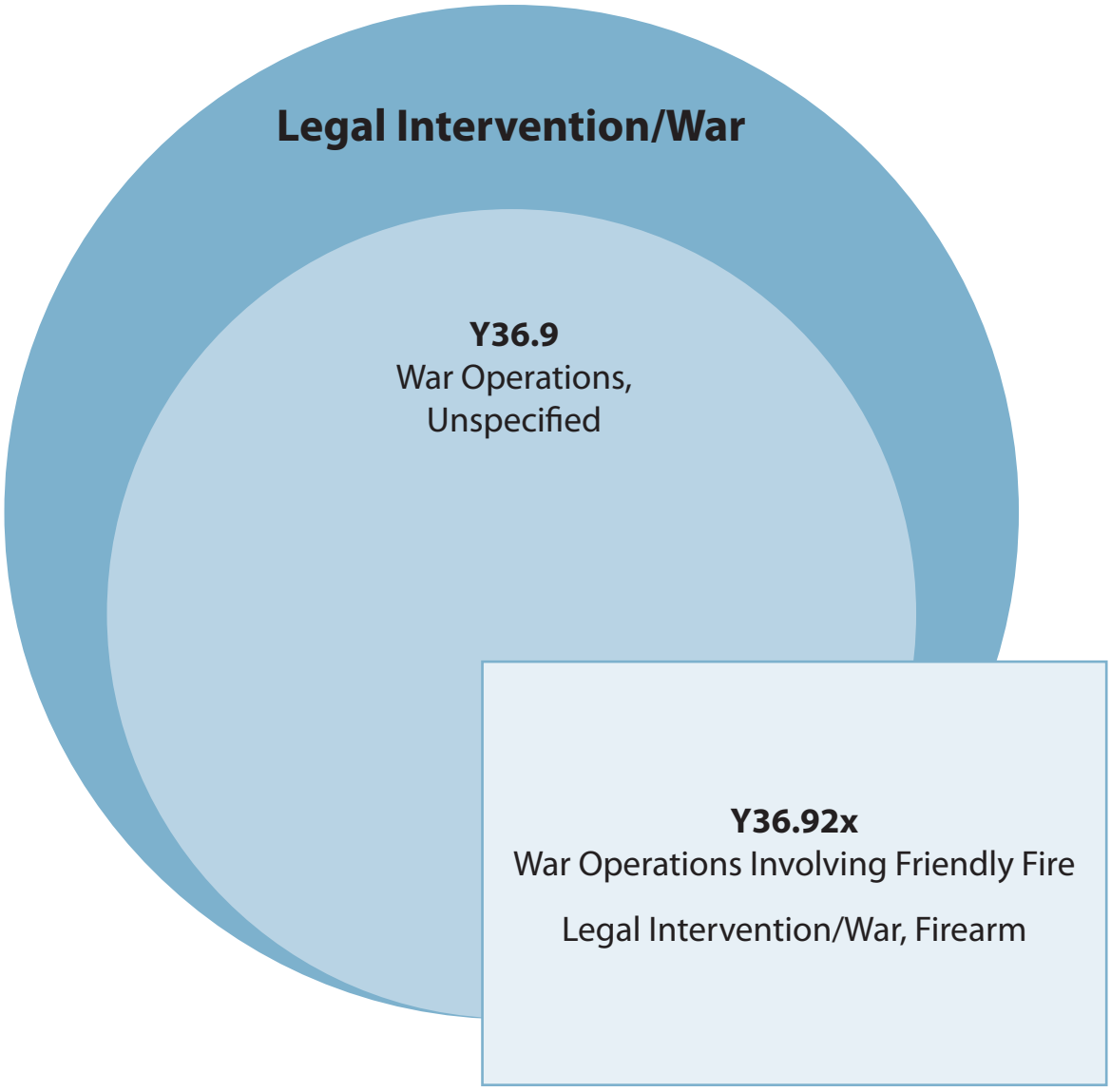
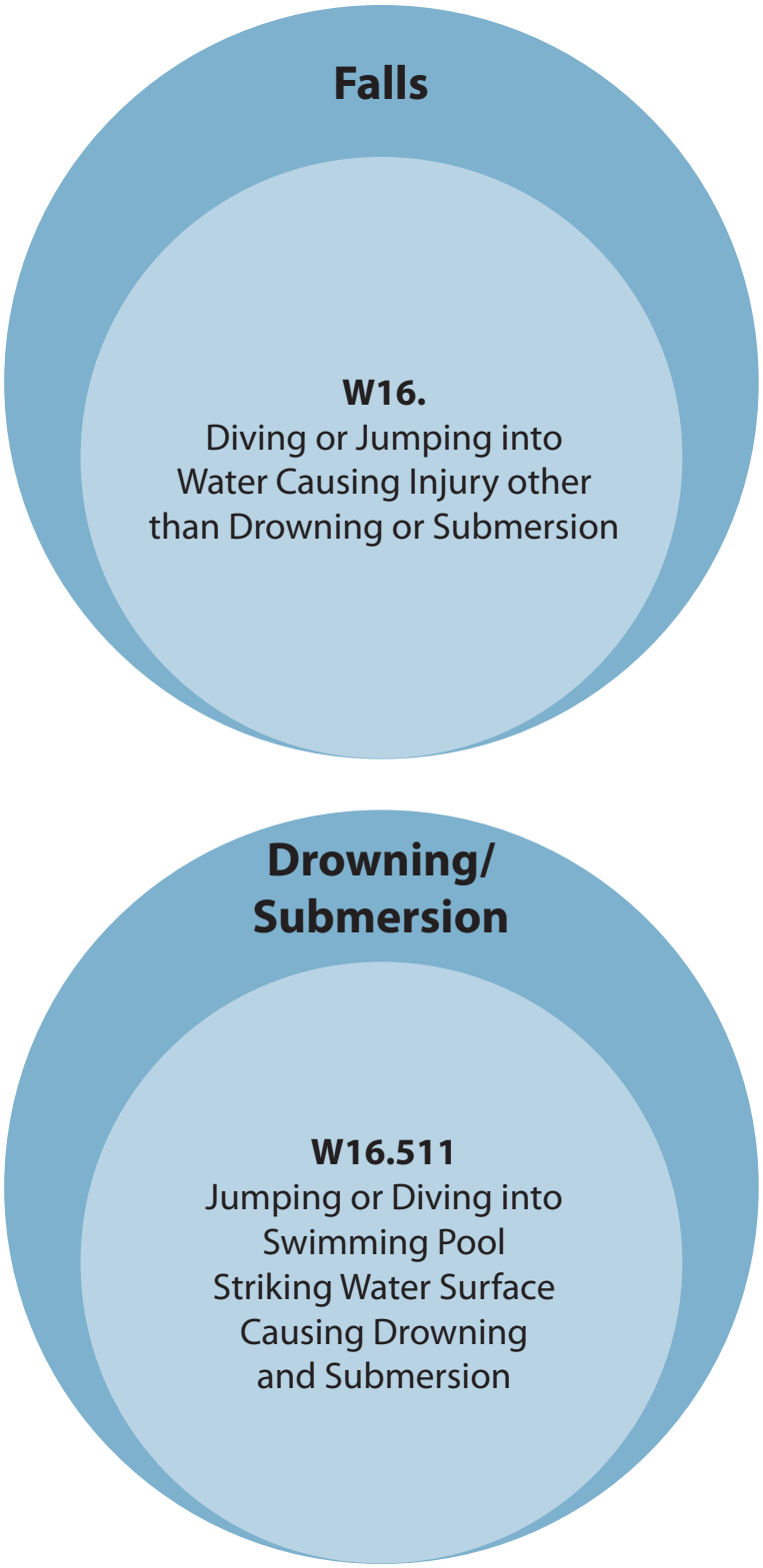


Figure A3. ICD-10-CM *child* code that is not a subset of the ICD-10 *parent* code.



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