

The transition to ICD-10: Implications for injury mortality research

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The Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems, ICD-10, was first used for the coding of national mortality data in 1994. The United States began coding its national mortality data using ICD-10 in data year 1999, with the first available mortality statistics being published likely by the end of the year 2000. Major changes have been made from ICD-9 to ICD-10 in terms of both external cause of injury codes as well as injury diagnosis codes. In many ways, the injury chapters in ICD-10 are more like a new classification system rather than an update of ICD-9.

To illustrate:

- 1) The external cause of injury codes are no longer a supplementary chapter of the ICD as they were in ICD-9;
- 2) All chapters are divided into an alphanumeric coding scheme of one letter and two numbers at the 3-digit level with decimal subdivisions for the 4th digit. Injury diagnostic codes are found in Chapter 19 and are prefaced with letters S and T- thus, the use of the commonly used “N” code for nature of injury must be avoided lest it be confused with chapter on diseases of the genitourinary system that begin with the letter N. Similarly, external causes of injury are found in Chapter 20 and use letters V, W, X and Y- and thus are definitely not “E-codes”[E is found in the chapter for endocrine, nutritional and metabolic diseases];
- 3) ICD-9 was often criticized for its single axial approach to external causes of injury and not effective for injury prevention initiatives. As a result, the codes in ICD-10 are now multi-axial in concept, in that there are requisite codes for injury incidents for place of occurrence and for activity the victim was involved in when the death occurred;
- 4) The letter “V” is used for transportation related injuries with the first subdivisions, i.e., being for the victim’s mode of transport (for example, pedestrian, occupant, pedal cyclist); the third character identified the victim’s counterpart or the circumstance of the accident (collision with vehicle, non-collision). The fourth character identifies the activity of the victim (driver, passenger) and whether the incident occurred in traffic or a non-traffic situation. Realize how different this is compared with ICD-9 when the first piece of information is the vehicle and whether the incident was traffic-related or not....and only at the decimal place do we know if the person is the occupant of a car, mc, pedestrian or pedal cyclist;
- 5) “Fracture not otherwise specified” was classified with falls in ICD-9 but in ICD-10 is classified with “exposure to unspecified factors”. Falls are also still problematic because of their specified exclusions- fall from an animal is a transportation code;

- 6) Late effects codes are now combined in one section rather than being placed with relevant sections of unintentional, suicide or undetermined intent;
- 7) New to ICD-10 are the optional activity codes describing what the person was doing prior to death;
- 8) The major subdivisions for diagnosis codes are by body part rather than by type of injury (as in ICD-9). For example, they are for head, neck, hip and thigh, knee and lower leg- rather than fracture, open wound, or superficial injury. Each of these categories are specified with body part.

Following are examples of how codes in ICD-10 should be read, of how ICD-10 differs from ICD-9 and examples of problems introduced with this revision of the ICD.

The ICD-10 is copyrighted by the World Health Organization (WHO) which owns and publishes the classification. WHO has authorized the development of an adaptation of ICD-10 for use in the United States for U.S. government purposes. As agreed, all modifications to the ICD-10 must conform to WHO conventions for the ICD. Except in rare instances, no modifications have been made to existing three-digit categories and four-digit codes, with the exception of title changes that did not change the meaning of the category or code.

**In both ICD-10 and 10 CM
injury diagnosis codes are found in
Chapter XIX with leading
alpha characters S & T**

S codes
Injuries related to a single body region

T codes
**Injuries to multiple or unspecified body
regions, poisoning and certain other
consequences of external causes**

**Injury diagnosis codes restructured
according to body region first**

■ Head	S00 - S09
■ Neck	S10 - S19
■ Thorax	S20 - S29
■ Abdomen, lower back, lumbar spine and pelvis	S30-S39
■ Shoulder and upper arm	S40-S49
■ Elbow and forearm	S50-S59
■ Wrist and hand	S60-S69
■ Hip and thigh	S70-S79
■ Knee and lower leg	S80-S89
■ Ankle and foot	S90-S99

and then according to nature of injury
3rd character

- 0 Superficial injuries
- 1 Open wounds
- 2 Fractures
- 3 Dislocations and sprains
- 4 Injuries of nerves
- 5 Blood vessels
- 6 Muscle and tendon
- 7 Crushing injury
- 8 Traumatic amputation
- 9 Other and unspecified injuries

How to dissect an injury 'S' code

- S02.5
 - S single body region
 - 0 injury to head
 - 2 fracture
 - .5 tooth
- S21.1
 - S single body region
 - 2 injury to thorax
 - 1 open wound
 - .1 front wall of thorax

T codes

- T00-T07 Multiple body regions
- T08-T14 Unspecified parts of trunk, limb or body region
- T15-T19 Effects of foreign body -entering through natural orifice
- T20-T32 Burns and corrosions
- T33-T35 Frostbite
- T36-T50 Poisoning -drugs
- T51-T65 Toxic effects of nonmedicinal substances
- T66-T78 Other & unspec effects of external causes
- T79 Certain early complications of trauma
- T80-T88 Complications of surg and med care nec
- T90-T98 Sequelae of injuries, poisonings and other consequences of external causes

Examples of T codes

- T01.0 Open wounds involving head and neck
Open wounds of sites classified S01.- and S11.-

- T20 Burn and corrosion of head and neck
Includes: ear, eye with other parts of face..., nose,
scalp, temple
- .0 burn of unspecified degree
- .1 burn of first degree
- ...
- .7 corrosion of third degree

ICD-10 codes for Poisoning

- T36 - T50 Poisoning by drugs, medicinals and biological substances
- T51-T65 Toxic effects of substances chiefly nonmedicinal as to source
- X40 - X49 Accidental poisoning by and exposure to noxious substances
- X60 - X69 Intentional self-poisoning
- X85 - X90 Assault by drugs, corrosive substances, pesticides, gases and vapors, and by other and unspecified chemicals and noxious substances

Carbon monoxide codes ICD-9 vs ICD-10

- | ICD-9 | ICD-10 |
|---|---|
| <ul style="list-style-type: none"> ■ Accidental poisoning by: E868 (506 deaths in 1995) <ul style="list-style-type: none"> - .0 liquified petroleum gas (57) - .1 other utility gas (13) - .2 mv exhaust gas (234) - .3 cm from incomplete combustion of other domestic fuels (44) - .4 cm from other sources (18) - .9 unspecified cm (140) ■ Toxic effect of cm: 986 | <ul style="list-style-type: none"> ■ X47 Accidental poisoning by and exposure to other gases and vapours ■ T58 Toxic effect of cm |
| | for 10 CM
→ |

External causes of morbidity and mortality

- Divided into alphanumeric sections
 - V01-V99 Transport 'accidents'
 - W00-X59 Other external causes of accidental injury
 - X60-X84 Intentional self-harm
 - X85-Y09 Assault
 - Y10-Y34 Event of undetermined intent
 - Y35-Y36 Legal intervention
 - Y40-Y84 Complications of medical and surgical care
 - Y85-Y89 Sequelae of external causes
 - Y90-Y98 Supplementary factors (not for underlying cause of death)

Official list of rankable external causes of injury death in ICD-10

- Accidents V01-X59, Y85-Y86
- Intentional self-harm (suicide) X60-X84, Y87.0
- Assault (homicide) X85-Y09, Y87.1
- Legal intervention Y35, Y89.0
- Operations of war and their sequelae Y36, Y89.1
- Complications of medical and surgical care Y40-Y84, Y88

Place of injury codes for W00-Y34 except Y06 and Y07 (neglect and maltreatment)

- Separate field for mortality / Extra digit for morbidity record
 - 0 Home
 - 1 Residential institution
 - 2 School, other institution and public admin. area
 - 3 Sports and athletic areas
 - 4 Street and highway
 - 5 Trade and service area
 - 6 Industrial and construction area
 - 7 Farm (not home or premises of home)
 - 8 Other specified
 - 9 Unspecified

Optional Activity codes for use in a supplementary character position with codes V01-Y34

- Separate field on mortality record indicating:
 - 0 While engaged in sports activity
 - 1 While engaged in leisure activity
 - 2 While working for income
 - 3 While engaged in other types of work
 - 4 While resting, sleeping, eating or other vital activities
 - 8 other specified activities
 - 9 unspecified activity
- Information will come from text item on death certificate: "describe how injury occurred"
- Quality of codes will be evaluated for data year 1999

**V codes- transport accidents
generally 4 characters with V as the 1st**

- Codes relating to land transport accidents- V01-V89 reflect **first** the victim's **mode of transport (pedestrian, pedal cyclist, car occupant, etc)**
- Codes are further subdivided to identify the victim's **counterpart** or type of event (pedestrian injured in collision **with bus**)
- Lastly, codes are divided into traffic, nontraffic, driver, passenger, person alighting or boarding, or unspecified

**V codes- transport accidents
Person injured is the 2nd character**

- ↓
- | | |
|-----------|-------------------------------------|
| ■ V01-V09 | Pedestrian |
| ■ V10-V19 | Pedal cyclist |
| ■ V20-V29 | Motorcycle rider |
| ■ V30-V39 | Occupant of 3-wheeled mv |
| ■ V40-V49 | Car occupant |
| ■ V50-V59 | Occupant of pick-up truck or van |
| ■ V60-V69 | Occupant in heavy transport vehicle |
| ■ V70-V79 | Bus occupant |
| ■ V80-V89 | Other land transport |

3rd character following V (as appropriate)

4=car occupant

for example, V40-V49

- 0 In collision with pedestrian or animal
- 1 In collision with pedal cycle
- 2 In collision with 2 or 3 wheeled mv
- 3 In collision with car, pick-up, or van
- 4 In collision with heavy transport vehicle or bus
- 5 In collision with railway train
- 6 In collision with other nonmotor vehicle
- 7 In collision with fixed or stationary object
- 8 In noncollision transport accident
- 9 In other and unspecified transport accidents

4th character (as appropriate)

V44.5 (car occupant injured in collision with heavy transport vehicle or bus)

- 0 Driver injured in **nontraffic** accident
- 1 Passenger injured in **nontraffic** accident
- 2 Person on outside of vehicle injured in **nontraffic** accident
- 3 Unspecified bus occupant injured in **nontraffic** accident
- 4 Person injured while boarding or alighting
- 5 Driver injured in **traffic** accident
- 6 Passenger injured in **traffic** accident
- 7 Person on outside of vehicle injured in **traffic** accident
- 8 Occupant [any] in other specified transport accident
- 9 Unspecified bus occupant injured in **traffic** accident

**Complexity of comparing ICD-9 to ICD-10:
Motor vehicle traffic codes**

- In 1995, the single most common E-code for mv traffic deaths was **E812.0** (19% of all mvt deaths)
- In ICD 10 there are **23 V** codes that E812.0 translates to including:
 - V32.5,V33.5,V39.4
 - V42.5,V43.5,V44.5,V49.4
 - V52.5, V53.5,V54.5,V59.4
 - V62.5,V63.5,V64.5,V69.4
 - V72.5,V73.5,V74.5,V79.4
 - V83.0,V84.0,V85.0,V86.0
- However, these V codes translate to other ICD-9 codes as well

V90-V99

- V90-V94 Water transport
 - 4th digit identifies vessel type
- V95-V97 Air and space transport accidents
 - 4th digit identifies type of aircraft, nonpowered craft and other specified
- V98-V99 Other and unspecified
 - for example, ski-lift, cable car

W00-Y05
New "problems introduced"

- **Firearm codes are less specific in ICD-10**
 - In ICD-9, there are separate codes for handguns, shotguns, hunting rifle, military firearms
 - In ICD-10 rifle, shotgun and larger firearms are combined

W00-Y05
New "problems introduced"

- **Falls**
 - E887 fracture, not otherwise specified has no comparable code in ICD-10. The only mappable code is X59- Exposure to unspecified factor
 - While the injury community doesn't recommend including E887 with falls, many nevertheless do

So.....

- No more E codes
- Instead there are V, W, X and Y codes
- No more N codes
- Instead there are S and T codes
- Codes for transportation related injuries are very different
- More extensive place and activity codes
- Official leading causes of injury death have changed