

International comparisons in the presence of different versions of ICD



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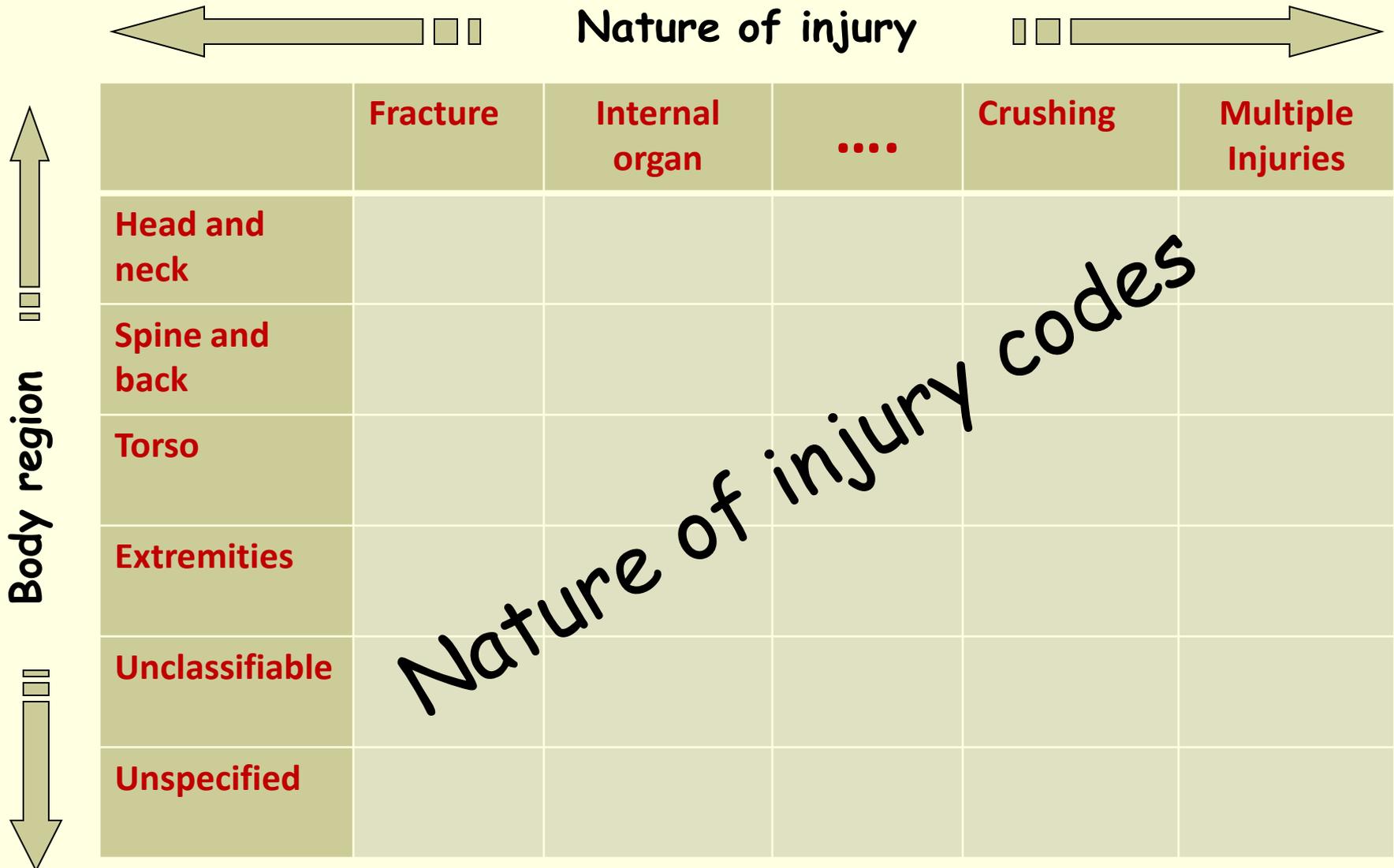
Major changes from ICD-9 to ICD-10: Nature of injury – Chapter XIX

- Alphanumeric: ICD-9 800-999 ICD-10 “S” or “T” codes
- Primary axis switch
 - ICD-9 – Blocks by Nature of injury with body region specified within nature
 - ICD-10 – Blocks by body region with nature of injury specified within body region
- Nature of injury matrices:
 - ICD-9-CM Barell matrix
 - ICD-10 Injury Mortality Diagnosis (developed based on Barell)
- Clinical Modifications of ICD-10 from many countries (e.g. ICD-10-CM, ICD-10-AM, Canada, Thailand, Sweden)

Comparability between ICD revision

- Cause of death comparability ratios based on groups of codes not single codes
- Nature of injury groupings
 - Barell matrix uses ICD-9 Clinical Modifications
 - Injury Mortality Diagnosis matrix uses ICD-10 (not the clinical modifications)
- Multiple nature of injury codes possible per injury.
 - ICD-9 Selects most “severe” (referred to as the Precedence list)
 - ICD-10 Selects the injury which led to the death (similar to external cause selection)

Diagnosis matrix structure



The diagram illustrates the structure of a diagnosis matrix. It features a grid with 'Body region' on the vertical axis and 'Nature of injury' on the horizontal axis. The vertical axis is marked with an upward-pointing arrow and a downward-pointing arrow, with the text 'Body region' written vertically. The horizontal axis is marked with a leftward-pointing arrow and a rightward-pointing arrow, with the text 'Nature of injury' written horizontally. The grid contains the following text:

	Fracture	Internal organ	Crushing	Multiple Injuries
Head and neck					
Spine and back					
Torso					
Extremities					
Unclassifiable					
Unspecified					

A large, diagonal watermark text 'Nature of injury codes' is overlaid on the grid.

Severity within cells of matrix

- Each body region and nature cell includes all ICD codes to describe injuries within that cell of the matrix (e.g. upper extremity fracture)
 - A wide range of severity will be included in each cell (e.g. contusion to the torso)
 - Range in severity within cell will differ by:
 - Detail in codes (within code severity)
 - Differences between ICD codes (between code severity)
 - Differences in proportion of injuries with each code
 - In general, as specificity of code or code group increases, the range in severity decreases

Individual code level severity

- Each body region and nature cell includes all ICD codes to describe injuries within that cell of the matrix (e.g. upper extremity fracture)
 - A wide range of severity will be included in each cell (e.g. contusion to the torso)
 - Range in severity within cell will differ by:
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Page from WHO

Translator ICD10 to ICD9
(includes nature of injury codes)

WHO also developed a translator available for Translator ICD9 to ICD10

Developed before ICD10 Implemented

Based on code descriptions and exclusion/inclusion criteria only

No validity of translator done

PDF I have dated -- 1997

ICD10	ICD9	N	ICD10	ICD9	N	ICD10	ICD9	N	ICD10	ICD9	N	ICD10	ICD9	N
CIM10	CIM9	N	CIM10	CIM9	N	CIM10	CIM9	N	CIM10	CIM9	N	CIM10	CIM9	N
R893	7923	10	R95-R99			S003	920	11	S009	9108	12	S027	8040	5
R893	7929	50	Ill-defined and			S004	3803	2	S009	9109	12	S027	8041	5
R894	7923	10	unknown causes of			S004	9100	13	S009	920	11	S027	8042	5
R894	7929	50	mortality			S004	9101	13	S010	8730	2	S027	8043	5
R894	7957	4	R95	7980	1	S004	9102	12	S010	8731	2	S028	8028	2
R895	7923	10	R960	7981	1	S004	9103	12	S011	8700	1	S028	8029	2
R895	7929	50	R961	7982	2	S004	9104	12	S011	8701	1	S029	8000	2
R895	7953	2	R98	7989	1	S004	9105	12	S011	8702	2	S029	8001	2
R896	7923	10	R99	7982	2	S004	9106	12	S011	8708	1	S029	8002	2
R896	7929	50	R99	7999	3	S004	9107	12	S011	8734	5	S029	8003	2
R896	7951	1	-----			S004	9108	12	S011	8735	5	S029	8028	2
R897	0341	2	-			S004	9109	12	S012	8732	3	S029	8029	2
R897	2754	8	S000-T983			S004	920	11	S012	8733	3	S029	8030	5
R897	7923	10	XIX INJURY,			S005	5212	2	S013	8720	2	S029	8031	5
R897	7929	50	POISONING AND			S005	9100	13	S013	8721	2	S029	8032	5
R897	7954	1	CERTAIN OTHER			S005	9101	13	S013	8726	2	S029	8033	5
R898	7923	10	CONSEQUENCES			S005	9102	12	S013	8727	2	S030	8300	1
R898	7929	50	OF			S005	9103	12	S013	8728	1	S030	8301	1
R898	7952	6	EXTERNAL CAUSES			S005	9104	12	S013	8729	1	S031	8396	7
R899	7923	10	-			S005	9105	12	S014	8734	5	S031	8397	7
R899	7929	50	LESIONS			S005	9106	12	S014	8735	5	S032	8736	4
R899	7969	2	TRAUMATIQUES,			S005	9107	12	S015	8734	5	S032	8737	4
R900-R948			EMPOISONNEMENT			S005	9108	12	S015	8735	5	S033	8396	7
Abnormal findings			S ET CERTAINES			S005	9109	12	S015	8736	4	S033	8397	7
on diagnostic			AUTRES			S005	920	11	S015	8737	4	S034	8481	1
imaging and in			CONSEQUENCES			S007	9100	13	S017	8738	5	S035	8396	7
function studies,			DE CAUSES			S007	9101	13	S017	8739	5	S035	8397	7
without diagnosis			EXTERNES			S007	9102	12	S018	8540	10	S035	8480	1
R900	7942	3				S007	9103	12	S018	8541	10	S040	9500	1
R908	7940	2	S000-S099			S007	9104	12	S018	8732	3	S040	9501	1
R91	7931	1	Injuries to the head			S007	9105	12	S018	8733	3	S040	9502	1
R92	7938	1	S000	9100	13	S007	9106	12	S018	8734	5	S040	9503	1
R930	7930	1	S000	9101	13	S007	9107	12	S018	8735	5	S040	9504	1
R931	7932	2	S000	9102	12	S007	9108	12	S018	8736	5	S040	9505	1
R932	7933	1	S000	9103	12	S007	9109	12	S018	8737	5	S040	9506	1
R932	7939	3	S000	9104	12	S007	920	11	S018	8738	5	S040	9507	1
R933	7934	1	S000	9105	12	S008	9100	13	S018	8739	5	S040	9508	1
R933	7939	3	S000	9106	12	S008	9101	13	S018	8740	5	S040	9509	1
R934	7935	2	S000	9107	12	S008	9102	12	S018	8741	5	S040	9510	1
R935	7936	1	S000	9108	12	S008	9103	12	S018	8742	5	S040	9511	1
R936	7937	2	S000	9109	12	S008	9104	12	S018	8743	5	S040	9512	1
R937	7937	2	S000	920	11	S008	9105	12	S018	8744	5	S040	9513	1
R938	7932	2	S001	9210	1	S008	9106	12	S018	8745	5	S040	9514	1
R938	7935	2	S001	9211	3	S008	9107	12	S018	8746	5	S040	9515	1
R938	7939	3	S002	9180	2	S008	9108	12	S018	8747	5	S040	9516	1
R940	7940	2	S003	9100	13	S008	9109	12	S018	8748	5	S040	9517	1
R941	7941	1	S003	9101	13	S008	920	11	S018	8749	5	S040	9518	1
R942	7942	1	S003	9102	12	S009	9100	13	S018	8750	5	S040	9519	1
R943	7943	1	S003	9103	12	S009	9101	13	S018	8751	5	S040	9520	1
R944	7944	1	S003	9104	12	S009	9102	12	S018	8752	5	S040	9521	1
R945	7948	1	S003	9105	12	S009	9103	12	S018	8753	5	S040	9522	1
R946	7945	1	S003	9106	12	S009	9104	12	S018	8754	5	S040	9523	1
R947	7946	1	S003	9107	12	S009	9105	12	S018	8755	5	S040	9524	1
R948	7947	1	S003	9108	12	S009	9106	12	S018	8756	5	S040	9525	1
R948	7949	1	S003	9109	12	S009	9107	12	S026	8023	1	S052	8712	4

“Fracture vault of skull”

S02.0 → 800.0

→ 800.1

→ 800.2

→ 800.3

Examples: High and Low SRRs for same ICD code New Zealand to Sweden

ICD code	Injury description	Swedish SRR*	NZ SRR*
S37.8	Injury of other pelvic organs	1.00	.83
T17.2	Foreign body in pharynx	.46	.90
S02.7	Multiple fractures involving skull and facial bones	.97	.21
S01.9	Open wound of head, part unspecified	.98	.81
S22.5	Flail chest	.35	.71

*SRR is probability of survival ranging from 0 (unsurvivable) to 1 (no threat to life)

Conclusion

- In general, using single codes or groups of codes, the more specificity in the code set, the more similar the severity between revisions
- Comparison on single ICD codes even with the same description can be problematic
- More research needed --- the US has publically available dual coded multiple cause death data to create comparability ratios.

Comparable Nature of injury

Comparable group	ICD-9CM Barell modified	ICD-10 IMD
fx	Fracture	FRACTURE
disl	Dislocation	DISLOCATION
internal	Internal organ injury	INTERNAL
ow	Open wound	OPEN WOUND
ampu	Amputation	AMPUTATIONS
bv	Blood vessel	BLOOD VESSELS
super/con	Superficial & contusion	CONTUSION /SUPERFICIAL
crush	Crushing	CRUSH
burn	Burn	BURNS
FB	Effect of foreign bodies entering orifice	Foreign body
OEEC	Other effects of external causes	Other effects of external causes
Pois	Poisoning	Poisoning
TE	Toxic effects	Toxic effects
Other /multiple	Multiple injuries Other specified injury	SPRAINS & STRAINS NERVES Early complications Child/adult maltreatment
Unspe	Unspecified injury	UNSPECIFIED

Barell matrix body regions

39	38	Head and Neck Other head, face and .	1	Type 1 TBI			
			2	Type 2 TBI			
			3	Type 3 TBI			
		4	Other Head				
		5	Face				
		6	Eye				
		7	Neck				
		8	Head, Face and Neck Unspecified				
40	40	Spinal Cord (SCI)	9	Cervical SCI			
			10	Thoracic/ Dorsal SCI			
			11	Lumbar SCI			
			12	Sacrum Coccyx SCI			
			13	Spine+ Back unspecified SCI			
			41	41	Spinal Column (VCI)	14	Cervical VCI
						15	Thoracic /Dorsal VCI
						16	Lumbar VCI
17	Sacrum Coccyx VCI						

43	43	Torso	19	Chest (Thorax)
			20	Abdomen
			21	Pelvis & Urogenital
			22	Trunk
			23	Back and Buttock
			24	Shoulder & upper arm
			25	Forearm & elbow
44	44	Upper	26	Wrist, hand & fingers
			27	Other & unspecified
			28	Hip
			29	Upper leg & thigh
			30	Knee
45	45	Lower	31	Lower leg & ankle
			32	Foot & toes
			33	Other & unspecified
			34	Other/ multiple
			35	Unspecified

47	47	Other & unspecified	34	Other/ multiple
			35	Unspecified
48	48	System wide	36	System-wide & site
			37	System-wide & site

Comparable body regions

Group called	Barell modified	IMD
TBI	1TYPE 1 TBI 2TYPE 2 TBI 3TYPE 3 TBI	Traumatic brain injury
Other Head	4OTHER HEAD 5FACE 6EYE 7NECK 8HEAD,FACE,NECK UNSPEC	Other head Neck Head and neck, other
Spinal cord	9CERVICAL SCI 10THORACIC/DORSAL SCI 11LUMBAR SCI 12SACRUM COCCYX 13SPINE+BACK, UNSPECIFIED	Spinal cord
Vertebral column	14CERVICAL VCI 15THORACIC/DORSAL VCI 16LUMBAR VCI 17SACRUM COCCYX VCI 18SPINE,BACK UNSPEC VCI	Vertebral column
Thorax	19CHEST (thorax)	Thorax
Abdomen	20ABDOMEN	Abdomen
Other trunk'	21PELVIS+UROGENITAL	Pelvis and lower back Abdomen, lower back, ?

Upper ext	24 SHOULDER&UPPER ARM 25 FOREARM&ELBOW 26 HAND&WRIST&FINGERS 27 OTHER&UNSPEC UPPER EXTREM	Upper extremity
Hip	28 HIP	Hip
Low ext	29 UPPER LEG&THIGH 30 KNEE 31 LOWER LEG&ANKLE 32 FOOT&TOES 33 OTHER&UNSPEC LOWER EXTREM	Other lower extremity
Mult	34 OTHER,MULTIPLE,NEC	Multiple body regions
Sys wide	SYSTEM WIDE & LATE EFFECTS 36 **** *** Frost bite distributed by body region Foreign body distributed by body region Early complications of trauma distributed by body region Poisoning Toxic effect	Systemwide
Unsp	35 UNSPECIFIED	Unspecified