

Annexes at manual for the calculation of direct medical costs of injury

The collection, harmonisation and analysis of data on injury incidence and related healthcare consumption and costs.

September 2008

Acknowledgements

APOLLO is a project that is co-sponsored by the European Commission DG SANCO under the Public Health Programme 2003-2008, Grant Agreement n°: SCP.2004119. The project aims to identify strategies and best practices for the reduction of injuries within the EU and is led by the Centre for Research and Preventing of Injuries (CEREPRI) of the University of Athens.

The subproject “The economic consequences of injury” is part of APOLLO Work Package 2 (The burden of injuries in the EU: indicators and recommendations for prevention and control) and was coordinated by the Consumer Safety Institute, Amsterdam, the Netherlands.

The contents of this publication do not necessarily reflect the opinion of the European Commission, Directorate-General of the Health and Consumer Protection.

Amsterdam, September 2008

Annex A Checklist for inventory of all available injury surveillance and health care consumption data systems

This annex is meant as a support by making an inventory of all available injury surveillance and health care consumption data systems in your country.

In this project 'injury' refers to all unintentional (home and leisure, transport, occupational) and intentional injuries. 'Injury surveillance system' refers to all more or less permanent systems that gather injury incidence data.

The overview will contain only existing injury surveillance and health care consumption systems of which data can be accessed and retrieved for research purposes.

Try to make an overview per data system:

- 1. What is the name of this injury surveillance / health care consumption data system?**
- 2. Who is the responsible organisation for this system?**
- 3. Since when is this system operational?**
- 4. What is the unit of registration in this system?**
How is a record in the data system defined, e.g. a patient, a consultation, an admission (patients can be admitted more than once), a disease episode.
- 5. Which category of patients are included in this system?**
Define the patient group of whom data are collected. E.g. injury patients attending emergency departments, admitted patients, etc.
- 6. What is the procedure of data collection for this system?**
Describe how data are collected, what information sources are used (e.g. patient records, police notification), who registers and codifies information, and who checks the data.
- 7. What is the frequency of data collection for this system?**
Is it a continuous data system, or are data collected on a specified interval.
- 8. Which are the recorded variables in this system?**
Describe which items (variables) are registered:
 - a. Of the victim/patient: e.g. age, date of birth, sex, destination at discharge. Try to be as precise as possible.
 - b. Of the accident: e.g. mechanism, activity, location, products involved, type of sport, economic sector, vehicle type victim, vehicle type other actor. Also indicate whether specific classifications are used (e.g. ICD-9 E-codification, IDB, ISS(EHLASS), NOMESCO, ICE). Try to be as precise as possible.
 - c. Of the diagnosis: type of injury, part of body injured, comorbidity. Also indicate whether specific classifications are used (e.g. IDB, ISS V2000, ICD-9, ICD-9-CM, ICD-10, ICIDH). Try to be as precise as possible.
 - d. Of the treatment: e.g. mode of transportation to the hospital, date of admission, date of discharge, length of stay, type of admission (first admission vs. readmission), follow-up treatment, time of death. Also indicate whether specific classifications are used (e.g. International Classification of Medical Procedures). Try to be as precise as possible.

9. What are the methodological characteristics of this system?

This question concerns a number of key characteristics of any data system.

- a. Coverage: The requested key parameters are: a) the percentage of the patient population under question 5. that is covered by the data system, b) the number of participating A&E departments, hospitals, physicians, etc. (depending on where the data system is based).
- b. Representativity: Describe whether the data system is representative for the population under 5, or whether specific patient groups, regions, etc. are under- or overrepresented.
- c. Validity/reliability: Describe to what extent the validity of the information in the data system is checked, e.g. by use of reference sources, specific procedures, experienced registration personnel.

10. How many months after a year of registration will data be checked and released?

11. How is the data availability of this system?

Indicate whether or not data are available electronically and whether they are collected locally and/or centrally.

12. Are there publications/reports available in which the (quality of the) data systems are described?

13. Which extrapolation factor is used in the ED data system, and how is it calculated?

Annex B Framework for assessment of content and quality of data systems

Make an assessment of the contents and quality of all the identified data sources.

All HDR and ED data systems have to be checked on:

- coverage,
- representativeness, and
- validity.

Coverage

The coverage of the data system can be calculated as follows:

Operationalisation 1: population in catchment area / total national population.

Population in the catchment area: population that is covered by the participating hospitals.

If no information is available about the population in the catchment area, coverage can be calculated as follows:

Operationalisation 2: admitted injury patients in participating hospitals / national total admitted injury patients.

Representativeness

- General operationalisation: under- and overrepresentativeness of specific characteristics; age, sex, urbanization, accident distribution, injury severity, type of injury. The information can partly be gathered by information of the organization of your data system and partly by analysis by yourself).
- Urbanization: the geographical description of the catchment area, e.g. which municipalities does the catchment area comprise. Source: contact person organization of your data system.
- Analyses of the representativeness of ED-data: Comparison of the characteristics of admitted injury patients in ED-systems with data of all admitted injury patients for the entire country (HDR) (for detailed information: see Validity). Source: analyses. For getting insight into the distribution of the patients by age, sex, injury group and admissions calculations have to be performed. Afterwards the project team will compare the outcomes of all participating countries, to search for deviations (e.g. for daycases, age-groups, sex) compared to the other participating countries.

Validity

The following analyses have to be performed to give insight into the validity of the data systems:

- Comparison of the admitted injury patients in ED with the HDR data (= 'gold standard'). Are ED-data of admitted patients comparable to the 'gold standard' (HDR) according to the breakdown of age, sex, accidents, injuries, and length of stay (LOS) between the patients? Differences can be tested by Chi-square tests (age, sex, injury groups, LOS in categories). The significance level is set at 0.05.
- Percentage of missing values of the most important variables (age, sex, injury, accident, hospital admission and length of stay). When the percentage of missings is below 5.0, it will not be mentioned.

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Annex D Data set descriptions

In this document an indication is given of the data sets that are required for this project. There are two separate data set definitions: one for ED data systems (IDB/ISS V2000) (Table 1), and one for HDR data systems (Hospital Discharge Register systems) (Table 2).

Table 1 Data set description for ED data systems (IDB/ISS V2000), primary and additional variables

Variable name	Variable definition use and instructions	Values and labels	Value of missings	Position	Length	Variable type
Primary variables						
Year	The most recent year available.	Year	--	1	4	N (numeric)
Age	The most detailed available level.	Years	999	5	3	N
Sex		1 = male, 2 = female	9	8	1	N
Extrap	Extrapolation factor by which incidence should be multiplied in order to arrive at national estimates.		999999	9	6	N
Hospadm	Whether the patient is admitted to a hospital for treatment.	1 = admitted, 2 = not admitted	9	15	1	N
LOS	Number of days a patient spends in hospital. Length of stay (LOS) is calculated as the date of discharge minus the date of admission. In case a patient is discharged at the day of admission, the LOS is zero.	Exact number	999	16	3	N
Intent	Selection of injury events (according to IDB-classification). For ISS data systems code all cases as Intent = 1	Use original codes 1 = unintentional, 2 = intentional self-harm, 3 = assault, 4 = other violence, 5 = undetermined intent, 8 = other specified intent, 9 = unspecified intent	9	19	1	N

Transp	Transport injury event (according to IDB-classification). For ISS data systems code all cases as Transp = 9.	Use original codes 1 = yes, 2 = no, 9 = unknown	9	20	1	N
Activity	Activity when injured (according to IDB-classification). For ISS data systems code sports cases = 5 (50-59), other cases = 99	Use original codes	999	21	4	N if ISS, T (text) if IDB
Injtype1	Type of injury nr. 1. Use original IDB/ISS-coding.	Use original codes	99	25	2	N
Injtype2	Type of injury nr. 2. Use original IDB/ISS-coding.	Use original codes	99	27	2	N
Injpart1	Part of the body injured nr 1. Use original IDB/ISS-coding.	Use original codes	9999	29	4	N if ISS, T if IDB
Injpart2	Part of the body injured nr 2. Use original IDB/ISS-coding.	Use original codes	9999	33	4	N if ISS, T if IDB
Additional (new to create) variables						
Injury	Primary injury defined and labelled according to injury group definitions in Annex E.	1 = brain injury, 2 = other skull-brain injury, etc.	99	37	2	N
Injuryl1	Injury groups clustered (cluster 1) according to Annex G.	1 = skull-brain injury, 2 = open wound head and face, etc.	99	39	2	N
Injuryl3	Injury groups clustered (cluster 3) according to Annex G.	1 = head and facial injury, 2 = eye injury, etc.	99	41	2	N
Accident	Type of accident. Accident defined and labelled according to type of accident definitions in Annex H.	1 = home and leisure, 2 = sports, 3 = transport, 4 = occupational, 5 = violence, 6 = intentional self-harm	9	43	1	N
Age7	Age defined into 7 groups.	1 = 0-14, 2 = 15-24, etc.	9	44	1	N
Age20	Age defined into 20 groups.	1 = 0-4, 2 = 5-9, etc.	99	45	2	N
LOS4	Length of stay (LOS) in 4 categories.	0 = 0, 1 = 1-3, 2 = 4-6, 3 = 7+	9	47	1	N

Source: EUROCOST-project

Table 2 Data set description for HDR data systems (Hospital Discharge systems), primary and additional variables

Variable name	Variable definition use and instructions	Values and labels	Value of missings	Position	Length	Variable type
Primary variables						
Year	The most recent year available.	Year	--	1	4	N (numeric)
Age	The most detailed available level.	Years	999	5	3	N
Sex		1 = male, 2 = female	9	8	1	N
LOS	Number of days a patient spends in hospital. Length of stay (LOS) is calculated as the date of discharge minus the date of admission. In case a patient is discharged at the day of admission, the LOS is zero.	Exact number	999	9	3	N
Extcause	Type of accident (External cause). Use original external-cause-of-injury coding: E800-E999-codes for ICD-9 or V01-Y98-codes for ICD-10.	Use original codes Example preferred ICD-9 coding: E880 Example preferred ICD-10 coding: W10	9999	12	4	T (text)
Primdiag	Primary diagnosis nr 1. Primary diagnosis is the main cause of the hospitalization as indicated by the physician. Use original injury coding: 800-999 codes for ICD-9 or S00-T98-codes for ICD-10	Use original codes Example preferred ICD-9 coding: 88020 Example preferred ICD-10 coding: S45.0	999999	16	6	N if ICD-9, T if ICD-10
Primdiag2	Primary diagnosis nr 2 (additional)– depends of your data system. Use original injury coding: 800-999 codes for ICD-9 or S00-T98-codes for ICD-10	Use original codes Example preferred ICD-9 coding: 88020 Example preferred ICD-10 coding: S45.0	999999	22	6	N if ICD-9, T if ICD-10
Primdiag3	Primary diagnosis nr 3 (additional)– depends of your data system. Use original injury coding: 800-999 codes for ICD-9 or S00-T98-codes for ICD-10	Use original codes Example preferred ICD-9 coding: 88020 Example preferred ICD-10 coding: S45.0	999999	28	6	N if ICD-9, T if ICD-10
Clinic	Type of clinic	1 = hospital, 2 = rehabilitation clinic	9	34	1	N

Admtype1	Admission type 1: Whether the admitted patient is day patient (did not stay overnight) or not.	1 = day patient, 2 = no day patient	9	35	1	N
Admtype2	Admission type 2: A readmission is defined as a second, third, etc, admission for the same injury in the same or another hospital.	1 = first admission, 2 = readmission	9	36	1	N
Latecons	Late consequences of injury. Whether the patient is admitted due to late consequences. ICD-9: E929 or ICD-10: Y85-Y87 and Y89	1 = yes, 2 = no, 9 = unknown	9	37	1	N
Additional (new to create) variables						
Injury	Primary injury defined and labelled according to injury group definitions in Annex E.	1 = brain injury, 2 = other skull-brain injury, etc.	99	38	2	N
Injury1	Injury groups clustered (cluster 1) according to Annex G.	1 = skull-brain injury, 2 = open wound head and face, etc.	99	40	2	N
Injury3	Injury groups clustered (cluster 3) according to Annex G.	1 = head and facial injury, 2 = eye injury, etc.	99	42	2	N
Accident	Type of accident. Accident defined and labelled according to type of accident definitions in Annex H.	3 = transport, 5 = violence, 6 = intentional self-harm, 7 = home and leisure (incl. sports) + occupational, 8 = all other injuries	9	44	1	N
Age7	Age defined into 7 groups.	1 = 0-14, 2 = 15-24, etc.	9	45	1	N
Age20	Age defined into 20 groups.	1 = 0-4, 2 = 5-9, etc.	99	46	2	N
LOS4	Length of stay (LOS) in 4 categories.	0 = 0, 1 = 1-3, 2 = 4-6, 3 = 7+	9	48	1	N

Source: EUROCOST-project

Annex E Injury group classifications

Table 1 Data set definition of injury groups IDB and ISS V2000

Injury group	IDB ¹		ISS V2000 ²	
	Type of injury ^a	Part of body injured ^b	Type of injury ^c	Part of body injured ^d
Head				
1. brain injury	10	1.30	1	10
2. other skull-brain injury	2, 5, 8, 11, 19-20	1.30-1.40	2, 5, 8-9, 11	10, 11
3. soft tissue head injuries	4	1.21, 1.40	4	11, 12
Face				
4. eye injury	2-22, 24-99	1.10	1-99	13
5. fracture facial bones	5	1.22-1.24	5	14-16
6. open wound face	4	1.22, 1.24, 1.28-1.29	4	14, 16, 18, 19
Vertebrae/Spine				
7. fractures/dislocations/sprain/strain	5-7	2.10, 3.10, 3.42	5-7	23, 32, 42
8. whiplash/neck sprain/distorsion cervical spine	99	2.99	99	29
9. spinal cord injury	19	2.10, 3.10, 3.42	8	23, 32, 42
Abdomen/Thorax				
10. internal organ injuries	2-11, 13-99	3.20 (3.21-3.29)	1-99	33, 34, 41
11. fracture rib/sternum	5	3.32, 3.38-3.39	5	31, 38-39
Upper extremity				
12. fracture of clavicle/scapula	5	4.10-4.20	5	50-51
13. fracture of upper arm	5	4.30	5	52
14. fracture of elbow/forearm	5	4.40-4.50	5	53-54
15. fracture of wrist (incl. carpal bones)	5	4.60	5	55
16. fracture of hand/fingers	5	4.70 (4.71-4.72)	5	56-57
17. dislocation/sprain/strain shoulder/elbow	6-7	4.20, 4.40	6-7	51, 53
18. dislocation/sprain/strain wrist/hand/fingers	6-7	4.60-4.70 (4.71-4.72)	6-7	55-57
19. injury of nerves	19	4.10-4.99	8	50-59
20. complex soft tissue injury	8-9, 20-21	4.10-4.99	9-12	50-59
Lower extremity				
21. fracture of pelvis	5	3.44	5	44
22. fracture of hip	5	5.10	5	60
23. fracture of femur shaft	5	5.20	5	61
24. fracture of knee/lower leg	5	5.30-5.40	5	62-63
25. fracture of ankle	5	5.50	5	64
26. fracture of foot (exc. Ankle)	5	5.60 (5.61-5.62)	5	65-66
27. dislocation/sprain/strain knee	6-7	5.30	6-7	62
28. dislocation/sprain/strain ankle/foot	6-7	5.50-5.60 (5.61-5.62)	6-7	64-66
29. dislocation/sprain/strain hip	6-7	5.10	6-7	60
30. injury of nerves	19	5.10-5.99	8	60-69
31. complex soft tissue injury	8-9, 20-21	5.10-5.99	9-12	60-69

Minor external				
32. superficial injury (incl. contusions)	2-3	1.20 (1.21-1.29), 1.98-1.99, 2.98-2.99, 3.30 (3.31-3.39), 3.41, 3.43-3.49, 4.10-9.99	2-3	12-20,28-31, 38-40,43-99
33. open wounds	4	2.98-2.99, 3.30 (3.31-3.39), 3.41, 3.43-3.49, 4.10-9.99	4	28-31, 38-40, 43-99
34. Burns	14	1.20 (1.21-1.29), 1.98-1.99, 2.98-2.99, 3.30 (3.31-3.39), 3.41, 3.43-3.49, 4.10-9.99	14	12-20,28-31, 38-40,43-99
35. Poisoning	23	1.10-9.99	13	10-99
36. Multi trauma	Not operational	Not operational	Not operational	Not operational
Other injuries				
37. foreign body	12	1.10-9.99	--	--
38. no injury after examination	1	1.10-9.99	97	10-99
39. other and unspecified injury	All other combinations		All other combinations	
Not included				

¹ IDB, version 1.1 (2005).

² Coding manual V2000 for HLA, ISS Database version august 2002 (2002).

Source: EUROCOST-project

^a= **Type of injury (IDB, version 1.1, 2005):**

- 1 = No injury diagnosed
- 2 = Contusion, bruise
- 3 = Abrasion
- 4 = Open wound
- 5 = Fracture
- 6 = Luxation, dislocation
- 7 = Distorsion, sprain
- 8 = Crushing injury
- 9 = Traumatic amputation
- 10 = Concussion
- 11 = Other specified brain injury
- 12 = Consequences of foreign body entering through natural orifice
- 13 = Suffocation (asphyxia)
- 14 = Burns, scalds
- 15 = Corrosion (chemical)
- 16 = Electrocution
- 17 = Radiation (sunlight, X-rays)
- 18 = Frostbite
- 19 = Injury to nerves and spinal cord
- 20 = Injury to blood vessels
- 21 = Injury to muscle and tendon
- 22 = Injury to internal organs
- 23 = Poisoning
- 97 = Multiple injuries
- 98 = Other specified type of injury
- 99 = Unspecified type of injury

^b= **Part of body injured (IDB, version 1.1, 2005):**

- 1.10 = Eye area
- 1.20 = Face, other and unknown part
 - 1.21 = Ear
 - 1.22 = Nose
 - 1.23 = Teeth
 - 1.24 = Jaw/cheek
 - 1.25 = Lip and oral cavity
 - 1.28 = Face, other specified
 - 1.29 = Face, unspecified
- 1.30 = Brain
- 1.40 = Skull
- 1.98 = Other specified part of the head
- 1.99 = Unspecified part of the head
- 2.10 = Cervical spine
- 2.20 = Organs throat
- 2.98 = Neck, throat, other specified
- 2.99 = Neck, throat, unspecified
- 3.10 = Thoracic spine
- 3.20 = Organs trunk
 - 3.21 = Lungs, bronchus
 - 3.22 = Heart
 - 3.23 = In- and external genital organs
 - 3.24 = Intra abdominal organs (eg., spleen, colon)
 - 3.25 = Pelvic organs (eg., kidney, bladder)
 - 3.28 = Organs trunk, other specified
 - 3.29 = Organs trunk, unspecified
- 3.30 = Thorax
 - 3.31 = Chest
 - 3.32 = Ribs and sternum
 - 3.38 = Thorax, other specified
 - 3.39 = Thorax, unspecified
- 3.40 = Abdomen, lower back, lumbar spine and pelvis
 - 3.41 = Abdomen, external
 - 3.42 = Lower spine (lumbar and sacral)
 - 3.43 = Lower back, buttocks
 - 3.44 = Pelvis
 - 3.48 = Abdomen, other specified
 - 3.49 = Abdomen, unspecified
- 3.98 = Trunk, other specified
- 3.99 = Trunk, unspecified
- 4.10 = Collar bone
- 4.20 = Shoulder
- 4.30 = Upper arm, humerus
- 4.40 = Elbow
- 4.50 = Forearm, lower arm
- 4.60 = Wrist
- 4.70 = Hand, fingers
 - 4.71 = Hand
 - 4.72 = Fingers
- 4.98 = Upper extremities, other specified
- 4.99 = Upper extremities, unspecified
- 5.10 = Hip
- 5.20 = Upperleg, thigh
- 5.30 = Knee
- 5.40 = Lower leg
- 5.50 = Ankle

- 5.60 = Foot and toes
 - 5.61 = Foot
 - 5.62 = Toes
- 5.98 = Lower extremities, other specified
- 5.99 = Lower extremities, unspecified
- 7.10 = Multiple body parts affected
- 7.20 = Whole body affected
- 9.10 = Organs, level not specified
- 9.98 = Body part, other specified
- 9.99 = Body part, unspecified

^c= Type of injury (Coding manual V2000 for HLA, ISS Database version august 2002):

- 1 = Concussion
- 2 = Contusion, bruise
- 3 = Abrasion
- 4 = Open wound
- 5 = Fracture
- 6 = Luxation, dislocation
- 7 = Distorsion, sprain
- 8 = Injury to nerve(s)
- 9 = Injury to blood vessels
- 10 = Injury to tendon(s) and/or muscle(s)
- 11 = Crushing
- 12 = Amputation
- 13 = Poisoning
- 14 = Burns, scalds
- 15 = Corrosion
- 16 = Electrocution
- 17 = Radiation
- 18 = Frostbite
- 19 = Suffocation (asphyxia)
- 97 = No injury diagnosed
- 98 = Type of injury, other specified
- 99 = Type of injury, unspecified

^d= Part of body injured (Coding manual V2000 for HLA, ISS Database version august 2002):

- 10 = Brain
- 11 = Skull
- 12 = Ear
- 13 = Eyeball, eyelid
- 14 = Nose
- 15 = Teeth
- 16 = Jaw/cheek
- 17 = Lip and oral cavity
- 18 = Head, other specified
- 19 = Head, unspecified
- 20 = Neck
- 21 = Throat, internal parts
- 23 = Cervical spine
- 28 = Neck/throat, other specified
- 29 = Neck/throat, unspecified
- 30 = Chest, external
- 31 = Ribs and sternum
- 32 = Thoracic spine
- 33 = Lungs, bronchus
- 34 = Heart
- 38 = Thorax, other specified
- 39 = Thorax unspecified

40 = Abdomen, external
41 = Abdomen, internal organs
42 = Lower spine
43 = Lower back, buttocks
44 = Pelvis
45 = Genitals
46 = Abdomen, other specified
49 = Abdomen, unspecified
50 = Collar bone
51 = Shoulder
52 = Upper arm, humerus
53 = Elbow
54 = Forearm, lower arm
55 = Wrist
56 = Hand, excl. fingers
57 = Fingers
58 = Upper extremities, other specified
59 = Upper extremities, unspecified
60 = Hip
61 = Upper leg/thigh
62 = Knee
63 = Lower leg
64 = Ankle
65 = Foot, excl. toes
66 = Toe
68 = Lower extremities, other specified
69 = Lower extremities, unspecified
70 = Multiple body parts affected
75 = Whole body affected
98 = Body part, other specified
99 = Body part, unspecified

Table 2 Data set definition of injury groups ICD-9CM and ICD-10

Injury group base level	ICD-9CM	ICD-10
Head		
1. brain injury	850	S06.0
2. other skull-brain injury	800-801, 803-804, 851-854, 950-951	S02.0-1, S02.7, S02.9, S06.1-9, S04.0-9, S07.1-9, T02.0, T04.0
3. soft tissue head injuries	873.0-1	S01.0, S08.0
Face		
4. eye injury	870-871, 918	S01.1, S05.0-9
5. fracture facial bones	802	S02.2-6, S02.8
6. open wound face	872, 873.2-9	S01.2-9, S08.1-9, S09.2
Vertebrae/Spine		
7. fractures/dislocations/ sprain/strain	805, 839.0-5, 846, 847.1-9	S12.0-7, S12.9, S13.0-3, S13.6, S22.0-1, S23.0-1, S23.3, S29.0, S32.0-2, S33.0-2, S33.5-7, T02.1, T03.0-1, T08, T09.2
8. whiplash/neck sprain/distorsion cerval spine	847.0	S13.4
9. spinal cord injury	806, 952	S14.0-1, S24.0-1, S34.0-1, S34.3, T06.1, T09.3
Abdomen/Thorax		
10. internal organ injuries	860-869, 900-902, 926, 929	S26.0-9, S27.0-9, S29.7, S36.0-9, S37.0-9, S39.6-9, T06.5
11. fracture rib/sternum	807.0-3, 809	S22.2-4, S22.8-9
Upper extremity		
12. fracture of clavicle/scapula	810-811	S42.0-1, S42.7-9
13. fracture of upper arm	812.0-3	S42.2-3
14. fracture of elbow/forearm	812.4-5, 813.0-3, 813.8-9	S42.4, S52.0-4, S52.7-9
15. fracture of wrist (incl. carpal bones)	813.4-5, 814	S52.5-6, S62.0-1
16. fracture of hand/fingers	815-817	S62.2-8
17. dislocation/sprain/strain shoulder/elbow	831-832, 840-841	S43.0-7, S53.0-4
18. dislocation/sprain/strain wrist/hand/fingers	833-834, 842	S63.0-7
19. injury of nerves	953.0-1, 953.4, 955	S14.2-4, S24.2, S44, S54, S64, T11.3
20. complex soft tissue injury	880.2, 881.2, 882.2, 883.2, 884.2, 885-887, 903, 927	S45-S49, S55-S59, S65-S69, T04.2, T05.0-2, T11.4-9
Lower extremity		
21. fracture of pelvis	808	S32.3-8
22. fracture of hip	820	S72.0-2
23. fracture of femur shaft	821.0-1	S72.3, S72.7-9
24. fracture of knee/lower leg	821.2-3, 822, 823	S72.4, S82.0-2, S82.4, S82.7-9
25. fracture of ankle	824	S82.3, S82.5-6
26. fracture of foot (exc. Ankle)	825, 826	S92.0-9
27. dislocation/sprain/strain knee	836, 844	S83.0-7
28. dislocation/sprain/strain ankle/foot	837-838, 845	S93.0-9
29. dislocation/sprain/strain hip	835, 843	S73.0-1
30. injury of nerves	953.2-3, 953.5, 956	S34.2, S34.4-8, S74, S84, S94, T13.3
31. complex soft tissue injury	890.2, 891.2, 892.2, 893.2, 894.2, 895-897, 904, 928	S15.1, S75-S79, S85-S89, S95-S99, T04.3, T05.3-5, T06.3, T13.4-9, T14.5

Minor external		
32. superficial injury (incl. contusions)	910-917, 919-924	S00,S10, S20, S30, S40,S50, S60,S70, S80,S90, T00, T09.0,T11.0, T13.0,T14.0
33. open wounds	874-884 (excl. 880.2, 881.2, 882.2, 883.2, 884.2), 890-894 (excl. 890.2, 891.2, 892.2, 893.2, 894.2)	S11, S21, S31, S41, S51, S61, S71, S81, S91, T01
34. Burns	940-949	T20-T32
35. Poisoning	960-989	T36-T65
36. Multi trauma ¹	Not operational	Not operational
Other injuries		
37. foreign body	930-939	T15-T19
38. no injury after examination	--	--
39. other and unspecified injury	807.4-6, 818-819, 827-829, 830, 839.6-9, 848, 953.8-9, 954, 957, 925, 959, 990-995	All other combinations
Not included	905-909 (late consequences), 958 (early complications), 996-999 (medical complications)	T90-T98 (late consequences), T79 (early complications), T80-T88 (medical complications)

¹ Can not be operationalized.

Source: EUROCOST-project

Annex F Hierarchical keys of injury groups

Table 1 Hierarchical key of injury groups of admitted patients, by ranking

Injury group	Hierarchical key
	Ranking
Head	
1. brain injury	20
2. other skull-brain injury	2
3. soft tissue head injuries	27
Face	
4. eye injury	33
5. fracture facial bones	26
6. open wound face	32
Vertebrae/Spine	
7. fractures/dislocations/ sprain/strain	14
8. whiplash/neck sprain/distorsion cervical spine	15
9. spinal cord injury	1
Abdomen/Thorax	
10. internal organ injuries	11
11. fracture rib/sternum	16
Upper extremity	
12. fracture of clavicle/scapula	9
13. fracture of upper arm	13
14. fracture of elbow/forearm	17
15. fracture of wrist (incl. carpal bones)	19
16. fracture of hand/fingers	24
17. dislocation/sprain/strain shoulder/elbow	30
18. dislocation/sprain/strain wrist/hand/fingers	31
19. injury of nerves	35
20. complex soft tissue injury	23
Lower extremity	
21. fracture of pelvis	5
22. fracture of hip	7
23. fracture of femur shaft	4
24. fracture of knee/lower leg	6
25. fracture of ankle	12
26. fracture of foot (exc. Ankle)	18
27. dislocation/sprain/strain knee	22
28. dislocation/sprain/strain ankle/foot	21
29. dislocation/sprain/strain hip	8
30. injury of nerves	36
31. complex soft tissue injury	3
Minor external	
32. superficial injury (incl. contusions)	29
33. open wounds	28
34. Burns	10
35. Poisoning	25
36. Multi trauma ¹	--
Other injuries	
37. foreign body	34
38. no injury after examination	38
39. other and unspecified injury	37

¹ Can not be operationalized.

Source: EUROCOST-project

Table 2 Hierarchical key of injury groups of non-admitted patients, by ranking

Injury group	Hierarchical key Ranking
Head	
1. brain injury	25
2. other skull-brain injury	2
3. soft tissue head injuries	28
Face	
4. eye injury	34
5. fracture facial bones	23
6. open wound face	30
Vertebrae/Spine	
7. fractures/dislocations/ sprain/strain	14
8. whiplash/neck sprain/distorsion cervical spine	15
9. spinal cord injury	1
Abdomen/Thorax	
10. internal organ injuries	20
11. fracture rib/sternum	22
Upper extremity	
12. fracture of clavicle/scapula	10
13. fracture of upper arm	8
14. fracture of elbow/forearm	9
15. fracture of wrist (incl. carpal bones)	11
16. fracture of hand/fingers	13
17. dislocation/sprain/strain shoulder/elbow	17
18. dislocation/sprain/strain wrist/hand/fingers	24
19. injury of nerves	35
20. complex soft tissue injury	16
Lower extremity	
21. fracture of pelvis	4
22. fracture of hip	6
23. fracture of femur shaft	3
24. fracture of knee/lower leg	5
25. fracture of ankle	12
26. fracture of foot (exc. Ankle)	21
27. dislocation/sprain/strain knee	18
28. dislocation/sprain/strain ankle/foot	19
29. dislocation/sprain/strain hip	7
30. injury of nerves	36
31. complex soft tissue injury	26
Minor external	
32. superficial injury (incl. contusions)	27
33. open wounds	29
34. Burns	32
35. Poisoning	31
36. Multi trauma ¹	--
Other injuries	
37. foreign body	33
38. no injury after examination	38
39. other and unspecified injury	37

¹ Can not be operationalized.

Source: EUROCOST-project

Annex G Injury group clustering

Table Injury groups and injury clustering

Injury group base level	Cluster 1	Cluster 2	Cluster 3
Head			
1. brain injury	1. skull-brain injury	1. head injury	1. head and facial injury (excl. eye)
2. other skull-brain injury			
3. soft tissue head injuries			
	2. open wound head and face		
Face			
4. eye injury	3. eye injury	2. eye injury	2. eye injury
5. fracture facial bones	4. facial fractures	3. facial injury (excl. Eye)	see 1.
6. open wound face	see 2.		
Vertebrae / Spine			
7. vertebral column fractures / dislocations / sprain / strain	5. injuries to vertebral column and spine	4. injuries to vertebral column and spine	3. spinal thoracic and abdominal injuries
8. whiplash, neck sprain, distortion of cervical spine			
9. spinal cord injury			
Abdomen / Thorax			
10. internal organ injury	6. internal organ injury	5. Injury to abdomen /thorax	see 3.
11. fracture rib / sternum	7. fracture rib / sternum		
Upper extremity			
12. fracture of clavicle / scapula	8. fracture of clavicle/scapula	6. upper extremity fractures	4. upper extremity injury (excl. nerves)
13. fracture of upper arm	9. fracture of upper arm		
14. fracture of elbow / forearm	10. fracture of elbow/forearm		
15. fracture of wrist (incl. carpal bones)	11. fracture of wrist (incl. carpal bones)		
16. fracture of hand / fingers	12. fracture of hand / fingers		
17. dislocation / sprain / strain shoulder / elbow	13. dislocation / sprain / strain shoulder / elbow	7. other upper extremity injury (excl. nerves)	
18. dislocation / sprain / strain wrist / hand / fingers	14. dislocation / sprain / strain wrist / hand / fingers		
19. injury of nerves	see 29.	See 15.	See 10.
20. complex soft tissue injury	15. complex soft tissue injury	see 7.	See 4.

Lower extremity			
21. fracture of pelvis	16. fracture of pelvis / hip / femur shaft	8. lower extremity fractures	5. lower extremity injury
22. fracture of hip			
23. fracture of femur shaft			
24. fracture of knee / lower leg	17. fracture of knee / lower leg		
25. fracture of ankle	18. fracture of ankle		
26. fracture of foot	19. fracture of foot		
27. dislocation / sprain / strain of knee	20. dislocation / sprain / strain of knee	9. other lower extremity injury (excl. hip and nerves)	
28. dislocation / sprain / strain of ankle / foot	21. dislocation / sprain / strain of ankle / foot		
29. dislocation / sprain / strain of hip	see 29.	See 15.	See 10.
30. injury of nerves	see 29.	See 15.	See 10.
31. complex soft tissue injury	22. complex soft tissue injury	see 9.	See 5.
Minor external			
32. superficial injury (incl. contusions)	23. superficial injury (incl. contusions)	10. superficial injury (incl. contusions)	6. superficial injury (incl. contusions and open wounds)
33. open wounds	24. other open wounds	11. open wounds	
34. Burns	25. burns	12. burns	7. burns
35. Poisoning	26. poisoning	13. poisoning	8. poisoning
36. Multi trauma	exclude from analysis	exclude from analysis	exclude from analysis
Other injuries			
37. foreign body	27. foreign body	14. foreign body	9. foreign body
38. no injury after examination	28. no injury after examination	n.a.	n.a.
39. other and unspecified injury	29. other and unspecified injury	15. other and unspecified injury	10. other and unspecified injury

n.a. = not available

Source: EUROCOST-project

Annex H Accident categories by data systems

Table 1 Recode from accident categories by IDB, ISS V2000 to EUROCCOST type of accident

EUROCCOST type of accident	Minimum set / Module	IDB	ISS V2000
Home and leisure injuries (HLI)	Minimum set 1	Intent = 1 (excluding Transport injury event = 1 or Activity = 1)	All cases
Transport injuries	Module 1	Transport injury event = 1	n.a.
Occupational injuries	Module 2	Activity = 1 (or 1.1-1.9)	n.a.
Intentional injuries	Module 4	Intent = 2-4	n.a.
All injuries	Module 3	Intent = 1-9	n.a.
Sports injuries	--	Activity = 3.1	Activity = 5 (or 50-59)

n.a. = not available

Source: EUROCCOST-project

Table 2 Recode from accident categories by ICD-9 and ICD-10 to EUROCCOST type of accident

EUROCCOST type of accident	Minimum set / Module	ICD-9-CM	ICD-10
All injuries	Minimum set 2	E800-E869, E880-E928, E950-E969, E970-E999	V01-V99, W00-W19, X01-X99, Y00- Y36, Y85-Y87, Y89

Source: EUROCCOST-project