

Amendments to the AWISS Injury Indicators

The All Wales Injury Surveillance System produces annual injury related health indicators for Wales using several data sources, two of which are the Emergency Department Data Set (EDDS) and Patient Episode Database for Wales (PEDW). This report describes changes to the AWISS specifications used to identify injury attendances/admissions in these two data sources.

EDDS

1. *Current specification*

The Emergency Department Data Set (EDDS) for Wales captures all activity at Accident and Emergency (A&E) departments and Minor Injury Units (MIU) in NHS Wales hospitals. The current AWISS EDDS injury specification defines injury attendances as all attendances with an 'injury' diagnosis in any of the 6 diagnosis fields in EDDS, or an 'injury' related treatment in any of the 6 treatment fields (Appendix A).

Other 'injury' related fields in the EDDS data (attendance group, mechanism of injury, injury location, injury activity etc.) were previously excluded due to completeness and validity issues.

2. *Data quality issues*

However, due to the poor completeness also of the EDDS diagnosis fields (~ 50% with no useful diagnosis information), relying on diagnosis and treatment fields alone in EDDS is likely to grossly underestimate the true numbers of injuries presenting at EDs across Wales.

Figure 1 presents the percentage of ED attendances by year, where only null, 98 (unspecified) or 99 (unknown) were recorded in the 6 EDDS diagnosis fields. For these attendances we have no useful diagnosis information to ascertain the reason for attendance. Figure 2 shows the same as Figure 1, broken down by attendees Health Board (HB). It is clear from Figure 2 completeness of the diagnosis fields varies significantly by region, making comparisons between regions difficult. In SBUHB, HDUHB and PTHB ~75% of attendances contain useful diagnosis information, whereas in the other HBs only ~50% have useful diagnosis information, with ~95% of attendees from ABUHB in 2019 having no useful diagnosis information.

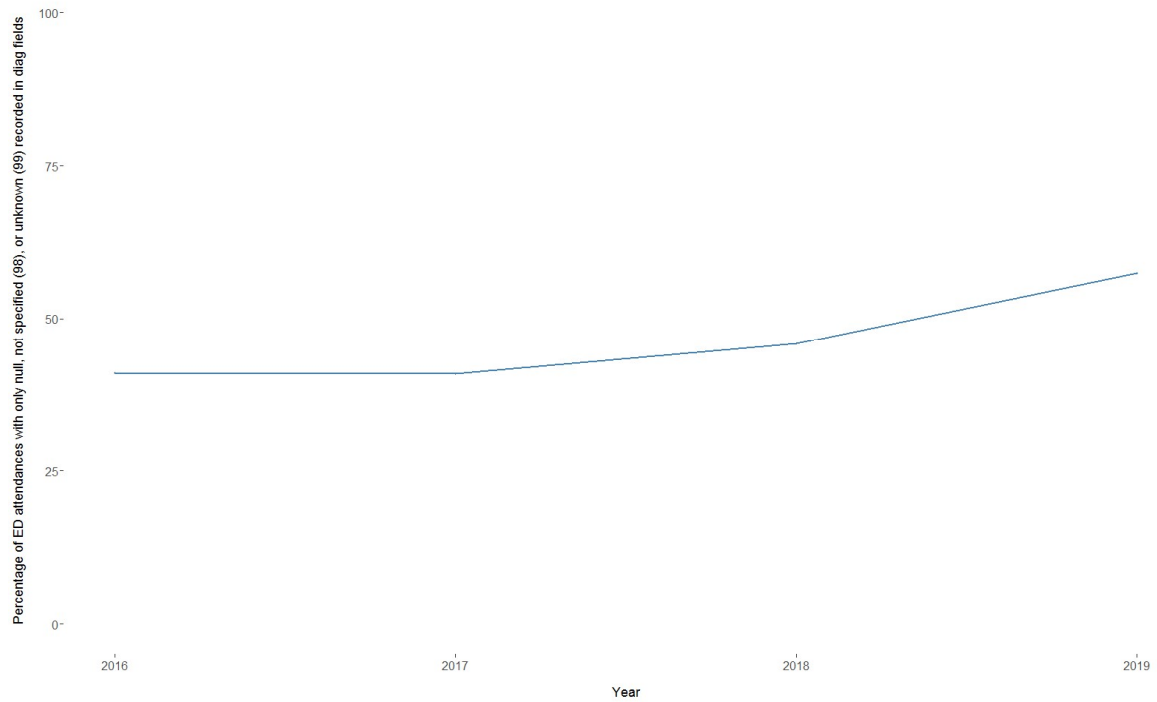


Figure 1: Percentage of ED attendances with only null, unspecified (98) or unknown (99) recorded in all 6 diagnosis fields (years 2016-2019, All-Wales).

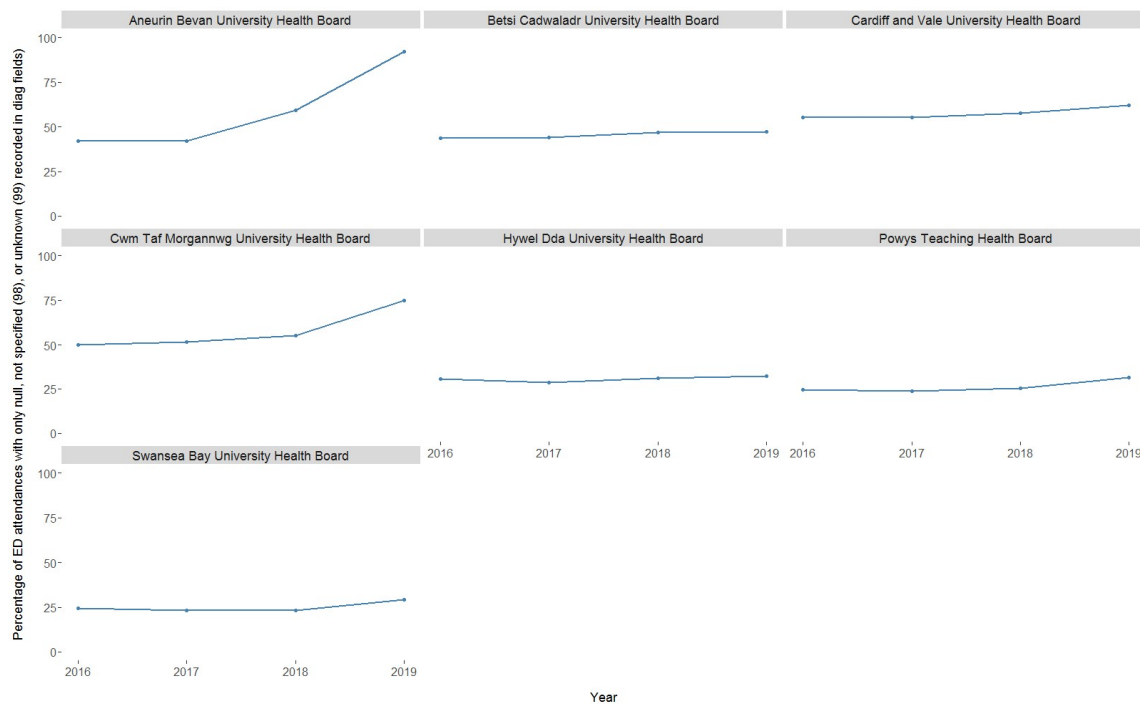


Figure 2: Percentage of ED attendances with only null, unspecified (98) or unknown (99) recorded in all 6 diagnosis fields by Health Board (years 2016-2019).

3. Potential to use other 'injury' fields

Due to issues identified with the EDDS diagnosis fields, it was agreed the other 'injury' related fields in EDDS (attendance group, mechanism of injury, injury location, injury activity etc.) could be incorporated into the AWISS injury specification to improve injury ED estimates across Wales. However as these fields have their own completeness and validity issues, careful consideration was given to ensure only attendances with a high probability of being injury related were included in injury counts.

Table 1 presents the top 20 primary diagnoses, for attendances recorded as having an 'injury' attendance group (e.g. accident, self-harm, assault, undetermined intent, intent not given) but with no injury diagnosis recorded in the 6 diagnosis fields. The primary diagnosis for the majority of these attendances are unknown and unspecified, but there appears to be a sizeable number of attendances with non-injury primary diagnoses. Some of the diagnoses could conceivably be related to an injury (e.g. Pain), some to the chronic effects of injury (e.g. Infection). It is possible that other attendances were a combination of injury and non-injury related events, with the trauma related diagnosis omitted (e.g. a neurological disorder which led to a fall).

First diagnosis	Description	Number of attendances (2016-2019)
99Z	Not recorded	1,084,581
98Z	Not specified	441,520
	Null	171,250
13Z	Infection, other	83,493
97Z	Nothing abnormal detected	70,148
18Z	Gastro conditions	62,851
14Z	Respiratory conditions	57,977
29Z	Pain, other and unspecified	43,740
19Z	Urological	38,219
21Z	Psychological/Psychiatric conditions	33,483
16Z	Cardiovascular	32,985
17Z	Neurological, other	31,958
29B	Abdominal pain	28,255
28Z	Ear, nose and throat conditions	23,262
20Z	Dermatological	16,424
25Z	Ophthalmic	15,331
29A	Chest pain	14,346
23Z	Gynaecological	14,313
16B	Vascular condition	14,251
16A	Myocardial Infarction	12,438

Table 1: Top 20 diagnoses in the first diagnosis position, for ED attendances recorded with an 'injury' attendance group, but with no injury diagnosis in any of the 6 diagnosis fields.

Several other fields in EDDS also collect information on injuries including:

- Mechanism of Injury
- Injury Location Type
- Road User
- Activity at the Time of Injury
- Sport Activity at the Time of Injury

However, several of these fields appear to be completed erroneously on occasions, recording location/activity/sport information on non-trauma events (e.g. location of a heart attack).

We deemed the 'mechanism of injury' field to be the most reliable of all the injury fields, as it is the least ambiguous, describing specifically the mechanism which resulted in the injury.

Table 2 presents number of ED attendances by primary diagnosis (top 10), that had an injury attendance group (11-15) and injury related mechanism of injury (1-13, 99), but only a non-injury diagnosis reported.

Code	Description	Number of attendances (2016-2019)
13Z	Infection, other	38,501
97Z	Nothing abnormal detected	37,149
18Z	Gastrointestinal	31,524
29Z	Pain, other	31,204
14Z	Respiratory conditions	30,615
17Z	Neurological conditions	22,392
16Z	Cardiovascular, other	22,026
19Z	Urological	21,256
21Z	Psychological/Psychiatric	19,130
29B	Abdominal pain	15,972

Table 2: Number of ED attendances by primary diagnosis (top 10), that had an injury attendance group (11-15) and injury related mechanism of injury (1-13, 99), and a non-injury diagnosis but no injury diagnosis in any of the diagnosis fields.

As our current injury criteria includes any mention of injury (01A-11Z, S&T ICD codes) and it is plausible diagnoses in Table 2 could have been injury related with the injury diagnosis omitted (e.g. pain resulting from an injury, psychotic episode which led to an injury) the decision was made to count all attendances with both an injury related attendance group (11-15) and injury related mechanism of injury; irrespective of whether an injury diagnosis was included in the attendance record or not. To note, as codes 13 and 99 in the mechanism of injury field are non-specific (13 = other, 99 = unspecified) and could have been

assigned to non-injuries erroneously, the decision was to conservatively only include those attendances with a specific mechanism of injury (e.g. 1 to 12).

Further, within the 'Activity at Time of Injury' EDDS field there is an option for 'Road Traffic Collision' (RTC). As this response clearly suggests a collision occurred, all attendances with RTC recorded were counted as injuries as well.

4. *New AWISS EDDS Injury Specification*

- An 'injury' diagnosis or 'injury' treatment (based on current inclusion criteria - Appendix A)

OR

- an injury 'Attendance Group' (11-15) and an injury related 'Mechanism of Injury' (1-12)

OR

- 'Road Traffic Collision' recorded in the 'Activity at the Time of Injury' field.

5. *Additional amendments*

Information on an attendee's age, sex and Lower layer Super Output Area (LSOA – typically an area with an average population of 1,500 people) were previously extracted from the EDDS alone. However, completeness issues were identified with these fields at the hospital level. The decision was made to supplement the EDDS data with age, sex and LSOA information collected in the Welsh Demographic Service Dataset (WDS).

Where information differed between EDDS and WDS, WDS was used for age and sex, and EDDS for LSOA (as it was presumed address information would be more up to date in ED than in General Practice (GP) registrations used to populate and update WDS). Where EDDS data was missing, WDS data was used to populate where possible.

PEDW

1. *Current Specification*

The Patient Episode Database for Wales (PEDW) contains all inpatient and day case activity undertaken in NHS Wales plus data on Welsh residents treated in English Trusts.

Only a minor amendment was made to the AWISS PEDW Injury specification. The current specification includes emergency admissions, where the 1st episode, in the 1st admission within a person super spell, contains the following ICD10 codes: S00-S99, T00-T65, T704, T708, T709, T71, T750, T751, T754, T794, T795, T796, T797, T798, T799, F100, F110, F120, F130, F140, F150, F160, F170, F180,

F190. Specifically these physical injury codes were required to either be in primary position in the first episode, or, if not in primary position, then only an R/Z ICD10 code or NULL value could precede the injury code. Our current specification is referred to as the RZ rule (Appendix B – full criteria)

2. *New AWISS PEDW Injury Specification*

The only adjustment to the current specification is to include admissions with external cause codes V01 – Y36, in addition to R and Z ICD codes, before physical injury diagnoses.

This amendment leads to only a small increase in the increases the total number of ‘injury’ admissions (Table 3).

Year	Number of ‘injury’ cases using current PEDW injury specification	Number of ‘injury’ cases using new PEDW injury specification	Increase in injury admissions
2016	69,090	69,098	8
2017	68,951	68,957	6
2018	69,717	69,731	14
2019	52,071	52,079	8

Table 3: Increase in ‘injury’ cases following PEDW specification change

FEEDBACK

AWISS would appreciate any feedback/suggestions on the new injury specification amendments

Please e-mail feedback, to Samantha Turner: s.turner@swansea.ac.uk

Appendix A

Previous EDDS Specification

- Only individuals, living in Wales, with a valid **Anonymised Linkage Field (ALF_E)** in the [SAIL Databank](#) were included. ALF_E's are a double encrypted version of an individual's NHS number.
- Only **Welsh residents** (inclusion in the [Welsh Demographic Service Dataset \(WSDS\)](#))*
- Valid sex code (1=Male, 2=Female)*
- **Age <=110 ***

* Age, sex and LSOA information taken from both EDDS and where information differed between EDDS and WSDS, WSDS was used for age and sex, and EDDS for LSOA (as it was presumed address information would be more up to date in ED than in GP registrations). Further where EDDS data was missing, WSDS data was used to populate where possible.

- Only new attendances included (e.g. follow-up attendances excluded)
- Injury diagnosis code present in diagnosis positions 1-6 (EDDS codes or ICD10 codes as defined below) or treatment codes in positions 1-6 as defined below.

Diagnosis codes in positions 1-6:

01A – LACERATION

01B – CONTUSION

01C – ABRASION

01D – SOFT TISSUE INFLAMMATION

01Z – WOUND, OTHER OR UNSPECIFIED

02A – GLASGOW COMA SCORE 15

02B – GLASGOW COMA SCORE<15

02C – DENTAL INJURY

02Z – HEAD INJURY, OTHER OR UNSPECIFIED

03A – OPEN FRACTURE

03B – CLOSED FRACTURE

03C – FRACTURE DISLOCATION

03Z – FRACTURE, OTHER OR UNSPECIFIED

04A – SPRAIN

04B – DISLOCATION

04C – SUBLUXATION

04Z – JOINT INJURY, OTHER OR UNSPECIFIED

05Z – AMPUTATION, OTHER OR UNSPECIFIED

06A – MUSCLE INJURY

06B – TENDON INJURY

06C – NERVE INJURY
06D – VISCERAL INJURY
06E – VASCULAR INJURY
06Z – SOFT TISSUE INJURY, OTHER OR UNSPECIFIED
07A – ELECTRIC
07B – CHEMICAL
07C – RADIATION
07D – SCALD
07E – SUNBURN
07H – FROSTBITE
07Z – BURNS, SCALDS AND THERMAL CONDITIONS, OTHER OR UNSPECIFIED
08A – INGESTED FOREIGN BODY
08Z – FOREIGN BODY, OTHER OR UNSPECIFIED
09A – NEEDLE STICK INJURY
09B – HUMAN BITE
09C – ANIMAL BITE
09D – INSECT BITE OR STING
09Z – PUNCTURE WOUNDS, OTHER OR UNSPECIFIED
10A – ALCOHOL
10B – PRESCRIBED DRUG
10C – NON-PRESCRIBED/PURCHASED DRUG
10D – ILLICIT DRUG
10Z – POISONING OR OVERDOSE, OTHER OR UNSPECIFIED
11A – NEAR DROWNING
11Z – DROWNING, OTHER OR UNSPECIFIED
OR ICD10 codes: S00-S99, T00-T65, and T71, X49

Treatment codes in positions 1-6:

03Z – WOUND CLOSURE
04Z – REMOVAL FOREIGN BODY
06Z – MANIPULATION

Attendance category:

1 – NEW ATTENDANCE
01 – NEW ATTENDANCE

Appendix B

Previous PEDW Specification

- Only individuals, living in Wales, with a valid **Anonymised Linkage Field (ALF_E)** in the [SAIL Databank](#) were included. ALF_E's are a double encrypted version of an individual's NHS number.
- Only **Welsh residents** (inclusion in the [Welsh Demographic Service Dataset \(WDSD\)](#))
- Valid sex code (1=Male, 2=Female)
- **Age <=110**
- Only patients with the following admission method codes:
 - **21**-A&E or dental casualty department of the health care provider;
 - **22**- GP, after a request for immediate admission has been made direct to a hospital provider by a General Practitioner or deputy;
 - **23**-Bed Bureau;
 - **24**-Consultant clinic of this or another health care provider;
 - **25**-Domiciliary visit by Consultant;
 - **27**-Via NHS Direct Services;
 - **28**-Other means, including admitted from the ED department of another provider where they had not been admitted;
 - **29**-Emergency transfer.
- Only cases where the 1st episode, in the 1st admission within a person super spell, contains the following ICD10 codes: S00-S99, T00-T65, T704, T708, T709, T71, T750, T751, T754, T794, T795, T796, T797, T798, T799, F100, F110, F120, F130, F140, F150, F160, F170, F180, F190
- Specifically we followed the **R/Z rule**. A physical injury ICD10 code was required to either be in primary position in the first episode, or, if not in primary position, then only an R/Z ICD10 code or NULL values could precede the injury code.