THE ALL WALES INJURY SURVEILLANCE SYSTEM

INJURY INDICATORS FOR WALES REPORT 2019
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Samantha L Turner
Data Science Building (Third Floor), Swansea University Medical School, Singleton Park, Swansea, Wales, United Kingdom
SA2 8PP

Phone (0) 1792 602769
Email s.turner@swansea.ac.uk
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EXECUTIVE SUMMARY

Injuries are a major public health problem in Wales, on average resulting in 3 injury fatalities, 107 injury admissions, and 868 injury related Emergency Department (ED) visits each day (average for the years 2010—2017).

In 2017 discussions between the All Wales Injury Surveillance System (AWISS) and Public Health Wales (PHW) identified the need to develop a suite of injury indicators for Wales, available through an online All Wales Injury Surveillance System (AWISS) interactive tool and report.

After consultation with a wide array of stakeholders, 25 injury indicators were agreed, covering the major areas of interest from a preventive and Welsh Government strategy perspective. The proposed indicators are based on measurements of incidence, fatality and burden, and cover: all-cause injuries, falls in older adults, hip fractures, road traffic injuries (RTI), injuries in the home and at leisure, burns and scalds, poisonings and intentional injuries resulting from self harm and assault.

On the whole rates are highest in the youngest and oldest age groups, males and the most deprived communities. On the contrary, self-harm related injuries and falls appear higher for females in certain age groups, and RTIs appear highest in individuals living in areas classified as middle quintile deprivation.

Multiple data sources were analysed to produce our indicator estimates, including the Welsh Demographic Service (WDS) dataset, the Emergency Department Data Set (EDDS), the Patient Episode database for Wales, and the Office for National Statistics (ONS) mortality dataset. Anonymised health records stored in these datasets, were accessed and analysed through the Secure Anonymised Information Linkage (SAIL) privacy protecting system, for the period 2010-2017.

The ability of the All Wales Injury Surveillance System to link and analyse anonymised health records to support the identification of risk factors and evaluation of injury preventative interventions, is recognised as a world leading infrastructure.

The following report presents a selection of the key findings. It is designed to convey the scale of the injury problem in Wales and support groups in targeting and evaluating injury prevention strategies and activities.

To access results on all indicators by year, age, gender, Local Authority (LA), Health Board (HB) and area level deprivation, please visit the interactive indicator tool on the AWISS website (www.awiss.org.uk). Raw results and graphical presentations can be directly downloaded from this website.
1. INTRODUCTION

1.1 Overview

To ensure the greatest reduction in the frequency and severity of injuries across Wales, it is essential that evidence based interventions, practices and policies are targeted towards those groups at highest risk of injury.

Every year in Wales, there are on average 1167 injury related deaths, 39,290 injury related hospital admissions and 316,957 injury related Emergency Department (ED) attendances (for years 2010-2017). These injuries and deaths come at a great cost to the Welsh population and NHS Wales.

Discussions between the All Wales Injury Surveillance System (AWISS - www.awiss.org.uk) and Public Health Wales (PHW) in 2017, recognised the need for a suite of injury indicators for Wales, to improve injury surveillance and support injury prevention programs and policies across Wales. Health indicators are quantifiable measures, designed to summarise a population’s health - in this case the impact of injuries on the population of Wales.

Following a consultation with injury experts and stakeholders across Wales [1] 25 indicators were agreed. All Indicators are presented as rates per 100,000 population, and are available by year, age, gender, Local Authority (LA), Health Board (HB) and small-area level deprivation. It was agreed that indicators would be updated annually and made publicly available via the AWISS website (www.awiss.org.uk) and this report.

The main aim of this report is to provide an overview of the key findings. A summary results table is followed by further discussion around some of the key findings. For more in depth analyses, and to download the full results/graphs please visit the online interactive tool (www.awiss.org.uk).

1.2 Injury Indicators for Wales

1) All cause injuries – fatalities
2) All cause injuries – emergency hospital admissions
3) All cause injuries – emergency department attendances
4) All cause injuries – Disability adjusted life years
5) Home and leisure injuries in all age groups – emergency department attendances
6) Home and leisure injuries in all age groups – emergency hospital admissions
7) Unintentional injuries in the home in 0-7 year age group – emergency department attendances
8) Burns and scalds in 0-4 year age group – emergency hospital admissions
9) Falls in 65+ years – emergency hospital admissions
10) Road traffic injuries in all age groups – emergency department attendances
11) Road traffic injuries in all age groups – emergency hospital admissions
12) Road traffic injuries in young adults aged 17 -24 years – fatalities
13) Road traffic injuries in young adults aged 17 -24 years – emergency hospital admissions
14) Pedestrian and cycling injuries in 0-16 year age group – emergency hospital admissions
15) Poisoning in all age groups – emergency department attendances
16) Poisoning in all age groups – emergency hospital admissions
17) Poisoning in children and young people aged 0-24 years – emergency department attendances
18) Poisoning in children and young people aged 0-24 years – emergency hospital admissions
19) Self-harm in young people aged 10-24 years – fatalities
20) Self-harm in young people aged 10-24 years – emergency hospital admissions
21) Assault in all age groups – emergency hospital admissions
22) Public Health Outcome Framework (PHOF): Hip fractures among older people, analysis lead by Public Health Wales
23) PHOF: Injury related deaths, analysis lead by Public Health Wales
24) PHOF: Road Traffic injury deaths, analysis lead by Public Health Wales
25) PHOF: Suicide, analysis lead by Public Health Wales

Results for the PHOF indicators can be accessed on the PHOF website:
http://www.publichealthwalesobservatory.wales.nhs.uk/phof

1.3 How does AWISS work?

AWISS is a population-based, multi-source injury surveillance system, designed to measure injury rates and patterns, in order to support the design and evaluation of injury reduction initiatives, interventions and policies across Wales. AWISS is funded by Public Health Wales, a NHS organisation providing professionally independent public health advice and services to protect and improve the health and wellbeing of the population of Wales. AWISS is based at Swansea University and utilises the Secure Anonymised Information Linkage (SAIL) databank (http://www.saildatabank.com/). SAIL is a large scale, privacy protecting database. It enables anonymised, routinely collected health, educational and social data at the individual, household and area level, to be linked and analysed to support health related outcomes, without ever knowing who individuals are or where they live. It is one of only six high-quality data linkage systems worldwide, and is unique in its ability to anonymise and link data at multiple levels.

1.4 Data source

To generate the injury indicator estimates, four routine healthcare datasets were analysed by AWISS in the SAIL system at Swansea University: the Welsh Demographic Service (WDS) dataset to obtain population estimates, the Office for National Statistics (ONS) fatality dataset, the Patient Episode Database for Wales (PEDW), and the Emergency Department Dataset (EDDS). A complementary data quality report [2] provides further information about these datasets, associated data quality issues, and how these quality issues impact the interpretation of indicator findings.

1.5 Meta-data

Meta-data providing further information about how indicators were calculated can be found in the appendix, pages 22-26.
2. SUMMARY FINDINGS

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<th>Overview (trends by age, gender, locality, deprivation and time)</th>
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<td>1. All cause injuries</td>
<td>Fatalities</td>
<td>Older age groups (75+) at highest risk of injury related fatality. Risk appears to increase with deprivation. Rate of injury death relatively constant over time.</td>
</tr>
<tr>
<td>2. All cause injuries</td>
<td>Emergency hospital admissions: all ages</td>
<td>Peaks in the 0-4 years, and then 15-19 years, and finally a rapid increase observed in older age groups (75+). Rate of injury related admissions have remained constant between 2010-2017.</td>
</tr>
<tr>
<td>3. All cause injuries</td>
<td>ED attendances: all ages</td>
<td>Peak in 10-14 age group. Higher % of males aged 10-14 attend ED compared with females (56% vs 44%). Risk of an injury related ED attendance higher in children living in the most deprived areas.</td>
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<tr>
<td>4. All cause injuries</td>
<td>Disability Adjusted Life Years (DALYs): all ages</td>
<td>Ongoing methodological discussions have delayed the calculation of injury DALYs. For Wales Results will be published in an updated report in early 2020.</td>
</tr>
<tr>
<td>5. Home and leisure injuries in the home</td>
<td>Emergency hospital admissions: all ages</td>
<td>Admissions peak in the 0-4 age group and 75+. Males at greater risk in the younger age groups, females at greater risk in the older age groups.</td>
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<tr>
<td>6. Home and leisure injuries</td>
<td>ED attendances: all ages</td>
<td>Difficult to draw conclusions due to poor quality data; results from two methods presented.</td>
</tr>
<tr>
<td>7. Unintentional injuries in the home</td>
<td>ED attendances: 0-7 years</td>
<td>Same data quality issues as above. Males more likely to present with an injury compared with females, and risk in the most deprived areas almost double the risk in the least deprived areas.</td>
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<td>8. Burns and scalds</td>
<td>Emergency hospital admissions: all ages</td>
<td>A substantial increase observed in recent years, most likely related to coding changes/changes in clinical practice. Males at greater risk than females.</td>
</tr>
<tr>
<td>9. Falls</td>
<td>Emergency hospital admissions: 65+</td>
<td>Females nearly twice as likely to be admitted compared with males. Relatively constant trend between 2010-2017. Increased risk with increasing deprivation.</td>
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<tr>
<td>10. Road traffic injuries</td>
<td>Fatalities: 17-24</td>
<td>Males at greater risk than females. Due to small counts and potential disclosure risks it is not possible to report the results in more detail.</td>
</tr>
<tr>
<td>11. Road traffic injuries</td>
<td>Emergency hospital admissions: all ages</td>
<td>Males at greater risk than females across all age groups. Peak admissions in young males. Risk drops from the age of 35 and rises again at 75+.</td>
</tr>
<tr>
<td>12. Road traffic injuries</td>
<td>Emergency hospital admissions: 17-24 years</td>
<td>Males over 3 times as likely to be admitted compared with females. Decreasing trend overtime. Individuals from middle deprivation quintile appear to be at greatest risk.</td>
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<td>13. Road traffic injuries</td>
<td>ED attendances: all ages</td>
<td>Peak in 15-29 age group. Difference between male and female risk of attendance much less than hospital admissions, suggesting males are more likely to be involved in serious RTIs. Risk of attendance increases with increasing deprivation.</td>
</tr>
<tr>
<td>14. Pedestrian and cycling injuries</td>
<td>Emergency hospital admissions: 0-16 years</td>
<td>Downward trend in admissions between 2010 and 2017. Males 3 times as likely to be admitted compared with females. Increasing risk with deprivation.</td>
</tr>
<tr>
<td>15. Poisoning</td>
<td>Emergency hospital admissions: all ages</td>
<td>Peak in 15-19 age group. Females nearly 3 times as likely to be admitted compared with males in this age group. Recent research suggests this may not be solely linked to increased risk.</td>
</tr>
<tr>
<td>16. Poisoning</td>
<td>ED attendances: all ages</td>
<td>Similarly risk of attendance peaks in the 15-19 age group, and females are over twice as likely to attend ED compared with males in this age group.</td>
</tr>
<tr>
<td>17. Poisoning</td>
<td>Emergency hospital admissions: 0-24 years</td>
<td>Females twice as likely to be admitted compared with males. Risk of admission increases with deprivation. Downward trend observed in males.</td>
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<td>18. Poisoning</td>
<td>ED attendances: 0-24 years</td>
<td>Increasing risk with increasing deprivation. Females at greater risk of attending ED with poisoning related injury compared with males.</td>
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<td>19. Self-harm</td>
<td>Fatalities: 10-24 years</td>
<td>Suicide is the leading cause of death in this age-group (21% of all deaths).</td>
</tr>
<tr>
<td>20. Self-harm</td>
<td>Emergency hospital admissions: 10-24 years</td>
<td>Females 3 times as likely to be admitted compared to males - recent research suggests this may not be linked solely to increased risk. Upward trend in females, constant trend in males between years 2010-2017. Risk increases with increasing deprivation.</td>
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<td>21. Assault</td>
<td>Emergency hospital admissions: all ages</td>
<td>Decreasing incidence from 2010-2017 (by 40%). Peak in males aged 20-24; males in this age group 12 times as likely to be admitted compared with females.</td>
</tr>
<tr>
<td>22. PHOF: Hip Fractures</td>
<td>Emergency hospital admissions: 65+</td>
<td>Increasing risk with increasing deprivation. Females nearly twice as likely to be admitted compared with males. Results via PHOF website: <a href="http://www.publichealthwalesobservatory.wales.nhs.uk/phof">http://www.publichealthwalesobservatory.wales.nhs.uk/phof</a></td>
</tr>
<tr>
<td>23. PHOF: All Injury</td>
<td>Fatalities: all ages</td>
<td>Risk increases with age and males over twice as likely to be involved in a fatal injury compared with females. Risk increases with increasing deprivation.</td>
</tr>
<tr>
<td>24. PHOF: Road Traffic Injuries</td>
<td>Fatalities: all ages</td>
<td>Males four times as likely to be fatally injured as females, and fatalities most common in individuals living in middle deprivation quintile. <a href="http://www.publichealthwalesobservatory.wales.nhs.uk/phof">http://www.publichealthwalesobservatory.wales.nhs.uk/phof</a></td>
</tr>
<tr>
<td>25. PHOF: Suicide</td>
<td>Fatalities: all ages</td>
<td>Most common in 18-64 year olds, males four times as likely to commit suicide than females.</td>
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3. ALL CAUSE INJURIES

In Wales, 1 in every 3 Emergency Department (ED) attendances includes either an injury diagnosis code, or an injury-related treatment code, with 12% of these injury ED attendances resulting in an admission to hospital for further treatment.

The first four AWISS injury indicators relate to injuries of any cause, and focus on: fatalities, hospital admissions, ED attendances and Disability Adjusted Life Years (DALYs). DALYs are a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death [3]. Ongoing methodological discussions have delayed the calculation of DALYs. As such we will only present findings on the first 3 indicators in this report. Injury related DALYs will be presented in an updated report in early 2020.

Figure 1 presents the rate of injury related hospital admissions per 100,000 population in 2017, by age group and gender. The highest risk of injury admission in younger age groups occurs in males aged 0-4, and females aged 15-19. A rapid increase in risk then occurs in 75+ age group for both gender. Males are generally at greater risk of admissions, except for ages 15-19 and 70+.

Figure 2 presents the rate of injury related ED attendances per 100,000 population in 2017, by age group and gender. Risk of attending ED with an injury peaks in 10-14 age group, with a rate of 25,190 per 100,000 population. This is equivalent to approximately 1 in 4 boys in this age group attending ED with an injury in 2017. Risk of an ED attendance appears to then decrease across the life course until the age 70+ when an increase in attendances is observed, similar to admissions.

Injury related ED attendances in Wales peak in 10-14 year olds. This age marks the onset of adolescence, a time of complex developmental changes which leads to a surge in novelty-seeking, risk-taking behaviour [4] and ultimately increased injury risk. Males appear to be at greater risk (Figure 3), a finding which resonates across the injury/risk-taking literature [5-6].

Figure 3. Percentage of ED attendances in 10-14 age group by gender, 2017.

Injury related ED attendances increase with deprivation (Figure 4), with 36% more attendances occurring in attendees from the most deprived communities compared with those living in the least deprived areas in 2017 (25,356 vs 19,153 per 100,000 population). Area level deprivation was assigned based on the attendees anonymised address (aggregated to area level in SAIL) and the Welsh Index of Multiple Deprivation [7]. The WIMD is an official Welsh Government measure of relative, area-level deprivation (1 = most deprived areas and 5 = least deprived).
3. ALL CAUSE INJURIES

Figure 4. Rate of injury related ED attendance per 100,000 population, by area level deprivation (WIMD), in the 10-14 age group, 2017

4. HOME AND LEISURE INJURIES

AWISS injury Indicators 5-7 focus on injuries occurring in the home and at leisure, with indicator 7 concentrating solely on home injuries in the 0-7 age group. Injuries in this setting are highest amongst those groups spending the greatest time in these environments, namely 0–19 years and 75+.

Location/activity at time of injury is poorly captured in both the inpatient and ED data, but is particularly scarce in ED data [2]. As such, ED based indicators 5 & 7, are presented using two methods; the first most likely producing an under-estimate of the true scale, and the second an over-estimate.

Most common causes of injury in 0-7s in the home (based on EU data)[22]:
- Fall down stairs
- Fall off bed/chair
- Pinch/crush in door
- Contact with hot liquid

Without improvements in data capture, and enhanced mapping of local hospital codes to national standardised datasets, it impossible to know the true number and impact of home and leisure injuries across Wales. Chapter 11 and our complementary data quality report [2] provide further information about the quality of injury data captured on people living in Wales and our recommendations for the future.
5. FALLS IN OLDER ADULTS

Our 9th indicator focuses on fall related admissions in the 65+ age group. Falls are the most common mechanism of injury in this age group, resulting in 30 hospital admissions in Wales every day, and place a substantial burden on population health and the health care sector. Several interventions have been demonstrated to effectively reduce the incidence of injurious falls compared with usual care [8], including: exercise, vision assessment and treatment, environmental assessment and modification, multifactorial assessment and treatment, and vitamin D supplementation.

6. ROAD TRAFFIC INJURIES

Road traffic injuries (RTIs) are a leading cause of non-fatal injury and death worldwide. Four of our indicators focus on RTIs: two on ED attendances and admissions across all age groups (a European Core Health Indicator), and two on admissions and fatal injuries in young adults (17-24 years).

Figure 6 presents the rate of RTI related hospital admissions per 100,000 population in 2017, by age group and gender in Wales. RTI admissions peak in the 15-29 age group, with males over two times as likely to be admitted compared with females. In 2017, approximately 105 males aged 20-24 were admitted to hospital for further treatment due to a RTI in Wales.

Figure 6. Rate of RTI related hospital admissions per 100,000 population in 2017, by age and gender.

To note, missing data points are due to counts of less than 5, which could not be released from SAIL. Counts of less than 5 are not released publicly, to mitigate disclosure risk.
6. ROAD TRAFFIC INJURIES

Figure 7 presents the rate of RTI related ED attendances per 100,000 population in 2017, by age group and gender in Wales. Similar to hospital admissions, a peak in attendances is observed in the 15-29 year age group. The difference in attendance rate between males and females is much smaller than admissions however, suggesting young males are at a higher risk of serious injury when compared with females. To note the quality of data collected on RTIs in EDs is poor and the true rate of RTIs is likely to be much higher. Please refer to the AWISS data quality report for further information [2].

Figure 8 presents data on RTI hospital admission rates in 17-24 year olds, between the years 2010 and 2017. Rates for male and female RTIs in this age group have decreased during this period, by 26% and 37% respectively.

Several interventions have been demonstrated to effectively reduce RTIs including: area wide traffic calming [10], 20mph zones [11], speed cameras [12-13], individualised/small-group road safety training [14], and community based road safety interventions [15]. Graduated Driver Licensing (GDL) programs appear effective in some jurisdictions, with higher levels of restrictions most effective at reducing fatalities [16-18].
Our 14th indicator focusses on pedestrian and cycling related hospital admissions in 0-16 year olds. In 2017, there were 395 pedestrian and cycling related admissions in this age group. Figure 9 suggests the rate of admissions has reduced over time; however a slight increase can be observed since 2015/16.

AWISS do not have access to exposure data e.g. information on how much children walk and cycle. Without this data, and the ability to calculate exposure based rates, it is impossible to know whether increases/reductions in cycling and pedestrian admission rates are due to changes in safety or changes in exposure. It could be the initial decrease in admissions (Figure 9) is related to a reduction in walking and cycling in this period, and the slight increase in recent years, associated with initiatives designed to increase active travel e.g. the Active Travel Act, 2014.

Children living in the most deprived areas almost... 2x As likely to be admitted to hospital compared with children living in the least deprived areas.

Figure 9. Rate of pedestrian and cycling related hospital admissions in 0-16 year olds, per 100,000 population, by year (2010-2017).

Individualised/small-group training focussing on dash-out prevention, crossing at parked cars, and selecting safe routes, appears to be effective at improving children’s pedestrian safety [14]. Community based pedestrian safety interventions are effective at reducing child pedestrian injuries, with “the degree of success being cumulative depending on the complexity of individual strategies employed” [15]. Whilst bicycle education and skills training may increase knowledge of cycling safety; this effect does not appear to translate into a reduction in cycling injuries. Experts still recommend that cycle training is offered to children, based on the improvements to knowledge and riding skills [19].

Although it was recommended by a European child safety policy document to place 20mph zones around every primary school [20], the Road Safety Framework for Wales highlighted that the majority of child pedestrian collisions take place away from schools [21].
8. POISONING RELATED INJURIES

AWISS Indicators 15-18 focus on poisoning related ED attendances and hospital admissions in all age groups and 0-24 years specifically.

**Figure 10** presents the rate of poisoning related admissions across Wales, per 100,000 population in 2017, by age and gender. Unintentional poisonings are common in 0-4 year olds (344 admissions in 2017). Young children are particularly susceptible to poisoning incidents, due their inquisitive nature and lack of awareness about the consequences of ingesting substances.

The European Injury Data Base (EU-IDB [22]), a standardised injury data system collecting data on injuries across Europe, indicates the most common poisoning agents in this age group are: cleaning agents, paracetamol, ibuprofen, antidepressants, nail polish, fuel and alcohol/cigarettes.

A drop in admissions is observed in the 5-9 year age group, followed by a rapid increase in admissions in 10-24 year age group, peaking in females aged 15-19 year (rate of 1,079 admissions per 100,000 population). Females are 3 times as likely to be admitted compared with males in this age group. A similar age/gender pattern is observed in ED data across the life course.

**Figure 11** presents a trend graph for poisoning related admissions in 0-24 year olds, by gender, between 2010 and 2017. Whereas poisoning related admissions appear to have decreased in males over this period, admissions for females appear to have increased.
8. POISONING RELATED INJURIES

Figure 12 shows the percentage of 0-24 year olds admitted to hospital with a poisoning related injury, living in the most deprived areas of Wales compared with the least deprived areas, between 2010 and 2017. Although children and young adults living in the most deprived areas are admitted to hospital more frequently, the gap in admissions between individuals living in the most and least deprived areas appears to be closing.

9. SELF-HARM INJURIES & FATALITIES: 10-24 YEARS

Indicators 19 and 20 focus on self harm related hospital admissions and fatalities in children and young adults aged 10-24 years. Self-harm is usually defined as intentional self-poisoning or self-injury. This covers a wide range of behaviours, including isolated and repeated events: self-cutting, poisoning, scratching, burning, banging, hitting, hair pulling and interfering with wound healing.

Suicide is a leading cause of death in this age group, with 31 out of 147 deaths in 2017 registered as suicide (21% of all deaths). The proportion of all deaths registered as suicide also appears to be increasing in this age group, from 9% in 2010 to 21% in 2017.

In 2017, there were 2,192 hospital admissions recorded as self-injury/self-poisoning in 10-24 year olds. A higher proportion of females are admitted compared with males; 74% and 26% respectively. A large inequity gap exists, with almost double the rate of self-harm admissions in the most deprived communities compared with the least deprived.
9. SELF-HARM INJURIES & FATALITIES

Figure 13 presents hospital admission rates for self-harm injuries in 10-24 year olds by gender, between the years 2010 and 2017. While the rate of admissions has remained constant for males, admissions have increased by 48% for females between 2010 and 2017. A study which will shortly be published in the Archives of Disease in Childhood, reports that females are more likely to be admitted compared with males in this age group in Wales. The authors report this disparity is most evident in 10-15 year olds, where 76% of females attending ED were admitted compared with 49% of males. NICE guidelines recommend that all under 16 year olds presenting with self-harm should be admitted for psychosocial assessment.

Given NICE guidelines, some of the observed increase in self-harm related admissions may be linked to improved health care management. Previous research found that males are more likely to leave ED before on-going care recommendations can be made, or refuse treatment, which may partly explain the lower admissions rate in males [23]. A Child Injury Needs Assessment for Wales commissioned by Public Health Wales in 2017 [24], provides further information about self-harm injuries in this age group, current policies and practice, and recommended areas for improvement across Wales.

![Figure 13. Hospital admission rates for self-harm injuries in 10-24 year olds by gender, between 2010 and 2017.](image)

10. ASSAULT

Violence/assault has been defined in the World report on violence and health as the “intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that results either in injury, death, psychological harm, mal-development or deprivation” [26]. Violence is a major public health concern across the UK with risk factors including: witnessing family violence, poor parenting, poor education, socioeconomic inequalities and substance abuse [25]. Further, violence can lead to mental health problems and increased health-risk behaviours (including smoking, alcohol and drug use, and unsafe sex); resulting in increased health, welfare and criminal justice costs [26].
10. ASSAULTS

Our final AWISS indicator focuses on assault related hospital admissions across all age groups (ICD-10 codes X85-Y05, Y08-Y09). In 2017 there were 865 assault related admissions across Wales; a 38% decrease since 2010 (1,396 admissions in 2010).

Figure 14 presents admission rates for assault related injuries by age and gender, for 2017. Admissions are highest in adolescents and young adults, peaking in males in 20-24 age group with 160.59 admissions per 100,000 population in 2017. Males in this age group are 12 times as likely to be admitted compared with females. Further individuals aged 20-24 living in the most deprived areas are twice as likely to be admitted compared with 20-24 year olds living in the least deprived areas.

ADULTS AGED 20-24 FROM THE MOST DEPRIVED AREAS ARE 2x AS LIKELY TO BE ADMITTED DUE TO ASSAULT COMPARED TO 20-24 YEAR OLDS FROM THE LEAST DEPRIVED AREAS.
11. ED DATA QUALITY

ED data collected in hospitals across Wales varies in quality and completeness, which impacts on our ability to accurately understand injury aetiology across Wales. To improve the quality and completeness of ED data, the AWISS have taken two key approaches [27]:

1. Encouraged the development of simplified, standardised data collection systems at the source
2. Explored the potential to use narrative data to fill gaps on location, intent, mechanism and activity at the time of injury

With regards to point one, the AWISS were instrumental in the development of the European Minimum Data Set (MDS - Figure 15, [28]) created by the Joint Action on Monitoring Injuries in Europe (JAMIE) project.

The JAMIE MDS is a single screen data collection system designed to simplify the capture of data on injury aetiology, and thus improve data quality. While the MDS only contains 5 questions and 14 useful responses (excluding ‘other’ and ‘unknown’) the combination of variables can derive up to 120 combinations of injury determinants. The options in bold (Figure 15) include additional screens in Wales to support prevention activities relating to assaults, road traffic injuries, falls and sports injuries. Although Welsh Government mandated the inclusion of the JAMIE MDS in a new, national ED computer system planned to be rolled out across Wales in 2015/16, this new system is yet to be adopted or implemented.

![Figure 15. Single-screen Joint Action on Monitoring Injuries in Europe Minimum Data Set. Questions 3–6 only appear when ‘yes’ is selected in question 2.](image-url)
This report demonstrates the high incidence of injuries across Wales, the majority of which are preventable. Each day in Wales, there are on average 3 injury fatalities, 107 injury related hospital admissions, and 868 injury related ED attendances. These injuries and deaths come at a great cost to the Welsh population and NHS Wales.

Some injuries appear to be on a downward trend in recent years (e.g. assaults, pedestrian and cycling injuries in 0-16 year olds, and RTIs in 17-24 year olds) while others appear to be on the increase (e.g. self-harm admissions in females). The majority of injuries are disproportionately higher in the most deprived communities of Wales (e.g. self-harm, assaults, poisonings); however some exceptions exist (e.g. RTI injuries in 17-24 year olds). The inequities gap appears to be reducing for some injuries and increasing for others. For example, although poisoning injuries in 0-24 year olds are highest in deprived communities, the difference in risk between the most and least deprived communities appears to be reducing. On the whole, injury fatalities, admissions and ED attendances appear highest amongst males, exceptions being non-fatal self-harm related injuries and falls in older adults, for which females are admitted more commonly.

The four key datasets used to generate our Injury Indicator estimates were: the Welsh Demographic Service (WDS) dataset; the ONS mortality dataset which is complete and accurate but often several years behind due to coroner’s inquests; hospital inpatient data set (PEDW) which is generally well coded but subject to variation in admission thresholds between hospitals; and ED data from the EDDS which suffers from poor data quality and completeness. As such, the majority of estimates presented in this report are likely to be underestimates of the true scale of injuries across Wales. Burden estimates, using the DALY methodology, will be presented in an updated report in 2020, and will help us better understand the overall impact of injuries in Wales and their resulting costs to the NHS. Previous estimates suggest the cost of injuries in Wales are in the billions, and with new improved DALY methods it is likely estimates will increase.

High quality data on injuries is key to making the right decisions in Wales. Poor data can lead to poor decisions, and so data quality plays a crucial role in the reduction of injuries across Wales. As such, the improvement of injury aetiology data in Wales should be made a priority.

**Recommendations:**

- More attention should be paid to the capture of injury aetiology in EDs. The implementation of a simplified, standardised data entry system, such as the MDS (page 18), in all EDs across Wales is recommended. Although Welsh Government mandated the inclusion of the MDS in a new, national ED computer system in 2015/16, this new system is yet to be adopted or implemented.
- The Emergency Department Data Set (EDDS) should be updated to reflect the new College of Emergency Department dataset which contains more detailed information on types of injury and other categories of disease.
- A government-led ED data quality initiative would be welcomed to set standards around ED data collected in hospitals throughout Wales.
- Wales should continue to engage with the International Collaborative Effort on Injury Statistics and the Injury VIBES consortia to standardise the measurement of the burden of injury and facilitate international comparisons.


13. REFERENCES


META DATA FOR INJURY FATALITY FIGURES

DATA SOURCE: The Office for National Statistics (ONS) mortality data were analysed in the All Wales Information Surveillance System (AWISS), within the Secure Anonymised Information Linkage (SAIL) Databank.

INCLUSION CRITERIA:
- Only individuals, living in Wales, with a valid Anonymised Information Linkage Field (ALF_E) in the SAIL Databank were included. ALF_E’s are a double encrypted version of an individuals NHS number.
- Valid ‘registration of death’ between 01/01/2010 – 31/12/2017
- Only Welsh residents (inclusion in the Welsh Demographic Service (WDS) dataset)
- Valid gender code (1=Male, 2=Female)
- Age <=110

INDICATOR CRITERIA:
Injury categories: Road Traffic Injuries: V01-V06 (fourth character 1, 9), V09 (fourth character 2, 3, 9), V10-V18 (fourth character 4, 5, 9), V19 (fourth character 4, 5, 6, 8, 9), V20-V28 (fourth character 4, 5, 9), V29 (fourth character 4, 5, 6, 8, 9), V30-V38 (fourth character 5, 6, 7, 9), V39 (fourth character 4, 5, 6, 8, 9), V40-V48 (fourth character 5, 6, 7, 9), V49 (fourth character 4, 5, 6, 8, 9), V50-V58 (fourth character 5, 6, 7, 9), V59 (fourth character 4, 5, 6, 8, 9), V60-V68 (fourth character 5, 6, 7, 9), V69 (fourth character 4, 5, 6, 8, 9), V70-V78 (fourth character 5, 6, 7, 9), V79 (fourth character 4, 5, 6, 8, 9), V82 (fourth character 1, 2, 3, 6, 7, 8, 9), V83 (fourth character 0, 1, 2, 3), V84 (fourth character 0, 1, 2, 3), V85 (fourth character 0, 1, 2, 3), V86 (fourth character 0, 1, 2, 3), V87 (fourth character 0, 1, 2, 3), V89 (fourth character 2, 3, 9). Intentional self-harm: X60-X84
Age group categories: 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+
Age groups for road traffic fatalities: 17-24 years.
Age groups for self-harm related fatalities: 10-24 years
Area Level Deprivation: based on Lower Super Output Area (LSOA) of individuals address, and 2011 Welsh Index of Multiple Deprivation (WIMD) fifths: 1=Most deprived, 2, 3, 4, 5=Least deprived.
Local Authority and Health Board: based on LSOA code of the patients’ address

POPULATION DATA SOURCE:
Welsh Demographic Service (WDS) dataset.
The Welsh population was estimated using WDS data and a reference date of 1st July every year between 2010 and 2017. The WDS maintains a register of all Welsh residents’. Age was assigned based on the July reference date, and only includes those individuals recorded as having an age<=110. Only those individuals with a valid gender code in the WDS dataset were included in our population estimates.

DATA PRESENTATION
- Injury fatality rates presented as rate per 100,000 population
- WHERE COUNTS WERE <5 FOR A GIVEN INDICATOR, RATES ARE PRESENTED AS NULL TO ADDRESS DISCLOSURE RISKS.
14. METADATA

META DATA FOR HOSPITAL ADMISSIONS

DATA SOURCE: Patient Episode Database for Wales (PEDW) analysed in the All Wales Information Surveillance System (AWISS) within the Secure Anonymised Information Linkage (SAIL) Databank. The PEDW dataset contains all inpatient and day case activity undertaken in NHS Wales plus data on Welsh residents treated in English Trusts.

INCLUSION CRITERIA:
- Only individuals, living in Wales, with a valid Anonymised Information Linkage Field (ALF_E) in the SAIL Databank were included. ALF_E’s are a double encrypted version of an individuals NHS number.
- Valid admission date between 01/01/2010 – 31/12/2017
- Only Welsh residents (inclusion in the Welsh Demographic Service (WDS) dataset)
- Valid gender 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, 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.

INDICATOR CRITERIA:
Injury categories: FALLS: W00-W15, W17-W19. ROAD TRAFFIC INJURIES: V01-V06 (fourth character 1, 9), V09 (fourth character 2, 3, 9), V10-V18 (fourth character 4, 5, 9), V19 (fourth character 4, 5, 6, 8, 9), V20-V28 (fourth character 4, 5, 9), V29 (fourth character 4, 5, 6, 8, 9), V30-V38 (fourth character 5, 6, 7, 9), V39 (fourth character 4, 5, 6, 8, 9), V40-V48 (fourth character 5, 6, 7, 9), V49 (fourth character 4, 5, 6, 8, 9), V50-V58 (fourth character 5, 6, 7, 9), V59 (fourth character 4, 5, 6, 8, 9), V60-V68 (fourth character 5, 6, 7, 9), V69 (fourth character 4, 5, 6, 8, 9), V70-V78 (fourth character 5, 6, 7, 9), V79 (fourth character 4, 5, 6, 8, 9), V82 (fourth character 1, 2, 3, 6, 8, 9), V83 (fourth character 0, 1, 2, 3), V84 (fourth character 0, 1, 2, 3), V85 (fourth character 0, 1, 2, 3), V86 (fourth character 0, 1, 2, 3), V87 (fourth character 0, 1, 2, 3, 4, 5, 6, 7, 8, 9) V89 (fourth character 2, 3, 9). PEDESTRIAN and CYCLIST: V01 – V19. BURNS: T20-T32. SELF HARM: X60 – X84. ASSAULT: X85- Y05, Y08-Y09. HOME AND LEISURE: All injuries minus V01 – V99, X60 – X84, X85- Y05, Y08-Y09. POISONING: F100, F110, F120, F130, F140, F150, F160, F170, F180, F190, T36-T65.


Area Level Deprivation: based on Lower Super Output Area (LSOA) of individuals address, and 2011 Welsh Index of Multiple Deprivation (WIMD) fifths: 1=Most deprived, 2, 3, 4, 5=Least deprived.

Local Authority and Health Board: based on LSOA code of the patients’ address.
14. METADATA

**POPULATION DATA SOURCE:** Welsh Demographic Service (WDS) dataset.
The Welsh population was estimated using WDS data and a reference date of 1st July every year between 2010 and 2017. The WDS maintains a register of all Welsh residents’. Age was assigned based on the July reference date, and only includes those individuals recorded as having an age<=110. Only those individuals with a valid gender code in the WDS dataset were included in our population estimates.

**DATA PRESENTATION**
- Hospital admission rates presented as **rate per 100,000 population**. Population figures obtained from WDS dataset.
- WHERE COUNTS WERE <5 FOR A GIVEN INDICATOR, RATES ARE PRESENTED AS NULL TO ADDRESS DISCLOSURE RISKS.

**META DATA FOR EMERGENCY DEPARTMENT ATTENDANCES**

**DATA SOURCE:** Data in the Emergency Department Data Set (EDDS) were analysed in the All Wales Information Surveillance System (AWISS), within the Secure Anonymised Information Linkage (SAIL) Databank. The Emergency Department Data Set for Wales (EDDS) captures all activity at Accident and Emergency (A&E) departments and Minor Injury Units (MIU) in NHS Wales hospitals.

**INCLUSION CRITERIA:**
- Only individuals, living in Wales, with a valid Anonymised Information Linkage Field (ALF_E) in the SAIL Databank were included. ALF_E’s are a double encrypted version of an individuals NHS number.
- Valid attendance date between 01/01/2010 – 31/12/2017
- Only Welsh residents (inclusion in the Welsh Demographic Service (WDS) dataset)
- Valid gender code (1=Male, 2=Female)
- **Age <=110**
- 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
14. METADATA

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

INDICATOR CRITERIA

- Injury categories
  - Poisonings: ICD10 codes T36-T65, X40-X49, Y10-Y19, X20-X29, X60-X69, X85-X90, EDDS codes 10A, 10B, 10C, 10D, 10Z or Mechanism of Injury = 1.
  - Unintentional injuries in the home method 1: Attend group = 11 (accidental injuries) and location of injury in own home, others home or residential institution
  - Unintentional injuries in the home method 2: Attend group = 11 (accidental injuries) and activity at time of injury was not during work (1, 01), education (2, 02), sports (including during education) (3, 03) or road traffic collision (6, 06)
14. METADATA

**Home and leisure method 1:** Activity at time of injury = 3, 03, 4, 04, 5, 05, 7, 07 (sport, leisure or play, home, DIY, gardening activities, being taking care of)

**Home and Leisure method 2:** Attend group not equal to 12 (assault), attend group not equal to 13 (self-harm) and injury was not a road traffic collision (activity at time of injury was not equal to 6, 06)

**Road traffic injuries:** Activity at time of injury =6 or 06 (road traffic collision)


- **Area Level Deprivation:** based on Lower Super Output Area (LSOA) of individuals address, and 2011 Welsh Index of Multiple Deprivation (WIMD) fifths: 1=Most deprived, 2, 3, 4, 5=Least deprived.

- **Local Authority and Health Board:** based on LSOA code of the patients’ address

**POPULATION DATA SOURCE:** Welsh Demographic Service (WDS) dataset. The Welsh population was estimated using WDS data and a reference date of 1st July every year between 2010 and 2017. The WDS maintains a register of all Welsh residents’. Age was assigned based on the July reference date, and only includes those individuals recorded as having an age<=110. Only those individuals with a valid gender code in the WDS dataset were included in our population estimates.

**DATA PRESENTATION**

- Emergency department attendance rates presented as **rate per 100,000 population.** Population figures obtained from WDS dataset.

- WHERE COUNTS WERE <5 FOR A GIVEN INDICATOR, RATES ARE PRESENTED AS NULL TO ADDRESS DISCLOSURE RISKS.