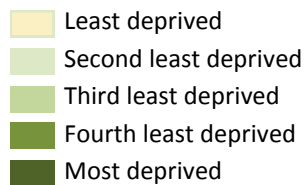# Violence profile: Preston

## Use of NHS data in local violence prevention

This profile utilises five sources of NHS data to present a picture of violence in Preston local authority (LA). The profile aims to provide health and other professionals involved in violence prevention with an understanding of NHS data sources and their potential for informing local violence prevention initiatives. The profiles examine the extent of violence, trends, at-risk groups and communities, and circumstances of assault. The profile focuses on NHS data and does not therefore provide a full picture of violence within Preston.

Figure 1: Preston LA by Lower Super Output Area (LSOA*) showing variation in deprivation.

Least deprived
Second least deprived
Third least deprived
Fourth least deprived
Most deprived

Royal Preston Hospital

* LSOAs are a set of geographical areas across England and Wales that are defined by population size (average population is 1,500).
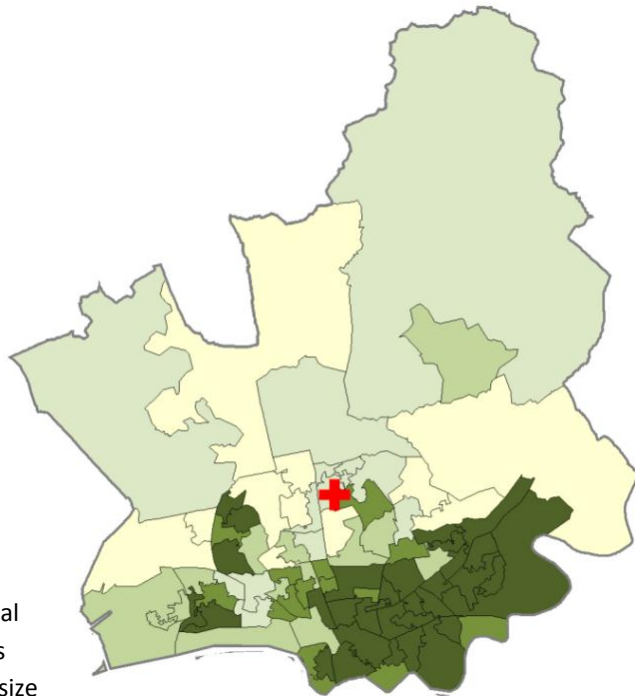
Box 1: Key findings

- Levels of violence, as measured by NHS and police sources, have generally been decreasing for Preston LA over recent years. However, rates of violence were higher than the England average for a number of indicators.
- Violence was most likely to occur on Saturdays and Sundays and between the hours of 8pm and 4am, largely reflecting Friday and Saturday nights (ambulance and A&E data).
- Assaults were most likely to occur in public places (A&E and TARN data).
- The majority of injuries from assaults were caused by a body part such as a fist (65%; A&E data). Around 11% of ambulance call-outs for assault reported involvement of a sharp object or a gun in the incident notes.
- In 58% of assault cases, the victim had consumed alcohol in the three hours prior to the incident occurring (A&E data).
- The majority of people treated for assault-related injuries were male (~70%) and aged 10-39 (~35% were aged 20-29, ~20% aged 10-19 and ~20% aged 30-39) (ambulance, A&E, hospital admissions and TARN data).
- There was a concentration of assaults occurring within Preston city centre.
- Areas of Preston with higher deprivation levels also had significantly higher rates of A&E presentations for assault and hospital admissions for assault.

The NHS data sources used are: 1) ambulance service call-outs; 2) attendances to Royal Preston Hospital Accident and Emergency Department (A&E); 3) Hospital Episode Statistics (HES) experimental A&E data; 4) HES hospital admissions; and 5) reports from the Trauma Audit and Research Network (TARN; clinical reports of severe trauma). For more information about the data sources used, see Table 2.

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Summary of violence

A summary of violence is presented in Table 1. Mortality data and police data have been presented alongside the NHS data sources to provide a rounded picture of violence. TARN data is not included in the summary table since there are known problems with the level of reporting (see page 8 for more information). "Hospital-based" A&E data refers to attendances to Royal Preston Hospital (regardless of a patient's area of residence). "Residence-based" A&E data refers to attendances reported to the HES experimental A&E database and covers all attendances to an A&E department for residents of Preston LA (regardless of which hospital they attended). For more information about the data sources see page 8.

Table 1: Indicators of violence for Preston local authority.

|	Number	Rate per 1,000 pop	England rate per 1,000 pop	% Change from previous 2 years	Direction of change
Ambulance callouts for assault-related incidents (2012/13)[1]	329	2.34	na	nc	nc
A&E attendances for assault (hospital-based) (2012/13)[2]	1459	na	na	-9.83	⬇
A&E attendances for assault (residence-based) (2010/11)[3]	1089	**8.06**	3.60	na	na
Emergency hospital admissions for assault (2011/12)[4]	109	0.74	0.64	-36.99	⬇
Deaths from assault (2011)[5]	<5*	nc	0.01	nc	nc
Police-recorded violent crime (2011/12)[6]	2285	**16.91**	13.60	-21.29	⬇
Police-recorded sexual crime (2011/12)[6]	201	**1.49**	0.96	1.52	⬆

1. Data from the North West Ambulance Service (NWAS). Crude rate per 1,000 population (mid 2012 estimates, ONS), 2012/13. Percent change has not been calculated for this indicator due to data uncertainties in 2010/11.
2. Data from Royal Preston Hospital A&E. Attendances for assault (regardless of patient residence), 2012/13.
3. Data based on Hospital Episode Statistics (HES) A&E experimental dataset; experimental data created by the former North West Public Health Observatory (www.eviper.org). First attendances for assault by residents of Preston local authority, 2010/11. Crude rate per 1,000 population (mid 2010 estimates, ONS). Percent change has not been calculated since the adjusted data is only available for the one year.
4. Data from HES admitted patient care. Emergency hospital admissions for assault (ICD-10 codes X85-Y09) by residents of Preston local authority, 2011/12. Directly Standardised Rate per 1,000 population (mid 2011 estimates, ONS).
5. Data from ONS mortality database. Deaths from assault, 2011. Percent change has not been calculated due to very low numbers.
6. Data from police-recorded crimes, crude rate per 1,000 population (mid 2011 estimates, ONS), 2011/12.

Data in **red text** indicate that the value is significantly higher (statistically) than the England average; * Low numbers have been suppressed; na = not available; nc = not calculated.

When is violence most likely to occur?

Figure 2 shows the percentage of assault-related incidents that fall within each month by data source. TARN data is not included due to problems with the level of reporting (see page 8). There was a slight rise in incidents in April for most data sources. A further rise in hospital admissions for assault was seen in September and October.

Figure 2: Percentage of assault-related incidents by data source, by month (three years combined data [see Table 2]).
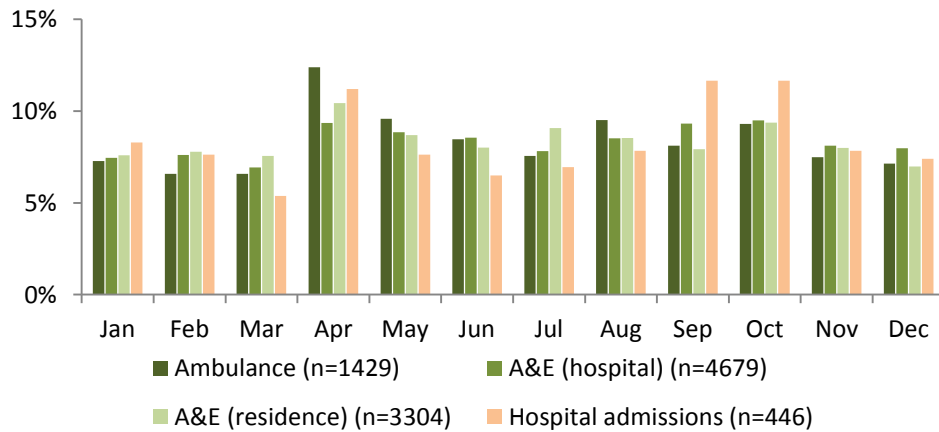
Incident time and day is included in Royal Preston A&E data (see Box 2; completion rates for 2012-13 were 45% [time] and 96% [day]). These data are displayed in Figures 3 and 4 (*A&E [hospital] incident time/day*). Information on assault timings can also be generated from calls to ambulance services. The time and day of presentation to Royal Preston A&E (proxy for assault time) has also been included in Figures 3 and 4 for information (A&E *[hospital]* and *A&E [residence]*). These data sources show that assaults took place most frequently between the hours of 8pm and 4am. Assaults occured most frequently on Saturdays and Sundays, which reflects Friday and Saturday nights.

Figure 3: Percentage of assault-related call-outs/attendances by data source, by hour (three years combined data; 2012-13 for incident time [see Table 2]).
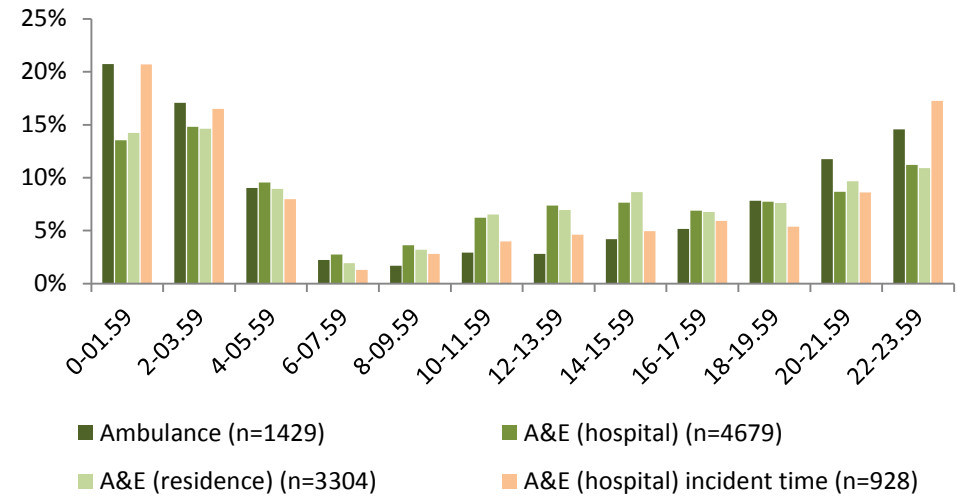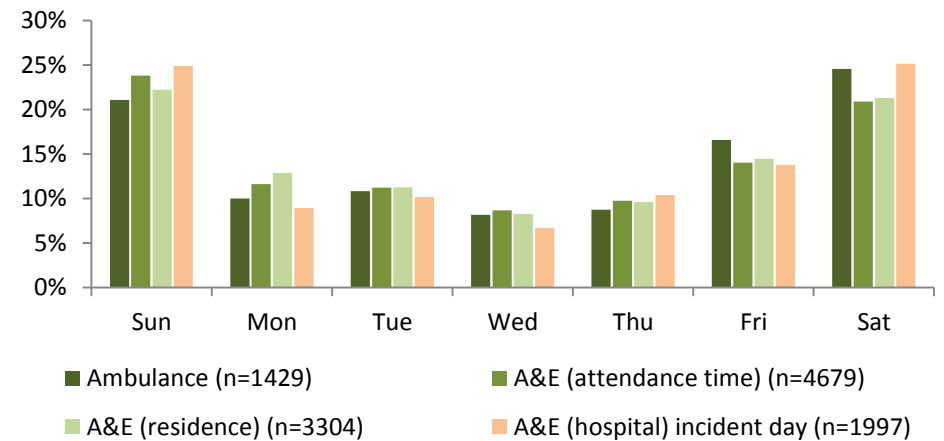

Figure 4: Percentage of assault-related call-outs/attendances by data source, by day (three years combined data; 2012-13 for incident day [see Table 2]).
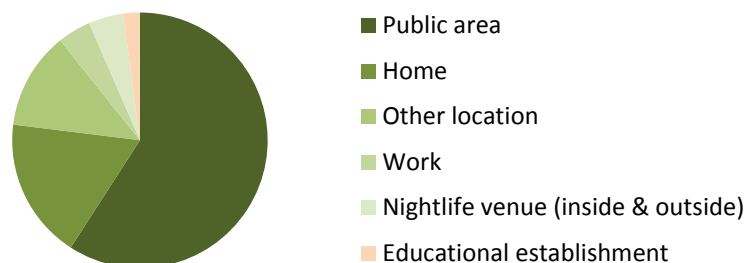
Circumstances around violence

Information on the circumstances of violence can be obtained from Royal Preston Hospital A&E data through the CEM-recommended data collection for assaults (see Box 2). Information is also available from TARN.

Location of assaults

Figure 5 shows the location of assault as reported by presentations to Royal Preston Hospital A&E. The majority of cases occurred in a public area (59%). TARN data (n=140) also show that where location is known (83% of cases), 53% of severe assault cases occurred in a public area. Around 14% of severe assaults occurred at home, 12% on a road and 21% in another (unspecified) location.

Figure 5: Location of assaults for presentations to Royal Preston Hospital A&E (three years combined data; n=4679 [see Table 2]).

- Public area
- Home
- Other location
- Work
- Nightlife venue (inside & outside)
- Educational establishment

Weapons used in assaults

Information on the weapon used in the assault can be extracted from a number of sources. For instance, around 11% of ambulance call-out incidents reported involvement of a sharp object or gun in the incident notes. Information on weapons can also be obtained from Royal Preston Hospital A&E data, although completeness of this field was poor (52% complete for 2012/13). Here, the

majority of assaults with a completed weapon field were caused by a body part (65%). Around 13% were caused by a sharp object, 8% by a blunt object, 4% were pushed and 10% were unknown. Information on the mechanism of assault is also included in TARN data, which shows that most severe assaults (63%) were caused by a blow to the body (Figure 6).

Figure 6: Mechanism of severe assault reported through TARN at Royal Preston Hospital (three years combined data; n=140 [see Table 2]).

- Blow
- Fall
- Other
- Incident/collision
- Stabbing
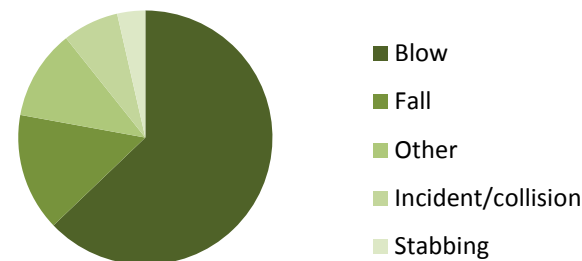
Use of alcohol

Data from Royal Preston Hospital A&E records the use of alcohol in the three hours prior to the incident. Around 58% of patients in 2012/13 reported drinking alcohol.

> **Box 2: CEM-recommended data collection at Royal Preston Hospital A&E**
>
> The College of Emergency Medicine (CEM) has produced guidelines for information sharing at A&Es to reduce violence. These guidelines promote collection of the following additional data fields by receptionists: the **date and time** of assault, the **location** (name of pub, school or street) and the **weapon** used. In September 2014, the Health and Social Care Information Centre developed an information standard on A&E information sharing to tackle violence[1], including the CEM-recommended questions, along with the time and date of the A&E attendance. Royal Preston Hospital A&E collected these fields as well as additional fields such as whether alcohol was used prior to assault. These fields can help improve understanding of violence in and around Preston (Figures 3 and 4), and can enable identification of hotspot areas for violence (see Figure 10).

[1]Available from: http://www.isb.nhs.uk/documents/isb-1594/amd-31-2012/1594312012spec.pdf

At-risk groups

Health data can be used alongside police data on victims and offenders (Box 3) to better understand which groups of the community are most affected by violence. Figures 7 and 8 show that the majority of people treated for assault-related injuries were male, with data for the most severe cases (hospital admissions and TARN) showing slightly higher percentages for males than other sources. The majority of assault victims were aged between 10 and 39 years of age, with the highest frequency of cases seen in the 20-29 age group.

In terms of ethnicity, the majority of assault victims were White British (87% for both Royal Preston Hospital A&E data and hospital admissions data where ethnicity is known [A&E data 97%; hospital admissions 95%]). This compared to around 76% White British within Preston LA population[2].

Figure 7: Percentage of assault-related incidents by data source, by sex (three years combined data [see Table 2])
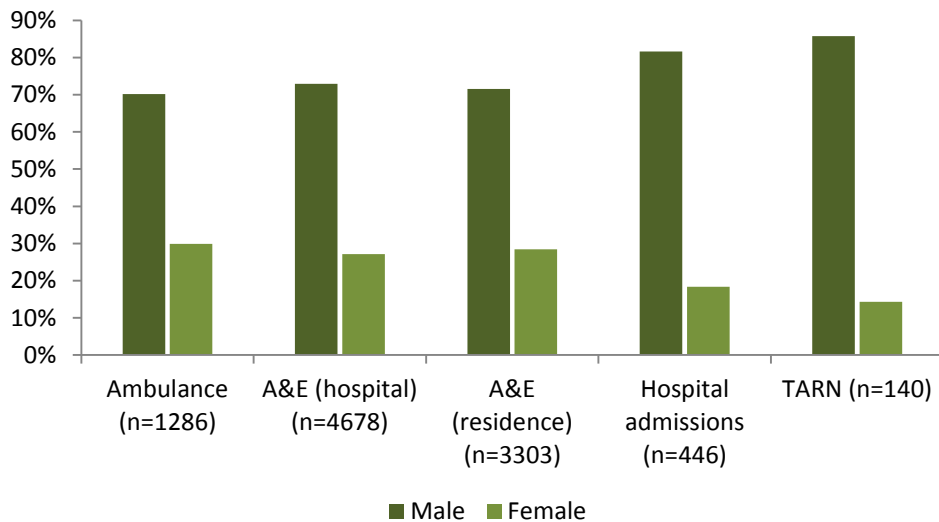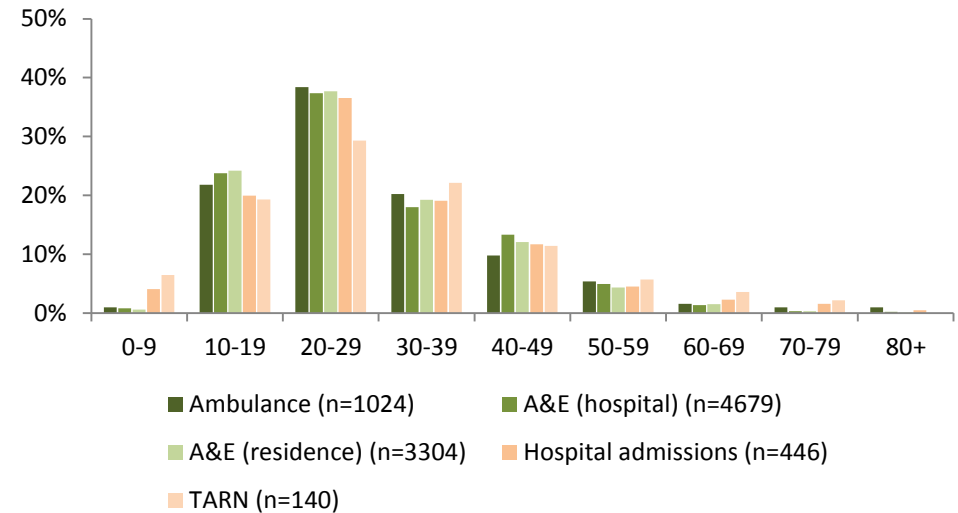

Figure 8: Percentage of assault-related incidents by data source, by age-group (three years combined data [see Table 2]).

Box 3: Police data for perpetrators and victims

Data from Lancashire Constabulary show that whilst the majority of perpetrators of violent crime for Preston were male (85%), the majority of victims were female (59%). The percentage of female victims was higher than that reported in health sources but reflects the wider range of violence reported to the police that includes less severe forms of violence. For instance, nationally, only around 50% of police-recorded violent crime results in injury. For both perpetrators and victims, the majority of cases were aged between 10 and 39, with the frequency of cases highest in the 20-29 age group. Around 75% of both victims and offenders were White British.
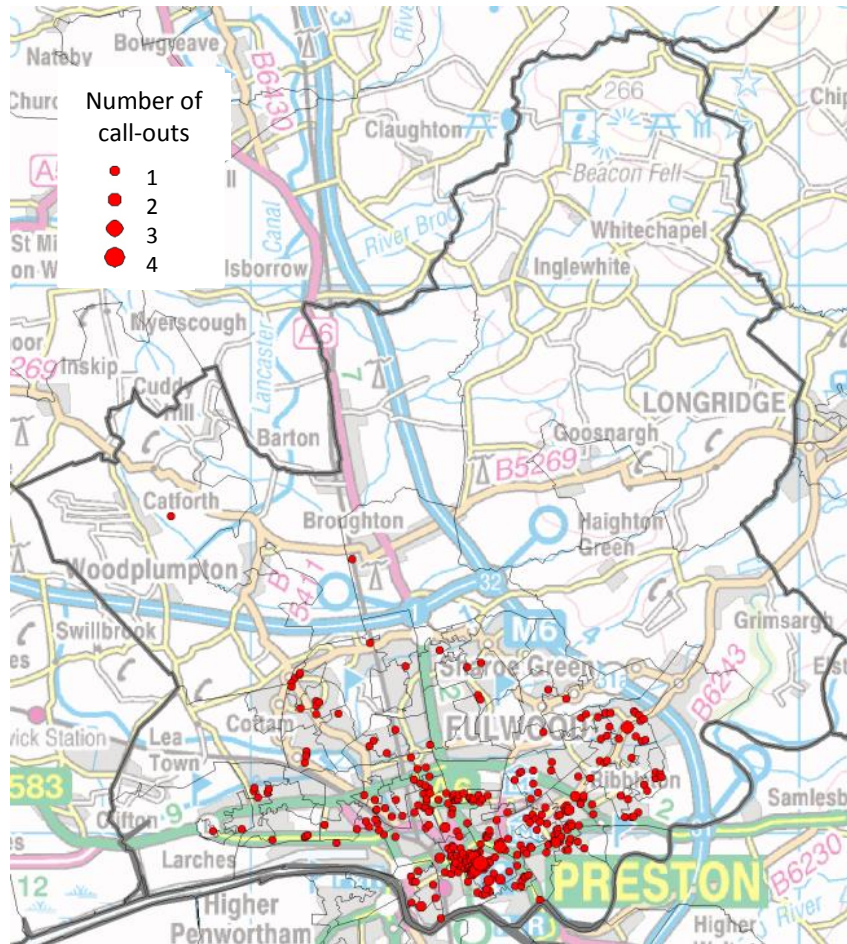
At-risk locations and communities

Health data can be used to identify where assaults take place and which communities are most at risk. Data from ambulance call-outs (Figure 9) and presentations to Preston Royal Hospital A&E (Figure 10) record the location of assaults and show a concentration of assaults within Preston city centre. Figures 11 and 12 show the rate of A&E presentations for assault and the rate of hospital admissions for assault by Lower Super Output Area (LSOA) of residence. These maps can help identify geographical areas to best target violence prevention interventions. Areas of Preston with higher deprivation levels (Figure 1) also had significantly higher* rates of A&E presentations for assault and hospital admissions for assault.

Figure 9: Location of ambulance call-outs for assault related incidents within Preston LA. 2012/13.

Figure 10: Location of assaults presenting to Royal Preston Hospital A&E, 2012/13.
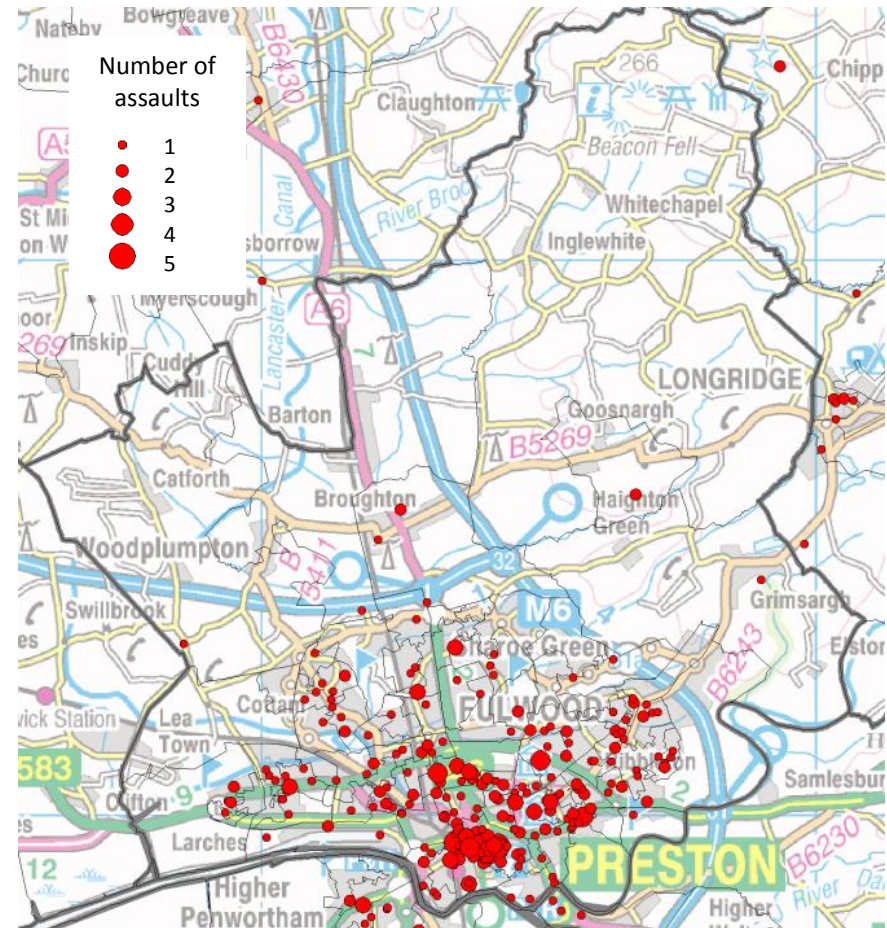
* Using Analysis of Variance (ANOVA). F=25.09 (p<0.01) for A&E presentations and F=21.73 (p<0.01) for hospital admissions.

Figure 11: Crude rate of A&E attendances for assault by LSOA of patient residence within Preston LA, 2009/10-2011/12.
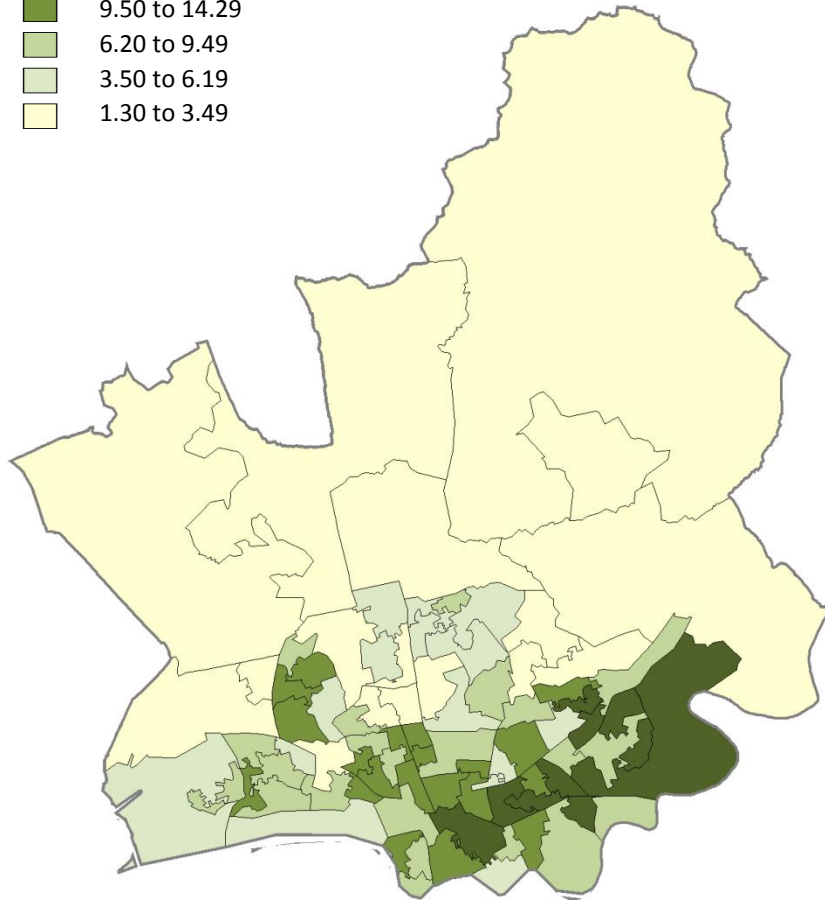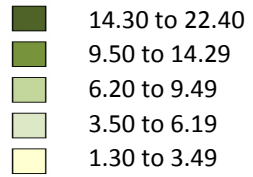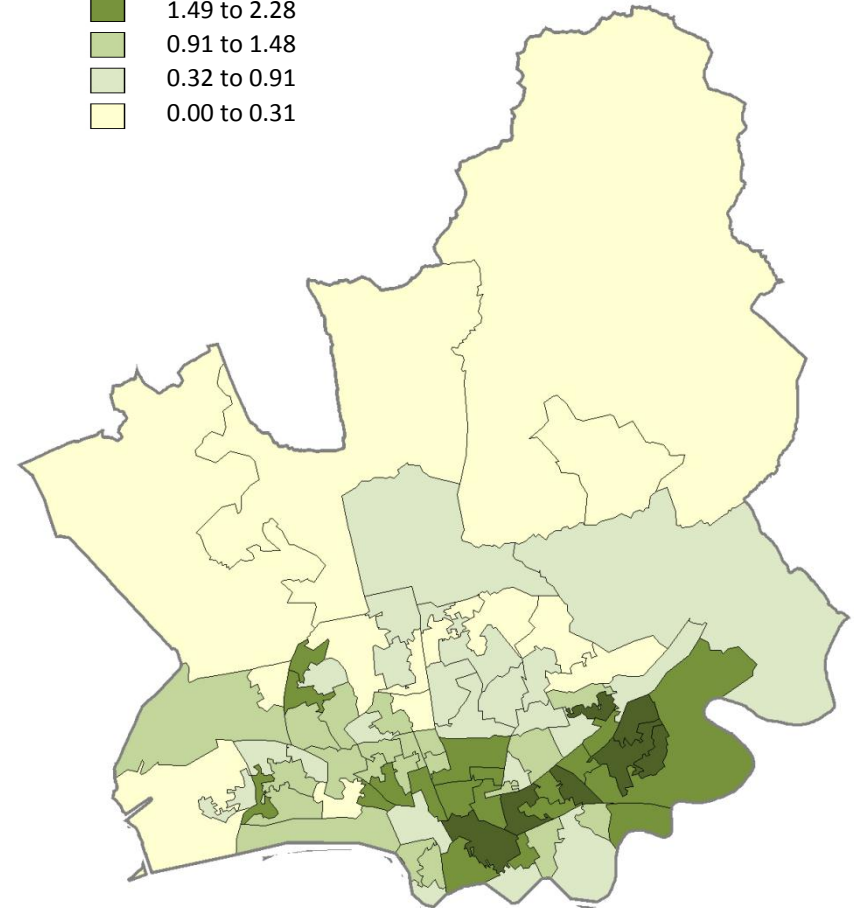
Figure 12: Crude rate of hospital admissions for assault by LSOA of patient residence within Preston LA, 2009/10-2011/12.
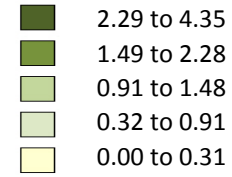
Crude Rate per 1,000 population

■	14.30 to 22.40
■	9.50 to 14.29
■	6.20 to 9.49
■	3.50 to 6.19
☐	1.30 to 3.49

Crude Rate per 1,000 population

■	2.29 to 4.35
■	1.49 to 2.28
■	0.91 to 1.48
■	0.32 to 0.91
☐	0.00 to 0.31

NHS data sources

A summary of the data sources used in this report is shown in Table 2, based on information from: Quigg et al. *Health data for violence prevention manual: A manual for community safety partnerships and other violence prevention partners, 2013.*

Table 2: Summary of NHS data sources.

Data source	Availability and access	Data fields available	Notes
1. Ambulance call outs	Data available via the North West Ambulance Service.	Variables include patient demographics, reason for the call out, call out time and date, and call out location.	Years 2010/11 to 2012/13. Analysis was restricted to all ambulance call-outs within Preston local authority for "assault" or "stab/gunshot".
2. Royal Preston Hospital A&E data (A&E hospital)	Data can be accessed via the Trauma and Injury Intelligence Group (TIIG). www.tiig.info/default.aspx	Variables include patient demographics, incident type, date and time of presentation, incident location, LSOA of residence, assault location, assault weapon and use of alcohol.	Years 2010/11 to 2012/13. This dataset includes all patients presenting to Royal Preston Hospital A&E regardless of their area of residence. Analysis was restricted to all patients presenting with an injury caused by "assault".
3. HES experimental A&E data (A&E residence)	Local authority level data are available via the Violence Indicator Profiles for England Resource (VIPER) www.eviper.org.uk. Bespoke data extracts/analyses are available via the Health & Social Care Information Centre (HSCIC) www.hscic.gov.uk/hes.	Variables include patient demographics, incident type, date and time of presentation and LSOA of residence.	Years 2009/10 to 2011/12. This dataset includes all Preston local authority residents presenting to an A&E in England regardless of which hospital they attended. This is an experimental dataset which means that although coverage was improving year on year, some data quality and coverage issues still remained. Analysis was restricted to all patients presenting with an injury caused by "assault".
4. HES Hospital admissions	Local authority level data are available via the Violence Indicator Profiles for England Resource (VIPER) www.eviper.org.uk. Bespoke data extracts/analyses are available via the Health & Social Care Information Centre (HSCIC). www.hscic.gov.uk/hes.	Variables include patient demographics, admission date and method and cause of hospital admission.	Years 2009/10 to 2011/12. This dataset includes information on all hospital admissions to NHS hospitals including private patients and admissions of NHS patients who are treated elsewhere. The data includes all Preston residents presenting to a hospital in England regardless of which hospital they attended. Analysis was restricted to ICD-10 codes X85-Y09 and emergency admissions.
5. Trauma Audit and Research Network (TARN)	Bespoke data extracts are available from TARN www.tarn.ac.uk.	Variables include patient demographics, type of injury (blunt or penetrating), injury mechanism (e.g. stabbing, shooting), and injury location (e.g. home, office).	Years 2010 to 2012. This dataset records clinical records of severe trauma (e.g. a length of stay in hospital of 72 hours or more). Analysis was restricted to patients where the cause of injury is assault or intent inconclusive. There were issues with data coverage: the number of cases for Royal Preston Hospital was lower than expected (69% of expected cases).

About the profiles

Recognising the valuable role that NHS data can play in addressing the growing problem of gang and youth violence in some English cities, the Coalition Government has prioritised work to improve data sharing on violence within hospitals, and particularly A&Es. The Department of Health is currently running a programme to support A&Es with collecting a minimum data set (see Box 2) and sharing this with Community Safety Partnerships.

This violence profile forms part of a wider, three-year project funded by the Department of Health that aims to identify and support the optimum use of NHS data in local violence prevention, and to identify the impacts of local NHS data sharing on levels of violence. Nine local authorities in the North West and London are participating in the project. For more information visit: *http://www.cph.org.uk/optimising-the-use-of-nhs-intelligence-in-local-violence-prevention-and-measuring-its-impact-on-violence/*

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