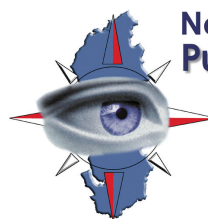




Violence-related

Accident & Emergency Attendances
by English Local Authority Area

Creating a complete experimental national dataset using the Hospital Episode Statistics (HES) Accident & Emergency Attendances in England (experimental statistics)



NorthWest
Public Health
Observatory



Contents

Summary	3
Introduction: health data and its role in violence prevention	6
Data quality and rationale for this study	7
Methodology	9
Data extraction and data quality considerations	9
Modelling A&E first attendances from HES inpatient data	10
Resident based distribution analysis of hospital admissions and A&E attendances	11
Assignment of estimated A&E first attendances to local authority areas	12
Calculation of comparative rates by local authority area	12
Results	14
Crude violence-related first A&E attendance rates (plus 95% confidence intervals, CI) per 100,000 resident population by local authority area – 2010/11 financial year	14
Key Findings	25
Deprivation and urban/rural population densities	26
Violence-related A&E attendances and Police recorded violence	28
Technical Discussion	31
Conclusions and Recommendations	32
References	33
Statistical Appendix	34
Data extraction and data quality considerations	34
Identification of statistical outliers – standardised residuals	35
Linear regression and predicted values	36
Assignment of estimated A&E first attendances to local authority areas	41

This work was undertaken by the North West Public Health Observatory, who received funding from the Department of Health; the views expressed in this publication are those of the authors and not necessarily those of the Department of Health.

Summary

- This report details the first full national violence-related Accident & Emergency (A&E) first^a attendance dataset by local authority in England. The report outlines the methodology used to create an experimental complete national dataset using the HES A&E Attendances in England (experimental statistics). This work has been undertaken to address data quantity and data quality issues in the HES A&E dataset.
- A&E departments see many individuals involved with assaults that are not reported to the police. Therefore, this experimental national dataset has been created to enhance existing intelligence on police recorded violent crime at the local authority level using A&E department data, and explore the geographical inequalities in violence-related A&E attendances across England.
- This resident based experimental analysis provides new intelligence for a variety of agencies working in violence prevention (local authorities, police, NHS Trusts, community safety partnerships, public health research, and the voluntary sector).
- Across England, based on HES A&E (experimental) and imputed values, the model estimates that in the 12 month period April 2010 to March 2011 there were 189,672 violence-related A&E first attendances (360.1 per 100,000 resident population).
- At the regional level, violence-related A&E first attendances are higher in the north of England compared to southern regions (with the exception of London). Across the English Regions the estimates range between 224.9 per 100,000 in the East of England and 512.2 per 100,000 in the North West.
- The estimates highlight wide geographical variation in violence-related A&E first attendances across English local authorities, ranging from 54.9 per 100,000 in East Devon to 994.8 per 100,000 in Liverpool.^b Figure 1 indicates that higher rates (darker red) are observed in areas with larger city centre populations.
- Residents of larger cities, smaller provincial towns and coastal towns experience higher levels of violence-related A&E first attendances (e.g. Preston 806.2 per 100,000; Middlesbrough 809.4 per 100,000; Blackpool 696.6 per 100,000) than less densely populated areas (e.g. Mid Devon 64.4 per 100,000; West Somerset 99.0 per 100,000).
- There is a strong positive correlation between deprivation and violence-related A&E attendances ($r = 0.74$; $p < 0.001$) indicating that A&E attendances rise with increasing levels of deprivation.
- The relationship between levels of urbanity and violence-related A&E attendances is significant albeit weaker than for deprivation ($r = 0.53$; $p < 0.001$) indicating that higher numbers of attendances are not exclusive to more densely populated areas, and that some predominantly rural areas experience high levels of violence-related attendances (e.g. Allerdale 310.6 per 100,000). However, at the local authority level, areas with the lower violence-related A&E first attendance rates were predominantly rural (e.g. West Devon 60.3 per 100,000; South Lakeland 69.4 per 100,000).

^a The data used in this study are restricted to 'first attendances' to avoid duplicates (e.g. a patient may attend A&E subsequent to their first attendance as a planned follow up appointment to have a dressing changed, or as an unplanned follow up attendance relating to the original reason for the first attendance).

^b Liverpool value for HES experimental A&E data are based on imputed data but the estimate has been validated against an independent dataset collected by the Trauma and Injury Intelligence Group (TIIG) based at Liverpool John Moores University.

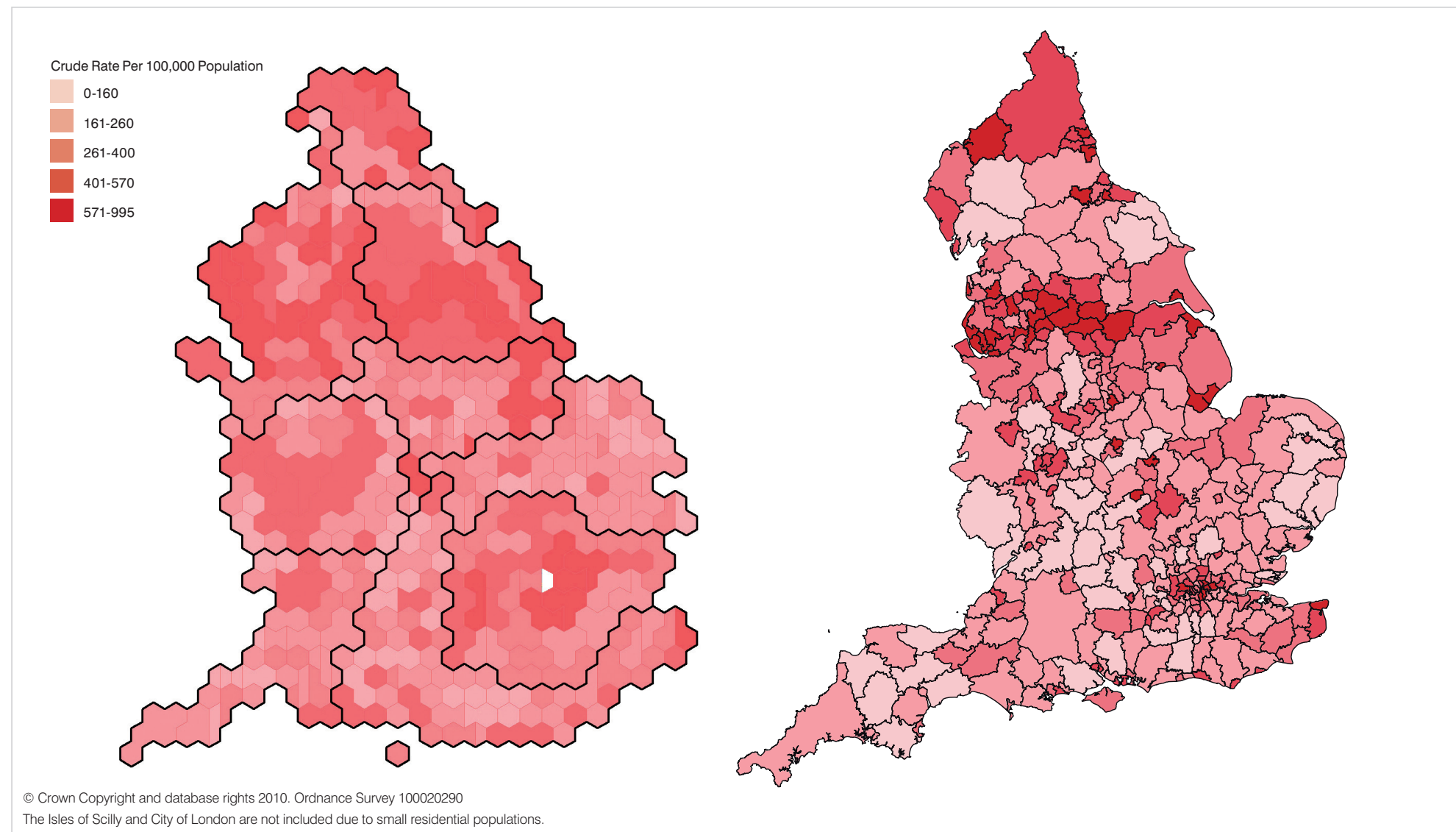
- Approximately 59% of the variance in A&E attendance rates across England can be explained by levels of deprivation or levels of urbanity, with deprivation ($\beta = 0.63$) having a much greater influence on violence-related A&E attendances than population density ($\beta = 0.23$).
- There is a strong positive correlation between violence-related A&E attendances and police recorded violence against the person (with injury) figures ($r = 0.86$; $p < 0.001$) indicating a close link between the rate of A&E assault attendances and more serious police recorded violence. There are more A&E assault presentations per police recorded assault with injury in the most deprived areas of England, compared to more affluent areas.

The process to derive these estimates has identified both data quality and quantity issues (e.g. missing data, invalid data) within the published HES A&E national dataset (experimental). With increased use of the data (e.g. to inform local policy and target local interventions to prevent violence) reporting should improve and the data will become a valuable resource for public health and health care planners as well as for multi-agency working with police and other services.

The NHS Public Health Outcomes Framework (PHOF) 2013-16 proposes the use of violence-related hospital admissions as an outcome measure of violent crime. Using hospital admissions data (HES) for the outcome measure does identify more serious violence-related incidents however A&E attendances could be more informative. Hospital admissions data has been used as part of this model using linear regression to predict missing and invalid A&E attendance data. As a key finding, the analysis in this report identifies that hospital admissions data are a strong predictor of A&E attendances, legitimising the use of violence-related hospital admissions as an interim PHOF measure while A&E data quality and quantity improves.

The government is committed to the use of A&E department data to achieve a reduction in violence. A range of evidence based and cost effective violence prevention interventions can be delivered to at risk communities by health, educational and social support services. A&E data can form a critical part of targeting such interventions as well as providing additional intelligence to inform criminal justice activities.

Figure 1: Map of crude violence-related first A&E attendance rates per 100,000 resident population by local authority area – 2010/11 financial year and related hexagon map of local authority population density^c with region overlay



Source: HES A&E attendances (experimental statistics) and model predicted values.

^c For the population representation local authorities are allocated hexagons according to population size. Each hexagon represents the same number of residents. Local authorities with large populations cover a larger area of the cartogram (i.e. are represented by a greater number of hexagons), while local authorities with smaller populations cover a smaller area. This hexagon map better represents the densely populated metropolitan areas.

Introduction: health data and its role in violence prevention

During the financial year 2010/11, a total of 765,157 separate offences were reported to the police relating to violence against the person in England. Nationally this represented a rate of 14.6 offences per 1,000 resident population.¹ However, UK research studies matching data from police and Accident & Emergency (A&E) departments have shown that only around one third of violent incidents requiring treatment in A&E are reported to the police.^{2,3} Key reasons for omissions in police recording of violent offences include: the fear of reprisal; the victims' fear of their own conduct being scrutinised; and the responsibility for reporting offences resting with the victim.⁴ These findings suggest that analysis of violence-related A&E attendances (alongside criminal justice intelligence) could help provide a clearer understanding of the burden of violence nationally, in particular for those more serious acts of violence which result in injury. Moreover, while police recorded crimes are reported based on the location of assault, A&E data provide information on the area of residence of those involved, allowing a better understanding of geographical variation in patterns of violence across England. Such additional intelligence is critical to ensuring better-informed and targeted violence prevention programmes and strategies.⁵

The importance of data sharing between health and criminal justice has been recognised by the government with a commitment to rolling out sharing of A&E department data with criminal justice services in order to achieve reductions in violence.⁶ Furthermore, across the wider public health policy arena, the NHS Public Health Outcomes Framework (PHOF) 2013-2016,⁷ sets out the desired outcomes for public health and how these will be measured. Aimed at local authorities, Directors of Public Health and other key stakeholders in health and wellbeing, the PHOF includes indicators relating to tackling domestic abuse, levels of violence in general, and older people's perception of community safety. Data on each of these will be available for every local

authority with 'levels of violence in general' initially using hospital admissions for assaults data. It is envisaged that once more robust A&E data are available nationally, the 'levels of violence in general' indicator could potentially use presentations for assault at A&E services in place of hospital admissions.

This report explores the completeness of existing violence-related A&E attendance data (collected through Hospital Episodes Statistics, HES), and develops a model for filling gaps in the current dataset. It explores what intelligence already shows about the distribution of violence across England and examines how A&E data could be best used as data quality improves and A&E data are established as a key indicator for violence within the PHOF.

Data quality and rationale for this study

In January 2009, HESonline™ made available its first publication of record level national Accident & Emergency data within HES for the financial year 2007/08. From this dataset, violence-related A&E first attendances could be extracted. The data used in this study are restricted to 'first attendances' to avoid duplicates (e.g. a patient may attend A&E subsequent to their first attendance as a planned follow up appointment to have a dressing changed, or as an unplanned follow up attendance relating

to the original reason for the first attendance). This national dataset drew on over 12 million individual attendance records at major A&E departments, single specialty A&E departments, Minor Injuries Units and Walk-In Centres across England. Published as 'Experimental Statistics', the uses for this potentially rich dataset were highlighted, however accompanied by several caveats around the data (Box 1).

Box 1: Accident & Emergency attendances in England (experimental statistics) 2007/08 – data quality issues⁸

- Not all NHS Trusts have completed data submissions;
- Where NHS Trusts have submitted A&E attendance data, the total number of records are lower compared to the Quarterly Monitoring of Accident & Emergency (QMAE)^d aggregate return (the official source of A&E information); and
- For some NHS Trusts data quality is poor in terms of invalid coding in clinical fields (diagnosis, investigation and treatment).

In recent years, these data quality issues have improved in terms of number of NHS Trusts submitting data, better comparability with Quarterly Monitoring of Accident & Emergency (QMAE)^d aggregate returns, and validity of coding within clinical fields (Table 1).⁹ However, comparison of the latest A&E attendances in England (Experimental Statistics) 2010/11 with QMAE (violence-related attendances subset) indicates that non submission of data and submission of poor quality data continue to prevent the

publication of a complete national violence-related A&E attendance dataset for England. In practical terms, the ability to monitor levels of violence-related presentations in A&E nationally (at the local authority level) would contribute considerably to informing multi-agency work to tackle this public health issue. Although data quantity and quality continue to improve year on year, it is expected to be some years before a complete dataset is available based on submissions by NHS Trusts to HES A&E.

^d QMAE is the official national source of A&E attendances, where counts are made in local NHS organisations and submitted as a national return to the Department of Health.

Table 1: Changes in data quality: number of valid records in HES A&E by key field 2009/10 and 2010/11 financial years

	2009/10		2010/11	
A&E KEY FIELDS	NUMBER OF VALID RECORDS	% OF TOTAL SUBMISSIONS VALID	NUMBER OF VALID RECORDS	% OF TOTAL SUBMISSIONS VALID
TOTAL NUMBER OF RECORDS	15,569,736		16,244,934	
A&E Arrival Mode	15,145,652	97.3%	15,824,313	97.4%
A&E Department Type (from April 2007)	10,971,330	70.5%	14,343,544	88.3%
A&E Attendance Category ¹	15,470,767	99.4%	16,125,834	99.3%
A&E Attendance Disposal ²	15,530,101	99.7%	16,203,945	99.7%
A&E Incident Location Type	14,057,208	90.3%	14,509,845	89.3%
A&E Patient Group	14,768,678	94.9%	15,481,824	95.3%
Source of Referral for A&E	15,443,282	99.2%	16,105,631	99.1%
Arrival Date	15,569,736	100.0%	16,244,934	100.0%
Arrival Time	15,569,736	100.0%	16,244,934	100.0%
A&E Initial Assessment Time	12,474,089	80.1%	13,246,928	81.5%
A&E Time Seen For Treatment	13,244,783	85.1%	13,953,329	85.9%
A&E Attendance Conclusion Time	14,631,019	94.0%	15,613,643	96.1%
A&E Departure Time	15,526,514	99.7%	16,212,725	99.8%
Primary A&E Diagnosis - 2 Character Level ³	9,043,559	58.1%	9,676,615	59.6%
First A&E Investigation - 2 Character Level ⁴	12,099,695	77.7%	14,175,261	87.3%
First A&E Treatment - 2 Character Level ⁵	10,292,444	66.1%	12,141,322	74.7%

¹ A&E Attendance Category relates to whether the attendance was a first A&E attendance, a follow-up A&E attendance planned, or a follow-up A&E attendance unplanned.

² A&E Attendance Disposal relates to whether a patient was admitted, discharged with GP follow up, discharged no follow up, referred or 'other'.

³ A&E Diagnosis relates to the clinician primary diagnosis. It is a six-character code made up of a diagnosis condition (n2), sub-analysis (n1), anatomical area (n2) and anatomical side (n1).

⁴ A&E Investigation relates to the clinician preliminary investigation procedures. It is a six-character code made up of investigation (n2) and local sub-analysis (up to an additional 4).

⁵ A&E Treatment relates to the clinician preliminary treatment administered. It is a six-character code made up of treatment (n2), sub-analysis (n1), and local use (up to an additional 3).

However, sufficient data are now available to examine general patterns of A&E attendances, to calculate estimates for areas currently not reporting wholly or partially to the HES A&E system and to examine the utility of the data. Therefore, this report develops a methodology to measure violence-

related A&E attendance at the local authority level, generate the first set of local authority estimates for the whole of England, and explore how these modelled estimates can create an experimental national picture of the geographical variation in the patterns of violence.

Methodology

The Department of Health's national HES published datasets include hospital admission inpatient data by cause. This dataset is nationally robust, recording individual Finished Consultant Episodes (i.e. details of each period of inpatient care under different consultants within one healthcare provider) for all

NHS Trusts in England. To create the model, the report first explores the strength of the relationship between violence-related hospital admissions (HES inpatient data) and robust locally collected violence-related A&E attendances (Box 2).

Box 2: Pilot analysis

In the North West, the Trauma and Injury Intelligence Group (TIIG) collects data from all 31 A&E departments (across 39 Local Authority areas) in the North West of England.¹⁰ The number of emergency violence-related hospital admissions (HES) in 2010/11 to North West NHS Trusts correlates strongly with violence-related A&E attendances across the North West for the same time period ($r = 0.85$; $p < 0.001$). Thus, preliminary analysis indicates that national violence-related hospital admissions data could potentially be used to model missing and erroneous values in the A&E national experimental dataset.

Data extraction and data quality considerations

Data were extracted for the 2010/11 financial year from the Department of Health's national HES dataset to provide the number of emergency violence-related hospital admissions by NHS Trust in England. For the same time period, data were extracted from the experimental A&E Attendances dataset for first time violence-related attendances by NHS Trust in England. The data used in this study are restricted to 'first attendances' to avoid duplicates. Further data extraction details are cited in the Statistical Appendix.

To merge the two datasets by NHS Trust in England, NHS Trusts which did not have an A&E Department (Types 1 to 3)^e were removed ($n=29$), leaving a total of 150 NHS Trusts across England with responsibility for reporting attendances at one or more A&E department sites to the Department of Health. Across these Trusts removed from the model there were a total of 34,713 violence-related hospital admissions

that were therefore not included. However, these hospital admissions amounted to 0.4% of the total for England. Data quality issues resulted in 19 NHS Trusts requiring imputation, nine due to non submission of A&E attendance data, and ten due to invalid data (i.e. the hospital admissions value was higher than the A&E attendance value). Therefore the model was based on 131 NHS Trusts, representing 87% of all Trusts with suitable A&Es. Further process details are cited in the Statistical Appendix.

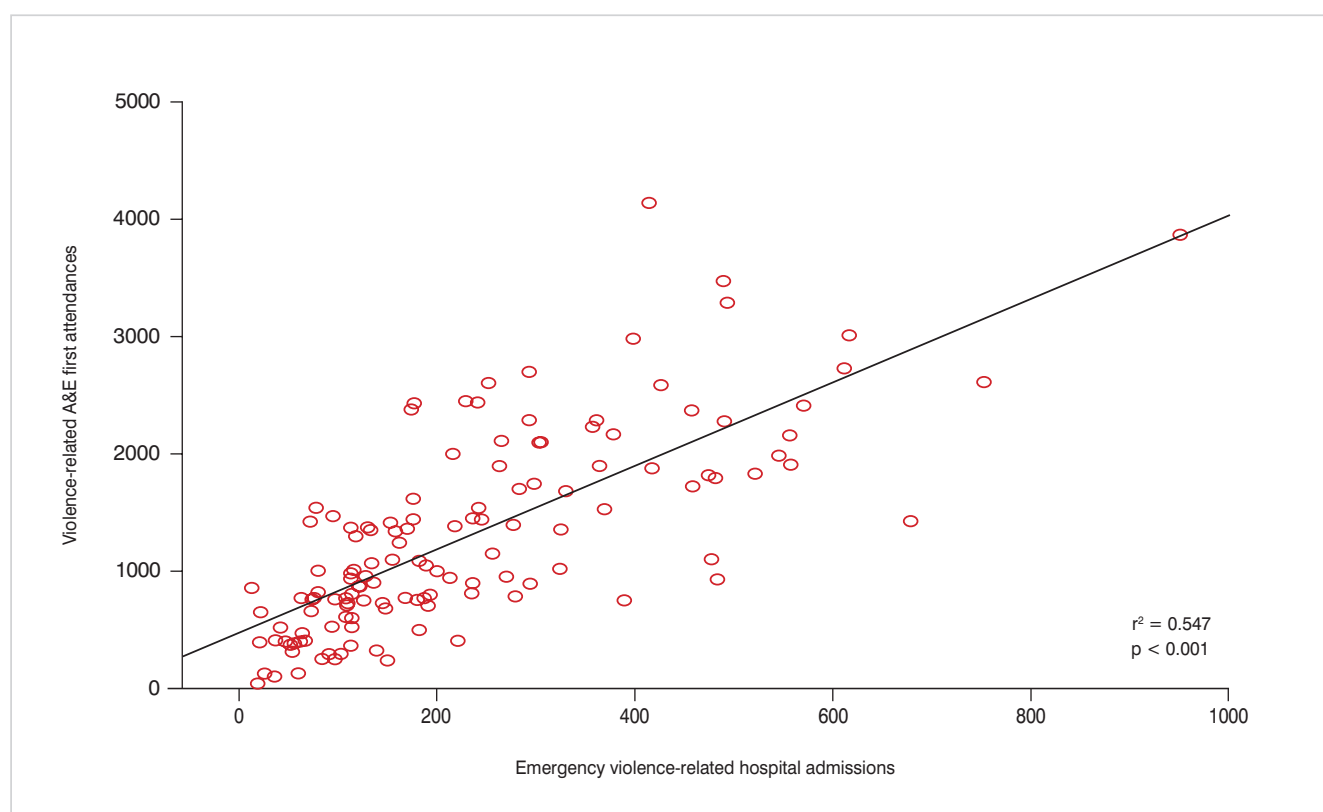
^e A&E Departments: Type 1 = A consultant led 24 hour service with full resuscitation facilities and designated accommodation for the reception of A&E patients. Type 2 = A consultant led single specialty A&E service (e.g. ophthalmology) with designated accommodation for the reception of patients. Type 3 = Other types of A&E / Minor Injuries Units (MIUs) with designated accommodation for the reception of patients.

Modelling A&E first attendances from HES inpatient data

Based on the 131 NHS Trusts, the number of emergency violence-related hospital admissions

(HES) 2010/11 was correlated with the HES violence-related A&E first attendances (experimental) for the same time period (Figure 2).

Figure 2: Correlation of emergency violence-related hospital admissions and violence-related A&E first attendances (experimental) 2010/11



Sources: HES emergency hospital admissions 2010/11 and HES A&E national dataset (experimental) 2010/11

Results identified a significant correlation between the two datasets ($r = 0.74$; $p < 0.001$) and a small subset ($n=4$) of NHS Trusts as outliers (see Appendix) likely to represent poorly reporting A&E services. These NHS Trusts were removed from the linear regression model and, in line with those removed due to missing or invalid A&E HES data, estimated values were imputed from those generated by the statistical model. The removal of the four 'extreme cases' NHS Trusts strengthened the relationship between the HES emergency violence-related hospital admissions and HES

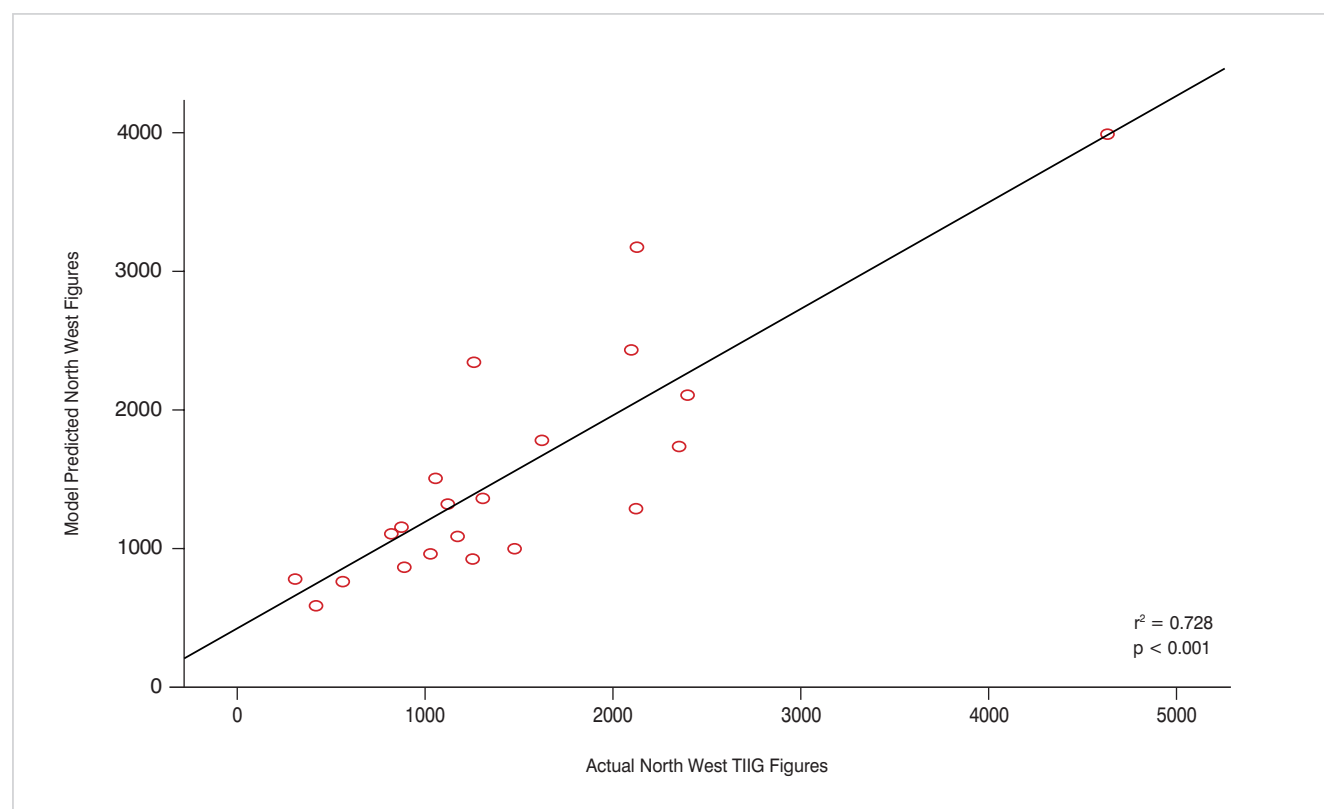
violence-related A&E first attendances ($r = 0.79$; $p < 0.001$). Thus, the final model was based on 127 NHS Trusts' actual data (84% coverage), requiring imputation of estimate violence-related A&E first attendances for 23 NHS Trusts in order to generate a complete England dataset. HES violence-related A&E first attendances were then imputed for the 23 NHS Trusts using the linear regression model predicting A&E first time attendances from HES inpatient data. A worked example is included in the Statistical Appendix.

Model Reliability

To test the extent to which the predicted values could be reliably used as an estimate of actual violence-related A&E first attendances, the model-

predicted values for NHS Trusts in the North West were correlated with known 'actual' figures for the same time period (Figure 3) reported to the Trauma Injury & Intelligence Group (TIIG).

Figure 3: Correlation of actual violence-related A&E first attendances in the North West and model-predicted values 2010/11



Sources: HES A&E national dataset (experimental) 2010/11 model and TIIG A&E attendance data 2010/11

The analysis identified a strong significant correlation between the two datasets: actual and predicted ($r = 0.85$; $p < 0.001$); indicating that HES violence-related hospital admissions were a good predictor for imputing the missing or erroneous values in the HES violence-related A&E first attendances dataset. A table of actual and imputed results by NHS Trust is included in the Statistical Appendix.

Resident based distribution analysis of hospital admissions and A&E attendances


For the 127 trusts using reported (as opposed to modelled) A&E HES data, local authority of residence


could be calculated for each presentation. Here, HES A&E violence-related attendances records were extracted with their Lower Level Super Output Area (LSOA)^f codes and LSOAs were linked to their relevant local authorities. However, for the 23 (of 150) NHS Trusts with modelled estimates of violence-related A&E first attendances, a different methodology was needed to assign A&E HES presentations to the 324^g local authorities (Table 2).

^f Lower Level Super Output Areas are geographies created by the Office for National Statistics each with an average population of 1,500 people.

^g The Isles of Scilly UA (Unitary Authority) and the City of London are not included in the analysis due to small residential populations.

Table 2: Structure of the matrix to assign HES A&E violence-related first attendances (experimental statistics) to local authorities (LAs)

NHS TRUST	LA 1	LA 2	LA 3	 Local authority (n = 324)
NHS TRUST 1	0.71%	5.64%	22.3%	
NHS TRUST 2	0.00%	0.00%	1.23%	
NHS TRUST 3	7.61%	2.40%	0.00%	

 Imputed NHS Trusts (n = 23)

Assignment of estimated A&E first attendances to local authority areas

For each of the 23 Trusts, emergency violence-related hospital admissions were extracted from the HES system and the HES admissions data distributions (i.e. for each Trust, the percentage of inpatient assaults by local authority of residence; see Table 2) were generated. To ensure that the application of HES admissions data distributions to the imputed A&E first attendances would provide reliable estimates, comparative analysis of HES admissions distributions against known 'actual' HES A&E first attendance distributions was undertaken. A sample of three NHS Trusts per region nationally (N=27) was used to compare the geographical distributions of the hospital admissions and A&E first attendances. A 5% cut off parameter was implemented (i.e. HES hospital admissions and HES A&E attendances were compared by patient local authority of residence where the proportions presenting from any given local authority were greater than 5%). For all 27 NHS Trusts, the proportions of residents admitted for assault to hospital from each local authority had distributions similar to that of A&E assault attendances. Tables detailing the results of this comparative analysis are provided in the Statistical Appendix.

Calculation of comparative rates by local authority area

Through this model, a national violence-related A&E first attendance (experimental) dataset has been generated, enabling the calculation of comparative rates by local authority area. Using this experimental dataset, crude rates per 100,000 resident population were calculated (95% Confidence (CI)) by local authority (Table 3).

At the national level, based on HES A&E (experimental) and imputed values, the model estimates that across England in 2010/11 there were 189,672 violence-related A&E attendances (360.1 per 100,000 resident population). This national figure is based on 84% actual attendances data and 16% imputed attendances.

Previous estimates have been produced for England and Wales (as opposed to solely England in this report) citing approximately 300,000 violence-related A&E attendances in 2011 across England and Wales. These previous estimates were based on a sample of 42 A&E departments across England and Wales for the calendar year 2011 (A&E Types 1, 3 and 4) whereas the estimates in this report include A&E Types 1, 2 and 3 for the financial year 2010/11).^h

^h A&E Departments: Type 1 = A consultant led 24 hour service with full resuscitation facilities and designated accommodation for the reception of A&E patients. Type 2 = A consultant led single specialty accident and emergency service (e.g. ophthalmology) with designated accommodation for the reception of patients. Type 3 = Other types of A&E / Minor Injuries Units (MIUs) with designated accommodation for the reception of patients. Type 4 = NHS Walk-in Centres

The different methodologies, time periods, geographical areas and A&E presentations included are likely to have contributed to the different estimates.

The numerator: Combination of actual and imputed violence-related A&E first attendances by England local authority.

The denominator: ONS Mid-Year Resident Population Estimates 2010.

For clarity, each local authority in Table 3 has been colour coded (sometimes referred to as the traffic light or rag rating system) to indicate what proportion of the data is actual as opposed to imputed. Where North West actual A&E data are available through the Trauma Injury and Intelligence Group (TIIG), the rag rating may be uplifted if, for example, red or amber local authorities' estimated values fall within 20% of the actual data collected locally:

Local authority Value < 60% Actual	R
Local authority Value 60% - 79% Actual	A
Local authority Value 80% + Actual	G

Results

Table 3: Crude violence-related A&E first attendance rates (plus 95% Confidence Intervals, CI) per 100,000 resident population by local authority area* – 2010/11 financial year (experimental)

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
East Midlands	Amber Valley CD	251	206.4	181.7	233.6	G
East Midlands	Ashfield CD	290	247.6	219.7	277.6	G
East Midlands	Bassetlaw CD	441	394.4	358.4	433.0	G
East Midlands	Blaby CD	245	260.6	229.0	295.3	G
East Midlands	Bolsover CD	226	303.1	264.8	345.3	G
East Midlands	Boston CD	339	574.2	514.7	638.7	G
East Midlands	Broxtowe CD	276	246.8	218.6	277.7	G
East Midlands	Charnwood CD	352	211.0	189.5	234.2	G
East Midlands	Chesterfield CD	386	382.0	344.9	422.1	G
East Midlands	Corby CD	340	609.0	545.9	677.3	G
East Midlands	Daventry CD	161	204.1	173.6	237.9	G
East Midlands	Derby UA	1334	540.3	511.7	570.1	G
East Midlands	Derbyshire Dales CD	91	129.3	104.1	158.7	G
East Midlands	East Lindsey CD	526	371.4	340.3	404.5	G
East Midlands	East Northamptonshire CD	166	194.7	166.2	226.7	G
East Midlands	Erewash CD	295	265.0	235.7	297.1	G
East Midlands	Gedling CD	371	327.9	295.3	363.0	G
East Midlands	Harborough CD	105	125.0	102.2	151.3	G
East Midlands	High Peak CD	184	199.1	171.0	229.6	A
East Midlands	Hinckley and Bosworth CD	164	156.1	133.1	181.9	G
East Midlands	Kettering CD	279	307.8	272.8	346.2	G
East Midlands	Leicester UA	1892	617.0	589.5	645.5	G
East Midlands	Lincoln CD	526	586.6	537.5	639.0	G
East Midlands	Mansfield CD	263	264.1	233.0	297.9	G
East Midlands	Melton CD	88	178.4	142.7	219.1	G
East Midlands	Newark and Sherwood CD	330	290.4	259.9	323.5	G
East Midlands	North East Derbyshire CD	212	215.6	187.6	246.7	G
East Midlands	North Kesteven CD	232	218.1	190.8	247.9	G
East Midlands	North West Leicestershire CD	187	206.0	177.5	237.7	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE- RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
East Midlands	Northampton CD	1242	585.3	553.2	618.8	G
East Midlands	Nottingham UA	2031	662.3	633.8	691.8	G
East Midlands	Oadby and Wigston CD	187	319.4	275.3	368.6	G
East Midlands	Rushcliffe CD	244	216.3	190.0	245.2	G
East Midlands	Rutland UA	42	108.9	78.5	147.2	G
East Midlands	South Derbyshire CD	285	303.8	269.3	340.8	G
East Midlands	South Holland CD	210	248.3	215.9	284.3	G
East Midlands	South Kesteven CD	273	206.4	182.6	232.4	G
East Midlands	South Northamptonshire CD	98	110.4	89.6	134.5	G
East Midlands	Wellingborough CD	222	293.1	255.8	334.3	G
East Midlands	West Lindsey CD	257	287.5	253.4	324.8	G
East of England	Babergh CD	93	108.7	87.7	133.2	G
East of England	Basildon CD	407	232.5	210.5	256.2	G
East of England	Bedford UA	710	441.8	409.9	475.6	G
East of England	Braintree CD	271	188.2	166.4	211.9	G
East of England	Breckland CD	297	226.8	201.8	254.2	G
East of England	Brentwood CD	125	167.1	139.1	199.1	G
East of England	Broadland CD	193	156.0	134.4	179.3	G
East of England	Broxbourne CD	234	257.8	225.7	293.0	R
East of England	Cambridge CD	407	323.7	293.1	356.8	G
East of England	Castle Point CD	177	198.0	169.9	229.4	G
East of England	Central Bedfordshire UA	506	198.1	181.2	216.1	G
East of England	Chelmsford CD	401	236.5	213.9	260.8	G
East of England	Colchester CD	450	248.6	226.2	272.7	G
East of England	Dacorum CD	317	221.5	197.8	247.3	R
East of England	East Cambridgeshire CD	137	161.3	135.4	190.7	G
East of England	East Hertfordshire CD	185	133.4	114.7	153.9	R
East of England	Epping Forest CD	258	207.0	182.4	233.7	R
East of England	Fenland CD	250	272.0	239.3	307.8	G
East of England	Forest Heath CD	125	194.3	161.7	231.5	G
East of England	Great Yarmouth CD	220	226.4	197.5	258.4	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
East of England	Harlow CD	376	460.7	415.1	509.4	R
East of England	Hertsmere CD	174	174.6	149.2	202.0	G
East of England	Huntingdonshire CD	379	226.5	204.3	250.5	G
East of England	Ipswich CD	194	151.6	130.7	174.1	G
East of England	Kings Lynn and West Norfolk CD	503	350.2	320.3	382.2	G
East of England	Luton UA	683	343.9	318.6	370.7	G
East of England	Maldon CD	104	164.4	134.4	199.3	G
East of England	Mid Suffolk CD	82	86.3	68.7	107.2	G
East of England	North Hertfordshire CD	220	174.9	152.5	199.6	R
East of England	North Norfolk CD	167	164.3	140.3	191.2	G
East of England	Norwich CD	536	373.6	342.6	406.6	G
East of England	Peterborough UA	573	330.5	304.0	358.7	G
East of England	Rochford CD	114	136.8	112.8	164.3	G
East of England	South Cambridgeshire CD	287	196.2	174.0	220.1	G
East of England	South Norfolk CD	167	137.1	117.1	159.6	G
East of England	Southend-on-Sea UA	479	289.8	264.4	317.0	G
East of England	St Albans CD	183	132.1	113.5	152.4	R
East of England	St Edmundsbury CD	250	239.6	210.4	270.7	G
East of England	Stevenage CD	199	242.9	210.2	279.0	R
East of England	Suffolk Coastal CD	84	67.6	53.9	83.7	G
East of England	Tendring CD	259	174.4	153.8	196.9	G
East of England	Three Rivers CD	149	167.9	141.7	196.7	R
East of England	Thurrock UA	315	197.3	176.1	220.3	R
East of England	Uttlesford CD	126	163.1	135.4	193.6	A
East of England	Watford CD	290	336.7	299.0	377.7	R
East of England	Waveney CD	190	161.7	139.5	186.3	G
East of England	Welwyn Hatfield CD	270	236.4	208.8	266.0	R
London	Barking and Dagenham LB	854	475.3	443.9	508.3	G
London	Barnet LB	954	273.9	256.8	291.8	G
London	Bexley LB	471	206.8	188.5	226.3	G
London	Brent LB	1376	536.2	508.2	565.3	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
London	Bromley LB	629	201.5	186.1	217.9	G
London	Camden LB	607	257.8	237.7	279.1	G
London	Croydon LB	1225	354.4	334.9	374.9	R
London	Ealing LB	1871	587.5	561.2	614.7	G
London	Enfield LB	1215	412.1	389.2	435.9	G
London	Greenwich LB	387	169.4	152.9	187.1	G
London	Hackney LB	1356	618.7	586.2	652.5	R
London	Hammersmith and Fulham LB	771	454.2	422.7	487.4	A
London	Haringey LB	1257	558.8	528.3	590.6	A
London	Harrow LB	831	361.4	337.3	386.8	G
London	Havering LB	669	283.3	262.2	305.6	G
London	Hillingdon LB	1425	535.4	507.9	563.9	G
London	Hounslow LB	1133	478.5	451.1	507.2	G
London	Islington LB	850	437.9	409.0	468.4	R
London	Kensington and Chelsea LB	478	282.2	257.4	308.6	R
London	Kingston upon Thames LB	340	201.2	180.4	223.8	G
London	Lambeth LB	1797	631.6	602.8	661.5	G
London	Lewisham LB	688	258.3	239.4	278.4	G
London	Merton LB	731	349.9	325.0	376.2	A
London	Newham LB	1874	780.4	745.5	816.6	G
London	Redbridge LB	1039	384.2	361.2	408.3	G
London	Richmond upon Thames LB	394	206.4	186.6	227.9	G
London	Southwark LB	1678	584.7	557.1	613.4	G
London	Sutton LB	602	310.0	285.7	335.8	R
London	Tower Hamlets LB	1706	717.3	683.7	752.2	G
London	Waltham Forest LB	861	378.8	353.9	405.0	G
London	Wandsworth LB	1090	376.5	354.5	399.6	G
London	Westminster, City of LB	758	299.4	278.5	321.5	G
North East	County Durham UA	1007	197.1	185.1	209.7	G
North East	Darlington UA	679	673.4	623.7	726.0	G
North East	Gateshead MCD	957	499.2	468.1	531.9	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
North East	Hartlepool UA	467	511.8	466.4	560.4	R
North East	Middlesbrough UA	1152	809.4	763.3	857.5	G
North East	Newcastle upon Tyne MCD	1602	548.3	521.8	575.8	G
North East	North Tyneside MCD	1187	598.1	564.5	633.1	G
North East	Northumberland UA	1319	422.8	400.3	446.2	G
North East	Redcar and Cleveland UA	580	422.1	388.5	457.9	G
North East	South Tyneside MCD	717	466.6	433.1	502.0	G
North East	Stockton-on-Tees UA	668	347.1	321.3	374.4	R
North East	Sunderland MCD	1655	583.8	556.0	612.6	G
North West	Allerdale CD	292	310.7	275.8	348.1	G
North West	Barrow-in-Furness CD	289	409.0	363.2	459.0	G
North West	Blackburn with Darwen UA	926	661.4	619.5	705.4	G
North West	Blackpool UA	975	696.6	653.6	741.8	G
North West	Bolton MCD	665	249.5	230.9	269.2	G
North West	Burnley CD	604	708.1	652.7	766.9	G
North West	Bury MCD	491	267.3	244.2	292.0	G
North West	Carlisle CD	635	607.6	561.3	656.8	G
North West	Cheshire East UA	1276	350.7	331.7	370.5	G
North West	Cheshire West and Chester UA	1260	385.1	364.1	406.9	G
North West	Chorley CD	510	483.7	442.6	527.6	G
North West	Copeland CD	353	507.8	456.2	563.7	G
North West	Eden CD	63	121.6	93.4	155.6	G
North West	Fylde CD	203	265.0	229.8	304.1	G
North West	Halton UA	795	666.4	620.9	714.4	G
North West	Hyndburn CD	354	436.4	392.1	484.3	G
North West	Knowsley MCD	1055	707.2	665.2	751.3	G
North West	Lancaster CD	394	279.4	252.5	308.4	G
North West	Liverpool MCD	4429	994.8	965.7	1024.5	G
North West	Manchester MCD	3027	606.9	585.4	628.9	G
North West	Oldham MCD	1266	576.2	544.9	608.8	G
North West	Pendle CD	499	559.0	511.1	610.3	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE- RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
North West	Preston CD	1089	806.2	759.0	855.5	G
North West	Ribble Valley CD	119	205.2	170.0	245.6	G
North West	Rochdale MCD	1271	619.2	585.6	654.2	G
North West	Rossendale CD	184	273.2	235.0	315.4	G
North West	Salford MCD	1570	685.8	652.3	720.5	G
North West	Sefton MCD	1642	601.7	573.0	631.6	G
North West	South Lakeland CD	72	69.4	54.3	87.4	G
North West	South Ribble CD	451	416.2	378.7	456.5	G
North West	St Helens MCD	1021	575.6	540.8	612.0	G
North West	Stockport MCD	1125	395.4	372.6	419.1	G
North West	Tameside MCD	1147	528.7	498.5	560.2	A
North West	Trafford MCD	741	341.2	317.1	366.7	G
North West	Warrington UA	1013	509.4	478.6	541.8	G
North West	West Lancashire CD	416	376.9	341.6	415.0	G
North West	Wigan MCD	1365	443.6	420.4	467.8	G
North West	Wirral MCD	1676	542.6	516.9	569.2	G
North West	Wyre CD	258	231.8	204.2	261.7	G
South East	Adur CD	160	259.5	220.2	302.2	G
South East	Arun CD	313	207.9	185.5	232.2	G
South East	Ashford CD	328	283.9	254.0	316.3	G
South East	Aylesbury Vale CD	400	229.6	207.6	253.2	G
South East	Basingstoke and Deane CD	645	390.4	360.8	421.7	G
South East	Bracknell Forest UA	271	232.5	205.3	261.5	G
South East	Brighton and Hove UA	1363	526.7	499.1	555.4	G
South East	Canterbury CD	481	314.0	286.6	343.3	G
South East	Cherwell CD	215	153.1	133.3	175.0	R
South East	Chichester CD	185	163.0	140.3	188.2	G
South East	Chiltern CD	137	150.1	125.9	177.2	G
South East	Crawley CD	121	112.7	93.3	134.4	G
South East	Dartford CD	316	334.2	298.4	373.2	G
South East	Dover CD	489	457.3	417.7	499.7	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
South East	East Hampshire CD	219	195.0	169.6	222.1	A
South East	Eastbourne CD	454	468.2	426.1	513.3	G
South East	Eastleigh CD	197	161.0	139.3	185.1	G
South East	Elmbridge CD	255	193.1	169.9	218.1	R
South East	Epsom and Ewell CD	171	230.0	196.4	266.7	R
South East	Fareham CD	234	208.7	182.8	237.3	G
South East	Gosport CD	345	431.8	387.5	479.9	G
South East	Gravesham CD	321	322.4	288.1	359.7	G
South East	Guildford CD	329	240.3	214.8	267.4	R
South East	Hart CD	269	294.8	260.3	331.9	G
South East	Hastings CD	469	538.0	490.4	589.0	G
South East	Havant CD	361	309.0	277.9	342.5	G
South East	Horsham CD	101	77.2	62.9	93.8	G
South East	Isle of Wight UA	521	370.9	339.8	404.2	G
South East	Lewes CD	211	216.5	188.3	247.8	G
South East	Maidstone CD	262	174.9	154.3	197.4	G
South East	Medway Towns UA	676	263.3	243.9	284.0	G
South East	Mid Sussex CD	239	180.6	158.3	204.8	G
South East	Milton Keynes UA	1004	415.8	390.5	442.3	G
South East	Mole Valley CD	122	143.8	119.2	171.5	R
South East	New Forest CD	262	148.0	130.6	167.1	G
South East	Oxford CD	359	233.6	209.8	258.7	R
South East	Portsmouth UA	841	406.1	379.1	434.5	G
South East	Reading UA	694	450.2	417.3	485.0	G
South East	Reigate and Banstead CD	184	133.0	114.2	153.3	A
South East	Rother CD	191	212.7	183.6	245.0	G
South East	Runnymede CD	132	153.8	128.5	182.2	R
South East	Rushmoor CD	523	568.2	520.6	619.1	G
South East	Sevenoaks CD	183	160.4	138.0	185.4	G
South East	Shepway CD	274	270.7	239.6	304.8	G
South East	Slough UA	361	275.5	247.7	305.3	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
South East	South Bucks CD	116	172.2	142.1	206.2	G
South East	South Oxfordshire CD	150	114.6	96.9	134.4	R
South East	Southampton UA	970	404.6	379.6	430.9	G
South East	Spelthorne CD	295	315.9	280.6	353.8	R
South East	Surrey Heath CD	394	466.6	421.7	515.0	A
South East	Swale CD	226	169.4	148.0	192.9	G
South East	Tandridge CD	66	79.4	61.4	101.0	G
South East	Test Valley CD	242	213.3	187.3	241.9	G
South East	Thanet CD	828	626.5	584.5	670.6	G
South East	Tonbridge and Malling CD	221	186.1	162.4	212.3	G
South East	Tunbridge Wells CD	290	268.1	238.1	300.8	G
South East	Vale of White Horse CD	142	118.9	99.8	139.7	R
South East	Waverley CD	177	146.9	125.9	170.1	R
South East	Wealden CD	233	161.7	141.6	183.8	G
South East	West Berkshire UA	240	155.6	136.5	176.5	G
South East	West Oxfordshire CD	123	118.8	98.5	141.3	R
South East	Winchester CD	170	148.8	127.3	172.9	G
South East	Windsor and Maidenhead UA	169	115.6	98.9	134.4	G
South East	Woking CD	231	247.5	216.2	281.1	R
South East	Wokingham UA	311	190.7	169.9	212.9	G
South East	Worthing CD	295	286.0	254.2	320.5	G
South East	Wycombe CD	463	281.2	256.2	308.0	G
South West	Bath and North East Somerset UA	555	308.8	283.6	335.5	G
South West	Bournemouth UA	749	445.3	413.9	478.3	G
South West	Bristol UA	2018	457.3	437.6	477.7	A
South West	Cheltenham CD	446	386.7	351.6	424.3	G
South West	Christchurch CD	101	213.5	173.9	259.4	G
South West	Cornwall UA	1096	204.7	192.8	217.2	G
South West	Cotswold CD	75	89.5	70.1	111.9	G
South West	East Devon CD	73	54.9	43.1	69.1	G
South West	East Dorset CD	142	161.7	136.2	190.6	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
South West	Exeter CD	204	170.2	147.6	195.2	G
South West	Forest of Dean CD	118	142.9	117.8	170.5	G
South West	Gloucester CD	666	562.7	520.7	607.1	G
South West	Mendip CD	185	170.2	146.1	196.0	R
South West	Mid Devon CD	49	64.4	47.6	85.1	G
South West	North Devon CD	197	215.4	186.3	247.6	G
South West	North Dorset CD	104	161.2	131.6	195.4	G
South West	North Somerset UA	477	224.7	205.0	245.8	G
South West	Plymouth UA	654	252.8	233.8	272.9	G
South West	Poole UA	397	279.3	252.5	308.2	G
South West	Purbeck CD	85	188.1	150.2	232.6	G
South West	Sedgemoor CD	188	166.5	143.3	191.8	G
South West	South Gloucestershire UA	531	200.5	183.8	218.3	R
South West	South Hams CD	96	114.7	92.9	140.0	G
South West	South Somerset CD	496	312.4	285.5	341.2	R
South West	Stroud CD	142	126.8	106.7	149.3	G
South West	Swindon UA	668	331.0	306.4	357.1	G
South West	Taunton Deane CD	358	327.3	294.3	363.0	G
South West	Teignbridge CD	221	173.8	151.5	198.1	G
South West	Tewkesbury CD	159	194.6	165.6	227.4	G
South West	Torbay UA	476	354.5	323.4	387.8	G
South West	Torridge CD	105	159.5	130.5	193.1	G
South West	West Devon CD	32	60.3	41.2	85.1	G
South West	West Dorset CD	166	172.1	146.5	199.8	G
South West	West Somerset CD	35	99.0	68.9	137.6	G
South West	Weymouth and Portland CD	183	288.0	247.8	332.9	G
South West	Wiltshire UA	767	166.8	155.2	179.1	G
West Midlands	Birmingham MCD	5290	510.2	496.6	524.2	R
West Midlands	Bromsgrove CD	214	229.4	199.4	261.8	G
West Midlands	Cannock Chase CD	78	82.2	64.7	102.2	A
West Midlands	Coventry MCD	726	229.8	213.4	247.2	G

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
West Midlands	Dudley MCD	1438	468.0	444.1	492.8	G
West Midlands	East Staffordshire CD	464	423.9	386.2	464.3	G
West Midlands	Herefordshire, County of UA	161	89.6	76.2	104.5	G
West Midlands	Lichfield CD	101	102.1	82.9	123.8	A
West Midlands	Malvern Hills CD	151	200.3	169.6	234.9	G
West Midlands	Newcastle-under-Lyme CD	349	280.6	251.7	311.3	G
West Midlands	North Warwickshire CD	75	121.2	94.6	151.0	A
West Midlands	Nuneaton and Bedworth CD	235	192.1	168.1	218.1	G
West Midlands	Redditch CD	371	472.0	424.8	522.1	G
West Midlands	Rugby CD	166	176.5	150.5	205.2	G
West Midlands	Sandwell MCD	1517	518.3	492.5	545.0	R
West Midlands	Shropshire UA	586	199.8	184.0	216.7	G
West Midlands	Solihull MCD	391	189.7	171.4	209.5	R
West Midlands	South Staffordshire CD	113	106.1	87.4	127.5	G
West Midlands	Stafford CD	106	84.4	68.9	101.8	G
West Midlands	Staffordshire Moorlands CD	175	183.5	157.2	212.7	G
West Midlands	Stoke-on-Trent UA	1014	422.4	396.8	449.2	G
West Midlands	Stratford-on-Avon CD	129	108.5	90.5	128.8	G
West Midlands	Tamworth CD	139	183.2	153.7	215.9	R
West Midlands	Telford and Wrekin UA	804	494.4	460.8	529.8	G
West Midlands	Walsall MCD	842	327.6	305.9	350.5	R
West Midlands	Warwick CD	113	81.1	66.8	97.5	G
West Midlands	Wolverhampton MCD	411	171.8	155.6	189.2	G
West Midlands	Worcester CD	507	535.2	489.6	583.8	G
West Midlands	Wychavon CD	230	196.8	172.0	223.6	G
West Midlands	Wyre Forest CD	400	407.1	368.2	449.1	G
Yorkshire and The Humber	Barnsley MCD	1400	615.1	583.3	648.2	G
Yorkshire and The Humber	Bradford MCD	2364	461.1	442.7	480.1	R
Yorkshire and The Humber	Calderdale MCD	1201	592.3	559.3	626.8	A

REGION	LOCAL AUTHORITY	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES	RATE PER 100,000 POPULATION	95% CI LOWER LEVEL	95% CI UPPER LEVEL	RAG
Yorkshire and The Humber	Craven CD	144	259.5	218.3	305.0	A
Yorkshire and The Humber	Doncaster MCD	2233	768.3	736.8	800.9	G
Yorkshire and The Humber	East Riding of Yorkshire UA	964	284.8	267.1	303.3	G
Yorkshire and The Humber	Hambleton CD	188	214.7	185.1	247.6	G
Yorkshire and The Humber	Harrogate CD	372	234.4	211.2	259.5	G
Yorkshire and The Humber	Kingston upon Hull, City of UA	1978	749.6	716.9	783.3	G
Yorkshire and The Humber	Kirklees MCD	2430	592.9	569.6	617.0	G
Yorkshire and The Humber	Leeds MCD	4052	507.3	491.8	523.1	G
Yorkshire and The Humber	North East Lincolnshire UA	1221	776.2	733.2	820.9	G
Yorkshire and The Humber	North Lincolnshire UA	813	503.9	469.8	539.8	G
Yorkshire and The Humber	Richmondshire CD	124	234.2	194.8	279.2	G
Yorkshire and The Humber	Rotherham MCD	1338	525.5	497.7	554.5	G
Yorkshire and The Humber	Ryedale CD	61	113.9	87.1	146.3	G
Yorkshire and The Humber	Scarborough CD	116	106.8	88.3	128.1	G
Yorkshire and The Humber	Selby CD	192	231.5	199.9	266.7	G
Yorkshire and The Humber	Sheffield MCD	2968	534.2	515.2	553.8	G
Yorkshire and The Humber	Wakefield MCD	2087	641.1	613.8	669.2	G
Yorkshire and The Humber	York UA	735	363.1	337.3	390.3	G

Source: Local authority level A&E Violence-related Attendances Dataset (experimental) 2010/11.

Local authorities can be unitary authorities (UA), county districts (CD), metropolitan county districts (MCD) and London boroughs (LB). The Isles of Scilly UA and the City of London LB are not included due to small residential populations.

Key Findings

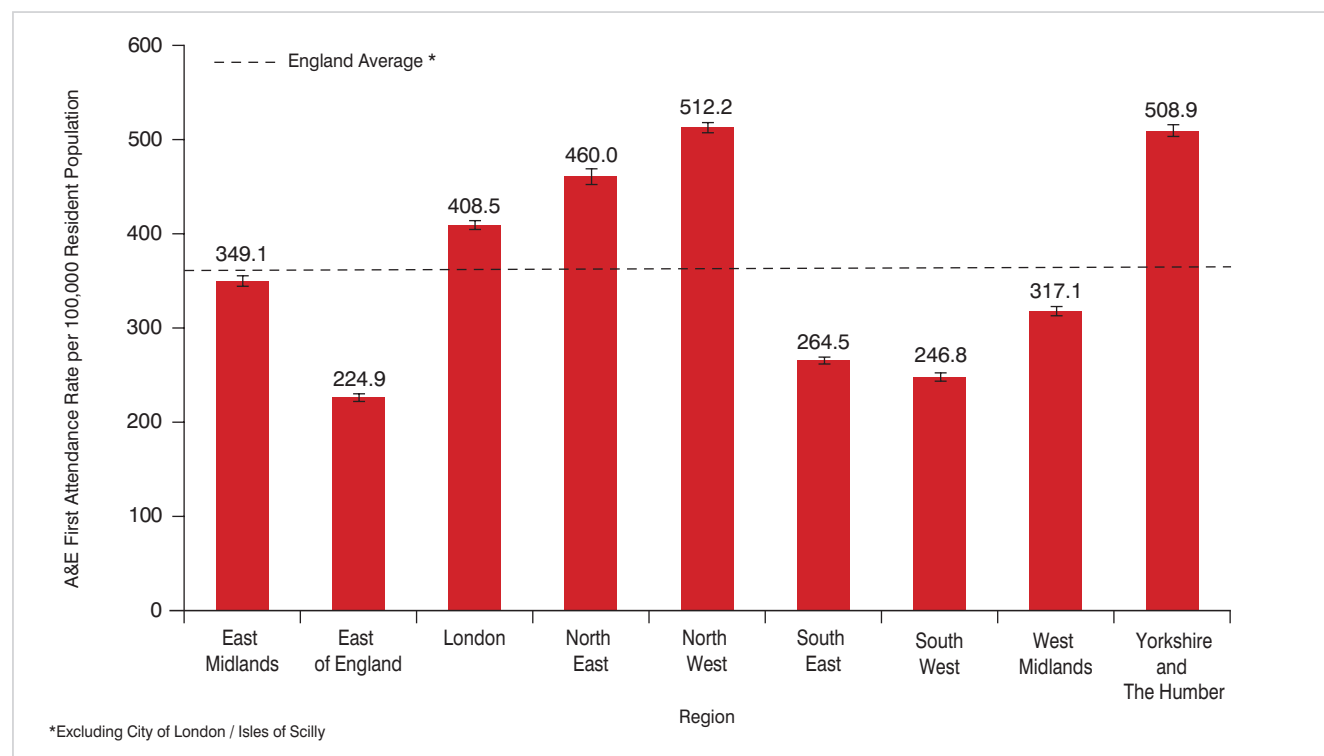
At the local authority level, Table 3 indicates geographical variation in violence-related A&E first attendance rates within the English regions.

Nationally, Liverpool local authority has the highest rate for violence-related A&E first attendances (994.8 per 100,000 resident population). As two of the three Liverpool NHS Trusts (serving the Liverpool population) had values imputed via the model, a combination of locally collected A&E data (Alder Hey / Royal Liverpool; from the TIIG system) and actual data from HES A&E (Aintree) have been used to calculate an independent observed rate for Liverpool. This local data analysis results in a marginally higher rate of 1086.4 per 100,000 population. Calculation of 95% Confidence Intervals for this independent observed rate for Liverpool

(95% CI Lower Limit = 1056.0 / 95% CI Upper Limit = 1117.5) indicates that the local result is significantly higher than the modelled estimate, suggesting that the HES estimate for Liverpool, although high, may be conservative. However, the locally derived result is NHS Trust based and therefore the higher rate may reflect the expected non-Liverpool resident A&E attendances by people visiting the city.

At the regional level, violence-related A&E first attendance rates are higher in the north of England compared to southern regions (Figure 4). The North West has the highest violence-related A&E first attendance rate (512.2 per 100,000), followed by Yorkshire and The Humber (508.9 per 100,000), the North East (460.0 per 100,000), and London (408.5 per 100,000). East of England has the lowest (224.9 per 100,000).

Figure 4: Violence-related A&E first attendance rates per 100,000 resident population by English Region (experimental) – 2010/11 financial year (95% CI)



Source: Local authority level A&E Violence-related Attendances Dataset (experimental) 2010/11

The geographical variation within regions is clearer when the range of violence-related A&E first attendance rates are presented (Table 4).

Table 4: Crude violence-related A&E first attendance rates per 100,000 resident population by Region (local authority range) – 2010/11 financial year*

REGION	LOCAL AUTHORITY LOWEST**	LOWEST RATE PER 100,000 POPULATION	LOCAL AUTHORITY HIGHEST**	HIGHEST RATE PER 100,000 POPULATION
East Midlands	Rutland UA	108.9	Nottingham UA	662.3
East of England	Suffolk Coastal CD	67.6	Harlow CD	460.7
London	Greenwich LB	169.4	Newham LB	780.4
North East	County Durham UA	197.1	Middlesbrough UA	809.4
North West	South Lakeland CD	69.4	Liverpool MCD	994.8
South East	Horsham CD	77.2	Thanet CD	626.5
South West	East Devon CD	54.9	Gloucester CD	562.7
West Midlands	Warwick CD	81.1	Worcester CD	535.2
Yorkshire & Humber	Scarborough CD	106.8	North East Lincolnshire UA	776.2

Source: Local authority level A&E Violence-related Attendances Dataset (experimental) 2010/11.

*The Isles of Scilly and City of London are not included due to small residential populations.

**Local authorities can be unitary authorities (UA), county districts (CD), metropolitan county districts (MCD) and London boroughs (LB). The Isles of Scilly UA and the City of London LB are not included due to small residential populations.

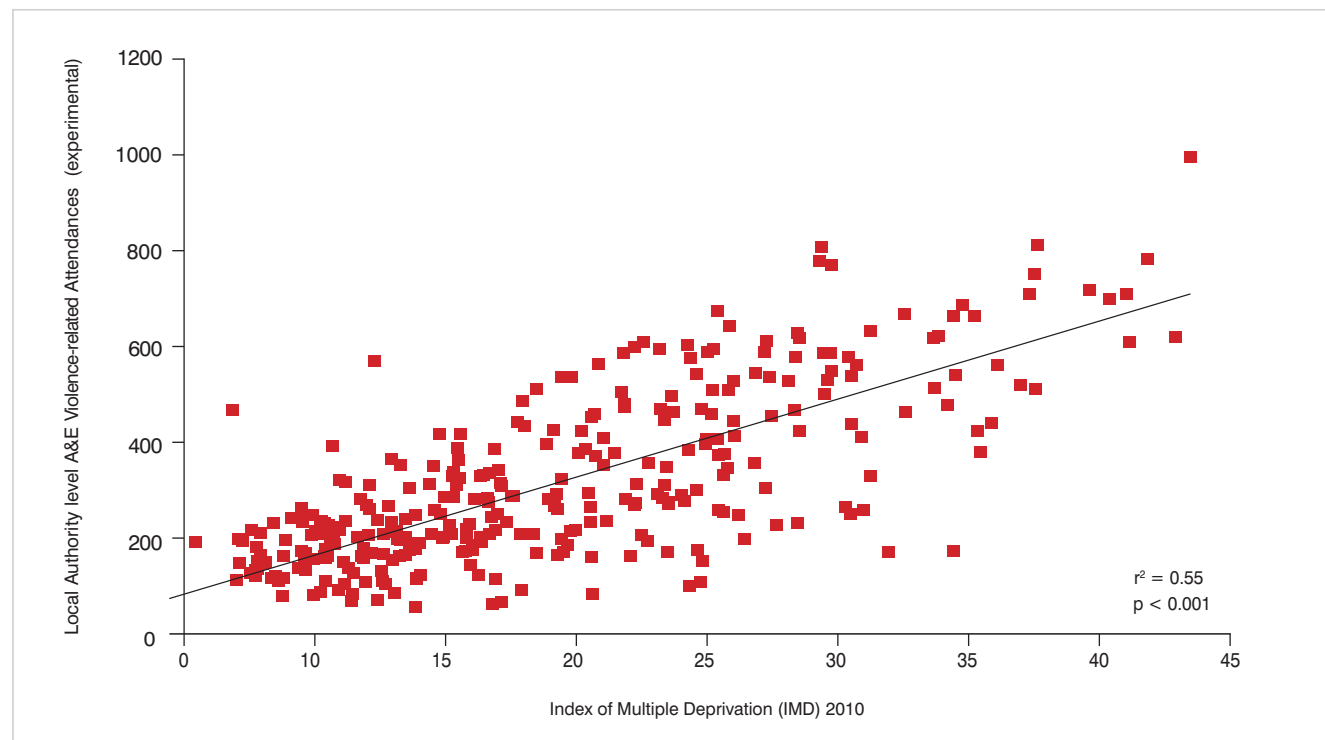
Deprivation and urban/rural population densities

Evidence suggests that differences in deprivation levels and urban/rural population densities are associated with different levels of violence in different geographical area types across England.¹¹ Therefore, the local authority (LA) A&E assault data were examined using intelligence on deprivation and urban/rural population densitiesⁱ at LA level.

There is a strong positive relationship between assault attendances and deprivation ($r = 0.74$; $p < 0.001$; Figure 5). This result indicates a pattern of rising A&E attendances with increasing levels of deprivation. For levels of urbanity and the local authority violence-related A&E attendances (Figure 6), there was also a significant relationship ($r = 0.53$; $p < 0.001$), albeit weaker than that for deprivation.

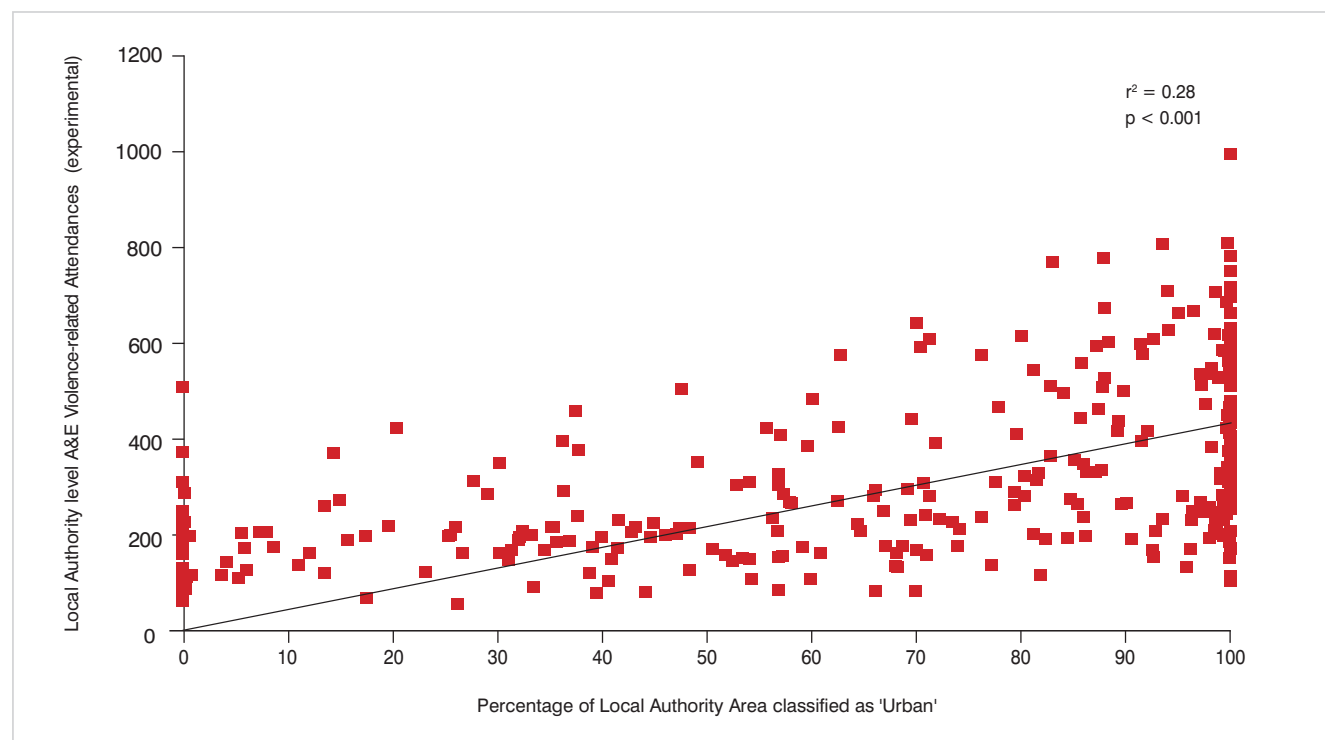
ⁱ The Office for National Statistics defines urban population densities as the percentage of the local authority population living in Major, Large or Other Urban areas. Full definitions are available at http://archive.defra.gov.uk/evidence/statistics/rural/documents/rural-defn/Rural_Urban_Introductory_Guide.pdf. The Index of Multiple Deprivation 2010 is the measure used in the report (local authority average national scores).

Figure 5: Correlation of the Index of Multiple Deprivation 2010 and estimated violence-related A&E first attendance rates per 100,000 resident population by English local authority - 2010/11 financial year (experimental)



Sources: Local authority level A&E Violence-related Attendances Dataset (experimental), IMD 2010

Figure 6: Correlation of the percentage of each local authority area classified as 'urban' and estimated violence-related A&E first attendance rates per 100,000 resident population by English local authority - 2010/11 financial year (experimental)



Sources: Local authority level A&E Violence-related Attendances dataset (experimental), DEFRA local authority Rural-Urban Classification (post 2009 boundaries)

To account for the confounding relationship between deprivation levels and urban/rural population densities, multiple regression analysis was undertaken. This identified independent relationships between both deprivation and urban/rural population densities at local authority level; but with the stronger relationship being with deprivation (deprivation, $\beta = 0.63$; urbanity, $\beta = 0.23$).

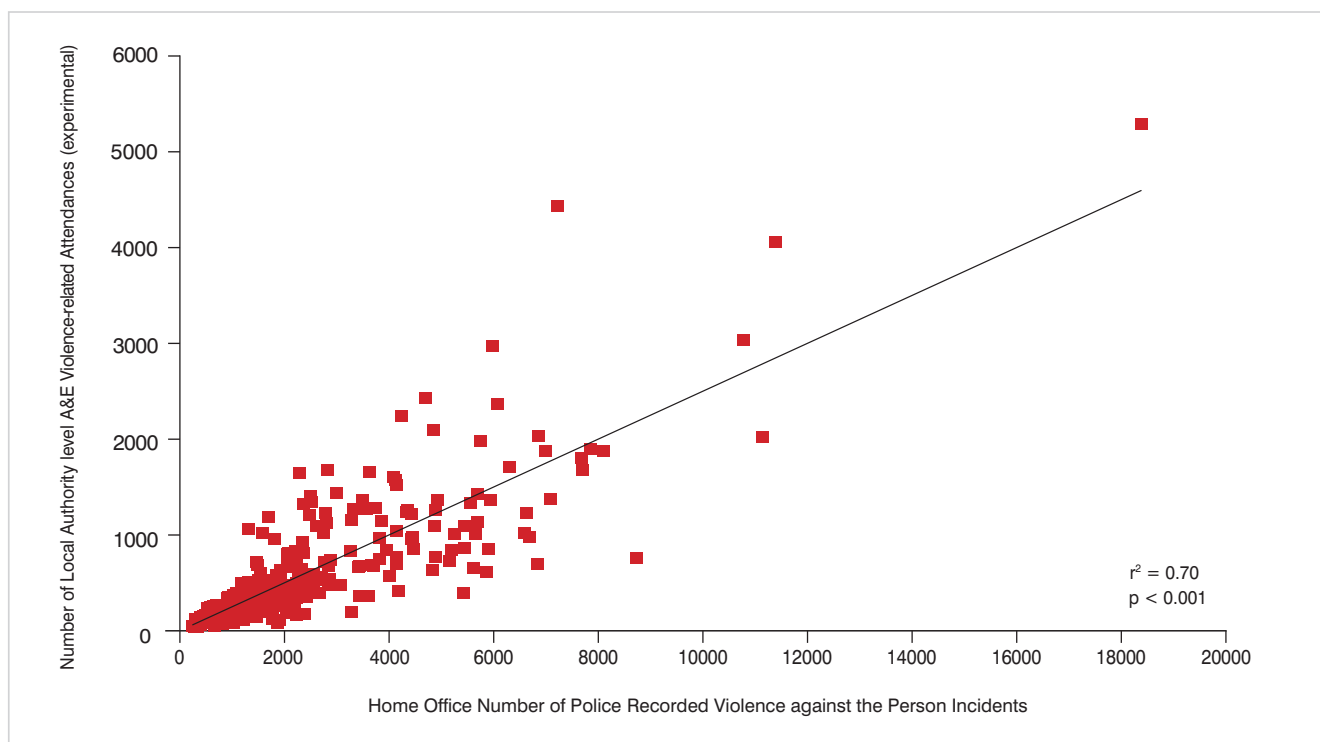
Further analysis indicated that higher numbers of violence-related A&E attendances were not exclusive to more densely populated areas, and that some predominantly rural areas experience high levels of violence-related attendances (e.g. Allerdale 310.6 per 100,000). However, at the local authority level, areas

with the lower violence-related A&E first attendance rates were predominantly rural (e.g. West Devon 60.3 per 100,000; South Lakeland 69.4 per 100,000).

Violence-related A&E attendances and police recorded violence

The Home Office collates data on police recorded violence against the person offences nationally. This data are based on the location of violent offences taking place (as opposed to residence of patients attending A&E for violence-related incidents in this report). However, comparing the A&E attendance rates with police recorded violence against the person, there is a strong positive relationship ($r = 0.84$; $p < 0.001$; Figure 7).

Figure 7: Correlation of the total number of police recorded violence against the person offences and estimated number of violence-related A&E first attendances by English local authority - 2010/11 financial year (experimental)

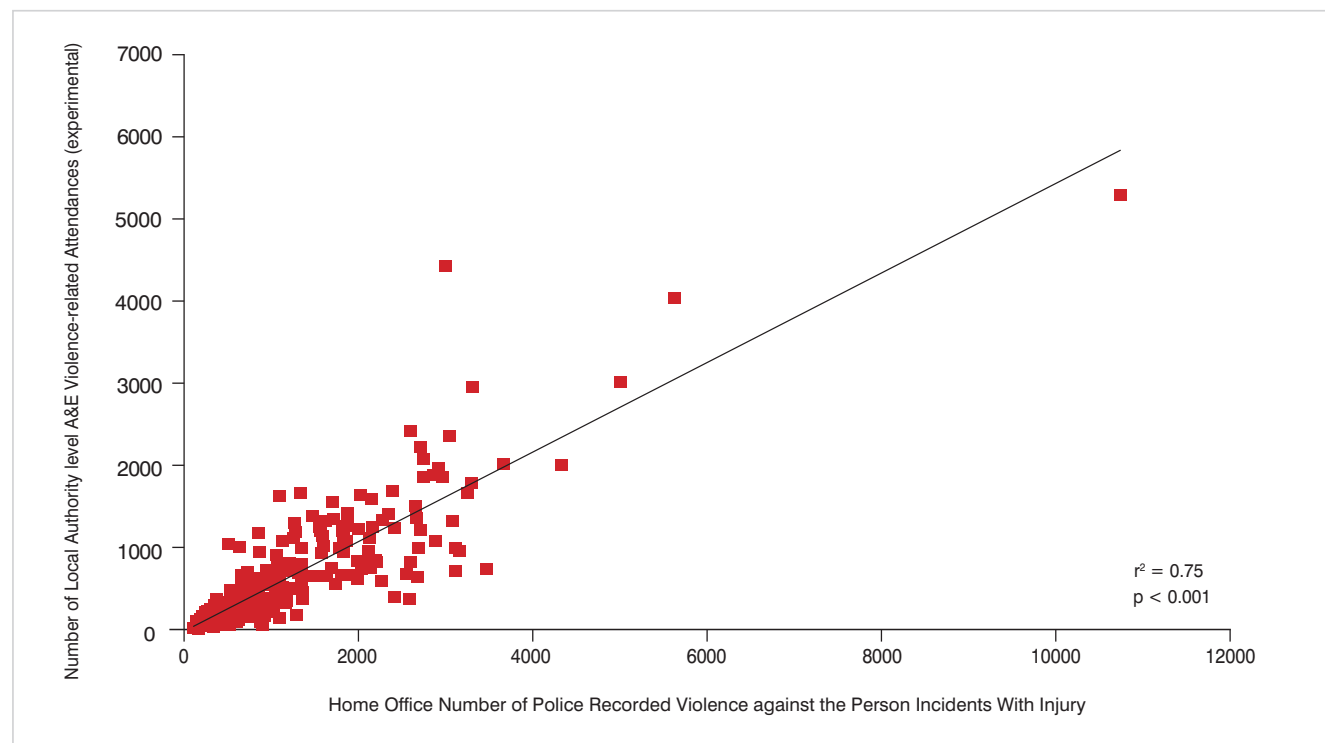


Sources: Local authority level A&E Violence-related Attendances Dataset (experimental), Home Office Police Recorded Crime 2010/11

The Home Office also publish a breakdown of their police recorded violence-related offences to distinguish between offences resulting in injury or not. Analysis of this subset of data indicates a stronger positive relationship with violence-related

A&E attendances, suggesting that there is a closer link between the more serious police recorded assaults and A&E assault attendances ($r = 0.86$; $p < 0.001$; Figure 8).

Figure 8: Correlation of the number of police recorded violence against the person offences ‘with injury’ and estimated number of violence-related A&E first attendances by English local authority - 2010/11 financial year (experimental)



Sources: Local authority level A&E Violence-related Attendances Dataset (experimental), Home Office Police Recorded Crime 2010/11

Additional analysis undertaken at the local authority level indicates that the greatest numbers of police recorded violence-related offences were focused in areas with large city centres, most likely due to police incidents being reported based on the location where crimes were committed. Further analysis of the relationship between violence-related

A&E attendances, police recorded violence-related offences resulting in injury, and national deprivation quintile indicates that there are more A&E assault presentations per police recorded assault with injury in the most deprived areas of England compared to more affluent areas (Table 5).

Table 5: Ratio of HES A&E (experimental) violence-related attendances and police recorded violence against the person (with injury) offences by national index of multiple deprivation 2010 quintile – 2010/11 financial year

IMD QUINTILE 2010	NUMBER OF POLICE RECORDED ASSAULTS WITH INJURY	NUMBER OF A&E ASSAULT ATTENDANCES (EXPERIMENTAL)	RATIO
Q1 (Most Deprived)	129,509	79,693	0.62
Q2	94,775	48,444	0.51
Q3	54,031	27,287	0.51
Q4	39,807	18,495	0.46
Q5 (Least Deprived)	28,108	14,109	0.50

Source: Local authority level A&E Violence-related Attendances Dataset (experimental) and Home Office Police Recorded Crime 2010/11

Statistical analysis of this relationship between the two data items (χ^2 for a trend) indicates that the number of A&E assault presentations per police recorded assault with injury generally decreases as deprivation decreases ($\chi^2 = 935.5$; $p < 0.001$). It is possible that the larger number of A&E assault presentations per police recorded assault with injury in the most deprived areas may reflect pressures on police capacity in deprived areas. This finding may also support existing analysis¹² suggesting that there is a preference by people in more deprived areas to bypass other available treatment resources within the healthcare system (e.g. GP, Walk-in Centre) and present directly to A&E departments. However, this is perhaps less likely with assaults than other conditions.

Technical Discussion

Using the methodological approach outlined above, for the first time an experimental national violence-related A&E first attendance dataset by English local authority has been created. This has enabled useful comparative analysis of violence-related A&E first attendances to measure the impact of violence on localities, and visualise the inequalities in patterns of violence across the English Regions.

The NHS Public Health Outcomes Framework (PHOF) 2013-2016⁷ identifies violence as a key public health issue, with violence-related hospital admissions being the placeholder outcomes measure within the PHOF suite of indicators. This analysis has highlighted that HES violence-related hospital admissions are a strong predictor for estimating HES violence-related A&E attendances. Therefore, the proposed placeholder PHOF violence indicator is justified prior to moving to an A&E attendance outcomes measure as the data quality improves.

The process itself has highlighted several key issues in relation to the quality of the HESonline™ A&E Attendances in England (experimental statistics) and current coverage within this experimental dataset. This will assist HES in their routine follow up contact with NHS Trusts to explore the barriers preventing both the submission of data, and the submission of good quality data. However, as a methodological exercise, coverage remained high enough to form the basis for estimating missing data (84% actual data).

Creating a complete national dataset by local authority has also enabled sub-region analysis of the influence both deprivation and urban/rural population densities can have on violence-related A&E attendances. This piece of work has also enabled useful preliminary comparative analysis of the relationship between violence-related A&E attendances and police recorded violence against

the person (with injury) data, and the influence deprivation can have on both A&E assault attendances and levels of reporting assaults to the police.

In addition, this new experimental dataset at local authority level has been added to and compared with other existing violence indicators held in the web based tool VIPER (Violence Indicator Profiles for the English Regions). VIPER provides data on violence for local authorities across the English Regions and the new Instant Atlas version can be accessed by the end of November 2012 from www.evipr.org.uk.

Conclusions and Recommendations

This modelling work has identified a statistically strong relationship between HES violence-related emergency hospital admissions and HES A&E violence-related first attendances, and that inpatient assaults are a strong predictor of assault attendances in A&E. Considering the outputs from this model, there is the potential to generate a richer experimental complete national A&E dataset to create a more informed picture of the patterns of violence nationally. In addition, the model provides a starting point for further more detailed violence-related analysis at the local authority level (e.g. age-specific analysis to explore child abuse or elder abuse A&E attendances).

In recent years, the A&E first attendance data within HES have improved with respect to quantity and accuracy, and the Health & Social Care Information Centre continue to support providers to improve

data quality. As a more detailed record level dataset compared to the aggregated Quarterly Monitoring of Accident & Emergency (QMAE) data returns to the Department of Health, HES A&E is a richer data source for undertaking A&E attendance cause specific analysis. This modelling work has shown that currently missing or erroneous data within HES A&E can be reliably predicted and imputed to enhance the value of this experimental national dataset. As a result of engineering a complete experimental HES A&E violence-related first attendance dataset, the local authority outputs (alongside police recorded crime statistics) could provide a clearer understanding of the burden of violence nationally and improve violence-related public health outcomes measures, to better inform community violence prevention programmes and strategies, tactical policing to reduce violence and local authority licensing decisions.

Recommendations

- Comments are sought from the Department of Health in terms of the methodological approach, and potential improvements to this experimental statistical model;
- As the data quality and quantity of HES A&E data improve, replicate the modelling work for the 2011/12 financial year when the next HES A&E Attendances dataset (experimental statistics) is released in November 2012;
- Explore the strength of the relationship between HES emergency hospital admissions and HES A&E attendances for other clinical conditions (e.g. alcohol-related), where the experimental national A&E dataset could be similarly enhanced.
- That the findings of this model be used as evidence that HES emergency hospital admissions are a good proxy measure to develop the Public Health Outcomes Framework Violent Crime indicator until the data quality and quantity of HES A&E data improve.
- Undertake additional work to explore the relationship between HES A&E violence-related attendances and police recorded violence against the person with injury.

References

1. Centre for Public Health.
Violence Indicator Profiles for the English Regions (VIPER) 2012,
Violence Indicator Profiles for the English Regions 2012 [cited 2012 18/06/12];
Available from:
<http://www.preventviolence.info/viper/>
2. Shepherd, J.P., et al.,
Trends in urban violence: a comparison of accident department and police records.
Journal of the Royal Society of Medicine, 1993. **86**(2): p. 87-88.
3. Sutherland, I., V. Sivarajasingham, and J. P. Shepherd,
Recording of community violence by medical and police services.
Injury Prevention, 2002. **8**(3): p. 246-247.
4. Clarkson, C., et al.,
Assaults: the relationship between seriousness, criminalisation and punishment.
Criminal Law Review, 1994. **4**: p. 4-20.
5. Bellis, M. A., et al.,
Protecting people Promoting health: A public health approach to violence prevention for England.
Liverpool. North West Public Health Observatory / Centre for Public Health / Department of Health. 2012.
6. Home Office.
Ending Gang and Youth Violence: A Cross Government Report,
Home Office. 2011, HM Government: London.
7. Department of Health.
Healthy Lives, Healthy People: Improving outcomes and supporting transparency – Part 1: A public health outcomes framework for England, 2013-2016,
Department of Health. 2012. Department of Health: London.
8. Health and Social Care Information Centre.
Accident & Emergency Attendances in England (Experimental Statistics) 2007-08,
Health and Social Care Information Centre. 2009, Government Statistical Service: London.
9. Health and Social Care Information Centre.
Accident & Emergency Attendances in England (Experimental Statistics) 2010-11,
Health and Social Care Information Centre. 2012, Government Statistical Service: London.
10. Quigg, Z., K. Hughes, and M.A. Bellis,
Data sharing for prevention: a case study in the development of a comprehensive emergency department injury surveillance system and its use in preventing violence and alcohol-related harms.
Injury Prevention, 2011. IP Online First [cited 2012 20/07/12]; Available from:
<http://injuryprevention.bmj.com/content/early/2011/12/30/injuryprev-2011-040159.full.pdf+html>
11. Pateman, T,
Rural and urban areas: comparing lives using rural/urban classifications,
Regional Trends 43. 2010/11. Office for National Statistics. 2011, ONS: London.
12. West, D,
Analysis: patients in poorer regions using A&E over GP.
Health Service Journal Online [cited 2012 13/11/12]; Available from:
<http://www.hsj.co.uk/analysis-patients-in-poorer-regions-using-ae-over-gp/5039243.article>

Statistical Appendix

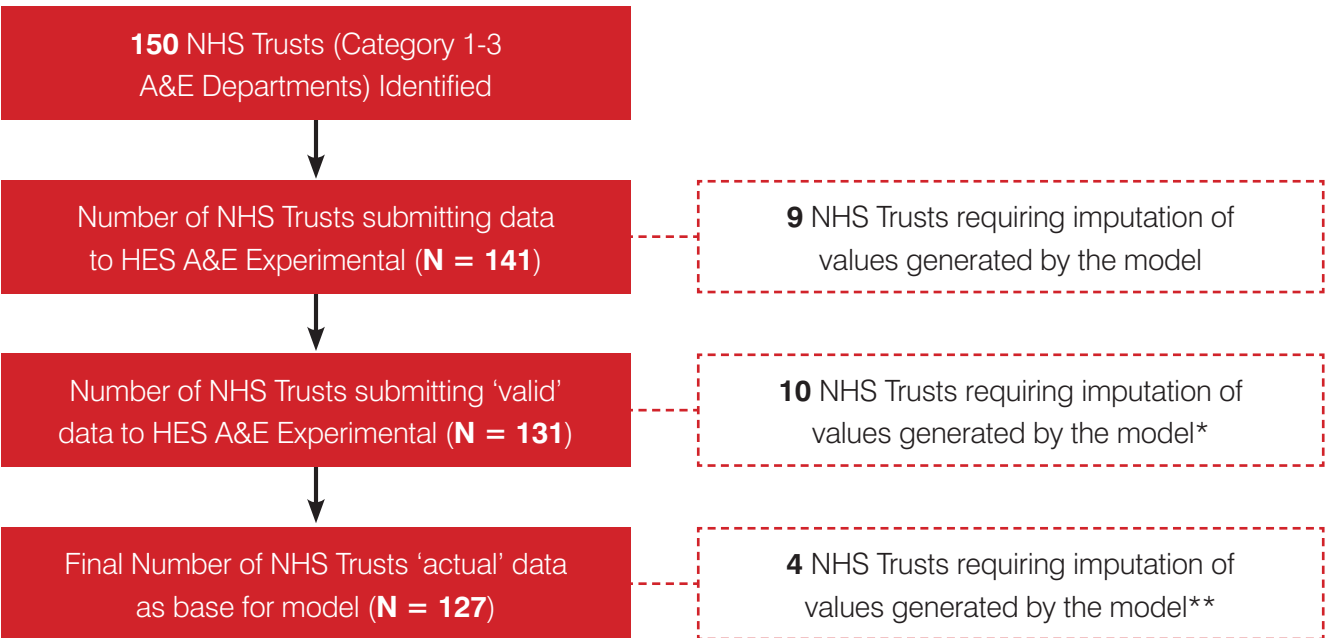
Data extraction and data quality considerations

Data were extracted for the 2010/11 financial year from the Department of Health's national HES datasets (ICD-10 external cause codes X85*-Y09*) to provide the number of emergency violence-related hospital admissions by NHS Trust in England (First Finished Consultant Episodes). For the same time period, data were extracted from the

experimental Accident & Emergency Attendances dataset for first time attendances (i.e. excluding planned and unplanned follow-up attendances) where the patient group = 20 (assault code) by NHS Trust in England.

The following flowchart depicts how data quality for some NHS Trusts resulted in the baseline of 150 NHS Trusts being reduced to 131 NHS Trusts as a base dataset for the model (representing 87% coverage):

Figure 9: Data cleaning flow diagram



* These 10 NHS Trusts had problematic data where the emergency violence-related hospital admissions values were higher than the HES A&E first attendance values submitted.

** These 4 NHS Trusts were identified as statistical outliers within the linear regression analysis (see Identification of statistical outliers – standardised residuals below).

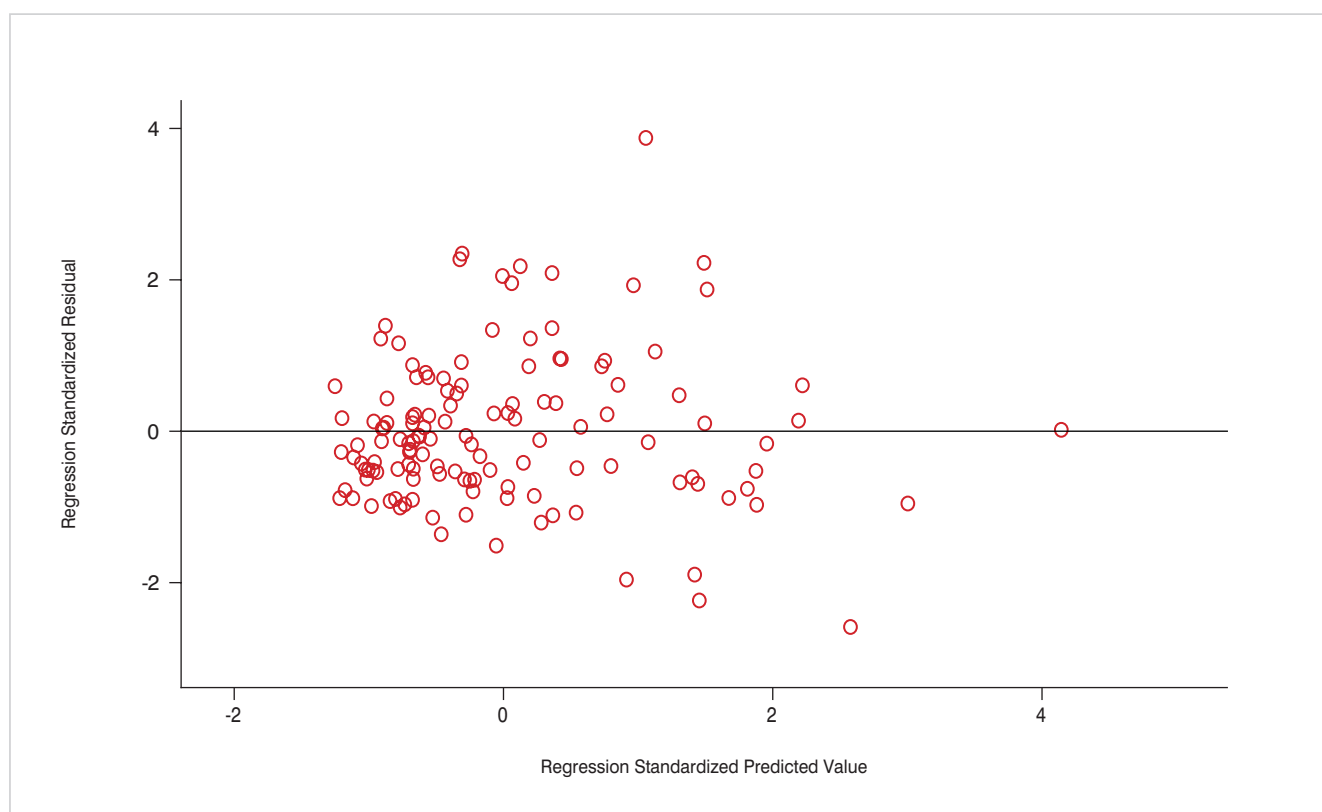
Identification of statistical outliers – standardised residuals

Using PASW Statistics version 17.0, linear regression was used to plot the relationship between the number of emergency violence-related hospital admissions (HES) 2010/11 and the HES violence-related A&E first attendances (experimental) for the same time period. This enabled generation of individual standardised

residual values for each of the 131 NHS Trusts, which could be examined, and statistical outliers identified (also referred to as extreme cases).

These 'standardised residuals' for each NHS Trust represent the extent to which the value for any given NHS Trust deviates from the regression line (the horizontal line at residual = 0).

Figure 10: Scatter plot of standardised residuals for emergency violence-related hospital admissions (HES) and HES violence-related A&E first attendances (experimental) 2010/11



Source: HES emergency hospital admissions 2010/11 and HES A&E national dataset (experimental) 2010/11

Through this analysis four NHS Trusts were identified as 'statistical outliers' or 'extreme cases', having standardised residual values ≤ -2.6 or ≥ 2.3 . These parameters are generated by PASW Statistics Version 17.0. These NHS Trusts were removed

from the model and in line with those removed due to missing or invalid A&E HES data, estimated values were imputed from those generated by the statistical model.

Linear regression and predicted values

Box 3: Worked example of one NHS Trust to impute a predicted HES violence-related A&E first attendance value using the linear regression formula

$$y = m x + b$$



Predicted Value (DV)^j = (regression line slope x No. HES Admissions (EV)^k) + the intercept^l

Predicted Value = (3.669 x 123) + 418.551

Predicted No. of violence-related A&E first attendances = **870**

Table 6: Number of violence-related first attendances to A&E by NHS Trust 2010/11 financial year – actual (HES A&E experimental) and imputed

NHS TRUST	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES
AINTREE UNIVERSITY HOSPITALS NHS FOUNDATION TRUST	2411
AIREDALE NHS FOUNDATION TRUST	657
ALDER HEY CHILDREN'S NHS FOUNDATION TRUST	785**
ASHFORD AND ST PETER'S HOSPITALS NHS FOUNDATION TRUST	664*
BARKING, HAVERING AND REDBRIDGE UNIVERSITY HOSPITALS NHS TRUST	2166
BARNET AND CHASE FARM HOSPITALS NHS TRUST	1382
BARNSELY HOSPITAL NHS FOUNDATION TRUST	1360
BARTS AND THE LONDON NHS TRUST	2612
BASILDON AND THURROCK UNIVERSITY HOSPITALS NHS FOUNDATION TRUST	757
BEDFORD HOSPITAL NHS TRUST	819
BIRMINGHAM CHILDREN'S HOSPITAL NHS FOUNDATION TRUST	646**
BLACKPOOL TEACHING HOSPITALS NHS FOUNDATION TRUST	1449
BRADFORD TEACHING HOSPITALS NHS FOUNDATION TRUST	2304**
BRIGHTON AND SUSSEX UNIVERSITY HOSPITALS NHS TRUST	2099
BUCKINGHAMSHIRE HEALTHCARE NHS TRUST	1002
BURTON HOSPITALS NHS FOUNDATION TRUST	769
CALDERDALE AND HUDDERSFIELD NHS FOUNDATION TRUST	2110
CAMBRIDGE UNIVERSITY HOSPITALS NHS FOUNDATION TRUST	1047
CENTRAL MANCHESTER UNIVERSITY HOSPITALS NHS FOUNDATION TRUST	1984
CHELSEA AND WESTMINSTER HOSPITAL NHS FOUNDATION TRUST	1013**

^j Dependent Variable

^k Explanatory Variable

^l The value of the Dependent Variable when the Explanatory Variable = 0

*Imputed - No HES A&E submission of data

**Imputed - Invalid data

***Imputed - Statistical Outlier

NHS TRUST	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES
CHESTERFIELD ROYAL HOSPITAL NHS FOUNDATION TRUST	748
CITY HOSPITALS SUNDERLAND NHS FOUNDATION TRUST	1896
COLCHESTER HOSPITAL UNIVERSITY NHS FOUNDATION TRUST	769
COUNTESS OF CHESTER HOSPITAL NHS FOUNDATION TRUST	767
COUNTY DURHAM AND DARLINGTON NHS FOUNDATION TRUST	1100
CROYDON HEALTH SERVICES NHS TRUST	1072***
DARTFORD AND GRAVESHAM NHS TRUST	956
DERBY HOSPITALS NHS FOUNDATION TRUST	1817
DONCASTER AND BASSETLAW HOSPITALS NHS FOUNDATION TRUST	2699
DORSET COUNTY HOSPITAL NHS FOUNDATION TRUST	370
EALING HOSPITAL NHS TRUST	1441
EAST AND NORTH HERTFORDSHIRE NHS TRUST	855*
EAST CHESHIRE NHS TRUST	524
EAST KENT HOSPITALS UNIVERSITY NHS FOUNDATION TRUST	2438
EAST LANCASHIRE HOSPITALS NHS TRUST	2370
EAST SUSSEX HOSPITALS NHS TRUST	1349
EPSOM AND ST HELIER UNIVERSITY HOSPITALS NHS TRUST	881**
FRIMLEY PARK HOSPITAL NHS FOUNDATION TRUST	1296
GATESHEAD HEALTH NHS FOUNDATION TRUST	1009
GEORGE ELIOT HOSPITAL NHS TRUST	290
GLOUCESTERSHIRE HOSPITALS NHS FOUNDATION TRUST	1538
GREAT WESTERN HOSPITALS NHS FOUNDATION TRUST	900
GUY'S AND ST THOMAS' NHS FOUNDATION TRUST	2096
HAMPSHIRE PARTNERSHIP NHS FOUNDATION TRUST	706
HARROGATE AND DISTRICT NHS FOUNDATION TRUST	405
HEART OF ENGLAND NHS FOUNDATION TRUST	1941***
HEATHERWOOD AND WEXHAM PARK HOSPITALS NHS FOUNDATION TRUST	496
HINCHINGBROOKE HEALTH CARE NHS TRUST	391
HOMERTON UNIVERSITY HOSPITAL NHS FOUNDATION TRUST	1369
HULL AND EAST YORKSHIRE HOSPITALS NHS TRUST	2586
IMPERIAL COLLEGE HEALTHCARE NHS TRUST	1793
IPSWICH HOSPITAL NHS TRUST	292
ISLE OF WIGHT NHS PCT	517

*Imputed - No HES A&E submission of data

**Imputed - Invalid data

***Imputed - Statistical Outlier

NHS TRUST	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES
JAMES PAGET UNIVERSITY HOSPITALS NHS FOUNDATION TRUST	398
KETTERING GENERAL HOSPITAL NHS FOUNDATION TRUST	934
KING'S COLLEGE HOSPITAL NHS FOUNDATION TRUST	2729
KINGSTON HOSPITAL NHS TRUST	648
LANCASHIRE TEACHING HOSPITALS NHS FOUNDATION TRUST	2230
LEEDS TEACHING HOSPITALS NHS TRUST	3869
LEWISHAM HEALTHCARE NHS TRUST	236
LUTON AND DUNSTABLE HOSPITAL NHS FOUNDATION TRUST	951
MAIDSTONE AND TUNBRIDGE WELLS NHS TRUST	896
MEDWAY NHS FOUNDATION TRUST	770
MID CHESHIRE HOSPITALS NHS FOUNDATION TRUST	1086
MID ESSEX HOSPITAL SERVICES NHS TRUST	753
MID STAFFORDSHIRE NHS FOUNDATION TRUST	99
MID YORKSHIRE HOSPITALS NHS TRUST	3474
MILTON KEYNES HOSPITAL NHS FOUNDATION TRUST	1096
MOORFIELDS EYE HOSPITAL NHS FOUNDATION TRUST	39
NEWHAM UNIVERSITY HOSPITAL NHS TRUST	1744
NORFOLK AND NORWICH UNIVERSITY HOSPITALS NHS FOUNDATION TRUST	1241
NORTH BRISTOL NHS TRUST	1138**
NORTH CUMBRIA UNIVERSITY HOSPITALS NHS TRUST	1338
NORTH MIDDLESEX UNIVERSITY HOSPITAL NHS TRUST	1468
NORTH TEES AND HARTLEPOOL NHS FOUNDATION TRUST	1061***
NORTH WEST LONDON HOSPITALS NHS TRUST	2604
NORTHAMPTON GENERAL HOSPITAL NHS TRUST	1616
NORTHERN DEVON HEALTHCARE NHS TRUST	310
NORTHERN LINCOLNSHIRE AND GOOLE HOSPITALS NHS FOUNDATION TRUST	2449
NORTHUMBRIA HEALTHCARE NHS FOUNDATION TRUST	2287
NOTTINGHAM UNIVERSITY HOSPITALS NHS TRUST	3289
OXFORD RADCLIFFE HOSPITALS NHS TRUST	1042**
PENNINE ACUTE HOSPITALS NHS TRUST	3963*
PETERBOROUGH AND STAMFORD HOSPITALS NHS FOUNDATION TRUST	703
PLYMOUTH HOSPITALS NHS TRUST	891
POOLE HOSPITAL NHS FOUNDATION TRUST	809

*Imputed - No HES A&E submission of data

**Imputed - Invalid data

***Imputed - Statistical Outlier

NHS TRUST	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES
PORTSMOUTH HOSPITALS NHS TRUST	1895
ROYAL BERKSHIRE NHS FOUNDATION TRUST	1421
ROYAL BOLTON HOSPITAL NHS FOUNDATION TRUST	680
ROYAL CORNWALL HOSPITALS NHS TRUST	1018
ROYAL DEVON AND EXETER NHS FOUNDATION TRUST	362
ROYAL FREE HAMPSTEAD NHS TRUST	521
ROYAL LIVERPOOL AND BROADGREEN UNIVERSITY HOSPITALS NHS TRUST	3156**
ROYAL SURREY COUNTY HOSPITAL NHS FOUNDATION TRUST	885*
ROYAL UNITED HOSPITAL BATH NHS TRUST	870
SALFORD ROYAL NHS FOUNDATION TRUST	1439
SALISBURY NHS FOUNDATION TRUST	321
SANDWELL AND WEST BIRMINGHAM HOSPITALS NHS TRUST	2910***
SCARBOROUGH AND NORTH EAST YORKSHIRE HEALTH CARE NHS TRUST	247
SHEFFIELD TEACHING HOSPITALS NHS FOUNDATION TRUST	2982
SHERWOOD FOREST HOSPITALS NHS FOUNDATION TRUST	804
SHREWSBURY AND TELFORD HOSPITAL NHS TRUST	1412
SOUTH DEVON HEALTHCARE NHS FOUNDATION TRUST	726
SOUTH LONDON HEALTHCARE NHS TRUST	797
SOUTH TEES HOSPITALS NHS FOUNDATION TRUST	2277
SOUTH TYNESIDE NHS FOUNDATION TRUST	608
SOUTH WARWICKSHIRE NHS FOUNDATION TRUST	126
SOUTHAMPTON UNIVERSITY HOSPITALS NHS TRUST	1354
SOUTHEND UNIVERSITY HOSPITAL NHS FOUNDATION TRUST	725
SOUTHPORT AND ORMSKIRK HOSPITAL NHS TRUST	867
ST GEORGE'S HEALTHCARE NHS TRUST	1722
ST HELENS AND KNOWSLEY HOSPITALS NHS TRUST	1830
STOCKPORT NHS FOUNDATION TRUST	998
SURREY AND SUSSEX HEALTHCARE NHS TRUST	249
TAMESIDE HOSPITAL NHS FOUNDATION TRUST	929*
TAUNTON AND SOMERSET NHS FOUNDATION TRUST	598
THE DUDLEY GROUP OF HOSPITALS NHS FOUNDATION TRUST	1700
THE HILLINGDON HOSPITALS NHS FOUNDATION TRUST	1372
THE NEWCASTLE UPON TYNE HOSPITALS NHS FOUNDATION TRUST	2157

*Imputed - No HES A&E submission of data

**Imputed - Invalid data

***Imputed - Statistical Outlier

NHS TRUST	NUMBER OF VIOLENCE-RELATED A&E FIRST ATTENDANCES
THE PRINCESS ALEXANDRA HOSPITAL NHS TRUST	767**
THE QUEEN ELIZABETH HOSPITAL, KING'S LYNN_ NHS FOUNDATION TRUST	758
THE ROTHERHAM NHS FOUNDATION TRUST	1393
THE ROYAL BOURNEMOUTH AND CHRISTCHURCH HOSPITALS NHS FOUNDATION	855
THE ROYAL WOLVERHAMPTON HOSPITALS NHS TRUST	404
THE WHITTINGTON HOSPITAL NHS TRUST	1031*
TRAFFORD HEALTHCARE NHS TRUST	398
UNITED LINCOLNSHIRE HOSPITALS NHS TRUST	2286
UNIVERSITY COLLEGE LONDON HOSPITALS NHS FOUNDATION TRUST	783
UNIVERSITY HOSPITAL OF NORTH STAFFORDSHIRE NHS TRUST	1539
UNIVERSITY HOSPITAL OF SOUTH MANCHESTER NHS FOUNDATION TRUST	1505**
UNIVERSITY HOSPITALS BIRMINGHAM NHS FOUNDATION TRUST	1907
UNIVERSITY HOSPITALS BRISTOL NHS FOUNDATION TRUST	1876
UNIVERSITY HOSPITALS COVENTRY AND WARWICKSHIRE NHS TRUST	928
UNIVERSITY HOSPITALS OF LEICESTER NHS TRUST	3011
UNIVERSITY HOSPITALS OF MORECAMBE BAY NHS FOUNDATION TRUST	768
WALSALL HEALTHCARE NHS TRUST	785*
WARRINGTON AND HALTON HOSPITALS NHS FOUNDATION TRUST	1681
WEST HERTFORDSHIRE HOSPITALS NHS TRUST	763*
WEST MIDDLESEX UNIVERSITY HOSPITAL NHS TRUST	1066
WEST SUFFOLK HOSPITALS NHS TRUST	469
WESTERN SUSSEX HOSPITALS NHS TRUST	941
WESTON AREA HEALTH NHS TRUST	382
WHIPPS CROSS UNIVERSITY HOSPITAL NHS TRUST	749
WINCHESTER AND EASTLEIGH HEALTHCARE NHS TRUST	408
WIRRAL UNIVERSITY TEACHING HOSPITAL NHS FOUNDATION TRUST	1527
WORCESTERSHIRE ACUTE HOSPITALS NHS TRUST	1999
WRIGHTINGTON, WIGAN AND LEIGH NHS FOUNDATION TRUST	1148
WYE VALLEY NHS TRUST	124
YEOVIL DISTRICT HOSPITAL NHS FOUNDATION TRUST	609*
YORK TEACHING HOSPITAL NHS FOUNDATION TRUST	980

*Imputed - No HES A&E submission of data

**Imputed - Invalid data

***Imputed - Statistical Outlier

Assignment of estimated A&E first attendances to local authority areas

A sample of three NHS Trusts per region nationally (N=27) were used to compare the geographical distributions of the HES hospital admissions and HES A&E attendances. A 5% cut off parameter was implemented (i.e. HES hospital admissions and

HES A&E attendances were compared by patient local authority of residence where the proportions presenting from any given local authority were greater than 5%). For all 27 NHS Trusts, the proportions of residents admitted to hospital from each local authority had distributions similar to that of A&E attendances:

Tables 7a to 7i: Sample comparison of the geographical distributions (patient residence) of the HES hospital admissions and HES A&E attendances

7a)

EAST MIDLANDS											
DERBY HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Derby UA	Amber Valley CD	South Derbyshire CD	East Staffordshire CD			Derby UA	Amber Valley CD				
57.68%	11.16%	7.37%	7.16%			69.24%	9.41%				
NOTTINGHAM UNIVERSITY HOSPITALS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Nottingham UA	Gedling CD	Broxtowe CD	Rushcliffe CD	Erewash CD		Nottingham UA	Gedling CD	Broxtowe CD	Rushcliffe CD	Erewash CD	
55.67%	8.50%	6.28%	6.28%	5.26%		58.56%	10.40%	7.69%	6.35%	6.32%	
UNIVERSITY HOSPITALS OF LEICESTER NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Leicester UA	Charnwood CD	Blaby CD				Leicester UA	Charnwood CD	Blaby CD	Oadby and Wigston CD		
63.37%	10.86%	6.16%				61.04%	10.66%	7.87%	6.08%		

7b)

EAST MIDLANDS											
CAMBRIDGE UNIVERSITY HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Cambridge CD	South Cambridgeshire CD	East Cambridgeshire CD	St Edmundsbury CD	Huntingdonshire CD		Cambridge CD	South Cambridgeshire CD	East Cambridgeshire CD	St Edmundsbury CD		
35.79%	19.47%	10.53%	6.32%	5.79%		36.77%	24.16%	10.79%	6.21%		
LUTON AND DUNSTABLE HOSPITAL NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Luton UA	Central Bedfordshire UA	Bedford UA	Milton Keynes UA	Welwyn Hatfield CD		Luton UA	Central Bedfordshire UA				
43.91%	16.97%	8.49%	5.17%	5.17%		63.83%	24.08%				
NORFOLK AND NORWICH UNIVERSITY HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Norwich CD	South Norfolk CD	Breckland CD	Broadland CD	Great Yarmouth CD	North Norfolk CD	Norwich CD	Broadland CD	Breckland CD	South Norfolk CD	North Norfolk CD	
44.17%	10.43%	7.98%	7.98%	7.98%	6.75%	41.90%	14.26%	14.18%	12.33%	10.96%	

7c)

LONDON											
GUY'S AND ST THOMAS' NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Lambeth LB	Southwark LB	Westminster, City of LB	Lewisham LB			Southwark LB	Lambeth LB	Westminster, City of LB			
25.66%	25.00%	6.91%	5.59%			28.24%	22.09%	5.58%			
BARKING, HAVERING AND REDBRIDGE UNIVERSITY HOSPITALS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Havering LB	Redbridge LB	Barking and Dagenham LB	Newham LB			Redbridge LB	Barking and Dagenham LB	Havering LB			
28.76%	27.70%	26.12%	6.33%			30.42%	28.58%	25.39%			
NORTH WEST LONDON HOSPITALS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Brent LB	Harrow LB	Ealing LB	Hillingdon LB			Brent LB	Harrow LB	Ealing LB	Barnet LB		
35.57%	18.18%	11.07%	5.14%			36.83%	25.04%	12.67%	5.15%		

7d)

NORTH EAST											
COUNTY DURHAM AND DARLINGTON NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
County Durham UA	Darlington UA	South Tyneside MCD				Darlington UA	County Durham UA				
71.55%	14.64%	5.02%				57.09%	33.55%				
NORTHUMBRIA HEALTHCARE NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Northumberland UA	North Tyneside MCD	Newcastle upon Tyne MCD				Northumberland UA	North Tyneside MCD				
46.94%	43.54%	5.44%				50.85%	42.76%				
THE NEWCASTLE UPON TYNE HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Newcastle upon Tyne MCD	North Tyneside MCD	Gateshead MCD	Northumberland UA			Newcastle upon Tyne MCD	North Tyneside MCD	Gateshead MCD	Northumberland UA		
45.96%	15.98%	13.64%	10.95%			67.50%	8.62%	8.07%	5.24%		

7e)

NORTH WEST											
AINTREE UNIVERSITY HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Liverpool MCD	Sefton MCD	Knowsley MCD	St Helens MCD			Liverpool MCD	Sefton MCD	Knowsley MCD			
35.20%	23.64%	12.08%	5.78%			43.34%	35.17%	13.89%			
CENTRAL MANCHESTER UNIVERSITY HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Manchester MCD	Salford MCD	Wigan MCD	Trafford MCD			Manchester MCD	Salford MCD	Trafford MCD			
56.23%	8.97%	7.51%	6.23%			63.86%	6.00%	5.44%			
NORTH CUMBRIA UNIVERSITY HOSPITALS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Carlisle CD	Copeland CD	Allerdale CD	Eden CD			Carlisle CD	Copeland CD	Allerdale CD			
39.62%	25.16%	22.01%	5.03%			46.41%	25.04%	20.70%			

7f)

SOUTH WEST											
GLOUCESTERSHIRE HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Gloucester CD	Cheltenham CD	Forest of Dean CD	Stroud CD	Tewkesbury CD		Gloucester CD	Cheltenham CD	Tewkesbury CD	Stroud CD	Forest of Dean CD	
42.80%	26.75%	7.41%	6.17%	5.76%		41.48%	26.20%	9.88%	7.67%	6.05%	
ROYAL DEVON AND EXETER NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Exeter CD	East Devon CD	Mid Devon CD				Exeter CD	East Devon CD	Mid Devon CD			
51.75%	19.30%	12.28%				48.07%	15.47%	9.94%			
UNIVERSITY HOSPITALS BRISTOL NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Bristol UA	South Gloucestershire UA	North Somerset UA				Bristol UA	South Gloucestershire UA	North Somerset UA			
78.95%	8.85%	5.98%				78.09%	6.98%	5.22%			

7g)

SOUTH EAST											
BRIGHTON AND SUSSEX UNIVERSITY HOSPITALS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Brighton and Hove UA	Lewes CD	Mid Sussex CD				Brighton and Hove UA	Mid Sussex CD	Lewes CD			
58.50%	9.15%	9.15%				61.60%	9.72%	6.96%			
EAST KENT HOSPITALS UNIVERSITY NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Thanet CD	Dover CD	Canterbury CD	Shepway CD	Ashford CD		Thanet CD	Dover CD	Canterbury CD	Ashford CD	Shepway CD	
34.30%	16.53%	16.12%	15.70%	14.05%		32.90%	19.16%	18.46%	12.67%	10.46%	
MAIDSTONE AND TUNBRIDGE WELLS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Tunbridge Wells CD	Maidstone CD	Tonbridge and Malling CD	Sevenoaks CD			Tunbridge Wells CD	Maidstone CD	Tonbridge and Malling CD	Sevenoaks CD		
28.27%	25.32%	19.83%	8.02%			29.69%	25.11%	21.32%	6.58%		

7h)

WEST MIDLANDS											
SHREWSBURY AND TELFORD HOSPITAL NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Shropshire UA	Telford and Wrekin UA					Telford and Wrekin UA	Shropshire UA				
56.49%	36.36%					55.67%	38.67%				
UNIVERSITY HOSPITALS BIRMINGHAM NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Birmingham MCD	Sandwell MCD					Birmingham MCD					
69.18%	8.42%					85.37%					
WORCESTERSHIRE ACUTE HOSPITALS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Worcester CD	Redditch CD	Wychavon CD	Wyre Forest CD	Malvern Hills CD	Bromsgrove CD	Worcester CD	Wyre Forest CD	Redditch CD	Wychavon CD	Bromsgrove CD	Malvern Hills CD
20.28%	16.59%	16.13%	15.67%	8.29%	7.37%	23.71%	18.66%	17.86%	10.06%	7.65%	6.80%

7i)

YORKSHIRE & HUMBER											
DONCASTER AND BASSETLAW HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Doncaster MCD	Bassetlaw CD	Rotherham MCD				Doncaster MCD	Bassetlaw CD				
62.93%	17.69%	6.80%				72.95%	14.71%				
LEEDS TEACHING HOSPITALS NHS TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Leeds MCD						Leeds MCD					
91.17%						90.44%					
SHEFFIELD TEACHING HOSPITALS NHS FOUNDATION TRUST											
HES HOSPITAL ADMISSIONS (% RESIDENT)						HES A&E ATTENDANCES (% RESIDENT)					
Sheffield MCD						Sheffield MCD					
83.71%						92.05%					

Authors:

Val Upton, Mark Bellis and Clare Perkins.

Acknowledgements:

The authors would like to thank the following for their contributions to this report:

Zara Quigg, Nicola Leckenby, Karen Hughes, Michela Morleo, Jenny Mason, Olivia Sharples (Centre for Public Health) and Sacha Wyke, Johnathan Rooney, Neil Potter, Mark Robinson, Dave Seddon, Ian Warren (North West Public Health Observatory).

North West Public Health Observatory
Centre for Public Health
Research Directorate
Faculty of Health and Applied Social Sciences
Liverpool John Moores University
2nd Floor, Henry Cotton Campus
15-21 Webster Street
Liverpool L3 2ET

Tel: 0151 231 4535
Email: nwpho-contact@ljmu.ac.uk
www.nwpho.org.uk
www.cph.org.uk

Published: November 2012
ISBN: 978-1-908929-22-8

