

Mental health in hospital Emergency Departments: cross-sectional analysis of attendances in England 2013/14

Simona Baracaia

Department of Applied Health Research, University College London, Gower Street, London WC1E 6BT, UK

David McNulty

University Hospitals Birmingham NHS Foundation Trust, Yardley Court, 11-13 Frederick Road, Edgbaston, Birmingham, B15 1JD

Simon Baldwin

University Hospitals Birmingham NHS Foundation Trust, Yardley Court, 11-13 Frederick Road, Edgbaston, Birmingham, B15 1JD

Jemma Mytton

University Hospitals Birmingham NHS Foundation Trust, Yardley Court, 11-13 Frederick Road, Edgbaston, Birmingham, B15 1JD

Felicity Evison

University Hospitals Birmingham NHS Foundation Trust, Yardley Court, 11-13 Frederick Road, Edgbaston, Birmingham, B15 1JD

Rosalind Raine

Department of Applied Health Research, University College London, Gower Street, London WC1E 6BT, UK

Domenico Giacco

Department of Health Sciences, Warwick Medical School, University of Warwick, Coventry, UK

Unit for Social and Community Psychiatry (World Health Organisation Collaborating Centre for Mental Health Service Development), Queen Mary University of London

Andrew Hutchings

London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London, WC1H 9SH

Helen Barratt

Department of Applied Health Research, University College London, Gower Street, London WC1E 6BT, UK

Correspondence to:

Dr Helen Barratt

Department of Applied Health Research, University College London, Gower Street, London WC1E 6BT, UK

h.barratt@ucl.ac.uk 020 7679 8285

Word count: 3201

Abstract

Objective: To describe the population of patients who attend Emergency Departments (ED) in England for mental health reasons.

Methods: Cross-sectional observational study of 6,262,602 ED attendances at NHS hospitals in England between 1 April 2013 and 31 March 2014. We assessed the proportion of attendances due to psychiatric conditions. We compared patient sociodemographic and attendance characteristics for mental health and non-mental health attendances using logistic regression.

Results: 4.2% of ED attendances were attributable to mental health conditions (median 3.2%, IQR 2.6-4.1%). Those attending for mental health reasons were typically younger (76.3% were aged less than 50 years), of White British ethnicity (73.2% White British), and resident in more deprived areas (59.9% from the two most deprived Index of Multiple Deprivation quintiles (4 and 5)). Mental health attendances were more likely to occur 'out of hours' (68.0%) and at the weekend (31.3%). Almost two thirds were brought in by ambulance. A third required admission, but around a half were discharged home.

Conclusions: This is the first national study of mental health attendances at EDs in England. We provide information for those planning and providing care, to ensure that clinical resources meet the needs of this patient group, who comprise 4.2% of attendances. In particular, we highlight the need to strengthen the availability of hospital and community care 'out of hours.'

Key messages

What is already known on this subject:

- Individuals with mental ill health make over three times as many Emergency Department (ED) visits annually compared with the rest of the population.
- To improve services and meet demand, information is required about the nature of mental health-related attendances. However, there is currently a lack of high quality, generalisable epidemiological data to inform change.

What this study adds:

- This is the first national study of mental health attendances at EDs in England. 4.2% of all attendances were attributable to mental health conditions. Compared to individuals with another diagnosis, those attending for mental health reasons were younger, of White British ethnicity, and resident in more deprived areas. Mental health attendances were more likely to occur 'out of hours' and at the weekend.
- We provide information for those planning and providing care, to ensure that clinical resources meet the needs of this patient group. In particular, we highlight the need to strengthen the availability of hospital and community care 'out of hours.'

Introduction

In England, individuals with mental ill health make over three times as many ED visits each year as the rest of the population.¹ In 2011/12, 41.2% of those known to mental health services attended an ED at least once, compared with 19.7% of the general population.² Rates of attendance are increasing and may rise further if funding for community-based services continues to be reduced.³ Similarly, in Australia, 3.6% of ED presentations are mental health-related,⁴ whilst in the USA ED visits related to mental health and substance-use increased more than 44% between 2006 and 2014.⁵ However, in England, concerns have been raised about the quality of emergency care for this group.^{6,7,8} Many patients experience problems in accessing help at the time they need it, for example at night, with potential implications for patient safety. As a consequence, many hospitals have invested in psychiatric liaison services. However, concerns still remain, particularly about the adequacy and availability of services out of hours.⁷

To improve services and meet demand, information is required about the nature of mental health-related attendances. However, there is currently a lack of high quality, generalisable epidemiological data to inform change. In our systematic review of studies describing the ED mental health population within publicly supported health care systems, such as the English NHS, we identified 18 publications from seven countries.⁹ We estimated that 4.0% of attendances in this setting are due to a mental health disorder. However, the majority of studies were conducted in single hospitals; had small sample sizes; and were of low quality. There is also limited information about the sociodemographic characteristics of patients, such as ethnicity and deprivation. Robust information is lacking about characteristics of attendances, such as time of day, and destination on departure from the ED. Improving emergency mental health care is a priority for the NHS.¹⁰ However, clinicians and managers are currently trying to achieve this without adequate information about the nature of demand.¹¹

We aim to address this gap by providing the first comprehensive national description of the ED mental health population in England, to help services prepare better for the arrival of this patient group. We first assess the proportion of adult ED attendances in England due to psychiatric conditions, to provide an estimate of overall demand. We then go on to describe patient sociodemographic characteristics and the nature of mental health attendances, including how these compare with other attendances.

Methods

Data source

We used the Hospital Episode Statistics (HES) Accident & Emergency (A&E) dataset to identify patient attendances at NHS EDs in England from 1 April 2013 to 31 March 2014. To estimate demand, we conducted our analysis at the attendance level. We refer to attendances - rather than patients - in our findings, to make this distinction clear. Multiple attendances by one individual are counted separately.

Patient inclusion criteria

Our focus was on adult attendances, so we excluded those aged <18 years. Individuals resident outside of England were also excluded. As the prevalence of mental illness is generally higher in those of no fixed abode,¹² we included those of unknown residence.

Trust inclusion criteria

To provide information about attendances at general EDs, we excluded specialist, community and mental health providers. Analyses were conducted at the level of NHS Trusts. Coding within the A&E dataset is known to be incomplete, with only 64.3% of

attendances in 2013/14 having valid diagnosis codes.¹³ We therefore sought to strike a balance between completeness and accuracy by only including Trusts with reasonable coding (Figure 1), on the basis that poor data recording is likely to be a feature of providers, rather than the case mix of the population they serve. Trusts can enter up to 12 diagnosis codes for an ED attendance, using either the A&E dataset coding system (39 broad categories of illness/ injury), or the International Classification of Disease, 10th revision (ICD-10). Our goal was not to provide exact diagnoses, but instead to give a reasonably accurate measure of demand. Both systems identify individuals attending as a result of a mental health problem, so we included Trusts using either.

When assessing coding quality, we identified thresholds that would enable us to analyse data from around two thirds of Trusts, and then compare against the third with the highest quality data. In some Trusts, diagnostic codes such as 'not classifiable' or 'no abnormality detected' were allocated to a significant number of patients. It is unlikely that large numbers of attendees at an ED have no underlying medical abnormality, and instead this represents an issue with local coding practices. We therefore excluded Trusts that coded >50% of first diagnoses as 'not classifiable' and/ or missing, as well as those where >20% of attendances were coded as 'no abnormality detected.' Missing diagnoses included all blank entries and non-valid diagnosis codes. Non-valid diagnosis codes were those that are neither standard ED codes nor standard ICD-10 codes. To ensure the appropriateness of these cut-offs, a sensitivity analysis was conducted excluding Trusts with >20% of diagnoses coded as missing, 'not classifiable' and/ or 'no abnormality detected.'

Mental health diagnosis

Mental health attendances were classified as those where the first diagnosis code was either 'psychiatric conditions' or 'poisoning (including overdose)' or, for EDs using ICD-10, where the classification was Chapter V (Mental and behavioural disorders) or Chapter XX, X60-X69 (Intentional self-harm by poisoning). Patients attending as a result of mental health problems may have another presenting complaint, for example traumatic injuries secondary to self-harm. However, 90.2% of attendances in our dataset had only one recorded diagnosis. No further diagnostic information was available, for example about comorbidities. Consequently it was not possible to identify individuals attending Trusts that use the HES A&E diagnostic coding system who had a non-psychiatric first diagnosis code (e.g. 'laceration'), but whose attendance could be attributable to mental ill health. We therefore excluded attendances with ICD-10 diagnosis codes X70-X84 (intentional self-harm, not including self-poisoning) to ensure that groups captured using both classification systems were as equivalent as possible. Non-mental health attendances were defined as individuals with a diagnosis code other than those used to define mental health attendances.

Variables

For each attendance, data were extracted as counts for each variable, with small numbers suppressed in published tables in compliance with data protection requirements. Available sociodemographic variables were age, sex, ethnicity, socioeconomic circumstances, and General Practitioner (GP) registration. We use the term sex here as this is the name of the variable in the HES dataset. Ethnic groups were combined into six higher-level categories, using the groupings from the 2018 HES A&E data dictionary (Table 1).¹⁴ To examine deprivation, each attendance was allocated to a 2011 'Lower Super Output Area' (LSOA) based upon the individual's postcode. There are 32,482 of these small area neighbourhoods in England and Wales, each encompassing approximately 1500 people. We measured the socioeconomic circumstances of each LSOA using the 2015 Index of Multiple Deprivation (IMD). IMD

2015 overall deprivation scores were attributed to each LSOA, which were then ranked. Data are presented according to quintile groups, defined as aggregations of deprivation ranked LSOAs, with quintile 1 containing the least deprived and quintile 5 the most deprived. We used the code of GP practice to determine whether patients were registered with a GP. Attendance characteristics include arrival day and time, referral source, arrival mode and destination on discharge from the ED.

Statistical analysis

Data were analysed using cross tabulation and logistic regression. All variables were categorical and missing values were assigned their own category. Attendance was cross tabulated against mental health diagnosis and each categorical variable in turn. Using logistic regression, we modelled mental health incidence against sociodemographic and attendance factors singly and in combination to produce univariable and multivariable outputs. Odds ratios were produced against the global population mean and observed margins. The principal analysis used SAS/STAT software, version 9.4.

Ethics approval

Not required because data obtained from secondary sources.

Patient and Public Involvement

Patients were not directly involved in the planning, design or delivery of this research. However, the study responds to concerns raised by service users and clinicians, locally and nationally, about the quality of care for those attending EDs.

Results

Study population

There were 17,077,215 attendances at 142 acute hospital Trusts in England, between 1 April 2013-31 Mar 2014. We followed a three-step process to identify our study population (Figure 1). First, 4,396,982 attendances were excluded because the individuals were aged less than 18 or not resident in England, leaving 12,680,233 attendances by adults resident in England. We then excluded 45 Trusts with poor diagnostic coding (n=4,191,879 attendances). Finally, we excluded 2,225,752 attendances where the first diagnosis code was missing, unclassifiable or recorded as 'no abnormality detected.' We therefore included 6,262,602 attendances by 4,517,988 individuals from 97/142 Trusts – 49.4% of the 12,677,332 attendances by adults resident in England during the study period. This included a small number of individuals resident in England, but registered with a General Practitioner in Wales (n=3,978, 0.1%)

Mental health-related attendances

Over the 12 months there were 263,628 attendances with a mental health diagnosis and 5,998,974 with a different diagnosis. Thus 4.2% of included attendances were for mental health reasons. However, the proportion of attendances that were mental health-related varied from 0.4% to 7.2% across the 97 included trusts (median 3.2%, IQR 2.6-4.1%).

Socio-demographic characteristics

Individuals attending with a mental health diagnosis were more likely to be younger: 76.3% were aged less than 50 years (Table 2). 51.7% were male and 73.2% White British. 59.9% were from the two most deprived IMD quintiles (4 and 5), and 4.2% did not have a recorded IMD quintile, including those of unknown or no fixed abode. 5.6% of those with a mental health diagnosis were missing information about GP registration. Information about the relative sizes of the mental health and non-mental health populations is included in Table 2.

Attendees with a White British background were more likely than those from other ethnic groups to have a mental health diagnosis (adjusted OR 1.10, 95% CI 1.10-1.10) (Tables 2 and 3). Individuals without a recorded IMD quintile were over four times more likely than average to have a mental health diagnosis (adjusted OR 4.22, 95% CI 4.11-4.32).

Attendance characteristics

The greatest proportion of mental health attendances were made on a Saturday (15.5%) and Sunday (15.8%) and two thirds occurred out of normal working hours (5pm-9am) (Table 4). 48.4% of those with a mental health diagnosis self-referred to the ED; 27.4% were referred by the emergency services, and 2.5% were referred by their GP. 61.9% arrived by ambulance and 4.6% were brought in by the police. 32.5% of attendances with a mental health diagnosis resulted in admission to hospital and a further 4.0% were transferred from the ED to another provider. 31.4% were discharged with no follow up and 18.1% were advised to follow up with their GP. Notably, 5.7% left the hospital before discharge, because they either left without being seen, or refused treatment. Information about the relative sizes of the mental health and non-mental health populations is included in Table 4.

Individuals arriving by ambulance were three times more likely to have a mental health diagnosis (adjusted OR 3.24, 95% CI 3.22-3.27) (Tables 4 and 5). Those referred by the police were over nine times more likely to have a mental health diagnosis (adjusted OR 9.30, 95% CI 9.08-9.53).

Sensitivity analyses

Excluding Trusts where more than 20% of diagnoses were coded as missing, 'not classifiable' and/or 'no abnormality detected,' we conducted a sensitivity analysis using data from 38 Trusts. This comprised 100,898 attendances with a mental health diagnosis and 2,482,046 attendances with another diagnosis. Although the proportion of attendances with a mental health diagnosis was slightly lower (3.9%, compared with 4.2% in the primary analysis), these more stringent inclusion criteria did not change the results observed in the primary analysis.

There is no specific diagnosis code for self-harm by means other than poisoning in the HES A&E dataset, so we were unable to identify and include such individuals in our analysis. To estimate how this might have impacted our prevalence estimate, we drew on the findings of the longitudinal Multicentre Study of Self-harm in England, which suggests that over 75% of ED attendances for self-harm are due to self-poisoning.¹⁵ Therefore, the true number of patients attending due to self-harm may be up to 25% higher than our figures suggest. During the study period, 129,363/263,628 patients with a mental health diagnosis had a self-harm diagnosis code of either 'poisoning (including overdose)' (HES A&E code) or 'intentional self-harm by poisoning' (ICD-10 Chapter XX, X60-X69). To estimate how much difference it would have made, had we been able to include all self-harm patients, we recalculated our prevalence estimate by inflating the number of patients attending due to self-harm by 25%. If we had included all self-harm attendances, we estimate that 4.9% of ED attendances would have been due to mental health conditions. This represents only a small increase in our original calculation (4.2%).

Discussion

This study provides the first national picture of demand for ED-based mental health care provided by hospitals in England. In 2013/14, 4.2% of adult attendances were due to

mental health conditions. Individuals with a mental health diagnosis were more likely to be younger, of White British ethnicity, and resident in more deprived areas. Attendances were more likely to occur 'out of hours' and at the weekend. Almost two thirds were brought in by ambulance. A third of those referred to the ED by the police had a mental health diagnosis.

The issues of incomplete and inaccurate coding within routine data sources, such as HES, are well-recognised. To our knowledge, there are no reviews of coding accuracy in the A&E dataset. We sought to strike a balance between completeness and accuracy by only including Trusts with a higher standard of coding. Sensitivity analyses demonstrated that more stringent inclusion criteria did not significantly influence the results, suggesting our thresholds were appropriate. Another limitation is that we were unable to identify individuals attending due to self-harm other than poisoning, for example traumatic injuries as a result of self-harm, as there is no specific diagnostic code for this in the HES A&E coding system and over 90% of records included only one diagnostic code. However, it is likely to have had only a small impact on our prevalence estimate. Equally, we classified attendances coded as 'poisoning' in the HES A&E dataset as mental health-related, because self-poisoning is by far the most frequent method of exposure for adults in England.¹⁶ However, there will inevitably be some cases of accidental poisoning within this category. Our data also date from 2013/2014. Over the last decade the total number of Emergency Department (ED) attendances have risen by 22%,¹⁷ and rates of attendance by those known to mental health services are also increasing,³ so demand is likely to be even greater now. In 2017, the NHS Emergency Care Data Set (ECDS) was introduced and should provide an improved level of detail about how and why people access urgent and emergency care.¹⁸

Our finding that 4.2% of attendances are mental health-related is broadly in line with other, smaller studies conducted within publically supported health care systems, such as the English NHS.⁹ To place this in context, chest pain accounts for 6% of ED attendances,¹⁹ and acute abdominal pain for 5-10% of presentations.²⁰ There is, however, limited information about the sociodemographic characteristics of mental health patients, attending EDs in other health care systems, or the characteristics of attendances, such as time of day, and destination on departure from the ED. Patients attending public EDs in Australia for mental health-related reasons between 2017-2018 were more likely to be male (52.1%), aged 25-34 (20.6%), and resident in areas classified as having the lowest socioeconomic status. Almost half arrived via ambulance or air ambulance (46.6%). More than a third (39.1%) of presentations resulted in the patient being admitted to hospital, but over half of patients were discharged from the ED.⁴ In our current study, variations between Trusts in England are likely due to differences in coding, but may partly reflect local population differences. Information about patient sociodemographic characteristics has previously been poorly reported. Here, patients attending for mental health reasons were proportionally more likely to live in more deprived areas and to be White British. Mental illness is well known to occur more frequently in more deprived areas of England.²¹ However, individuals from other ethnic backgrounds were less likely than average to attend the ED for mental health reasons. This finding is surprising and warrants further investigation, particularly as there are recognised inequalities in access to care in this setting.²² In England, individuals from minority ethnic groups are at higher risk of developing mental ill health, and are more likely to access health care in an unstructured way, with disproportionate rates of detention under the 2007 Mental Health Act.^{23,24} Those attending for a mental health-related reason were also more likely than average to have been referred in by other emergency services and the police, in line with other studies from health care systems similar to the English NHS.⁹ England's Five Year Forward View for mental health reported that the largest number of presentations for

psychiatric crisis occurred between 23:00pm and 7:00am.²⁵ We found that almost a third (29.0%) will occur between midnight and 9:00am. Notably, however, 38.9% also take place between 5:00pm and midnight.

The size of our study population means that there is an increased likelihood of finding statistically significant associations. Whilst statistical significance is not necessarily the same as clinical significance, this study has important implications for those planning and running services. For example, our findings suggest that attendances are more likely to occur out of hours and at the weekend, so the availability of specialist care in acute hospitals needs to be improved at these times. Community care pathways should also be strengthened, to provide alternatives to the ED. Services are not necessarily available around the clock currently in England.⁵ Calls for better mental health training for the emergency services are not new.²⁶ However, we highlight the crucial role they play in providing pre-hospital care. EDs can also reasonably anticipate that one in three mental health attendees will require admission. On the other hand, around half will be discharged, either with no follow up (31.4%) or with instructions to see their GP (18.1%). Given that the rise in mental health-related ED attendances is thought to be partly due to a lack of alternative services⁵ this discharged group warrants further investigation, including whether or not they access further care. Finally, we intentionally conducted our analysis at the level of ED attendances, in order to provide information about demand for service planning. However, individual patients may make multiple attendances, and future research should explore whether there are any differences between frequent versus non-frequent attenders.

Conclusion

This is the first national study of mental health attendances at EDs in England. We provide information to help those who plan emergency services ensure that appropriate clinical resources are available when they are needed most. In particular, we highlight the need for strengthened availability of hospital and community care 'out of hours,' and the provision of resources for the one in three individuals who will require admission. This is especially important given that the number of people experiencing mental health disorders is likely to rise over the next few decades.

Footnotes

Contributors SBar, DM, AH and HB contributed to study conception, data analysis and data interpretation. SBal, JM and FE contributed to data analysis and data interpretation. RR and DG contributed to study conception and data interpretation. SBar and HB drafted the manuscript, which was critically revised for important intellectual content by DM, SBal, JM, FE, DG, RR, and AH. All co-authors read and approved the final draft.

Funding This research was funded by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care North Thames at Bart's Health NHS Trust (NIHR CLAHRC North Thames). The views expressed in this article are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care.

Competing interests None declared.

Ethics approval Not required because data obtained from secondary sources (Hospital Episode Statistics).

Provenance and peer review Not commissioned; externally peer reviewed.

Patient consent for publication Not required.

Data availability statement In line with the data sharing agreement between NHS Digital and University Hospitals Birmingham NHS Foundation Trust, aggregate small number suppressed outputs for the study period (1 April 2013 and 31 March 2014) are available on request from the corresponding author, Dr Helen Barratt.

Figure 1: Study population

Provided separately

Table 1: Ethnic groupings

Ethnic group	HES A&E data set groups
British White	A = British (White) B = Irish (White)
Other White	C = Any other White background
Black	D = White and Black Caribbean (Mixed) E = White and Black African (Mixed) M = Caribbean (Black or Black British) N = African (Black or Black British) P = Any other Black background
Asian	F = White and Asian (Mixed) H = Indian (Asian or Asian British) J = Pakistani (Asian or Asian British) K = Bangladeshi (Asian or Asian British) L = Any other Asian background
Other	G = Any other Mixed background R = Chinese (other ethnic group) S = Any other ethnic group
Unknown	Not stated Not known

Table 2: Summary of sociodemographic characteristics of attendances

	Total population		Attendances with a mental health diagnosis		Attendances with a non-mental health diagnosis	
	Number	%	Number	%	Number	%
Age						
18-24	957,069	15.3%	59,960	22.7%	897,109	15.0%
25-49	2,511,578	40.1%	141,182	53.6%	2,370,396	39.5%
50-74	1,734,223	27.7%	51,384	19.5%	1,682,839	28.1%
75+	1,058,529	16.9%	11,027	4.2%	1,047,502	17.5%
Missing	1,203	0.0%	75	0.0%	1,128	0.0%
Sex						
Female	3,179,718	50.8%	127,112	48.2%	3,052,606	50.9%
Male	3,080,170	49.2%	136,410	51.7%	2,943,760	49.1%
Unknown	2,714	0.0%	106	0.0%	2,608	0.0%
Ethnic group						
British White	4,515,060	72.1%	193,091	73.2%	4,321,969	72.0%
Other White	251,501	4.0%	9,330	3.5%	242,171	4.0%
Asian	302,086	4.8%	8,306	3.2%	293,780	4.9%
Black	187,381	3.0%	7,309	2.8%	180,072	3.0%
Other	160,621	2.6%	6,930	2.6%	153,691	2.6%
Unknown	845,953	13.5%	38,662	14.7%	807,291	13.5%
Index of Multiple Deprivation quintile						
Q5 (most deprived)	1,762,841	28.1%	96,128	36.5%	1,666,713	27.8%
Q4	1,366,163	21.8%	61,619	23.4%	1,304,544	21.7%
Q3	1,158,827	18.5%	41,047	15.6%	1,117,780	18.6%
Q2	1,030,316	16.5%	31,030	11.8%	999,286	16.7%
Q1 (least deprived)	900,297	14.4%	22,184	8.4%	878,113	14.6%
Missing	44,158	0.7%	11,620	4.4%	32,538	0.5%
GP registration						
England	6,061,396	96.8%	248,503	94.3%	5,812,893	96.9%
Wales	3,978	0.1%	254	0.1%	3,724	0.1%
Missing	197,228	3.1%	14,871	5.6%	182,357	3.0%

Table 3: Sociodemographic characteristics of attendances and the relative odds of a mental health diagnosis

	Univariable odds ratio			Multivariable odds ratio*		
	Odds ratio	95% confidence interval	p-value	Odds ratio	95% confidence interval	p-value
Age						
18-24	1.78	1.76-1.79	<.0001	2.13	2.11-2.15	<.0001
25-49	1.58	1.58-1.59	<.0001	1.86	1.85-1.87	<.0001
50-74	0.81	0.81-0.82	<.0001	0.74	0.73-0.74	<.0001
75+	0.28	0.28-0.29	<.0001	0.16	0.16-0.17	<.0001
Missing	5.25	4.13-6.69	<.0001	1.94	1.45-2.61	<.0001
Sex						
Female	0.95	0.95-0.96	<.0001	1.00	1.00-1.01	0.19
Male	1.05	1.05-1.06	<.0001	1.00	0.99-1.00	0.17
Unknown	1.68	1.38-2.04	<.0001	1.14	0.91-1.43	0.26
Ethnic group						
British White	1.04	1.04-1.04	<.0001	1.10	1.10-1.10	<.0001
Other White	0.81	0.80-0.83	<.0001	0.73	0.72-0.75	<.0001
Asian	0.63	0.61-0.64	<.0001	0.57	0.56-0.59	<.0001
Black	0.78	0.76-0.80	<.0001	0.66	0.65-0.68	<.0001
Other	0.96	0.94-0.99	0.0016	0.76	0.74-0.78	<.0001
Unknown	1.09	1.08-1.11	<.0001	0.93	0.92-0.94	<.0001
Index of Multiple Deprivation quintile						
Q5 (most deprived)	1.42	1.41-1.42	<.0001	1.23	1.22-1.23	<.0001
Q4	1.14	1.13-1.15	<.0001	1.08	1.08-1.09	<.0001
Q3	0.89	0.88-0.90	<.0001	0.93	0.92-0.94	<.0001
Q2	0.75	0.74-0.75	<.0001	0.84	0.83-0.85	<.0001
Q1 (least deprived)	0.61	0.60-0.62	<.0001	0.75	0.74-0.75	<.0001
Missing	8.25	8.07-8.43	<.0001	4.22	4.11-4.32	<.0001
GP registration						
England	0.98	0.98-0.98	<.0001	0.9972	0.9966-0.9978	<.0001
Wales	1.52	1.34-1.73	<.0001	1.09	0.95-1.25	0.21
Missing	1.79	1.76-1.82	<.0001	1.10	1.07-1.12	<.0001

* Adjusted for sociodemographic and attendance characteristics

Odds ratios are presented relative to the global mean rather than a reference category

Table 4: Summary of attendance characteristics

	Total population		Attendances with a mental health diagnosis		Attendances with a non-mental health diagnosis	
	Number	%	Number	%	Number	%
Day of arrival						
Monday	1,010,030	16.1%	37,490	14.2%	972,540	16.2%
Tuesday	889,024	14.2%	35,048	13.3%	853,976	14.2%
Wednesday	869,952	13.9%	36,393	13.8%	833,559	13.9%
Thursday	866,294	13.8%	35,555	13.5%	830,739	13.8%
Friday	859,672	13.7%	36,760	13.9%	822,912	13.7%
Saturday	865,683	13.8%	40,771	15.5%	824,912	13.8%
Sunday	901,947	14.4%	41,611	15.8%	860,336	14.3%
Time of arrival						
9am to 5pm	3,194,297	51.0%	84,310	32.0%	3,109,987	51.8%
5pm to Midnight	1,980,398	31.6%	102,518	38.9%	1,877,880	31.3%
Midnight to 9am	1,087,907	17.4%	76,800	29.1%	1,011,107	16.9%
Mode of arrival						
Ambulance	1,985,214	31.7%	163,258	61.9%	1,821,956	30.4%
Other	4,180,634	66.8%	99,614	37.8%	4,081,020	68.0%
Unknown	96,754	1.5%	756	0.3%	95,998	1.6%
Source of referral						
Self	4,068,389	65.0%	127,570	48.4%	3,940,819	65.7%
Emergency Services	924,897	14.8%	72,262	27.4%	852,635	14.2%
GP	340,988	5.4%	6,714	2.5%	334,274	5.6%
HC provider	223,940	3.6%	6,094	2.3%	217,846	3.6%
Social Services	4,396	0.1%	215	0.1%	4,181	0.1%
Work or Education	58,379	0.9%	906	0.3%	57,473	1.0%
Police	37,498	0.6%	12,221	4.6%	25,277	0.4%
Other	518,248	8.3%	34,994	13.3%	483,254	8.1%
Unknown	85,867	1.4%	2,652	1.0%	83,215	1.4%
Destination on discharge						
Admit to hospital	1,680,378	26.8%	85,707	32.5%	1,594,671	26.6%
Transfer: other provider	70,674	1.1%	10,428	4.0%	60,246	1.0%
Refer: hospital clinic*	748,992	12.0%	6532	2.5%	742,460	12.4%
Refer: other professional	118,217	1.9%	11,483	4.4%	106,734	1.8%
Discharge - GP follow up	1,251,791	20.0%	47,813	18.1%	1,203,978	20.1%
Discharge - no follow up	2,273,891	36.3%	82,760	31.4%	2,191,131	36.5%
Self-discharged**	66,564	1.1%	15,018	5.7%	51,546	0.9%
Died	9867	0.2%	28	0.0%	9839	0.2%
Other	36,233	0.6%	3588	1.4%	32,645	0.5%
Unknown	5995	0.1%	271	0.1%	5724	0.1%

* Includes A&E clinic, fracture clinic, or other outpatient clinic

** Left without being seen, or refused treatment

Table 5: Characteristics of attendances and the relative odds of a mental health diagnosis

	Univariable odds ratio			Multivariable odds ratio*		
	Odds ratio	95% confidence interval	p-value	Odds ratio	95% confidence interval	p-value
Day of arrival						
Monday	0.88	0.87-0.89	<.0001	0.94	0.93-0.95	<.0001
Tuesday	0.94	0.93-0.94	<.0001	0.97	0.96-0.98	<.0001
Wednesday	1.00	0.99-1.01	0.36	1.01	1.00-1.02	0.04
Thursday	0.98	0.97-0.99	<.0001	1.00	0.99-1.01	0.68
Friday	1.02	1.00-1.03	0.0005	1.03	1.02-1.04	<.0001
Saturday	1.13	1.12-1.14	<.0001	1.04	1.03-1.05	<.0001
Sunday	1.11	1.10-1.12	<.0001	1.02	1.01-1.03	<.0001
Time of arrival						
9am to 5pm	0.67	0.67-0.68	<.0001	0.79	0.79-0.80	<.0001
5pm to Midnight	1.35	1.34-1.36	<.0001	1.22	1.22-1.23	<.0001
Midnight to 9am	1.86	1.85-1.88	<.0001	1.37	1.36-1.38	<.0001
Mode of arrival						
Ambulance	2.53	2.51-2.54	<.0001	3.24	3.22-3.27	<.0001
Other	0.67	0.66-0.67	<.0001	0.66	0.66-0.66	<.0001
Unknown	0.23	0.22-0.25	<.0001	0.29	0.27-0.31	<.0001
Source of referral						
Emergency Services	2.76	2.74-2.79	<.0001	1.18	1.17-1.20	<.0001
GP	0.52	0.51-0.53	<.0001	0.88	0.86-0.90	<.0001
HC provider	0.75	0.73-0.77	<.0001	0.96	0.94-0.99	0.003
Other	1.63	1.61-1.65	<.0001	1.45	1.43-1.47	<.0001
Police	12.5	12.24-12.80	<.0001	9.30	9.08-9.53	<.0001
Self	0.81	0.80-0.81	<.0001	0.94	0.93-0.94	<.0001
Social Services	1.14	0.99-1.31	0.07	1.54	1.33-1.77	<.0001
Unknown	0.46	0.42-0.51	<.0001	0.65	0.59-0.72	<.0001
Work or Education	0.43	0.40-0.46	<.0001	0.45	0.42-0.48	<.0001

* Adjusted for sociodemographic and attendance characteristics

Odds ratios are presented relative to the global mean rather than a reference category

References

- 1 Dorning H, Davies A, Blunt I. Focus on: People with mental ill health and hospital use - Exploring disparities in hospital use for physical healthcare. Nuffield Trust: QualityWatch; 2015. Available from: http://www.qualitywatch.org.uk/sites/files/qualitywatch/field/field_document/QualityWatch_Mental_ill_health_and_hospital_use_full_report.pdf (Accessed 22 May 2018)
- 2 Health and Social Care Information Centre. HES-MHMDS Data Linkage Report: Summary Statistics, 2011/12. London: HSCIC; 2013. Available from: https://files.digital.nhs.uk/publicationimport/pub11xxx/pub11037/hes_mhmd_link_summ_stat_1112.pdf (Accessed 22 May 2018)
- 3 Gilbert H. Mental health under pressure. London: Kings Fund; 2015. Available from: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/mental-health-under-pressure-nov15.pdf (Accessed 22 May 2018)
4. Australian Institute of Health and Welfare. Mental health services provided in emergency departments. Canberra: AIHW; 2019. Available from : <https://www.aihw.gov.au/getmedia/3e73774f-62b9-4fc7-93f6-5d455b01de37/Mental-health-services-provided-in-emergency-departments-2017-18.pdf.aspx> (Accessed 24 Oct 2019)
5. Moore BJ, Stocks C, Owens PL. *Trends in Emergency Department Visits, 2006–2014. HCUP Statistical Brief #227*. Rockville, MD: Agency for Healthcare Research and Quality, September 2017. www.hcup-us.ahrq.gov/reports/statbriefs/sb227-Emergency-Department-Visit-Trends.pdf (Accessed 24 Oct 2019)
- 6 NHS Confederation. Briefing: Mental health and crisis care. London: NHS Confederation; 2014. Available from: <http://www.nhsconfed.org/~media/Confederation/Files/Publications/Documents/mental-health-crisis-care.PDF> (Accessed 22 May 2018)
- 7 Care Quality Commission. Right here, right now: people’s experiences of help, care and support during a mental health crisis. London: CQC; 2015 Jun.
8. National Confidential Enquiry into Patient Outcome and Death. Mental health in general hospitals: treat as one. London: NCEPOD; 2017. <https://www.ncepod.org.uk/2017mhgh.html>. (Accessed 22 May 2019).
- 9 Barratt H, Rojas-Garcia A, Clarke K, et al. Epidemiology of Mental Health Attendances at Emergency Departments: Systematic Review and Meta-Analysis. *PloS one* 2016;11(4):e0154449. doi: 10.1371/journal.pone.0154449
- 10 Department of Health and Concordat signatories. Mental Health Crisis Care Concordat Improving outcomes for people experiencing mental health crisis. London: Department of Health, 2014. https://www.crisiscareconcordat.org.uk/wp-content/uploads/2014/04/36353_Mental_Health_Crisis_accessible.pdf (Accessed 22 May 2018)
- 11 House of Commons Health Committee. Report: Urgent and emergency services. London: Stationery Office, 2013. <https://publications.parliament.uk/pa/cm201314/cmselect/cmhealth/171/17102.htm> (Accessed 22 May 2018)
- 12 Fazel S, Khosla V, Doll H, Geddes J. The Prevalence of Mental Disorders among the Homeless in Western Countries: Systematic Review and Meta-Regression Analysis. *PLoS Medicine* 2008;5(12):e225. doi: doi:10.1371/journal.pmed.0050225
- 13 Health and Social Care Information Centre. Hospital Episode Statistics: Accident and Emergency Attendances in England - 2013-14. London: HSCIC, 2015. <https://files.digital.nhs.uk/publicationimport/pub16xxx/pub16728/acci-emer-atte-eng-2013-14-rep.pdf> (Accessed 22 May 2018)
- 14 Health and Social Care Information Centre. HES Data Dictionary - Accident and Emergency. London: Health and Social Care Information Centre, 2019 <https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics/hospital-episode-statistics-data-dictionary> (Accessed 7 August 2018)
- 15 Geulayov G, Kapur N, Turnbull P, Clements C, Waters K, Ness J, Townsend E, Hawton, K. Epidemiology and trends in non-fatal self-harm in three centres in England, 2000-2012: findings from

- the Multicentre Study of Self-harm in England. *BMJ Open* 2016; **6**:e010538. doi: 10.1136/bmjopen-2015-010538
- 16 Thomas S, Bevan L, Bhattacharyya S, et al. Presentation of poisoned patients to accident and emergency departments in the North of England. *Human & Experimental Toxicology* 1996,15(6):466–470.
- 17 NHS Digital. Hospital Accident and Emergency Activity, 2015-16. London: NHS Digital, 2017. Available at : <http://www.content.digital.nhs.uk/catalogue/PUB23070> (Accessed 24 Oct 2019)
- 18 <https://www.england.nhs.uk/ourwork/tsd/ec-data-set/> (Accessed 24 Oct 2019)
- 19 Goodacre S, Cross E, Arnold J, Angelini K, Capewell S, Nicholl J. The health care burden of acute chest pain. *Heart*. 2005;91:229–230
- 20 Kamin RA, Nowicki TA, Courtney DS, Powers RD. Pearls and pitfalls in the emergency department evaluation of abdominal pain. *Emerg Med Clin North Am*. 2003; 21:61–72, vi.)
- 21 Delgadillo J, Asaria M, Ali S, Gilbody S. On poverty, politics and psychology: The socioeconomic gradient of mental healthcare utilisation and outcomes. *British Journal of Psychiatry* 2016, 209(5):429–430. doi:10.1192/bjp.bp.115.171017
- 22 Suresh K, Bhui K. Ethnic minority patients' access to mental health services. *Psychiatry* 2006;5:413–16. doi:10.1053/j.mppsy.2006.08.005
- 23 Gajwani R, Parsons H, Birchwood M, Singh S. Ethnicity and detention: Are black and minority ethnic (BME) groups disproportionately detained under the Mental Health Act 2007? *Social Psychiatry and Psychiatric Epidemiology* 2016; 51(5):703–711.
- 24 McKenzie K, Bhui K. Institutional racism in mental health care. *BMJ* 2007; 334: 649–650.
- 25 Mental Health Taskforce. The Five Year Forward View for Mental Health: A report from the independent Mental Health Taskforce to the NHS in England. London: NHS England, 2016. <https://www.england.nhs.uk/wp-content/uploads/2016/02/Mental-Health-Taskforce-FYFV-final.pdf> (Accessed 22 May 2018)
- 26 Roberts L, Henderson J. Paramedic perceptions of their role, education, training and working relationships when attending cases of mental illness. *Australasian Journal of Paramedicine* 2014;7(3).