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Use of Emergency Departments by Children & Young People Following Telephone Triage: A Large Database Study

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Abstract

Background Although one objective of NHS 111 is to ease the strain on urgent and emergency care (UEC) services, studies suggest the telephone triage service may be contributing to increased demand. Moreover, whilst parents & caregivers generally find NHS 111 satisfactory, concerns exist about its integration with the healthcare system and the appropriateness of advice. This study aimed to analyse the advice provided in NHS 111 calls, the duration between the call and emergency department (ED) attendance and the outcomes of such attendances made by children and young people (C&YP).

Methods A retrospective cohort study was carried out of C&YP (≤17) attending an ED in the Yorkshire & Humber region of the UK following contact with NHS 111 between 1st April 2016-31st March 2017. This linked-data study examined NHS 111 calls and ED outcomes. Lognormal mixture distributions were fit to compare the time taken to attend following calls. Logistic mixed effects regression models were used to identify predictors of low acuity NHS 111-related ED attendances.

Results Our study of 348,401 NHS 111 calls found they were primarily concerning children aged 0-4. Overall, 13.1% of calls were followed by an ED attendance, with a median arrival time of 51 minutes. Of the 34,664 calls advising ED attendance 41% complied, arriving with a median of 38 minutes - 27% of which defined as low acuity. Although most calls advising primary care were not followed by an ED attendance (93%), those seen in an ED generally attended later (median 102 minutes) with 23% defined as low acuity. Younger age (<1) was a statistically significant predictor of low acuity ED attendance following all call dispositions apart from home care.

Conclusion More tailored options for unscheduled healthcare may be needed for younger children. Both early low acuity attendance and late high acuity attendance following contact with NHS 111 could act as useful entry points for clinical audits of the telephone triage service.

What is already known on this topic

- Prior studies have raised concerns that NHS 111 may be contributing to increased demand for urgent and emergency care services such as EDs by children and young people.
- Medical professionals have expressed concerns about call handler expertise, integration with the healthcare system, and appropriateness of the advice.

What this study adds

- Compliance in relation ED use was high for NHS 111 calls provided with a home care disposition. Only 2.3% of these calls were followed by an ED attendance within 24 hours. Attendance in these cases occurred over 7 hours after the call conclusion on average.
- Compliance was low for NHS 111 calls provided with an ED disposition, with only 41% being followed by an ED attendance within 24 hours, 28% of which defined as low acuity. These attendances generally occurred soon after the call (median of 38 minutes).
- Younger children were more likely to make NHS 111 related ED attendances for conditions which may reasonably have been managed in other settings than older children.

How this study might affect research, practice or policy

- As parents of younger children are more likely to call NHS 111 and have related ED attendances, more services and resources tailored for unscheduled care in this age group may be needed.
- Both early low acuity attendance and late high acuity attendance following contact with NHS 111 could act as useful entry points for clinical audits of the telephone triage service.

Background

In England, the medical telephone triage service NHS 111 forms an important component in the provision of urgent and emergency care (UEC), with callers receiving a largely algorithm based assessment using NHS Pathways to determine the most appropriate healthcare service for their clinical need.(1) NHS 111 was introduced to ensure more appropriate and more timely emergency department (ED) attendances, whilst reducing avoidable ones.(2) This was driven by patient feedback suggesting it was often difficult to know which NHS service to contact for routine or UEC.(3) Additionally, reduction in pressure on UEC services is a major driver of NHS 111, demonstrated by recent NHS winter campaigns designed to encourage parents and caregivers of children and young people (C&YP) to contact NHS 111 prior to attending EDs for treatment.(4, 5) However, the effectiveness of NHS 111 in reducing the demand for UEC services has been questioned by medical professionals and researchers alike, with studies conducted in the early years of NHS 111 suggesting that the telephone triage service may actually be contributing to an increase in the demand for these services.(6)

NHS 111 handles 2.8 million calls annually, with one study reporting that 10% of C&YP (age <17) seen in an ED were directed there by the telephone triage service.(7, 8) Although C&YP present a challenge to NHS 111 due to the clinical judgement usually required when diagnosing these patients, parents and caregivers were generally satisfied with the care provided for C&YP during calls.(9) However, there are concerns raised by healthcare professionals about the clinical expertise of call handlers, the need for better integration with other parts of the healthcare system and the appropriateness of the advice provided during calls.(10) A systematic search for publications in the design of this research found three quantitative studies exploring ED use by C&YP following contact with telephone triage services within the UK and highlighted a clear

evidence gap in relation to parental decision-making and subsequent ED outcomes. (11, 12, 13) As C&YP are amongst the highest users of UEC services, investigating parental decision-making and pathways of care after contacting NHS 111 can help effectively manage the flow of these patients through the UEC system.(14) This is further demonstrated in a NHS 111 service evaluation report suggesting the benefit of data linkage work exploring the UEC services used following contact with the telephone triage service.(14) Therefore the aim of this study is to provide insights into parental and caregiver decision-making by analysing compliance with NHS 111 advice, the time taken to attend an ED following contact with NHS 111 and the characteristics and outcomes of subsequent ED attendances made by C&YP.

Methods

Study Design

Retrospective cohort study.

Data Used

This study used data collected from the "Connected Health Cities: Data linkage of urgent care data" study (known as the "CUREd research database").(15) The CUREd research database holds data from NHS 111 calls, emergency ambulance incidents, ED attendances and emergency admissions to hospitals in the Yorkshire and Humber region of the UK. Each entry has an anonymised common patient identifier code to facilitate linkages across the datasets.(16) This study used data from the NHS 111 calls and ED datasets for C&YP aged 17 and under, in the year period 1st April 2016-31st March 2017. The NHS 111 calls dataset comprised calls made to the NHS 111 telephone service operated by The Yorkshire Ambulance Service NHS Trust and the ED dataset comprised patient records for attendances made to the 13 participating Hospital Trusts' EDs, Urgent Care Centres and Walk-In-Centres.

Patient And Public Involvement

Patients were not directly involved in the planning or execution of this research which analysed routinely collected healthcare data. However, PPI plays a pivotal part in the conceptualisation and collection of the CUREd research database and involves a Data Release Committee (DRC) which acts as an oversight panel for the CUREd platform including patient and public representation, health care stakeholders, and information governance specialists. The DRC reviewed this study which was designed to be a secondary data analysis based on a noted literature gap.

CUREd Database Ethics Approval

The CUREd database has approval from the Leeds East National Health Service (NHS) Research and Ethics Committee (18/YH/0234) and from the NHS Health Research Authority's Confidentiality Advisory Group (18/CAG/0126).

Research Ethics Approval: Human Participants

Not applicable.

Data Management

Data Extraction

The data extraction, cleaning, linking and statistical analyses were performed using R-Studio (version 4.1.1).(17) From the NHS 111 Call dataset, the anonymised patient identifier code, unique record identifier, patient sex, age at call, incident index of multiple deprivation (IMD), date/time of call, episode end date/time, episode length and final disposition description were extracted. From the ED attendance dataset, the anonymised patient identifier, encrypted attendance record identifier, patient sex, patient ethnicity, IMD, age, arrival mode, referral information, attendance disposal, arrival date/time, conclusion time and low acuity attendance indicator were extracted. The distribution of patients by IMD quintiles in the data was not even; this reflects both the demography of Yorkshire and Humber generally – with more people living in deprived areas than the English average and greater ED use by people of lower sociodemographic status.

Data Linkage

To identify ED attendances that occurred following the use of NHS 111, the ED and NHS 111 datasets were first linked using patient ID, and then date and time. We set the threshold for linkage as ED attendance arrival date/times occurring within 24 hours of an NHS 111 call. A 24-

hour threshold was used to accommodate the fact that patients may have been provided with a 24-hour NHS 111 call disposition (such as "attend primary care service within 24 hours"). In the case that multiple NHS 111 calls were made within 24 hours of an ED attendance, the final NHS 111 call was used in the linked dataset. In the case that multiple ED attendances occurred within 24 hours of a single NHS 111 call, the first attendance was used in the linked dataset to avoid multiple representations.

Definitions

NHS 111 Call Dispositions

Insert Figure 1

Time Taken to Attend ED Following an NHS 111 Call

The time taken to attend an ED following contact with NHS 111 was calculated as the difference between the conclusion time of an NHS 111 call, and the subsequent arrival time at an ED. For patients receiving a call-back from NHS 111, the call conclusion was defined as the time a call episode was ended by the call handler.

NHS 111 Related ED Attendance

An NHS 111-related ED attendance was defined as an unplanned ED attendance made by a patient within 24 hours after the NHS 111 call conclusion.

Attendance Acuity

A low acuity ED attendance was defined as an attendance made to a type 1 ED meeting the following 3 conditions indicating a clinical condition which might reasonably have been dealt with in an alternative clinical setting (18):

•Attendance produced at least one of the following investigation codes: None, urinalysis, pregnancy test or dental investigation.

•Attendance produced at least one of the following treatment codes: Prescription(s), guidance/advice only, recording vital signs, dental treatment or no investigation.

•Attendance produced at least one of the following disposals: Discharged (following treatment to be provided by GP/no follow up treatment required) or left department before being treated.

A high acuity ED attendance was defined as an attendance that resulted in the patient being admitted to hospital, and an intermediate acuity ED attendance was defined as all attendances not falling into the low or high acuity attendance category. When considering low acuity ED attendances in this study, it is possible that the patient was correctly seen in the ED (eg, some patients may have attended the ED at the explicit instruction of a healthcare professional, even though they subsequently met the definition of a low acuity attendance).

Source of Decision to Attend ED Following Contacting with NHS 111

For ED attendances occurring after non-ED call dispositions, referral information was obtained and categorised into three groups: patients who self-referred to the ED, patients referred by a GP or other healthcare provider and patients referred by local authority social services, educational/work establishment, police and other non-medical services. The final category also contained missing referral values.

Statistical Analysis

Patient and Call Characteristics

Descriptive statistics were used to provide a summary of key call and ED attendance characteristics. The patient characteristics summarised were sex, age, ethnicity and IMD status.

Time Taken to Attend an ED Following an NHS 111 Call

On initial inspection, the time taken to attend an ED following an NHS 111 call displayed a bimodal distribution with a large proportion of attendances occurring soon after the call and a small proportion occurring later. These bimodal distributions were decomposed into two distributions representing a first and second wave of time to attend (for each call disposition) using a bimodal lognormal (lognormal-lognormal) mixture method. Model parameters were computed using an Expectation-Maximisation (EM) algorithm and permitted estimates of the median, lower/upper quartiles and the proportion of attendances belonging to each of the two waves (supplemental material).(19)

Predictors of Low Acuity NHS 111 Related ED Attendances

Logistic mixed effects regression models were computed to find predictors of low acuity NHS 111 related ED attendances made by C&YP for each of the call dispositions. The fixed effects variables considered in these models were: the age, sex and IMD status of the patient in addition to whether the call was made out-of-hours. Patient level random effects were also accounted for in these models.

Results

Patient, Call and Attendance Characteristics

In the study period, 348,401 calls were made to NHS 111 concerning 227,219 C&YP aged 17 and under in the Yorkshire & Humber region of the UK. The age demographic was skewed towards younger children - with the majority of call subjects being aged 0-4 (60%) (Table 1). Of the calls made to NHS 111, 46,970 (13.4%) resulted in an ED attendance within 24 hours of the call conclusion (Figure 2). After excluding 1,409 for which there were multiple representations, this left 45,561 (13.1%) NHS 111 related ED attendances for inclusion in the analysis. These attendances were made by 40,715 individuals (Table 1). For the 45,561 NHS 111 related ED attendances, the dispositions provided in calls were: Ambulance dispatched (9,171, 20.1%), ED (14,144, 31.1%), primary care (14,870, 32.6%), home care (601, 1.3%) and caller terminated call (6,775, 14.9%).

Distribution of the Time Taken to Attend ED Following an NHS 111 Call

A lognormal mixture (lognormal-lognormal) distribution was fit to model the time between the call conclusion and ED arrival. In general, this showed two distinct waves of attendance, split by those who attend soon after the call (early attenders), and those who attend less quickly after the call (late attenders) (Figure 3). Overall, NHS 111 related ED attendances occurred relatively soon after the call conclusion (median of 51 minutes across all dispositions), however the distribution of time taken to attend depended on the disposition provided (Table 2).

Compliance with home care advice (in relation to ED use) was high as the majority of these calls were not followed by an ED attendance within 24 hours of its conclusion (25,788, 97.7%). Similarly, of calls provided with a primary care disposition, 203,586 (93.2%) were not followed

by an ED attendance within 24 hours of the call. Attendances after a primary care disposition generally occurred relatively soon after the call (median of 102 minutes). For calls provided with an ED call disposition, 14,144 (40.8%) were followed by an ED attendance within 24 hours. The majority of these ED attendances occurred within a short timeframe (median of 38 minutes). The arrival time distribution for attendances after caller-terminated calls mirrored those with ED dispositions (Figure 3).

Source of Decision to Attend ED Following Contacting with NHS 111 and ED Outcomes

Overall, 218,457 (62.7%) of calls made to NHS 111 advised primary care, 14,870 (6.8%) of which being followed by an ED attendance. Of these attendances 9,254 (62%) were self-referred and 3,815 (25.7%) were referred by a GP or healthcare provider. Of the GP-referred attendances, 82.1% were defined as either intermediate or high acuity and had a median arrival time of 122 minutes for both acuity groups. For the 601 ED attendances occurring after a home care disposition, 410 (68.2%) were self-referred, with 72.7% of these attendances being defined as either intermediate or high acuity. The median arrival time for these two acuity groups were 467 and 271 minutes respectively. For calls followed by an ED attendance after the caller terminated the call, 3,910 (57.7%) were self-referred, with 78.4% of these attendances being defined as either intermediate or high acuity (median arrival time of 38 and 39 minutes respectively) (Table 3).

Of the 23,315 ED attendances either advised to attend ED or transferred to 999 by NHS 111, 24.6% were defined as low acuity and 17.6% were defined as high acuity (Table 3). The median arrival times in these two acuity groups were not significantly different (median of 52 minutes). For the 22,720 ED attendances not advised to attend ED (home care, primary care and caller terminated call), 22.7% were low acuity and 23.4% of attendances being defined as high acuity.

High acuity ED attendances following a primary care disposition generally occurred later, and low acuity attendances sooner with a median arrival time of 116 and 85 minutes respectively. Age was a statistically significant predictor of low acuity NHS 111 related ED attendances for all dispositions apart from home care, with younger patients (<1) being more likely to make these attendances in comparison to older individuals (Table 4). Whether the call was made out of working hours (weekdays 8am-6pm) was not a statistically significant predictor of low acuity NHS 111 related ED attendances.

Discussion

Summary of Principal Findings

Our study of 348,401 NHS 111 calls found they were primarily concerning children aged 0-4. Overall, 13.1% of calls were followed by an ED attendance, with a median arrival time of 51 minutes. Of the 34,664 calls advising ED attendance 41% complied, arriving with a median of 38 minutes - 27% of which defined as low acuity. Although most calls advising primary care were not followed by an ED attendance (93%), those seen in an ED generally attended later (median 102 minutes) with 23% defined as low acuity. Younger age (<1) was a statistically significant predictor of low acuity ED attendance following all call dispositions apart from home care.

Comparison with other Studies

Other studies have explored characteristics of ED use following contact with NHS 111 for C&YP.(13) Younger children were similarly found to be most likely to have a call made on their behalf. A study conducted on a telephone triage service in Switzerland found compliance with the call advice to be higher than the figures provided using NHS 111 data in our study (75% compliance with an ED disposition).(20) The study additionally found that compliance decreased

significantly with increased distance between the place the call originated from and the ED. However, the child's age, sex and health complaints had no effect on compliance. The main reasons for non-compliance with the ED advice were improvement in the child's condition (50.7%), parents' decision to go elsewhere (18.3%) and an appointment with a paediatrician (15.5%).

Strengths and Limitations

The existence of a low acuity measure in the CUREd dataset enabled us to specifically explore novel predictors of non-urgent NHS 111 related ED attendances for C&YP. However, although this low acuity measure provides useful attendance information on a system level, it does not explore the appropriateness of an ED attendance on an individual basis. In addition to this, the acuity measure was initially designed for adult patients, meaning some attendance reasons that are high acuity for C&YP may have been missed. For example, a child under the age of one attending an ED with febrile illness may be defined as low acuity as the condition is likely to be less serious in adult patients. Factors such as the signs and symptoms provided to NHS 111 by parents and caregivers were not considered so it was not possible to determine if the individual was correctly advised to attend ED but was subsequently deemed low acuity by a healthcare professional. As the data used in this study is over 7 years old, telephone triage dispositions provided by NHS 111 in more recent years may have changed (due to the Covid-19 pandemic for example).

Implications for Practice and Further Research

Only 41% of calls provided with an ED disposition were followed by an ED attendance within 24 hours, with 27% of these being defined as low acuity in this study. This suggests that the decision-making algorithm used by NHS 111 is risk-averse when providing advice for C&YP.

This is further demonstrated by the fact that only a small proportion of calls were provided with a home care disposition (26,389, 7.6%). Approximately half of attendances occurring after a home care disposition arrived 17 hours after the call. We are unable to differentiate between a child's condition changing to warrant reassessment and delays in accessing primary care or other services to explain this.

Of ED attendances made after a NHS 111 primary care disposition, 62% were self-referred. It is unknown whether this was because the parent/caregiver could not obtain a primary care appointment or because the young person or parents believed ED attendance was more appropriate. Approximately a quarter of ED attendances made after NHS 111 advised primary care were referred by a GP and occurred relatively soon after the call. Given the limited capacity of primary care to see and assess children at very short notice, this suggests that while the primary care team may have been contacted by the young person or their parents - many who attended ED after a primary care disposition would not have been assessed in person in primary care. Among late ED attendances following NHS 111 triage to primary care, there was a higher rate of high acuity attendances. It is not possible from this data to tell whether this was a consequence of progression of illness crossing appropriate safety-netting thresholds or due to unnecessary treatment delay.

As the distribution of the time taken to attend was similar for those terminating the call and those provided with an ED disposition, this may suggest that some parents and caregivers were unhappy with the telephone triage process, thus terminating the call and attending ED promptly. This finding provides an opportunity for future research to explore insights as to why these parents and caregivers terminated the call prior to a disposition being reached.

The distribution of ED arrival times following a 999 call transfer differed from the other dispositions. This is because the arrival time is likely influenced by paramedic decision-making and service capacity rather than parental/caregiver decision-making. Time to arrival in these cases aggregates the time for the ambulance/first responder to arrive at the scene and the time taken to treat and transport the patient to the ED.

As younger age was found to be a predictor of low acuity NHS 111 related ED attendances, future research could explore the balance between the risk-averse nature of the telephone triage service and potential parental/caregiver anxiety caused by directing young individuals to UEC services with low acuity problems. Both early low acuity attendance and late high acuity attendance could act as useful entry points for clinical audits of telephone triage use by C&YP.

Conclusion

This study suggests that while ED attendance after NHS 111 calls is generally prompt, compliance varies based on the advice given. As younger children are often triaged by NHS 111 and treated in the ED, this highlights the need for more tailored healthcare services in this demographic. Both early low acuity attendance and late high acuity attendance following contact with NHS 111 could act as useful entry points for clinical audits of the telephone triage service.

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Contributor Statement

AK, CB and KH conceived the study. AK designed the analysis which was conducted as part of AK's PhD research and supervised by CB, KH, GJ and RS. AK conducted and reported all analyses. CB, KH, GJ and RS reviewed and all interpreted the findings. AK drafted the original manuscript with support from CB, KH, GJ and RS. All authors reviewed the final manuscript. CB acts as guarantor for this work and attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Competing Interest

No competing interests.

Tables

Table 1-NHS 111 Patient Information

Characteristics	NHS 111 Users N=227,219		ED Users Following NHS 111 Contact N=40,715	
	n	**%**	**n**	**%**
Sex				
Male	117,224	51.6	21,323	52.4
Female	108,119	47.6	19,392	47.6
Missing	*1,876*	*0.8*	-	-
Age Group				
<1	57,423	25.3	8,547	21
1-4	78,617	34.6	16,639	40.9
5-9	45,243	19.9	7,062	17.3
10-14	26,108	11.5	4,537	11
15-17	19,828	8.7	3,927	9.6
Missing	*3*	*0.01*	*3*	*0.01*
Ethnicity				
White	-	-	29,927	73.5
Asian	-	-	5,187	12.7
Black	-	-	642	1.6
Mixed Ethnicity	-	-	1,493	3.7
Other Ethnicities	-	-	852	2.1
Missing	-	-	*2614*	*6.4*
IMD Status				
1 (Most Deprived)	85,066	37.4	18,030	44.3
2	37,820	16.6	7,421	18.2
3	31,066	13.7	5,675	13.9
4	31,059	13.7	5,543	13.6
5 (Least Deprived)	23,441	10.3	3,963	9.7
Missing	*18,767*	*8.3*	*83*	*0.2*

Table 2 Expectation-Maximisation Estimates of Early and Late Waves of ED Attendance Following Contact with NHS 111 (Lognormal-Lognormal Mixture Distribution)

Disposition	Proportion of attendances in first wave (%)	Median of first wave (hrs)	IQR of first wave (hrs)	Proportion of attendances in second wave (%)	Median of second wave (hrs)	IQR of second wave (hrs)
Caller Terminated Call	93	0.6	0.9	7	16.4	14.3
Home care	53	2.7	4.9	47	17	14.3
Primary care	85	1.5	2.5	15	21.5	13.6
ED	95	0.6	0.9	5	17.6	15.9
Ambulance Dispatch	41	0.7	0.8	59	1	0.7

Table 3-Source of Decision to Attend ED and Subsequent Outcomes Following Contact with NHS 111

NHS 111 Disposition	Source of Decision to Attend ED	Acuity of ED Attendance Following Contact with NHS 111								
		Low Acuity			Intermediate Acuity			High Acuity		
		n	%	Time[1]	n	%	Time	n	%	Time
Ambulance (N=9,171)	-	1,726	18.8	52	4,759	51.9	51	2,686	29.3	52
ED (N=14,144)	-	4,019	28.4	38	8,705	61.6	38	1,420	10	37
Primary care (N=14,870)	**Self (n=9,254)**	2,235	24.2	85	5,199	56.1	100	1,820	19.7	117
	GP/Healthcare Provider (n=3,815)	681	17.9	96	1,563	40.9	122	1,571	41.2	122
	Other/Missing (n=1,801)	515	28.6	66	857	47.6	79	429	23.8	102
Home care (N=601)	**Self (n=410)**	112	27.3	494	259	63.2	467	39	9.5	271
	GP/Healthcare Provider (n=93)	27	29	430	39	42	374	27	29	654
	Other/Missing (n=98)	32	32.7	431	59	60.2	473	7	7.1	149
Caller Terminated Call (N=6,775)	**Self (n=3,910)**	845	21.6	39	2,468	63.1	38	597	15.3	39
	GP/Healthcare Provider (n=1,509)	289	19.2	36	859	40.3	34	361	23.9	37
	Other/Missing (n=1,356)	363	26.8	36	687	50.7	36	306	22.5	34

[1]The median time taken to attend ED following the conclusion of an NHS 111 call

Table 4-Predictors of Low Acuity ED Attendances Following Contact with NHS 111 (Logistic Mixed Effects)

	Home Care		Primary Care		ED		Ambulance		Caller Terminated Call	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Predictor										
Sex										
Male (ref)	-	-	-	-	-	-	-	-	-	-
Female	1.05	0.72-1.53	1.05	0.97-1.14	0.93	0.86-1.00	0.96	0.86-1.07	0.92	0.82-1.04
Age										
15-17 (ref)	-	-	-	-	-	-	-	-	-	-
<1	1.35	0.57-3.19	1.60	1.36-1.88	2.06	1.74-2.44	2.06	1.65-2.56	1.76	1.39-2.23
1-4	1.47	0.67-3.22	1.39	1.19-1.62	1.91	1.64-2.23	1.96	1.59-2.42	1.60	1.29-1.98
5-9	1.07	0.45-2.51	1.35	1.14-1.61	1.32	1.12-1.57	1.90	1.48-2.45	1.41	1.11-1.79
10-14	1.86	0.32-2.28	1.06	0.87-1.30	1.05	0.87-1.26	1.59	1.20-2.10	1.11	0.86-1.43
Deprivation										
5-Least Deprived (ref)	-	-	-	-	-	-	-	-	-	-
1-Most Deprived	1.50	0.74-3.02	1.00	0.87-1.16	0.87	0.77-0.99	0.95	0.78-1.17	0.88	0.72-1.08
2	1.14	0.53-2.45	0.97	0.83-1.14	0.79	0.69-0.91	0.82	0.66-1.03	0.86	0.69-1.09
3	0.73	0.32-1.70	0.98	0.82-1.16	0.85	0.73-0.99	0.99	0.79-1.25	1.09	0.86-1.37
4	0.88	0.38-2.02	0.97	0.81-1.15	0.98	0.85-1.14	1.20	0.96-1.52	1.06	0.84-1.34
Call Made Out-of-Hours										
No (ref)	-	-	-	-	-	-			-	-
Yes	1.04	0.71-1.53	0.95	0.87-1.02	0.96	0.88-1.03	0.97	0.87-1.09	0.96	0.85-1.08
N	552		13,582		12,740		8,526		6,154	

Figure Legends

Figure 1-Call Disposition Description

Figure 2- Call Disposition & Subsequent ED Use Flowchart

Figure 3-Fitted Lognormal-Lognormal Mixture Distribution for the Time Taken to Attend ED Following NHS 111 Dispositions (Log-scale)

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