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# Avoidable visits to UK emergency departments from the patient perspective: A recursive bivariate probit approach

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ABSTRACT

Unsustainably high numbers of patients attending emergency departments (ED) is a serious issue worldwide, with consequences for the quality and timeliness of emergency care. Avoidable visits, i.e. unnecessary or that should be dealt with elsewhere, exacerbate this issue. Most studies focussed on avoidable attendances use clinical data collected by hospital staff, while this study relies on survey data collected from patients asked to recall their last ED attendance and reflect on its necessity. We apply a Recursive Bivariate Probit model to quantify the factors affecting patients' perception of an ED visit being avoidable (or not), unveiling how it relates to socio-demographic and contextual factors. We find that patients who do not trust their General Practitioner (GP) are less likely to think their ED visit was avoidable. The perception of whether an ED visit was avoidable is also associated with symptoms experienced, patients' ethnicity and waiting time for a GP appointment.

## 1. Background

The increasing number of Emergency Department (ED) attendances have been recognised as one of the biggest challenges that emergency health services are facing worldwide [1,2]. The effects of overcrowding include higher rates of patient mortality [3], transport and treatment delays, and financial effects [4].

Overcrowding at EDs has been linked to factors such as ageing populations in which multimorbidities prevail. Other causes are nonurgent visits, the influenza season and hospital-related shortages such as staff or hospital bed shortages [4]. Several reports mention "frequent-flyer" patients as another cause for overcrowding. Huang et al. [5] define these as patients who visit the same ED 4 times a year or more and find that they account for 14 % of the total number of ED visits. These frequent users are made up of a mix of patients suffering from chronic illnesses, cancer, alcoholism and other conditions.

An additional issue contributing to overcrowding is avoidable visits. As discussed by Parkinson et al. [6], there is no clear definition of this term. Nevertheless, the authors identify different groups of avoidable attendances: divertible (that would have more appropriately been treated elsewhere), preventable (attendance was appropriate but could have been prevented), and unnecessary (no care required). A systematic review found that inappropriate attendance ranged between 10 and 90 %, with nearly half of the studies placing the figure between 24 and 40 % [7]. Reducing these attendances can relieve pressures caused by overcrowding.

In the UK, many ED (commonly referred to as Accident and Emergency, or "A&E") visits take place for non-urgent conditions. NHS England estimated that 40 % of ED attendances and 24 % of admissions are preventable [8,9]. Bickerton et al. [10] report that a common assumption in the UK is that up to 60 % of emergency department (ED) attendances are non-urgent. This figure is not in line with the one reported by Ismail et al. [11] as the result of a systematic review of UK-based studies, which places this share at 40 % of all attendances. Studies based on specific cities or hospitals in England have reported figures between these two, e.g. 40 % Dale et al. [12] or 55 % [13]. The substantial cost to the NHS and the taxpayers of these "inappropriate" [14] ED visits has been widely publicised, and several solutions have been proposed (e.g. [15]).

Carret et al. [7]'s cross-country review finds strong evidence of an inverse association between age and inappropriate attendance. Morris et al. [16] identify those aged 18–45 as mainly responsible for avoidable attendance in the UK. Carret et al. [7] also find that females, those without comorbidities and not registered with a General Practitioner

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(GP) are more likely to attend unnecessarily. Dale et al. [12] links unnecessary attendances to milder symptoms or problems that started over 24 h before the visit, and often did not involve injury. Ismail et al. [11]'s review of UK studies has found that many studies cite access, patient self-assessment of illness severity and confidence in the quality of ED care as the main drivers of unnecessary attendance.

A systematic review of US studies identified convenience of accessing the ED and negative perception of other care providers as reasons for unnecessary attendance [17]. The latter is a key element, especially in terms of convenience, e.g. ease of setting appointments, waiting periods, and business hours [7,18].

A recent review of qualitative literature has shown that many relevant factors are hard to capture in traditional surveys or clinical data as they relate to subjective perception, nudging from other people or personal circumstances [19]. One such factor is patients' feelings towards their regular care provider, including whether they trust them. Continuity in the relationship between a patient and a physician is believed to be closely related to trust and associated with lower use of the ED [20]. Tarrant et al. [21] find that trust in a GP is associated with the anticipation of seeking care from them. Recent data collected as part of the "GP Patient Survey" run by NHS England [22] have highlighted that there is a small but growing share of patients who state they do not trust their healthcare professional at all, and around a quarter of patients trust them "to some extent", but the link with the overall use of health facilities has not been widely investigated.

Most studies investigating avoidable ED attendance rely on clinicians' or nurses' assessments of urgency based on vital signs and reported symptoms (e.g. [12]). A limited number of studies gather information on patients' perceived urgency. For example, Gill & Riley [23] interviewed patients who attended the ED with non-urgent symptoms but who perceived them as urgent. The study used a non-representative convenience sample. These studies demonstrate the difference in perception of urgency as assessed by patients and hospital staff (e.g. [24]).

In this study, we aim to better understand patient perceptions of avoidable ED visits. Surveying a representative sample of the population of interest, we compare respondents who, after having attended the ED, state whether their visit was necessary or whether they could have visited their GP instead. We focus on patient perceptions rather than clinical assessment of necessity. While the latter is standard practice, it has been criticised by existing literature. For example, Liu et al. [25] found that 4.2 % of "nonurgent'' patients were actually hospitalized, and some even died (0.03 %). Capturing patients' perspectives could help understand the relationship between avoidable attendance and socio-demographic and psychological factors. In turn, this could help design policies to encourage patients to use emergency services appropriately.

We use choice modelling to understand individual decisions (e.g. [26,27]). While controlling for the effect of socio-demographic characteristics in line with previous studies, we focus on the relationship between avoidable attendance and trust in GPs. Hence, we contribute to the literature both by capturing the patient's perspective and by isolating the effect of trust while controlling for known correlates of avoidable attendance.

## 2. Methods

### 2.1. Data collection protocol

The data was collected via an online survey funded by the NIHR Yorkshire and Humber Patient Safety Translational Research Centre (PSTRC). The survey took place in November and December 2019 and was aimed at understanding the use of EDs by UK residents aged 18–45, the category identified by previous studies as more likely to attend EDs unnecessarily. The University of Leeds Ethics Committee approved the survey (LTTRAN-101).

The main requirement for participation was age, but quotas were applied to promote representativeness in terms of gender, ethnicity and income.

The survey was informed by literature and designed in collaboration with experts from the PSTRC and an ED consultant. The questions were discussed with the Yorkshire Quality and Safety Research patient panel (https://yqsr.org/involving-patients-and-the-public/) to assess relevance, clarity and suitability. A pre-test with a small convenience sample was performed, and improvements were made based on their feedback. The data was collected via the survey company Qualtrics by recruiting participants from a large nationwide list of residents who are contacted via email and rewarded through a credit system. The sample size was pre-determined based on the project budget.

Respondents were asked about their last ED visit, including which symptoms they were experiencing, whether someone recommended they attend the ED and if they felt that their visit was necessary. They were also asked if they trusted their GP. Socio-demographic characteristics (e.g. age, gender, income, residential location) were collected, as well as ease of access to a GP and hospitals and pre-existing conditions.

Participants were asked to list the symptoms they were experiencing when they last visited the ED. Symptoms were classified into 6 categories:

1. Pain (e.g. abdominal) or infection
2. Injury or wounds
3. Adverse reaction to food/alcohol or vomit
4. Flu symptoms and headache
5. Mental health issues
6. Other symptoms (e.g. skin discomfort or toothache)

When asked whether they thought that their visit to the ED was necessary, patients could say that it was or indicate that they believe their issues could have been treated elsewhere, for example at the GP or the Pharmacy. For simplicity, we will call avoidable attendance (from the perspective of the patient) those cases in which patients stated that their visit could have been avoided, and in particular they could have seen the GP instead, which was the most frequent response.

### 2.2. Methodological framework

We developed a model that explains the factors related to avoidable ED attendance, with a specific interest in understanding whether a lack of trust in GPs affects the likelihood of attending the ED when not necessary. A key modelling challenge is to account for potential endogeneity. Our concern is that there might be unobserved factors affecting both the likelihood of someone attending the ED when not necessary as well as their trust in GPs. For example, people with undiagnosed or hard-to-diagnose conditions or certain mental illnesses might not trust their GP due to the lack of a clear treatment plan and seek care at the ED. Multimorbidity, associated with high-intensity use of EDs and socio-economic status could be other such factors [28]. Further, those who require care are often influenced by their caregiver, whose opinion may impact both avoidable ED attendance and GP trust [29]. Such confounders are unknown or cannot be quantified, thus justifying the modelling approach proposed in this paper.

Given that the two variables are recorded as binary outcomes, we apply a Recursive Bivariate Probit model (RBP). The RBP is widely recognised as a natural choice for modelling two dichotomous variables simultaneously [30,31]; see e.g. [32] or [33]. A RBP involves simultaneously estimating two probit models allowing for correlation in the error terms, and where one of the dependent variables is used as an explanatory variable in the other probit model. See the Supplementary document "Description of the methodology" for details on the model formulation.

## 3. Results

We first present the descriptive statistics of our sample and describe the key variables used in the study. We then present the RBP results.

### 3.1. Descriptive statistics

A total of 966 responses were collected across the UK. Participants stating that they had not been to the ED in the past 10 years or ever were excluded, as upon discussion with the patient panel we concluded that they would not be able to reliably recall whether their visit was avoidable. As the study focuses on contrasting people who believe that their ED attendance was necessary with those who believe they could have seen the GP, we also exclude observations from people who said their issue could have been dealt with elsewhere, e.g. at the pharmacy or using home remedies. This group included 71 respondents, and due to the limited number of observations for each outcome, these could not be incorporated into the model (see Appendix 2 for sensitivity analyses). We also excluded participants with missing home locations, as well as pregnant women, as their number was so low that we could not have controlled for it in our models. We also excluded those who were advised to go to the ED by a healthcare professional. This resulted in 572 usable responses.

As shown in Table 1, the sample is well-balanced and broadly representative of the population of interest in terms of gender, age and ethnicity. For details on the coding of the Level of deprivation (area), please see Appendix 1.

Table 2 shows the variables entering our model which relate to the respondents' relationship with their GP and their last visit to the ED. About 30 % of respondents believe that their last visit to the ED was avoidable and around 73 % trust their GP (see Table A1 in Appendix 1 for details on these variables). Due to the key role of the "trust" variable in this study, we also show how this varies across different groups of respondents (Table A3 in Appendix 1). Table 2 also shows which symptoms were reported to EDs and that a little less than half of the sample had experienced the symptoms for some time before going to the ED. Only 20 % of them were hospitalised.

We also include in the model the straight line distance between participants' homes (in the form of their postcode) and the nearest GP practice. The mean distance is 0.76 km, with a standard deviation of 0.95 km (see Supplmentary Fig. 1). This is simply used as a proxy. While distance to health facilities is not one of the key variables generally considered in ED attendance studies (perhaps partly due to the general reliance on clinical data), distance has been shown to affect the use of health providers (e.g. [34]), hence we believe it is appropriate to control for it in this context.

**Table 1**
Descriptive statistics for sociodemographic variables.

| | Levels | N | % sample | % population (2021 Census) |
|---|---|---|---|---|
| Sex | Female | 279 | 48.78 | 51 |
| | Male | 293 | 51.22 | 49 |
| Age | 18–24 | 112 | 19.58 | 23.1 |
| | 25–34 | 240 | 41.96 | 37.51 |
| | 35–45 | 220 | 38.46 | 39.39 |
| Occupation | Employed | 463 | 80.94 | 71.74 |
| | Student | 40 | 6.99 | 10.36 |
| | Not employed or unable to work | 69 | 12.07 | 17.91 |
| Education | No qualifications | 8 | 1.4 | 18.2 |
| | Level 1 | 51 | 8.9 | 9.6 |
| | Level 2 | 63.5 | 11.1 | 13.4 |
| | Apprenticeship | 0 | - | 5.3 |
| | Level 3 | 63.5 | 11.1 | 16.9 |
| | Level 4 | 306 | 53.5 | 33.8 |
| | Other | 80 | 13.99* | 2.8 |
| Ethnicity | Asian | 41 | 7.17 | 9.25 |
| | Black | 21 | 3.67 | 4.04 |
| | Mixed | 14 | 2.45 | 2.88 |
| | White British | 444 | 77.62 | 74.42 |
| | White other | 39 | 6.82 | 7.29 |
| | Other | 13 | 2.27 | 2.11 |
| Lived in UK since | I was born and raised in the UK | 504 | 88.11 | 84 |
| | >10 years | 36 | 6.29 | 9.28 |
| | 5–10 years | 19 | 3.32 | 2.72 |
| | 5 years or less | 13 | 2.27 | 3.84 |
| Level of deprivation (area) | High | 237 | 41.43 | 33.58 |
| | Medium | 225 | 39.33 | 41.01 |
| | Low | 110 | 19.23 | 25.41 |
| Region | North East | 21 | 3.67 | 4.07 |
| | North West | 67 | 11.71 | 11.40 |
| | Yorkshire and The Humber | 54 | 9.44 | 8.42 |
| | East Midlands | 43 | 7.52 | 7.50 |
| | West Midlands | 65 | 11.36 | 9.14 |
| | East of England | 35 | 6.12 | 9.73 |
| | London | 91 | 15.91 | 13.52 |
| | South East | 75 | 13.11 | 14.26 |
| | South West | 46 | 8.04 | 8.76 |
| | Scotland | 46 | 8.04 | 8.42 |
| | Wales | 29 | 5.07 | 4.78 |

### 3.2. Model results

Marginal effects derived from the RBP model are reported in Table 3. The estimated coefficients for the RPB and a range of sensitivity tests are shown in Appendix 2. Most variables enter both Equations, except for gender, length of residency in the UK and student status, which have been excluded from the *avoidable attendance* Equation. This is because

**Table 2**
Descriptive statistics for health and ED attendance-related variables.

| Variable | Levels | N | % |
|---|---|---|---|
| Avoidable attendance | 1. Yes | 190 | 33.22 |
| | 0. No | 382 | 66.78 |
| Distrust in GP | 1. Yes | 154 | 26.92 |
| | 2. No | 418 | 73.08 |
| Last visit to the ED | In the last 6 months | 134 | 23.43 |
| | Between 6 months and a year ago | 140 | 24.48 |
| | Between 2 and 5 years ago | 197 | 34.44 |
| | Between 5 and 10 years ago | 101 | 17.66 |
| Symptom presented | 1. Pain or infection | 174 | 30.42 |
| | 2. Trauma | 248 | 43.36 |
| | 3. Reaction to food/ alcohol or vomit | 67 | 11.71 |
| | 4. Flu symptoms and headache | 89 | 15.56 |
| | 5. Mental health issues | 62 | 10.84 |
| | 6. Other mild symptoms | 29 | 5.07 |
| Symptoms experienced for some time before going to A&E | 1. Yes | 265 | 46.33 |
| | 0. No | 307 | 53.67 |
| Outcome of last visit to A&E | 1. Hospitalised | 125 | 21.85 |
| | 0. Not hospitalised | 447 | 78.15 |
| Waiting time for an urgent GP appointment | 0. Same day | 232 | 40.56 |
| | 1. Within a week | 252 | 44.06 |
| | 2. Longer than a week | 88 | 15.38 |
| Distance to hospital | "Very far" | 21 | 3.67 |
| | "Far" | 81 | 14.16 |
| | "Neither far nor close" | 183 | 31.99 |
| | "Close" | 232 | 40.56 |
| | "Very close" | 55 | 9.62 |

**Table 3**
Marginal effects for the avoidable attendance Equation.

| Independent variable | Direct | Indirect | Total | [95 % Conf. Interval] (total) | |
|---|---|---|---|---|---|
| *Distrust in GP* | −0.315 | . | −0.315 | −0.5234 | −0.1065 |
| | *0.1064*** | . | *0.1064**** | | |
| *Symptom 1 (Pain/ infection)* | 0.0995 | 0.1170 | 0.2165 | 0.0521 | 0.3807 |
| | *0.0373**** | *0.0499*** | *0.0839**** | | |
| *Symptom 3 (Trauma)* | −0.0623 | −0.0296 | −0.0919 | −0.3067 | 0.1230 |
| | *0.054* | *0.0612* | *0.1097* | | |
| *Symptom 4 (Flu/ headache)* | 0.2075 | 0.2322 | 0.4396 | 0.2308 | 0.6484 |
| | *0.0475**** | *0.0636**** | *0.1066**** | | |
| *Symptom 5 (Mental health)* | 0.0759 | 0.1036 | 0.1795 | −0.0403 | 0.3991 |
| | *0.0548* | *0.0621** | *0.1122* | | |
| *Not white British* | 0.2114 | 0.2182 | 0.4297 | 0.2557 | 0.6035 |
| | *0.0377**** | *0.0575**** | *0.0888**** | | |
| *Hospital far* | −0.1465 | −0.0735 | −0.2200 | −0.3948 | −0.0451 |
| | *0.0433**** | *0.0585* | *0.0893*** | | |
| *Dist. GP* | −0.0616 | −0.0544 | −0.1160 | −0.2029 | −0.0290 |
| | *0.0209**** | *0.0257*** | *0.0444**** | | |
| *Symptoms before* | 0.1301 | 0.1158 | 0.2459 | 0.1026 | 0.3890 |
| | *0.0345**** | *0.0429**** | *0.0731**** | | |
| *Was hospitalised* | −0.2308 | −0.2231 | −0.4539 | −0.6570 | −0.2507 |
| | *0.0435**** | *0.0664**** | *0.1037**** | | |
| *Low deprivation area* | −0.0643 | −0.0810 | −0.1453 | −0.3186 | 0.0281 |
| | *0.0453* | *0.0463** | *0.0885* | | |
| *GP Wait time = a week* | 0.0076 | −0.0265 | −0.0189 | −0.1659 | 0.1283 |
| | *0.0382* | *0.0408* | *0.0751* | | |
| *GP wait time > a week* | 0.1605 | −0.0242 | 0.1364 | −0.0765 | 0.3492 |
| | *0.0743*** | *0.0571* | *0.1087* | | |
| *Female* | . | −0.0485 | −0.0485 | −0.0923 | −0.0047 |
| | . | *0.0224*** | *0.0224*** | | |
| *In UK < 5 years* | . | −0.1198 | −0.1198 | −0.2168 | −0.0228 |
| | . | *0.0496*** | *0.0496*** | | |
| *Student* | . | −0.0892 | −0.0892 | −0.1712 | −0.0071 |
| | . | *0.0419*** | *0.0419*** | | |

Standard errors are reported in *italic*.
"*", "**" and "***" mean that the effects are significant at the 10 %, 5 % and 1 % level respectively.

these variables were suspected to introduce multicollinearity, as we found a strong association effect between them and *distrust*, which is introduced as an endogenous predictor in the *avoidable attendance* Equation.

### 3.2.1. Results for the avoidable attendance equation

Marginal effects measure the magnitude of change in the conditional probability of the outcome variable when one covariate varies by a unit, all else being equal. Following Greene [30], we report both direct and indirect marginal effects. Direct marginal effects correspond to the effect that the variables entering the *avoidable attendance* Equation have on the probability of *avoidable attendance*. The indirect effects correspond to the influence that the variables entering the *distrust* Equation have on the probability of *avoidable attendance*. This is because *distrust* is introduced as a regressor in the *avoidable attendance* Equation, so the effect of the variables directly affecting the probability of *distrust* will indirectly affect the probability of *avoidable attendance*. Standard errors and confidence intervals were computed using the delta method [35]. Results are reported in Table 3. Detailed results including p-values, z-scores and confidence intervals for direct, indirect and total marginal effects are reported in Appendix 1.

The effect of *distrust in GP* is found to be strong and significant: patients who do not trust their GP are nearly 32 % less likely to state that their ED visit was avoidable. This result confirms the instrumental role of patient trust in avoiding avoidable ED visits also when comparing the magnitude of this effect to the ones of other variables considered.

Looking at the total effect of variables related to health status, patients who report pain and infection or flu symptoms and headache are respectively 21.65 % and 43.96 % more likely to say that their visit was avoidable, compared to people with mental issues, trauma, vomiting or an adverse reaction from eating food or drinking alcohol, and/or other mild symptoms. Finally, people who have experienced their symptoms for some time are 24.59 % more likely to state that they could have visited their GP rather than going to the ED, while it is −45.39 % for respondents who ended up being hospitalised.

People whose ethnicity is not White British are 42.97 % more likely to state that their visit was avoidable; while living in an area with a low index of deprivation has not been found to significantly influence model results. Respondents who reported living far from a hospital are 22 % less likely to state that their visit to the ED was avoidable. Moreover, each additional kilometre between a patient and the nearest GP reduces the chances they state that their ED visit was avoidable by 11.6 %.

The total marginal effect for the respondents who stated that they need to wait more than a week to get a GP appointment has not been found to be significant, but the direct effect shows that they are 16.05 % more likely to state that their ED visit while avoidable with respect to those who can get an appointment on the same day (no significant differences were observed for those who can get an appointment within a week).

Finally, we find that women are 4.85 % less likely to state that their visit was avoidable, while people who have recently moved to the UK and students are respectively 11.98 % and 8.92 % less likely.

Except for the variable related to waiting time to get a GP appointment, we find that indirect marginal effects generally account for more than half of the total effects, suggesting the strong role that *distrust in GP* plays in *avoidable attendance*.

**Table 4**
Marginal effects for the distrust in GP equation.

| Variable | Marginal effect | Std. Err. | z | P-value | [95 % Conf. Interval] | |
|---|---|---|---|---|---|---|
| *Symptom 1 (Pain/ infection)* | −0.0035 | 0.0381 | −0.09 | 0.93 | −0.0781 | 0.0711 |
| *Symptom 3 (Trauma)* | −0.0691 | 0.0516 | −1.34 | 0.18 | −0.1701 | 0.0320 |
| *Symptom 4 (Flu/ headache)* | 0.0118 | 0.0474 | 0.25 | 0.80 | −0.0811 | 0.1047 |
| *Symptom 5 (Mental health)* | −0.0261 | 0.0582 | −0.45 | 0.65 | −0.1402 | 0.0880 |
| *Not white British* | 0.0420 | 0.0423 | 0.99 | 0.32 | −0.0409 | 0.1248 |
| *Hospital far* | −0.1558 | 0.0410 | −3.8 | 0.00 | −0.2361 | −0.0754 |
| *Dist. GP* | −0.0272 | 0.0173 | −1.57 | 0.12 | −0.0611 | 0.0067 |
| *Symptoms before* | 0.0559 | 0.0362 | 1.54 | 0.12 | −0.0152 | 0.1269 |
| *Was hospitalised* | −0.0705 | 0.0423 | −1.67 | 0.10 | −0.1534 | 0.0125 |
| *Low deprivation area* | 0.0110 | 0.0431 | 0.25 | 0.80 | −0.0735 | 0.0954 |
| *GP Wait time = a week* | 0.0576 | 0.0377 | 1.53 | 0.13 | −0.0163 | 0.1314 |
| *GP wait time > a week* | 0.3414 | 0.0426 | 8.01 | 0.00 | 0.2579 | 0.4250 |
| *Female* | 0.0791 | 0.0328 | 2.42 | 0.02 | 0.0149 | 0.1433 |
| *In UK < 5 years* | 0.1954 | 0.0727 | 2.69 | 0.01 | 0.0530 | 0.3379 |
| *Student* | 0.1455 | 0.0584 | 2.49 | 0.01 | 0.0310 | 0.2600 |

#### 3.2.2. Results for the distrust in GP equation

As with the *avoidable attendance* Equation, results are reported in the form of marginal effects, detailed in Table 4 below. There are no indirect marginal effects for this Equation. We found a clear link between *distrust in GP* and the waiting time to get a GP appointment. Respondents who stated that they could get an appointment within a week are 9 % more likely to express distrust towards their GP, compared to respondents who can get an appointment within a day. Respondents who need to wait for more than a week are found to be 34.14 % more likely to distrust their GP.

Moreover, we find that female patients are 7.91 % more likely to express distrust towards their GP compared to males. Students are 14.55 % less likely to trust their doctor than employed and non-working people. Those who recently moved to the UK are also significantly less likely to express trust towards their GP (19.54 %) than others.

Most of the other variables in the second equation are either not statistically significant or not meaningful from an interpretation standpoint but were included for consistency with the first equation. This is not a strict requirement for model identification, as Maddala [36] first suggested introducing exclusion restrictions where one or several explanatory variables should only be included in $Y^{*}_{2,i}$. However, Wilde [37] demonstrated that this doesn't need to be the case and model identification can be achieved when there is sufficient variation in the data, as also discussed by Brugiavini *et al.* [38], who adopted a modelling strategy similar to ours (this is also the case for Green [30] among other seminal examples).

## 4. Discussion

The results of our model are largely in line with existing literature, and incorporating multiple factors in the model simultaneously allows us to assess their impact all else being equal.

Patients who distrust their GP are nearly 31.50 % less likely to state that their ED visit was avoidable. To understand this conclusion, it is important to remember that avoidability is assessed from the patient, rather than the clinician's, perspective. This means that patients who distrust their GP thought that they could not have cared for them, and had no option but to go to the ED. Such an assessment could conflict with the one by the healthcare provider, who might believe that the symptoms such patients presented with were not appropriate for the ED. Such an interpretation seems to align with studies that find that the prevalence of unnecessary attendance (when measured with triage codes) is significantly higher among patients who do not trust their primary health provider (Afilalo et al. [39]).

While our survey asked respondents directly whether they trusted their GP, we acknowledge that this might be one element in a larger set of feelings towards the primary health care provider which are linked to satisfaction with their services (e.g. Sarver et al. [40]). While it is not within the scope of this paper to identify such components, we contribute to this discussion by showing the importance of one such factor.

Another important aspect that the existing literature associates with nonurgent ED attendance relates to accessibility (e.g. Sarver et al. [40]). When considering the perspective of the patient, we find that people who live closer to a hospital or far from a GP practice are more likely to be convinced that their visit was not avoidable, highlighting that, irrespective of the outcome of the consultation, they might still believe that they could not access regular care providers. We appreciate that straight-line distance is a relatively crude way to represent accessibility and that a more sophisticated approach might involve considering car ownership and transport networks.

Existing literature confirms our finding that people who do not act quickly upon the insurgence of symptoms are more likely to use the ED unnecessarily (e.g. [41]).

Our finding that people from ethnic minority backgrounds are more likely to state that their visit was avoidable is in line with the literature showing that such patients are more often presenting to the ED with non-urgent symptoms, although most results are from studies based in the US (e.g. Liu et al. [25]). In the UK, there are differences in terms of general health across different ethnic groups, as well as differences in health literacy [42], which might result in higher use of emergency services.

We find that patients reporting pain and infection, flu symptoms and headache as well as mental health issues are less likely than others to think that their visit was unavoidable. As most of the literature relies on ED staff assessment of urgency given a wide range of categorisations of the symptoms, a comparison is not immediate. We can affirm with a good level of confidence that some of these symptoms, such as flu symptoms and headache, would be classified as non-urgent. Similarly, patients who ended up being hospitalised are 45.39 % more likely to think that their visit was not avoidable than those who were not. Concerning such results, we need to acknowledge that respondents were asked to reflect on their choice ex-post, and they might have been told by the ED staff that their visit was not appropriate. The data were collected across ten years and this might imply a shifting perception of avoidable attendance over time, although an examination of the answer to this question by year of ED visit showed that the variation was random.

When it comes to our second model (where "trust" is the dependent variable), the result showing that female patients are less likely to trust their GP is in line with existing literature (Tarrant et al. [21]). This study also finds that younger people are less likely to trust their GP. In our case, age variables were not significant, but we found a negative effect for students. As occupational status was not included in most past studies, a comparison is difficult, but as age and occupational status are generally correlated, the wider range of socio-demographics collected in our case might enable us to better explore the relevance of different factors linked with trust in the GP.

This study presents some limitations. The significance of marginal effects does not imply causality. We can hence say that there is an association between trust in the GP and avoidable ED attendance, but richer causal patterns could only be derived by using panel data. We are also potentially subject to two selection biases due to using an online survey and largely capturing urban dwellers.

In our study, we do not rely on objectively defined measures of avoidable attendance, but we capture patients' perceptions, which implies possible sources of noise in terms of how different people might have interpreted the questions and what their ideas about health services, which are not all captured in the survey for the mere reason of having a tractable survey length. While this can be seen as a limitation, it also constitutes a strength of the study, which takes a different perspective from most previous work, helping to shed light on the dissonance between the professionals' and the patients' perspectives.

## 5. Conclusions

These results shed light on the patient perspective of avoidable attendance of ED visits in the UK. We have shown that there are significant correlations between avoidable attendance and patients' characteristics, such as their ethnicity, residential location, and symptoms experienced. We have also found a relationship between avoidable attendance and wait time for a GP appointment and trust in the GP.

While the present study aims to provide insights into behaviour rather than directly inform policy, we believe that there are different ways the study could support practice. A key conclusion is that unnecessary ED attendance may be more likely generated by patients who distrust their GP. We also found that reducing waiting time for a GP appointment seems like a clear way to attempt to increase trust, although there might be other hidden factors.

The factual and psychological factors affecting the relationship between patients and healthcare providers are likely complex, and further research will hopefully shed more light on it, with new insights to support the study of unavoidable ED attendance as well as other

research questions. We also believe that future research should more formally compare the assessment of avoidable attendance from the patient and healthcare professional perspectives, to better understand where discrepancies occur and how to address them. Finally, as other studies before this have hypothesised, clearer communication by the GP on what requires emergency care and what alternative options, such as minor injuries services and helplines, might help reduce the pressure on EDs.

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## CRediT authorship contribution statement

**Chiara Calastri:** Conceptualization, Data curation, Formal analysis, Project administration, Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing, Funding acquisition, Investigation. **John Buckell:** Conceptualization, Investigation, Writing – review & editing. **Romain Crastes dit Sourd:** Data curation, Formal analysis, Methodology, Software, Writing – review & editing.

## Declaration of competing interest

None.

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.healthpol.2025.105265.

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