

# **Use of Emergency Departments (ED) during the first wave of the SARS-CoV-2 pandemic in the UK: Insights and lessons learnt**

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## Abstract

### Background

The coronavirus pandemic has been linked to a sharp drop in Emergency Department (ED) attendances in Spring 2020, but the exact reasons for such drop are unclear.

### Aim

To investigate if and how patients decision to go to the ED differ during a pandemic and to understand who still attends EDs and why and whether avoidable attendances reduce.

### Methods

Two online surveys were conducted before (Nov-Dec 2019; N=996) and during (May 2020, N=1,411) the pandemic. Both samples were recruited by a survey panel and representative of the UK population aged 18-45. The key outcomes measured in the first study concern the circumstances and reasons for the last ED attendance. The second survey captures similar information but with a focus on how the pandemic affected such choices.

### Results

Compared to 2019, a higher proportion of flu-like symptoms was reported to EDs in 2020. Those more likely to attend the ED in a pandemic live closer to a hospital and do not have chronic illnesses. About 85% of respondents who did not go to EDs in 2020 declared that their reasons were related to the epidemic.

### Conclusions

If ED attendance is to be discouraged by people potentially infected with the virus, more effective policies need to be enforced. The pandemic acted as a strong deterrent to go to the ED for people who presented serious symptoms, mainly for fear of catching the virus or putting others at risk. This could have serious consequences in the long run.

## What this paper adds

What is already known on this subject	<ul style="list-style-type: none"><li>- Overcrowding and the share of avoidable attendances at EDs are key challenges in the UK</li><li>- Limited research investigates patients' decisions to attend the ED, possibly because of the difficulty in gathering suitable data</li><li>- The Covid-19 pandemic brought about a sharp decrease in attendance, and further understanding of patients decisions at this time might help tackle avoidable attendance.</li></ul>
What this study adds	<ul style="list-style-type: none"><li>- Different conditions reported during a pandemic: more flu-like symptoms and less injuries and wounds.</li><li>- People who do not go to the ED when needed during the pandemic report</li></ul>

	<p>reasons such as fear of infection or to overburden the system.</p> <p>-A higher share of attendance during the pandemic is deemed unnecessary by patients</p>
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## Introduction

In 2020, the world has experienced major disruption due to the SARS-CoV-2 (also referred to as Covid-19 or coronavirus) pandemic. On 14 May 2020, while the need for Intensive Care Units (ICU) in the UK was exceeding capacity, the National Health Service (NHS) reported<sup>1</sup> that ED attendances in April 2020 had been 57% lower than those recorded in the same month the previous year. Such drop might be related to people avoiding ED for fear of infection<sup>2</sup>, but possibly also to a lower rate of infection by other viruses due to lockdown<sup>3</sup>. This created concern that people with potentially serious conditions might not attend EDs during the pandemic, potentially worsening their condition in the long run.

The Royal College of Emergency Medicine highlighted the need to learn from the crisis to rethink the provision of care at EDs<sup>4</sup> and tackle inappropriate attendances which result in crowding and risk of infection. Indeed, the number of ED attendances in the UK has been increasing for years (NHS England and NHS Digital, 2019) and a large proportion are believed to relate to non-urgent conditions. A recent study reports a mean figure of 19.4%, with ample variation across hospitals and departments (Morris et al., 2018), although the nature of this problem remains partly unclear due to the differences in the literature on what constitutes an urgent condition (O’Keeffe et al. 2018). Tackling such inefficiencies is especially important against the backdrop of an ageing population (which implies higher treatment costs) and the slowing growth of NHS funding observed in the past 10 years.

One of the objectives of this study is tackling a key shortcoming of studies focusing on unnecessary attendance: the reliance on data collected at or by EDs. The worthiness of the symptoms is assessed clinically and only patients who visited an ED are considered. But in order to understand which patients are more likely responsible of avoidable attendances, it is essential to capture their point of view and survey both patients who decide to go to ED upon feeling ill and those who do not, as only this will allow to compare the two groups.

<sup>1</sup> NHS England, *Monthly Data - A&E Attendances and Emergency Admissions*. Url: /

<sup>2</sup> Sky News, 14 May 2020, *Coronavirus: A&E visits fall to record low as people stay away during outbreak*. Url: <https://news.sky.com/story/a-e-visits-down-57-in-april-compared-to-last-year-11988038>

<sup>3</sup> The Health Foundation, 15 May 2020, *How is COVID-19 changing the use of emergency care?*. Url: <https://www.health.org.uk/news-and-comment/charts-and-infographics/how-is-covid-19-changing-the-use-of-emergency-care>

<sup>4</sup> Royal College of Emergency Medicine. Covid-19: Resetting emergency department care. 6 May 2020. [https://www.rcem.ac.uk/docs/Policy/RCEM\\_Position\\_statement\\_Resetting\\_Emergency\\_Care\\_200506.pdf](https://www.rcem.ac.uk/docs/Policy/RCEM_Position_statement_Resetting_Emergency_Care_200506.pdf).

Focusing on patients' perspective also allows us to understand whether they make different care-seeking decisions during a pandemic. The use of separate pre- and during-pandemic samples allows us to compare the two settings and gain insights into the use of ED in both circumstances.

Specifically, this study aims to answer the following questions:

1. Do people seek urgent care in different circumstances during a pandemic?
2. Who attends the ED during a pandemic, and why?
3. Does the share of avoidable attendance change during a pandemic?

## **Methods**

### *Setting*

Two online surveys were conducted as part of the "Safety Innovation Challenge" initiative, funded by the NIHR Yorkshire and Humber Patient Safety Translational Research Centre (PSTRC). The first took place in November and December 2019 and aimed at understanding the use of EDs by people aged 18-45, the category mainly responsible for avoidable attendance (e.g. Morris et al., 2018).

The second survey, very similar to the first one but with minor changes to account for the pandemic circumstances, was conducted in May 2020. Both surveys were approved by the University of Leeds Ethics Committee.

### *Participants*

The first survey collected 966 responses, the 2020 survey 1,411. There was no overlap as the two groups were recruited separately. The main requirement for participation was age, but quotas were applied to ensure representative samples of the relevant population (18-45 years old and UK resident) in terms of gender, ethnicity and income. Participants who reported that they have not been to EDs in the past 10 years or ever were excluded from the analysis, as they would not be able to report details about their choices.

### *Interventions*

The two surveys were designed in collaboration with experts from the PSTRC and an ED doctor and informed by previous literature. The questions were discussed with the Yorkshire Quality and Safety Research patient panel<sup>5</sup> to assess relevance, clarity and suitability, and pre-tested with a small convenience sample directly recruited by the research team. The data was collected via the survey company Qualtrics, which recruits potential participants from a large nationwide pool of people and rewards them via a credit system. The company delivered two samples of a pre-established size and ensured their representativeness, in line with census data.

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<sup>5</sup> Url: <https://yqsr.org/involving-patients-and-the-public/>

We collected socio-demographic characteristics (e.g. age, gender, income, residential location), ease of access to a General Practice (GP) and hospitals and pre-existing medical conditions. Respondents were asked details about the last time they visited the ED as well as their symptoms, the circumstances and whether they feel they could have sought care elsewhere<sup>6</sup>. The second survey included additional questions to infer the reasons for going/not going to the ED during the Covid-19 pandemic.

### *Analysis*

The data from the two surveys was merged in Microsoft Excel, which was also used to produce descriptive statistics and bar charts. Statistical testing was performed in R (R Core Team, 2020). In order to answer RQ1 we perform Chi-Square tests to compare the reasons that brought people to EDs before and during the pandemic (i.e. after 10 March 2020<sup>7</sup>).

RQ2 is tackled by analysing a subsample of the second survey made up of respondents who reported experiencing severe health symptoms after March 10. Among them, only 38% went to the ED. Chi Square tests allow us to establish which characteristics distinguish people who decide to go or not to go to the ED in such circumstances. Most respondents in the second survey had been to EDs in the past 10 years but had not experienced symptoms since March 10. We thus asked them to imagine that on the day of the survey they were experiencing the same symptoms as when they last visited ED and to state whether they would still go to the ED to seek care during the pandemic. We produced charts to present the outcome of this hypothetical question.

RQ3 aims to understand the effect of the pandemic on avoidable attendances. In both surveys, respondents who reportedly visited EDs in the past 10 years were asked to consider whether their last visit to the ED was avoidable, and whether their condition could have been treated elsewhere, such as at the GP practice or at the Pharmacy. We use Chi-Square tests to assess the differences between the pre and during-pandemic responses. Figure 1 clarifies the key questions of the survey used for the analysis, with the relevant sample sizes.

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<sup>6</sup> The full list of variables collected in the survey is available in the [Online Appendix](#)

<sup>7</sup> Date chosen as the “start” of the pandemic in the UK, when awareness of the virus became acute in the country with nearly 400 cases and 6 deaths.

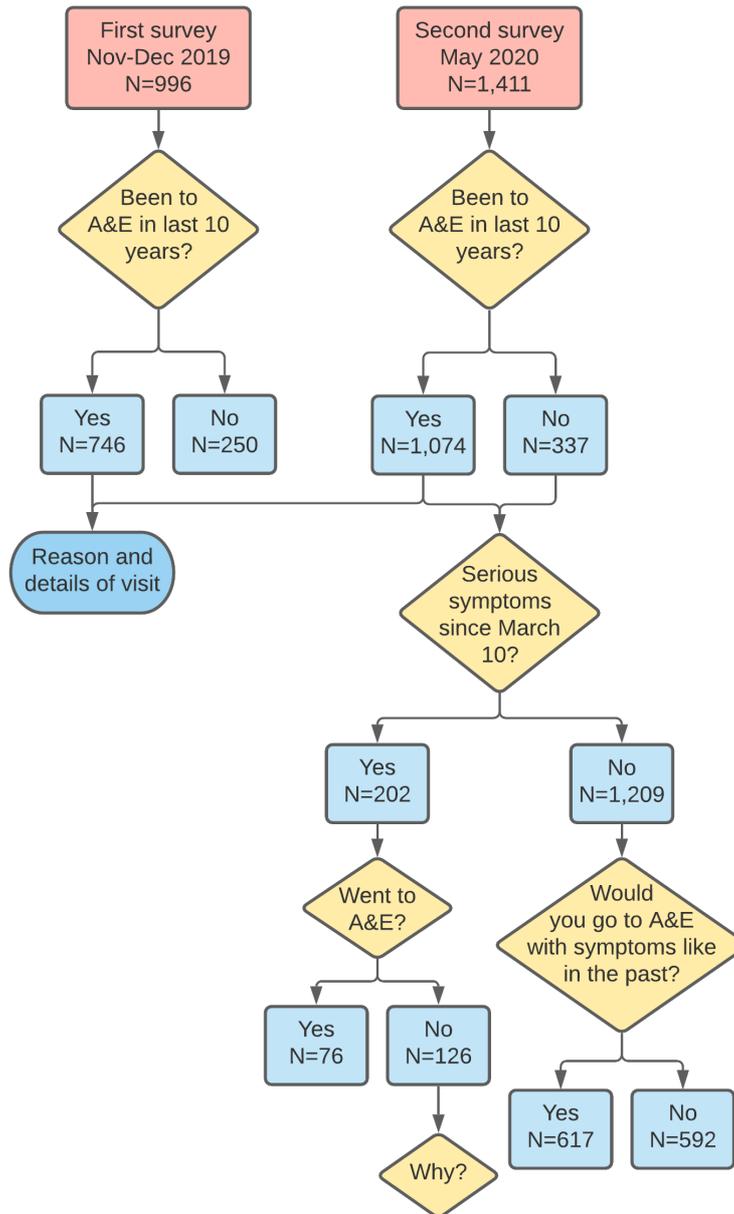


Figure 1

## Results

### RQ 1: Do people seek urgent care in different circumstances during a pandemic?

Figure 2 shows the percentage of people who went to the ED with a given symptom before and during the pandemic. The former could have participated in either the first or second survey while the latter are from the second survey (cf. Table 1, showing the number of observations for each RQ).

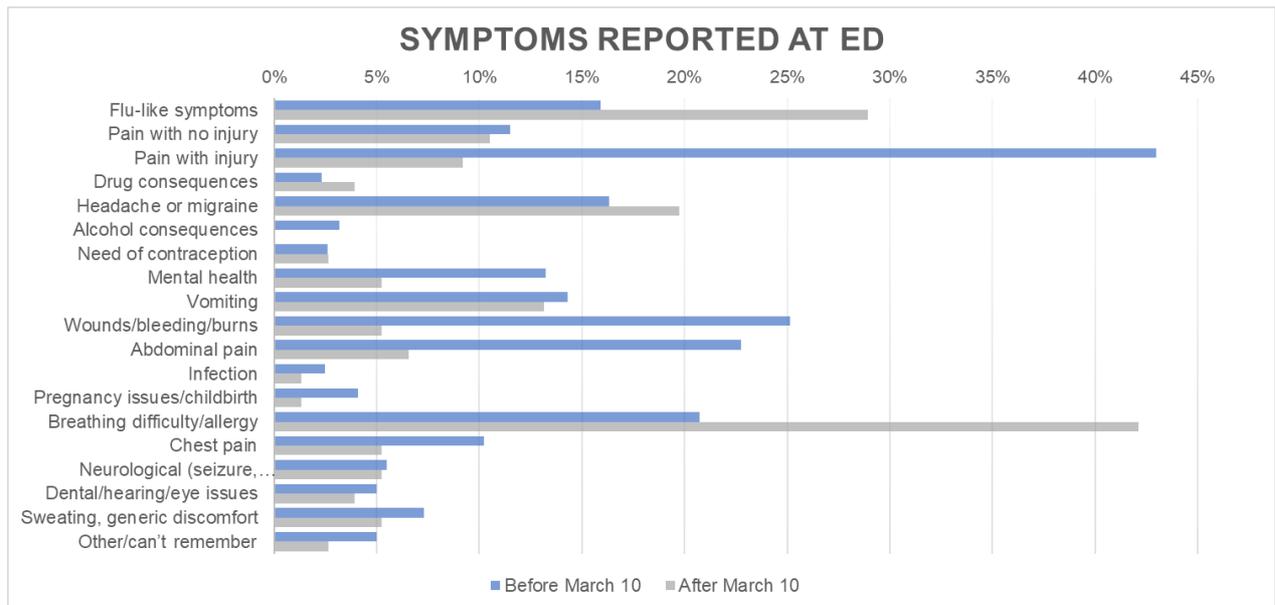


Figure 2

People who go to the ED during the pandemic report a much higher rate (the difference is statistically significant) of potential coronavirus-related symptoms, i.e. *Flu-like symptoms*, *Headache or migraine* and *Breathing difficulty/allergy*.

The share of patients presenting *Pain with injury* and *Wounds* is instead significantly lower. There are no significant differences in the number of cases with *Pain with no injury*, *Vomiting* and *Abdominal pain*. The limited number of observations made it impossible to conduct the test for the difference for other conditions.

		RQ 1 and 3			RQ 2		RQ 2 (hypothetical Q)	
		First survey (N=1,744)	Second survey (N=76)	Total	First survey (N=0)	Second survey (N=202)	First survey (N=0)	Second survey (N=202)
Sex	Female	886	33	919	-	85	-	641
	Male	858	43	901	-	117	-	568
Age	18-24	462	30	492	-	72	-	352
	25-34	683	24	707	-	74	-	418
	35-45	599	22	621	-	56	-	493
Ethnicity	Asian	122	6	128	-	18	-	86
	Black	53	6	59	-	13	-	31
	Mixed	27	2	29	-	4	-	27
	White	1502	57	1559	-	156	-	1050
	Other	27	6	33	-	11	-	15

Table 1

### Research question 2: Who attends the ED during a pandemic, and why?

Table 2 shows the results of Chi Square tests investigating the association between the choice to go to the ED during a pandemic and a number of variables. A higher share of those with lowest and highest education attend ED during the pandemic. We find no significant difference in terms of sex, age, income, car availability and living status (i.e. whether a person lives alone or with others). People living nearer a hospital are more likely to attend the ED (in line with findings by McKee et al, 1990). Patients with a chronic conditions are less likely to attend the ED, possibly as a result of being more careful to shield themselves from coronavirus and other viruses/infections. A connection with past experience with hospitals was also found.

Variable	Categories	Share not going	Share going	Pearson's Chi-squared test (p-value)
Sex	Male	63%	37%	0.7642
	Female	61%	39%	
Age	Age 18-24	58%	42%	0.4923
	Age 25-34	68%	32%	
	Age 35-45	61%	39%	
Income	Low income	60%	40%	0.7430
	Medium income	66%	34%	
	High income	61%	39%	
Education	No Uni degree	58%	42%	0.0013
	UG degree	84%	16%	
	PG degree	51%	49%	
Car in household	Has car	63%	37%	0.4731
	No car	55%	45%	
Cohabitation	Lives with others	64%	36%	0.2526
	Lives alone	52%	48%	
Perceived distance to hospital	Very far	52%	48%	0.0055
	Far	80%	21%	
	Neither far nor close	68%	32%	
	Close	56%	44%	
	Very close	35%	65%	
Chronic illness	Has chronic disease	69%	31%	0.0038
	Does not have chronic disease	49%	52%	
Overall experience with hospitals	Positive	51%	50%	0.0003
	Some positive, some negative	79%	21%	
	Negative	53%	47%	
Hospitalisation experience	Hospitalised in the past	64%	37%	0.5576
	Never Hospitalised in the past	59%	41%	

Table 2

Respondents not going to the ED in spite of experiencing serious symptoms<sup>8</sup> did so because they were self-isolating (44%, cf. Figure 3). Other reasons were avoiding the risk of catching covid-19 (25%) or other viruses (28%). Overall, 85% of respondents declared that their reasons not to go were related to the pandemic.

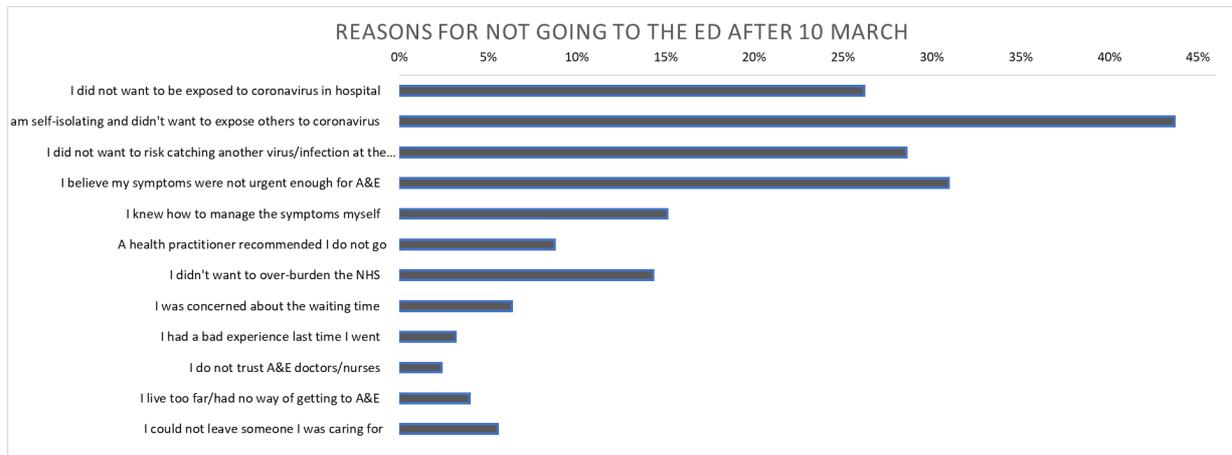


Figure 3

Half of the people who were asked the hypothetical question (i.e. whether they would have gone to the ED today if they had experienced the symptoms from the last time they went to ED) stated that they would still go. Those who stated they would not go had reported the symptoms presented in Figure 4 below upon their last visit to the ED. Nearly 25% presented pain after an injury, 17% had chest pain and 11% presented wounds or bleeding.

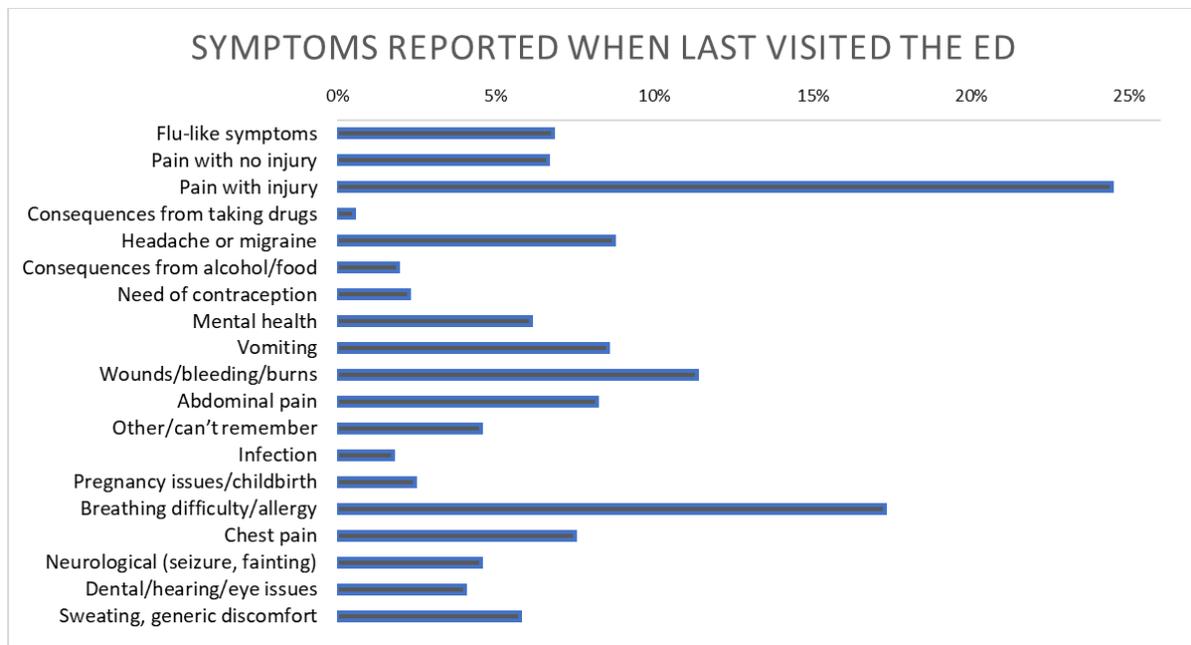


Figure 4

<sup>8</sup> Patients were asked to select their symptoms from an extensive list. In the analysis phase, we established which are considered worthy of emergency care with the help of existing literature and input from ED consultants. We refer to these as “serious” conditions from the perspective of the patient.

When asked why they would not go to the ED with such symptoms during the pandemic, 24% reported as the main concern the fear of catching covid-19 while at hospital (cf. Figure 5). In the figure, next to the value for all respondents considered, we highlight the response by those presenting symptoms classified as “serious”.

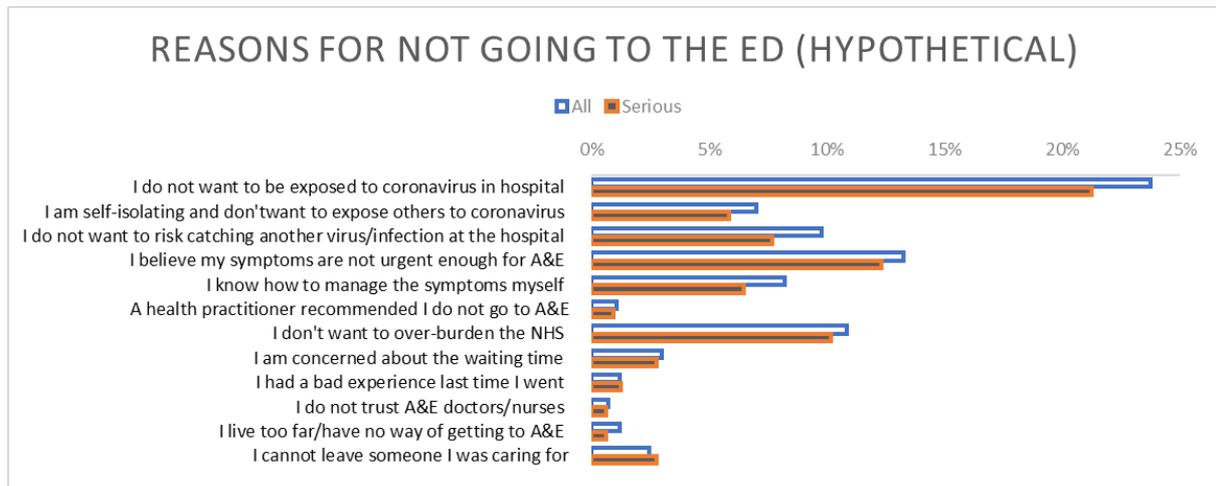


Figure 5

### Research question 3: Does the share of avoidable attendance change during a pandemic?

The Chi-square test shows a significant difference ( $p$  value:  $1.65^{-7}$ ) in the perception of whether a visit was avoidable depending on whether it took place before or after March 10. A lower share of the attendances after March 10 are deemed necessary, with a higher share of people thinking they could have gone to the Pharmacy instead.

Could you have been treated elsewhere?	Before 10 March	After 10 March
No, I don't think so	62%	43%
Yes, at the GP/district nurse/other clinic	31%	32%
Yes, at the pharmacy	4%	16%
Yes, at home (no action)	3%	9%

Table 2

## Discussion

Our results show that people report different symptoms to the ED during a pandemic, in particular a higher share of potential Covid-19 symptoms and fewer cases of *Pain with injury* and *Wounds*. The decision to go to the ED during a pandemic is not related to respondents' socio-demographics (although we find an education effect), but we find links with previous experiences and chronic conditions. People with mixed experience of hospitals as well as those living nearer to hospitals are more likely to go to the ED while patients with chronic

conditions are less likely. A lower share of the patients who went to the ED during the pandemic believe that their visit was unavoidable<sup>9</sup>.

There is obviously limited literature on the Covid-19 pandemic, but our findings in terms of associations between use of the ED and patient characteristics are in line with previous work, e.g. McKee et al (1990) finds an association between proximity to a hospital and use of the ED.

The small number of observations for people who attended ED during the pandemic limits the amount of findings, but is sufficient for a number of statistically significant results. These show how our approach of focusing on patients' perceptions and collecting data from both people who do attend ED and people who do not can produce relevant insights.

We acknowledge that our analysis of a hypothetical question, presented in support of the main analysis, might not reflect real-life behaviour but can still contribute to the overall picture of patient behaviour. When it comes to avoidable attendance, it was our intention to capture patients' perceptions rather than clinical assessment. At the same time, we acknowledge that participants might have been explicitly told by ED staff that they should not have attended. In the case of people reporting potential covid-19 symptoms, this would explain the high share of people stating that their issues could have been addressed through the Pharmacy.

Our finding that a lower share of injuries and wounds reported might signal that some people are not attending when they need to. Indeed, we find that patients who experience serious symptoms but do not go to the ED largely do so for fear of the virus or to protect others, effectively putting themselves at risk of worsening their condition. This, together with the high share of patients attending with potential covid-19 symptoms, suggests potential communication issues to be tackled.

In conclusion, this study provides new insights on the use of ED during a pandemic and how this differs from previous years in terms of symptoms reported, attendance and perception of avoidability of visits. The study gathers the decisions and perceptions of patients, hoping to shed light on how and why people decide to seek urgent care.

## References

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<sup>9</sup> The pre-pandemic data gathers experience across ten years and this might imply a shifting perception of avoidable attendance over time. To test this, we examined the answer to this question by year of ED visit and found that the variation pre-Covid was mainly random.

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