RCEM
Royal College of Emergency Medicine

Patron: HRH Princess Royal
Octavia House
54 Ayres Street, London
SE1 1EU

Tel +44 (0)20 7404 1999
rcem@rcem.ac.uk
www.rcem.ac.uk

Health and Social Care Select Committee

Addendum to the topical session on A&E

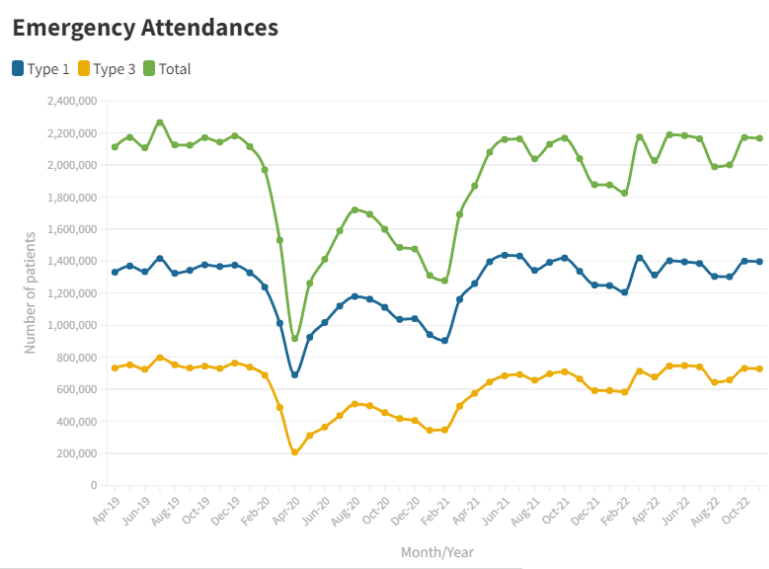
Introduction

The Urgent and Emergency Care (UEC) system supports a significant number of patients with a vast variety of medical conditions and social problems, ranging from acute emergencies and trauma to acute mental health crises, and the care of homeless, and elderly patients. Emergency Departments (EDs) are by their nature dynamic, providing responsive care to those who need it and an essential front-line service available 24 hours a day, seven days a week. Very few people plan to visit an ED, yet everyone is a potential patient.

This document is an addendum to the topical evidence session at the Health and Social Care Select Committee on A&E delivered on the 24th of January. It provides additional information about Emergency Department demand, outlines the evidence that links long waiting times to patient harm and excess deaths, explains the methodology behind the College's excess deaths calculations, and provides additional information on capacity in hospitals, NHS 111 and performance metrics.

Emergency Department Demand

Performance figures for December 2022 reveal that there were 54,532 12-hour stays from decision to admit – the highest figure on record – and the four-hour target stood at 49.6%.[1] This signals that the emergency care service is unable to provide responsive and safe care to patients with the current level of resource.

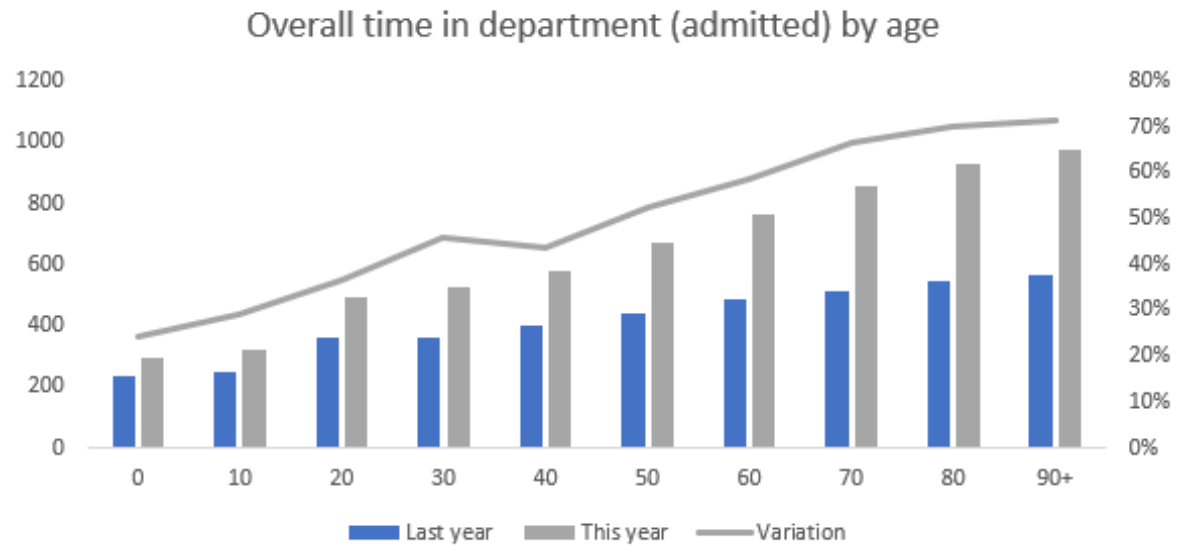


ED attendance figures can provide a useful measure of overall demand for emergency care. The graph above shows that attendances to Type 3 services remain below pre-pandemic

[1] RCEM Data & Statistics

levels and attendances to all forms of emergency service have remained static over the past few months.

NHS England recently reported that over the last five to seven years the percentage of patients attending an ED with more than three long-term conditions has risen from 10% to 30%.[2] Patients who are stuck in crowded corridors require admission. These patients are most at risk of harm and cannot be redirected to a GP, urgent treatment centre, and are generally unable to care for their own medical needs through an online or telephone service. There is little evidence to suggest that solutions aimed at managing demand to EDs will improve crowding.



Additionally, there is a huge variation of waiting times. The graph above shows the average time in department for admitted patients broken down by age. As the age of the patient increases the change in time in department exponentially increases. Older people are more vulnerable to the harms of long stays in EDs.

Why is crowding associated with excess deaths?

RCEM has long argued that crowding is dangerous for patients. Several primary research studies and systematic reviews have examined the link between ED crowding, delay to admission and subsequent death. Crowded EDs delay and dilute the quality of care, and while this may not have an immediate effect on the patient, it increases a patient's risk of death after they have left the ED. Several primary research studies and systematic reviews have examined the link between ED crowding and subsequent death.

<u>UK studies examining the link between crowding and excess deaths</u>

In England, the harm caused by crowding in the ED was modelled by the National Bureau of Economic Research and IFS in 2018. The research focused on the counterfactual question of what would have happened if the 4-hour standard had not existed between 2011 and 2013. They found that 30-day patient mortality was reduced by 0.4% as a result of the ED 4-hour standard.[3] The NHS Benchmarking Network looked at data for 2019–2020 and found a coefficient of determination of 0.07 between ED stays of 4 hours or longer and the Summary

[2] House of Lords, Public Service Committee, Access to Emergency Services
[3] Gruber J, Hoe TP, Stoye G. Saving lives by tying hands: the unexpected effects of constraining health care providers. National Bureau of Economic Research and Institute of Fiscal Studies, 2018. http://www.nber.org/papers/w24445

Hospital-level Mortality Indicator for a hospital. This suggests that time in ED would explain 7% of the variation in mortality between sites.[4]

In 2022, a cross-sectional, retrospective observational study was carried out of patients admitted from every Type 1 ED between April 2016 and March 2018. Observed mortality was compared with expected mortality, as calculated using a logistic regression model to adjust for sex, age, deprivation, comorbidities, hour of day, month, previous ED attendances/emergency admissions and crowding in the department at the time of the attendance. The research concluded that delays to hospital inpatient admission for patients in excess of 5 hours from time of arrival at the ED are associated with an increase in all-cause 30-day mortality.[5] Between 5 and 12 hours, delays cause a predictable dose–response effect. For every 82 admitted patients whose time to inpatient bed transfer is delayed beyond 6 to 8 hours from time of arrival at the ED, there is one extra death. For every 72 admitted patients whose time to the inpatient unit is delayed beyond 8 to 12 hours from time of arrival at the ED, there is one extra death. The College has utilised this modelling to calculate the number of excess deaths associated with crowding in EDs.

International evidence on the association between crowding and excess deaths

There is a growing body of international evidence to suggest that delays in EDs are associated with excess deaths, this appears to be replicated in most countries that have an emergency care system. Research from the US examined five million discharge records from hospitals across California between October 2015 to the end of 2017. The research found that as the ED in a hospital became more crowded, people throughout that hospital became more likely to die.[6] When ED occupancy was above average, inpatients in the hospital were 3.1% more likely to die. Then, when the ED became more crowded, inpatients were 3.8% more likely to die than the average death rate for all patients. When EDs were the most crowded, patients were 5.4% more likely to die.

Further US evidence shows that when a new hospital is opened nearby, overall, ED occupancy drops by 10% and there is an associated 24% drop in in-hospital mortality[7]. Hence, when there is less demand in EDs and there is less crowding, there is a lower risk of mortality. A cohort study carried out in Stockholm of 7 EDs found that ED crowding was associated with an increased 30-day mortality.[8] In Australia, a retrospective analysis of admissions and death records were carried out in three urban hospitals. The research found an association between hospital and ED overcrowding and increased mortality.[9]

Morley et al carried out a systematic review to critically analyse the findings of peer-reviewed research studies investigating the causes and consequences of crowding. They identified 40 studies describing adverse consequences of crowding, where six studies showed an association between crowding and mortality[10].

[4] NHS Benchmarking Network. Acute Hospital bed stock analysis: a review of bed numbers and hospital KPIs between 2010/11 and 2019/20. Manchester: NHSBN, 2021.
[5] https://emj.bmj.com/content/emermed/39/3/168.full.pdf
[6] Hsuan, C., *et al.* (2022) Association of emergency department crowding with inpatient outcomes. *Health Services Research.* doi.org/10.1111/1475-6773.14076.
[7] Woodworth (2020). Swamped: Emergency Department Crowding and Patient Mortality. https://www.sciencedirect.com/science/article/abs/pii/S0167629618311676?via%3Dihub
[8] https://onlinelibrary.wiley.com/doi/10.1002/emp2.12243
[9] https://pubmed.ncbi.nlm.nih.gov/16515429/
[10] Morley et al (2018). Emergency department crowding: A systematic review of causes, consequences and solutions. https://pubmed.ncbi.nlm.nih.gov/30161242/

Recent estimates of excess deaths relating to crowding

RCEM's calculations based on EMJ modelling

12 Hr TOA Attendances	England 12 hour from Time of Arrival	Wales 12 hour from Time of Arrival	Scotland from Time of Arrival	NI from Time of Arrival	**total**	Excess deaths per month (12 hour waits ÷ 72)	per week
January	103,922	8,927	2266	7,801	122,916	1707	427
February	103,302	9,086	2404	7,917	122,709	1704	426
March	133,680	10,807	4,128	8,586	157,201	2183	546
April	123,075	10314	3,588	7,883	144,860	2012	503
May	114,660	10147	3284	7,835	135,926	1888	472
June	125,280	10154	3937	8,190	147,561	2049	512
July	142,283	10574	4483	9,005	166,345	2310	578
August	133,286	10595	4967	8,917	157,765	2191	548
September	139,806	10150	5296	8,830	164,082	2279	570
October	169,234	10923	6814	Not yet published	186,971	2597	649
November	Not yet published	9945	5270	Not yet published			
December	Not yet published	Not yet published	Not yet published	Not yet published			
				Total:	1,506,336		

The College utilised the numbers of patients waiting 12 hours or more from their time of arrival. This data is routinely published in Wales, Scotland, and Northern Ireland. In England, the College submits a Freedom of Information request to NHS Digital in order to obtain the figure. The 12-hour time of arrival figure for the UK was calculated and divided by 72 in order to arrive at an excess deaths figure for each month. While this is a crude estimate, it is likely an underestimate, given that the number needed to harm (1 in 72) actually applies to those waiting between 8-12 hours and we know that the longer a patient waits, the more likely they are to come into harm.

Our figures may be an underestimate. The EMJ modelling did not calculate additional risk for patients waiting over 12 hours. However, as the study showed long waits increase the risk of death, it is likely that the risk could be higher among people waiting over 12 hours than those waiting 8-12 hours. We deliberately took a cautious approach by applying an estimate of harm from 8-12 hours to people who had stayed more than 12 hours. Our figures do not include other parts of the emergency care system where delays may be dangerous. The lack of public confidence in emergency care may be discouraging people from seeking help when they should. Our underlying evidence does not include people who die while waiting for an ambulance or who are not admitted after attending an emergency department. These real risks are not quantified in our population.

The reasons for increased deaths are multifactorial; identifying a person with unexpected serious illness is harder when a department is crowded, infection prevention and control procedures are difficult to maintain so people acquire flu and covid in hospital, and time critical treatment for common conditions such as heart attacks and sepsis is delayed. Older people who endure long waits for admission are more likely to become delirious. The pressure to discharge people from hospital means that many people will reattend as they have not fully recovered.

Financial Times Analysis – published August 2022

The Financial Times analysis of excess death data published by the Office for Health Improvement and Disparities (OHID) confirmed RCEM's estimates of excess deaths linked to ED crowding, based on the EMJ modelling. This is not peer reviewed evidence but is supportive. They found that as many as 500 excess deaths occurred every week in England

due to over 2021 and 2022.[11] The data revealed that in summer 2021 and 2022 there were sustained excess deaths exceeding the number of deaths caused by coronavirus. When examining the cause of death as a percentage of typical levels, there was a broad-base increase of deaths across many different conditions. When examining the estimates of excess deaths associated with ED crowding, they mirror the pattern of the non-covid related excess deaths figures as published by OHID.

COVID19 Actuaries Response Group Analysis 'additional deaths' and 'excess deaths'– published January 2023

This analysis utilised the EMJ methodology to calculate 'additional deaths' compared with what would be expected if there were no long delays admitting patients.[12] They used two approaches, one using the numbers of patients waiting more than four and 12 hours between the decision to admit them and their admission. They estimated a lower uncertainty bound for the number of additional deaths arising from these delays by summing the two figures below:

- Additional deaths from delays of 4-12 hours, calculated by dividing the number waiting 4-12 hours by the "number needed to harm" from 4–6-hour delays (191); and
- Additional deaths from delays of more than twelve hours, calculated by dividing the number waiting twelve hours or more by the "number needed to harm" from 8–12-hour delays (72)

This resulted in 3,224 additional deaths in three months, or 248 each week. They also examined total waits or length of stay. More than 1.6 million people in major A&E departments waited more than four hours between arrival in A&E and time of discharge, transfer or admission between September and November 2022. That compares to 426,000 with a trolley wait exceeding four hours. The 1.6 million people waiting four hours or more, includes a significant number who waited twelve hours or more. NHSE data shows that there were over 286,000 total waits exceeding twelve hours in eight weeks in September and October. If we divide this by the "number needed to harm" from 8-12 hour delays (72) then we get 3,976 additional deaths in eight weeks, or 497 each week.

They also calculated excess deaths, explaining that these calculations typically compare mortality now to what was expected or observed retrospectively. To analyse the contribution of crowding to excess deaths, they deduct the number of deaths arising from crowding prior to the pandemic from the number arising now. In the five years leading up to the pandemic they calculate 80 (in 2015) to 220 (in 2019) deaths arising from long delays at the same time of year using the DTA approach. This leads to the increase in long ED delays contributing between 200 and 340 excess deaths each week between September 2022 and November 2022, compared to what was experienced before the pandemic. While supportive, this evidence is not peer reviewed.

The Economist's analysis of excess deaths – published January 2023

To assess the College's claim, The Economist built a model using hospital level data in patient mortality and ED waiting times for 121 Trusts in England on a rolling 12-monthly basis between March 2016 and July 2022.[13] They confirmed RCEM's analysis that crowding in the ED is associated with higher mortality. They found that a 10-percentage point increase in the proportion of ED patients waiting between 4-12 hours for admission is associated with an additional 1.2 deaths per 1000 patients arriving at a hospital. This model suggests that an

[11] https://www.ft.com/content/f36c5daa-9c14-4a92-9136-19b26508b9d2
[12] https://covidactuaries.org/2023/01/11/are-nhs-waiting-timescontributing-to-excess-deaths/
[13] https://www.economist.com/britain/2023/01/11/how-many-excess-deaths-in-england-are-associated-with-a-and-e-delays.

additional 3400 ED associated deaths occurred between August and November 2022; 260 deaths per week. This evidence is not peer reviewed

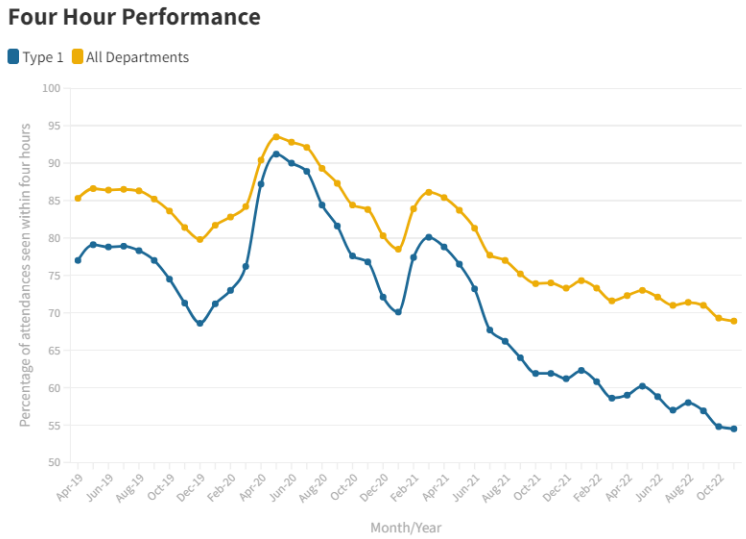
Capacity in hospitals

The NHS in the UK has fewer beds per capita than most comparable OECD nations.[14] RCEM's Beds in the NHS report recommended an additional 3,500 additional staffed hospital beds to be opened for Winter 2022/23.[15] In the medium-to long term we called for an additional 10,300 staffed beds across England. NHSE aimed to open 7000 extra beds across hospital, community and virtual setting this winter. In hospital settings, there have been an increase of 2067 Type 1 General and Acute beds since September 2022. A recent study revealed that 1% increase in bed occupancy was associated with a 9.5 percentage point decrease in a Trusts' probability of meeting the four-hour target, and an approximately six patient increase in four hour to 12 hour waits from decision to admit per 1,000 admissions.[16]

NHS 111

Increasing clinical input into NHS 111 will not tackle crowding but will ensure that patients are likely to be directed to appropriate healthcare settings. However, the proportion of calls that are 'clinically validated' must be significantly increased by recruiting more clinicians to work for NHS 111. In 2021/22, 50.9% of calls were assessed by a clinician or clinical advisor.[17] The CQC's state of care report found that where NHS 111 made additional use of midwives, mental health practitioners and pharmacists, they could give more appropriate clinical advice to patients, supporting local systems to redirect patients.[18] A study of paediatric clinicians working in NHS 111 revealed it is likely to increase self-care dispositions, and reduce onward referrals to primary care, ED and ambulances. Disposition rates differed significantly between the calls taken by paediatric versus (vs) non-paediatric clinicians: 69% vs 43% were advised on self-care only, 13% vs 18% to attend EDs, and 1% vs 4% to receive an urgent ambulance call out.[19]

Metrics and performance



[14] OECD Data, Hospital Beds
[15] RCEM (2022) Beds in the NHS
[16] Friebel & Juarez (2020) Spill Over Effects of Inpatient Bed Capacity on Accident and Emergency Performance in England. Health Policy, 124:11. 1182-1191
[17] Integrated Urgent Care Aggregate Data Collection
[18] CQC (2022) The state of health care and adult social care in England 2021/22
[19] Stilwell PA, Stuttard G, Scott-Jupp R, et alPaediatric NHS 111 Clinical Assessment Services pilot: an observational studyArchives of Disease in Childhood 2022;107:e14.

Disaggregating performance figures will provide better transparency and opportunities for benchmarking. The patient experience of those that are admitted versus patients that do not require admission, and those that access healthcare via a Type 1 department or a Type 3 department, vary greatly. At present, the monthly performance data is published in an aggregate format. However, disaggregating the data by these patient groups would provide greater transparency and better opportunities for benchmarking, ensuring that resource is distributed in the most efficient way. Data from Northern Ireland demonstrates how disaggregating the data can paint a clearer picture of where the issues lie. During September 2022, the median time patients admitted to hospital spent in ED was 13 hours 19 minutes, compared to 3 hours 14 minutes for those discharged home.[20] Additionally, the graph above shows four-hour performance broken up by Type 1 EDs and all departments. Detailed disaggregated data enables hospitals to focus on providing care to the sickest patients.

Additionally, we have long argued that the current way in which the 12-hour metric is measured and published – from the decision to admit (DTA) – is misleading and unhelpful for clinicians. Publication of the 12-hour data from ToA is patient-centred and will bring about greater accountability in the entire health and social care system. This will help us, NHS England, Trusts, and Integrated Care Systems to better understand the extent of crowding, long stays and corridor care taking place in our EDs by elucidating unwarranted variation, that is not as apparent in the DTA data. The graph below shows the relationship between high proportion of 12-hour ToA waits, and poor performance against the four-hour metric. The last time that four-hour performance stood at 76.5% in May 2021, 2.26% of patients waited 12 hours or more from their time of arrival.[21] As of, October 2022, this figure stood at 12.1%.[22] Finally, better quality data will reduce bureaucracy and time spent judging 12-hour decision to admit breaches.

[20] Emergency Care Waiting Time Statistics July – September 2022, NI Department of Health
[21] RCEM Data & Statistics
[22] RCEM Data & Statistics