NHS

GIRFT
GETTING IT RIGHT FIRST TIME

Emergency Medicine

GIRFT Programme National Specialty Report

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GIRFT National Clinical Leads for Emergency Medicine

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GIRFT is part of an aligned set of programmes within NHS England and NHS Improvement

**Table 30, p74, updated March 2022*

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Cover photo: "A&E at dusk"
The ED of the Royal Bolton Hospital in the evening
Photograph by: Paul Messer, Medical Photographer & Registered Medical Illustrator

Foreword from Professor Tim Briggs

I am delighted to recommend this Getting It Right First Time review of emergency medicine, led by Dr Chris Moulton and Dr Cliff Mann.

This report comes at a time when the NHS has undergone profound changes in response to the COVID-19 pandemic. The unprecedented events of 2020/21 – and the extraordinary response from everyone working in the NHS – add greater significance to GIRFT's recommendations, giving many of them a new sense of urgency.

COVID-19 has stress-tested emergency departments and thrown a national spotlight on many of the issues that Chris and Cliff had found on their deep-dive visits in the years preceding the pandemic. Actions in this report can help the NHS as it faces the substantial challenge of recovering services, while remaining ready for any future surges, by operating more effectively and safely than ever before.

Chris and Cliff have applied the GIRFT approach to emergency departments, often viewed by the public as the front-door to acute hospitals and the main port of call when in pain, unwell and in need of help. The recognisability of A&E services means that they are often in the news, and issues in emergency departments are often indicators of problems upstream or downstream in the hospital or healthcare system.

This report's findings, and the 17 recommendations that it sets out, are based on Chris and Cliff's visits to 90 emergency departments and a huge amount of urgent and emergency care data from a wide variety of sources. Implementing these recommendations will help to match emergency care capacity to local demand more effectively, improve patient flow in hospitals, and reduce unwarranted variation in the resources available to emergency departments.

It has been encouraging to hear about the outstanding dedication of the emergency department teams that Chris and Cliff have visited, and the many examples of innovation they have seen. Sometimes, this is being achieved against the odds, with some emergency department staff facing daily struggles with poor facilities or insufficient capacity, especially in areas of greater deprivation and need.

It is vital that we recognise the dedication of emergency department staff; GIRFT cannot succeed without this commitment to improvement from clinicians, managers and everyone involved in delivering care.

Finally, it is with huge sadness that I and the whole GIRFT team pay tribute to Cliff as a colleague and joint author of this report. Cliff passed away before publication of his work. But his legacy lives on in the findings, insight and recommendations that will support all those working in emergency medicine. This report is a lasting tribute to Cliff and his immense contribution to improving care for patients.

Professor Tim Briggs *CBE*

GIRFT Programme Chair and National Director of Clinical Improvement for the NHS.

Professor Tim Briggs is Consultant Orthopaedic Surgeon at the Royal National Orthopaedic Hospital NHS Trust. He led the first review of orthopaedic surgery that became the pilot for the GIRFT programme, which he now chairs. In January 2019 he was made National Director of Clinical Improvement for the NHS.

Introduction from Dr Chris Moulton and Dr Cliff Mann

Throughout our GIRFT visits to emergency departments (EDs), we have been constantly surprised by the level of variation – both unwarranted and warranted. No two departments are the same. The best EDs are shining palaces of emergency care, while the worst are unfit for purpose and manifestly under-resourced. Although these poorer departments are not 'third world' as often described, they are certainly below the standards to be reasonably expected in the sixth richest country in the world.

Some of the variation that we found is due to geographic, social and demographic factors. Some is due to historical and funding issues. However, much is a result of system and operational processes, and a failure to meet the local demand for emergency care. Unfortunately, the EDs with the largest burden of deprivation and disease often have the poorest facilities and the fewest staff.

We found no evidence that the best staff are invariably employed in the best equipped EDs, or vice versa. Rather, we found many marvellous examples of dedication, innovation and good organisation in outstanding teams that are delivering excellent care in dilapidated buildings and in the face of daily struggles against seemingly overwhelming odds.

Over the past 50 years, A&E has become a super-brand that triggers an instant association for people with unplanned medical needs. Such ingrained patterns of behaviour are notoriously difficult to change, especially at times when people are in pain or otherwise distressed. Too much money has been wasted on trying to direct people away from EDs without providing viable alternatives – and hence with minimal evidence of success.

Our report focuses on giving providers accurate information to identify how best to meet the demand for emergency care from the catchment population. This required us to develop some new metrics to interpret the data and some different ways of representing it. One such metric, the aggregated patient delay (APD), has already been adopted by NHS England and NHS Improvement's Model Hospital portal and some of our other metrics are also entering common usage. The Summary ED Indicator Table (SEDIT) that we have developed is now available online and updated monthly, thus providing a readily available source of current and comparative information for all EDs.

This review was the first non-surgical GIRFT workstream and began in May 2017. At that time, we could not have anticipated the unprecedented global crisis that the coronavirus pandemic was to bring to health services worldwide. The COVID-19 situation has stress-tested emergency care provision, throwing a national spotlight on many of the issues that we have found on our visits to EDs over the past three years and making the case for change more urgent than ever before.

Dr Chris Moulton

GIRFT Clinical Lead for Emergency Medicine

Dr Moulton is a consultant in emergency medicine at the Royal Bolton Hospital, Bolton NHS Foundation Trust and is a former vice-president of the Royal College of Emergency Medicine.

Dr Cliff Mann *OBE*

GIRFT Clinical Lead for Emergency Medicine

This report is dedicated to the memory of Dr Cliff Mann who sadly passed away in February 2021. At the time of writing this report he was the National Clinical Director for Urgent and Emergency Care for NHS England, and a consultant in emergency medicine at the Somerset NHS Foundation Trust. He was also a former president of the Royal College of Emergency Medicine.

Statement of support

The Royal College of Emergency Medicine

The Royal College of Emergency Medicine supports and endorses this national report. The findings and recommendations in this report are consistent with our own experience as frontline clinicians.

The GIRFT data has provided useful and valuable insights to how the urgent and emergency care pathway is performing. We are particularly concerned about patients who wait more than 12 hours and are pleased that the report highlights the unwarranted variation in this measure. No patient has a clinical need that requires 12 hours or more in an emergency department.

It is also perturbing that even in emergency care there is sustained and consistent evidence of the harmful effect of deprivation, both in healthcare need and delivery. The rising volume and cost of litigation identified in this report make a strong case for investing in emergency care. There are savings to be made here by increasing access to diagnostic services and adequate senior supervision.

It is morally unacceptable to accept high levels of avoidable patient harm in emergency care, while other parts of healthcare have been supported to improve safety. We are pleased that this report takes a system wide approach, as there is a tendency for stressed services to retreat into silos.

The COVID-19 pandemic and the rapid, disruptive changes in supply and demand have illustrated how patients can be harmed by avoidably poor processes. The GIRFT data provides a useful data-driven approach to allow leaders to identify where resource and effort can be most sensibly spent.

Executive summary

The demand for emergency medicine throughout England continues to grow year-on-year due to a growing and ageing population. The capacity and systems to deal with this demand vary greatly between different trusts, thereby resulting in unwarranted variation in patient experience and outcomes.

The Getting It Right First Time (GIRFT) programme has provided a unique opportunity to examine the delivery of emergency care across the country. The collection and analysis of relevant data, including the development of new metrics, has enabled us to better understand the causes and consequences of variation. In so doing, we have been able to identify the dominant constraints relevant to each emergency care system.

Deep-dive visits have enabled discussions with local teams and provided assurance that the site-specific reports are concordant with the daily experiences of staff and patients at each trust.

The findings from the GIRFT programme's review into emergency medicine have led to 17 recommendations which are based upon our key themes of demand, capacity, flow and outcomes.

Matching ED capacity to demand

Demand for emergency care is primarily driven by catchment demographics, casemix and access to other options for urgent care. Understanding these factors is essential in order to plan and resource the necessary capacity to match demand at each site.

The number of general and acute beds, number of emergency department (ED) major and resuscitation cubicles and both ED and hospital staffing establishments are key capacity constraints. The mismatch between demand and capacity at many sites was striking and evident from both our data and our deep dive visits.

Evidence-based alternatives to ED attendance and hospital admission are an effective means of mitigating some acute care pressures. This in turn reduces postponements of elective care. Patients should only need to attend ED or be admitted to hospital when it adds value to their care.

Improving patient flow and outcomes

Before the GIRFT-EM programme, the only metric by which EDs were assessed was the NHS four-hour operational standard. This binary target led to improved ED resourcing and system changes that certainly improved patient flows and outcomes for at least ten years following its introduction in 2004. However, in recent years, changes in casemix and in the practice of primary care have increased the percentage of patients attending EDs who require either admission and/or significant investigation (including imaging). This proportion varies widely between trusts and therefore weakens the case for a single binary time standard covering all patients at all sites.

The aggregated patient delay (APD) metric uses the total wait time beyond a given threshold to demonstrate unwarranted delays in care. For admitted ED patients, we use a six-hour threshold as we consider there to be no clinical reason for a patient to be in the ED beyond six hours after time of arrival. In addition, evidence shows that patients who remain in the ED for longer than six hours, have an associated increased 30-day mortality risk.[1] The APD can also be used, with appropriate thresholds and endpoints, for specific cohorts e.g. mental health patients and processes such as ambulance handovers.

Our most striking and concerning finding was the number of patients who experienced delays of more than 12 hours from time of arrival to ward admission. In 2019, this was more than half a million patients. However, there was again huge variation, with some sites reporting one such delay per week and others recording hundreds per week. Unsurprisingly, these figures correlate almost exactly with ambulance handover delays. We therefore found ineffective and inefficient hospital admission systems that caused reduced ED and ambulance service productivity, and increased patient harms.

[1] *Jones S[1,2], Moulton C[3,4], Swift S[2], Molyneux P[2], Black S[5], Mason N[2], Oakley R[2], Mann C[3,6].*
1 New York University Medical School, Department of Population Health, New York, USA. 2 Methods Analytics, London, UK.
3 NHS England (The "Getting It Right First Time" programme). 4 The Royal Bolton Hospital, Bolton, UK. 5 Black Box Data Science. 6 Musgrove Park Hospital, Taunton, UK.

COVID-19

The COVID-19 pandemic exposed limitations and inadequacies in practices and facilities at many sites. This led to predictable unwarranted variation in the ability of sites to safely manage a highly contagious disease. Infection prevention and control in most EDs is compromised by a lack of enclosed cubicles and insufficient space for social distancing.

The COVID-19 pandemic saw a drop in patients attending the ED, particularly for minor conditions. Postponement of elective work led to increased bed availability with consequent improvements in patient flow.

Reducing avoidable costs

There is enormous expenditure on locum and agency staff in EDs which disproportionately affects many of the smaller providers. The annual cost nationally exceeds £500 million pounds. Litigation is the second highest potentially avoidable financial burden with a national cost of more than £400 million a year. There is considerable unwarranted variation in these liabilities between different trusts. Finally, lost productivity as a consequence of poor IT systems also results in many millions of pounds of avoidable expenditure.

Understanding the causes and effects of unwarranted variation

In order to reduce unwarranted variation in EDs, knowledge and understanding of the key emergency care metrics is essential. The Summary Emergency Department Indicator Tables (SEDITs), developed by the GIRFT-EM programme, provide this data for each site with monthly updates.

Each SEDIT contains several key charts that allow rapid comparison of EDs. The GIRFT-EM 'quadrant chart' provides an overall summary of the data, enabling immediate identification of the relationships between demand, capacity, flow and outcomes at each of the 174 type 1 EDs.

We would like to thank all our colleagues in the GIRFT-EM team and all the people who have supported our work over the last three years. We are confident that the metrics and methodologies described in this document will make an important contribution to the understanding of emergency care in England and will better enable equitable and adequate resourcing of all EDs for the benefit of our patients.

Findings and recommendations

The findings from our GIRFT-EM analyses and visits point to a set of recommendations on how the provision of emergency medicine can be improved across the four domains of demand, capacity, flow, and outcomes.

Our findings show that the NHS must address the following three key priorities in order to reduce quantifiable harm and unacceptable patient outcomes:

1. match emergency care capacity to local demand more effectively;
2. improve patient flow in EDs using solutions based on GIRFT-EM metrics; and
3. reduce unwarranted variation in the resources available to EDs.

We have made 17 recommendations to deliver these priorities and identified the stakeholders responsible for implementing each recommendation.

Priority: Match emergency care capacity to local demand

Key finding	Recommendation	Owners	Timescale
Demographics, casemix, and access to other options for urgent and emergency care are the key drivers of ED demand.	**1.** Trusts, working with commissioners, to determine and fully understand their local demand and then ensure that both the hospital and ED capacities match that demand.	Trusts; Commissioners	3 months
All new and existing services create both intended and unintended consequences for the urgent and emergency care system.	**2.** Trusts, along with commissioners, to identify the ED burden arising from both new and existing services in primary, secondary and tertiary care, and to put measures in place to manage and mitigate that burden.	Trusts; Commissioners	6 months, then ongoing
General and acute beds are unevenly distributed throughout the NHS. Availability of general and acute beds seldom reflects local demand pressures and a lack of their availability is the single biggest constraint for many trusts.	**3.** Commissioners to work with trusts to enable a targeted expansion in the provision of hospital bed capacity to manage local demand.	Commissioners; Trusts	Immediately for trusts in the lowest quartile; 6 to 12 months for other trusts
There is a widespread absence of a systematic approach to matching the capacity of the ED to patient volumes or casemix.	**4.** Trusts to benchmark the number and adequacy of their ED cubicles, isolation facilities, resuscitation areas, x-ray and computed tomography (CT) capacity, and staffing to ensure that overall capacity at least meets the current national mean.	Trusts	12 months
Same Day Emergency Care (SDEC), and urgent clinics are often an effective alternative to inpatient care for appropriate conditions and should be considered as the default option for those conditions. Co-located services can also reduce ED demand.	**5a.** Trusts to work with their commissioners to optimise the provision of SDEC and urgent clinic access, including the supporting imaging, as outlined in the NHS Long Term Plan and NHS Planning Guidance (2019 and 2020).	Trusts; Commissioners	12 months
	5b. Trusts to ensure timely access to urgent care services and specialist opinions such that patients only attend ED when it adds value to their care.	Trusts	12 months

Priority: Improve ED patient flow using solutions based on GIRFT-EM metrics

Key finding	Recommendation	Owners	Timescale
Delays in admitting patients beyond six hours from time of arrival are associated with an increase in mortality and other harms.	**6a.** Trusts to ensure that all admissions occur: • within one hour of completing the necessary ED investigations and treatment; and • within six hours of arrival.	Trusts	12 months
	6b. Trusts to assess their number of six-hour breaches, review ED flow and take action to improve hospital capacity and systems accordingly.	Trusts	3 months
The Emergency Care Data Set (ECDS) enables meaningful comparison of casemix variation between sites and in the same site over time.	**7.** Trusts to produce a monthly report of the ED casemix variation and use this data to monitor and improve services.	Trusts	3 to 6 months
Inconsistently applied time metrics are a cause of unwarranted variation.	**8a.** Trusts to measure all event and flow times from the patient's time of arrival.	Trusts	3 months
	8b. EDs to report all breaches of 12 hours from time of arrival.	Trusts	3 months
	8c. Care Quality Commission to review 12-hour breach records as part of their routine inspection.	CQC	12 months
The four-hour standard is a binary metric that favours departments with the highest proportions of low complexity patients. The Aggregated Patient Delay (APD) metric provides greater operational utility, matched to clinical priorities.	**9a.** Trusts to monitor and report the Aggregated Patient Delay (APD) at 6 and 12 hours as key metrics for measuring ED performance.	Trusts	6 months
	9b. NHS England and NHS Improvement and the CQC to use the Aggregated Patient Delay (APD) metric in their reviews.	NHS England and NHS Improvement; CQC	12 months
The Summary Emergency Department Indicator Tables (SEDITs) and the GIRFT-EM quadrants demonstrate the relationship between demand, capacity, flow and outcomes, highlighting the dominant constraints.	**10a.** Trusts to use their Summary Emergency Department Indicator Table (SEDIT) to understand their demand, capacity, flow and outcome rankings, and take action accordingly.	Trusts	3 to 6 months
	10b. Trusts to evaluate the causes and consequences of their current GIRFT-EM quadrant position and take appropriate action.	Trusts	3 to 6 months

Priority: Reduce unwarranted variation in the resources available to EDs

Key finding	Recommendation	Owners	Timescale
Current tariffs and contracts based on HRG groups appear to systematically under-remunerate acute trusts. Unwarranted variation in local coding exacerbates this problem.	**11a.** Commissioners' funding systems to reflect accurate and actual costs incurred and reported nationally in the provision of efficient and effective emergency care.	Commissioners	12 to 18 months
	11b. Trusts and commissioners to ensure high-quality coding and costing of clinical activity.	Trusts; Commissioners	6 months
	11c. The Care Quality Commission to review and report on Emergency Care Data Set data quality as part of all their ED inspections.	CQC	6 months
The workforce is both the greatest asset of an ED and its largest cost with £523m per year spent on ED agency and locum staff. The burden is carried disproportionally by smaller providers. Well- staffed EDs continue to attract staff at the expense of poorly staffed ones.	**12a.** Trusts to invest in the facilities and opportunities for staff by adopting the priorities and values of the NHS People Plan.	Trusts	12 to 18 months
	12b. Health Education England, NHS England and NHS Improvement, and NHS Employers to collaboratively address the underlying human resource issues.	HEE; NHS England and NHS Improvement; and NHS Employers	24 months
Underfunding of EDs has created sites that are in a poor state of repair.	**13.** NHS England and NHS Improvement should support trusts and systems to consider capital funding for their ED(s), with a view to ensuring that every trust has an ED(s) with an appropriate physical environment. This would enable the provision of high quality patient care and allow a good working environment for staff.	Trusts; NHS England and NHS Improvement; Commissioners	6 to 12 months
COVID-19 has highlighted the inadequacy of facilities for infection prevention and control in most EDs.	**14.** All EDs to be configured to comply with infection prevention and control requirements.	Trusts	For immediate action
There is remarkable unwarranted variation in the usability of the many different ED IT systems. This adds to the clerical burden on clinical staff, reduces productivity and impedes data completion.	**15a.** Trusts to ensure that ED hardware and software is purchased, developed and revised to enable clinical staff to work efficiently and effectively, without loss of productivity.	Trusts	24 months
	15b. The Royal College of Emergency Medicine to benchmark the usability of IT systems to enable trusts to make informed choices prior to procurement.	RCEM	12 to 18 months
Adding a drug to an ED formulary can take more than 12 months, even when use of the drug is well established.	**16.** GIRFT to work with NHS England and NHS Improvement and the Royal College of Emergency Medicine to develop and publish a list of standard drugs to be automatically available to ED teams without the need for local applications. (This has already been achieved with the list of required antidotes.)	GIRFT; NHS England and NHS Improvement; RCEM	6 to 12 months
ED litigation liabilities exceed £400 million per year. This is principally due to failure to diagnose, often linked to failure to image.	**17a.** Trusts to review their ED-attributed litigation, to identify recurrent themes and to take action accordingly.	Commissioners; Trusts	6 to 12 months
	17b. Commissioners and providers to ensure 24-hour availability of urgent cross-sectional imaging (both computed tomography and magnetic resonance scanning), rapid reporting of imaging and senior clinical advice to reduce patient harms.	Commissioners; Trusts	6 to 12 months

Emergency medicine today

Emergency medicine is perhaps the oldest medical profession in the world and is based on the primeval human instinct to help others who are ill or injured. Along with public health, midwifery and primary care, it is one of the main pillars of healthcare.

Today, urgent care is provided in a number of different care settings as well as in the 'traditional' ED or Accident & Emergency department. Our review focuses on major (Type 1) A&E departments. For consistency, we refer to these as EDs (emergency departments) throughout our report.

What it is and who it cares for

Emergency medicine delivers care to patients with acute and urgent illnesses or injury. Patients can be of any age, from the youngest and most vulnerable to the oldest and most frail. There are few limits to the range of physical or psychological symptoms that may cause patients to present to an ED.

The urgent nature of the care that is needed means that timeliness is important. Practice may involve triage, assessment, treatment or resuscitation. Furthermore, EDs often care for patients who are under the influence of alcohol or drugs, in psychiatric crisis, accompanied by police or prison officers, or hostile to other patients and staff.

Prominence in the public consciousness

Emergency medicine occupies a unique place in the public consciousness. There is huge interest in the work of emergency medicine, as can be seen from the proliferation of documentaries, reality TV shows and dramas centred on A&E and ambulance services.

The performance of EDs is frequently taken as a proxy measure of all acute care, with target-related results guaranteed to make headline news whenever they are released.

The hospital front door

Unlike most other medical specialties, the nature of emergency medicine means that no appointment is required to access care and patients do not need to be previously 'registered'. As such, EDs have increasingly become a first point of contact for many patients with conditions that can and should be managed by other services.

This means that the workload of EDs, and their ability to manage that workload, is significantly influenced by the broader health and social care system. It also means that, for many people, the ED provides a defining experience of hospitals and the NHS. Our report looks at how wider healthcare issues affect the performance of EDs.

Current service organisation

Today, emergency medicine in England is provided in a number of different settings; there are four types of urgent and unscheduled care providers in the NHS:

- **Type 1:** a consultant led 24-hour service with full resuscitation facilities;
- **Type 2:** paediatric EDs and specialist emergency care units, i.e. ophthalmology and dental departments;
- **Type 3:** urgent care centres, minor injury units etc;
- **Type 4:** walk-in centres.

This report is only concerned with the Type 1 EDs.

Emergency care of children and young people

Around 25% of annual ED attendances are children and young people. Although dedicated paediatric departments (those categorised as 'Type 2') were outside the direct scope of our review, the majority of our findings and recommendations certainly apply to the emergency care of children and young people. Most Type 1 EDs provide emergency care to children / young people and dedicated children's EDs have many similar problems.

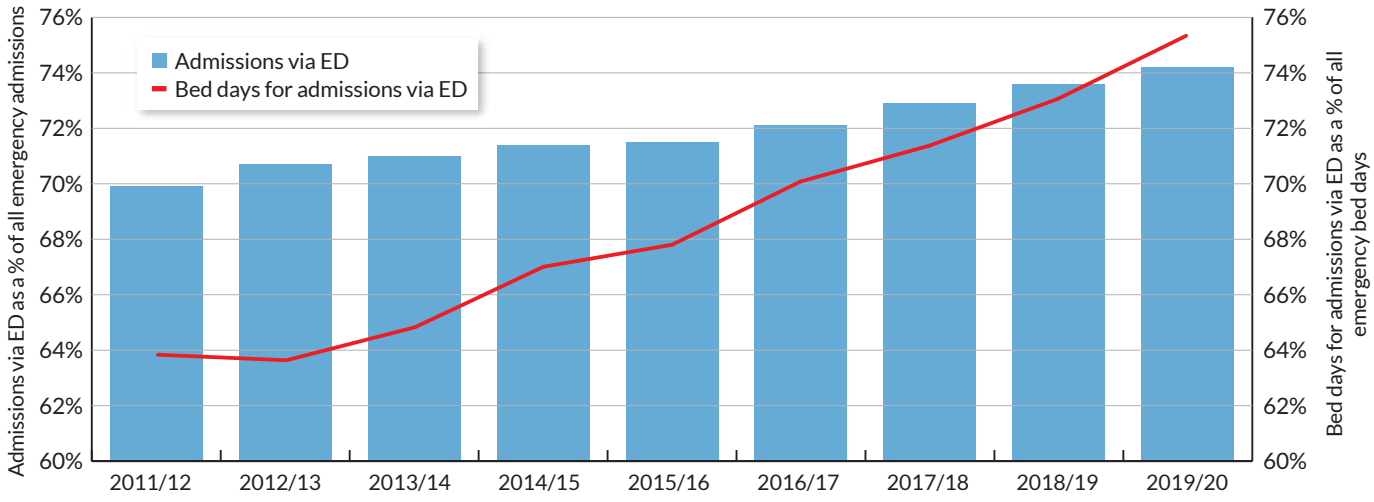
Relationship with complementary services

EDs have a close working relationship with the emergency services and especially with the ambulance service. The most effective departments also have good working relationships with community and social services.

Demand for emergency medicine

Nationally, demand for emergency care has shown a year on year increase for more than 30 years. The changes to hospital admissions in the last decade are shown in **Figure 1**. We look at this issue in more detail in the demand section of this report.

Figure 1: Growth in admissions via ED and hospital acute bed days



Data source: HES, 2011-2020

Funding and expenditure

In 2019, Type 1 ED operating costs were around £3.07bn,[2] which is equivalent to around 3.5% of total trust operating costs of £87.3bn. This means that EDs receive less than £1 for every £25 of hospital expenditure. Yet approximately 75% of acute admissions occur via the ED and 75% of bed capacity is occupied by acute admissions.[3]

The average cost of an ED attendance in England is around £139, but this varies widely between departments as shown in **Table 1**.

Table 1: Average ED expenditure per attendance

	ED total spend per attendance	ED pay spend per attendance	ED non-pay spend per attendance
Average	£139.04	£122.58	£16.46
Range	£56.12 to £296.39	£45.09 to £273.46	£2.03 to £59.37

Data source: NHS Benchmarking Questionnaire, 2018/19

[2] *National Cost Collection for the NHS, 2018/19. NHS England and NHS Improvement.*

[3] *HES APC 2019/20*

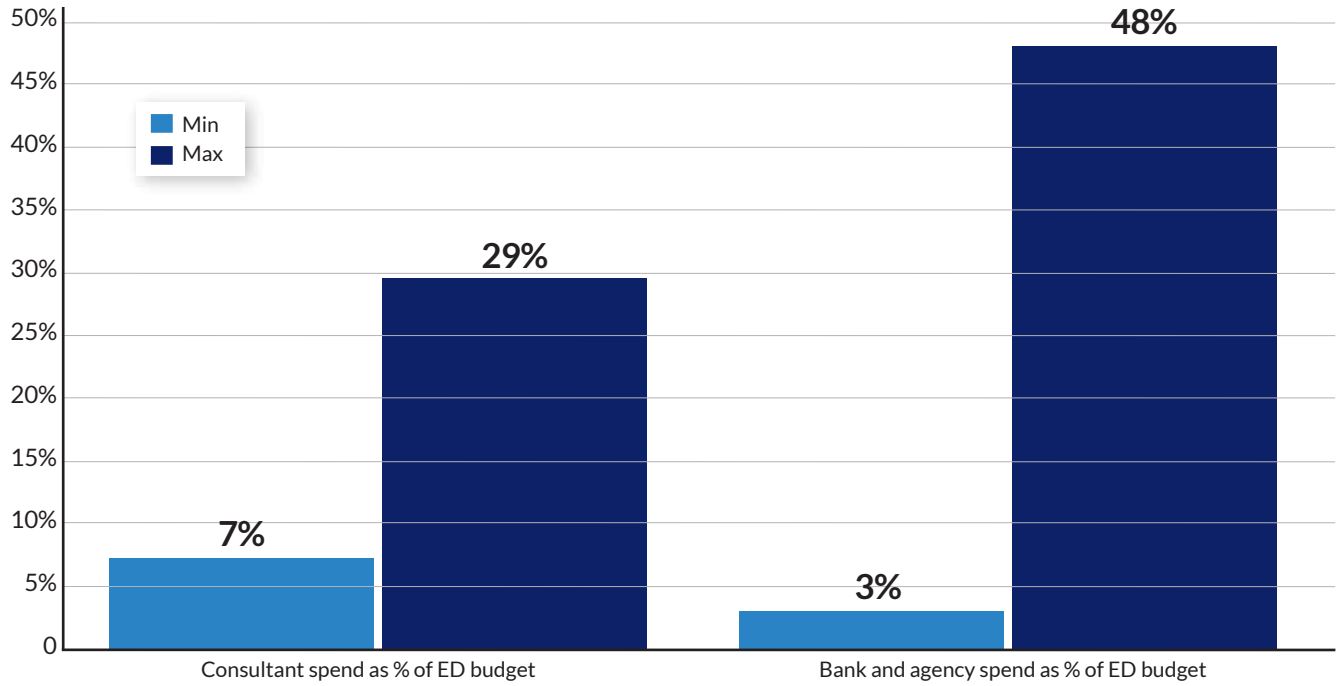
Workforce costs

Total pay costs for all EDs in England is £1.94 billion (2018/19). Workforce costs account for an average of 85.3% of all ED expenditure.[4]

On average, EDs spend 14% of their total budget on consultants. However, the range is from 7% to 29%.[5] This wide variation reflects the dependency of many EDs on locum, bank and agency staff, as shown in **Figure 2**.

- 21% of ED consultant expenditure is on locums – approximately £56 million per year.
- 27% of total ED workforce expenditure pays for locum, bank and agency staff – around £523 million per year.

Figure 2: ED expenditure on consultant and temporary staff



Data source: NHSBN, 2018/19

The Carter report identified pay costs for agency staff as an opportunity for improvement. The current expenditure on locum, bank and agency staff in EDs is equivalent to the annual running costs of around 40 EDs. The burden of temporary staffing is carried disproportionally by smaller providers. Moreover, well-staffed EDs continue to attract staff at the expense of poorly staffed ones.

[4] *NHSBN Questionnaire*
[5] *NHSBN 2018/19*

About our analysis

Scope and methodology

Our review focuses on Type 1 emergency medicine units: the major EDs. By focusing purely on these units, we have been able to review variation between providers of similar types of services.

At the time of publication, there are 174 Type 1 EDs, which are spread across 129 trusts. (The number constantly changes because of ongoing service and trust reconfigurations.)

During our review, it became clear that Type 1 EDs can be usefully subdivided into four main groups, each group with its own characteristics and challenges:

- teaching hospitals and specialist / trauma centres;
- large district general hospitals;
- smaller hospitals in a rural or remote location; and
- hospitals in a coastal location (excluding large teaching hospitals).

This report and our recommendations are based on both quantitative and qualitative assessments. Data has been extracted from national data sets, including Hospital Episode Statistics (HES), the Emergency Care Data Set (ECDS), the NHS Benchmarking Network's (NHSBN) emergency care reports, and audited annual accounts from each provider. This data and subsequent analyses were triangulated with information that we discovered at our deep-dive visits.

To date, we have visited 79 trusts and 90 individual EDs.

Deep-dive visits

Our deep-dive visits to EDs provided an opportunity to review departmental data with clinical staff and representatives from trust leadership and management teams. These individuals' extensive local knowledge provided fuller context and explanation.

Prior to each deep-dive visit, we sent the trust a data pack. The pack reported a range of metrics for the trust in question and benchmarked the data across all EDs in England.

We also asked each ED to time how long it took to carry out a specific clinical task, using their ED computer system.

During the visits, we also assessed the ED estate and facilities.

After the deep dive, we provided the trust with a report that contained data summaries, observations, comments and suggested areas for further consideration. The GIRFT implementation team then continued to provide advice and support.

Differences between emergency medicine and the surgical specialties

There are some key differences between emergency medicine and the surgical specialties that were the original focus of GIRFT workstreams. Many of these differences relate to the identification and measurement of outcomes. We have therefore modified and adapted the underlying GIRFT methodology.

Attitudes, behaviours and cultures

Issues related to attitudes, behaviours and cultures are common throughout trusts and EDs. These endemic factors are not easily quantified, but can be inferred from our analyses, especially by reference to the GIRFT-EM quadrant charts. See the *Outcomes* section p70.

Data quality and metrics

The quality of Hospital Episode Statistics (HES) A&E data is not high and no single metric provides a comprehensive assessment of an ED's performance. This meant that we needed to take a more creative approach to assessing clinical variation in EDs by developing new metrics and combining these together to highlight underlying systems and behaviours.

Emergency Care Data Set

The introduction of the Emergency Care Data Set (ECDS) has enabled a greater depth of analysis, in particular of clinical data fields including acuity and diagnoses. This enables meaningful comparison of casemix variation between sites and over time.

We urge all trusts to fully implement the ECDS, especially since it now mandates recording of the Clinical Frailty Score, the National Early Warning Score (NEWS) and the Ready to Proceed metric. This will support our recommendation that trusts should produce a monthly report of the ED casemix variation and use this data to monitor and improve services.

NHS Benchmarking Network

The NHS Benchmarking Network (NHSBN) provides data collection and benchmarking services to the NHS. We worked closely with NHSBN to collect data not available from HES, including:

- staff numbers;
- staff skill mix;
- bank and agency expenditure;
- clinical facilities;
- clinical services (e.g. primary care, frailty, mental health); and
- finance.

Much of this additional information was obtained from a questionnaire that NHSBN sends annually to each trust. We are grateful to the NHSBN staff for their continuing help and for allowing us to influence the contents of the questionnaire.

Issues with data and metrics

There are issues with a number of the metrics that are used by a wide range of agencies to report and comment on what is happening in EDs across England. Improving the quality and timeliness of this data, and the way that it is collected in the future, will enable deeper and better insights into the work of EDs.

Data lag

One recurrent issue is the lag with some of the data items that we have used. Our figures relate to the most recent data period available rather than to current performance.

This reflects the nature of HES / ECDS data and annual NHSBN returns. However, during the course of our GIRFT-EM programme, we secured funding to create site-specific Summary ED Indicator Tables (SEDITs) which are now available online to all providers with data that is updated monthly.

Problematic metrics

There are problems with regards to the veracity of some national data. Some datasets are trust-based rather than site-specific, with consequent loss of relevance in some areas. Other metrics that we have identified as being problematic include:

- DTA (Decision To Admit time)
- DID (Diagnostic Information Dataset) for radiology
- Proportion of attendances by ambulance
- Comorbidities
- Friends and Family Test data
- Staff survey data (which is hospital rather than ED-specific)
- Summary Hospital-level Mortality Indicator (SHMI)
- Staff sickness, turnover and vacancy rates

We have provided further information about these issues in the body of our report where we discuss these topics in more detail.

Findings in the key domains

Our review focuses on four key domains:

1. Demand
2. Capacity
3. Flow
4. Outcomes

We have developed effective metrics for each of these domains and analysed those metrics for every ED that we visited. This data is now available and updated monthly for all EDs in England via the SEDITs.

The findings from our GIRFT-EM analyses and visits point to a set of recommendations on how the provision of emergency medicine can be improved across each of the four domains.

Demand

Demand is the work that an ED and its parent hospital are required to do. Over the past 15 years, demand for emergency medicine in England has been climbing broadly in line with population growth. However, there is considerable variation in demand between different EDs.

The level of demand at each ED is determined by four main factors:

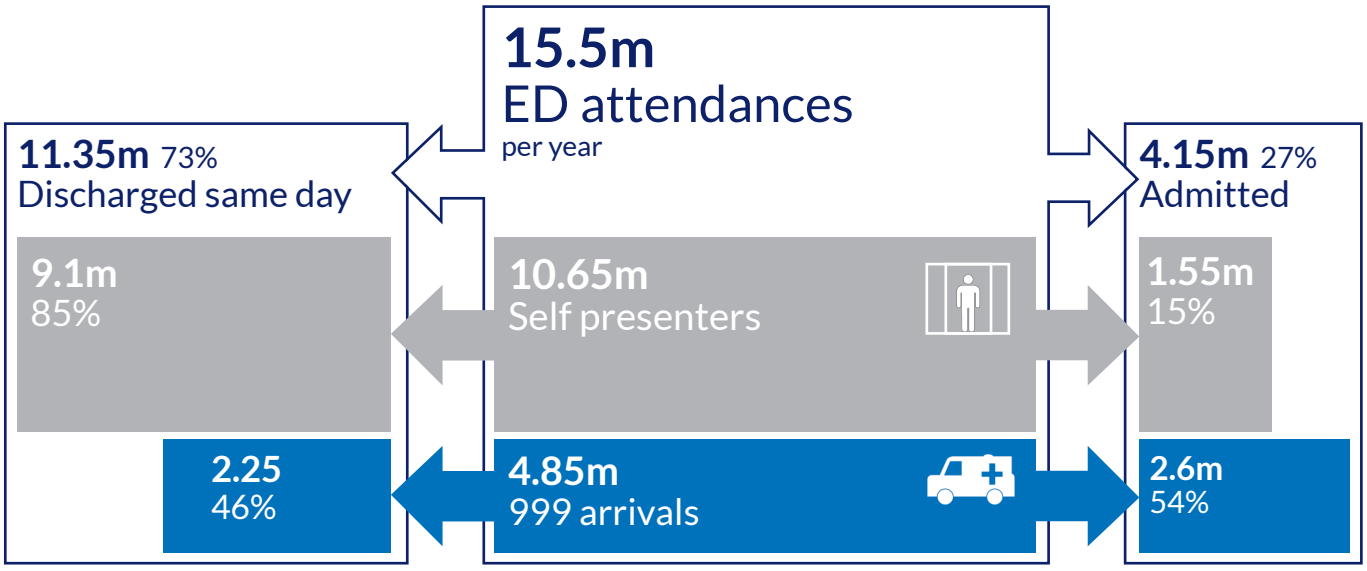
1. the size of its catchment population;
2. the age profile of its catchment population;
3. the level of deprivation in its catchment population; and
4. the availability of alternative sources of urgent care in the locality.

Given the nature of these factors, it is clear that demand is exceedingly difficult for EDs to influence. What is critical is that hospital staff and healthcare commissioners understand the nature of their local demand so that they can design and deliver services to meet it.

Demand for emergency medicine in England

ED attendances and admissions provide useful measures of overall demand for emergency medicine. **Figure 3** shows the proportions of self-presenting patients and ambulance arrivals and how these relate to admissions and discharges.

Figure 3: ED attendances, admissions and discharges

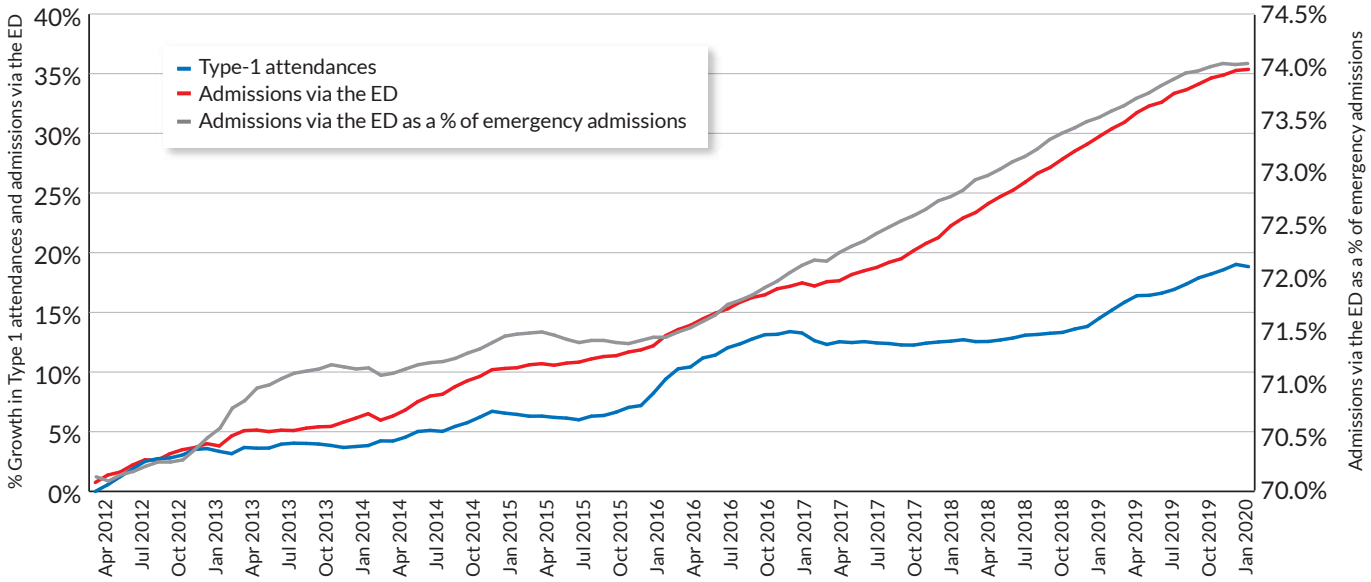


Data source: HES

The mode of arrival is commonly conflated with 'seriousness' or 'acuity' when in fact the correlation is far from strong. Whilst the very sickest or most badly injured ordinarily arrive by ambulance, it is not the case that most patients arriving by ambulance are severely ill or injured. Similarly, whilst most self-presenting patients do not require hospital admission, a significant proportion (37%) of patients who do require admission self-present.

There has been a steady and significant increase in both the numbers of total emergency admissions per year and the proportion of these admissions from the ED, as shown in **Figure 4**. The number of patients admitted to hospital via the ED has grown by more than a third in the last eight years. These admissions now account for 74% of all non-elective admissions.

Figure 4: Year on year trends in ED attendances and admissions

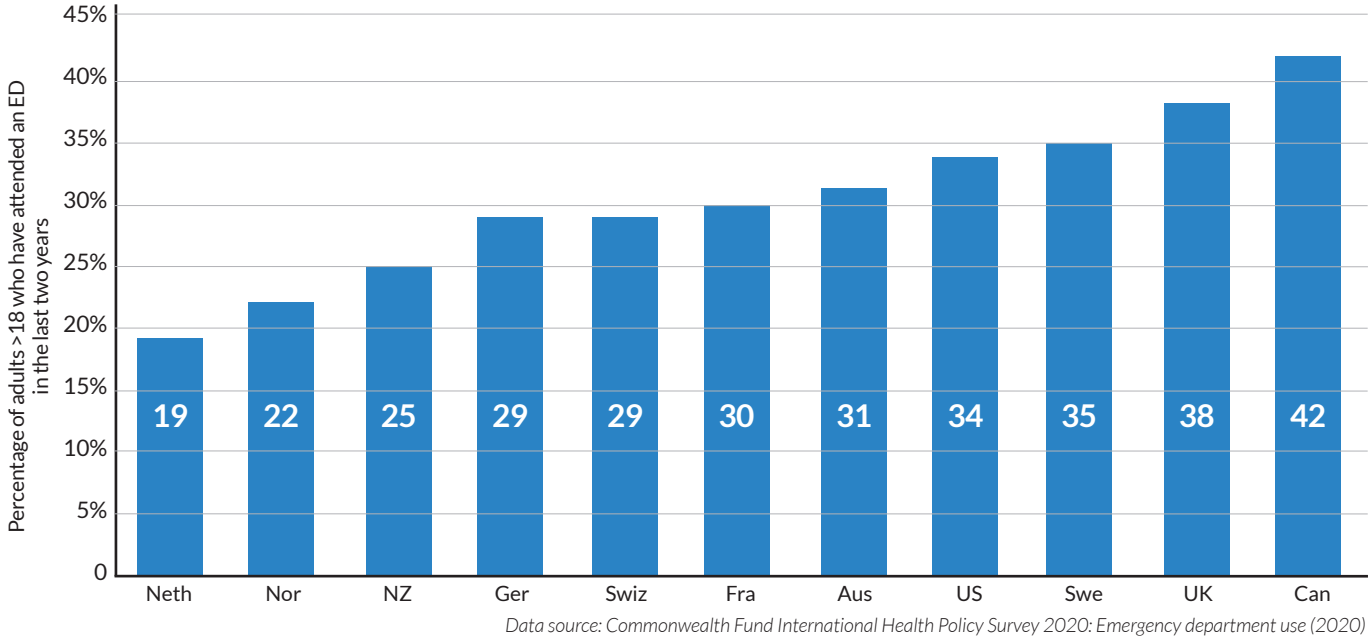


Data source: AE HES & APC HES, 2012-2020

International comparisons

The use of EDs varies significantly between countries, even those with similar healthcare challenges. The rate of ED attendance in the UK is relatively high amongst comparator countries; it is double the rate of the Netherlands,[6] as shown in **Figure 5**.

Figure 5: Percentage of adults in 11 developed countries who have attended an ED in the previous two years



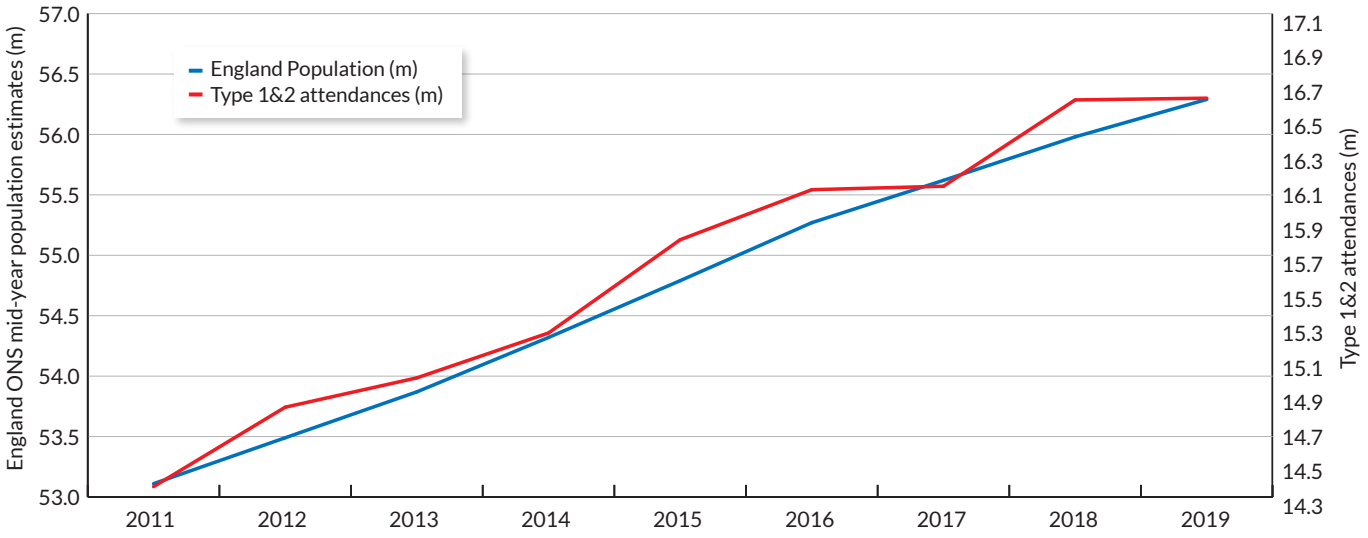
Data source: Commonwealth Fund International Health Policy Survey 2020: Emergency department use (2020)

[6] *Commonwealth Fund International Health Policy Survey: Emergency department use (2020)*

Population growth and ED demand

Between 2011/12 and 2019/20, attendances at Type 1 & Type 2 (children's) EDs have been increasing broadly in line with population growth, as shown in **Figure 6**. The 'threshold' for ED attendance has also apparently decreased with attendance rates increasing from one ED attendance per 3.42 members of the population to one attendance per 3.2 members of the population.

Figure 6: Attendance at Type 1 and Type 2 EDs versus population growth in England from 2011 to 2019



Data source: AE HES and ONS data, 2011-2019

There has been a 15.68% increase in attendances at Type 1 & Type 2 EDs between 2011/12 and 2019/20, as shown in **Table 2**. There were 2,245,480 more Type 1 and Type 2 ED attendances in 2019/20 than in 2011/12. Across England, this is equivalent to an increased annual workload of 22 large EDs.

Table 2: Attendances at EDs from 2011/12 to 2019/20

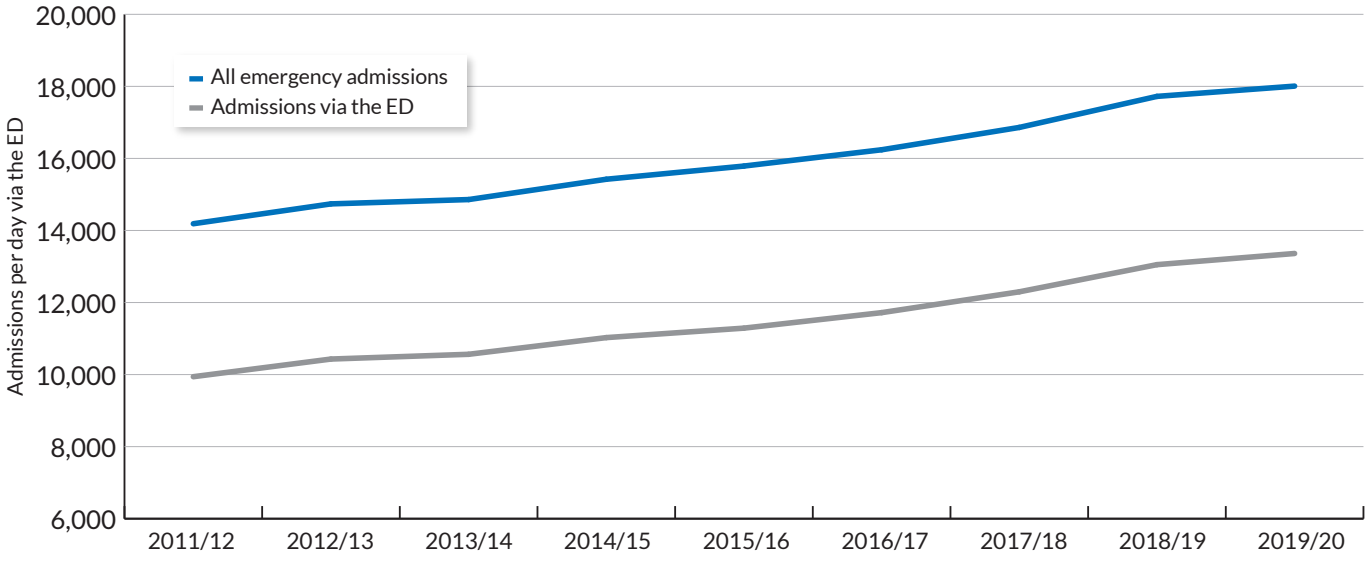
Year	Attendances per day	
	Type 1 and Type 2 EDs	All EDs
2011/12	39,231	46,195
2012/13	40,593	48,774
2013/14	41,073	49,425
2014/15	41,789	51,807
2015/16	43,140	53,466
2016/17	44,068	54,559
2017/18	44,121	54,586
2018/19	45,482	57,459
2019/20	45,383	57,189

Data source: AE HES, 2011-2020

Increased rate of emergency admissions

There has been an even greater increase in the rate of admissions from Type 1 and Type 2 EDs in the same period. Admissions have increased by over 30%, as shown in **Figure 7** and **Table 3**.

Figure 7: Admissions from EDs from 2011/12 to 2019/20



Data source: APC HES, 2011-2020

Table 3: Admissions from EDs from 2011/12 to 2019/20

Year	Admissions	
	Type 1 and Type 2 EDs	All EDs
2011/12	3,638,295	5,192,504
2012/13	3,807,474	5,379,481
2013/14	3,855,539	5,423,107
2014/15	4,024,392	5,628,925
2015/16	4,131,804	5,778,475
2016/17	4,277,562	5,927,447
2017/18	4,488,494	6,153,780
2018/19	4,763,683	6,468,699
2019/20	4,890,214	6,590,720

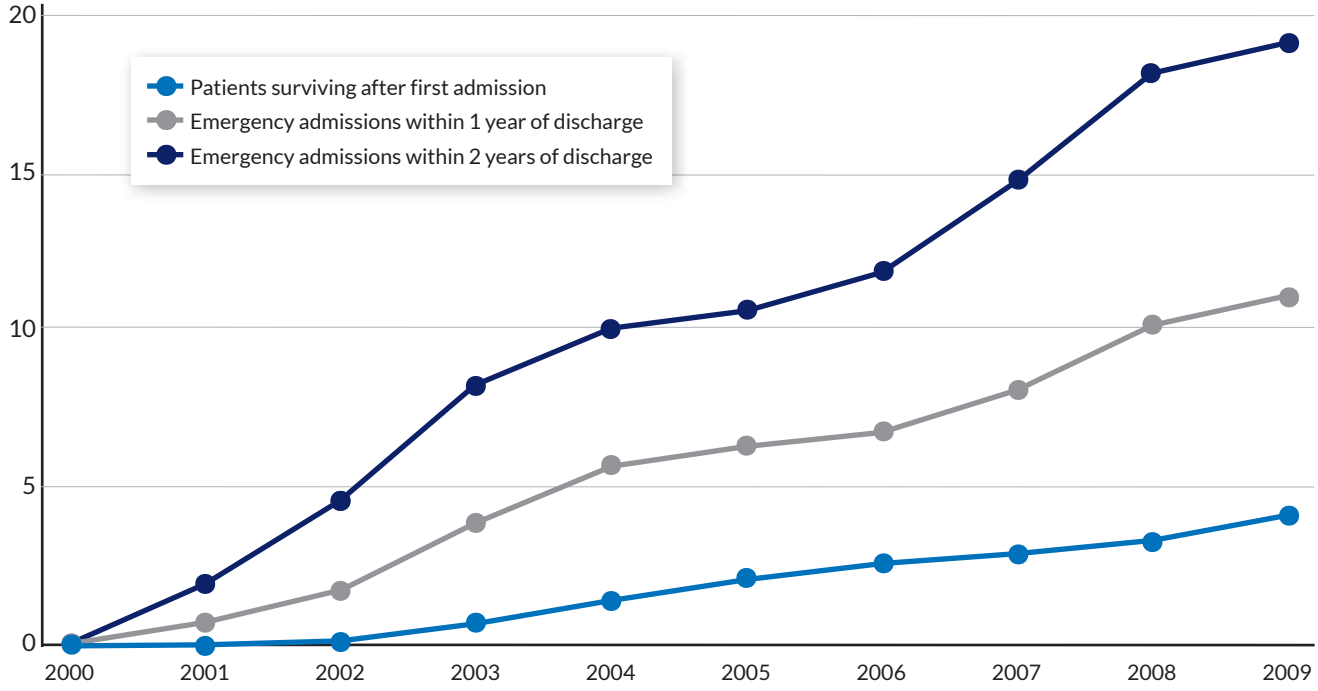
Data source: APC HES, 2011-2020

Chronic conditions and improvement in survival rates

Patients with long-term health conditions account for more than 60% of ED attendances. The need for acute healthcare usually occurs when these people reach their personal limit for managing their condition(s) effectively.

Health Foundation research shows that improvements in survival account for about 37% of the total increase in emergency admissions. The ability to help people get well again, following an episode of illness, naturally creates a larger cohort of people who may later need to be admitted to hospital. **Figure 8** shows how the number of emergency admissions within one year and two years of discharge have more than proportionally increased with the number of patients surviving after their first admission.

Figure 8: Emergency admissions following a first acute event (per 100 admissions), 2000 to 2009 [Index admission level zero = year 2000]



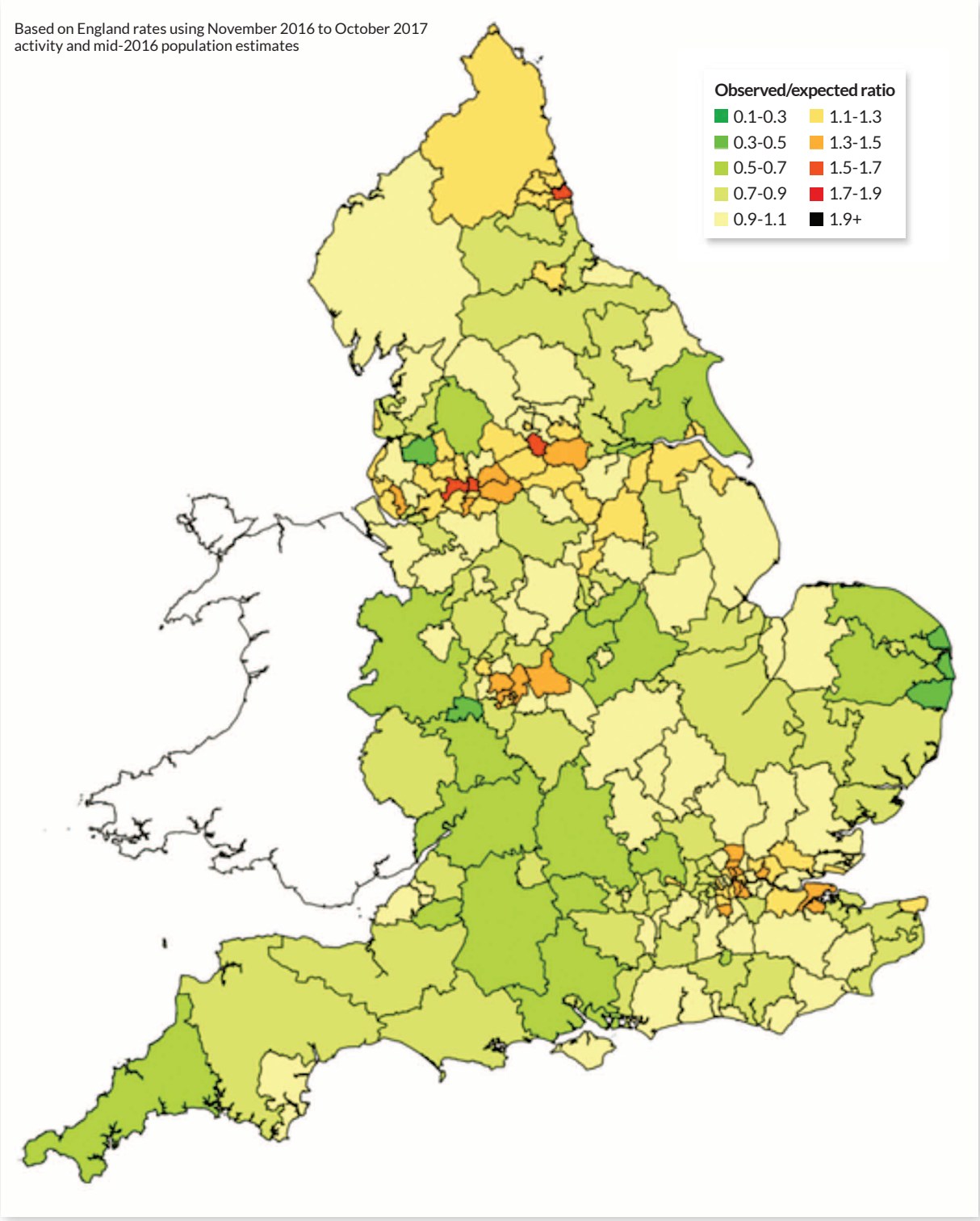
Source: Laudicella, M, 2017[7]

[7] *Laudicella, M., Martin, S., Li Donni, P., and Smith, P.C. (2017) Do Reduced Hospital Mortality Rates Lead to Increased Utilization of Inpatient Emergency Care? A Population-Based Cohort Study. Health Services Research.*

Geographical factors and demand

There is wide variation in the proportion of Type 1 EDs' catchment populations that attend each year, with a range from 16% to 43%. **Figure 9** shows the ratio of observed Type 1 ED attendances to expected attendances for England.

Figure 9: Map of observed Type 1 ED attendances to expected attendances in England



Source: Ordinance Survey data Crown Copyright and database Copyright 2018

For each trust, the catchment population was determined as shown in **Figure 10**. The number of ED attendances per year was then plotted against the catchment population to show the wide variation in attendance rates that is seen in **Figure 11**.

Figure 10: Catchment population per trust

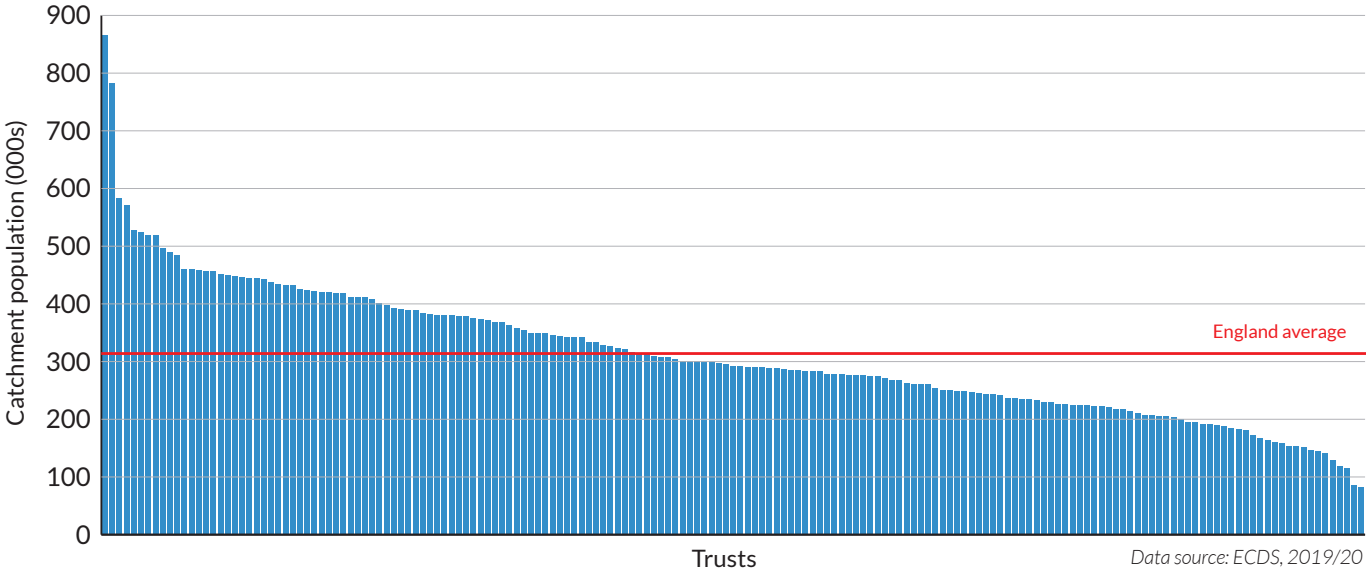
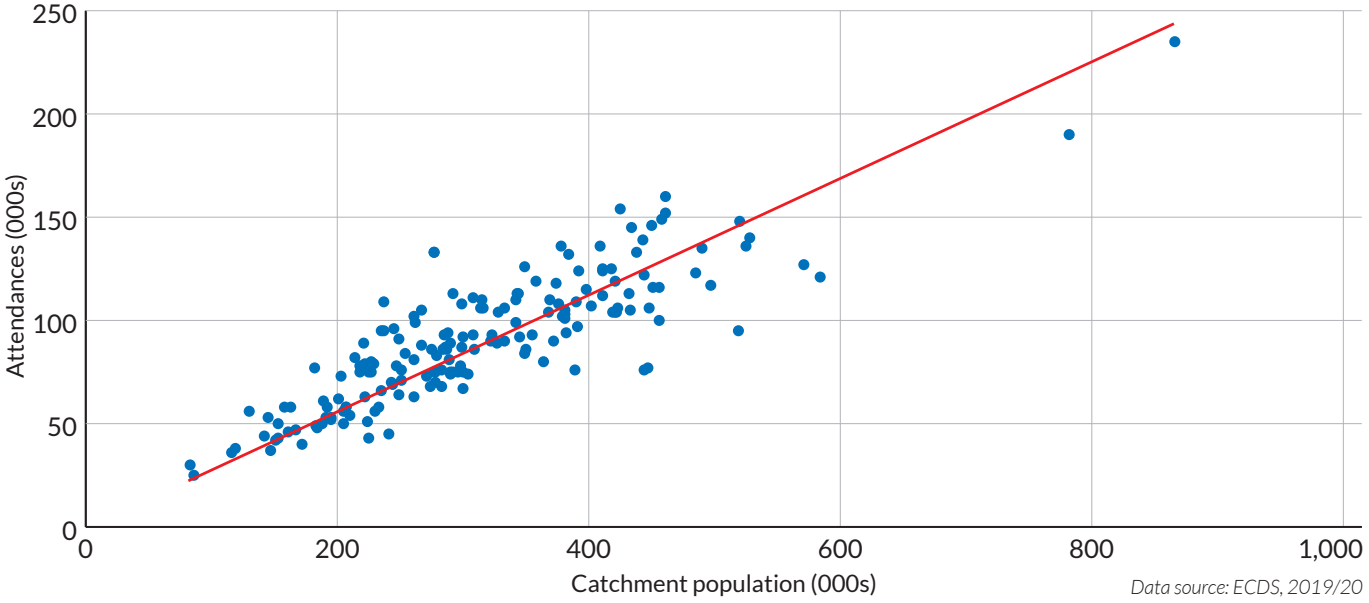


Figure 11: Annual ED attendances versus catchment population



Co-located primary care services

Attendances suitable for primary care account for between 15 to 20% of ED visits, with the highest proportion being children. Of these patients, 50% have been advised to attend the ED by a health professional.[8]

There is a correlation between higher ED attendance rates and a lower proportion of patients that require admission. Therefore, there are likely benefits in providing alternative urgent care services at hospitals with high standardised attendance rates; hence the rationale behind our recommendation for co-located primary care services at such sites.

Coastal, rural and urban EDs

The data shows that EDs in certain locations are particularly likely to be challenged by demographic features, casemix, resources and seasonal variation. This is especially true of the coastal sites. Examples of such EDs include Blackpool, Margate, Weston-super-Mare and Scarborough.

A report by the Social Market Foundation found that 'workers in seaside towns now earn almost £5,000 less than those elsewhere in the country.'[9] The same report also found that 'people in coastal areas can now also expect to die earlier than those elsewhere.' In addition, coastal communities typically have large numbers of retired people, many people from disadvantaged groups, and high numbers of itinerant workers.

Rural sites suffer from many of these issues too and often struggle to recruit staff, many of whom are based in the large urban centres. Patients and ambulances may have long distances to travel to the hospital and to the regional specialist centres.

EDs in large towns often serve a very deprived population without the level of resources of a city department. They too may suffer from recruitment problems as staff choose to live and work near the metropolitan teaching hospitals where they were trained.

Ambulance conveyance, NHS 111 and demand

We found that the national data quality for ambulance attendances and conveyancing rates is poor. For example: several EDs, including two major trauma centres, have zero recorded ambulance attendances.

The ambulance conveyance rate is the proportion of people who call for an ambulance and are then taken to hospital rather than being assessed and treated by a paramedic at home. The rate differs somewhat between the 11 regional ambulance services in England. It averages 57% and varies from 52.2% to 60.7% as shown in **Table 4** (right). It is seldom appreciated that ambulance services are able to advise and treat many patients safely without conveyance to hospital. We are aware of a number of initiatives aimed at increasing the proportion of patients that do not need to be conveyed to an ED or can be taken directly to non-ED services e.g. Same Day Emergency Care facilities. This of course, is an example of using extra healthcare capacity - in this case paramedic skills - to reduce ED demand.

Table 4: Ambulance conveyance rates by the 11 regional ambulance services

Regional service	Conveyance rate
England average	57.0%
East Midlands	60.7%
East of England	57.1%
Isle of Wight	59.8%
London	57.3%
North East	57.4%
North West	58.2%
South Central	52.2%
South East Coast	60.4%
South Western	52.7%
West Midlands	55.1%
Yorkshire	58.3%

Data source: NHS England, Ambulance Quality Indicators, 2020

[8] *Mann C and Moulton C (2015), Sentinel sites survey, Royal College of Emergency Medicine.*

[9] *Corfe S, Falling off a cliff, Social Market Foundation, 2019. https://www.smf.co.uk/publications/falling-off-cliff/*

Where reliable data is available, it shows that, at most EDs, the proportion of patients who arrive by ambulance is similar to the admission (conversion) rate. However, these two groups, whilst overlapping considerably, are not identical. The proportion of ED patients who arrive by ambulance is shown in **Table 5**.

Table 5: Proportion of ED patients who arrive by ambulance

Mean	Lower quartile	Upper quartile	Range
31%	27%	36%	16% to 54%

Data source: ECDS, 2019/20

However, not all patients who arrive at the ED by ambulance require admission. The variation in the proportion of ambulance arrivals who are admitted to a hospital bed is shown in **Table 6**. As previously stated, ambulance arrival data is of poor quality and so this table uses the 5th to 95th centile range rather than the absolute range.

Table 6: Conversion rate for ED patients who arrive by ambulance

Mean	Lower quartile	Upper quartile	Range (5th to 95th centile)
50%	45%	58%	27% to 64%

Data source: ECDS, 2019/20

NHS 111 and demand

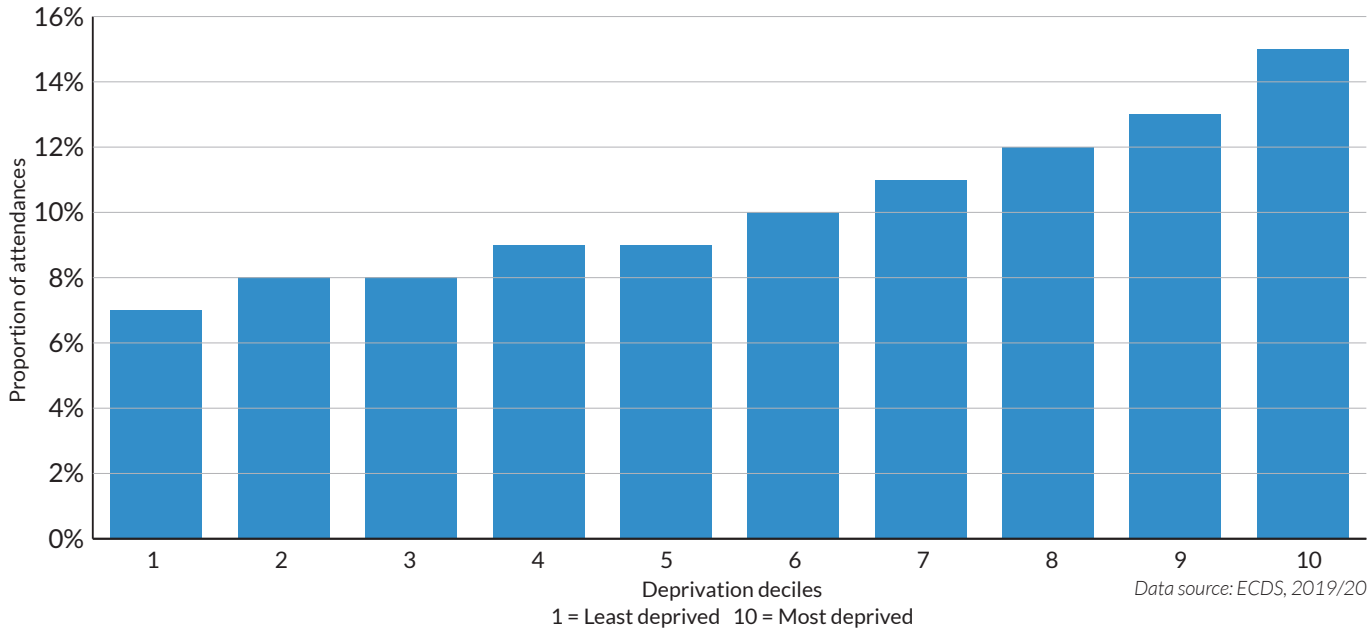
There were 1.4 million calls to the NHS 111 service in England in February 2019. Of these patients, 8.7% were recommended to attend their local ED. A further 13.4% of patients were referred to the ambulance service, who then conveyed the majority to an ED. This means that nearly 22.1% of patients who called NHS 111 were effectively referred to an ED.

There is a large peak of NHS 111 referrals to EDs at the weekend. This reflects the paucity of options within the *Directory of Services* that is available to NHS 111 health advisors outside of the working week. See p106 *Appendix 1: Optimal directory of services for urgent and emergency care*.

Deprivation and demand

Deprivation is the single most important factor in ED demand. In 2019/20, there were more than twice as many ED attendances for the 10% of the population who live in the most deprived areas compared with the 10% who live in the least deprived areas, as shown in **Figure 12**.

Figure 12: Proportion of ED attendances by level of deprivation



Data source: ECDS, 2019/20

There are several main reasons why the rate of ED attendance increases with deprivation. Areas of high deprivation have multiple socioeconomic disadvantages including:

- higher levels of comorbidities;
- less access to GPs, and preventative care facilities; and
- higher than average proportions of patients born overseas, where access to most medical care is generally via attendance at a hospital.

Variation in deprivation

Given the significance of deprivation in driving demand, we have used a deprivation metric for the populations served by each ED. This is the percentage of patients attending the ED who live in the most deprived quintile of households nationally. When we compare the metric for all EDs, it demonstrates the enormous variation between different EDs, with a range of between 1% and 70%, as shown in **Table 7**.

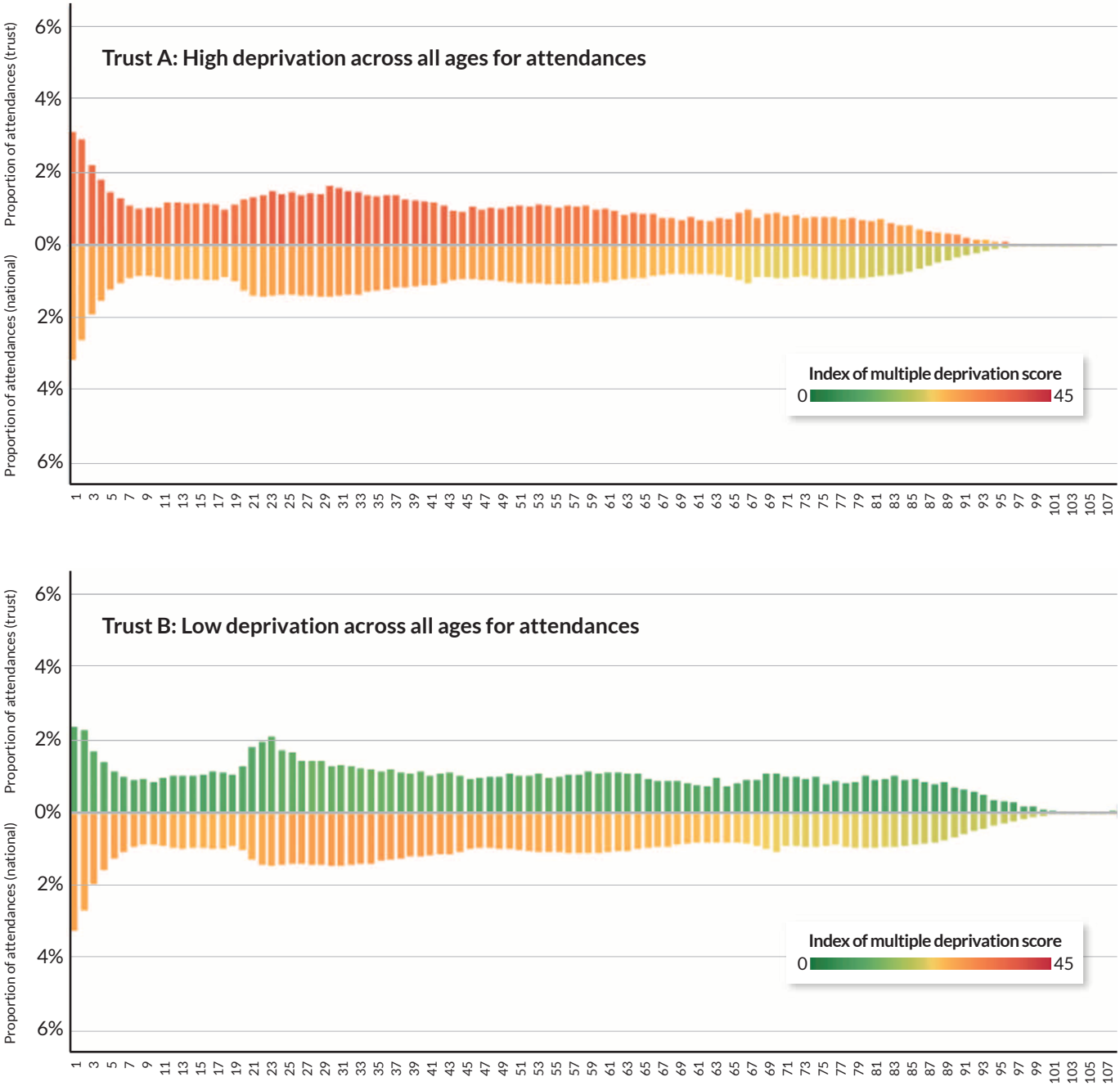
Table 7: Proportion of ED patients from the most deprived quintile of English households

Mean	Lower quartile	Upper quartile	Range
25%	11%	36%	1% to 70%

Data source: ECDS, 2019/20

The charts in **Figure 13** illustrate the great differences to be found in the deprivation profile of two example trusts. The top half of each chart (above the x-axis) shows the profile for the trust in question and the bottom half of each chart (below the x-axis) shows the average for England. The charts plot the proportion of attendances at each trust by age. Deprivation is shown for each age on a range from most deprived (red) to least deprived (green). It can immediately be seen that children are affected as much, if not more, than adults.

Figure 13: Examples of ED attendances by age and deprivation score at trusts serving populations with high and low levels of deprivation.



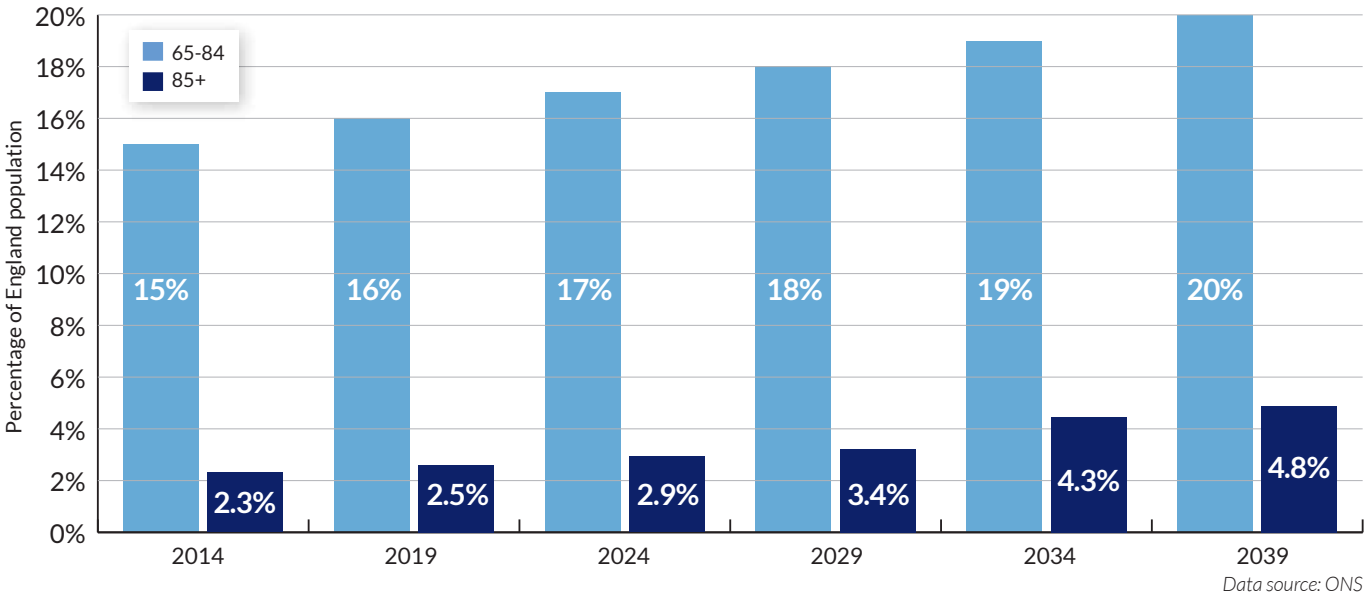
The top half of each chart (above the x-axis) shows the trust in question and the bottom half (below the x-axis) shows the average for England.

Data source: AE HES, APC HES and ONS, mid-year 2018

Age and demand

The UK's population has been steadily aging since the early 2000s and this pattern will continue in the coming decades, as shown in **Figure 14**.

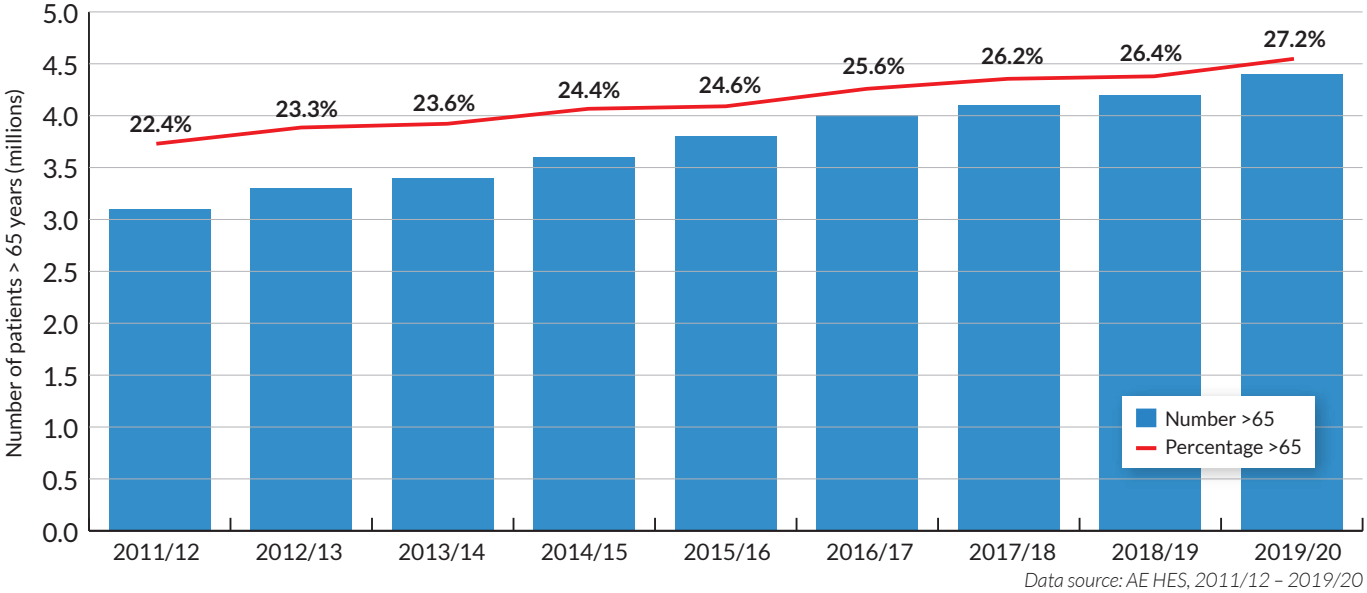
Figure 14: Percentage of population of England aged 65-84 and 85 and over



Data source: ONS

The aging population is a major factor in increasing the demand on many healthcare services, including EDs, as shown by **Figure 15**.

Figure 15: Type 1 attendances by patients aged over 65



Data source: AE HES, 2011/12 – 2019/20

Variation in average age of patients admitted via ED

The average age of patients admitted via EDs varies from 44 to 65 years, with an average age nationally of 57 years. The proportion of patients admitted from an ED who are aged over 75 years old also varies considerably as shown in **Table 8** below.

Table 8: Average age of people admitted from ED and proportion over 75 years old

ED admissions	Mean	Lower quartile	Upper quartile	Range
Average age (years)	56.8	54.3	59.8	44.5 to 64.8
% > 75 years old	31.5%	28.8%	37.0%	15.7% to 41.6%

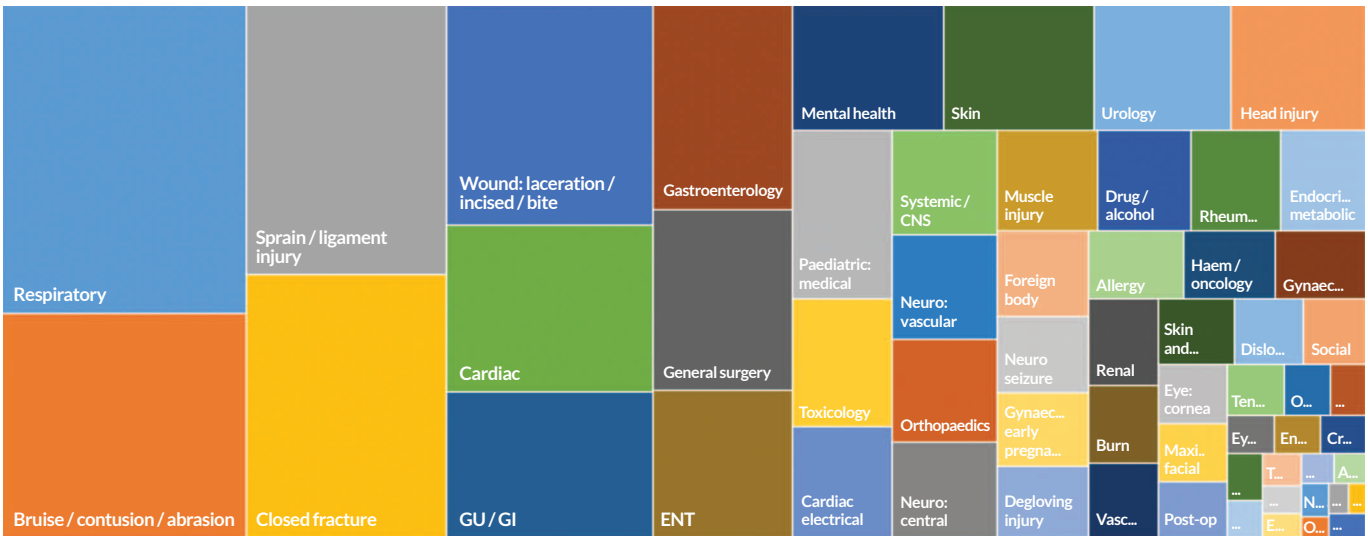
Data source: APC HES

The probability of a person who presents to an ED being admitted to hospital increases steadily with age (see **Figure 27**). Therefore, an ED with an older catchment population (and thus more older people attending) will usually have a disproportionately high conversion rate (see page 37 *Variation in admission from EDs*).

Casemix and demand

The casemix of patients presenting to an ED varies with local demographic factors and the availability of other sources of urgent care. **Figure 16** shows the relative proportions of the broad diagnostic categories of ED patients.

Figure 16: Relative proportions of broad diagnostic categories of ED patients



Data source: ECDS, 2019/20

Common conditions

Analysis of the national Emergency Care Data Set (ECDS) demonstrates the breadth of ED casemix, as shown in **Figures 17a** and **17b**.

Figure 17a: ED discharge diagnosis categories - Type 1 2019/20 diagnosis codes level 3 (>1%)

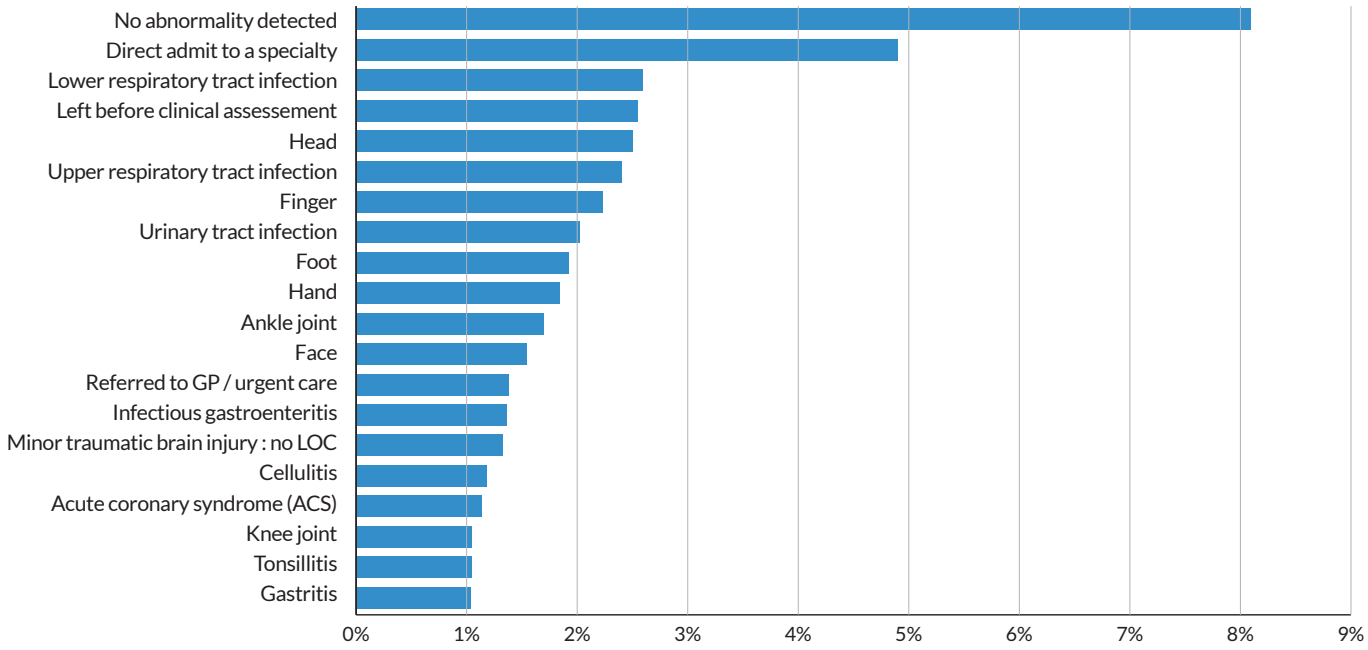
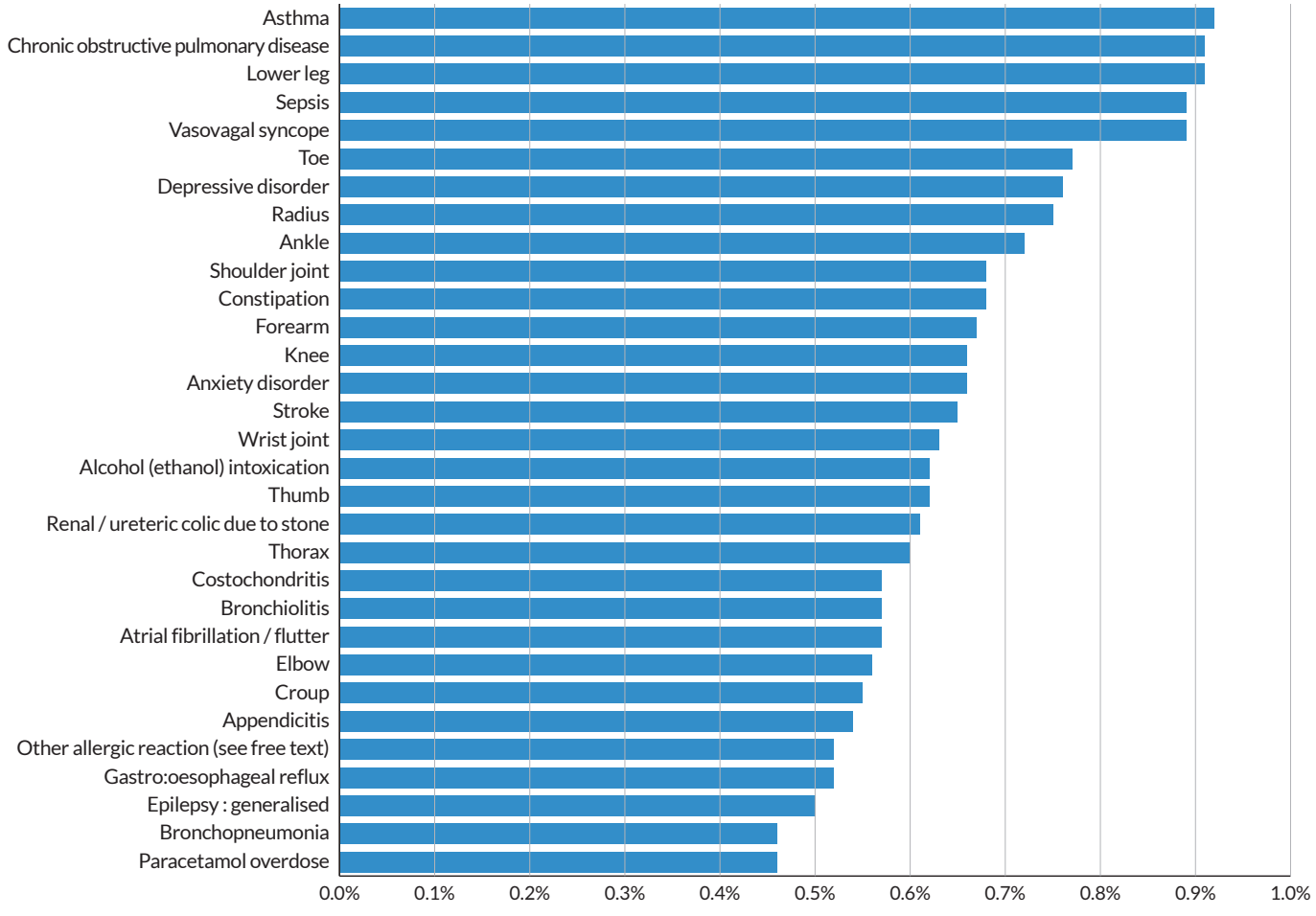


Figure 17b: ED discharge diagnosis categories - Type 1 2019/20 diagnosis codes level 3 (0.45%-0.99%)



Data source: ECDS, 2019/20

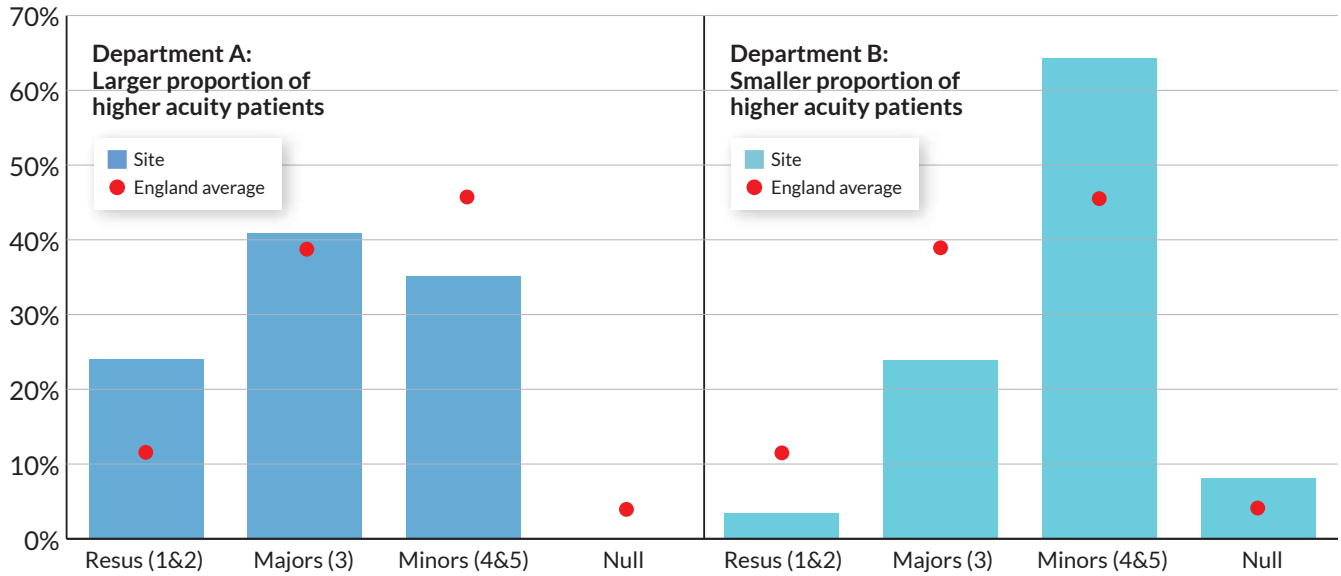
This highlights the breadth of ED practice and the limited scope for the input of disease-specific clinical specialists on the wider ED patient cohort, although this is not to deny the value of such experts in making significant contributions to the care of specific patient groups.

Acuity and the GIRFT-EM acuity metric

In emergency medicine, acuity describes the severity of a patient's illness, the amount of care required and the level of resource utilisation.

To enable comparison between different departments, we developed a GIRFT-EM 'Acuity Index' using the ratio of higher acuity patients (triage categories 1 Immediate, 2 Very Urgent and 3 Urgent) to lower acuity patients (triage categories 4 Standard and 5 Low). **Figure 18** shows two quite different ED acuity distributions, which should be expected to have similarly different ED capacity requirements.

Figure 18: Example of variation in acuity between two EDs



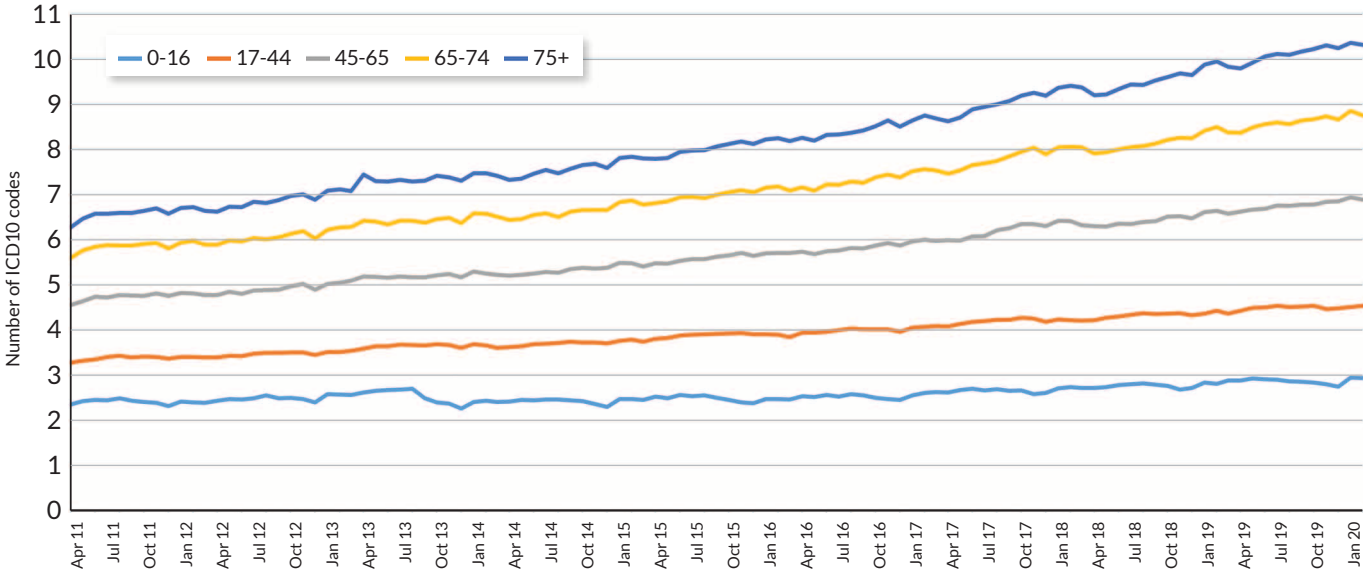
Data source: ECDS, 2019/20

Comorbidities

There is obviously a relationship between levels of comorbidity and ED demand. However, we found that comorbidity coding practices and accuracy of coding varied greatly. This means that current comorbidity data is unreliable and, in some instances, contrary to other data that relates to employment levels, income and other indices associated with comorbidity.

Figure 19 shows the linear relationship between age and comorbidity for ED admissions. During the last decade, there has been an increase in the number of recorded comorbidities with age, such that people admitted from an ED over 65 years of age had an average of 5.6 diagnostic codes attributed to their admissions in April 2011, rising to nearly 9.0 by January 2020.

Figure 19: Relationship between age and comorbidity



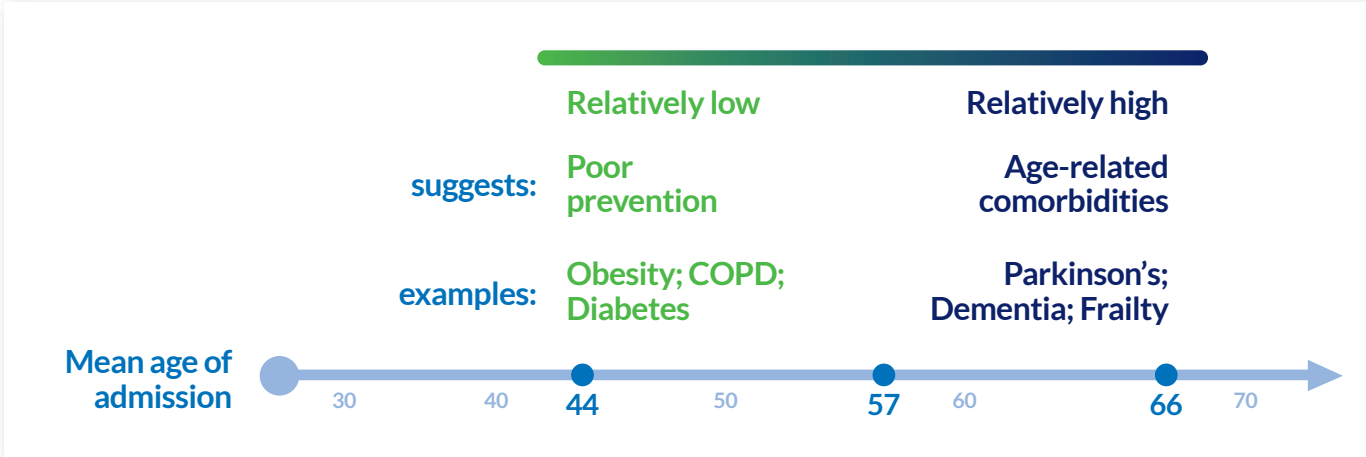
Data source: APC HES, April 2011 – January 2020

There is a correlation between higher emergency admission rates and both significantly higher and lower average age of admissions:

- Higher mean age is associated with age- and frailty-related conditions, such as dementia and Parkinson's; and
- Lower mean age is associated with poor prevention leading to conditions such as obesity or smoking-related illnesses.

This relationship has implications for service provision. For example, there is a need for enhanced frailty and elderly care services where the average age of admissions is higher, and for primary prevention and acute medical services where the average age is lower. This is illustrated in **Figure 20**.

Figure 20: Average age of people admitted from ED and implications for service requirements



Comorbidity metrics

The Charlson comorbidity index (CCI) assigns numerical values to comorbidities. A person's aggregated score can be used in statistical modelling to predict the likelihood of death within a set time period. The average CCI score for admissions via the ED is 2.89.

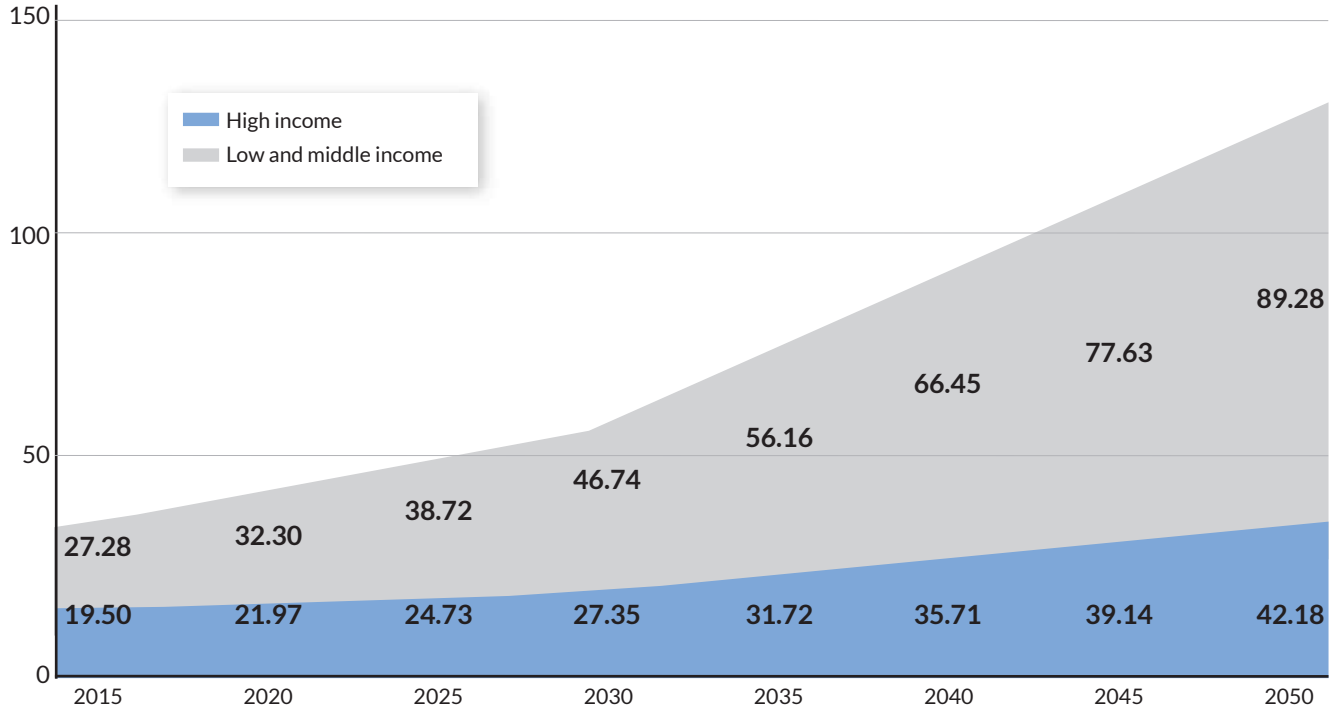
The Elixhauser comorbidity index offers a number of advantages over the CCI, including the omission of those comorbidities that do not contribute to the mortality of patients, the inclusion of a number of comorbidities that do, and a scoring methodology that more accurately reflects the impact of each comorbidity on the likelihood of death.

As noted above, the coding of comorbidities was so unreliable that we were unable to apply either score meaningfully to our analysis.

Dementia

The cost of dementia care was over 1% of global GDP in 2015 and is continuing to rise as the number of patients with dementia increases. It is estimated that a quarter of all ED admitted patients will have dementia as one of their comorbidities within the next decade.[10] See **Figure 21**.

Figure 21: Projected number of people with dementia in high-income and low- and middle-income countries



Source: World Alzheimer Report, 2015

[10] *World Alzheimer Report 2015. Alzheimer's Disease International, 2015.*

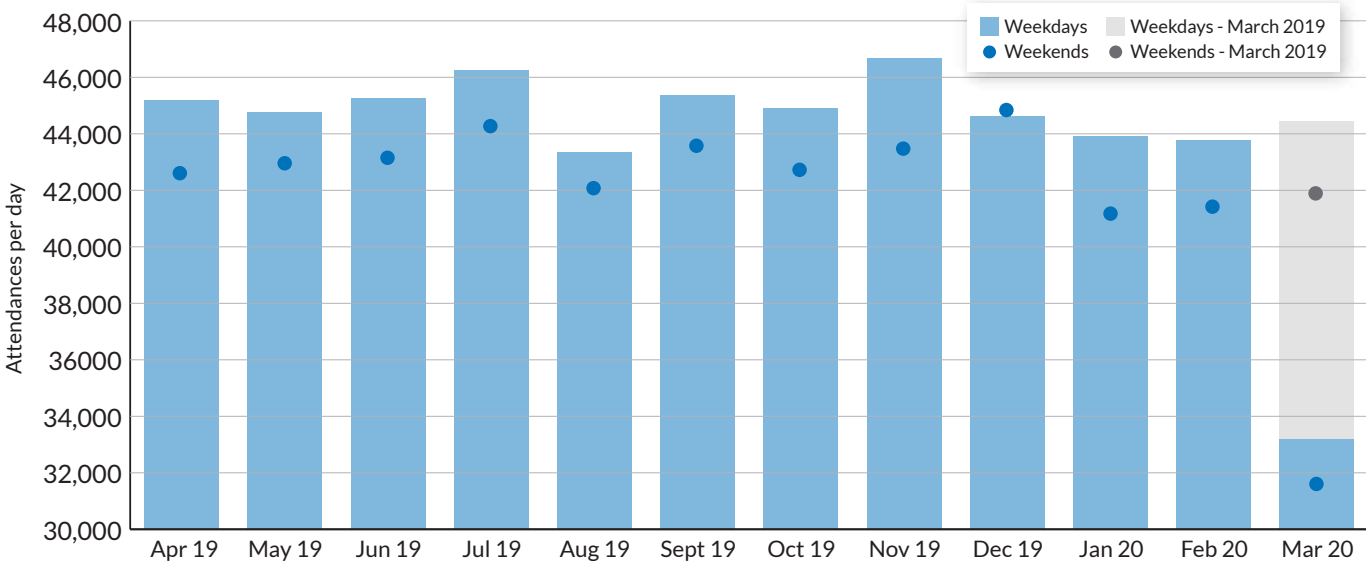
Variation in demand according to season, month, day and time

Demand for ED services also varies by season, month, day of the week, and time of the day. Monthly and diurnal variation are the most significant.

Variation by season and month

Nationally, ED attendance rates peak in the summer and fall slightly during the winter months, as shown in **Figure 22**.

Figure 22: Average ED attendances per day by month – weekdays and weekends



Note: March 2019 is displayed in grey as March 2020 demand was significantly impacted by COVID-19.

Data source: ECDS, 2019/20

However, emergency admissions tend to be higher in the winter months, as shown in **Table 9**.

Table 9: Emergency admissions via the ED

Month	2016	2017	2018	2019	2020
January	353,778	358,045	383,879	414,698	408,501
February	333,519	322,294	347,470	370,476	374,612
March	357,724	365,117	385,196	409,617	319,392
April	333,458	347,805	370,142	398,802	252,680
May	359,307	369,644	392,433	406,065	308,798
June	346,030	356,052	376,782	392,446	332,910
July	356,986	365,685	390,294	408,752	358,058
August	342,617	356,405	382,863	393,710	365,503
September	345,085	356,160	379,951	391,228	
October	357,874	373,673	398,478	412,649	
November	351,285	372,551	397,128	408,116	
December	366,086	387,919	407,286	416,017	

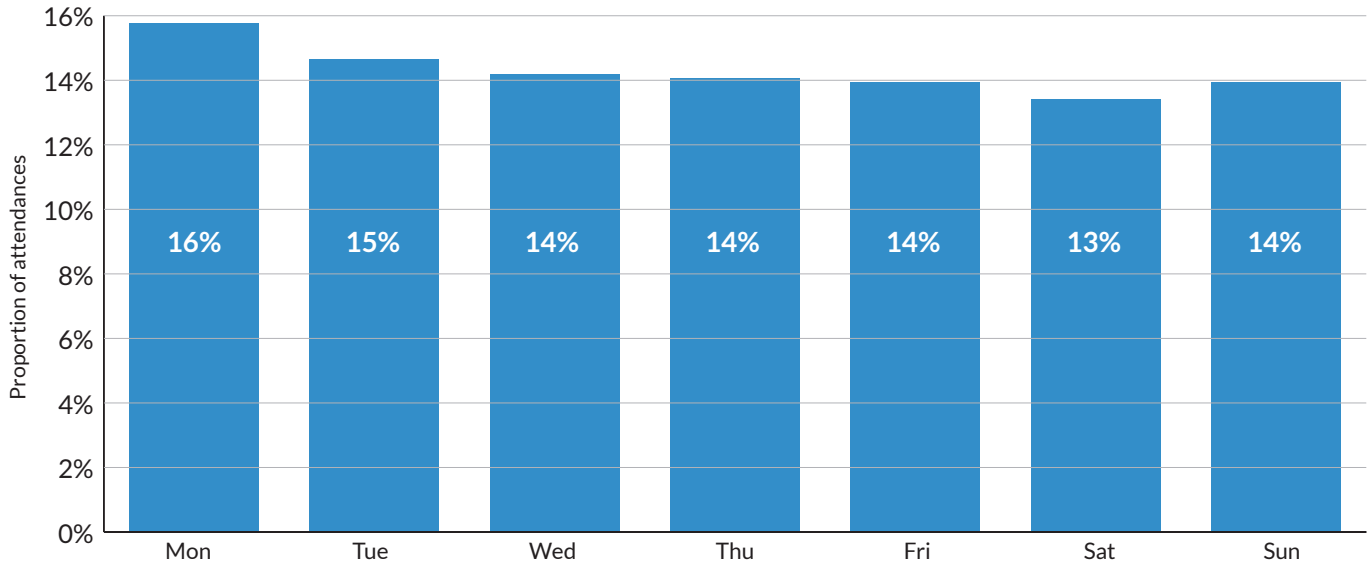
Note: 2020 demand was significantly impacted by COVID-19.

Source: NHS England and NHS Improvement

Variation by day of week

ED attendance rates throughout England are highest on Mondays and Tuesdays, as shown in **Figure 23**.

Figure 23: Proportion of ED attendances by day of week

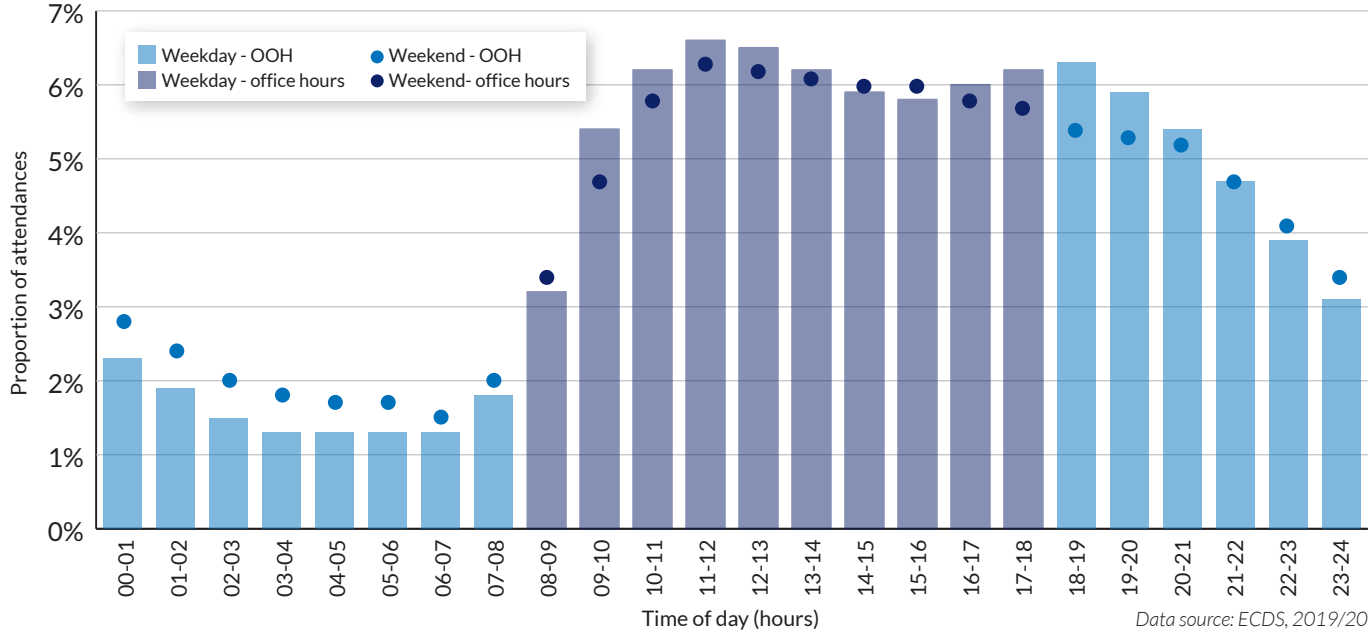


Data source: ECDS, 2019/20

Variation by time of day

ED demand peaks between 11am and midday, and again between 6pm and 7pm. It is at its lowest between 3am and 7am, as shown in **Figure 24**. There is a slightly different picture on weekdays from that of weekends.

Figure 24: Proportion of ED attendances by hour on weekdays and weekends



Data source: ECDS, 2019/20

ED workload at night

Some departments have many more attendances and admissions per hour overnight (12am to 8am) than other EDs, as shown in **Table 10**. Staffing levels tend to be lower during the night and so this places great pressure on night staff and tends to exacerbate morale issues and staff burnout.

Table 10: Proportion of emergency admissions to a trust during the night

Mean	Lower quartile	Upper quartile	Range
11%	8%	13%	1.6% to 29%

Data source: ECDS

Variation in admissions from EDs

Conversion rate

The conversion rate is the percentage of attendances at an ED that are then admitted to hospital. It varies considerably between EDs, as shown in **Table 11**.

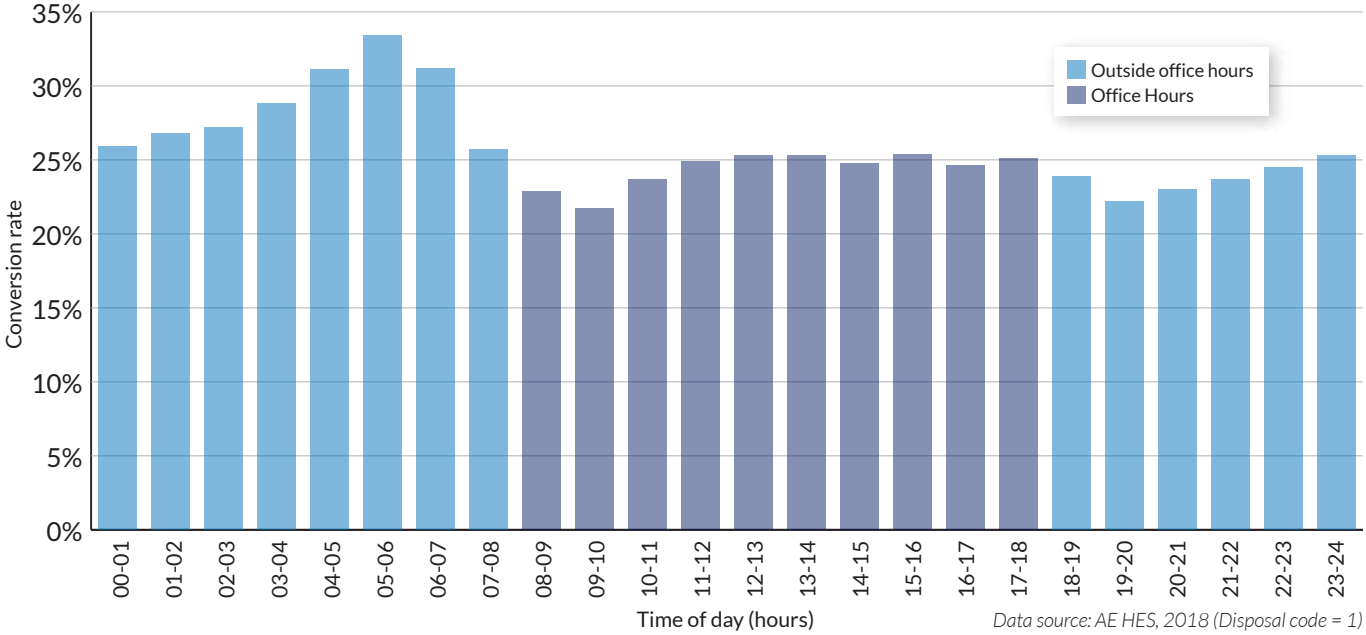
Table 11: Conversion rate for attendances at EDs

Mean	Lower quartile	Upper quartile	Range
30.4%	24%	34%	16% to 43%

Data source: HES, 2018 (Disposal code = 1)

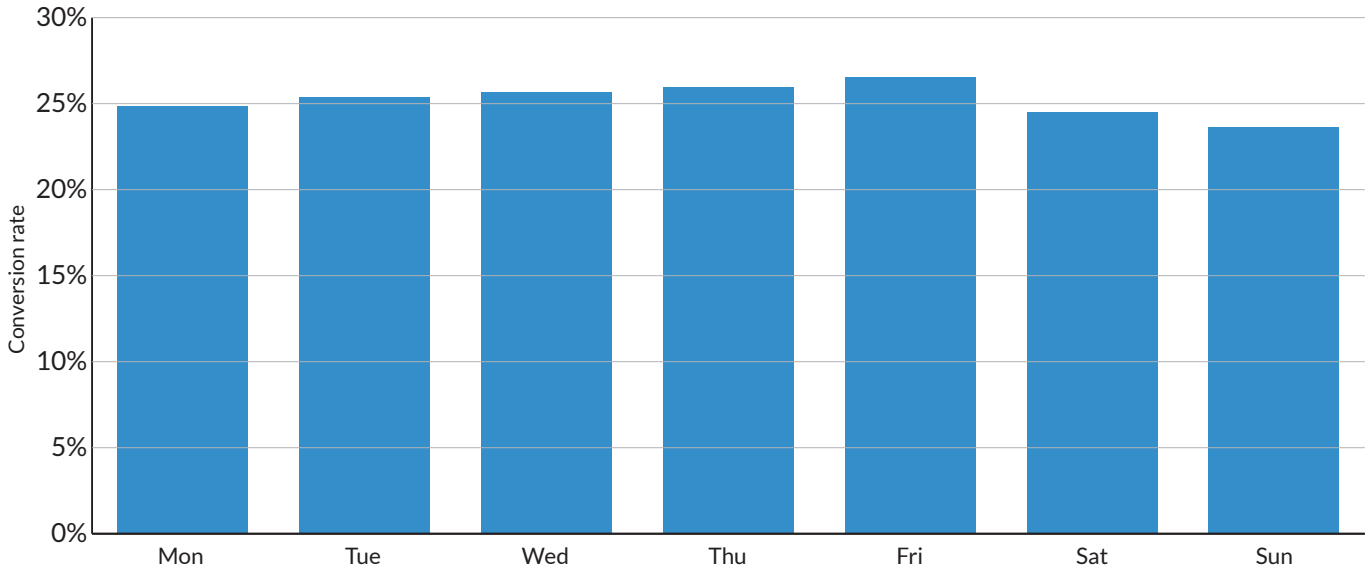
It also varies by time of day, as shown in **Figure 25**, but there is barely any variation in conversion rate by day of week, as shown in **Figure 26**.

Figure 25: Conversion rate by time of day – example trust profile



Data source: AE HES, 2018 (Disposal code = 1)

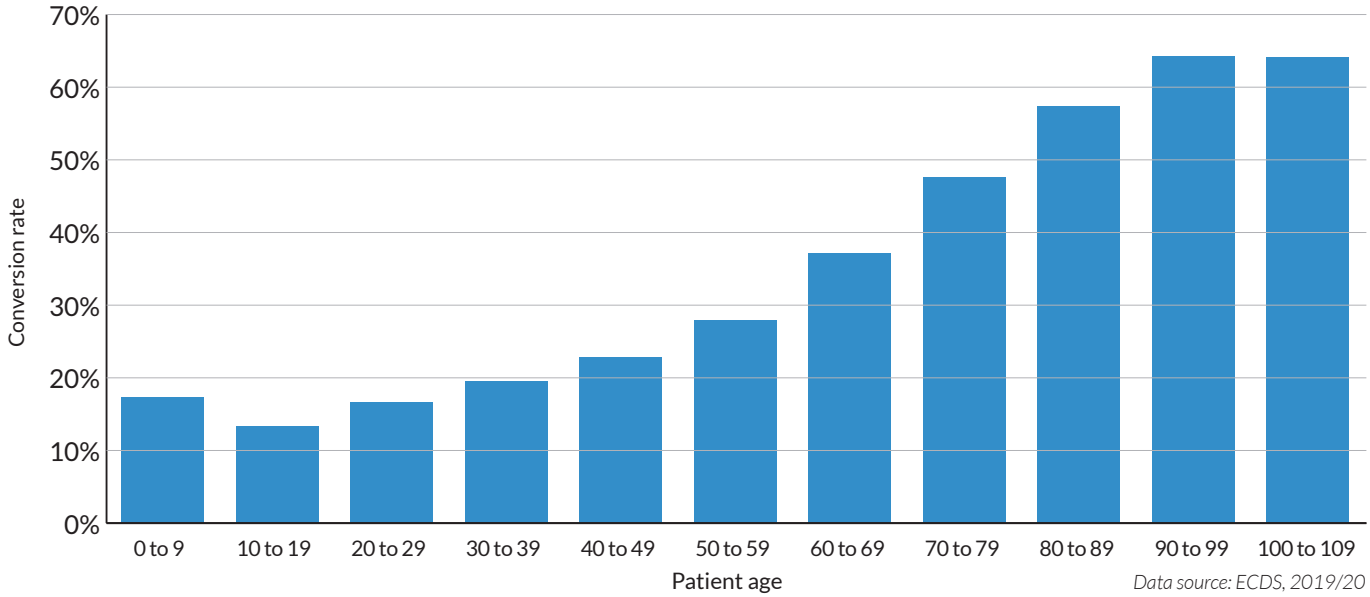
Figure 26: Conversion rate by day of week



Data source: HES, 2018 (Disposal code = 1)

However, there are huge differences in the conversion rate by patient age, as shown in **Figure 27**. The likelihood of being admitted to hospital increases steadily throughout adult life.

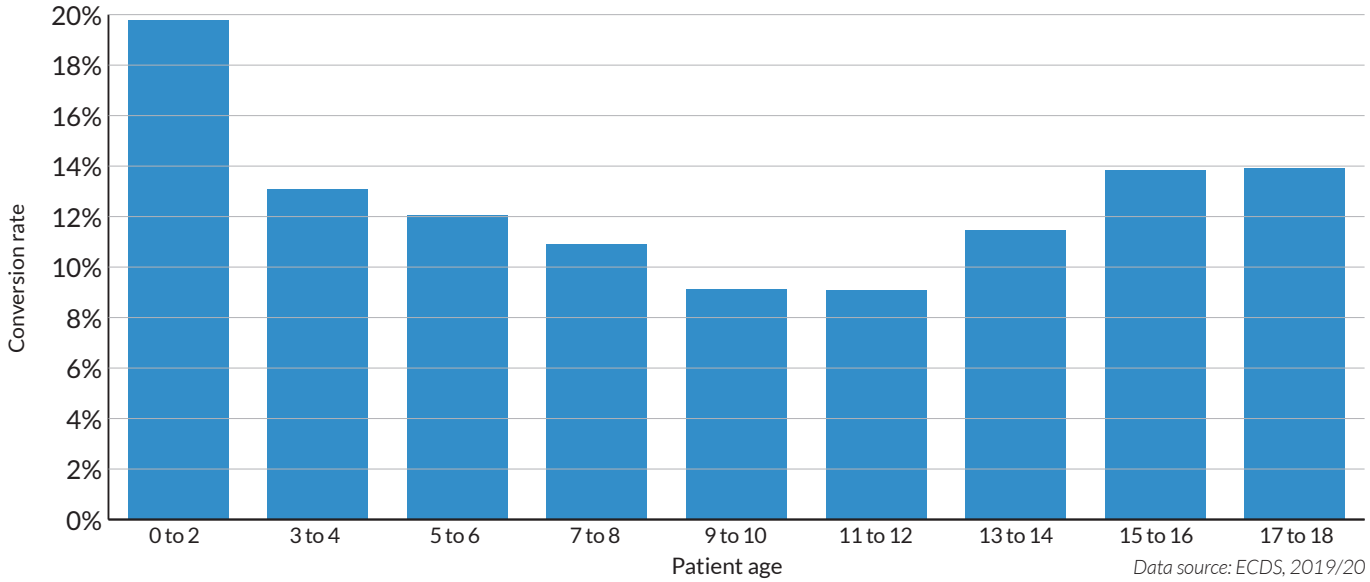
Figure 27: Conversion rate by patient age group



Data source: ECDS, 2019/20

Similarly, there is variation in the conversion rate by age in children, as show in **Figure 28**.

Figure 28: Conversion rate by age group in children



Data source: ECDS, 2019/20

Reported conversion rates are affected by:

- age of the catchment population;
- local casemix;
- ambulance conveyance rates;
- the presence of urgent care centres within the vicinity of the ED; and
- Type 1 attendances being incorrectly coded as Type 3 attendances.

Impact of acute admissions on trusts

There is substantial variation between trusts in the proportion of acute versus elective work undertaken. Hospitals with relatively high proportions of acute work face several challenges, such as:

- spikes in emergency admissions, which are less easily accommodated by changes in elective work;
- reduced flexibility in bed usage (smaller hospitals are particularly affected by this factor); and
- reduced reliability of income.

Funding mechanisms have favoured elective and specialist commissioned care over emergency care for many years. This has limited both capital and revenue spending at those sites with the greatest emergency workload.

Acute admissions via the ED

There is also significant variation in the proportion of acute admissions that enter the hospital via the ED, as shown in **Table 12**.

Table 12: Proportion of acute admissions via the ED

Mean	Lower quartile	Upper quartile	Range
76%	71%	86%	36% to 99%

Data source: APC HES

In hospitals where high proportions of non-elective admissions occur via the ED, timely admission and flow is often compromised. Hospitals where more than 75% of acute admissions pass via the ED generally have worse flow metrics but we found that those where the percentage is less than 66% usually have good ED flow.

Managing the demand for urgent and emergency care

Co-located services

Co-located services can reduce the number of patients who need to use the ED whilst providing them with a better experience. Such services might include:

- primary care services (which can care for 15 to 20% of all ED patients[11]);
- mental health services;
- community pharmacy;
- frailty services (including occupational therapists);
- urgent dental care;
- alcohol and drug services; and
- homelessness support.

A&E hub concept

The Royal College of Emergency Medicine has developed an A&E hub concept that includes co-located services. The services would be reconfigured, with EDs acting as a hub around which the other key services would operate. This would improve the patient experience, enabling patients to get the care that they need more quickly, and also reduce the pressure on EDs.

If each of these services were in place for every ED, the number of patients seen by the ED could be reduced by around 32% (over five million patients a year). See **Figure 29**.

Figure 29: A&E hub concept

Source: Royal College of Emergency Medicine estimates, 2015

[11] *Mann C and Moulton C (2015), Sentinel sites survey, Royal College of Emergency Medicine*

Same Day Emergency Care

Demand on EDs is reduced in areas where people can access Same Day Emergency Care (SDEC) on Acute Medical Units (AMUs) or Acute Surgical Units (ASUs) for example.

NHS England describes SDEC activity as:

The investigation, care and treatment of patients for whom admission to hospital would have been the default option in the absence of an SDEC service.

NHS England's target for SDEC activity, as stated in the NHS Long Term Plan, is 33%.

Hospitals that deliver high levels of SDEC benefit SDEC patients and non-SDEC patients alike; the former because their condition can be managed without admission, the latter because reduced admission rates improve bed availability and timeliness of admissions. **Table 13** shows the differing rates of SDEC activity between hospitals.

Table 13: Proportion of appropriate urgent care activity that is SDEC

Mean	Lower quartile	Upper quartile	Range
30%	23%	35%	9% to 54%

Data source: APC HES

Urgent access clinics

Urgent access ('hot') clinics are dedicated clinics providing emergency care for specific conditions. Examples include clinics for:

- bleeding in early pregnancy;
- haematuria (blood in urine); and
- transient ischaemic attacks.

Urgent access clinics can reduce both ED attendance and hospital admission rates. Additionally, some patients receive a more appropriate service by going directly to a specialist clinic rather than having a prior assessment in the ED e.g. patients with clear ophthalmic problems.

Urgent access to diagnostics and radiology

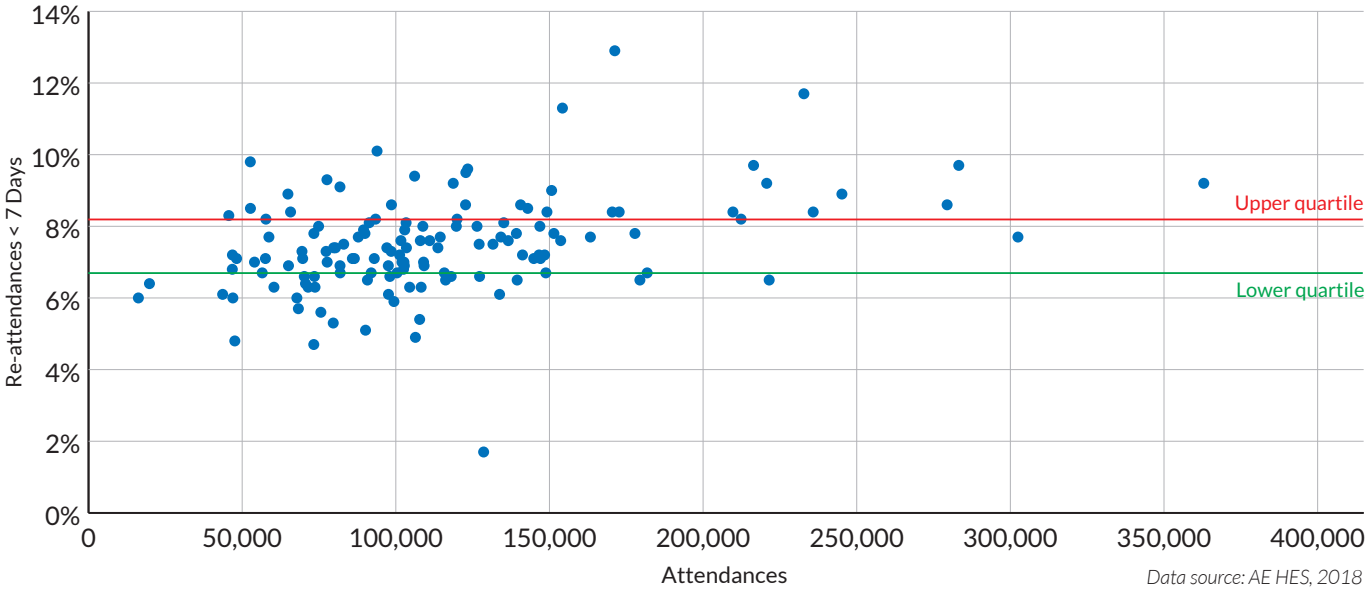
Diagnostics are a key enabler of best practice in EDs. Prompt access to radiology and other investigations can prevent hospital admissions and also reduce litigation rates e.g. CT pulmonary angiogram (CTPA) for possible pulmonary embolism and MR scan for possible cauda equina syndrome. Moreover, timely access to imaging is essential for the efficient running of both SDEC and urgent access clinics. On many of our site visits, we found significant diagnostic constraints. Lack of point of care testing, lack of dedicated x-ray facilities and lack of co-located CT scanning areas were commonplace. There was often no access to urgent MR scanning out-of-hours. In consequence, there were clear inefficiencies and barriers to timely imaging. Moreover, various protocols and policies created by non-EM clinicians further constrained access to imaging even when the facilities were available.

We also recognise that a lack of specialists to report these urgent images, especially CT and MRI scans, causes further delays to definitive diagnosis and subsequent treatment. The impact of these deficiencies is further discussed in the litigation section of the report.

Repeat attendances

A considerable amount of ED work comes from patients re-attending within seven days. This is especially the case at some sites, as shown in **Figure 30**.

Figure 30: ED re-attendances within seven days



Data source: AE HES, 2018

It is generally agreed that, in most cases, patients attending with the same problem within a week of hospital or clinic discharge should return directly to the specialty that treated them rather than being assessed first in the ED.

Reducing the demand for ED

The branding view on ED demand

A&E is a super-brand, familiar to most of the public for over 50 years. As such, it stimulates a behavioural script: an automatic response to a need. These patterns of behaviour are notoriously difficult to change, especially in the absence of alternatives that people find as easily accessible and as acceptable as attending an ED.

Public awareness campaigns

There have been many national and local public awareness campaigns to try to reduce the demand for ED services. As demand has continued to increase steadily in parallel with population growth, it is difficult to assess whether these campaigns have had any significant effect, or whether demand would have increased even faster without these initiatives. Since demand trends in England are comparable to those seen internationally, we have focused on how capacity can meet demand, rather than on attempting to reduce ED demand per se.

Limiting ED demand

The problem of ever-increasing ED demand is not easily addressed. The best way of minimising the demand is for local systems to provide the right type and availability of services so that patients have easily accessible alternatives to attending the ED. This is the rationale for the NHS 111 First initiative which seeks to enable patients to obtain clinical advice for urgent (not emergency) problems via the telephone and, when necessary, to be directly 'booked' to a range of more appropriate services, including primary care, secondary care clinics, mental health services etc.

The ED must always provide a safety net for individual patients but not a safety net for the entire healthcare system.

Internal demand

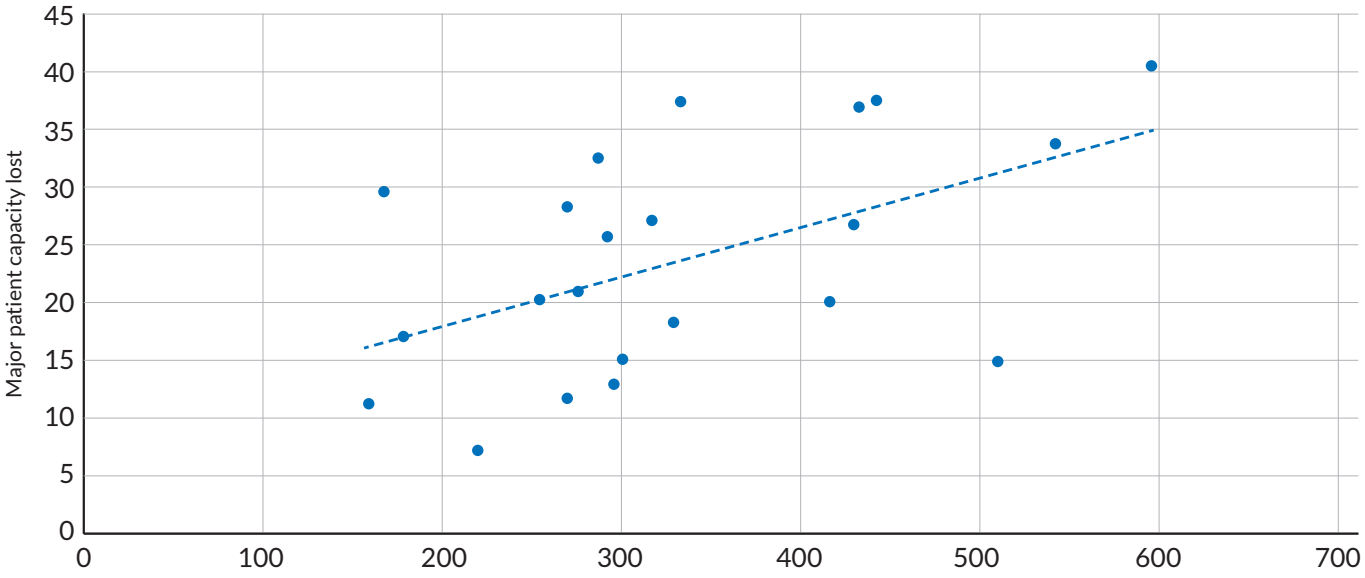
Systems and processes within a hospital, including IT systems that are not fit for purpose, can increase the workload of the ED very significantly. This can greatly impede the productivity of ED teams, especially in understaffed departments. The extent of this extra burden varies considerably between sites without obvious justification, showing that much of it is unwarranted.

Exit block

Exit block is when an ED is unable to transfer patients to other departments or wards because those departments are not in a position to receive additional patients. Subsequent overcrowding in the ED is the greatest internal demand constraint for EDs. It creates additional work for the staff of the ED who are left caring for many patients who should be in a bed on an inpatient ward.

Data from 22 sites demonstrates that, if patients were moved to the ward from the ED in a timely fashion, on average 24 more 'major' patients per day at each site could be managed with the same ED resources. See **Figure 31**.

Figure 31: Patient capacity lost as measured by time of arrival and duration to completion per day



Data source: AE HES 2018 and NHS Benchmarking Questionnaire 2018/19

Avoidable lost time in ED

Much of the capacity of an ED is lost through inefficient hospital patient admission processes, including delaying admission until immediately prior to the four-hour threshold. This creates measurable loss of capacity, especially cubicle space and nursing time. See **Figure 32**. For a typical ED, every hour of delay beyond five hours equates to 15 additional four-hour patient episodes or three 'lost' major cubicles per day.

Figure 32: Internal demand due to lost efficiency

ED computer systems

IT and software systems often impede rather than help clinical processes, while ineffective and poorly performing systems are also an under-recognised threat to patient safety.

There is remarkable unwarranted variation in the usability of the more than 40 different ED software systems currently in use in England. Hardware provision and quality also varies considerably between EDs. This adds to the clerical burden on clinical staff, reduces productivity and impairs timely and accurate data completion.

In the high volume specialty of emergency medicine, one extra minute per patient spent using computers (or any other task) consumes 250,000 staff hours per year. This is equivalent to 31,250 eight-hour shifts or 179 shifts for every Type 1 ED in England.

To estimate the IT burden for ED staff at a given hospital, we asked each department to complete and time a basic, standardised computer script prior to our visit. This self-reported 'GIRFT-EM script time' varied greatly, as seen from **Table 14**.

Table 14: 'GIRFT-EM script time' in minutes

Mean	Lower quartile	Upper quartile	Range
5.3	3.5	6.0	2 to 12

Data source: GIRFT-EM

If all EDs were able to move to the lower quartile, this would release more than 25,000 clinical shifts per year.

New drugs for use in ED

Adding a drug to an ED formulary can take more than 12 months and many hours of consultant time, even when the use of the drug is well established and it has been widely prescribed elsewhere for many years.

A standard list of ED drugs should be published that comprises drugs that should be readily available, without complicated and unnecessary local bureaucracy, to any ED that requests them. Such a national list is already in use for therapeutic antidotes. This would help to reduce the unwarranted variation in the treatments available to patients at different EDs.

We recommend that GIRFT work with NHS England and NHS Improvement and the Royal College of Emergency Medicine to develop and publish a list of standard drugs to be readily available to ED teams.

External agencies and inspections

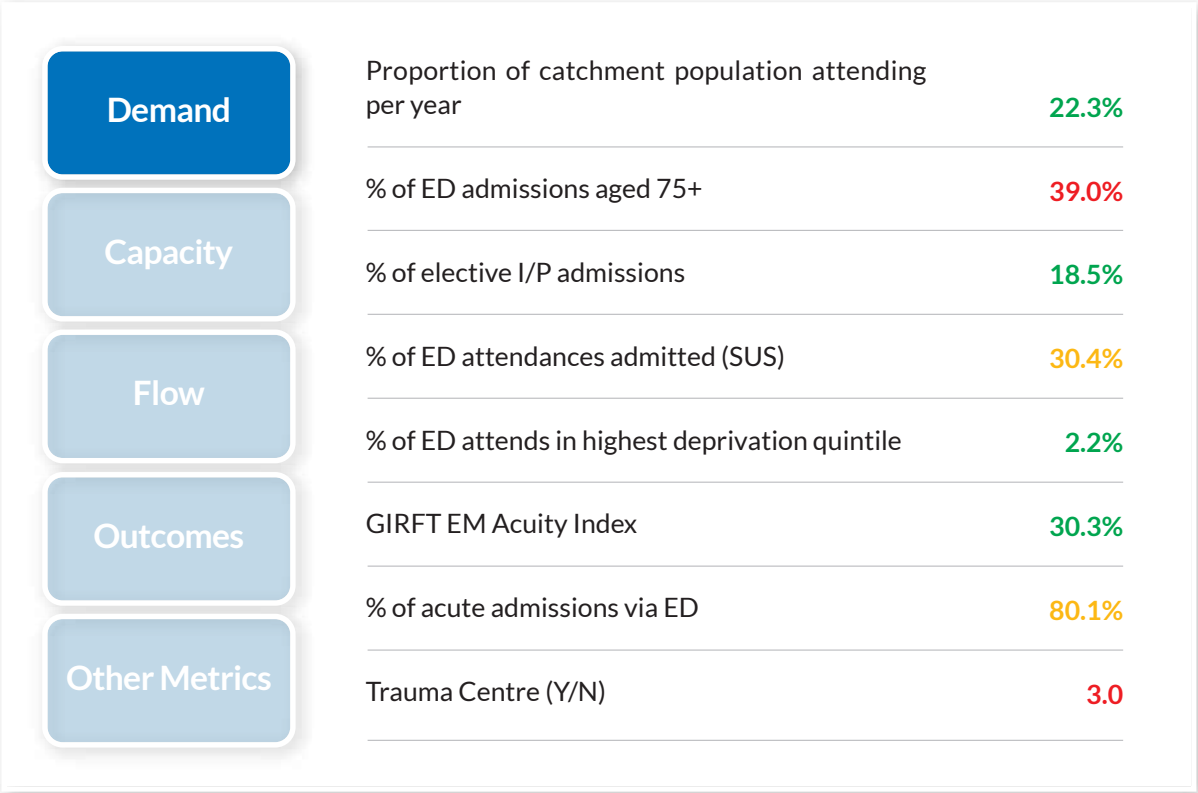
Constant visits, inspections and contradictory advice create competing demands for ED staff. We found clear evidence of such contradictions during many of our visits. For example, in one ED, staff were told to remove curtains in the corridors as it 'normalised' unacceptable care. In the second ED of the same trust, the instruction was to install patient alarms in the corridor so that patients who were waiting there could summon attention.

Instances such as this highlight the need for consistently applied standards and recommendations following inspections.

Demand in the SEDIT

The Summary ED Indicator Table (SEDIT) displays key metrics from across the four domains considered in our review. It enables trusts to identify their dominant constraint(s) and places them in a GIRFT-EM quadrant, thus indicating their improvement priorities. The SEDIT and ED quadrants are discussed further elsewhere in the report. The panels in **Figure 33** show the SEDIT and its key demand metrics for illustration purposes.

Figure 33: Demand metrics in the SEDIT



Source: The SEDIT

Summary of demand section

1. The demand for urgent and emergency care is seldom in the control of the ED.
2. Demand is only rarely amenable to reduction. It can however be met in ways other than ED attendance.
3. Demand can be managed by a range of urgent care options, including SDEC and co-located services.
4. Demand can also be reduced by specialties offering urgent clinic slots and taking certain patient groups directly from the ED without the need for prior ED assessment.
5. All patients recently under the care of specialty teams should be able to return to the relevant specialty assessment area unless requiring resuscitation.
6. 'Internal demand' on the ED should be reduced; such inefficiencies are inherently wasteful. This particularly includes the IT burden that is placed on EDs.
7. Patients should only need to attend the ED when ED input adds value to their care.
8. The demand for urgent and emergency care should always be matched by adequate ED, urgent care and hospital capacity.

Capacity

The capacity requirement for any Emergency Department (ED) should be determined by predictable and anticipated demand. Downstream capacity, such as bed occupancy levels, are a reliable predictor of ED overcrowding and exit block.

We looked at five key determinants of ED and hospital capacity:

1. ED major cubicles and resuscitation cubicles;
2. emergency medicine consultants;
3. ED nurses;
4. general and acute hospital beds; and
5. hospital consultants.

If the numbers of any of these five factors are deficient, they badly affect the flow and outcomes of the ED.

The quality of the estate and facilities also has a major effect on the productivity of an ED. Following each visit, we made an informed assessment of the adequacy of the ED estate and facilities at each site.

Major and resuscitation cubicles

Major cubicles are the ED spaces where most 999 or non-ambulant patients are taken for assessment and care. Resuscitation cubicles are where patients with life-threatening conditions, such as compromised breathing or circulation, are treated.

The number of admissions per major and resuscitation (resus) cubicle is a key determinant of an ED's capacity. We found huge variation between EDs from 590 admissions to 3,500 admissions per major and resus cubicle per year, as shown in **Table 15**. On average, a typical major and resus cubicle must accommodate 1,269 admissions per year.

When looking at these figures, it is important to note that, as approximately 50% of patients occupying major and resus cubicles are not admitted, the actual demand for major and resus cubicles therefore substantially exceeds the number of admissions.

Table 15: Admissions per major and resus cubicle per year

Mean	Lower quartile	Upper quartile	Range
1,269	919	1,510	590 to 3,500

Source: AE HES, NHS Benchmarking Questionnaire

Time in cubicle

The average time spent by a patient in each cubicle is the other determinant of the number of spaces required. The product of the time spent in a cubicle and the number of patients equals the total space/time requirement, as shown in **Table 16**.

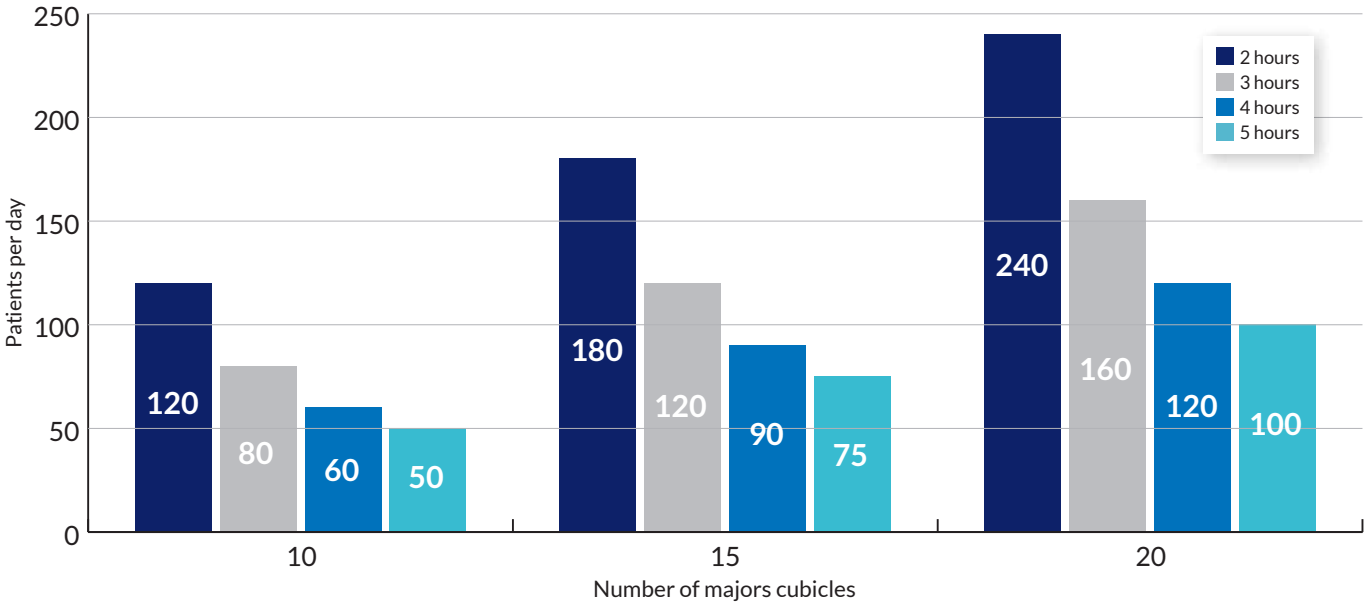
Table 16: Example of capacity for 15 cubicles with different average occupancy time per patient

Number of cubicles	15	15	15	15
Cubicle hours per day	360	360	360	360
Average patient hours in cubicle	2	3	4	5
Maximum daily capacity	180 patients	120 patients	90 patients	75 patients

Figure 34 highlights how increasing the time in cubicle exponentially reduces capacity. For example:

- increasing time in cubicle by one hour reduces capacity by a third;
- Increasing time in cubicle by another hour reduces capacity by another quarter.

Figure 34: Capacity/flow relationship between number of cubicles and average patient time in cubicle



In England, there are 4,163 major and resus cubicles. Even assuming a conservative estimate that one third of patients in these cubicles are not admitted, if the average 'Time in Cubicle' exceeds five hours, then there is insufficient national ED capacity to avoid 'corridor care'.

Goldilocks principle: From our deep dive visits and analysis of the data, it is evident that the 'Goldilocks principle' of not too small and not too large applies to EDs. If a department is too small, there is a contingent risk of patients waiting in corridors. But if an ED is too big, then the risk increases of 'hiding' delays to timely admission in a large patient warehouse.

Pressures on major and resus cubicle capacity

We estimate that 77 EDs in England will need to achieve a time in cubicle of less than four hours by 2025 if they are to meet projected future demand with their current major and resus capacity. This is comprised of:

- 56 EDs where the time in cubicle for all major and resus patients would need to be less than four hours if those departments were to meet their current demand; and
- 21 further EDs which will need to do the same within the next five years at the annual rate of growth in admissions of 4.6% per year since 2016.

ED staffing levels

There is enormous, and usually unwarranted, variation in the type and number of staff employed by EDs. As well as variation in the numbers of consultants and nurses, there is variation in other roles crucial to EDs, such as doctors other than consultants, advanced clinical practitioners (ACPs), advanced nurse practitioners (ANPs), pharmacists, and physician associates (PAs).

Staffing data

Currently, reliable ED staffing data is only available for consultants and registered nurses; numbers for other groups of ED staff are almost impossible to determine with any degree of accuracy.

However, from our deep-dive visits, we found a strong correlation between staffing levels for consultants and registered nurses with other types of staff. EDs with relatively high numbers of consultants generally have adequate numbers of other ED staff too, while EDs that struggle to recruit and retain consultants have similar problems with the recruitment and retention of all staff groups.

Given the relationship between consultant numbers, nursing staff numbers and other staff, metrics based on consultant numbers and nurse numbers provide an effective proxy for assessing overall ED staffing levels.

ED consultants

Consultant data tends to be reliable because their numbers are relatively stable and accurately reported. Attendances and admissions per whole time equivalent (WTE) ED consultant per year are shown in **Table 17**. The figures relate only to consultants trained in emergency medicine.

Table 17: Number of ED attendances and admissions per WTE consultant per year

	Mean	Lower quartile	Upper quartile	Range
Attendances	8,731	7,155	10,680	3,919 to 46,154
Admissions	2,563	2,080	3,164	1,022 to 8,123

Data source: NHS Benchmarking Network Questionnaire 2018/19

It is widely accepted that good practice for ED consultant presence on the 'shop floor' should be at least 16 hours a day, 7 days a week (a 16/7 rota). It is not possible to run a 16/7 rota properly with fewer than ten consultants.

High quality emergency medicine requires senior input and supervision. Trusts must recognise this fact and facilitate emergency medicine as a sustainable and fulfilling career for all grades rather than just a phase of a career through which to pass.

ED nursing staff

The range for the number of ED attendances per WTE registered nurses varies hugely from 554 to 2,483. From our deep-dive visits, we repeatedly found that EDs with high numbers of admissions per registered nurse struggled to deal with their demand effectively, leaving them with poorer flow and outcomes.

Attendances per registered ED nurse per year are shown in **Table 18**.

Table 18: Number of ED attendances per WTE registered nurse per year

Mean	Lower quartile	Upper quartile	Range
1,271	959	1,356	554 to 2,483

Data source: NHSBN Questionnaire and APC HES

Workforce matrix

Capacity planning in emergency departments must take account of clinical staffing requirements involving the whole multi-professional team. We have worked alongside NHS England and NHS Improvement and Health Education England to develop a proposed workforce matrix to help EDs (and other hospital departments) group and structure their workforce according to capability by providing approximate staff equivalents. See page 107 *Appendix 2: Workforce Matrix*.

Hospital capacity for emergency admissions

General and acute hospital beds

There are too few available hospital beds for the size and demographic profile of the current and predicted UK population. However, this shortage is not equally shared between trusts. There is huge variation between sites in the number of acute admissions per hospital bed. The range is nearly threefold, as seen from **Table 19**.

Table 19: Number of general and acute beds per 1,000 acute admissions

Mean	Lower quartile	Upper quartile	Range
12	10	13	6 to 18

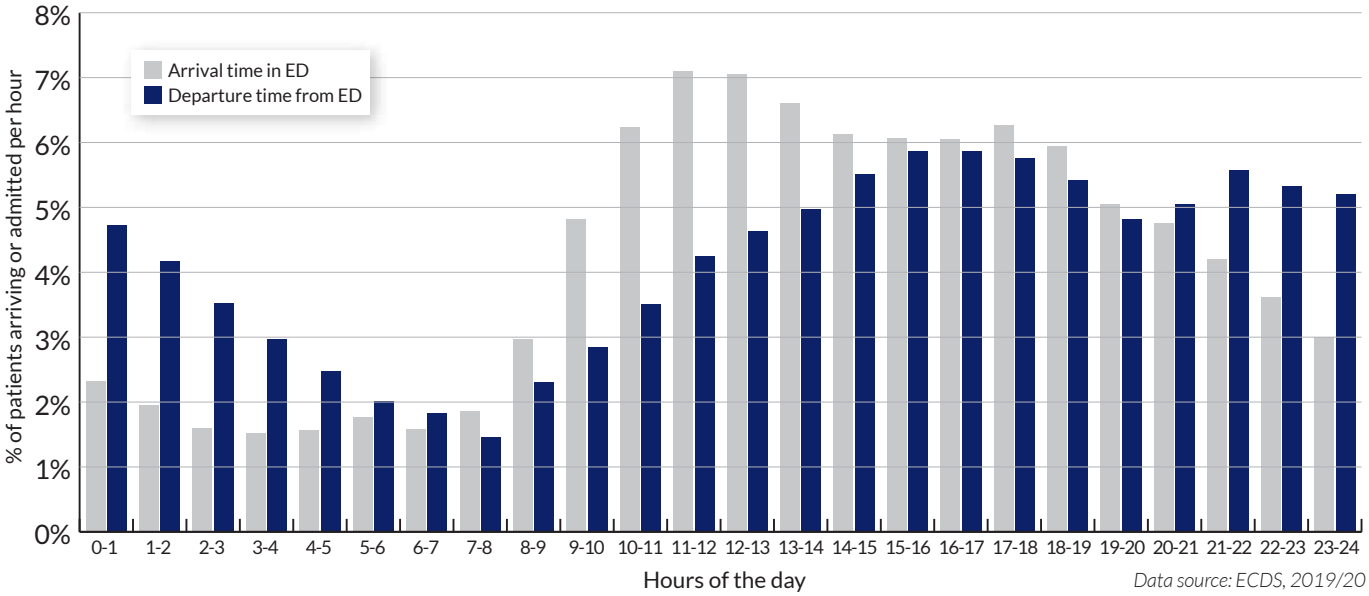
Data source: NHS England KH03 and APC HES

In England, there are fewer than two hospital beds per 1,000 citizens (excluding maternity and mental health beds).

Bed availability and exit block

In most hospitals, there is a substantial mismatch between bed availability and ED arrival time for medical admissions, largely unrelated to the duration of the ED episode of care. **Figure 35** demonstrates this pattern and highlights the need for clinical teams and trusts to make use of the 'Ready to Proceed' (RtP) metric proposed in the recent UEC Clinical Review of Standards and described below. Reducing the gap between RtP and time to ward admission is key to reducing and eliminating exit block.

Figure 35: ED arrival times versus ED departure times for admitted medical patients (on weekdays)



Data source: ECDS, 2019/20

Hospital consultants

The number of all admissions (both elective and non-elective) per hospital consultant per annum is shown in **Table 20**. The combined figure is used here to take account of all inpatient work for consultants.

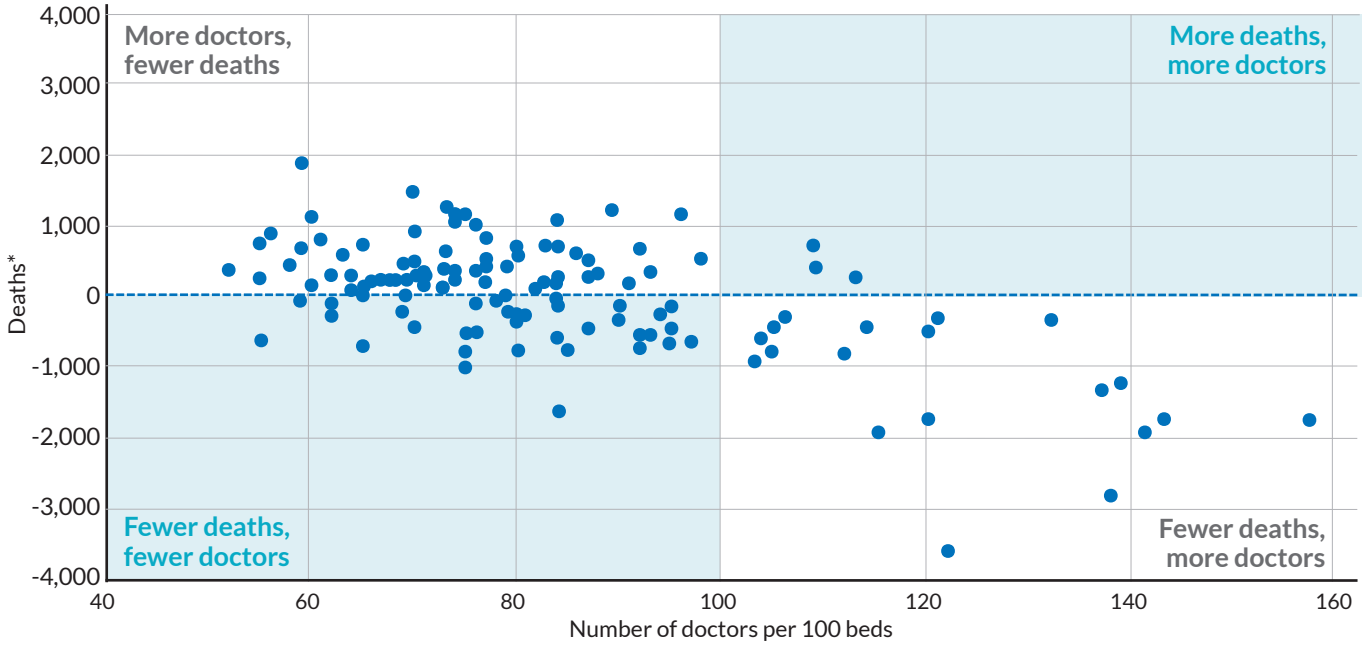
Table 20: Admissions per WTE hospital consultant per annum

Mean	Lower quartile	Upper quartile	Range
440	378	492	204 to 716

Data source: NHS England and APC HES

Numbers of hospital staff are not just about an equitable workload; they also have a measurable effect on patient outcomes as seen in **Figure 36**.

Figure 36: The relationship between numbers of hospital doctors and hospital mortality rate



*Number of deaths above or below the number expected based on national average.

Data source: Professor Sir Brian Jarman, Emeritus Professor of Primary Health Care, Imperial College London

Dominant constraints to ED patient flow

During the GIRFT-EM visits, it became clear that four elements of ED and hospital capacity were so critical to good ED patient flow and outcomes that each one of them, if deficient, was a 'dominant constraint'. These four factors are:

1. EM consultants
2. ED registered nurses
3. Major and resuscitation spaces
4. General and acute beds

The dominant constraints for each ED (if any) are shown at the top of the SEDIT for that site.

Interaction between major and resus cubicle numbers, staffing levels and bed availability

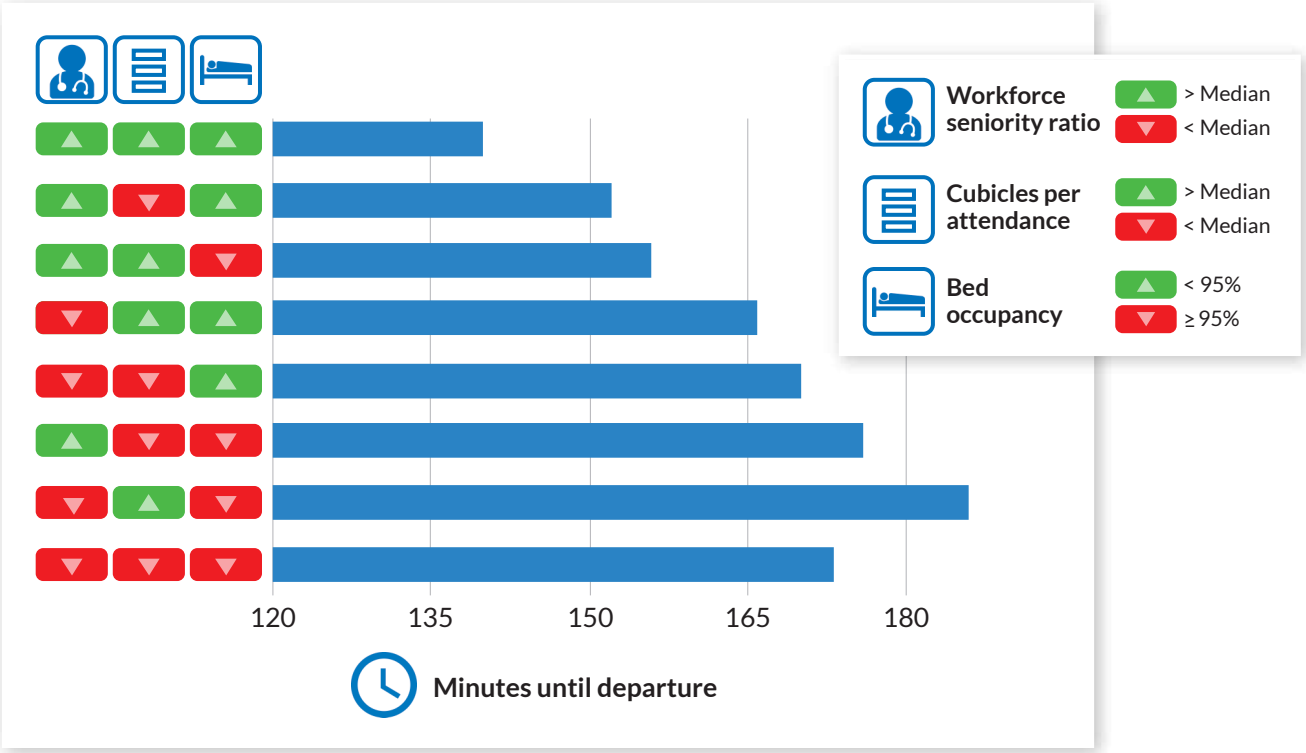
We analysed the interplay between three of the above four key variables that determine the adequacy of ED capacity:

1. the number of senior medical staff per shift;
2. the ratio of major cubicles and resus cubicles to attendances; and
3. hospital bed occupancy, i.e. the number of available beds.

Unsurprisingly, patients spend less time in EDs whenever all three variables are better than average. Departments with sufficient senior staff to make key decisions, sufficient cubicles to accommodate patients, and sufficient hospital beds for admissions have the lowest patient times in the ED. Counterintuitively, the worst combination is not the opposite of the best, as shown in **Figure 37**. The worst combination is to have a lower number of senior medical staff but an above average number of cubicles. This effectively creates an ED with the worst ratio of doctors to patients, but little hospital incentive to move patients in a timely fashion because ED space is not at a premium.

Triathlon principle: It can help to think of this issue as being similar to the three disciplines in a triathlon: it doesn't matter how fast you can run and swim if your bike has no wheels, and the speed of your bike doesn't matter if you can't swim.

Figure 37: The effect of key variables on the predicted average time in ED



Estate, infrastructure and facilities

There is remarkable variation in the standard of estate, infrastructure and facilities to be found within EDs. At the time of publication, we have identified 28 EDs that require a complete rebuild or substantial redevelopment to be able to function adequately at their current level of demand. In addition, around a third of departments are too small to manage their current workloads effectively.

Isolation facilities in EDs

The COVID-19 pandemic of 2020 has once again highlighted the urgent need for more isolation facilities. Many EDs have resuscitation rooms with only curtained partitions between patients, and most have very few individual cubicles with walls and doors. In addition, waiting rooms are often small and cramped with limited possibilities for social distancing. See page 108 *Appendix 3: ED isolation and decontamination facilities.*

Grading the ED estate and facilities

At each visit, we graded the ED estate as good, adequate or unacceptable. The relative proportions of each grade for the 90 sites that we have visited to date are shown in **Table 21**.

Table 21: Grading of ED estate and facilities

Good	Adequate (a wide range of standards)	Unacceptable
25%	38%	37%

Data source: 90 ED sites visited during deep-dive visits, 2019

Staff toilets

The ratio of staff toilets to members of staff provides a useful proxy measure for the quality of staff facilities. On average, there is approximately one staff toilet for every 40 members of staff in EDs in England. We also found that the total number of toilets in an ED that are available exclusively for staff use ranges from one to seven. Acceptable numbers of facilities are provided by the HSE Approved Code of Practice.[12] The huge (10-fold) variation in ED staff per toilet cubicle is shown in **Table 22**.

Table 22: Number of staff per ED staff toilet cubicle

Mean	Lower quartile	Upper quartile	Range
38	31	59	10 to 99

Data source: NHSBN Questionnaire, 2018/19

Special rooms and equipment

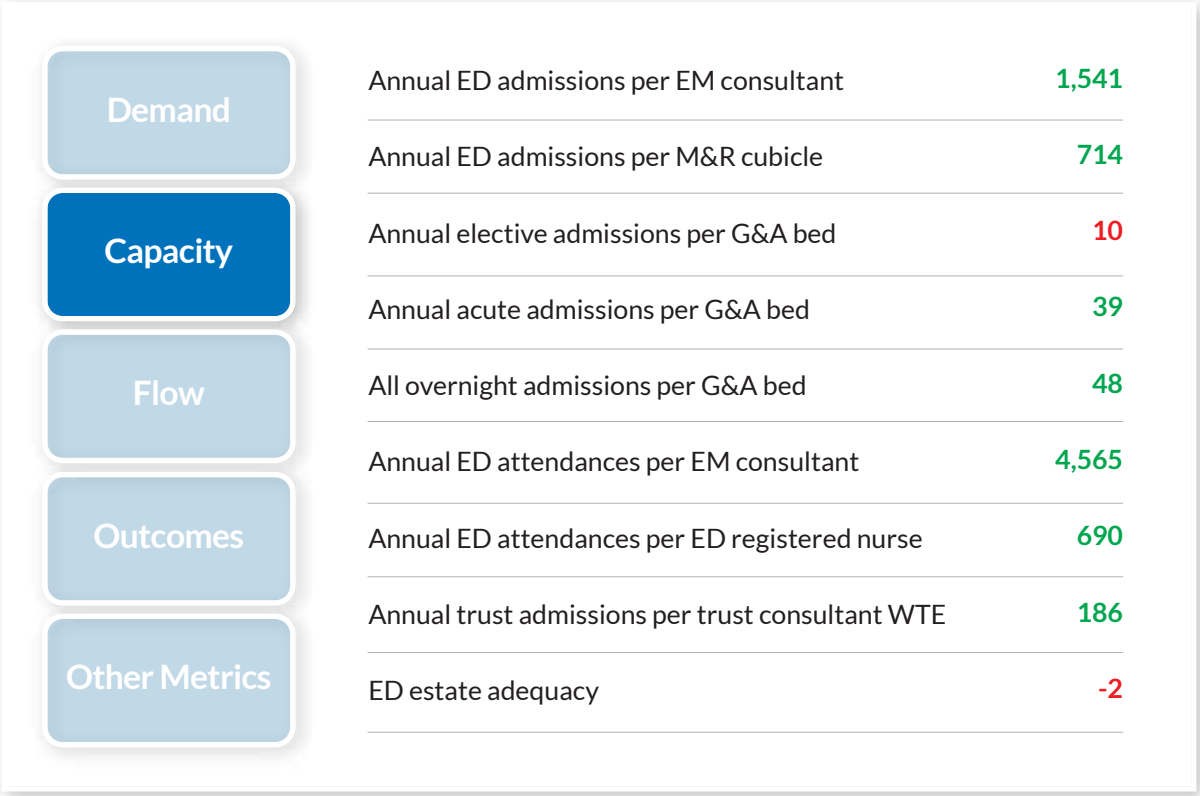
We found that certain dedicated rooms and special equipment in EDs greatly facilitate the practice of emergency medicine and the delivery of high-quality care. Some of these facilities are described in *Appendix 4*.

[12] *HSE, How many toilets should a workplace have? https://www.hse.gov.uk/contact/faqs/toilets.htm*

Capacity in the SEDIT

The Summary ED Indicator Table (SEDIT) and ED quadrants are discussed further elsewhere in the report. The panels in **Figure 38** show the SEDIT and its key capacity metrics for illustration purposes.

Figure 38: Capacity metrics in the SEDIT



Source: The SEDIT

Summary of capacity section

1. Unlike the demand for urgent and emergency care, the capacity to meet the demand is very amenable to change.
2. The planning of EDs should take account of the interplay between the number of major and resus cubicles, the number of staff and the availability of hospital beds for admitted patients.
3. Every ED must have adequate isolation and social distancing facilities to manage infectious diseases safely for both patients and staff.
4. Proven methods to address the increasing demand for urgent and emergency care are described in the demand section of this report – co-located services, SDEC, urgent access clinics etc. They all do so by increasing the urgent and emergency care capacity of the whole local system.
5. Hospital and ED capacity should always be matched to current and anticipated demand in the catchment population.

Flow

Flow refers to the movement of patients through the emergency care system. Good flow is critical to the efficiency and effectiveness of every ED. When EDs are unable to transfer patients to an inpatient ward as soon as clinically appropriate, they become increasingly congested and crowded. This leads to 'exit block' and delayed ambulance handover times.

We looked at the key factors that affect ED flow and the consequences of exit block.

Patient flow through the ED

Impact of the four-hour operational standard

It has been 20 years since the Department of Health and Social Care introduced the four-hour operational standard to emergency medicine. At the time of its introduction, it was a world-first recognition of the importance of measuring and managing flow in EDs.

The standard set a target of four hours for the period from time of patient arrival to discharge, admission or transfer (DAT). In the first ten years after its introduction, the NHS operational standard transformed patient experience, improved resource allocation, and led to proper scrutiny of emergency care. Some of the benefits and problems associated with the four-hour standard are listed in **Table 23**.

Table 23: Benefits and problems of the four-hour standard

Benefits
■ Increased number of senior emergency physicians employed by trusts ■ Increased investment in EDs by trusts ■ Improved and more timely access to diagnostic services ■ Reduced delay and waiting times for ED patients ■ Highlighted systems under greatest pressure ■ Easily understood and intuitive metric
Problems
■ Binary metric: 'pass' or 'fail' of the four-hour threshold ■ Greatest benefit and convenience often afforded to the least sick ■ Created supply-induced demand, especially out-of-hours ■ Produced an adversarial culture between the ED and other hospital departments ■ Often used as the sole arbiter of quality, to the detriment of other aspects of patient care ■ As with all standards, can be 'gamed', and produced perverse incentives, such as delays to admission until four hours had elapsed ■ Failed to eliminate the ongoing problems of exit block and ED overcrowding

DAT time standards

We assessed flow according to the DAT (discharged, admitted or transferred) time standards at 2, 4, 6 and 12 hours, as shown in **Figure 39**. Average performance for all English EDs is shown in **Table 24**. The scatter of national performance at each of the four times is shown in **Figure 40**.

DAT rates are influenced by conversion rate. We discuss conversion rates in the section on *Variation in admissions from EDs*, on page 37.

Figure 39: Discharge, Admission or Transfer (DAT) standards

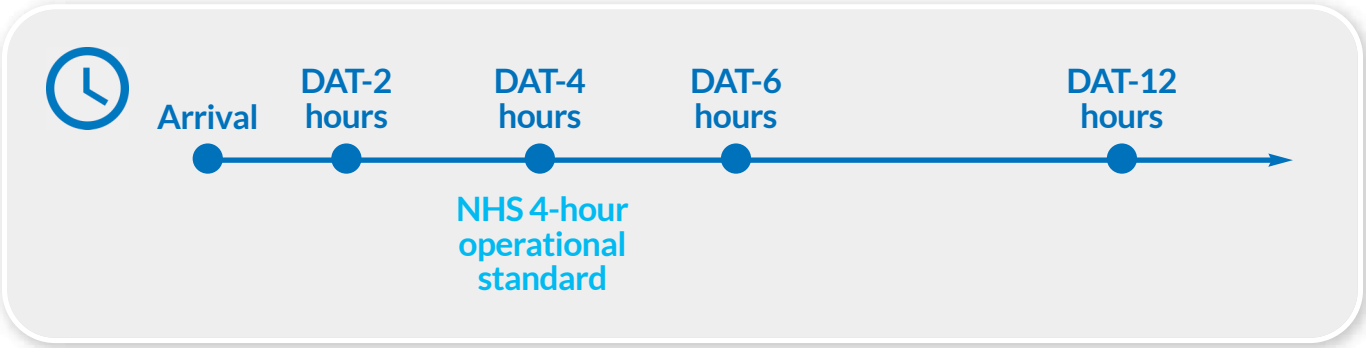
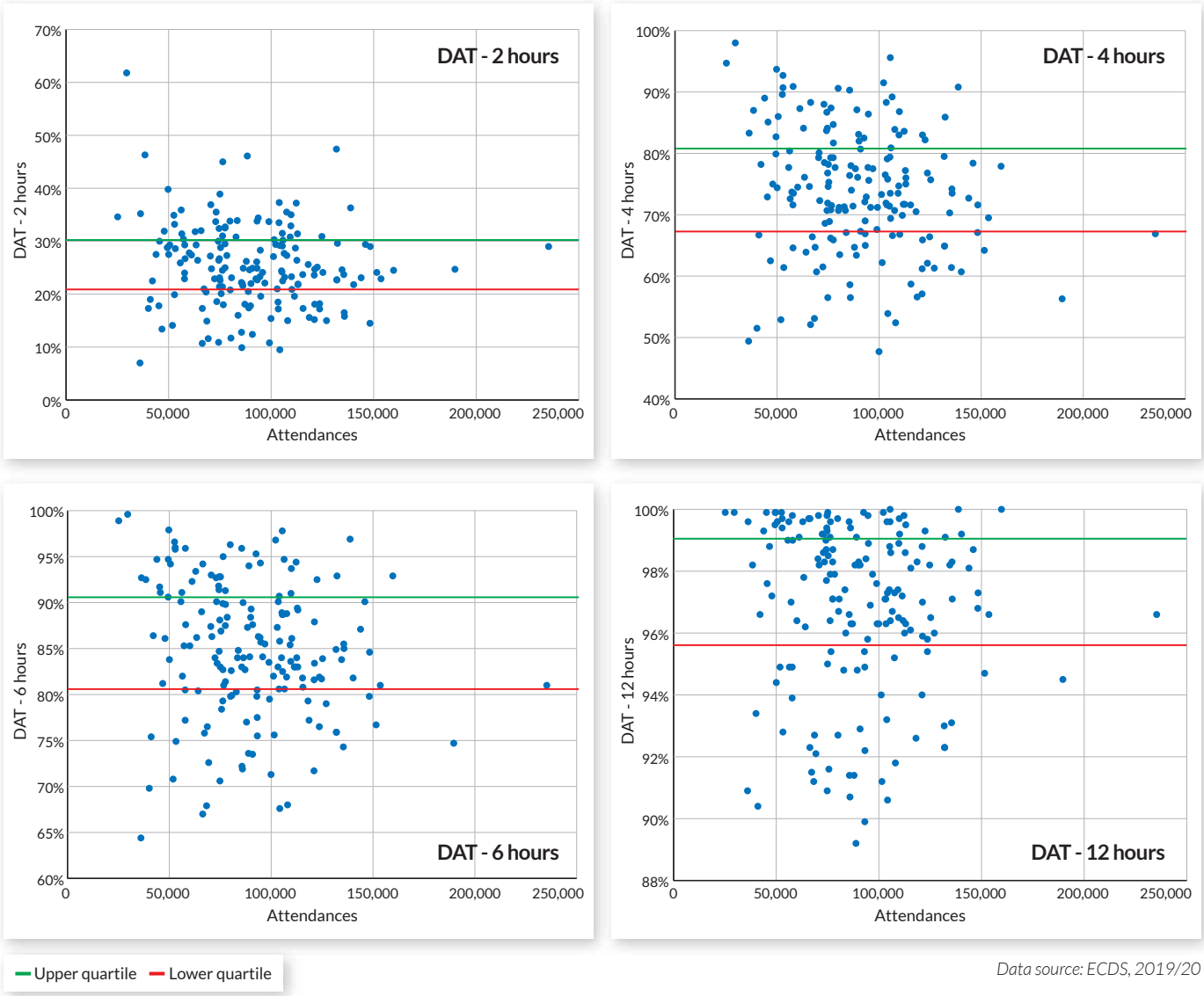


Table 24: Average performance across England for the four DAT time standards

Standard	Mean	Lower quartile	Upper quartile	Range
DAT-2	25%	20%	30%	7% to 62%
DAT-4	73%	67%	81%	48% to 98%
DAT-6	84%	80%	91%	62% to 100%
DAT-12	96%	95%	99%	87% to 100%

Data source: ECDS 2019/20

Figure 40: Scatter of national performance for four DAT times (2 hours, 4 hours, 6 hours & 12 hours)



Data source: ECDS, 2019/20

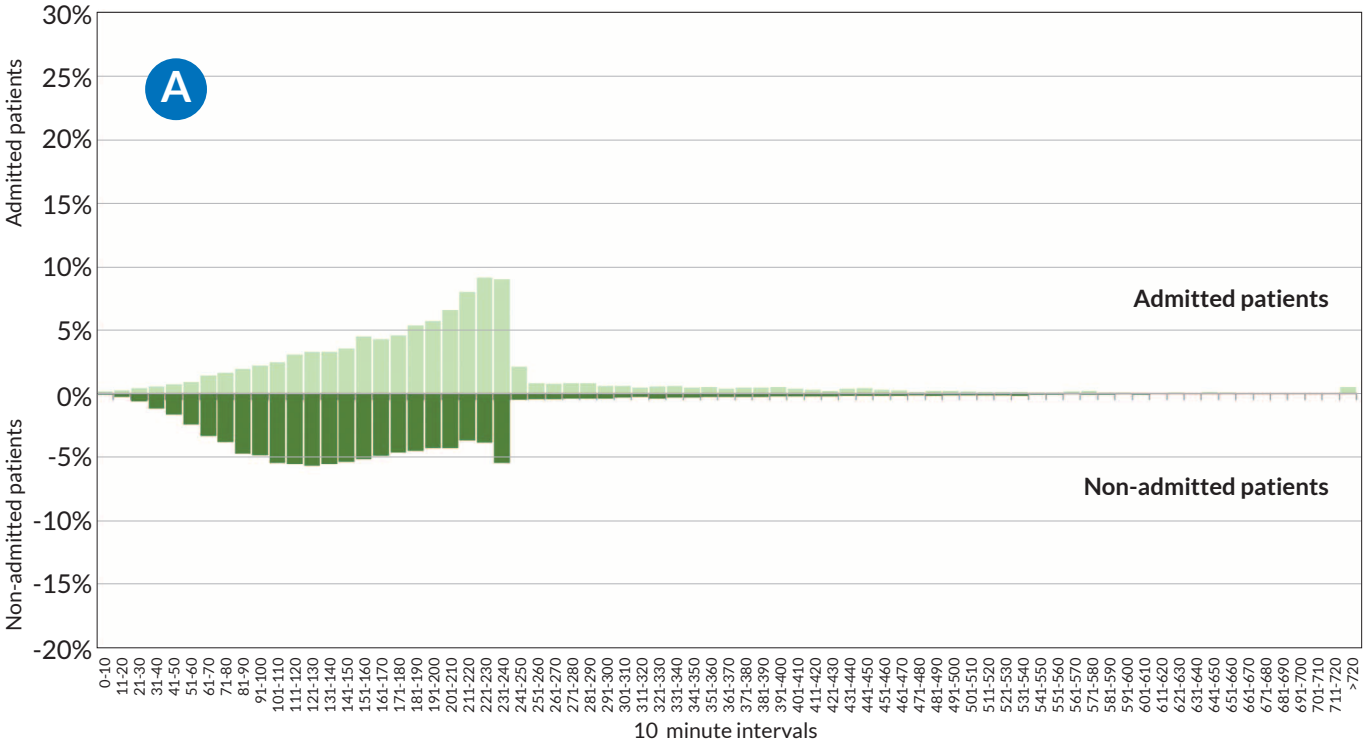
Target-associated flow

Examination of patient waiting times for discharge, admission or transfer demonstrated considerable variation in the way that the four-hour standard has influenced system behaviour. The spectrum ranges from best practice, where patients are managed in a timely fashion, to situations where admissions are clustered around the two thresholds of four and 12 hours. We called this latter pattern of system behaviour 'target-associated flow'. **Figure 41** shows examples of different system flow patterns.

Figure 41: Examples of different patient flow patterns for discharge and admission

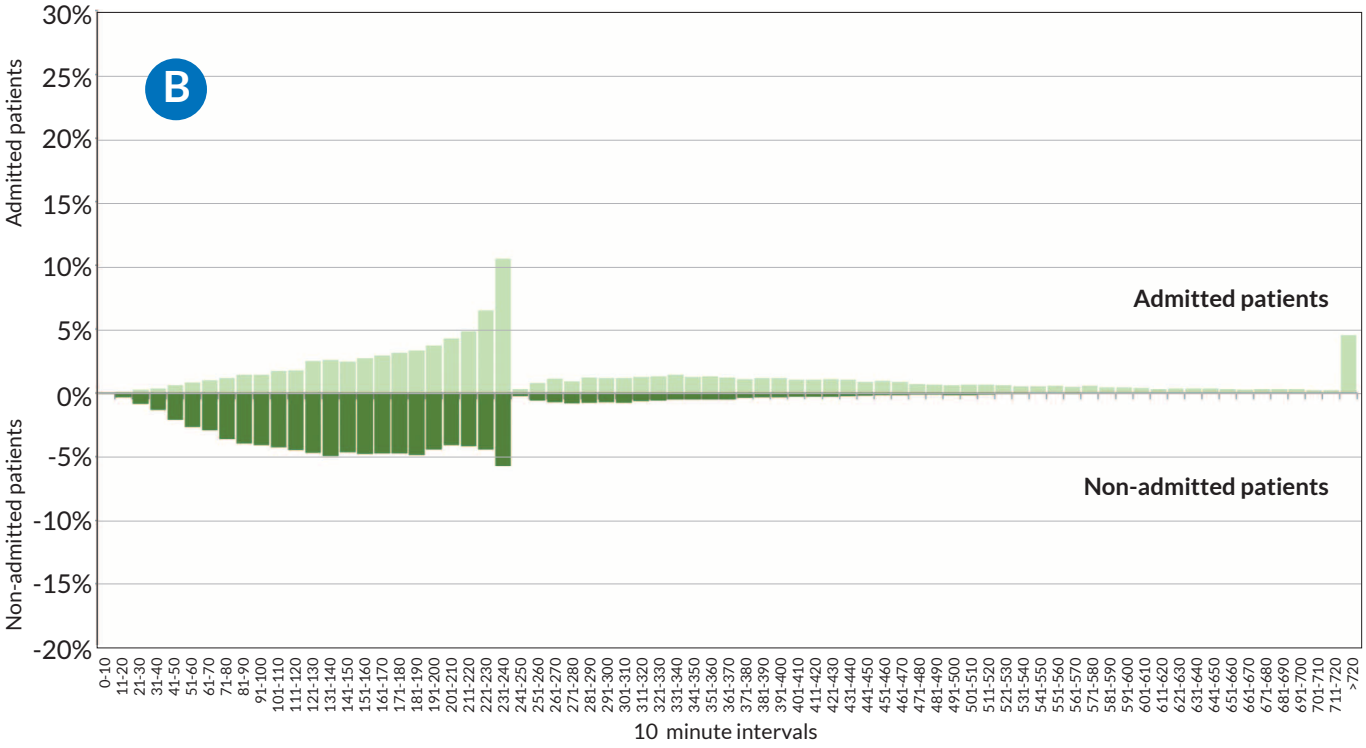
Department A:

- Steady flow of admitted patients from two hours after arrival
- Almost all patients admitted or discharged within four hours



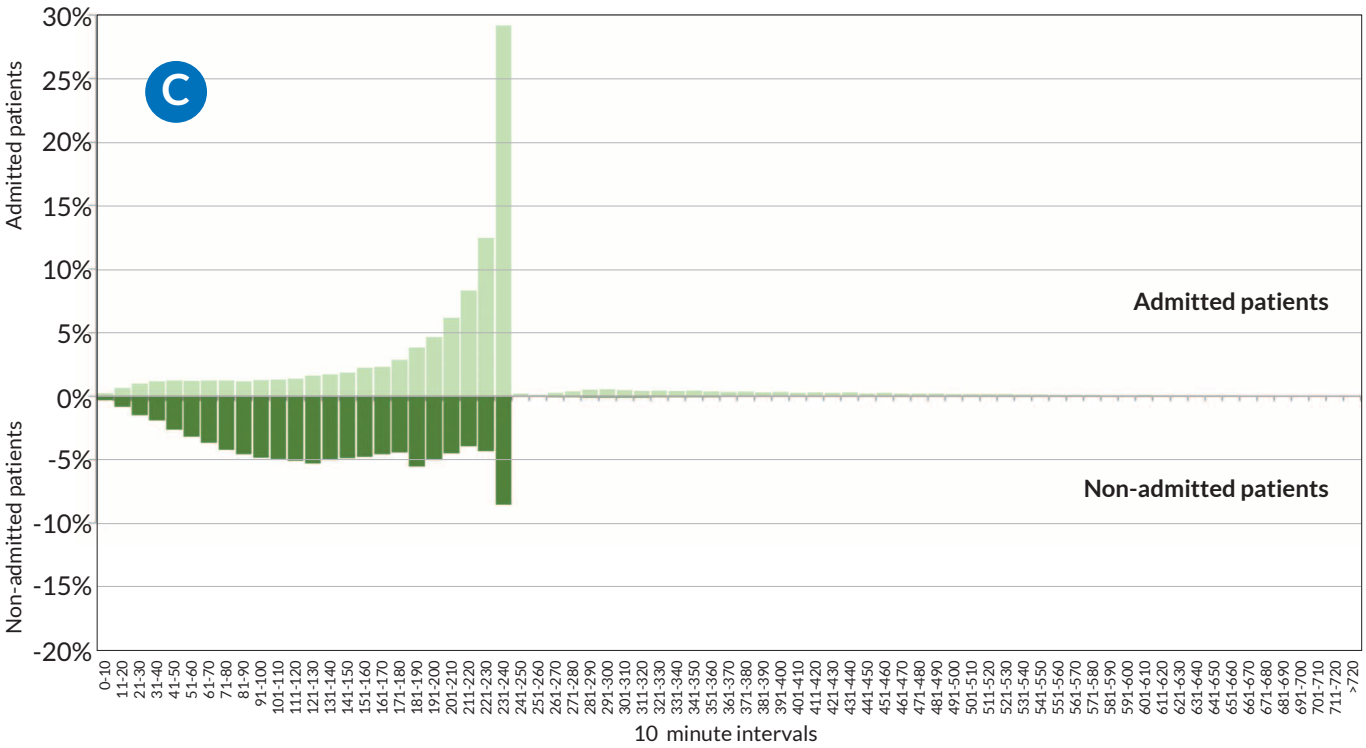
Department B:

- Steady rate of admissions between two and 12 hours, with spikes at both four and 12 hours
- Non-admitted patient cohort is efficiently managed with high rate of timely discharges



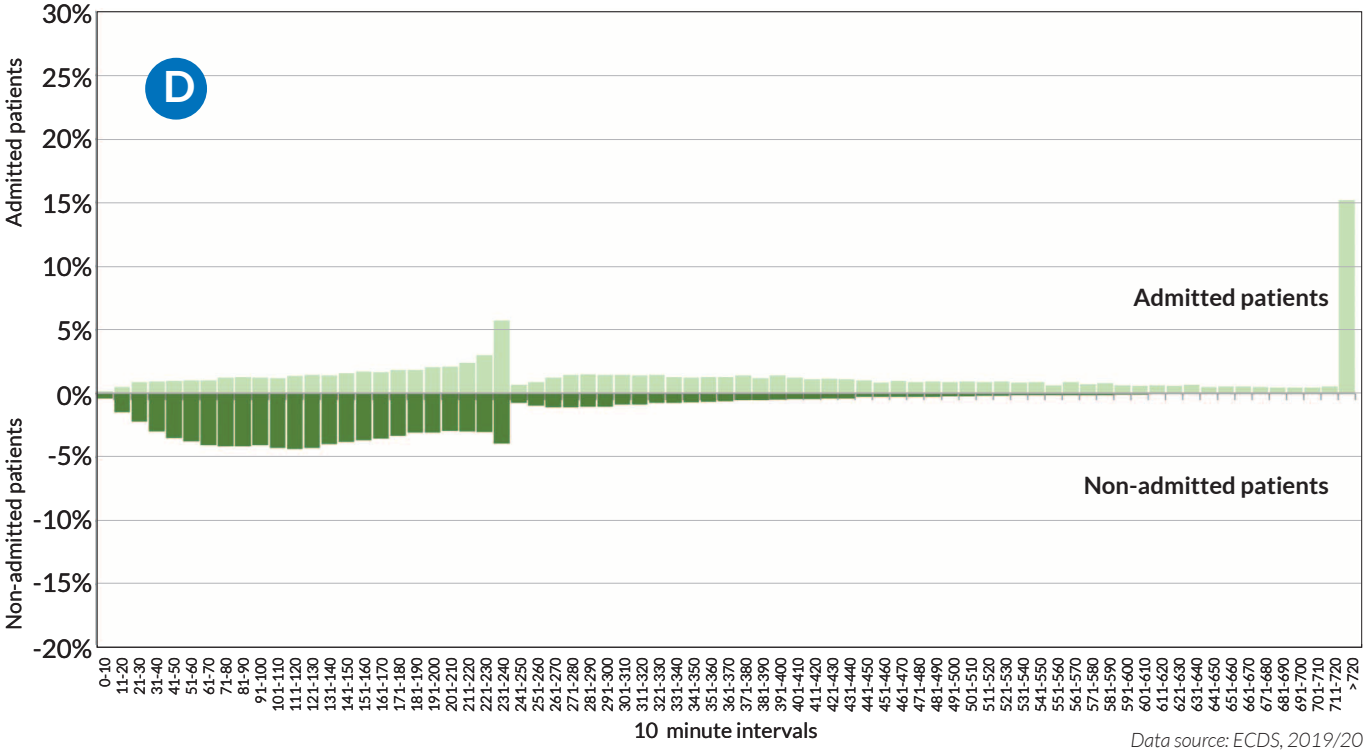
Department C:

- Almost all admissions occur just before four-hour threshold, with an extremely small proportion in the following hours
- Spike at four hours for non-admitted patients with few further delays



Department D:

- Spike of admissions just before four-hour threshold but, if not admitted within four hours, delay to find an inpatient bed continues until 12 hours or more
- More patients wait beyond 12 hours than are admitted within four hours



Data source: ECDS, 2019/20

Delays to timely admission disadvantage the patients who are waiting for a bed as well as reducing available ED staff and space for new arrivals. This is a further example of unwarranted internal demand.

The GIRFT Emergency Medicine Index

The GIRFT Emergency Medicine Index or GEMI is used in the SEDIT to give a numerical representation of the flow in an ED. It is calculated as follows:

GEMI = [100 - DAT4%] + [APD6 / 10]

This is the same as:

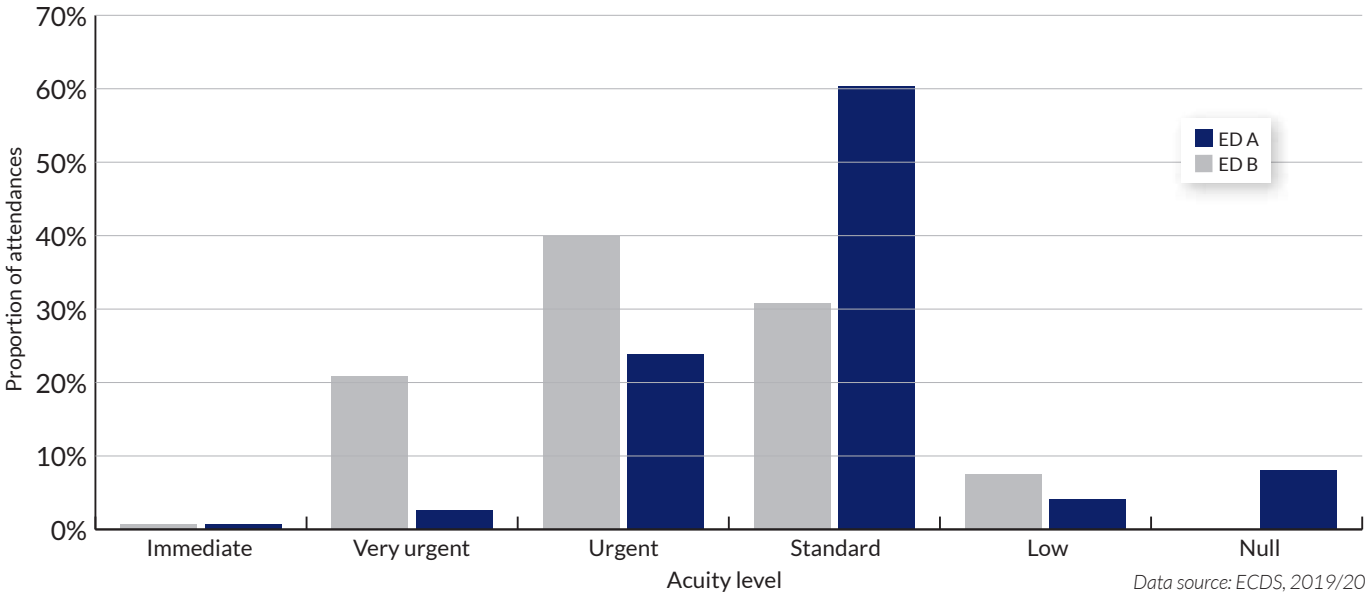
GEMI = [All patient breach rate at 4 hours as a %] + [APD at six hours / 10]

The combination of a metric that shows short patient turnaround times with another that looks at long delays for admission gives a score that indicates poorer ED flow as it increases.

Variation in ED casemix and its effect on patient flow

The proportion of an ED's workload that can be appropriately managed within two hours, four hours and six hours depends on its casemix. However, there are considerable differences in the acuity and complexity of the work faced by different EDs. The Emergency Care Data Set (ECDS) now provides improved casemix data. **Figure 42** shows how the casemix profile can vary significantly between different EDs.

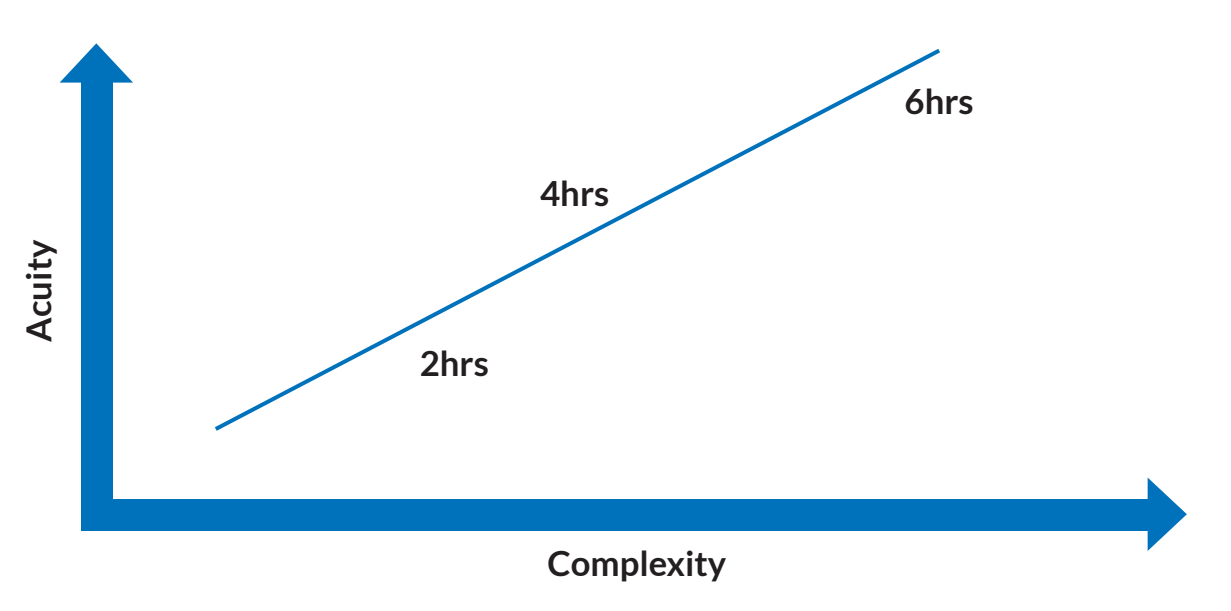
Figure 42: Comparison of level of acuity and complexity for two different EDs



Data source: ECDS, 2019/20

The duration of the time spent in an ED will increase depending on casemix severity (acuity) and complexity (such as the number of comorbidities), as shown in **Figure 43**. Low acuity and low complexity patients are usually managed more rapidly using fewer resources.

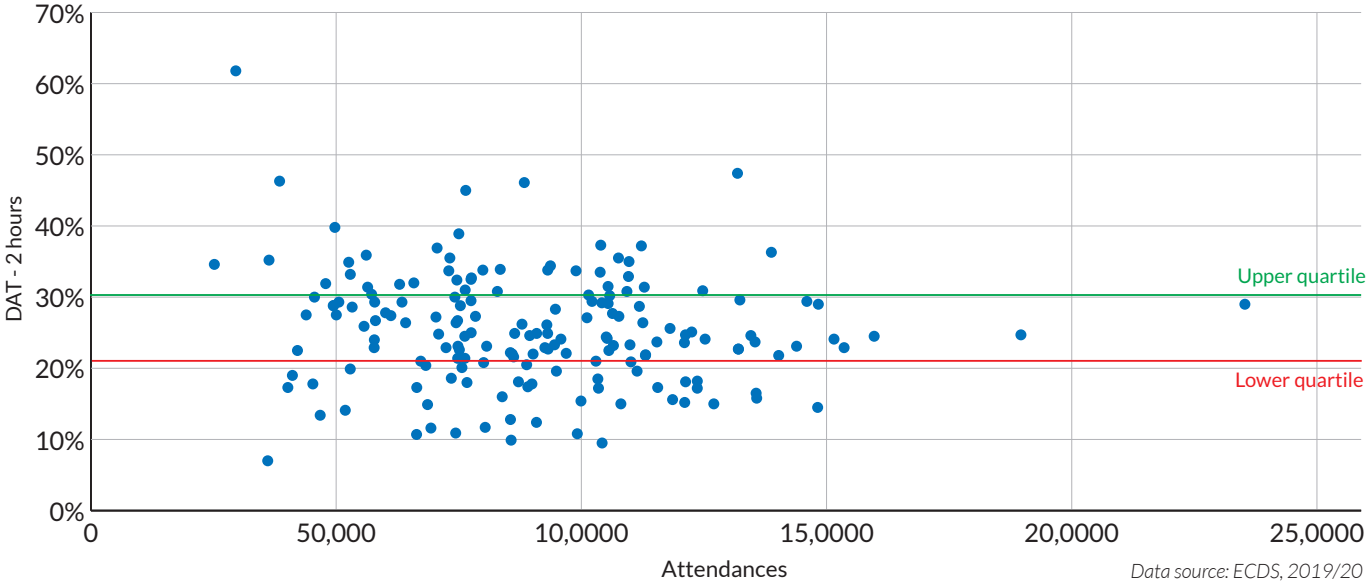
Figure 43: The effect of increasing acuity and complexity on time in ED



Dealing with minor conditions quickly

There is a five-fold variation between EDs in the proportion of care episodes that are completed within two hours, as shown in **Figure 44**. This variation cannot be explained on the basis of casemix alone.

Figure 44: Percentage of ED attendances with discharge, admission or transfer (DAT) within two hours



Data source: ECDS, 2019/20

Urgent treatment centres

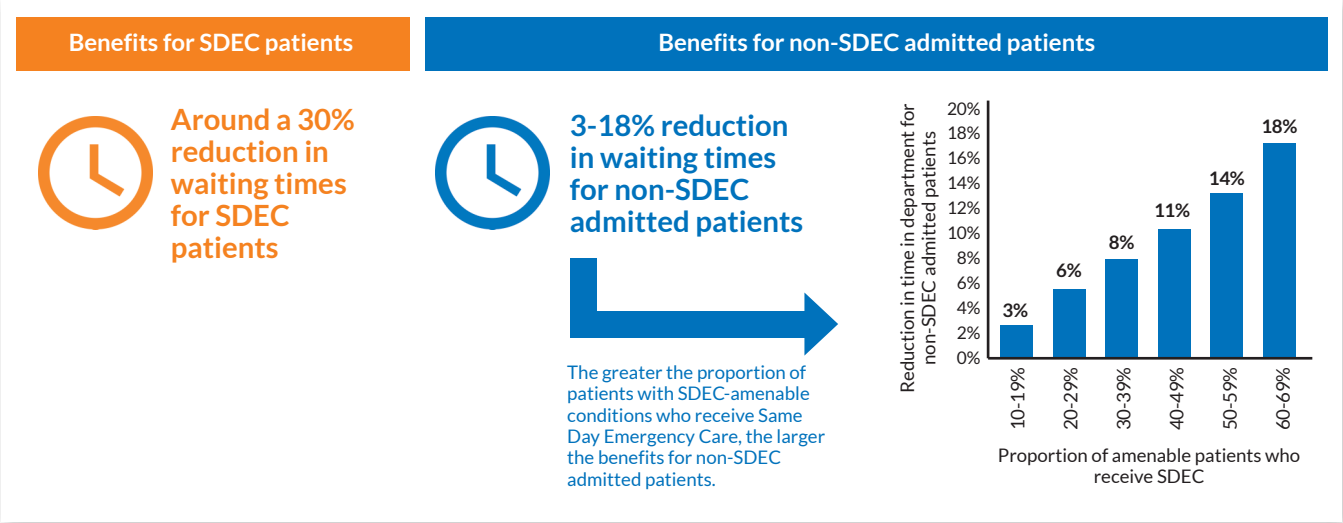
Although not the subject of this GIRFT workstream, the development of urgent treatment centres (UTCs) was a key component of the NHS England urgent and emergency care review of 2013. Many EDs now have a co-located UTC in which a large number of the patients who present with minor illness and injury can be treated more rapidly.

UTCs therefore offer the potential to ease the pressure on EDs. At the time of publication, there were 188 UTCs, 174 EDs and 7,000 GP practices to deliver urgent and emergency care for a population of almost 56 million people in England. In our view, the current level of overall emergency care provision still falls well short of that required to meet demand and ensure timely treatment.

Same Day Emergency Care

When the four-hour standard was introduced, admission (conversion) rates were 20% of 13 million attendances. That rate is now 30% of nearly 16 million attendances. Treatment without admission takes time. This fact, together with mounting bed capacity pressures, has led to the increasing use of same day emergency care pathways. SDEC is preferred by patients, is cost-effective and benefits both the admitted and the non-admitted patient groups – see **Figure 45**.

Figure 45: The impact of SDEC on ED waiting times



Note: Chart based on trust fixed effects model, i.e. controlling for the specific trust that a patient attends. Shows coefficients from modelled reduction in waiting time for non-SDEC admitted patients.

Better metrics to analyse and manage ED flow

We have developed new flow metrics as part of the GIRFT-EM programme. These provide better understanding of the patterns of ED patient flow. Use of these metrics replaces the dichotomous four-hour standard with continuous variables that are more sensitive to patient experiences and outcomes.

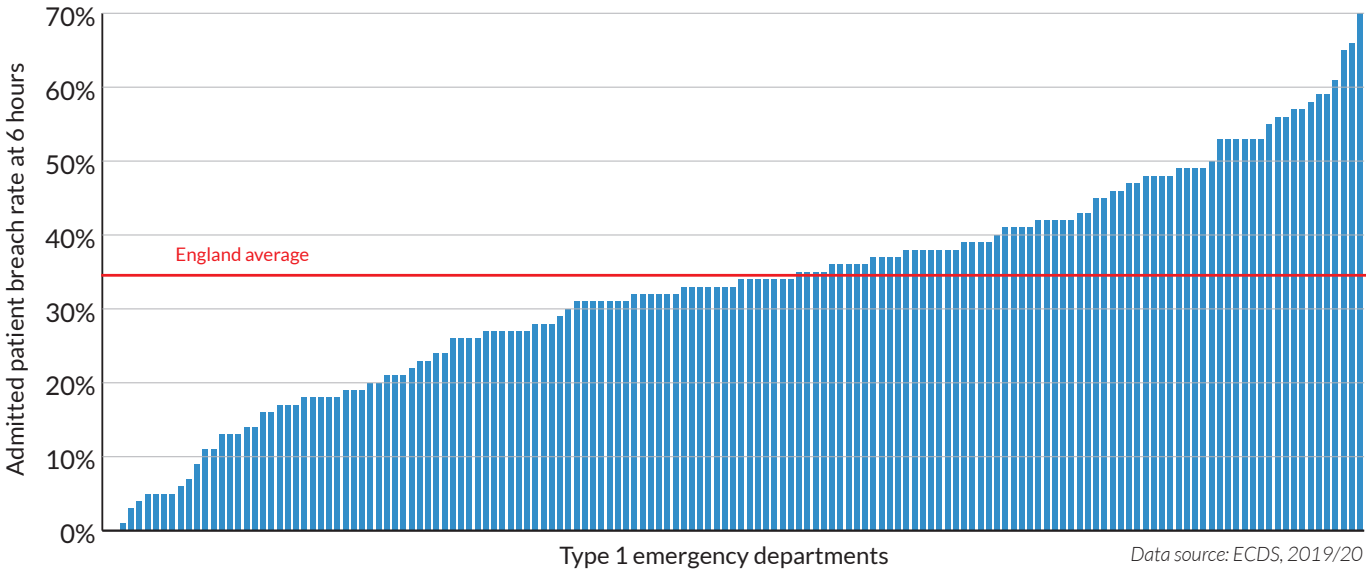
Admitted Patient Breach Rate

The admitted patient breach rate (APBR) is the proportion of admitted patients who exceed a four-hour (or six- or 12-hour) threshold. Thus, the APBR-4 is the percentage of admitted patients for whom the four-hour target is missed.

In our opinion, there are no clinical reasons for a patient to be in an ED for more than six hours from their time of arrival. In addition, GIRFT-EM data demonstrates worse outcomes for patients who spend extended time in the ED. We propose that the six-hour threshold should be a key clinically relevant performance standard.

The proportion of admitted patients breaching the six-hour threshold ranges from 3% to 60%. **Figure 46** shows the wide variation in APBR-6 throughout England.

Figure 46: Admitted patient breach rate at six hours after arrival in ED (APBR-6)

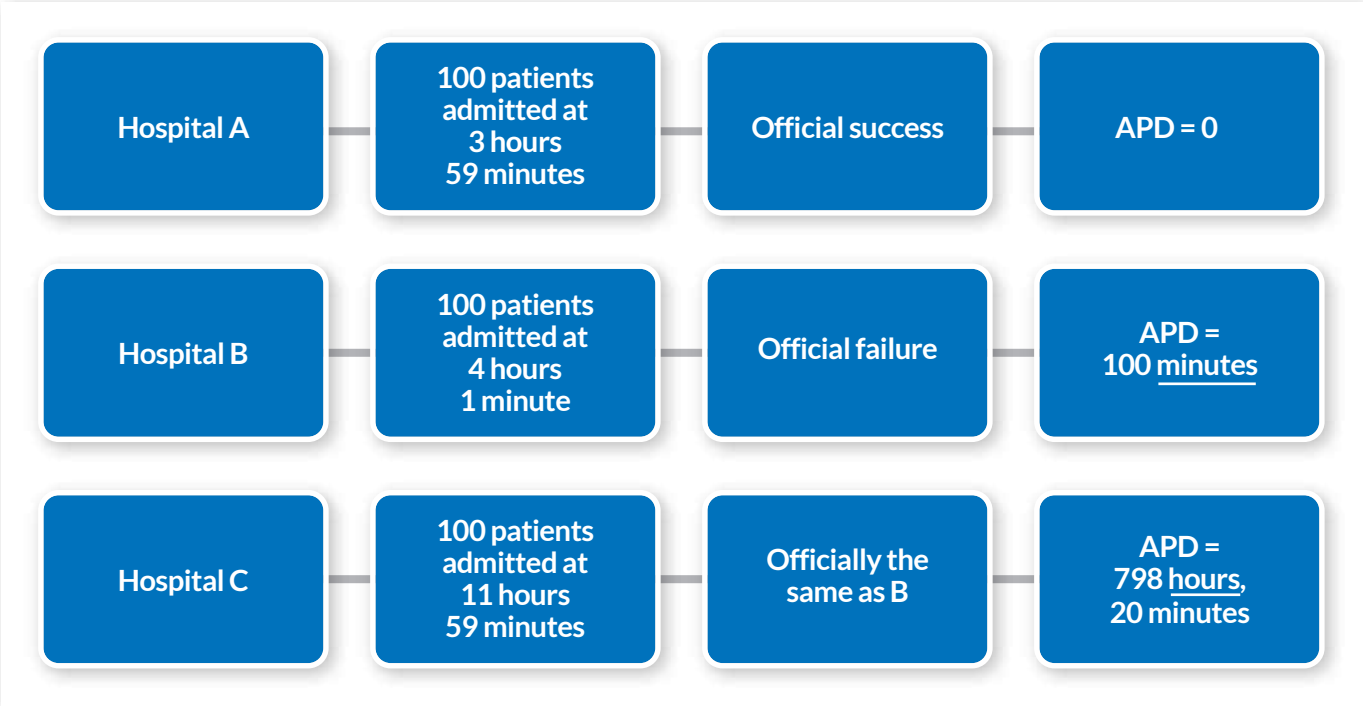


Aggregated Patient Delay

Aggregated patient delay (APD) is the total time in the ED in excess of four (or six or 12) hours for all admitted patients, expressed as hours per hundred patients. See page 70, the *Outcomes* section for calculating the APD and further information.

The APD metric is a continuous variable, unlike the four- (or 12-) hour standards and provides for more meaningful comparison between EDs. As it only applies to admitted patients, its use incentivises discharge. We believe that a six-hour threshold is more consistent with current casemix and outcome data than the current four-hour operational standard. **Figure 47** shows the rationale for the APD and how it avoids a cliff-edge distinction between success and failure.

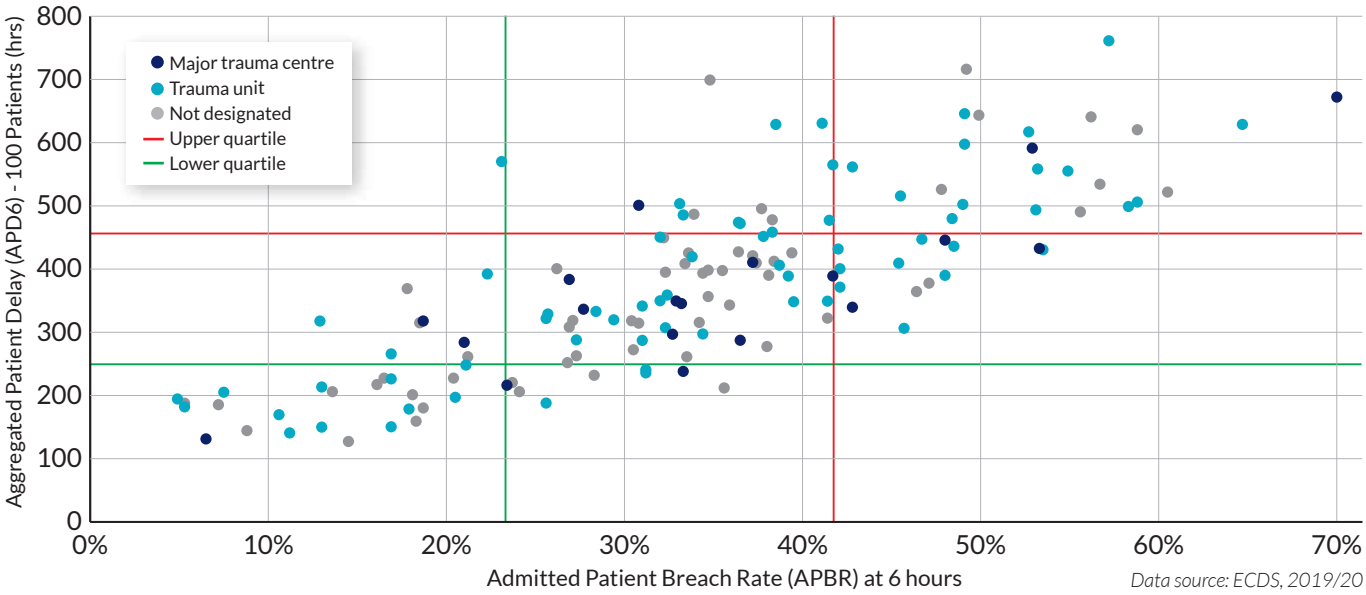
Figure 47: The rationale for the APD metric (in this case the APD-4 with a four-hour operational standard)



APD is most meaningful when plotted against APBR, as shown in **Figure 48**. In this chart, which uses the six-hour threshold, EDs towards the bottom left have both the lowest number of delays and the shortest delays to admission. Those in the top right have both the greatest number of delays and the longest delays to admission.

Plotting ED performance in this way provides a much richer and more meaningful picture of performance than the four-hour standard alone. Importantly, the chart prompts recognition of the fact that it is not a 'breach' of a threshold per se that is of greatest concern, but the duration of the associated delay.

Figure 48: APD-6 plotted against APBR-6 for all EDs in England (showing trauma-receiving status of each ED)

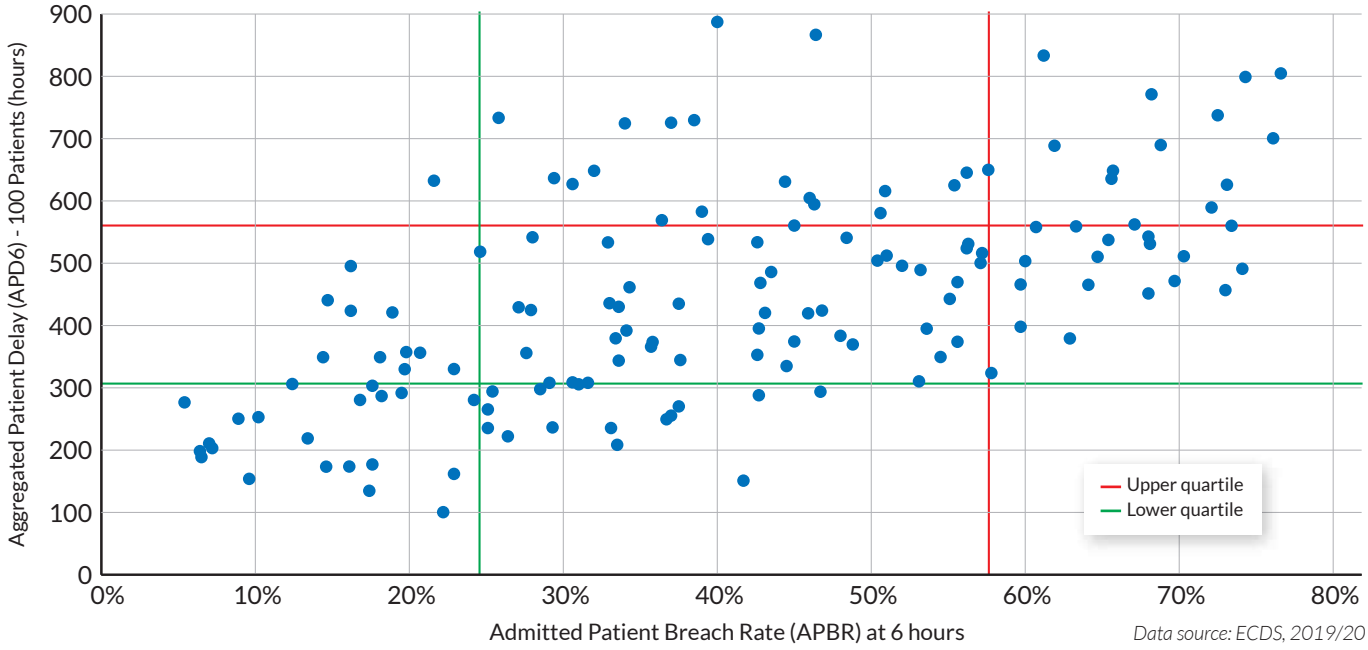


Data source: ECDS, 2019/20

APD and APBR for specific groups of patients

The APD and APBR system can be used to monitor ED flow for specific groups of patients such as those with mental health problems or patients who are waiting for ambulance handovers. Once the patient group has been selected, a threshold of waiting time must be determined in order to set the 'breach time' for the APBR and to measure the delays for the APD. The two metrics can then be plotted against each other as shown in **Figure 49**, in this case for patients with isolated mental health diagnoses. The huge variation in the delays for these patients at different sites should be noted.

Figure 49: APD-6 plotted against APBR-6 for patients with mental health diagnoses only for all EDs in England



Data source: ECDS, 2019/20

Ready to Proceed from the ED

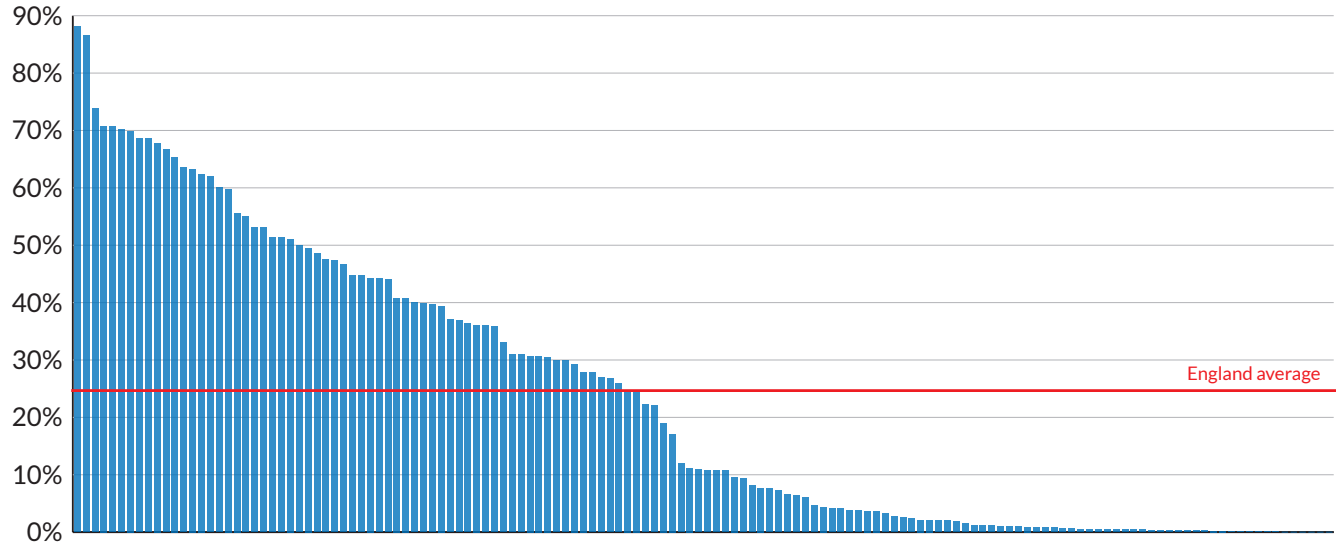
'Ready to Proceed' (from the ED to a ward or other clinical area) (RtP) is a relatively new metric that is collected within the ECDS. It reveals delays to patient flow that result from either inefficient hospital systems or lack of hospital capacity. **Table 25** and **Figure 50** show the variation in the proportion of admitted patients who had a delay of more than 60 minutes from when their ED care was finished (the RtP time) until their time of departure from the ED.

Table 25: Proportion of ED admissions more than 60 minutes from RtP time

Mean	Lower quartile	Upper quartile	Range
25%	1%	43%	0% to 88%

Data source: ECDS 2019/20

Figure 50: Percentage of admissions more than 60 minutes from ED conclusion



Data source: ECDS, 2019/20

APD and RtP in national models of care and measurement

The NHS National Medical Director and National Director of Emergency and Elective Care's *Transformation of Urgent and Emergency Care*[13] report sets out a strategy for how urgent and emergency care provision will be transformed, drawing on learning from the COVID-19 pandemic.

The report recognises that good patient flow (both in and out of EDs) is integral to preventing overcrowding and the associated risk of nosocomial infection. It recommends that trusts monitor both the average time admitted patients spend in their EDs and the amount of time lapsed once admitted patients are declared 'ready to proceed'.

This aligns with our recommendation 6: *'Trusts should ensure that all admissions occur within one hour of completing the necessary ED investigations and treatment, and within six hours of arrival.'* The GIRFT-EM metrics are ideal for this purpose.

Length of stay

Length of stay (LoS) is a useful metric that provides insights into the proportion of admitted patients who are managed in a timely way and thus the efficiency and effectiveness of inpatient teams and discharge processes. The variation in lengths of stay for patients admitted to different hospitals is shown in **Table 26**.

Zero length of stay

Whilst previously often regarded as a measure of inappropriate admissions, zero LoS now more frequently reflects SDEC, which is characterised by short, targeted courses of inpatient investigation and therapy. SDEC refers to a specific clinical episode of less than 24 hours for the treatment of patients who would otherwise have been admitted to hospital. It may include the use of a hospital bed. SDEC does not include all zero LoS patients as some of these patients have non-medical needs e.g. social or transport requirements. Since all SDEC is zero LoS, but not all zero LoS is SDEC, this leads to difficulties in measuring the true amount of SDEC at each site.

Length of stay below two days

Most acute admissions result in an LoS of two days or less. By looking at the proportion of patients that a hospital discharges within this time frame, we can infer the efficacy of inpatient processes at that trust.

Length of stay more than six days

Where a trust has a relatively high proportion of patients with an LoS of more than six days, there are likely to be medical or social delays or a combination of both. Such delays result in increased bed occupancy rates.

[13] *Transformation of Urgent and Emergency Care, 2020. NHS England.*

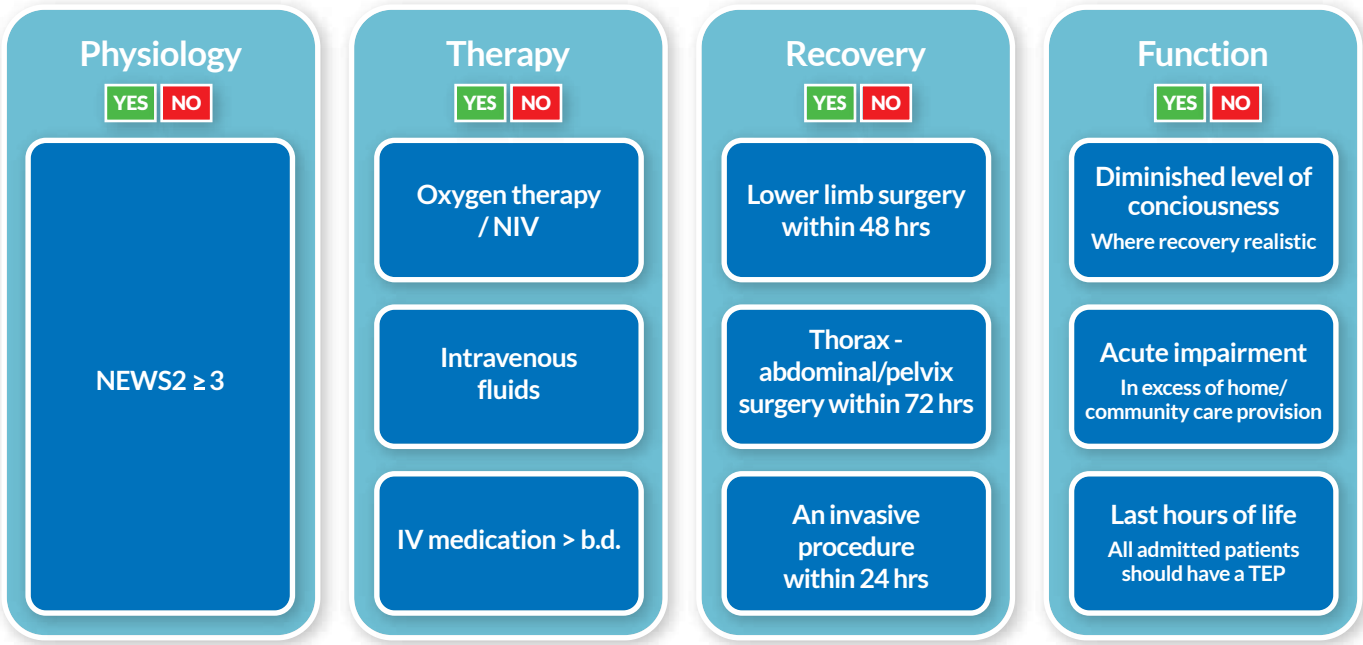
Table 26: Proportion of admissions by length of stay

Length of Stay	Mean	Lower quartile	Upper quartile	Range
0 days	30%	23%	36%	9% to 54%
< 2 days	50%	43%	55%	31% to 70%
> 6 days	21%	19%	24%	11% to 34%

Data source: APC HES 2019/20

NHS England and NHS Improvement recently issued guidance for trusts to promote best practice in acute bed management and discharge processes.[14] **Figure 51**, taken from this guidance, summarises the principle, solely medical, reasons for patients to remain in hospital. Further guidance is available, including on discharge to assess.[15]

Figure 51: Reason to reside checklist



Every patient on every general ward should be reviewed on a twice daily board round using the checklist above.
If the answer to each question is NO, active consideration for discharge to a less acute setting must be made.

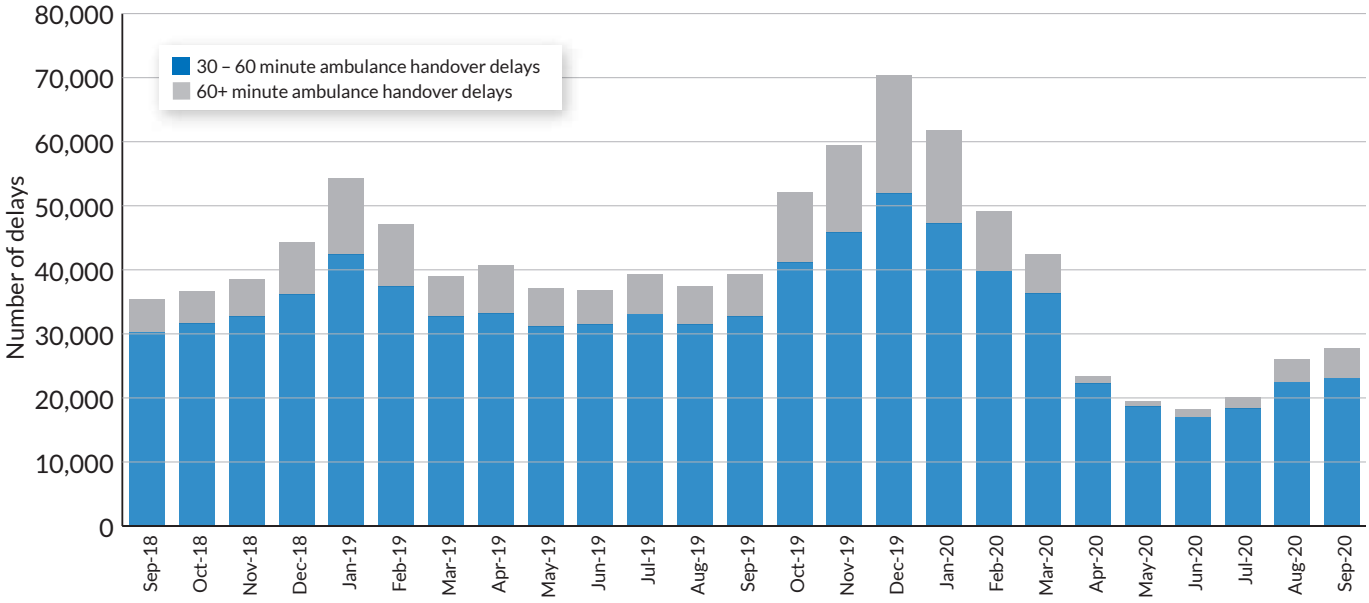
Source: NHS England and NHS Improvement, 2020

Ambulance handover delays

Delays in transferring the care of patients from ambulance personnel to ED staff usually occur when an ED is too full to accept any new patients. As such, ambulance handover delays offer a powerful measure of the impact of poor ED flow. **Figure 52** shows how these delays have increased over the last few years.

[14] *Reference guide for emergency medicine, NHS England and NHS Improvement (2020). Version 5, 22 April 2020. https://www.nice.org.uk/covid-19/specialty-guides*
[15] *https://www.gov.uk/government/publications/hospital-discharge-service-policy-and-operating-model*

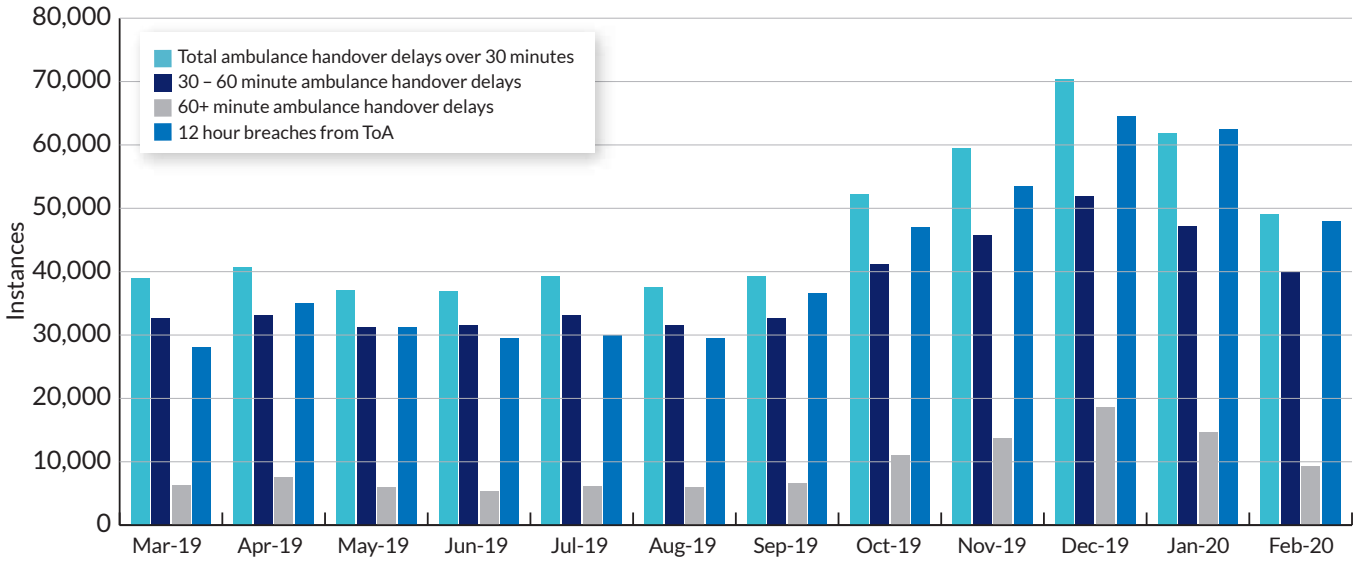
Figure 52: Increasing ambulance handover delays



Data source: NHS SitRep, 2018 to 2020

Figure 53 and **Table 27** show the very strong correlation between ambulance handover delays and 12-hour waits for patients in the ED. Both are features of ED overcrowding due to high bed occupancy levels within the hospital.

Figure 53: Ambulance handover delays and 12-hour delays in ED



Source: NHS England and NHS Improvement

Table 27: Correlation coefficients of ambulance handover delays and 12-hour delays in ED

	Total ambulance handover delays	30 to 60 minute ambulance handover delays	60+ minute ambulance handover delays
12-hour breaches from time of arrival (ToA)	0.9748	0.9767	0.9650

Source: NHSEI

Delays to handover from ambulance staff can account for a significant proportion of the total delay to definitive treatment for a patient. In addition, delays in transfer of patients from ambulance services to EDs result in:

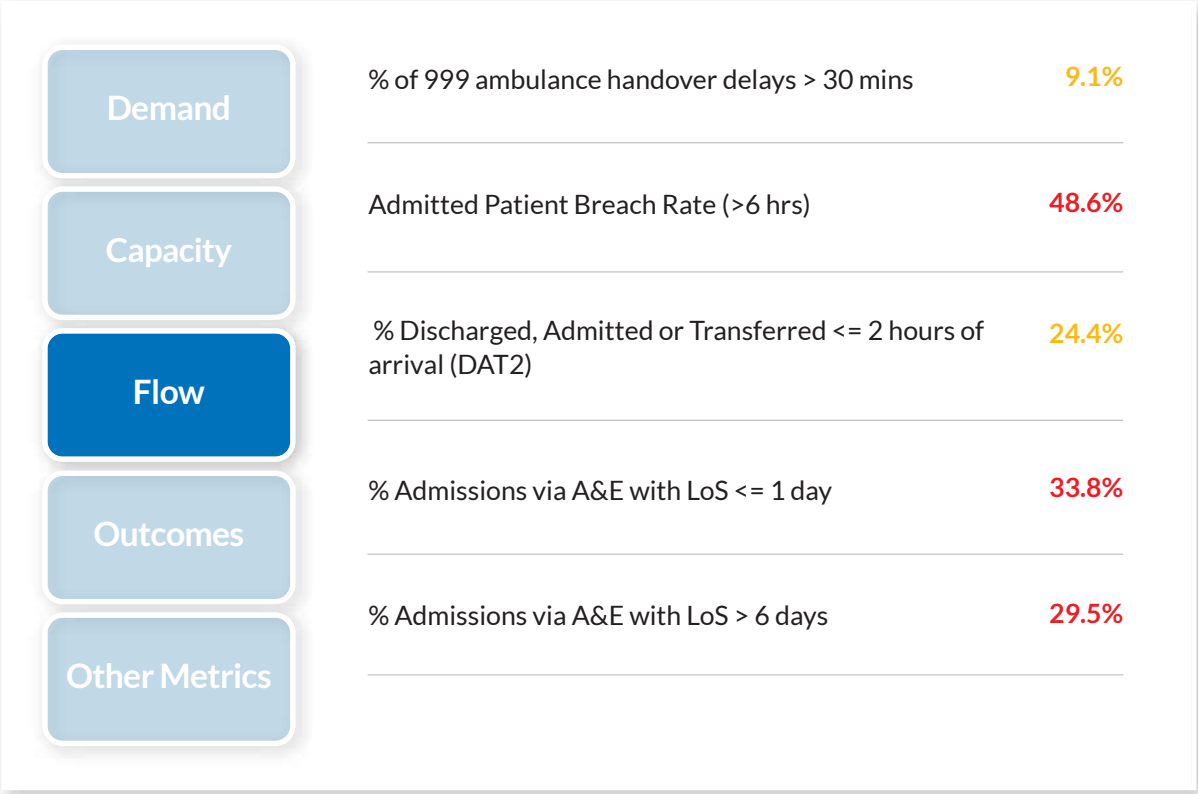
- poor patient experiences;
- crowded areas of the ED (and these are often inappropriate areas such as corridors);
- increased risk to patients already on site due to ED overcrowding and the spread of infection;
- increased risk in the wider community because fewer ambulances are available to respond to emergencies;
- stress for paramedics and other ambulance staff;
- reduced ability to respond to a serious or major incident;[16] and
- poor ambulance service performance due to time wasted queuing in EDs.

[16] *https://www.improvement.nhs.uk/documents/2019/Ambulance_handover_guidance.pdf*

Flow in the SEDIT

The Summary ED Indicator Table (SEDIT) and ED quadrants are discussed further elsewhere in the report. The panels in **Figure 54** show the SEDIT and its key flow metrics for illustration purposes.

Figure 54: Flow metrics in the SEDIT



Source: The SEDIT

Summary of flow section

1. Timely patient flow is essential for the efficiency and effectiveness of every ED.
2. Exit block causes poor patient flow, congestion and overcrowding in EDs and leads to delays in ambulance handovers.
3. Exit block is usually the result of a lack of available inpatient beds.
4. The GIRFT-EM metrics of DAT times, target-associated flow, APBR and APD enable better understanding of flow problems in a way that is clinically relevant and operationally useful.

Outcomes

Outcome metrics in emergency medicine

Outcome metrics are difficult to determine in emergency medicine which presents a unique challenge when trying to use data to measure and compare performance of EDs. Very few outcomes in emergency medicine are clear cut. This is unlike some other specialties, especially surgery, where it may be possible to compare outcomes of an operative versus a non-operative intervention for example. In emergency medicine, any outcome is often related to the intervention of several ED clinicians and the wider ED team. For admitted patients, outcomes also depend on the subsequent decisions and actions of inpatient clinical teams.

Time as an outcome metric in emergency medicine

Time matters to patients as a measure of quality of care. In this respect, the four-hour operational standard was remarkably successful, benefitting both admitted and discharged patients alike from all diagnostic and social groups. Prior to the GIRFT-EM programme, the four-hour standard was the only widely reported emergency care 'outcome' metric; partly due to its apparent simplicity and partly due to the absence of other useful metrics.

However, time is much more than a simple patient experience metric and is applicable to a far wider cohort than just patients with the ordinarily recognised time-sensitive conditions such as ST-elevation myocardial infarction (STEMI), stroke and major trauma. Delay-related harm increases after six hours from arrival in the ED; hence the importance of the APD-6 metric.

All GIRFT-EM metrics reference time of patient arrival in the ED as the basis of the measurement. The 'Decision to Admit' (DTA) time is neither reliable nor consistently applied and it is therefore of little use.

Aggregated Patient Delay

Calculating the APD

The Aggregated Patient Delay (APD) is the sum of the number of hours that patients have waited beyond a given threshold. To enable meaningful comparisons for monitoring and improvement, the APD can then be expressed as an average number of hours per 100 patients for a given period (day, week, month, quarter, or year). We use the six-hour threshold (APD-6), eight-hour threshold (APD-8) and 12-hour threshold (APD-12) metrics as summary measures of avoidable patient harm.

For example:

- if the number of admitted patients that waited for more than six hours from their time of arrival to their time of admission is 361;
- and the sum of the delays beyond the threshold of six hours for each patient is 1500 hours;
- then the average delay per patient is 4.16 hours.

To enable standardisation (whilst making it clear that this is a system flow and outcome metric and not an individual patient metric), this figure is then multiplied by 100 to give an averaged aggregated delay time. See **Figure 55** below.

Figure 55: Calculating the APD

$$\text{APD-6} = \frac{\text{sum of delays over six hours}}{\text{number of patients waiting > 6 hours}} \times 100 \text{ patients}$$

$$\text{APD-6} = \frac{1{,}500 \text{ hours}}{361 \text{ patients}} \times 100 \text{ patients} = 416 \text{ hours}$$

In this example, the APD-6 is 416 hours, which approximates to the current national average, as shown in **Table 28**.

Table 28: APD-6 for EDs in England

Mean	Lower quartile	Upper quartile	Range
417 hours	262 hours	473 hours	127 to 761 hours

Data source: ECDS 2019/20

It can be seen that patients at some sites experience average delays to admission that are six times longer than patients at other sites.

Benefits of the APD metric

The key benefits of the APD include the following:

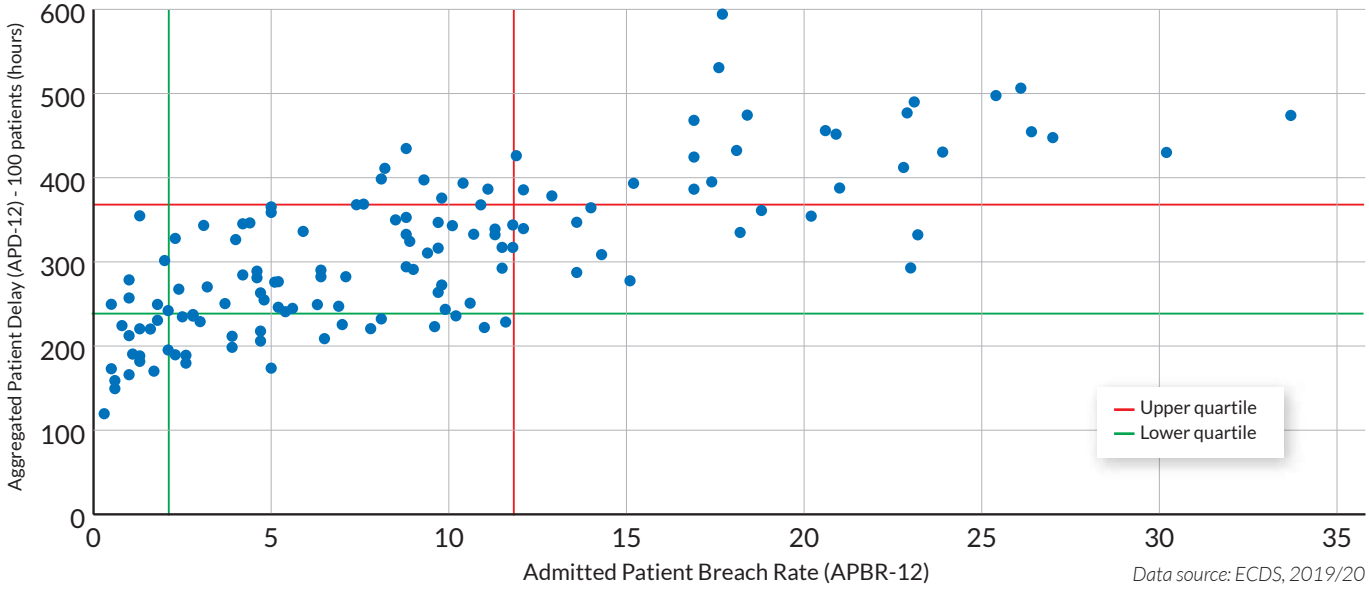
- Avoids a binary distinction between success and failure.
- Prevents the gaming associated with decision to admit (DTA) times (and subsequent calculations of 12-hour trolley waits based on the DTA time) by using a hard start time of patient arrival/registration at the ED.
- Maintains the original purpose and utility of the four-hour operational standard but can be used for any time threshold (or any patient group).
- Enables easy distinction between minor breaches of little consequence to patients, and significant delays associated with exit block, ED overcrowding and consequent patient morbidity and mortality.
- Incentivises trusts to eradicate unacceptably long waits experienced by patients awaiting admission to a hospital bed.
- Can be used as both a system flow and an outcome metric; as a continuous variable, it is well suited for use in quality improvement.

Thus, the APD is a reliable, patient-centred, clinically focused and operationally useful measure of ED flow, exit block and overcrowding.

Combining APD and Admitted Patient Breach Rate (APBR)

Plotting the APD against the Admitted Patient Breach Rate (APBR) for the same time threshold provides a powerful view of both the number and magnitude of delays for admitted patients. **Figure 56** highlights delays beyond 12 hours of arrival at the ED.

Figure 56: APD-12 plotted against APBR-12 for all EDs in England

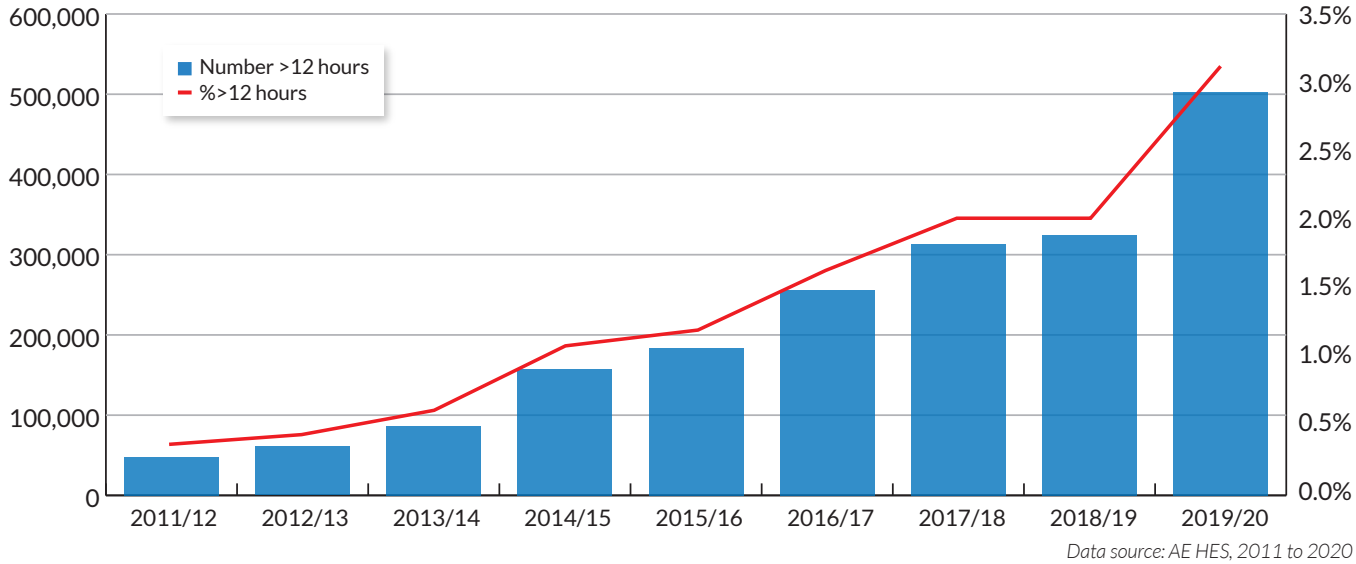


Data source: ECDS, 2019/20

Excessive delays in ED: 12 hours or longer

There is an endemic problem of excessive and unacceptable delays in EDs. **Figure 57** shows the inexorable rise in the number of patients delayed for more than 12 hours from time of arrival over the last nine years.

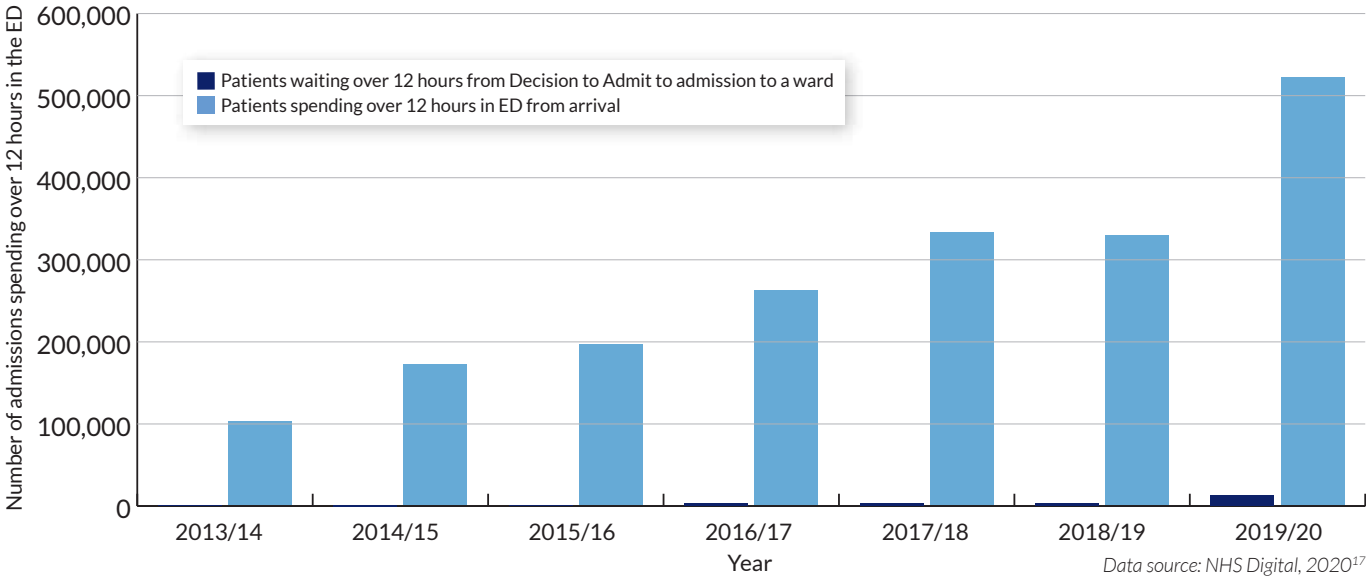
Figure 57: The increase in 12-hour waits in ED from time of arrival



Data source: AE HES, 2011 to 2020

Recognition of this problem has been masked by the use of the Decision to Admit (DTA) time as the start of the clock rather than the patient's actual time of arrival in the ED. In consequence, the numbers reported are reduced by orders of magnitude and so misrepresent the true picture, as shown in **Figure 58**.

Figure 58: Over 12-hour delays in EDs: trolley waits from DTA versus true 12-hour delays from time of arrival



Data source: NHS Digital, 2020[17]

Lack of transparency regarding these long delays is clearly detrimental to good patient care. There can be no reasonable justification for continuing to report DTA times; by contrast there are compelling reasons to report all times from time of arrival, including the number and proportion of patients whose discharge from the ED is delayed beyond 12 hours from time of arrival. This data is already available.

Variation in the number of 12-hour delays

There is extraordinary variation in the number of 12-hour delays (and thus the associated admitted patient breach rates and aggregated patient delays at 12 hours), as shown in **Table 29** and **Figure 56**. The best EDs have fewer than one 12-hour breach each week; the worst have more than 200 per week.

Table 29: 12-hour delays, APBR-12 and APD-12

Metric	Mean	Lower quartile	Upper quartile	Range
12-hour delays per annum	2,900	676	4,136	23 to 10,481
12-hour delays (%)	3.2%	0.9%	4.6%	0.03% to 10.8%
APBR-12 (%)	8.6%	2.1%	12.0%	0.03% to 35.7%
APD-12 (hours)	352	237	368	68 to 592

Data source: ECDS 2019/20

High APBR-12 and APD-12 values are always the result of non-ED issues and yet cause ED overcrowding, system failure, and poor staff morale. They are also strongly associated with ambulance handover delays – see page 66 *Ambulance handover delays* and in particular, **Table 27** on page 68. Most significantly, long delays in EDs cause patient harm.

[17] *https://www.digital.nhs.uk/data-and-information/publications/statistical/hospital-accident--emergency-activity/2019-20/performance-times*

Relationship between time spent in ED and patient harm

Historically, there has been a prevailing view that waits in EDs, whilst inconvenient and a clear cause of poor patient experiences, are little more than that. However, several studies have shown that patient mortality increases when there is ED overcrowding and long delays to admission to an inpatient hospital ward. The Keogh Review (2013) of Urgent and Emergency Care acknowledged this fact.

The large GIRFT-EM data set presented a unique opportunity to explore the relationship between delays to timely admission and patient harm. We wanted to confirm the existence or absence of delay-related harm per se, rather than harm due to ED overcrowding. In addition, we wanted to know at what point any harm started and to gain an estimate of the quantum of that harm.

Between April 2016 and March 2018, there were over 7.4 million admissions (for 5.25 million unique patients) from EDs in England. The crude 30-day mortality rate was 8.71% (95% confidence interval: 8.69% to 8.74%). To explore whether delays to timely admission were correlated with harm (as measured by 30-day mortality), we created a logistic regression model that controlled for:

- age and gender;
- deprivation;
- Elixhauser comorbidity index (using van Walraven scoring);
- month / year / hour of day;
- number of emergency admissions in the previous 12 months;
- number of ED attendances in the previous 12 months;
- trust / site; and
- ED crowding (as measured by departmental performance against the NHS four-hour operational standard, at the time of the patient's attendance).

Table 30 shows the increase in the Standardised Mortality Ratio (SMR) associated with ED delays beyond five to six hours from time of arrival.

Table 30: ED delay-related mortality

Hours in the ED	SMR	Percentage change in the SMR	95% lower confidence limit for the SMR	95% upper confidence limit for the SMR	Adjusted absolute mortality rate	Number needed to harm (30-day mortality)
Up to 4 hours	0.94	-6%	0.92	0.95	8.2%	-191
4 - 6 hours	1.06	6%	1.04	1.08	9.2%	191
6 - 8 hours	1.14	14%	1.11	1.18	9.9%	82
8 - 12 hours	1.16	16%	1.12	1.21	10.1%	72

Data source: HES and ONS 2016 - 2018[18]

There are numerous clinically plausible reasons to support the hypothesis of a temporal relationship between delayed admission and increased mortality, with ample published evidence of the harmful effects of delays to therapy, multiple handovers and increased length of hospital stay. The quantitative effects on morbidity and the qualitative effects on patient experience are known to be even greater.

It is evident from **Table 30** that the level of harm is not evenly distributed between EDs. In fact, the number of estimated extra deaths due to delays in ED varies from one per day to none per year. The capacity data in this report indicates the likelihood of different causes of harm at different sites.

[18] *Jones S, Moulton C, Swift S, Molyneux P, Black S, Mason N, Oakley R, Mann C. Association between delays to patient admission from the emergency department and all-cause 30-day mortality. Emergency Medicine Journal 2022; 39:168-173.*

Other measures of ED outcomes

Summary Hospital-level Mortality Indicator

The Summary Hospital-level Mortality Indicator (SHMI) is the ratio between the actual number of patients who die following hospitalisation at a trust and the number that would be expected to die on the basis of average figures for England taken from HES and ONS data. It covers all deaths reported of patients who were admitted to non-specialist acute trusts in England and who either die whilst in hospital or within 30 days of discharge. The SHMI methodology does not make any adjustment for deprivation or for the severity of the condition for which the patient was in hospital.

Although emergency care undoubtedly makes a large contribution to a hospital's mortality data, the SHMI reports on deaths at trust level, making it impossible to attribute any difference between observed and expected mortality to the ED alone.

Sentinel conditions

We looked at data for three sentinel conditions:

- non-ST-segment-elevation myocardial infarction (NSTEMI)
- pulmonary embolism (PE)
- subarachnoid haemorrhage (SAH)

The data proved ineffective as an outcome measure for EDs for two main reasons:

1. Poor and variable coding at most trusts made the data unreliable. Some sites recorded several co-existing diagnoses, for example malignancy and pulmonary embolism, whereas others only recorded a single disease.
2. The in-hospital mortality of conditions varied depending on whether or not patients were transferred out of the hospital to a specialist centre; for example, if patients with SAH were transferred to a tertiary neurosurgical unit.

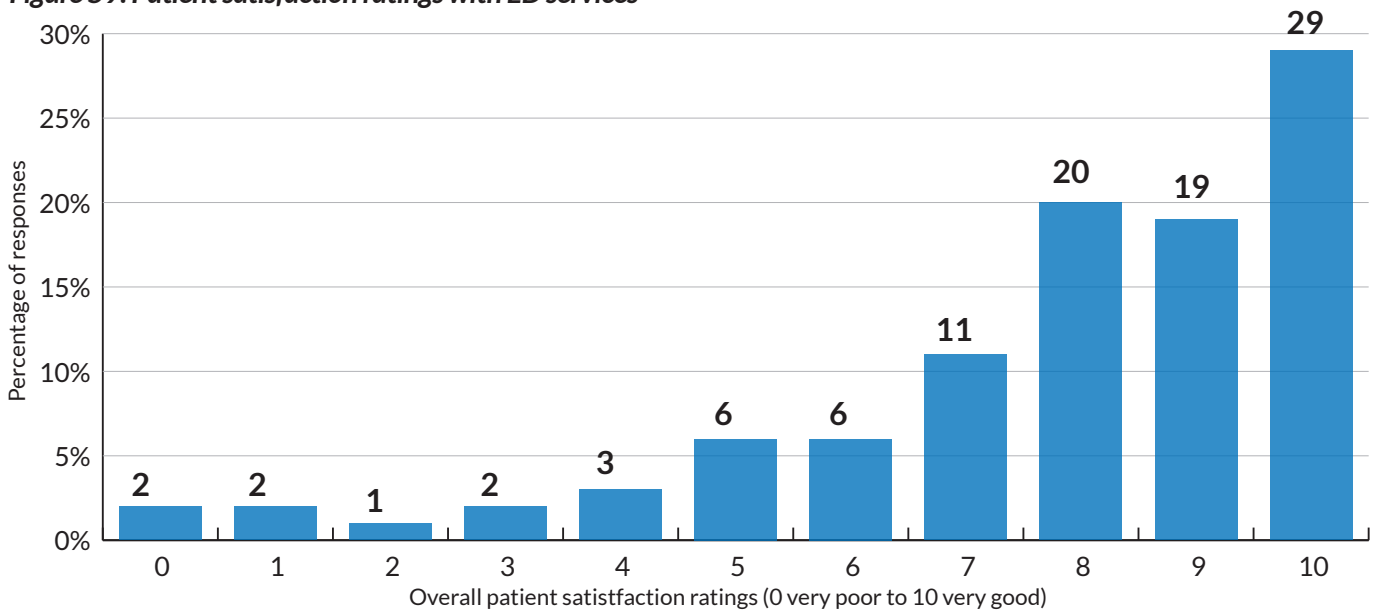
Patient feedback

We believe that having a patient-centred ED metric is very important.

The Friends and Family Test (FFT) was created to collect the views of service users. However, the average response rate for an ED is currently just 12.2%.

Of this sample of patients, an average of 88.3% would recommend the service at the ED that they attended to a friend or family member. This accords with the most recent CQC report on patient satisfaction with A&E services, as shown in **Figure 59**.

Figure 59: Patient satisfaction ratings with ED services



Source: Urgent and emergency care survey 2018, CQC, 2019[19]

Staff feedback

The NHS staff survey has a good response rate and NHS staff can be regarded as 'expert patients.' However, it is a hospital-wide survey rather than being focused solely on ED staff. **Table 31** shows the distribution of staff responses.

Table 31: Variation in NHS staff survey scores between trusts

Mean	Lower quartile	Upper quartile	Range
3.76	3.63	3.88	3.34 to 4.18

Data source: NHS Staff Survey, 2016

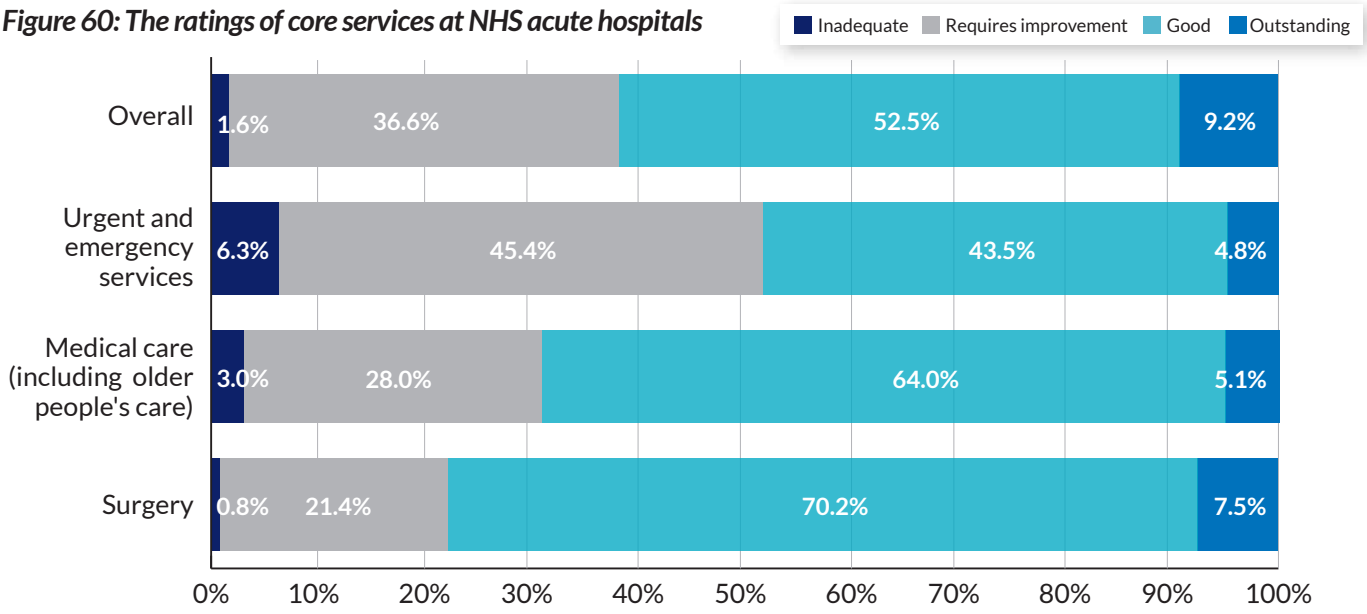
When 12-hour breach numbers are plotted against the results of the NHS staff survey, there is a correlation coefficient of 0.9, indicating a strong relationship between long ED delays and staff opinions throughout the trust.

Care Quality Commission ratings of emergency services

In the CQC's June 2020 report on acute hospital core services, more than 50% of EDs were rated as inadequate or requiring improvement, as shown in **Figure 60**. There is a strong correlation between these ratings of services and poor ED flow and outcomes as measured by the GIRFT-EM metrics.

[19] *See https://www.cqc.org.uk/publications/surveys/urgent-emergency-care-survey-2018*

Figure 60: The ratings of core services at NHS acute hospitals



Source: Care Quality Commission, 2020

Litigation

At a cost of over £400 million per annum, emergency medicine now accounts for the highest volume and the second highest value of NHS litigation liabilities (after obstetric care). In 2019/20 it accounted for 12% of all claims and 8% of the overall estimated value of claims against NHS trusts.

Cost of ED litigation

Litigation liabilities relating to ED activity are equivalent to an average of 14% of total ED operating costs. The average cost per claim is £203k and the average liability per ED attendance is £19.39. For the range of these costs see **Table 32**.

Table 32: Average costs of litigation attributed to EDs

Average ED costs	Mean	Lower quartile	Upper quartile	Range
Per attendance	£19.39	£10.20	£22.34	£1.76 to £61.93
Per claim	£203k	£110k	£249k	£37k to £698k

Data source: Claims notified to NHS Resolution, 2013/14 to 2017/18

If the upper quartile ED litigation costs were reduced to the mean, there would be an annual saving of over £80 million. If the mean costs were then reduced to the lower quartile, there would be a further annual saving of over £150 million.

Whilst the number of claims against EDs has hardly changed (from around 1,500 per year), the cost of these claims has doubled in the five years from 2013 to 2018. One in 10,000 ED attendances requires NHS Resolution to hold a provision in government accounts to cover a future claim.

Conditions that lead to high ED litigation costs

Four main medical conditions account for a disproportionate amount of ED litigation costs, despite relatively small numbers of claims. Fractures are responsible for another large component of total ED litigation costs, but the volume of claims is much greater. This is shown in **Table 33**, using data from the period April 2015 to April 2018.

Table 33: The ED litigation costs of five main conditions over three years

Medical condition leading to claim	Number of claims in three-year period	Average cost per claim	% of total ED claims cost in three-year period	Total cost over three-year period
Meningitis	32	£2,880,000	9.4%	£92.2 million
Cauda equina syndrome	123	£810,000	10.2%	£99.7 million
Intracranial bleed	67	£742,000	5.1%	£49.7 million
Infection / sepsis	303	£472,000	14.6%	£143.1 million
Fractures	1,055	£77,250	8.3%	£81.5 million

Data source: Claims notified to NHS Resolution, 2013/14 to 2017/18

Failure to diagnose as a cause of ED litigation

Emergency medicine litigation is primarily driven by errors and delays in diagnosis (59%) and treatment (33%). Failure to image is an important component of failure to diagnose. The relative breakdown for fractures is shown in **Table 34**. There is some overlap in the cases and some uncertain data.

Table 34: The ED litigation due to fractures over a three-year period

	Total claims	Delay or missed diagnosis	Failure to image	Failure to interpret results correctly
Number	1,055	889	120	70
Percentage	100%	84.3%	11.4%	6.6%

Data source: Claims notified to NHS Resolution, 2013/14 to 2017/18

The contribution of imaging to reducing litigation and its role in enabling good patient flow should mandate the provision of timely and readily available access to cross-sectional imaging and senior radiological advice for all EDs. This should include:

- 24/7 access to CT scanning, with reports available within one hour;
- 24/7 access to MRI at all sites for cauda equina / spinal cord compression, with reports available within one hour; and
- all plain film images reported within 12 hours.

Reducing ED litigation

Litigation reflects poor patient outcomes and, whilst more patients experience culpable errors than pursue litigation, rates of litigation still represent an objective ED outcome measure.

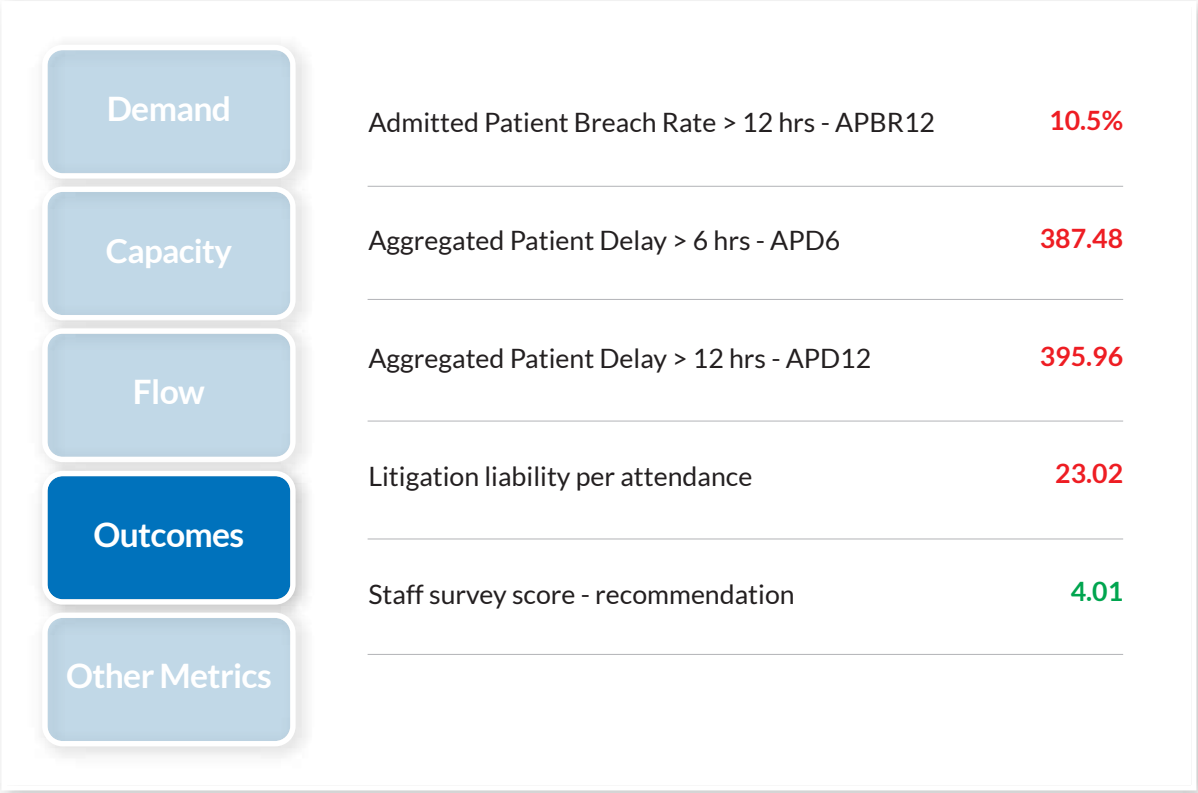
Certain conditions are particularly likely to generate ED litigation. The availability of timely imaging and expert interpretation of the findings / results may be crucial in reducing delayed or missed diagnoses. Requests for imaging should always be supported by high-quality referral information.

The high expenditure on ED litigation is one of the two major areas that the GIRFT-EM programme has identified for cost savings. All hospitals should review the litigation that is attributed to their ED. They should identify recurring themes and then implement changes accordingly. The GIRFT five-point plan for reducing NHS litigation costs should be reviewed - see page 110 *Appendix 5*.

Outcomes in the SEDIT

The Summary ED Indicator Table (SEDIT) and ED quadrants are discussed further elsewhere in the report. The panels in **Figure 61** show the SEDIT and its key outcome metrics for illustration purposes.

Figure 61: Outcome metrics in the SEDIT



Source: The SEDIT

Summary of outcomes section

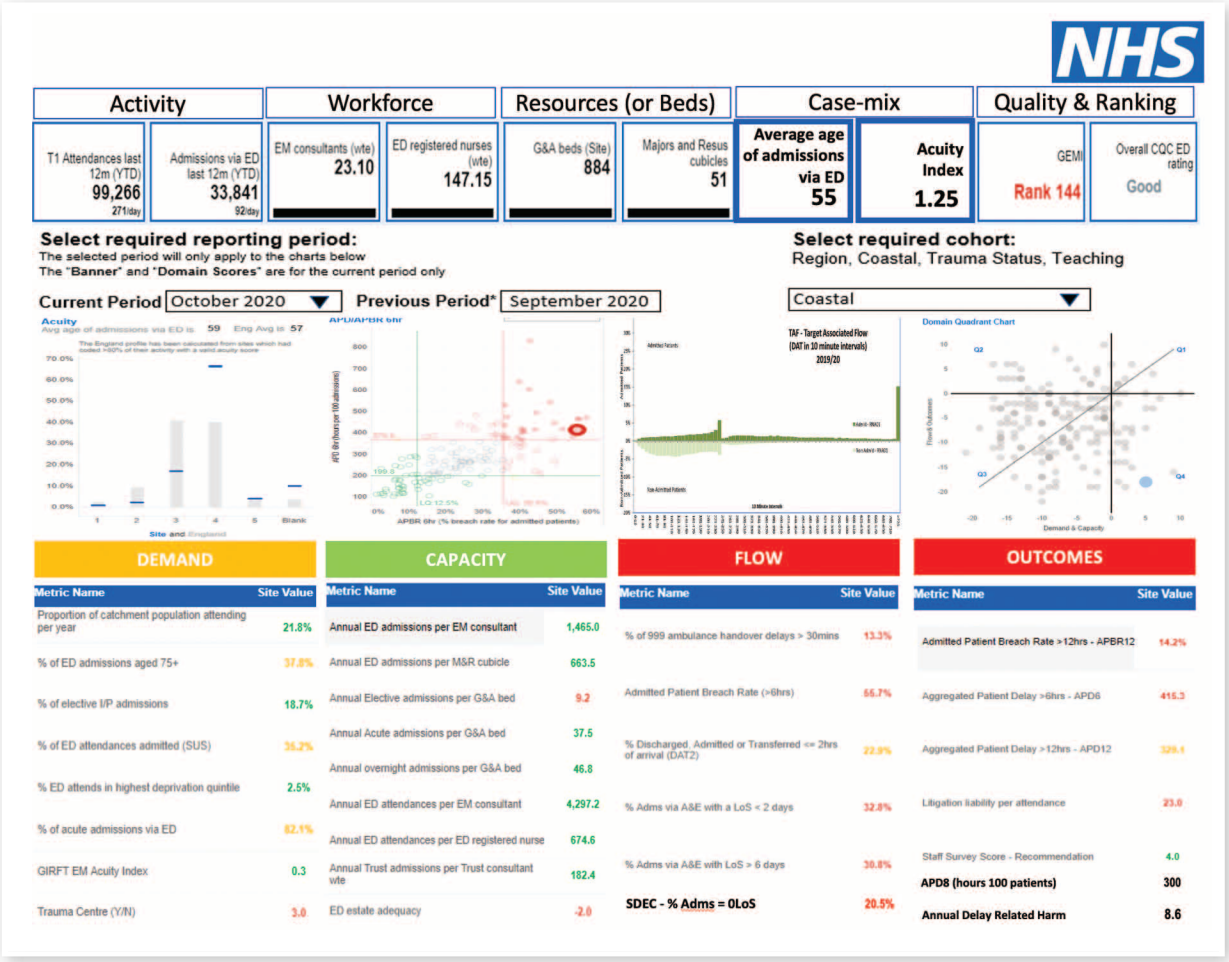
1. Exit block and ED overcrowding harm patients.
2. Delays to admission from ED in excess of six hours from time of arrival cause a quantifiable increase in patient mortality.
3. The harm probably results from a number of different causes and varies from department to department depending on local circumstances.
4. Long delays almost certainly have an even greater effect on patient morbidity and a very marked co-existing negative effect on patient experience.
5. Litigation is an ED outcome. Reduction in litigation costs would be a major cost saving. All hospitals should review the litigation that is attributed to their ED and then implement changes accordingly.
6. The GIRFT-EM metrics, SEDITs and quadrant charts can be used to rate the relative performance of an ED and to guide future improvement.

Summary ED Indicator Table (SEDIT)

We have developed the Summary ED Indicator Table (SEDIT) as a tool to enable EDs and their trusts to understand the relationship between their demand and capacity profile and their flow and outcomes. The SEDIT provides a view of the interplay between each of the key metrics, including ED litigation costs. See **Figure 62**.

A monthly-updated SEDIT is now available for all EDs via the NHS England Insights Platform.
https://www.england.nhs.uk/insights-platform/

Figure 62: Example of a Summary ED Indicator Table (SEDIT)



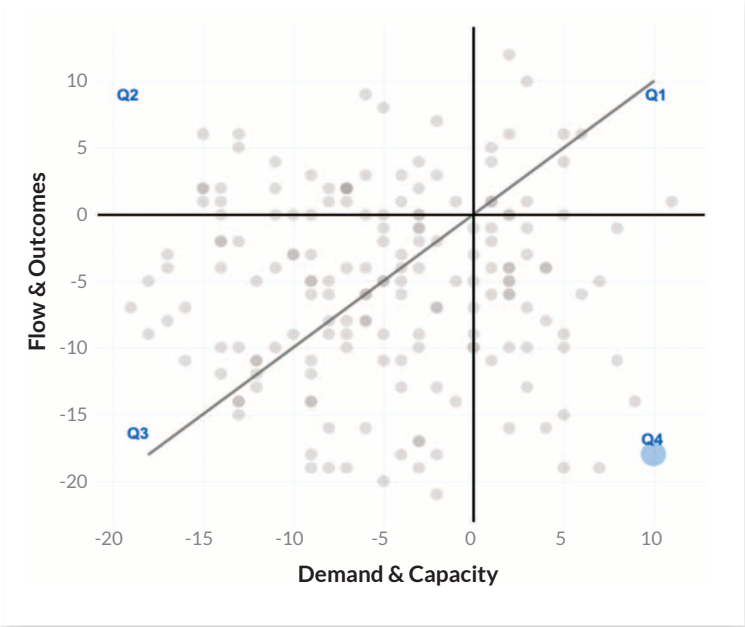
Source: The SEDIT

GIRFT-EM quadrant charts

Our review shows how overall ED performance can be measured in terms of flow and outcomes. In turn, these are a function of demand and capacity.

The GIRFT-EM quadrant chart maps an ED's position for each of the four domains using scores derived from the key SEDIT metrics. **Figure 63** shows an example of a quadrant chart.

Figure 63: Example of GIRFT-EM quadrant chart



Source: The SEDIT

Weighting of key metrics

The key metrics from the SEDIT for each ED are weighted depending on their quartile, as shown in **Table 35**.

A metric can be positive or negative depending on what it is measuring. For example, if an ED is in the upper quartile for the DAT-2 metric, the weighting would be +2. But if it is in the upper quartile for the APD-12 metric, then the weighting would be -2.

The sum of the demand and capacity weightings are plotted on the x-axis and the flow and outcome weightings are plotted on the y-axis.

Table 35: Weighting of key metrics by quartile

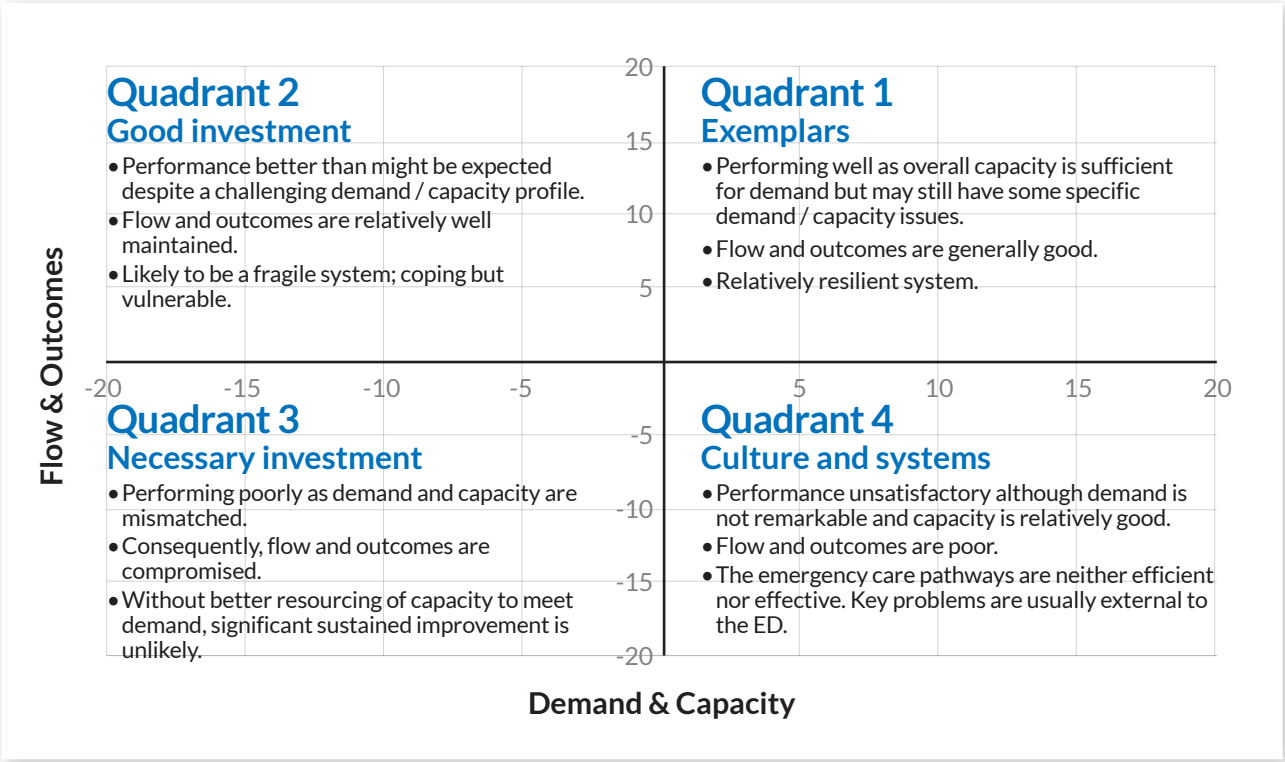
Quartile	Weighting
Upper	+2 or -2
Upper middle	+1 or -1
Lower middle	-1 or +1
Lower	-2 or +2

What the GIRFT-EM quadrants show

By referring to the quadrants, EDs can quickly visualise their performance within the context of their parent hospital and in comparison to other EDs.

Figure 64 shows the quadrant numbers and their significance, providing a description of the characteristics of trusts in each quadrant.

Figure 64: GIRFT-EM quadrant chart showing numbering and overall significance of each quadrant

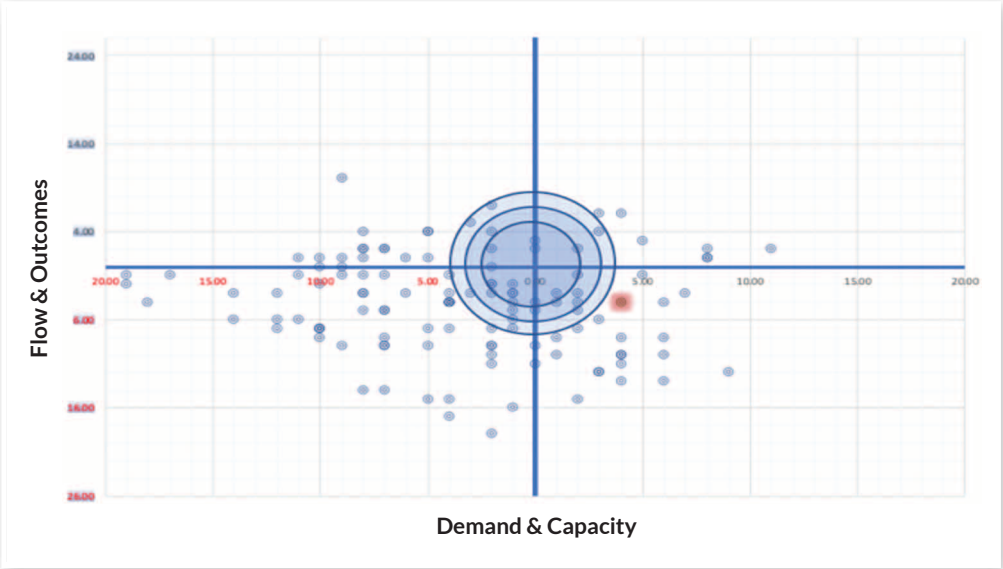


Source: The SEDIT

Degrees of confidence in the quadrants

Confidence in the quadrant positions is inversely proportional to the distance from the intersection of the axes. This means that we can be most confident of the quadrant positions of EDs that are furthest from the intersection of the x and y axes as shown in **Figure 65**.

Figure 65: GIRFT-EM quadrant chart showing discriminatory value



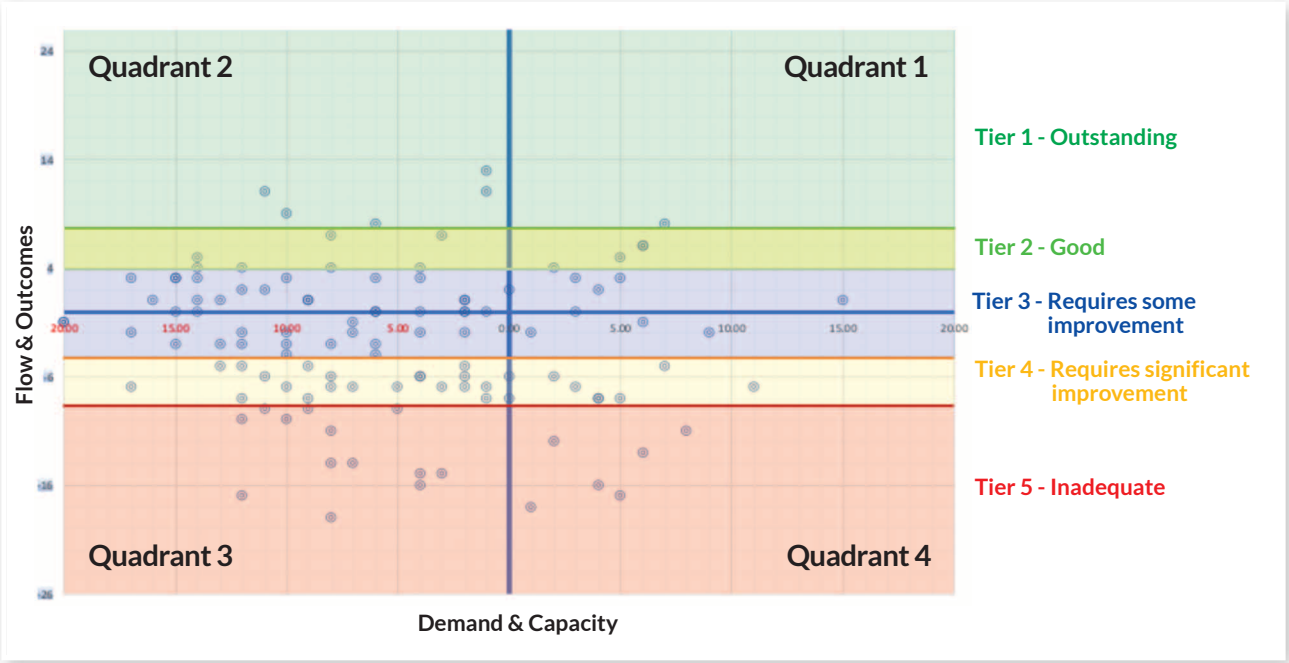
Source: The SEDIT

Using the GIRFT-EM quadrant chart

Patient experience is most closely aligned to the flow and outcome metrics. This means that we can apply tiers to the ED quadrant chart to reflect these experiences, as shown in **Figure 66**.

Staff experience relates more closely to the ED's demand/capacity profile as represented on the x-axis. In consequence, the experience of staff in EDs in quadrants 2 and 3 is likely to be worse than that of those working in EDs in quadrants 1 and 4.

Figure 66: GIRFT-EM quadrant chart showing flow and outcome tiers



Source: The SEDIT

EDs and their trusts should study the GIRFT-EM quadrants and SEDITs to understand how they are currently performing. They should then use these insights to identify options for improvement and to measure these changes by reference to their data.

Coding in the ED

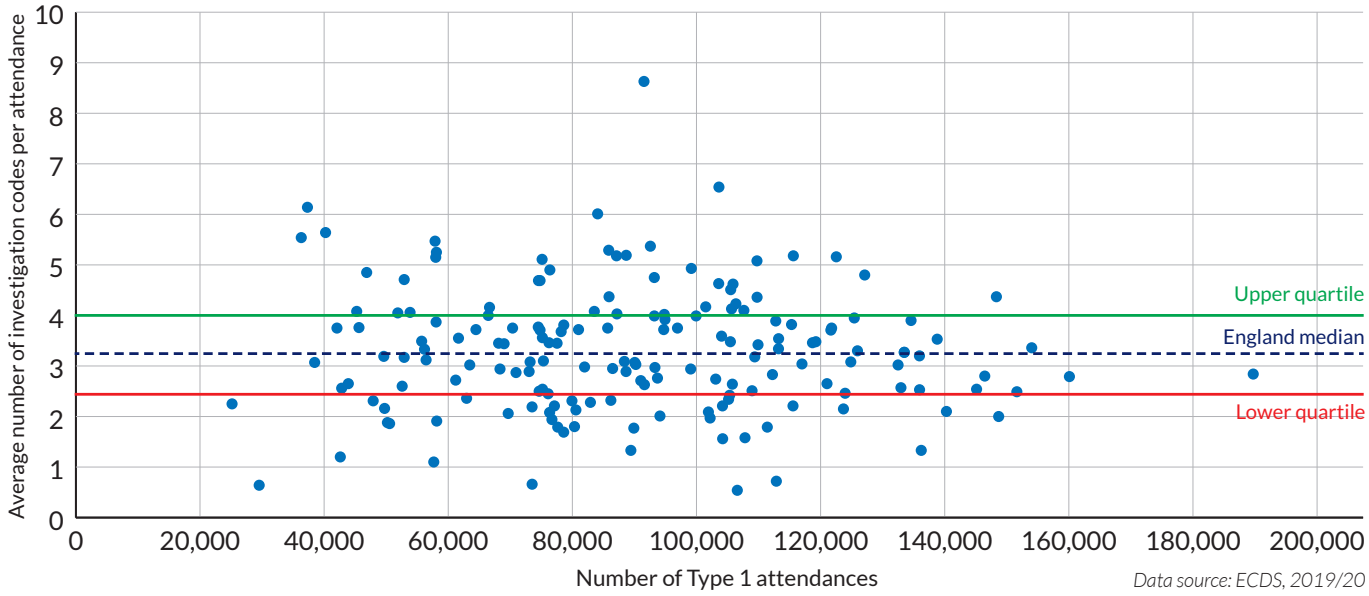
Current tariffs and contracts based on HRG groups appear to systematically under-remunerate acute trusts and emergency work. The substantial unwarranted variation in local coding practices exacerbates this problem.

Coding of ED activity

There is substantial unwarranted variation in ED funding. This variation is driven, in part, by variation in coding practices.

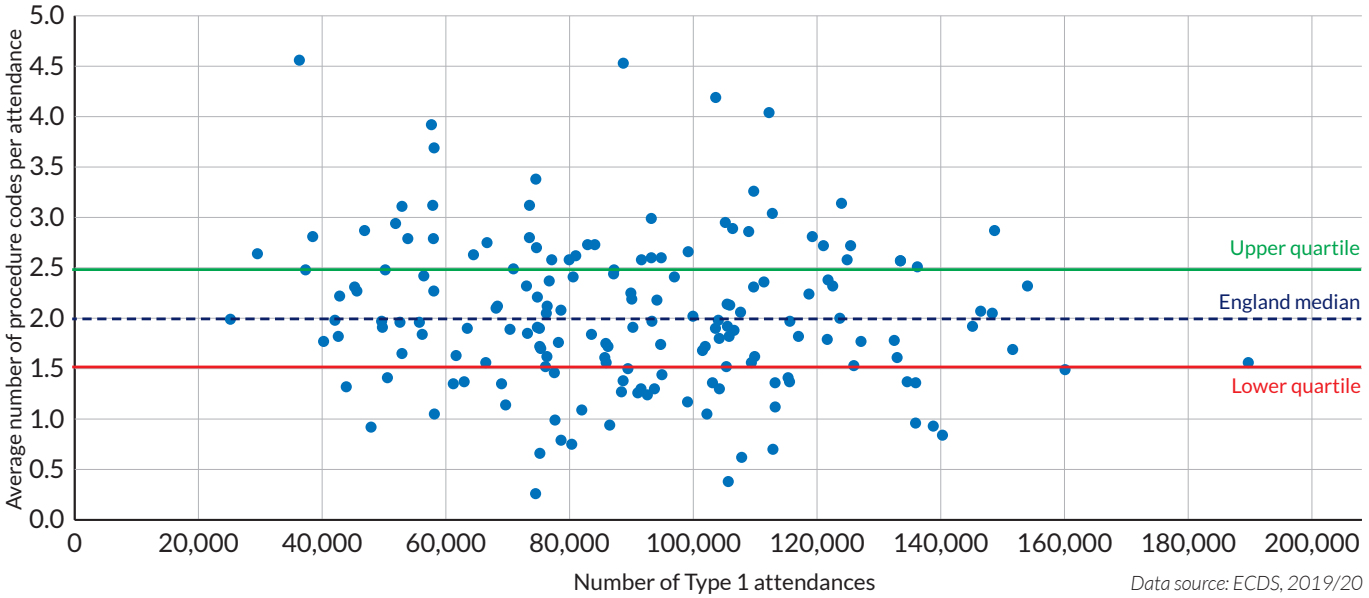
The revenue received by trusts is based on a national tariff that is derived from coded investigations and procedures. Since the tariff is derived from the coding, any variation in coding practice inevitably means that the tariff and subsequent contracts are based on compromised data. **Figure 67** and **Figure 68** show the wide variation in the levels of coding of these activities.

Figure 67: Variation in ED coding of investigations



Data source: ECDS, 2019/20

Figure 68: Variation in ED coding of procedures

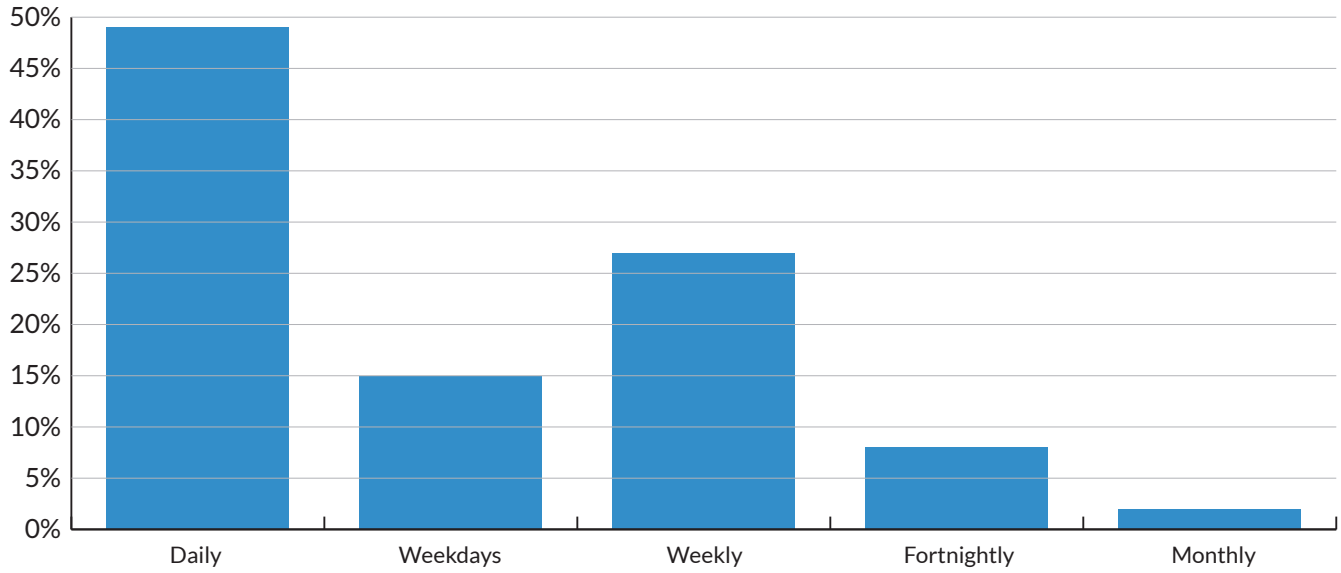


Data source: ECDS, 2019/20

Timeliness of data submission

There is also wide variation in when data is submitted, as shown in **Figure 69**.

Figure 69: Frequency of ECDS data submission



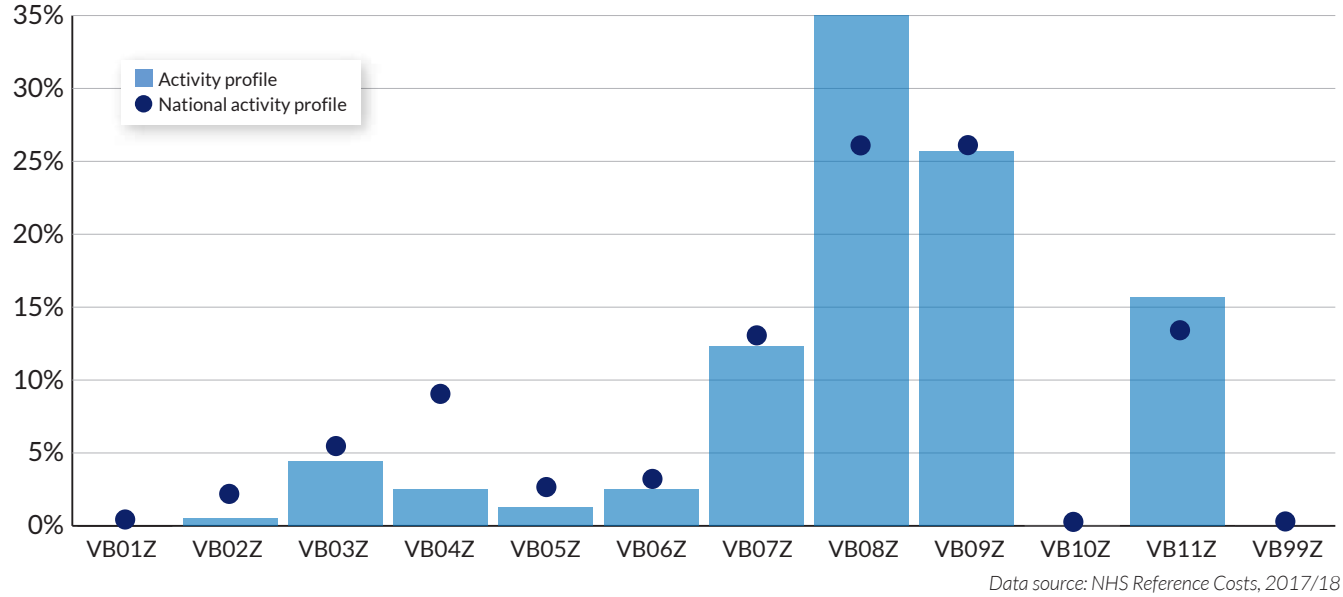
Data source: ECDS Data Completeness and Coverage Report, data for January 2020

Health Resource Group codes

The NHS has 12 Health Resource Group (HRG) codes for emergency medicine, each associated with a payment per patient that ranges from £65 to £346, as shown in **Figure 70**. Failure to record the investigations and treatments undertaken in the ED results in reduced income.

There is an ED funding paradox in that only low complexity patients return an income that is likely to match their treatment costs. These patients therefore 'fund' the care of people who are more ill or severely injured.

Figure 70: Example of ED income from the 12 HRG codes for emergency medicine

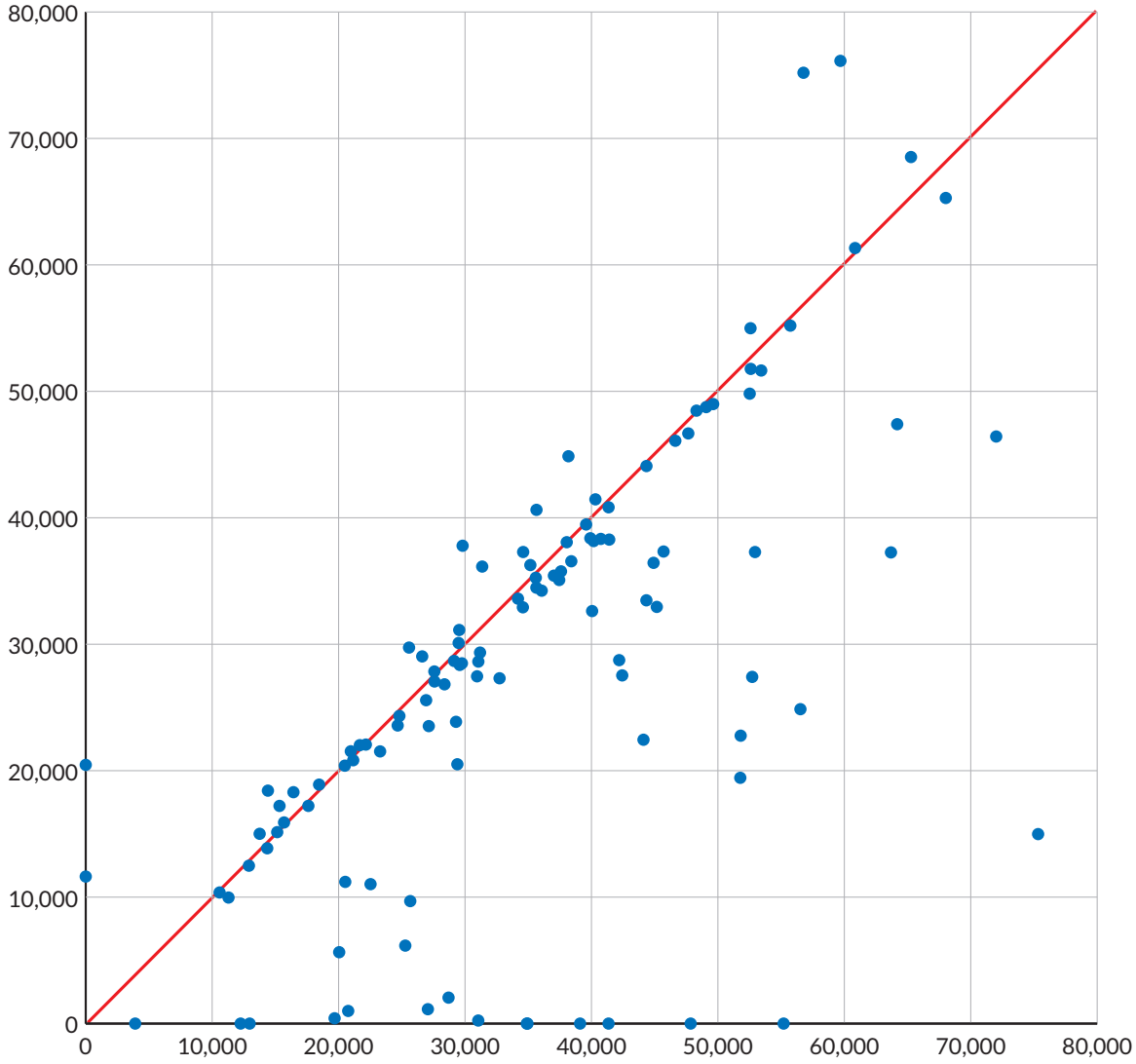


Data source: NHS Reference Costs, 2017/18

Variation between NHS data sets

The difference between admissions from the ED reported in ECDS and admissions recorded in HES Admitted Patient Care (APC) demonstrates the extraordinary lack of concordance in the same key denominator in two important NHS data sets. As **Figure 71** shows, numbers from the two sources frequently show poor agreement.

Figure 71: ED admissions as reported in ECDS versus APC HES



Data source: ECDS and APC HES, 2019/20

Summary of coding section

1. Accurate and timely coding of ED information is essential for communication with other health professionals, for funding of activity and for management and improvement purposes.
2. All healthcare staff should regard the input of accurate information as an essential part of their role.
3. The IT provision for EDs should facilitate high-quality coding with as little effect on clinical productivity as possible.

COVID-19 and emergency medicine

This section of our report reviews the emergency medicine experience of COVID-19. We have not set out to report or comment on the management of COVID-19 patients.

The changes in most ED metrics that related to the first peak of the COVID-19 pandemic were transient. This means that, while COVID-19 has increased the urgency of several of our recommendations, all of our findings and recommendations remain relevant.

Key impacts of COVID-19 on emergency medicine

The COVID-19 pandemic triggered the biggest ever worldwide health response. In the UK, healthcare providers have made comprehensive changes to adapt, including cancelling face-to-face consultations, postponing operations, and delaying cancer treatments. Emergency care, of course, can never be deferred.

COVID-19 has had four key impacts on emergency medicine:

- **Increased demand for acute respiratory care**

  The most significant increases have been for older patients and in cities and towns with the highest levels of deprivation.
- **Tested the emergency care system's ability to cope with large numbers of highly infectious patients**

  This has further highlighted the widespread deficiencies in ED waiting room space and cubicles. It has also spotlighted the unacceptable lack of isolation and infection control facilities.
- **Reduced demand for most conditions, particularly relatively minor conditions**

  This may provide a template for reducing ED demand in the future, although the abnormal situation throughout the coronavirus pandemic changed social behaviours and thus altered traditional patterns of injury and illness.
- **Accelerated innovation and the adoption of new ways of working**

  Examples include: sending patients directly to specialty assessment areas; establishing urgent clinics; carrying out virtual consultations; and streamlining administration processes. It is our hope that the best of these changes will become established in the future delivery of NHS urgent and emergency care.

Timeline in 2020

The COVID-19 pandemic created a time-limited 'natural experiment', lasting from March to June of 2020. We refer to that period as the 'acute COVID-19 period'. There was also a second wave of infection in the autumn and winter of 2020/21. **Table 36** shows the timeline for the coronavirus pandemic in England during 2020.

Table 36: Timeline of the COVID-19 pandemic in England during 2020

Date	Event
31 January	First confirmed case in England
12 March	Risk level raised from moderate to high
17 March	Foreign and Commonwealth Office advises against non-essential world-wide travel
23 March	First 'lockdown' introduced
10 May onwards	Gradual easing of lockdown restrictions
July to August	Local / regional restrictions enforced
14 October	Tier system introduced
5 November	Second national lockdown
2 December	Second lockdown ends, revised tier system introduced

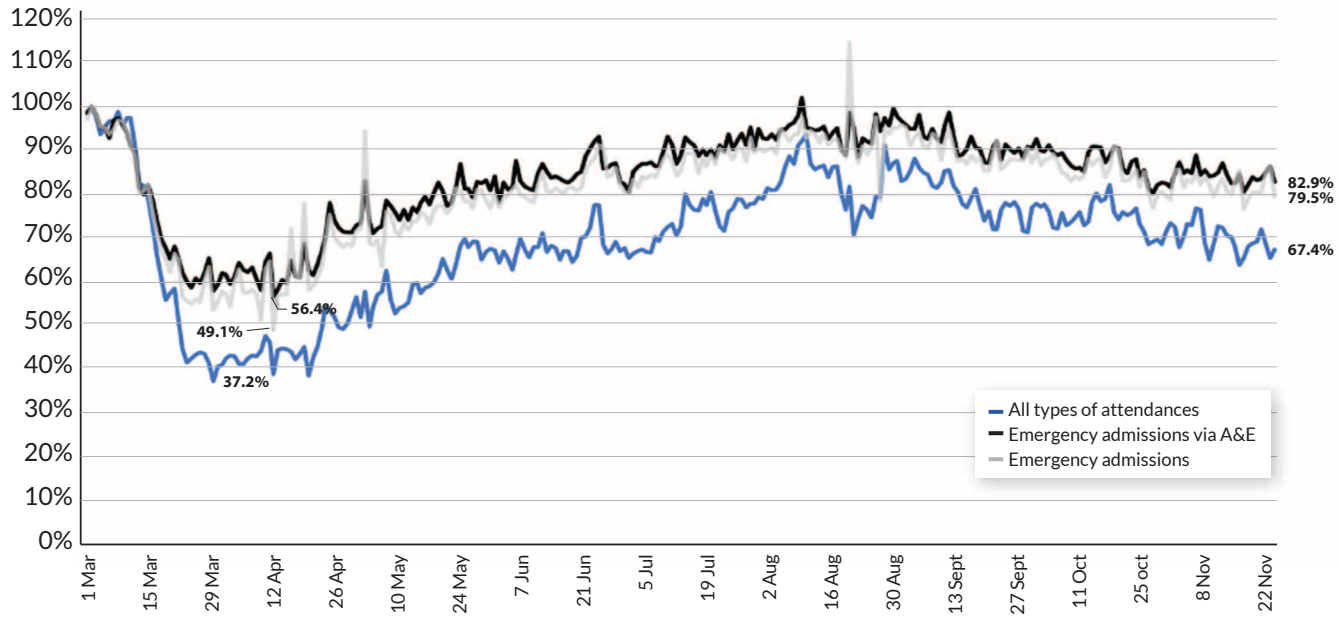
COVID-19 and demand

COVID-19 had a significant impact on overall ED demand, with a significant reduction in overall ED attendances and to a lesser extent in admissions.

Overall ED attendances and admissions

Figure 72 shows the percentage changes in ED attendances and admissions during the COVID-19 pandemic. During April 2020, ED attendances fell by almost 60% in all NHS regions, while admissions via the ED fell by almost 40%. However, by the end of April, both attendances and admissions via the ED were steadily rising. In mid-August 2020, admission numbers were actually above those seen in the same week in 2019.

Figure 72: Percentage changes in ED attendances and admissions during the COVID-19 pandemic

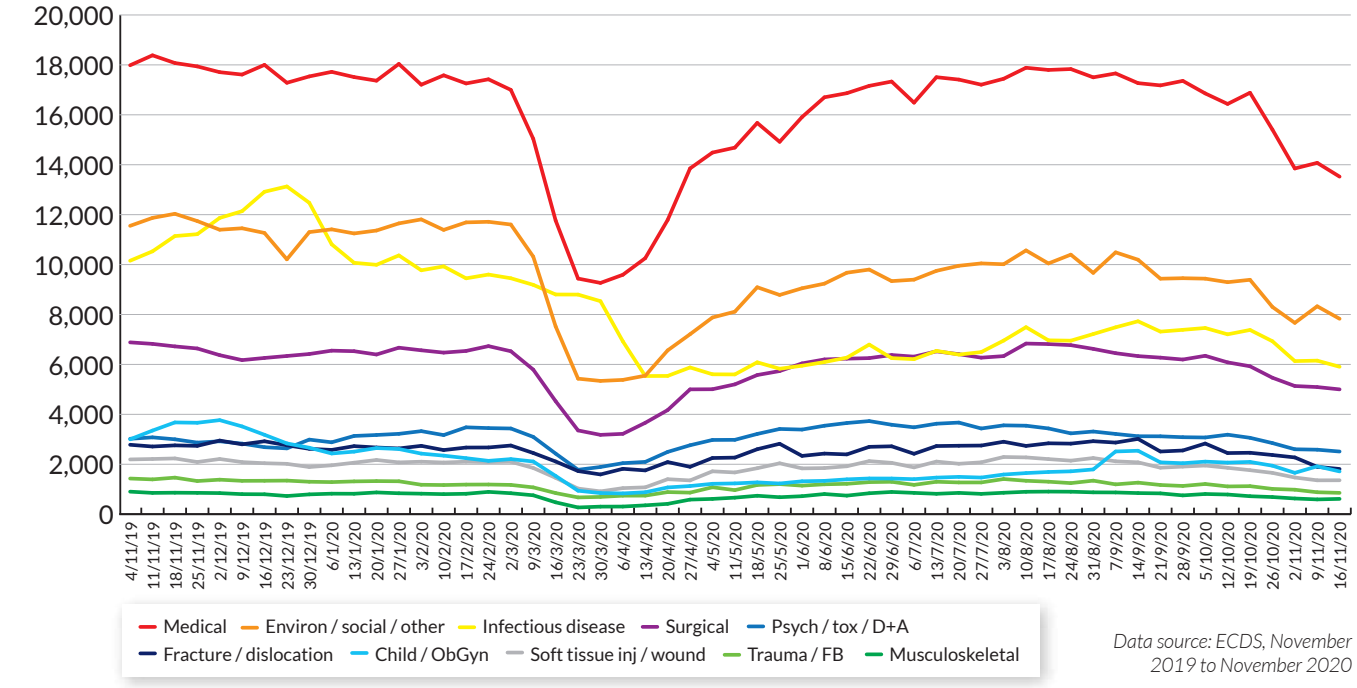


Source: NHS England and NHS Improvement

Attendances and admissions by patient groups

As **Figure 73** shows, all patient groups saw reduced admissions during the acute COVID-19 period, but some groups had a sharper drop than others. Of greatest note is the continued reduction in rates of admission for infectious diseases, despite overall admission rates returning to normal. This is most likely related to the collateral benefits of social distancing and increased hygiene measures, which obviously reduce the contagion risks of many communicable diseases.

Figure 73: Admissions via the ED for all patient groups during the COVID-19 pandemic

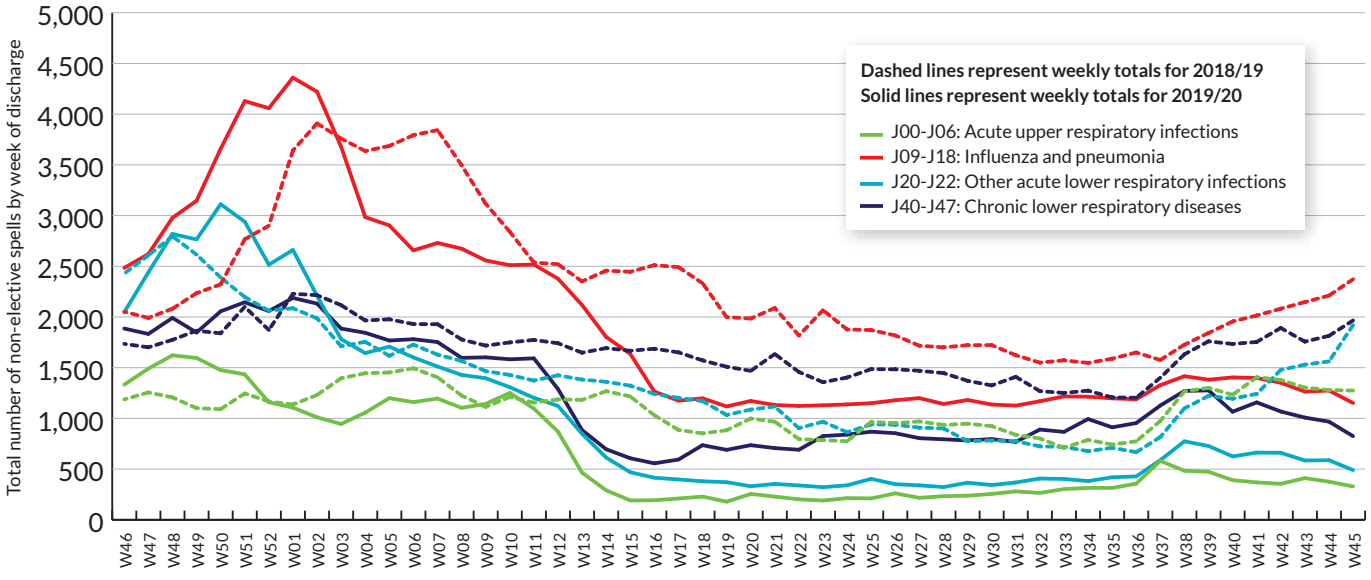


Data source: ECDS, November 2019 to November 2020

Admissions for respiratory illness

The rates of admission for respiratory illness have also remained much lower than in the same period in previous years, as seen in **Figure 74**.

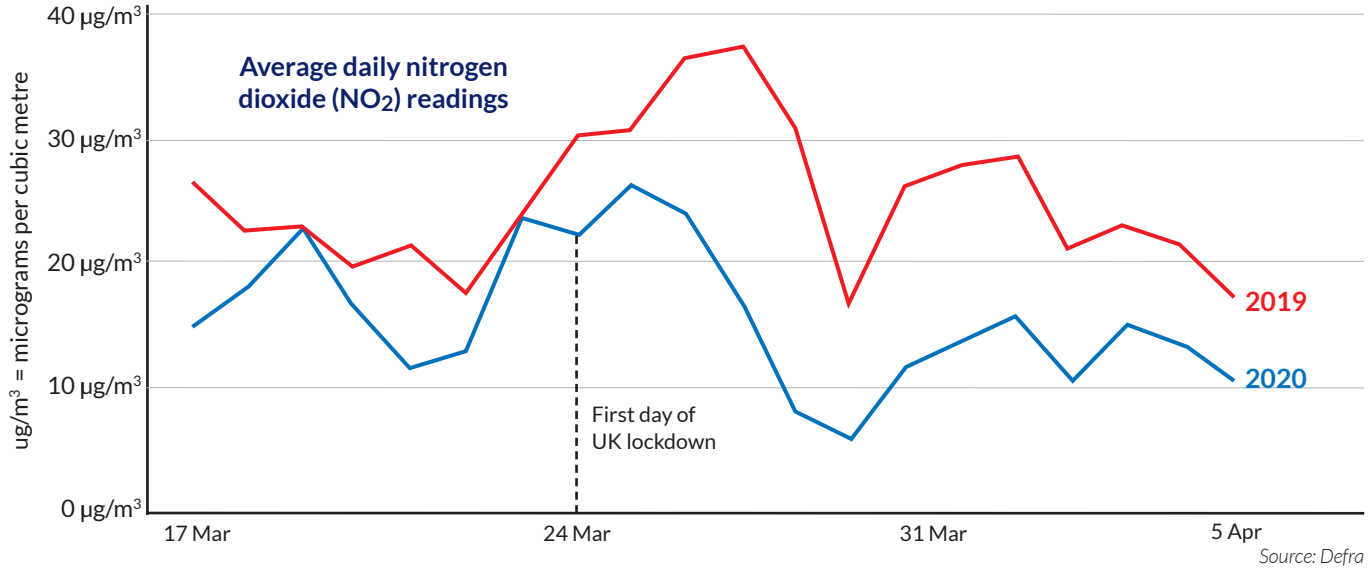
Figure 74: Admissions for respiratory illness during the acute COVID-19 period of 2020 compared with the same period in 2019



Source: NHS England and NHS Improvement, 2019/20

Poor air quality is associated with over 25,000 deaths per year in the UK.[20] Air pollution fell during the acute COVID-19 period (see **Figure 75**) and improved air quality is likely to have had a positive impact on those with respiratory illness. The reduced prevalence of some respiratory illnesses during lockdown would appear to support this suggestion.

Figure 75: Air pollution in the UK in March / April 2020 compared to March / April 2019



Source: Defra

Attendances due to trauma

Lockdown and social distancing measures caused less travelling, an absence of organised collective sport or recreation, and the closure of licensed premises. The reduction in these activities led to significantly fewer ED attendances as a result of trauma. Head injuries, ankle dislocations, and attendances related to alcohol intoxication all fell by 50%.

Because a greater proportion of acute presentations in young children relate to injuries and infectious diseases, the reduction in paediatric attendances at EDs was even greater, as shown in **Table 37**.

[20] *NHS England, Review of interventions to improve outdoor air quality and public health, 2019.*

Table 37: Reductions in children's attendances at English EDs by condition

Diagnosis	Average weekly attendances*	% reduction per week in April 2020	Net reduction
Upper respiratory tract infection	4,958	-48%	-2,379
NAD	3,123	-66%	-2,061
Croup	1,169	-89%	-1,040
Infectious gastroenteritis	1,204	-72%	-866
Tonsillitis	1,661	-49%	-813
Bronchiolitis	1,648	-46%	-758
Direct admission to specialty	1,352	-48%	-648
Minor head injury	1,024	-63%	-645
Lower respiratory tract infection	1,187	-39%	-462
Total			**-9,672**

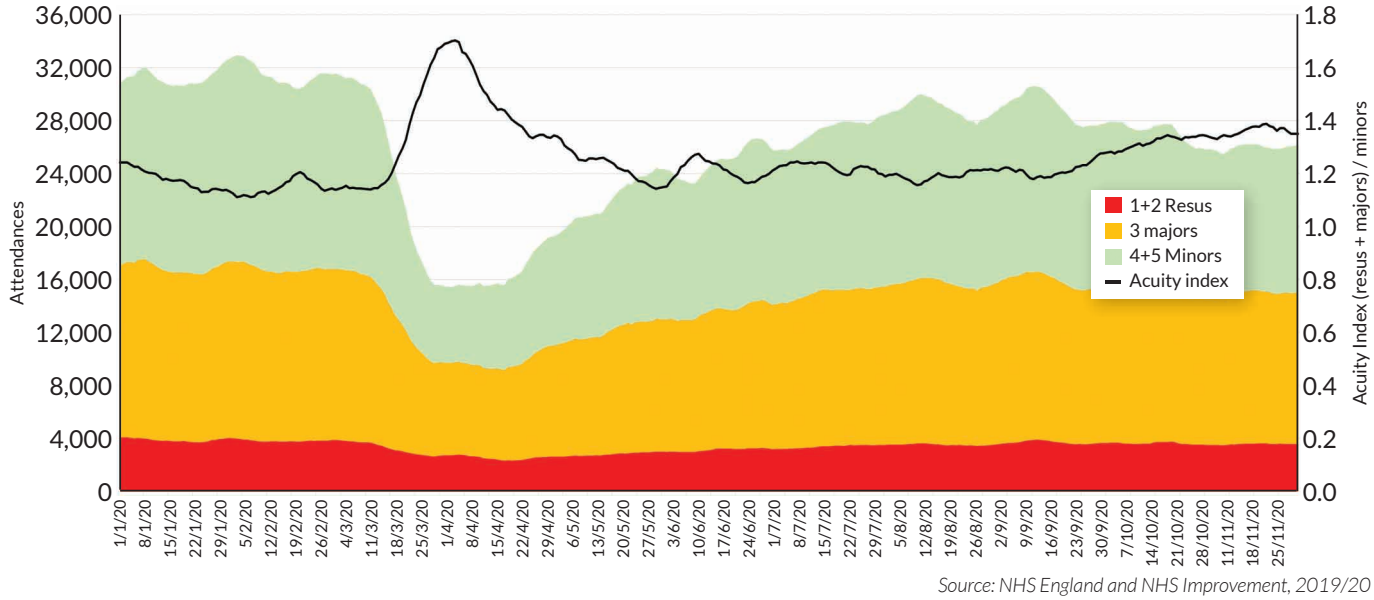
*Table uses October 2019 data as reference point because that week offered improved quality ECDS data over equivalent month of April 2019. The week chosen is historically similar to April.

Data source: ECDS

Acuity

Not all types of presentations were equally affected by COVID-19. The greatest reduction in attendances during the acute COVID-19 period was seen in lower acuity cohorts, as shown in **Figure 76**. (Acuity can be crudely approximated to the 'need' to attend the ED. See page 32 *Acuity* in the Demand section.)

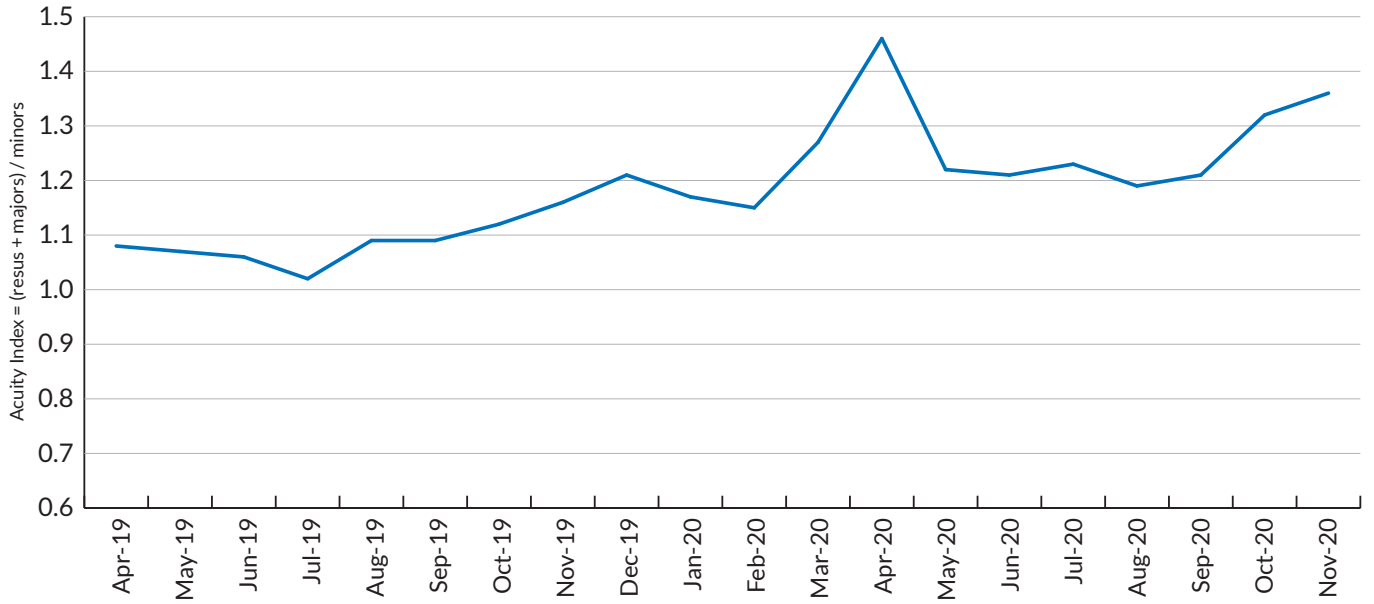
Figure 76: Change in type 1 ED activity by level of acuity during the COVID-19 pandemic



Source: NHS England and NHS Improvement, 2019/20

The biggest falls in attendance were seen in patients with no abnormality detected and those who left without being seen. This meant that higher acuity presentations, which were less affected, subsequently accounted for a greater proportion of overall presentations, as shown in **Figure 77**.

Figure 77: Increase in the proportion of higher acuity patients during the COVID-19 pandemic



Data source: ECDS, April 2019 to November 2020

Increases in demand

Conditions with increased ED attendance rates were unsurprising. As well as attendances for symptoms of COVID-19 itself, there were increases in attendance for related conditions:

- SARS (Severe Acute Respiratory Syndrome); and
- sample collection (for COVID-19).

ECDS developed specific codes for COVID-19 after initially using those for SARS, LRTI and pneumonia.

COVID-19 and capacity

The COVID-19 crisis has provided a unique insight into both ED and hospital capacity. Two key concerns were:

- the potentially overwhelming numbers of patients with COVID-19; and
- the need to separate and isolate infected patients.

Increasing and adapting emergency care capacity

In readiness for increased demand, many sites increased their ED footprint by erecting temporary structures or repurposed other clinical areas. Some sites adapted their capacity to deal with demand by streaming more patients away from the ED to other on-site services; for example, streaming children, patients with minor injuries, and patients with eye conditions to the appropriate specialty.

Isolation facilities in EDs

Most significantly, the threat of transmitted coronavirus infection highlighted the urgent need for more isolation facilities. Many EDs have resuscitation rooms with only curtained partitioning and most have very few individual cubicles with doors. In addition, waiting rooms are often small and cramped with limited possibilities for social distancing. Indeed, many departments struggle to ensure even basic privacy and do not routinely protect patients and their clinicians from being observed or overheard.

In our visits, we did find some examples of good isolation facilities, particularly in newer ED buildings. Key features of well-configured sites are:

- cubicles and resuscitation spaces with walls and doors so that they are fully Infection Prevention and Control (IPC) compliant;[21]
- anterooms to enable barrier nursing; and
- clinical rooms with a negative pressure airflow system.

Urgent measures must be taken to remedy the nosocomial risks that arise from inadequate infection control facilities, cramped ED waiting areas, and corridor care. Implementing our recommendations will address each of these issues.

See *Appendix 3: ED isolation and decontamination facilities* for a brief overview of the required provision of isolation rooms and decontamination rooms.

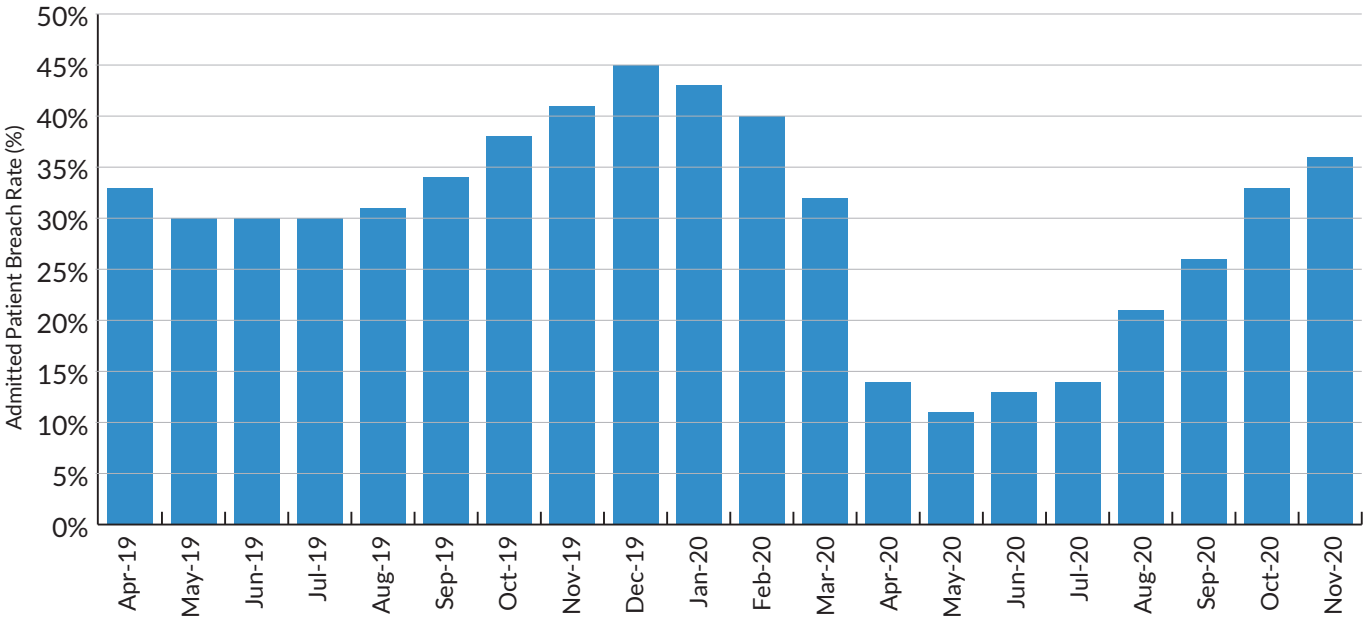
COVID-19 and flow

The acute COVID-19 period saw increased bed availability. In the early weeks of the acute period, this enabled timelier admission of patients and a consequent improvement in all flow metrics. **Figure 78** shows the reduction in the monthly Admitted Patient Breach Rate at six hours. **Figure 79** and **Figure 80** show the reduction in the Aggregated Patient Delay at six and 12 hours respectively.

However, it is concerning that both breach rates over six hours and longer delays have increased each month since June 2020.

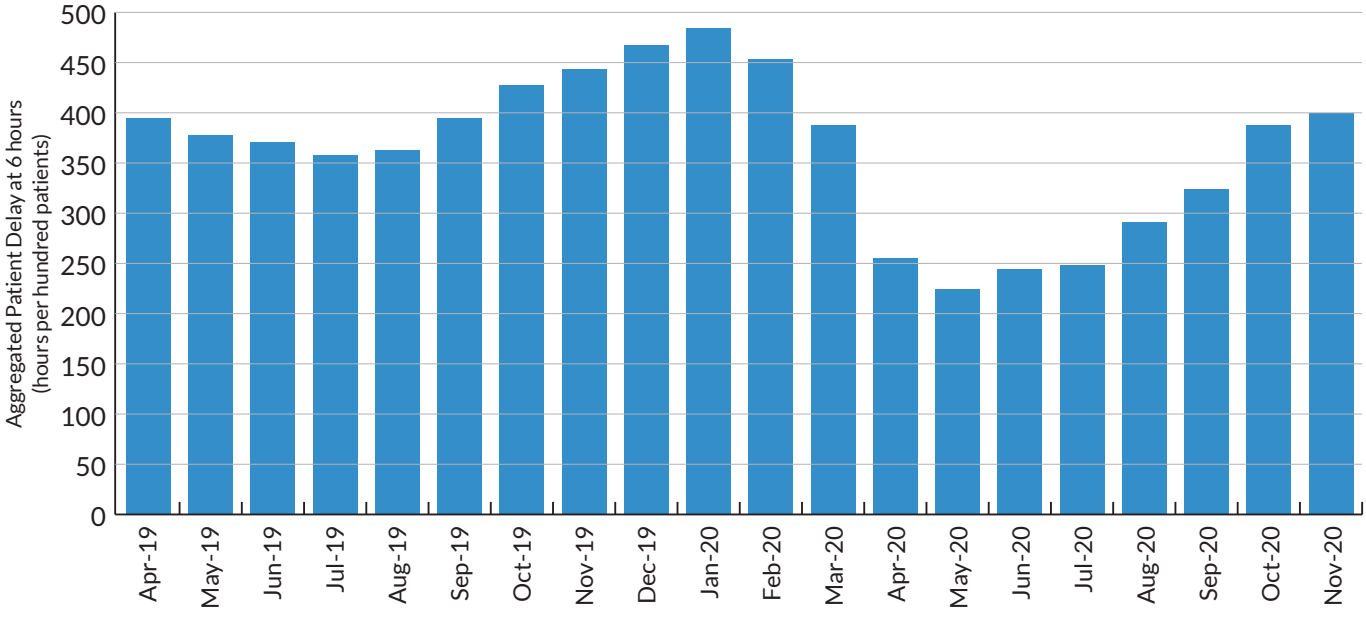
[21] *Emergency Department Infection Prevention and Control during the Coronavirus Pandemic. RCEM, 2020 https://www.rcem.ac.uk/docs/RCEM%20Guidance/RCEM_BPC_Guideline_COVID_IPC_090620.pdf*

Figure 78: Monthly APBR-6 in Type 1 EDs during the COVID-19 pandemic



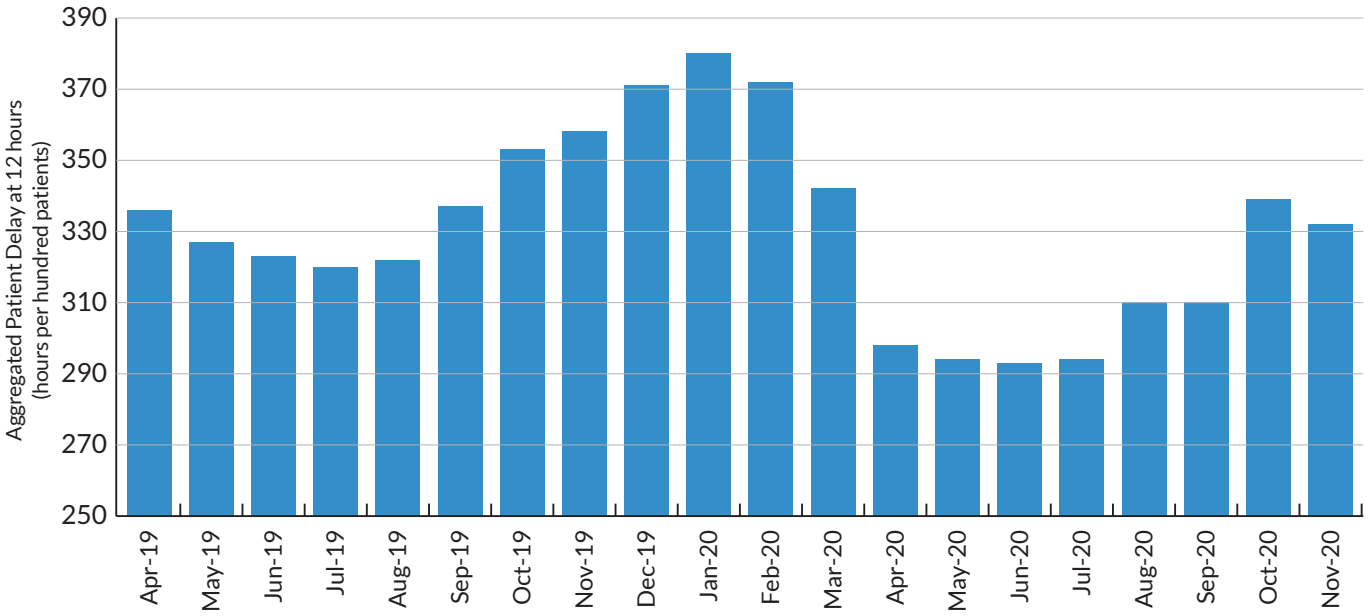
Data source: ECDS, April 2019 to November 2020

Figure 79: Monthly APD-6 in Type 1 EDs during the COVID-19 pandemic



Data source: ECDS, April 2019 to November 2020

Figure 80: Monthly APD-12 in Type 1 EDs during the COVID-19 pandemic

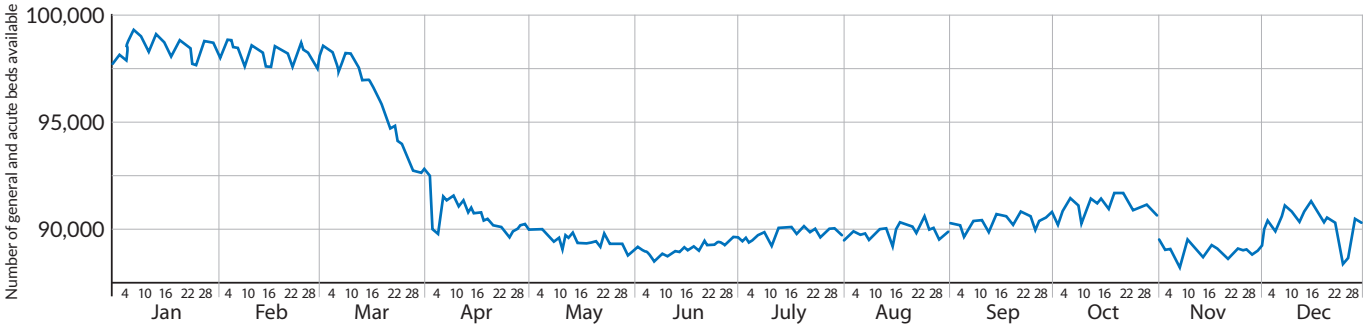


Data source: ECDS, April 2019 to November 2020

Bed availability

At first during the acute COVID-19 period, bed availability increased (and occupancy decreased) because of the cancellation of elective care. This was despite a significant (>10% reduction) in general and acute beds across the NHS, as shown in **Figure 81**.

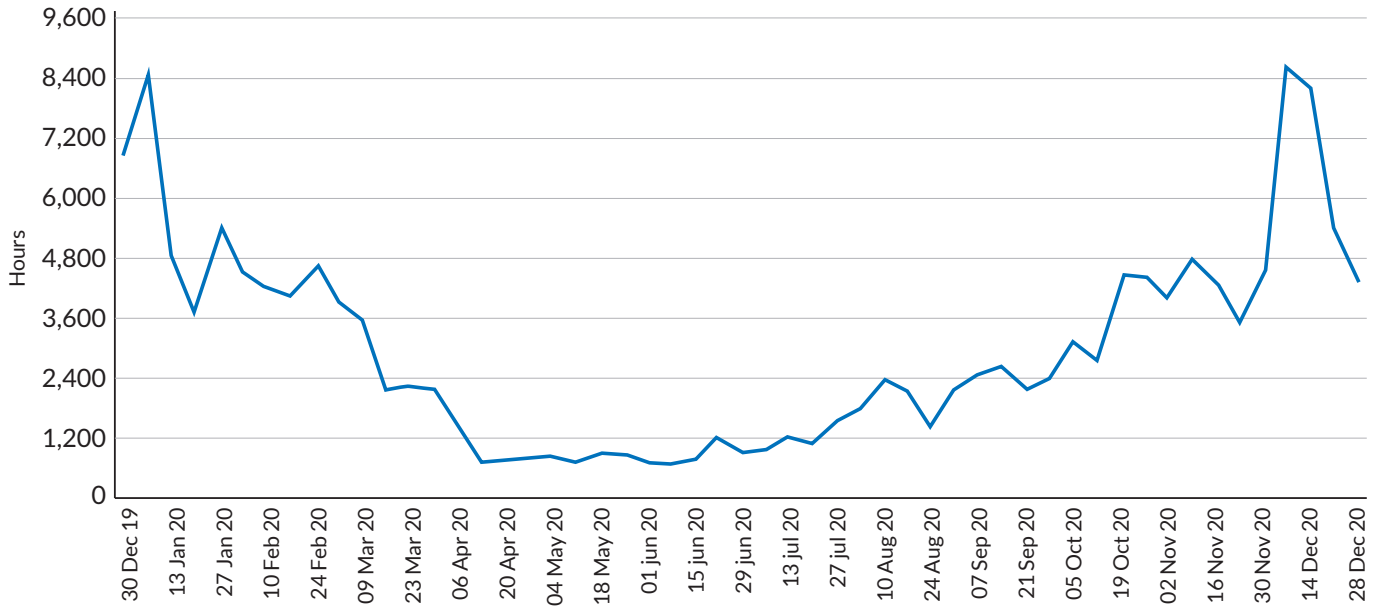
Figure 81: NHS general and acute bed numbers before and during the COVID-19 pandemic



Source: NHS England and NHS Improvement, 2020

However, as elective activity returned, lack of available beds, exit block and the consequential risks of corridor care and emergency ambulance handover delays became more pressing. For example, **Figure 82** shows how the hours lost due to 999 ambulance handover delays quickly returned to rates at least equivalent to those seen before the acute COVID-19 period.

Figure 82: Hours per week lost due to emergency ambulance handover delays during the COVID-19 pandemic



Source: NHS England and NHS Improvement, 2020

It should be noted that as infection control mandates careful separation of patients between wards with infection and those that are infection free, bed availability does not always reflect bed occupancy levels. This of course, is always true in the case of male versus female beds and for beds in specialist areas.

ED radiology

The COVID-19 pandemic led to many trusts rediscovering the benefits of an immediate radiology opinion. This prevents the need for radiologists to report investigations at a later date and also reduces the number of patients that need to be recalled. Trusts that have moved to 'hot reporting' of ED radiographs have apparently found the system to be both helpful and efficient.

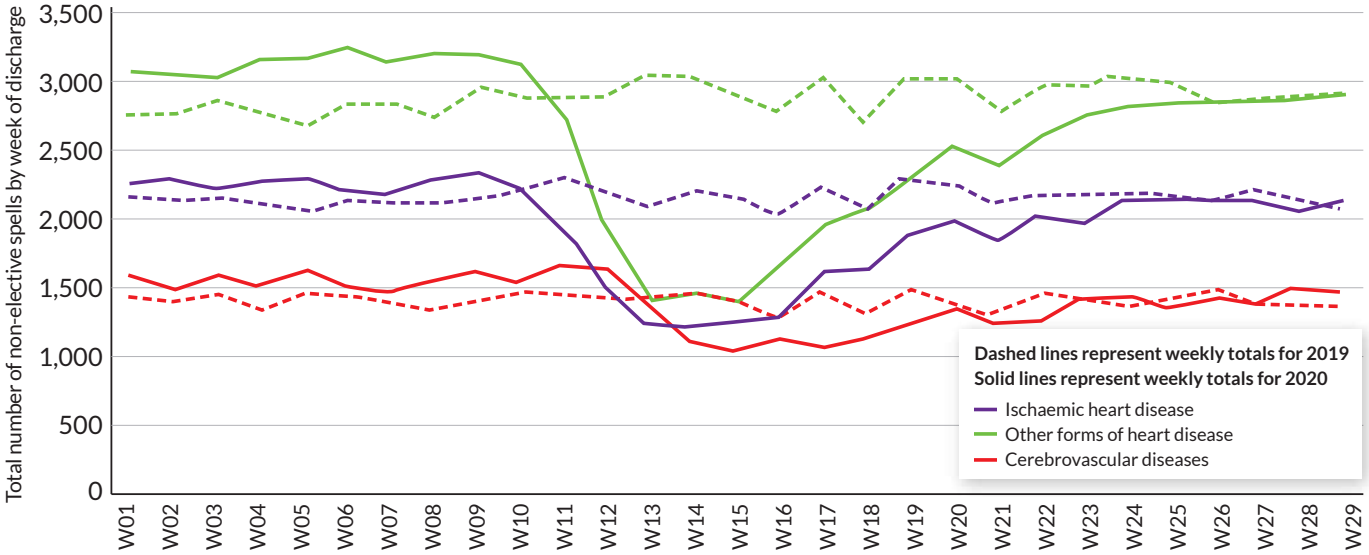
Radiology reporting of chest x-rays has improved flow through the ED and has helped to ensure that patients are admitted to the correct type of ward, which is particularly important when considering COVID-19 and the risks of nosocomial infection.

COVID-19 and outcomes

Admissions for serious illnesses

In April and May 2020, there were major concerns that significant numbers of patients with serious illnesses, such as myocardial infarction and stroke, were not seeking help and that consequently, there was a lost opportunity to reduce mortality and morbidity for these people. ECDS data shows that this unwelcome collateral harm did not persist beyond May 2020. **Figure 83** compares weekly admissions during 2020 (dashed lines) with the same period in 2019 (solid lines).

Figure 83: Weekly admissions to hospital in 2020 of patients with serious illnesses compared with the previous year

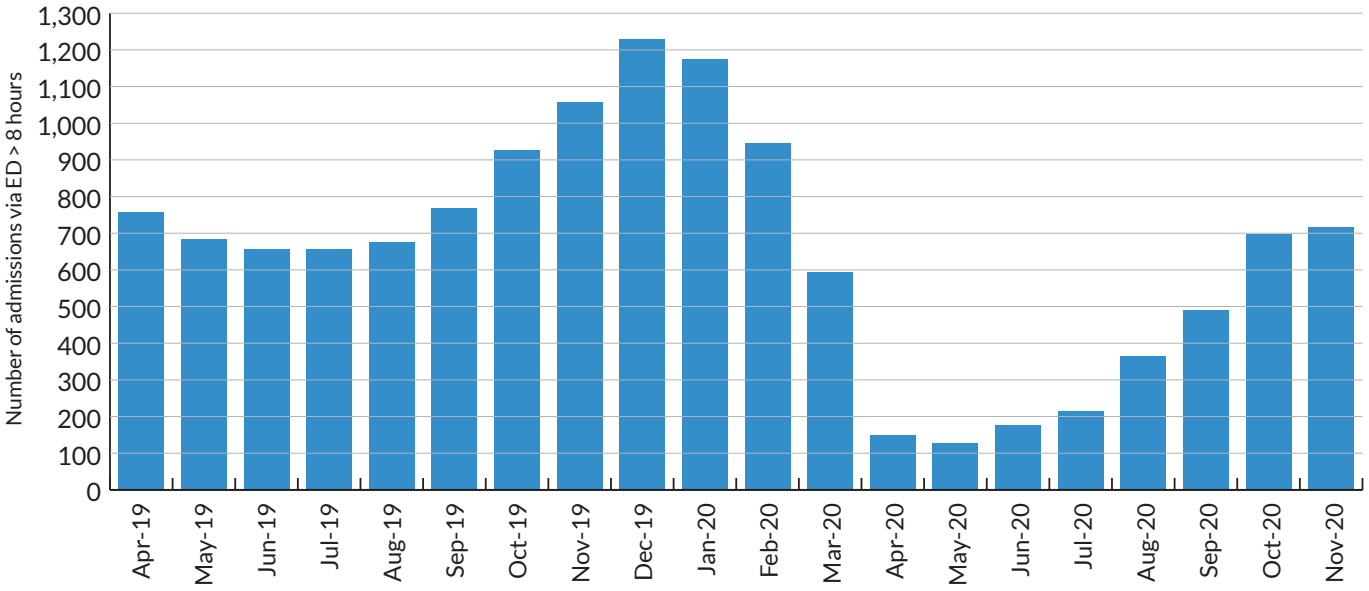


Source: NHS England and NHS Improvement, 2019/20

Delay-related harm

Levels of delay-related harm improved during the acute COVID-19 period, as shown in **Figure 84**. The reduction in both the numbers of delayed admissions from ED and the total duration of the delays led to a significant reduction in the level of harm normally associated with excess time spent in the ED.

Figure 84: GIRFT-EM estimated delay-related harm to admitted ED patients during the COVID-19 pandemic



Data source: ECDS, April 2019 to November 2020

COVID-19 and emergency medicine: key conclusions

The data from the acute COVID-19 period confirms the findings of our review of emergency medicine and reinforces the need to implement our recommendations.

Key conclusions are:

- **ED productivity is routinely impeded by the unintended consequences of wider system behaviours and failure to recognise the burden of internal demand.**

  Only when all stakeholders appreciate the interdependencies of ED demand, capacity, flow and outcomes can the consequent improvements in operational efficiency and effectiveness deliver better experiences and outcomes for our patients.

  As cases of coronavirus transmission decrease, the NHS aims to restore and improve services in order to address a mounting backlog of patients. However, the constraints identified in this report will increasingly limit the effective functioning of EDs and impair the whole emergency care system.

- **Lack of available beds is a key driver of exit block, which impedes ED function and causes patient delay and attributable harm.**

  Delays to admission are neither inevitable nor inconsequential. They cause ED overcrowding and ambulance handover delays. Reducing delays improves both outcomes and patient experience.

- **When admission is timely and unimpeded by downstream obstacles, most EDs require only modest expansion to manage patients who require admission.**

  This is true of most EDs, although by no means all: some EDs do require more than a modest expansion as their estate is so poor.

- **Many minor illnesses and injuries do not require ED attendance.**

  Not attending the ED with this group of illnesses and injuries does not result in significant patient harm.

- **The incidence of injury and contagious illness are a function of people's behaviours and activities.**

  The incidence of many infections is reduced by better public and personal hygiene measures. In view of the continued prevalence of coronavirus infection and the likelihood of other pandemics in the future, it is essential that basic infection control facilities, improved hygiene measures and the space for social distancing are guaranteed in all EDs as soon as possible.

- **Most EDs are inadequately designed and built to deal with highly infectious diseases safely.**

  In EDs in England, there is a widespread lack of enclosed cubicles and resuscitation spaces and usually no anterooms or negative pressure airflow rooms at all.

Activity and notional financial opportunities

Potential benefits

This report sets out a series of ways to improve the provision of emergency care across the four domains of demand, capacity, flow and outcomes. When implemented, the recommendations have the potential to improve patient care and reduce avoidable harms.

Improvements to patient experience would be seen by ensuring more equitable access to timely care, delivered in the most appropriate setting, providing the best possible outcomes. All of these improvements will benefit providers by matching capacity to local demand and improving flow. While the impact in some areas is hard to measure, in others there is a clear tangible benefit.

Notional financial opportunity

The notional financial opportunity could be between £19m and £40m per year. The figures, based on a selection of metrics (**Table 38**), are for illustration only and are designed to highlight opportunities that may be possible and to provide an estimated financial value, which may not be cash-releasing. The metrics do not represent a comprehensive set of all opportunities discussed in the report.

Individual providers should assess their own services to determine the unwarranted variation that exists and the associated opportunity. Their assessment, further evidenced with use of the SEDIT, will help prioritise the service changes to deliver improved efficiency and, above all, improved care.

Table 38: Notional financial opportunities

Improvement	Standard			Target		
	Target	Activity opportunity*	Gross notional financial opportunity**	Target	Activity opportunity*	Gross notional financial opportunity**
Reduce spend on locum consultants *(recommendation 12)* Opportunity: Reduce overall spend on consultants due to reduced use of locums. *Base data: Locum spend is direct from emergency departments in response to a questionnaire in 2018/19. Responses covered 83% of sites, spending has been prorated to cover all sites.* *Cost estimated based on clinical view regarding realistic reductions in consultant locum usage and spend.*	*Clinical view* 5.0% Reduction in spend on locums		£2.81m	*Clinical view* 10.0% Reduction in spend on locums		£5.62m
Reduce time spent entering patient details on IT systems *(recommendation 15)* Opportunity: Reduce the time spent on entering patient details into the emergency department's IT system. *Base data: IT time per emergency department was collected by the GIRFT-EM team during deep-dive visits. Data covered 36% of sites, findings have been prorated to all sites.* *Cost estimate based on the nurse time saved, costed at mid-range band 5.*	*National average* 5.28 Average minutes per patient data entry	243,000 Nursing hours	£4.09m	*Lower quartile* 3.50 Average minutes per patient data entry	524,000 Nursing hours	£8.80m
Reduce the time in department > 6 hours *(recommendation 6)* Opportunity: Reduce the patient hours beyond six hours (per patient) spent in the emergency department *Base data: April 2019 to March 2020.* *Cost estimated based on the nurse time saved, costed at mid-range band 5. Assumes a nurse looks after four >6-hour-patients at a time.*	*Clinical view* Reduce hours to 6 hours (per patient) by 50%	3,073,000 patient hours	£12.91m	*Clinical view* Reduce hours to 6 hours (per patient) by 100%	6,145,000 patient hours	£25.82m
Total			**£19.81m**			**£40.24m**

* Activity opportunities are annual figures

** Costing financial opportunity: unless otherwise stated, estimates are based on national average of 2018/19 reference costs, uplifted to 2019/20 pay and prices using tariff inflation.

About the GIRFT programme

Getting It Right First Time (GIRFT) is a national programme designed to improve treatment and care by reviewing health services. It undertakes clinically-led reviews of specialties, combining wide-ranging data analysis with the input and professional knowledge of senior clinicians to examine how things are currently being done and how they could be improved.

Working to the principle that a patient should expect to receive equally timely and effective investigations, treatment and outcomes wherever care is delivered, irrespective of who delivers that care, GIRFT aims to identify approaches from across the NHS that improve outcomes and patient experience, without the need for radical change or additional investment. While the gains for each patient or procedure may appear marginal they can, when multiplied across an entire trust – and even more so across the NHS as a whole – deliver substantial cumulative benefits.

The programme was first conceived and developed by Professor Tim Briggs to review elective orthopaedic surgery in order to address a range of observed and undesirable variations in orthopaedics. In the 12 months after that pilot programme, it delivered an estimated £30m–£50m savings in orthopaedic care – predominantly through changes that reduced average length of stay and improved procurement.

The same model has been applied to over 40 different areas of clinical practice. It consists of four key strands:

1. A broad data gathering and analysis exercise, performed by health data analysts, which generates a detailed picture of current national practice, outcomes and other related factors.
2. A series of discussions between clinical specialists and individual hospital trusts, which are based on the data – providing an unprecedented opportunity to examine individual trust behaviour and performance in the relevant area of practice, in the context of the national picture. This then enables the trust to understand where it is performing well and what it could do better – drawing on the input of senior clinicians.
3. A national report, that draws on both the data analysis and the discussions with the hospital trusts to identify opportunities for NHS-wide improvement.
4. An implementation phase where the GIRFT team supports providers to deliver the improvements recommended.

GIRFT and other improvement initiatives

GIRFT is part of an aligned set of workstreams within NHS England and NHS Improvement. It is the delivery vehicle for one of several recommendations made by Lord Carter in his February 2016 review of operational efficiency in acute trusts across England.

The programme has the backing of the Royal Colleges and professional associations and has a significant and growing presence on the Model Hospital portal, with its data-rich approach providing the evidence for hospitals to benchmark against expected standards of service and efficiency. The programme also works with a number of wider NHS programmes and initiatives which are seeking to improve standards while delivering savings and efficiencies.

Implementation

GIRFT has developed an implementation programme designed to help trusts and their local partners to address the issues raised in trust data packs and the national specialty reports to improve quality. The GIRFT team provides support at a local level through the NHS England regional teams, advising on how to reflect the national recommendations into local practice and supporting efforts to deliver any trust specific recommendations emerging from the GIRFT visits. GIRFT also helps to disseminate best practice across the country, matching up trusts who might benefit from collaborating in selected areas of clinical practice. Through all its efforts, local or national, the GIRFT programme strives to embody the 'shoulder to shoulder' ethos that has become GIRFT's hallmark, supporting clinicians nationwide to deliver continuous quality improvement for the benefit of their patients.

Glossary

Acute Medical Unit (AMU)
A hospital unit dedicated to providing acute medical care for patients who present as medical emergencies.

Acute Surgical Unit (ASU)
A hospital unit dedicated to providing acute surgical care for patients who present as surgical emergencies.

Advanced clinical practitioners (ACPs)
Healthcare professionals educated to Master's degree level who have developed the skills and knowledge to enable them to take on extended clinical roles.

Advanced nurse practitioners (ANPs)
Experienced and highly educated Registered Nurses who work in the same way and at the same level as ACPs. (The names are often interchangeable; most ACPs are ANPs.)

Casemix
The type or mix of patients, categorised by disease type and severity.

Cauda equina syndrome
Compression of the terminal nerves of the spinal cord in the lower back. If surgical treatment is delayed, permanent neurological damage occurs.

Charlson comorbidity index (CCI)
An index that assigns a score to 22 medical conditions in order to provide a one-year mortality prediction.

CT pulmonary angiogram (CTPA)
A computed tomography (CT) scan using x-rays and a computer to create detailed images of the pulmonary arteries (the arteries that carry de-oxygenated blood to the lungs). It is often used to diagnose a pulmonary embolism (a blockage of the artery by a blood clot).

DID (Diagnostic Information Dataset) for radiology
A central collection of detailed information about diagnostic imaging tests carried out on NHS patients, extracted from local Radiology Information Systems (RISs) and submitted monthly.

Elixhauser comorbidity index
A measure of 30 comorbidities (medical conditions) that can be used to predict mortality risk. The Elixhauser comorbidity index offers a number of advantages over the Charlson comorbidity index, including omitting comorbidities that do not contribute to patient mortality.

Emergency Care Data Set (ECDS)
The national data set for urgent and emergency care.

Formulary
A list of medicines approved for use.

Hospital Episode Statistics (HES)
Data on all patient admissions, outpatient appointments and ED/A&E attendances at NHS hospitals in England. HES APC is designed to collect a detailed record for each episode of admitted patient care commissioned by the NHS and delivered in England, by either an NHS hospital or the independent sector. HES AE has been superseded by the ECDS.

Intracranial haemorrhage (bleed)
Bleeding within the skull, usually outside of the brain. (Inside the brain would be called intracerebral haemorrhage.)

Model Hospital
A free digital tool provided by NHS England and NHS Improvement to enable trusts to compare their productivity and identify opportunities to improve. The tool is designed to support NHS provider trusts to deliver the best patient care in the most efficient way.

https://www.model.nhs.uk

National Early Warning Score (NEWS)
A tool (actually a set of clinical observations) designed to improve the detection and response to clinical deterioration, including sepsis, in adult patients.

NHS Benchmarking Network (NHSBN)
An organisation that collects data from over 300 health and social care organisations in the UK and then provides detailed bespoke and national benchmarking reports.

NHS Long Term Plan
A long-term programme designed to prepare the NHS for the future.

https://www.longtermplan.nhs.uk

Nosocomial infections
Also known as hospital-acquired infections, these are infections contracted within a hospital environment.

Physician associates (PAs)
A relatively new group of healthcare professionals (at least in the UK) with the skills and knowledge to deliver care and treatment under defined levels of medical supervision.

Pulmonary embolism (PE)
A blockage of the pulmonary arteries (the arteries that carry de-oxygenated blood to the lungs) by a mobile blood clot.

Same Day Emergency Care (SDEC)
NHS England describe SDEC activity as:

"The investigation, care and treatment of patients for whom admission to hospital would have been the default option in the absence of an SDEC service. It may also include patients who have had a brief overnight stay and are discharged through SDEC the next day as well as patients followed up in SDEC after 'early supported' discharge."

ST segment elevation myocardial infarction (STEMI)
A serious type of heart attack where there is a complete interruption to some of the blood supply of the cardiac muscle. This is caused by a blockage of a coronary artery and, if not treated promptly, can cause extensive damage to the heart or even sudden death.

Subarachnoid haemorrhage (SAH)
Bleeding on the surface of the brain (in the subarachnoid space) that can cause neurological damage or death. It can be either spontaneous or due to trauma.

Summary Hospital-level Mortality Indicator (SHMI)
The ratio between the actual number of patients who die following hospitalisation at a trust and the number that would be expected to die on the basis of average figures for England taken from HES and ONS data. It covers all deaths reported of patients who were admitted to non-specialist acute trusts in England and who either die whilst in hospital or within 30 days of discharge.

Urgent treatment centres (UTCs)
GP- or nurse-led centres equipped to diagnose and treat many of the most common ailments that cause people to seek urgent medical help. Some UTCs are co-located on the same site as major A&E departments; others are at a distance from the nearest hospital.

Acknowledgements

The GIRFT-EM visits have given us the opportunity to see both the best and the worst of emergency care in England. We are very grateful to all our emergency department colleagues who allowed us to see their departments and to discuss their data. Some of them were working in very poor conditions in badly understaffed EDs. Our hard-working project manager, Darren Best, ensured that every visit was a model of military precision; his company and attention to detail made the whole experience incredibly enjoyable.

We would also like to thank Professor Tim Briggs whose overarching GIRFT programme gave us the opportunity to hone our interest in the unwarranted and unacceptable variation in NHS emergency care. In addition, the support of Rachel Yates, Nicola Joyce and the entire GIRFT team was absolutely essential for our success; we are particularly grateful to Matthew Barker, the GIRFT policy lead, for giving us the freedom to structure and write the report in the way that we felt best.

Professor Sir Brian Jarman, John Machin and Cherrie Ho all willingly shared their data with us and our very helpful senior editor, Kathleen Reinoga, demonstrated endless patience as we constantly revised, changed and developed this report. Finally, our colleague, Andrew Boasman, responded steadfastly to our never-ending requests for more data, better metrics and improved charts; it is his work that informs and illustrates the GIRFT-EM national report.

Chris Moulton and Cliff Mann

Tribute to Dr Cliff Mann

This report, and its recommendations, is a legacy to the NHS of Dr Cliff Mann who sadly passed away in February 2021.

With his co-author, colleague and close friend Dr Chris Moulton, he visited EM departments at NHS trusts across England, advising on potential improvements and sharing best practice, ahead of the publication of their GIRFT national report for emergency medicine. They also held a series of highly valued regional meetings to share knowledge across systems.

Dr Moulton said: "Cliff was one of the most outstanding doctors I have ever met.

"We travelled the country together and Cliff's ability to influence and inspire people was always evident. He was clever, insightful and innovative, with a sparkling wit and repartee. His commitment to emergency medicine and to its constant improvement using the GIRFT methodology was unwavering.

"But I shall miss Cliff most as a wonderful companion and a kind and loyal friend. I don't think that we shall see his like again."

Dr Mann was appointed to the GIRFT programme in June 2017. He was appointed an Officer of the Order of the British Empire (OBE) in the 2018 New Year's Honours list for services to emergency medicine and, in September 2020, named in the HSJ's list of the 100 most powerful and influential people in the NHS and health policy in England.

Data and copyright acknowledgements

The GIRFT programme would like to thank the following organisations for making data available:

- NHS Benchmarking Network
- NHS Digital
- NHS England and NHS Improvement
- NHS Resolution

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Appendix 1: Optimal directory of services for urgent and emergency care

This optimal directory of services for urgent and emergency care describes the services that should be available to ensure that patients are assessed and treated at the right time in the right place by the right service. Patients should not attend an ED unless that attendance adds value to their care. See **Table 39**.

Table 39: Optimal directory of services for urgent and emergency care

Service	Care provision
General practice (GP)	Primary care conditions
Urgent Treatment Centre (UTC)	Minor injuries and illnesses
Same Day Emergency Care (SDEC)	Medical and surgical conditions where a specialist opinion may avoid traditional hospital admission
Urgent ('Hot') clinics	Ophthalmological; ear, nose and throat; maxillofacial; urological; bleeding in pregnancy; and similar conditions
Frailty services (with overnight beds)	Deterioration in the elderly
Dentistry services	Urgent dental problems
Mental health services	Urgent exacerbations of psychological conditions
Drug and alcohol services	New and known patients with drug- and alcohol-related problems
Community rapid response teams	Urinary catheter problems; falls without significant injury; etc.
Pharmacy services	Drug-related issues; repeat prescriptions; etc.
Social care services	Care needs; homelessness; other social problems
A&E	Bookable and immediate access by self-referral or ambulance (999); phone advice from A&E senior staff (e.g. for equivocal accidental overdoses)

Appendix 2: Workforce matrix

Working alongside NHS England and NHS Improvement and Health Education England, we have developed the proposed workforce matrix shown in **Figure 85** to enable EDs (and other hospital departments) to group and structure their workforce by capability.

Figure 85: Workforce matrix

	Broad scope of practice clinician • treats all conditions and works in all clinical areas of department	**Focused scope of practice clinician** • works in a single clinical area of the department, or • is (sub)speciality-specific, or • is condition-specific when treating patients
	Groups	**Groups**
A Clinical team leader / supervisor	A1-α (no supervision required) A1-β (remote supervision)	A2
B On-site supervision	B1-α (limited supervision) B1-β (close supervision)	B2
C Complete supervision	C1	C2

Source: Walton H, Moulton C, Mann C.

Appendix 3: ED isolation and decontamination facilities

On our GIRFT-EM visits, we saw very few examples of adequate decontamination facilities and even fewer of sufficient isolation and infection control facilities.

Prior to COVID-19, this obvious deficiency seemed of relatively little interest to both ED clinicians and managers. However, the coronavirus pandemic brought a new urgency to the provision of isolation and infection control facilities in all EDs.

This appendix gives a brief overview of the minimum required provision of isolation rooms and decontamination rooms. In addition, all EDs must have sufficient space for social distancing in the waiting areas and corridors, a laminar flow of patients through the clinical areas of the department, good hygiene facilities for both staff and patients and scrupulous cleaning of all areas.

Isolation rooms

Rooms capable of isolating patients are a key element in preparedness for treating people with highly infectious diseases.

Every major ED should have at least 50% of its cubicles and most resuscitation bays capable of isolation. Ideally, isolation cubicles should have sliding glass doors with darkening glass or an external curtain to reduce the need for frequent curtain changes.

There should also be at least one or more cubicles that are purpose-designed for barrier nursing care, featuring an external anteroom (with a sink) for donning and doffing personal protective equipment (PPE). This type of specialised cubicle should have a negative pressure airflow system.

Decontamination rooms

Special rooms for decontaminating people are a key element in preparedness for a terrorist or other chemical, biological, radiological or nuclear (CBRN) incident.

Every major ED should have a fixed and purpose-built decontamination room with external and internal doors and hot and cold showers.

Appendix 4: Examples of systems and facilities that support high-quality emergency care

During our GIRFT-EM visits, we noted a number of systems and facilities that enabled EDs to work more productively and to deliver high-quality emergency care. This appendix lists a selection of some of the most innovative and effective things that we saw, but is not intended to be exhaustive. A bright and spacious environment and high standards of cleaning and maintenance are not included in the list but were obvious when they occurred.

Systems and personnel

- Dedicated x-ray room with staffing
- Dedicated CT scan room with staffing
- Onsite ED laboratory with staffing
- Integrated mental health suite with staffing
- ED stores quartermaster
- ED operating department technician (ODT) for equipment checking and maintenance

Rooms and spaces

- Well-organised reception area and waiting spaces with clear and consistent signage; sub-waits to organise and improve flow through the ED
- Standardised cubicles and resuscitation rooms (with standard equipment and cleaning schedules); ideally fronted with electronically darkening glass
- Ambulant major area (with special recliner chairs)
- Bariatric room with bed and ceiling-mounted bariatric hoist
- X-ray viewing area (darkened with a large screen)
- Rooms for specialised purposes: e.g. procedure, treatment and suture room; plaster and splint room; eyes, ENT and dental room; gynaecology and catheters room

Equipment

- Automated self-registration check-in stations in reception (with triaging software)
- Ambulance weigh-bridge (to determine patient's weight on arrival)
- Hand-washing stations with light-up reminders
- Dedicated high resolution x-ray viewing screens
- Automatic drug dispensers
- Anaesthetic gas machine or a Quantiflex continuous flow nitrous oxide machine
- Electric ear syringe for atraumatic removal of intra-aural foreign bodies

Appendix 5: GIRFT five-point plan for reducing NHS litigation costs

Recommendation	Action	Timescale
Implement the GIRFT 5-point plan for reducing litigation costs.	**A.** Clinicians and trust management to assess their benchmarked position compared to the national average when reviewing the estimated litigation cost per unit of activity. This information is available in the 'GIRFT and NHS Resolution Litigation data packs' which trusts receive annually.	For immediate action
	B. Clinicians and trust management to discuss with the legal department or claims handler the claims submitted to NHS Resolution included in the data set to confirm correct coding to that department. Inform NHS Resolution of any claims that are not coded correctly to the appropriate specialty via **CNST.Helpline@resolution.nhs.uk**	On completion of A
	C. Once claims have been verified, clinicians and trust management to further review claims in detail, including expert witness statements, panel firm reports and counsel advice as well as medical records to determine where patient care or documentation could be improved. If the legal department or claims handler needs additional assistance with this, each trust's panel firm should be able to provide support.	On completion of B
	D. Claims should be triangulated with learning themes from complaints, inquests and serious incidents (SI). Where a claim has not already been reviewed as an SI, we recommend that this is carried out to ensure no opportunity for learning is missed. The findings from this learning should be used to implement sustainable and effective interventions that measurably reduce risks to patients. Where these are successful, they should be shared through multiple routes, including discussion at meetings.	On completion of C
	E. Where trusts are in the top quartile of trusts for litigation costs per activity, GIRFT will be asking national clinical leads and regional hubs to follow up and support trusts in the steps taken to learn from claims. Clinical leads and regional hub directors will also be able to share examples of good practice with trusts.	For continual action throughout GIRFT programme

For more information about GIRFT,
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The full report and executive summary are also available to download as
PDFs from: www.GettingItRightFirstTime.co.uk