

Focus on: Emergency hospital care for children and young people

What has changed in the past 10 years?

Research report



About QualityWatch

QualityWatch is a major research programme providing independent scrutiny into how the quality of health and social care is changing. Developed in partnership by the Nuffield Trust and the Health Foundation, the programme provides in-depth analysis of key topics and tracks an extensive range of quality indicators. It aims to provide an independent picture of the quality of care, and is designed to help those working in health and social care to identify priority areas for improvement. The programme is primarily focused on the NHS and social care in England, but also draws on evidence from other UK and international health systems.

 The QualityWatch website www.qualitywatch.org.uk presents key indicators by area of quality and sector of care, together with analysis of the data. This free online resource also provides research reports, interactive charts and expert commentary.

About this report

QualityWatch Focus On reports are regular, in-depth analyses of key topics. These studies exploit new and innovative methodologies to provide a fresh view of quality in specific aspects of health and social care. This QualityWatch Focus On looks at children and young people's use of hospitals, with particular reference to emergency admissions during the 10-year period from 2006/07 to 2015/16. Download and view other resources on this topic area at www.qualitywatch.org.uk/cyp.

Acknowledgements

The authors are grateful for the contributions provided by Bob Klaber, Carol Ewing, Claire Lemer, Delan Devakumar, Felicity Taylor, Helen Smith, Isobel Howe, Leonora Weil, Mando Watson, Mitch Blair, Peter Gill, Ronny Cheung, Ruth Gilbert, Sonia Saxena and Nuffield Trust and Health Foundation staff members.

The authors are particularly grateful to Jenny Neuburger, Holly Dorning, Dougal Hargreaves and Leonora Merry.

Hospital Episode Statistics data © 2006/07-2015/16, re-used with the permission of NHS Digital. All rights reserved.

Contents

Glossary	4
List of figures, tables and boxes	5
1 Introduction	7
2 Methods	12
3 Findings	15
4 Discussion and conclusions	28
Appendix	34
References	42

Glossary

Accident & Emergency (A&E) attendance: A single visit by an individual to a major or minor A&E department (excludes NHS walk-in centres). The visit may or may not result in an admission to hospital as care can be delivered in this setting.

Average length of stay: The average number of whole days between admission to hospital and the discharge date.

Day case admission: A patient admitted electively to hospital with the intention of receiving care, but who does not need a hospital bed overnight. If the patient stays overnight, this would be classed as an elective admission.

Elective admission: An admission to hospital where the decision to admit can be separated in time from the actual admission, as it is planned. The expectation with this type of admission is that the patient will remain in hospital for at least one night.

Emergency admission: An admission to hospital that is unpredictable and at short notice because of clinical need. This admission can come via a variety of routes, including the hospital's A&E department, a general practitioner, a consultant clinic or a bed bureau. Our definition excludes transfers of admitted patients from other hospital providers in an emergency.

Emergency hospital care: Includes care provided at A&E and following an emergency admission to hospital.

Emergency readmission (30 day): An emergency admission to hospital that occurs within 30 days following discharge for a previous emergency admission, with no planned care episodes occurring in between.

Hospital Episode Statistics (HES): A data warehouse containing details of all admissions to NHS hospitals in England.

Maternity admission: An admission of a pregnant woman to a maternity ward (including delivery facilities) except when the intention is to terminate the pregnancy.

Other admission: An admission that is not captured by the day case, elective, emergency, maternity and transfer classification.

Short stay: An inpatient stay of less than a day.

Transfer admission: An admission where an admitted patient from one hospital is transferred to another hospital. This includes transfers in an emergency.

List of figures, tables and boxes

Figures

Figure 1.1: Factors influencing the use of emergency hospital care by children and young people

Figure 3.1: Distribution of all admissions for 0 to 24-year-olds across the different admission types, 2006/07 and 2015/16

Figure 3.2: Number and directly standardised rate of emergency admissions for 0 to 24-year-olds, 2006/07 to 2015/16

Figure 3.3: Number of emergency admissions by age band, 2006/07 and 2015/16

Figure 3.4: Emergency admission rates by age band, directly standardised rates per 100,000 population aged 0–24, 2006/07 to 2015/16

Figure 3.5: Number and directly standardised rate of A&E attendances per 100,000 population aged 0–24, 2007/08 to 2015/16

Figure 3.6: The 10 most common conditions diagnosed on emergency admission for 0 to 24-year-olds, 2006/07 and 2015/16

Figure 3.7: Emergency admission rates for the 10 most common conditions, directly standardised rates per 100,000 population, 2006/07 to 2015/16

Figure 3.8: The five most common conditions diagnosed on emergency admission for infants, 2006/07 and 2015/16

Figure 3.9: Average length of stay following emergency admission for 0 to 24-year-olds, directly standardised by age and sex, 2006/07 to 2015/16

Figure 3.10: Emergency admission rates by length of stay (0, 1, 2+ days), directly standardised rates per 100,000 population aged 0–24, 2006/07 to 2015/16

Figure 3.11: Average length of stay following emergency admission for the 10 common conditions for 0 to 24-year-olds, directly standardised by age and sex, 2006/07 to 2015/16

Figure 3.12: 30-day emergency readmission rates following emergency admission for 0 to 24-year-olds by age band, directly standardised rates per 1,000 emergency admissions, 2006/07 to 2015/16

Figure 3.13: 30-day emergency readmission rates following emergency admission for 0 to 24-year-olds by length of stay, directly standardised rates per 1,000 emergency admissions, 2006/07 to 2015/16

Figure 3.14: 30-day emergency readmission rates following emergency admission for 0 to 24-year-olds for the 10 common conditions, directly standardised rates per 1,000 emergency admissions, 2006/07 to 2015/16

Figure 3.15: In-hospital mortality rate for 0 to 24-year-olds, directly standardised rate per 1,000 emergency admissions, 2006/07 to 2015/16

Figure A.1: Emergency admission rates for the five most common conditions for infants, directly standardised rates per 100,000 population aged 0, 2006/07 to 2015/16

Figure A.2: Total number of live births in England and Wales, 2006 to 2015

Table

Table 1.1: What this report does and doesn't do

Table A.1: Frequently used ICD-10 diagnosis codes for the 10 common conditions for 0 to 24-year-olds

Boxes

Box 2.1: Population structure changes for children and young people between 2006 and 2015

Box A.1: 'Intestinal infections' and changing diagnosis code frequency – a word of caution

1

Introduction

Why is it important to understand the use of emergency hospital care by children and young people?

Emergency care across the NHS in England is under great pressure. The number of people attending Accident & Emergency (A&E) departments is at an all-time high (NHS Digital, 2017a), demand for beds is also at record levels (Appleby, 2016) and the four-hour A&E target (of seeing 95 per cent of patients arriving at A&E within four hours) has not been met since July 2013 (QualityWatch, 2016).

Discussion of the pressures on emergency care within the NHS tends to focus predominantly on older people. This is understandable – adults have more emergency admissions, the over 65s account for the majority of emergency bed days in NHS hospitals, stay longer in A&E than the rest of the population and are more likely to be admitted to hospital in an emergency (Blunt, 2014).

Children and young people (under the age of 25) make up almost a third (30 per cent, 16.6 million) of the population in England (Office for National Statistics, 2016). Their healthcare needs can be very different from adults (Kossarova and others, 2016). Their condition can deteriorate and improve rapidly, and often requires specialist advice and support. Like older people, they can be particularly vulnerable and dependent on carers.

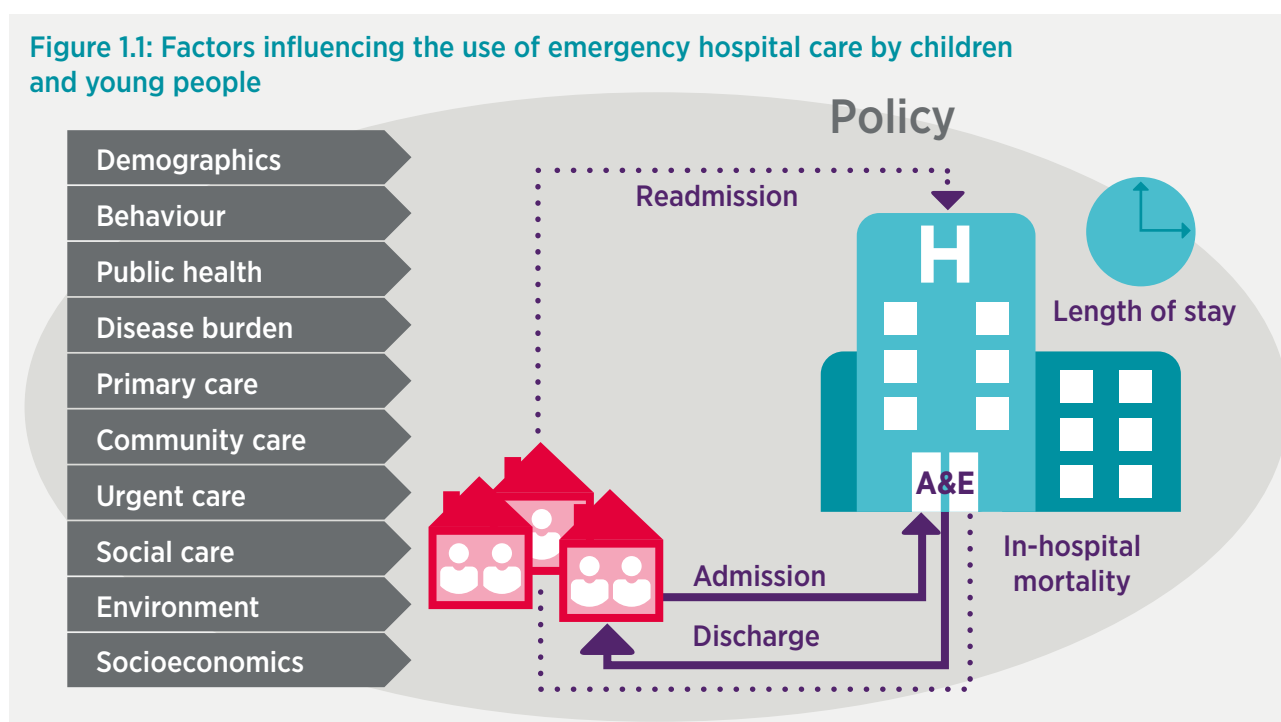
Children and young people are more frequent users of A&E than adults. In 2015/16, there were 425 A&E attendances for every 1,000 children and young people compared with 345 A&E attendances for every 1,000 adults aged 25 and over (NHS Digital, 2017a). There have also been recent increases in emergency admissions for infants (less than a year old) and for short-stay emergency admissions (less than a day) for children and young people (Gill and others, 2013; Saxena and others, 2009).

As well as an increase in emergency care activity for children and young people and their heavy use of A&E, research has highlighted potential issues with the quality of care they receive. For example, a 2014 survey of inpatient care and day cases for children and young people (aged 8–15) found that children and their parents generally reported a very good experience of hospital care. However, the survey also highlighted a number of areas for improvement, including staff awareness of children's medical history before treatment and the quality and availability of information provided on discharge (Care Quality Commission, 2015). This is in addition to other evidence highlighting concerns about the quality of care that children receive (Children and Young People's Health Outcomes Forum, 2012; 2015; Kennedy, 2010; Kossarova and others, 2016).

Why do children and young people use emergency hospital care?

There are numerous reasons why children and young people, their families and carers may seek emergency care in a hospital. In many situations, it is the right place to go, or it could be the only option. Emergency hospital care, however, is only one part of a complex health and social care system (see Figure 1.1). Although this report focuses primarily on emergency hospital admissions, children and young people can have their emergency care needs – especially the less severe ones – met in a range of other ways, for example, through general practitioners (GPs), nurses, pharmacists, the NHS 111 telephone helpline and urgent care clinics either in the community or the hospital.

Figure 1.1: Factors influencing the use of emergency hospital care by children and young people



Supply factors (availability and quality of services), demand factors (the need for services) and the interaction between them influence why people seek emergency hospital care. We now look at these influencing factors. First, constant **demographic** change (migration, births and deaths) in the size and structure of the population means that the number and type of patients seeking emergency care are also constantly changing. Second, people's **behaviours** change and have an impact on demand in terms of both the things people do that put them at risk of emergency admission and when and how they seek to access care. Third, the **public health** system is linked to people's behaviour as it works to prevent people from developing conditions through a range of methods, including encouraging good lifestyle practices, controlling communicable diseases and legislation. The effectiveness of the system can, therefore, have an influence on demand for emergency hospital care (Davies and others, 2016). Fourth, the incidence, prevalence, virulence and complexity of certain conditions (**disease burden**) can change over time, which may lead to variation in the use of emergency hospital care. The flu virus, for example, has many types, some of which, regardless of vaccine effectiveness, disproportionately affect children, an example being the 2009 H1N1 outbreak (Sachedina and Donaldson, 2010). Fifth, the availability,

accessibility and quality of care in and outside the hospital (**primary, community, urgent and social care**) and people's perceptions of this influence how they seek care and, therefore, the demand for emergency hospital care. Access to primary care has been shown to have an impact on the number of A&E attendances (Cecil and others, 2016). It has also been shown that services such as NHS 111 receive a greater concentration of calls about children and young people outside of primary care hours (Burger and others, 2015). Broader **environmental and socioeconomic factors**, in particular financial difficulties and poverty, may also be associated with health-seeking behaviours as well as admission behaviour. Higher neighbourhood deprivation, for example, has been associated with increased A&E attendances in both adults and children (Rudge and others, 2013).

Policy changes can have an important influence on all of these factors. For example, the reforms introduced in primary care in 2004, which allowed the responsibility for arranging out-of-hours care to be passed from individual GPs to primary care trusts, have been associated with changes in A&E attendances and emergency admissions for children and young people (Gill and others, 2013; Saxena and others, 2009). The introduction of the four-hour A&E waiting time target from 2000 may have influenced decisions to admit patients to hospital (Gill and others, 2013). Other recent large-scale policy changes that will have had an influence on the system include the Health and Social Care Act 2012, which led to clinical commissioning groups and the movement of public health functions to local authorities, where they have experienced significant budget cuts (Davies and others, 2016). Continuing financial difficulties in the NHS may also influence the availability, accessibility and quality of healthcare services for both children and young people and adults.

What do we already know about the quality of emergency hospital care for children and young people?

Quality of care is a complex, multidimensional concept, which can be viewed and measured in a variety of different ways. The QualityWatch programme analyses an extensive range of indicators across six domains (access, capacity, effectiveness, equity, person-centred care and experience, and safety) to assess the quality of health and social care services in England over time, combined with in-depth reports on specific topics (Fisher and others, 2016). The overall quality of emergency hospital care is one aspect that has been covered by the QualityWatch programme but the quality of emergency hospital care for children and young people is an area that this report will help to further understand.

There are a variety of indicators that can provide information about the quality of emergency hospital care, such as emergency readmissions, length of stay, mortality, waiting times for diagnosis or treatment, patients' experiences and patient-reported outcomes. In some cases, for example, an emergency readmission could indicate substandard quality of care during the initial hospital stay due to inadequate resolution of the initial problem, or poor discharge preparation and planning in terms of preparing the patient for discharge and educating them on what they should do when they get home, or poor post-discharge care (Benbassat and Taragin, 2000; Fischer and others, 2014; Horwitz, 2017). It is important to note that no single indicator or measure can provide a complete picture of care quality and that each indicator should be taken in context.

Many of these indicators are available on the QualityWatch website (www.qualitywatch.org.uk/indicators) or in the NHS Outcomes Framework (NHSOF) and Public Health Outcomes Framework (PHOF). The indicators that are provided in these frameworks cover children and young people but could be strengthened as they do not highlight trends by age group or are limited to specific topic areas (Children and Young People's Health Outcomes Forum, 2012; 2015; Department of Health, 2016; Public Health England, 2016a). In relation to emergency hospital care for children and young people, the list of indicators is even more limited. For example, the NHSOF has nearly 70 indicators, but only nine focus on children and young people, and of these only two relate to emergency hospital care:

- 2.3ii: unplanned hospitalisation for asthma, diabetes and epilepsy in under 19s
 - the rate has fallen over the past decade, with fluctuations from 389.1 per 100,000 population in 2006/07 to 311.7 in 2015/16 (NHS Digital, 2017b)
- 3.2: emergency admissions for children with lower respiratory tract infections
 - the rate has increased over the past decade, from 303.6 per 100,000 population in 2006/07 to 422.7 in 2015/16 (NHS Digital, 2017c).

Another example of the minimal focus on children and young people in national measures of quality is the lack of representation of children aged under 16 in national healthcare surveys. This is of concern when surveys of young adults (aged 16–24) have often reported a worse experience of healthcare in comparison with adults (Hargreaves and Viner, 2012).

Standards have been developed by the Royal College of Paediatrics and Child Health (RCPCH) setting out how high-quality and safe services for children and young people should be provided in acute general paediatric services (RCPCH, 2015). More detailed standards for emergency care settings have also been published by the RCPCH, which cover areas including the emergency care environment, management of the sick or injured child and safeguarding in emergency care settings (Intercollegiate Committee for Standards for Children and Young People in Emergency Care Settings, 2012). These standards set out best practice but there are still challenges and research gaps in how to measure the quality of emergency hospital care for children and young people.

Previous studies quantifying aspects of emergency hospital care for children and young people have highlighted the following:

- in 1996/97, short duration stays (one day or less) accounted for 59 per cent of all inpatient emergency stays for 0 to 19-year-olds and by 2006/07 this had increased to 71 per cent (Chief Nursing Officer's Directorate, 2008)
- increases in the proportion of emergency inpatient stays that are short (one day or less) were greater than increases in the proportion of emergency inpatient stays that are longer (two or more days) (Saxena and others, 2009)
- recurrent emergency admissions are common especially for children with chronic conditions (Wijlaars and others, 2015).

These findings paint a picture of growing numbers of children and young people being admitted to hospital for short periods and perhaps in an increasingly repetitive fashion. The implications for quality of care are not clear cut, but with the added evidence of growing numbers of A&E attendances and emergency admissions, it is important to continue to monitor how children and young people use emergency hospital care.

Studies published so far have not covered a consistently defined age group and collections of indicators that have been produced such as the *Atlas of Variation in Healthcare* for children and young people (Public Health England, 2016b) have often focused on variation across England at one point in time. A new set of quality improvement metrics produced by the RCPCH – covering management of acute illness, patient safety, activity and patient flow, patient and parent/carer experiences and staff experience – should encourage consistent measurement but much of the data is not yet routinely collected (RCPCH, 2016a). All of this means that so far it has been difficult to build a consistent picture of the quality of care provided to children and young people in emergency hospital settings over time.

What does this report do?

The aim of this report is to use indicators produced from Hospital Episode Statistics (HES) data to gain a better understanding of the use and quality of emergency hospital care for children and young people (aged less than 25, with age bands <1, 1–4, 5–9, 10–14, 15–19, 20–24) over a 10-year period (2006/07 to 2015/16). The report uses more recent years of data to provide an update to previous evidence that emergency hospital care use by children and young people is increasing (Chief Nursing Officer’s Directorate, 2008; Gill and others, 2013). The report also looks at the most common conditions that children and young people were diagnosed with when admitted as an emergency. The report then explores the quality of emergency hospital care for children and young people using three indicators which can be calculated using HES data – length of stay, readmissions and in-hospital mortality – to quantify any change in quality. See Table 1.1 for an overview of this report.

Table 1.1: What this report does and doesn’t do

This report does	This report doesn’t
Provide an overview of the trends in the use of emergency hospital care provided by NHS hospitals in England by children and young people	Attempt to provide an overview of the use of all forms of emergency care by children and young people in and outside of the hospital setting
Provide an insight into the main conditions that children and young people are admitted for as an emergency	Cover all aspects of emergency care provided by hospitals due to data limitations (for example, in terms of the quality of A&E attendance data)
Provide an analysis of use and quality of emergency hospital care by age group	Provide a breakdown of conditions for which children and young people attend A&E due to data availability issues
Provide an insight into the quality of emergency hospital care for children and young people using three indicators that can be drawn from HES	Cover all aspects of the quality of emergency hospital care (for example, patients’ experiences and safety)
Signpost related pieces of work in the area	Provide a detailed analysis of the individual diagnosis codes
Provide the basis for discussions about the quality of care for children and young people	

2

Methods

Cohort identification

The analysis was conducted using 10 years of admitted patient data from Hospital Episode Statistics (HES) from 2006/07 to 2015/16. The HES admitted patient dataset covers all inpatient admissions and day cases in NHS hospitals in England. HES A&E attendance data between 2007/08 and 2015/16 were also used for part of the analysis, but due to poor-quality data before 2014/15 and incomplete diagnosis coding, they could not be used extensively.

The analysis was confined to children and young people aged under 25 years old* whose gender was recorded and who were resident in England at the time of admission. 'Well babies', defined as neonates less than 28 days old who require care in a maternity neonatal ward, were not included in the analysis as they did not meet the criteria for how emergency admissions were defined.

The admission patterns and conditions affecting children and young people vary by age and so the cohort was split into age bands: <1, 1–4, 5–9, 10–14, 15–19 and 20–24. The age bands encompassed five years, as recommended by the Children and Young People's Health Outcomes Forum (2012), with the exception that infants (defined as younger than a year old throughout this report) were separated from the one to four-year-old age band as they were expected to have a different interaction with emergency hospital care compared with the rest of the group.

Activity measurement

Emergency admission numbers and rates were used to measure activity. An emergency admission was defined as any admission to hospital classified using the admission method, admission source and methodology from NHS Outcomes Framework indicator 3A – 'Emergency admissions for acute conditions that should not usually require hospital admission' – without exclusion based on condition (Clinical Indicators Team, 2016). A&E attendance data were also used to provide additional information on activity. A&E attendances were defined as any single visit by an individual to a major or minor A&E department, with NHS walk-in centres excluded. The population denominators for emergency admissions and A&E attendances were drawn from the Office for National Statistics' mid-year population estimates for 0 to 24-year-olds for the years 2006 to 2015 (Office for National Statistics, 2016). The rates were directly standardised by age and sex using the 2015 mid-year population estimates for 0 to 24-year-olds in England to account for changes in the structure of the population (see Box 2.1 for these population changes).

* Chosen as 25 is the approximate age at which the brain finishes developing (Cornish, 2015).

Box 2.1: Population structure changes for children and young people between 2006 and 2015

The age structure for children and young people changed over the 10-year period. There were more 0 to eight-year-olds and 21 to 24-year-olds in 2015 compared with 2006 and fewer 12 to 16-year-olds. The population size was greater in 2015 at 16.6 million individuals compared with 15.8 million in 2006. The sex ratio shifted slightly to more females overall in 2015.



Quality measurement

Emergency readmissions, average length of stay and in-hospital mortality following emergency admission were used as measures of quality. An emergency readmission was defined as an emergency admission for any condition within 30 days of discharge for a previous emergency admission. If there was a planned care episode between two emergency admissions, a readmission was not counted. Average length of stay was defined as the average number of whole days between emergency admission and discharge. Those admitted and discharged on the same day would have a length of stay of zero. In-hospital mortality was defined using death recorded under the method of discharge following an emergency admission. For the quality measures, the population denominators were the emergency admissions for each year, broken down by age and sex. The emergency readmissions, length of stay and in-hospital mortality rates were directly standardised by age and sex using the 2015/16 emergency admissions data.

Condition-specific analysis

For the condition-specific analysis, we used the primary diagnosis from the first episode of care in an inpatient stay, which should be the main reason for admission and the main condition treated or investigated. The primary diagnosis field in the dataset contains diagnosis codes, which were interpreted using the *International Statistical Classification of Diseases and Related Health Problems (10th Revision)* (ICD-10). Clinical Classifications Software aggregates ICD-10 codes into broad diagnosis groups (Agency for Healthcare Research and Quality, 2016) and we used these in our research.

3

Findings

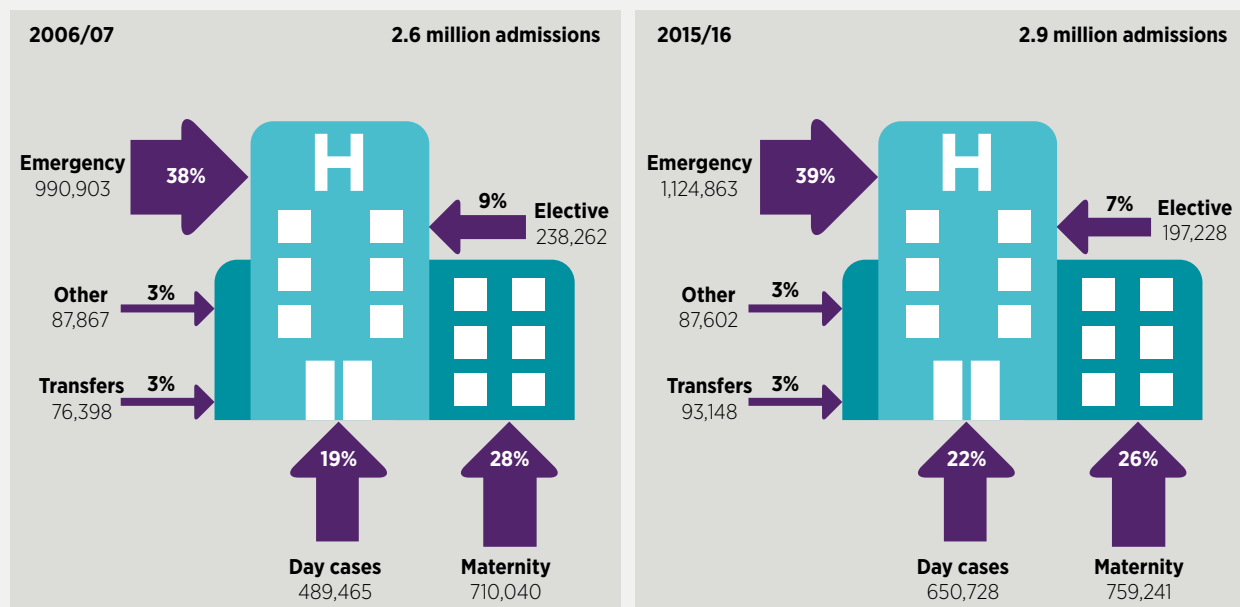
How did emergency hospital care use by children and young people change between 2006/07 and 2015/16?

In this section, emergency admissions provide an insight into whether emergency hospital care use by children and young people changed between 2006/07 and 2015/16. Being admitted as an emergency suggests that the condition was severe enough to warrant this and in some cases this implies that the care that had been provided up to that point in the community or in previous hospital visits had been substandard. Care pathways and perhaps a preference for admitting patients for observation will also have an influence on whether someone is admitted as an emergency.

How common are emergency admissions for children and young people?

There was an increase in overall admissions (emergency and planned) for children and young people between 2006/07 and 2015/16, from 2.6 million admissions to 2.9 million admissions. Emergency admissions were the most common type of admission for this age group in both 2006/07 and 2015/16 (see Figure 3.1). In 2015/16, 39 per cent of all admissions were classified as emergency admissions.

Figure 3.1: Distribution of all admissions for 0 to 24-year-olds across the different admission types, 2006/07 and 2015/16



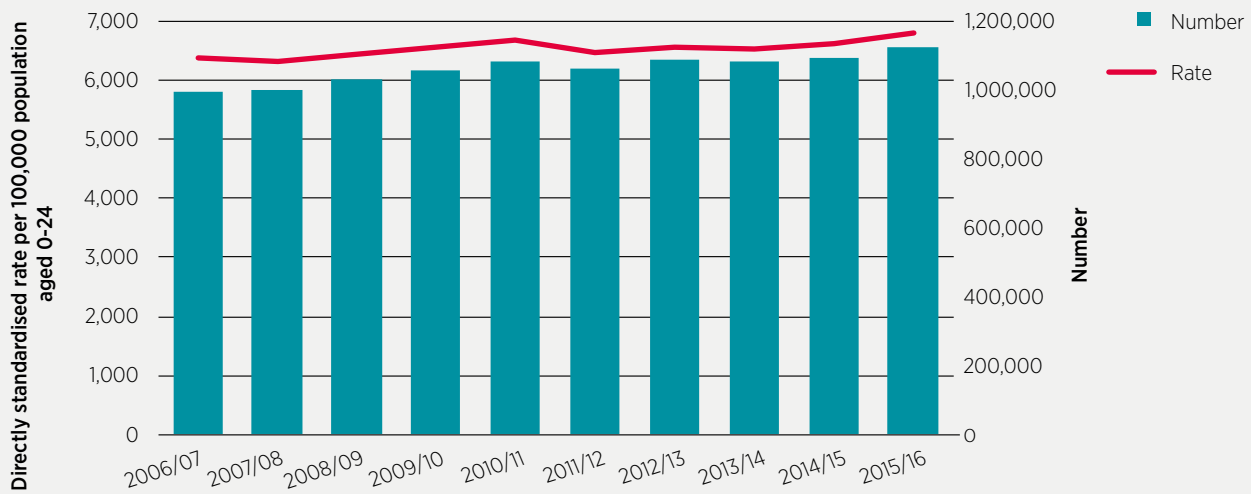
Source: Hospital Episode Statistics, 2006/07 and 2015/16

How did trends in emergency admissions change over the decade for children and young people?

As well as a large proportion of admissions for children and young people being in an emergency rather than planned, the numbers also increased over time. The absolute number of emergency admissions for children and young people

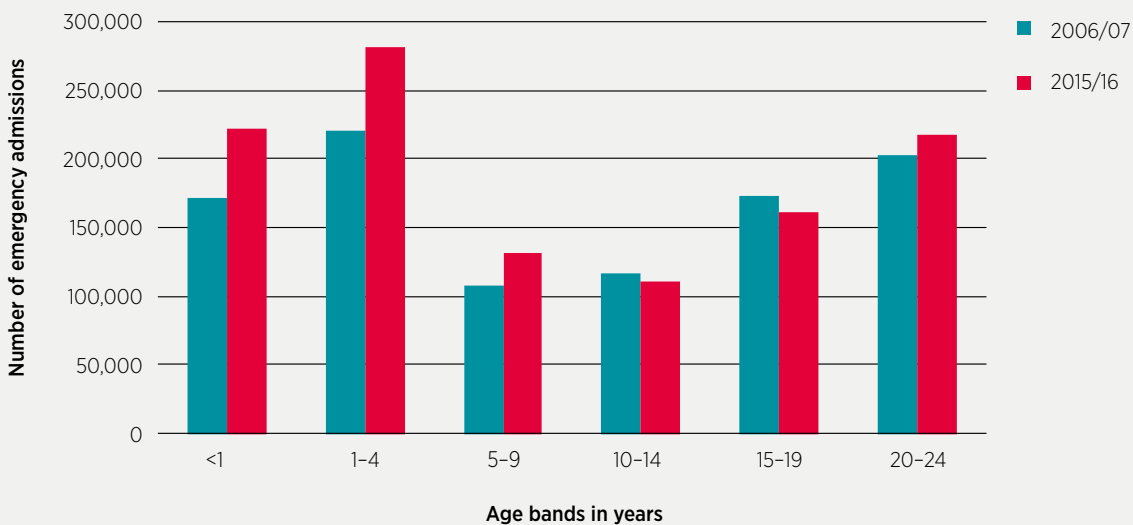
increased by 14 per cent (133,960) between 2006/07 and 2015/16, from 990,903 to 1,124,863 (see Figure 3.2). Among children aged one to four, the number of emergency admissions increased by 28 per cent and for infants the increase was up to 30 per cent (see Figure 3.3). The number of emergency admissions for 10 to 14-year-olds and 15 to 19-year-olds decreased over the period. These figures compare to a 20 per cent increase in the number of emergency admission for all ages between 2006/07 and 2015/16.

Figure 3.2: Number and directly standardised rate of emergency admissions for 0 to 24-year-olds, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

Figure 3.3: Number of emergency admissions by age band, 2006/07 and 2015/16

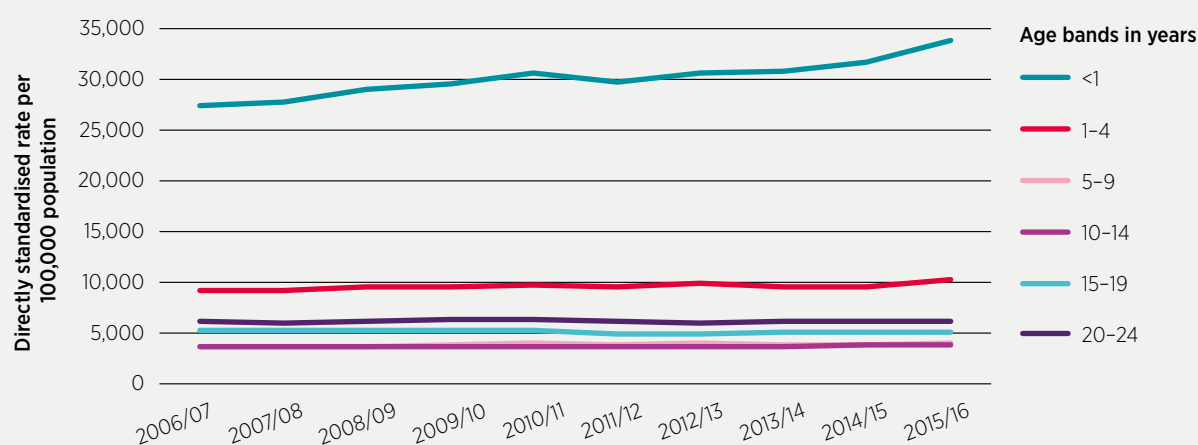


Source: Hospital Episode Statistics 2006/07 to 2015/16

The directly standardised emergency admission rate for children and young people increased by 6 per cent between 2006/07 and 2015/16, from 6,375 to 6,781 emergency admissions per 100,000 population aged 0–24. This was split into a period of increase between 2007/08 and 2010/11 and a second period of increase between 2013/14 and 2015/16 (see Figure 3.2 for further detail on the intervening years).

The trends for the directly standardised emergency admission rates for each age band varied over the period (see Figure 3.4). After taking population changes into account, the emergency admission rate for infants showed the largest increase at 23 per cent, from 27,415 emergency admissions per 100,000 population in 2006/07 to 33,684 in 2015/16. The emergency admission rates for one to four-year-olds (by 11 per cent), five to nine-year-olds (by 8 per cent) and 10 to 14-year-olds (by 2 per cent) also increased. The emergency admission rate for 15 to 24-year-olds declined over the period. So while there were overall increases in emergency admissions, the majority of the increases were due to the youngest age groups, in particular infants.

Figure 3.4: Emergency admission rates by age band, directly standardised rates per 100,000 population aged 0–24, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

A&E attendances and emergency admissions

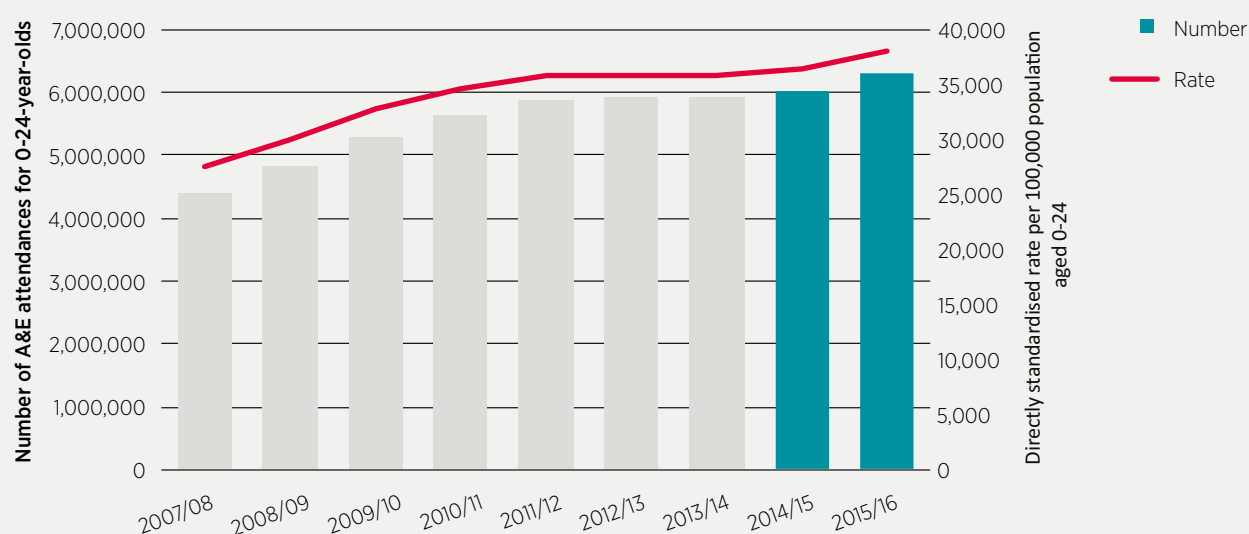
In 2015/16, 62 per cent of all emergency admissions for children and young people were via A&E, a slight increase on the 60 per cent referred via this route in 2006/07. Only 22 per cent of emergency admissions in 2015/16 were referred by a GP, a decline from the 24 per cent referred via this route in 2006/07. The majority of emergency admissions, therefore, were via A&E departments rather than care providers in the community.

Before 2014/15, there were known inconsistencies with the HES A&E data, which led to undercounting (see page 38 for further details). Therefore, the majority of the increase shown in A&E attendances between 2007/08 and 2011/12 was due to improved coverage (see Figure 3.5). In 2015/16, there were over 6.3 million A&E attendances by children and young people, 11 per cent of which resulted in an emergency admission. There was an increase of 5 per cent in the number of A&E

attendances between 2014/15 and 2015/16; after adjusting for population change, the increase was 4 per cent.

When broken down by age band, 20 to 24-year-olds and one to four-year-olds had the highest number of A&E attendances in 2015/16, but relative to their population size, infants had the highest number of A&E attendances at 74,522 per 100,000 population. This was similar to the pattern seen for emergency admissions.

Figure 3.5: Number and directly standardised rate of A&E attendances per 100,000 population aged 0-24, 2007/08 to 2015/16



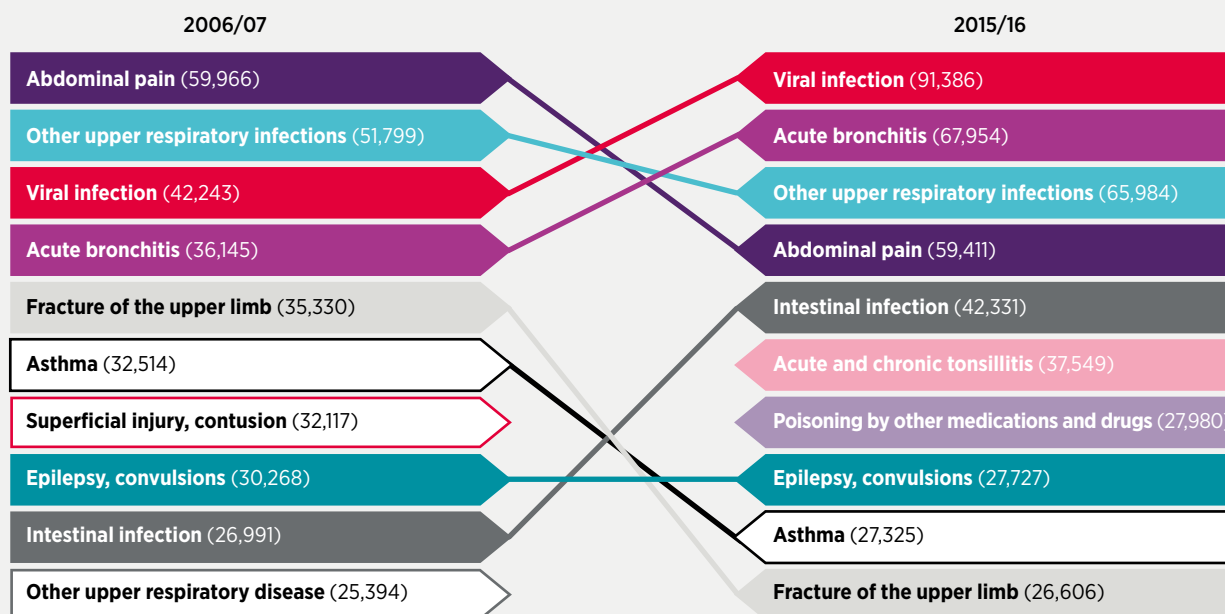
Note: There were known inconsistencies with the HES A&E data prior to 2014/15 which led to undercounting of attendances.
Source: Hospital Episode Statistics 2007/08 to 2015/16

Did the composition of emergency hospital care use by condition change?

In 2015/16, 10 conditions* accounted for 42 per cent of all emergency admissions for children and young people. Broadly, this set of conditions changed little between 2006/07 and 2015/16 (see Figure 3.6); superficial injury/contusion and other upper respiratory disease dropped out of the list and acute and chronic tonsillitis and poisoning by other medications and drugs moved onto it.

* Clinical Classifications Software groupings (see Agency for Healthcare Research and Quality, 2016). The groupings cover multiple primary diagnoses.

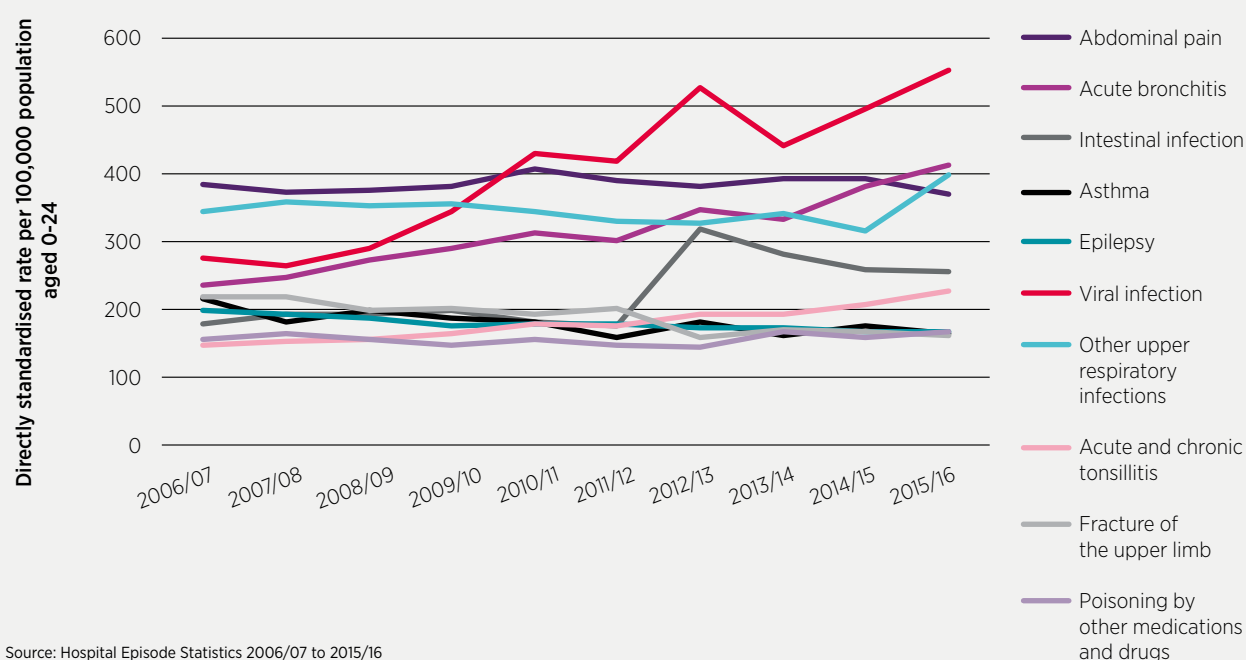
Figure 3.6: The 10 most common conditions diagnosed on emergency admission for 0 to 24-year-olds, 2006/07 and 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

The prevalence of emergency admissions for the 10 common conditions changed between the two time points. There were large percentage increases in the number of emergency admissions for several conditions, including viral infection (116 per cent), acute bronchitis (88 per cent), acute and chronic tonsillitis (68 per cent) and intestinal infection (57 per cent). Over four-fifths of the acute and chronic tonsillitis emergency admissions were for acute tonsillitis (see Table A.1 on page 36 for details on the main diagnosis codes for the other condition groupings). The directly standardised emergency admissions rates for viral infection, acute bronchitis, acute and chronic tonsillitis (mainly acute) and intestinal infection also showed increases between the two time points (see Figure 3.7).

Figure 3.7: Emergency admission rates for the 10 most common conditions, directly standardised rates per 100,000 population, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

There were declines in emergency admissions for fracture of the upper limb, superficial injury/contusion, asthma and epilepsy. In some cases the change in emergency admissions may have been due to shifts in the way a condition is cared for. For example, a decline in emergency admissions for fracture of the upper limb coincided with an increase in day case admissions, suggesting a shift in the way this condition is treated.

While there were some changes in the order of the conditions and the prevalence of certain conditions increased greatly, the reasons for hospital emergency admission changed little over the 10-year period for children and young people.

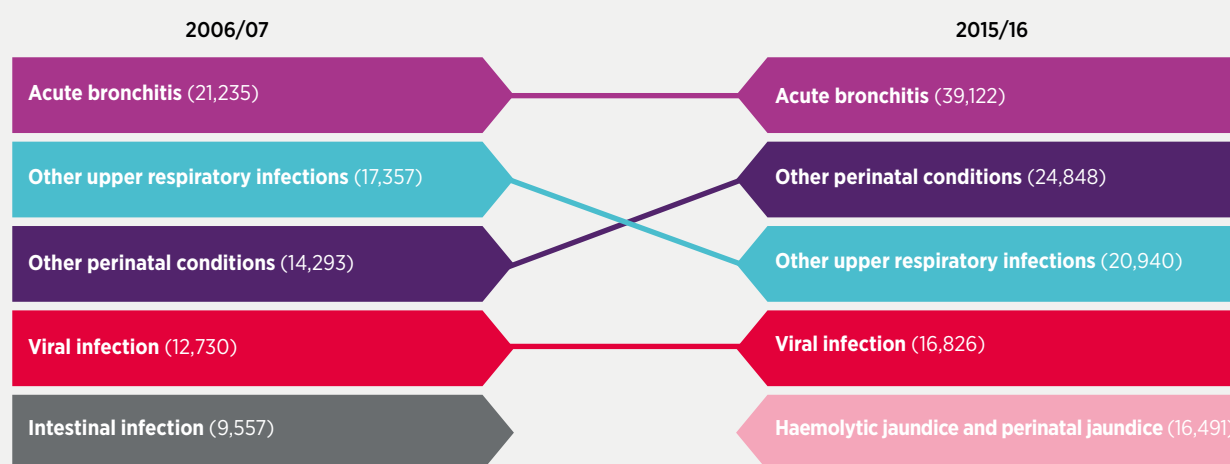
It is important to note that some of these trends may be linked to systematic administrative changes. The increase in intestinal infections, for example, is attributable to a change in the use of diagnosis codes (see page 35 for further details). For the other conditions where there was a large increase, an official administrative change in the use of diagnostic codes does not appear to have been responsible for the increase; however, changes in preference for particular diagnoses at the hospital or individual level cannot be ruled out.

The 10 most common conditions for children and young people presented in Figure 3.6 are not necessarily representative of the conditions that most affect specific age bands. For example, the presence of viral infection, acute bronchitis and other upper respiratory infection in the list is largely attributable to high numbers of admissions in the younger age groups (0–9 years), while the presence of abdominal pain and poisoning by other medications and drugs is due to high numbers of admissions among the older age groups (10–24 years).

The older age groups (10 to 14-year-olds, 15 to 19-year-olds and 20 to 24-year-olds) were also admitted in larger numbers for a much more diverse set of conditions than infants and one to four-year-olds. For example, the five most

common conditions for infants (see Figure 3.8), accounted for 53 per cent of all emergency admissions for that age group. These are not all reflected in the 10 most common conditions for children and young people. The number of emergency admissions for haemolytic and perinatal jaundice more than doubled between 2006/07 and 2015/16, to 16,491. The other perinatal condition category, which includes diagnoses relating to feeding and respiratory problems, increased by almost three-quarters, to 24,848 emergency admissions.

Figure 3.8: The five most common conditions diagnosed on emergency admission for infants, 2006/07 and 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

Summary findings

Emergency hospital care use by children and young people increased between 2006/07 and 2015/16. In 2015/16 there were 14 per cent (133,960) more emergency admissions than in 2006/07. After adjusting for population changes, there was still an increase in emergency admissions albeit to a lesser extent (the rate per 100,000 population increased by 6 per cent). The largest increases in emergency admission rates occurred for infants and one to four-year-olds: 23 per cent and 11 per cent respectively. It is likely that any changes in emergency admissions are linked to A&E attendances as the majority of emergency admissions are via A&E.

Eight of the 10 most common emergency admission diagnoses for 0 to 24-year-olds in 2006/07 remained the same in 2015/16, albeit with higher numbers and rates for viral infection, acute bronchitis and acute and chronic tonsillitis. For infants there were large increases in emergency admissions for haemolytic and perinatal jaundice and other perinatal conditions.

How did the quality of emergency hospital care for children and young people change between 2006/07 and 2015/16?

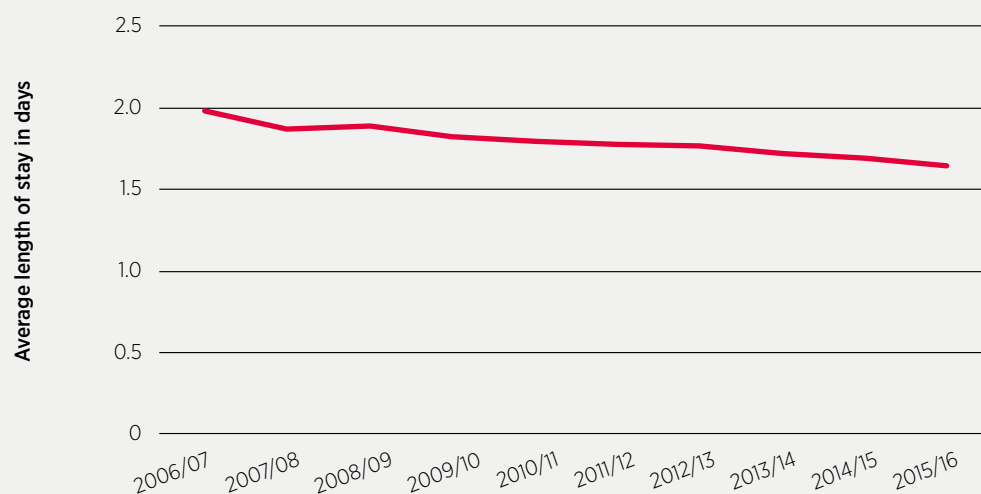
In light of the emergency hospital care activity outlined, this section looks at trends in length of stay, 30-day emergency readmissions and in-hospital mortality following emergency admission between 2006/07 and 2015/16, to provide an indication of the quality of emergency hospital care.

What are the trends in length of stay for emergency admissions?

Length of stay is often used as an efficiency measure because it provides an indication of the resources invested for an admission, but it can also be linked to quality of care (OECD, 2015). Spending an unnecessary amount of time in hospital can be detrimental to health, while too short a time may mean that adequate opportunity has not been given to resolve the problem.

The average length of stay for children and young people following an emergency admission declined by 17 per cent between 2006/07 and 2015/16: from 1.99 days to 1.64 days (see Figure 3.9). The main decrease occurred between 2006/07 and 2007/08. This trend of decline is reflected in the average length of stay for each of the age bands (graph not shown).

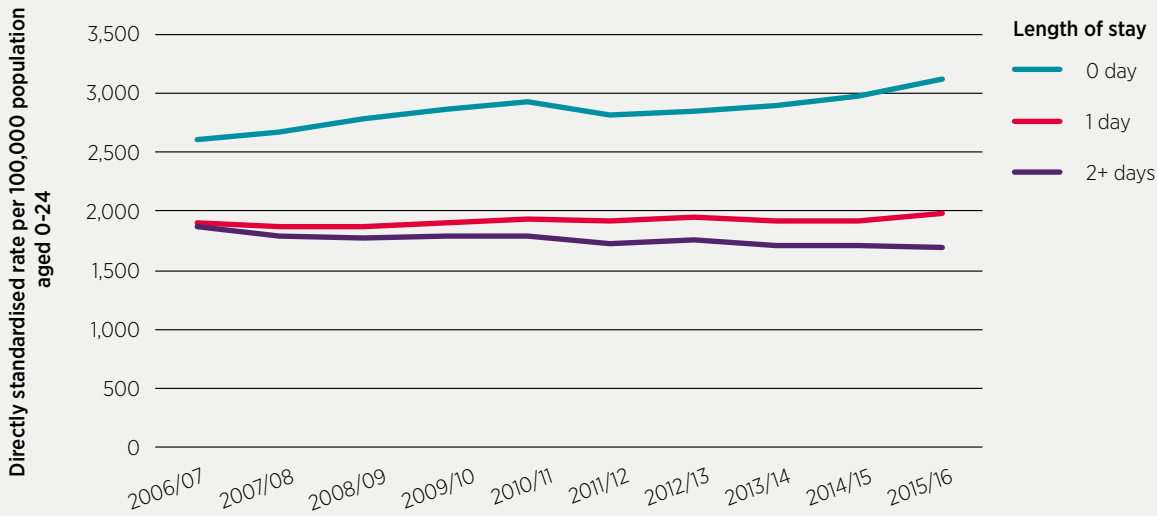
Figure 3.9: Average length of stay following emergency admission for 0 to 24-year-olds, directly standardised by age and sex, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

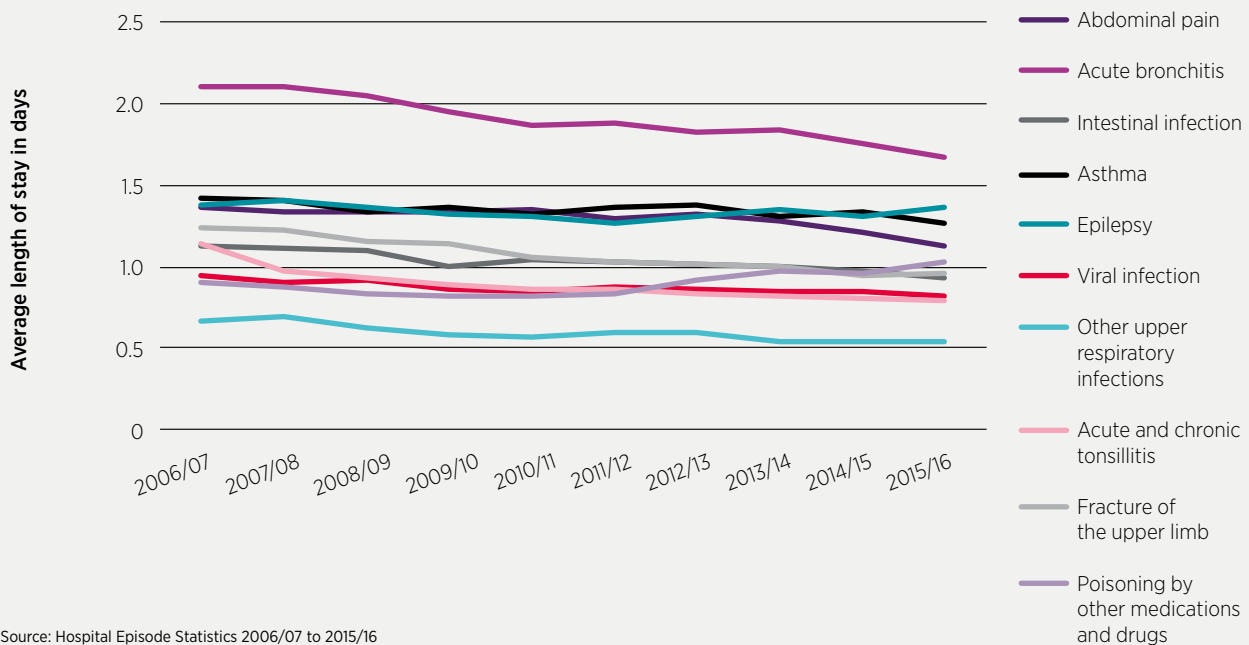
Part of the reason why children and young people were, on average, spending less time in hospital following emergency admission in 2015/16 than before is that short stays (that is, admission and discharge on the same day) are becoming an increasingly common type of emergency admission for this group. Same-day discharges increased by 20 per cent between 2006/07 and 2015/16, from 2,603 to 3,117 emergency admissions per 100,000 population (see Figure 3.10). This means that in 2015/16 same-day discharges represented 46 per cent of all emergency admissions. The rate of emergency admissions with a duration of two days or more declined slightly over the period, while the rate for stays of one day remained largely the same. This means that in 2015/16 children and young people were more likely to have a short stay following an emergency admission than to stay for longer.

Figure 3.10: Emergency admission rates by length of stay (0, 1, 2+ days), directly standardised rates per 100,000 population aged 0-24, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

Figure 3.11: Average length of stay following emergency admission for the 10 common conditions for 0 to 24-year-olds, directly standardised by age and sex, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

Condition-specific length of stay

The length of stay following emergency admissions for each of the 10 most common conditions (Figure 3.6) declined between 2006/07 and 2015/16 (see Figure 3.11). Acute and chronic tonsillitis and fracture of the upper limb saw the largest percentage declines in average length of stay, with a decrease of 30 per cent and 23 per cent respectively. In 2015/16, the length of stay for these conditions was, therefore, on average much shorter than at the start of the 10-year period.

What are the trends in emergency readmissions following emergency admission?

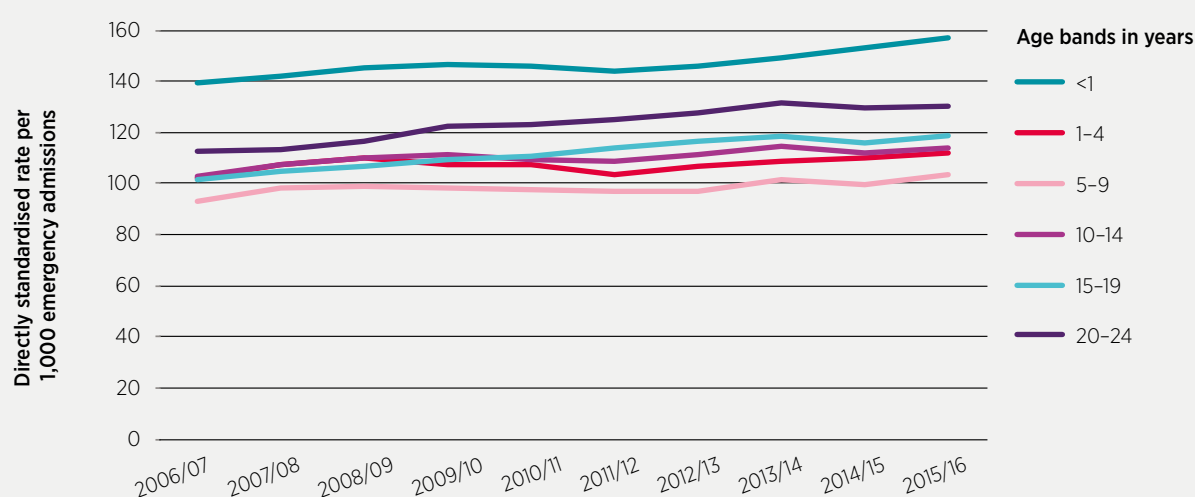
While the link between readmissions and quality of care is complex, readmissions can be used to indicate quality of care. Among other things, increasing readmissions may indicate:

- an inadequate resolution of the initial problem
- poor discharge planning, for example in relation to preparing the patient for leaving hospital and educating them about what to do when they get home, and the transitional care plan put in place
- poor post-discharge care, perhaps through a lack of follow-up appointments where needed (Benbassat and Taragin, 2000; Horwitz, 2017).

The rate of emergency readmissions in the 30 days following discharge from a previous emergency admission for children and young people increased by 12 per cent between 2006/07 and 2015/16, from 110 to 124 readmissions per 1,000 emergency admissions. The readmission rate increased for all the age bands (see Figure 3.12). While the increase for one to four-year-olds was lower at 9 per cent, 15 to 19-year-olds and 20 to 24-year-olds experienced the largest increases: 17 per cent and 15 per cent respectively.

In summary, children and young people but in particular the older age groups (15 to 24-year-olds) were more likely to be readmitted in 2015/16 compared with 2006/07.

Figure 3.12: 30-day emergency readmission rates following emergency admission for 0 to 24-year-olds by age band, directly standardised rates per 1,000 emergency admissions, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

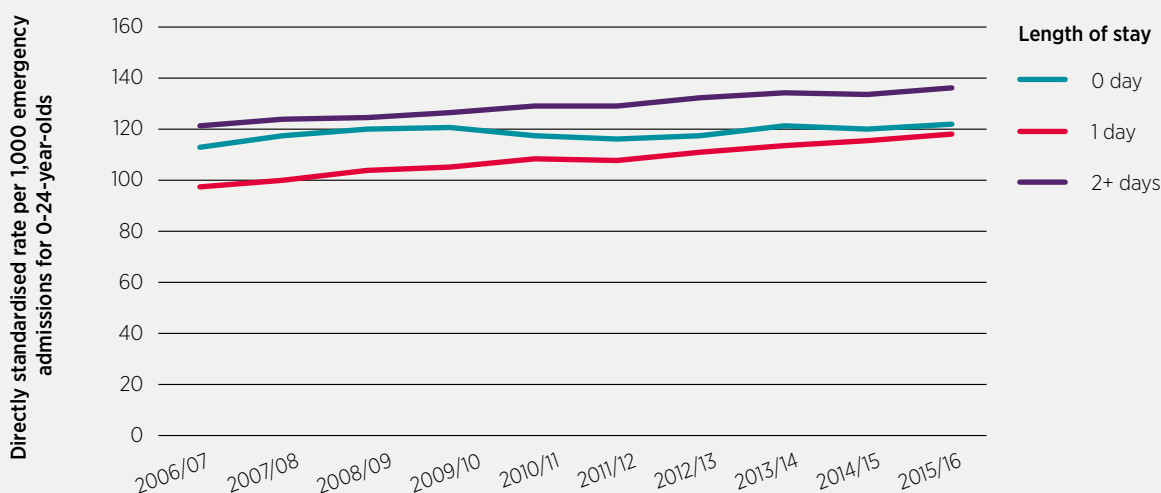
Shorter stays and readmissions

The shift towards shorter lengths of stay and the increase in readmissions may be linked. In some cases, shorter periods of care could mean that less time has been allocated to the resolution of the problem and potentially inappropriately early discharge. It could also indicate an agreed trade-off between the patient and

doctors that the patient will return if the problem gets worse or re-emerges as they do not want to remain in hospital. Both can lead to readmission at a later date. It is, therefore, useful to have an understanding of what the readmission rates are for the different lengths of stay.

Between 2006/07 and 2015/16 there was an increase in the directly standardised 30-day readmission rate for each of the length-of-stay categories (see Figure 3.13). Emergency readmissions within 30 days increased the most for those with a length of stay of one day, an increase of 21 per cent. They increased the least for those with a stay of less than a day, an 8 per cent increase. Thirty-day readmissions were most common following a length of stay of two days or more – they increased by 12 per cent. In 2015/16 the readmission rates were 11 per cent higher following a length of stay of two days or more than for those with a stay of less than a day.

Figure 3.13: 30-day emergency readmission rates following emergency admission for 0 to 24-year-olds by length of stay, directly standardised rate per 1,000 emergency admissions, 2006/07 to 2015/16



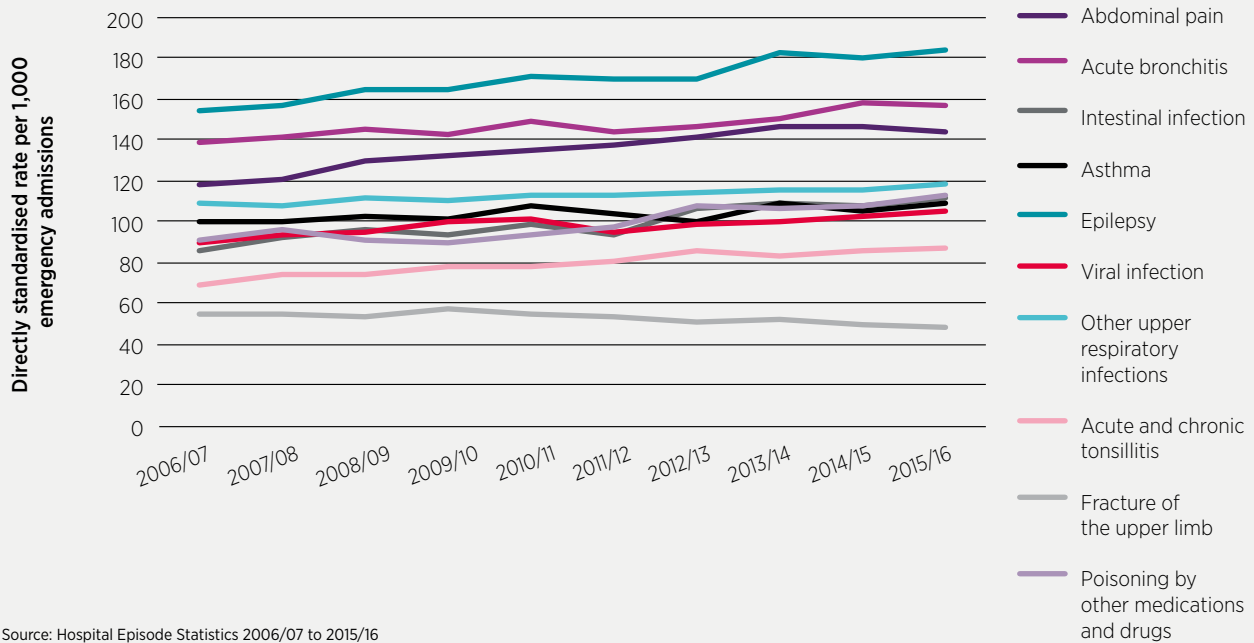
Source: Hospital Episode Statistics 2006/07 to 2015/16

Condition-specific emergency readmissions

There was a general increasing trend in 30-day emergency readmissions for the majority of the 10 most common conditions (see Figure 3.14). Between 2006/07 and 2015/16, the readmission rate following emergency admission increased for each condition, with the exception of fracture of the upper limb, which declined by 13 per cent. Acute and chronic tonsillitis and poisoning by other medications and drugs saw the highest increases: 27 per cent and 25 per cent respectively.

This means that, in 2015/16, children and young people were more likely to be readmitted as an emergency following an emergency admission for almost all the conditions studied, but especially for acute and chronic tonsillitis and poisoning by other medications and drugs.

Figure 3.14: 30-day emergency readmission rates following emergency admission for 0 to 24-year-olds for the 10 common conditions, directly standardised rates per 1,000 emergency admissions, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

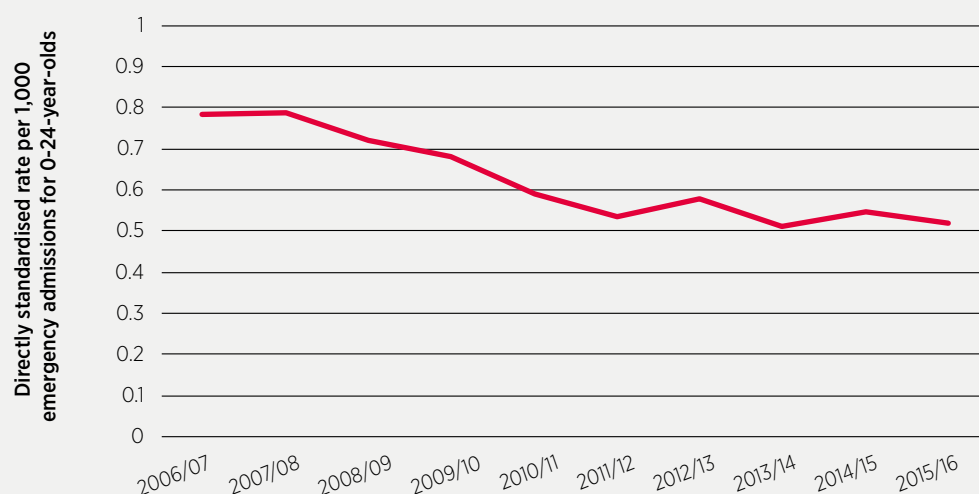
What are the trends in in-hospital mortality following emergency admission?

In-hospital mortality following an emergency admission is an adverse outcome. While suggesting something about the severity of the patient’s condition, it may also provide an indication of whether the appropriate care was provided.

In-hospital mortality following emergency admission for children and young people is a rare event. Between 2006/07 and 2015/16, the rate declined, from one death per 1,274 emergency admissions to one death per 1,923 emergency admissions (see Figure 3.15). The rate from 2011/12 to 2015/16 showed little change. Among the different age groups, 15 to 19-year-olds and 20 to 24-year-olds had the highest numbers of in-hospital deaths, followed by infants, but there was a trend of declining mortality in each age group.

In sum, in-hospital mortality is rare for children and young people. Although the decline has slowed, they were less likely to die in hospital following emergency admission in 2015/16 than earlier in the 10-year period.

Figure 3.15: In-hospital mortality rate for 0 to 24-year-olds, directly standardised rate per 1,000 emergency admissions, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

Summary findings

Between 2006/07 and 2015/16, there was some change in the indicators used to measure the quality of emergency hospital care.

Children and young people on average spent less time in hospital following emergency admission in 2015/16 compared with 2006/07, as the average length of stay declined by 17 per cent. Short stays (of less than a day) were the most common type of emergency admission for children and young people and are becoming increasingly common, as noted earlier.

Meanwhile, 30-day emergency readmissions have become more likely for children and young people, particularly for 15 to 19-year-olds and 20 to 24-year-olds.

All lengths of stay had an increase in 30-day emergency readmissions and for all conditions, with the exception of fracture of the upper limb. Acute and chronic tonsillitis and poisoning by other medications and drugs had the highest increases in readmission rates.

In-hospital mortality following emergency admission is a rare event for children and young people. In 2015/16, children and young people were less likely to die in hospital following emergency admission than in 2006/07, but the decline has slowed.

4

Discussion and conclusions

Summary

Using HES, this report builds on previous research by providing a review of the trends in the use and quality of emergency hospital care for children and young people between 2006/07 and 2015/16. It contributes to the evidence on how children and young people continue to strongly rely on emergency hospital care to have their needs met but that the way care is provided may be changing. Before we go on to discuss the findings, it is important to note that, as with any research analysis, there are limitations to this research that should be considered carefully, for example in relation to the quality of the data, coding issues, the quality of care measures used and the scope of the research (see page 38 for further details).

We found that emergency admissions for children and young people continued to increase over the past 10 years but the rate of increase has slowed compared to the decade before (Chief Nursing Officer's Directorate, 2008; Gill and others, 2013). Of potential concern is the increase in both A&E attendances and emergency admissions in the most recent years. Meanwhile, the indicators we looked at suggest that quality in the emergency hospital setting has been maintained, with some early signals of deterioration or potential changes in the way care is delivered. While the overall rates for emergency admissions have not increased as much as expected, we did find higher rates in certain age groups (infants) and for certain conditions (viral infection, acute bronchitis and acute and chronic tonsillitis). We also found an increase in short-stay admissions (less than a day) and an increase in 30-day readmissions. This suggests that children and young people in certain age groups may not have access to the most appropriate and effective care for their needs.

There are a range of complex reasons why children and young people, their families and carers may seek emergency care from a hospital and the full interaction between them is difficult to disentangle (see Figure 1.1 on page 8). They range from socioeconomic and demographic factors (for example, population change) to changes in policy that affect the availability and quality of services. They also include changes in people's perceptions and experience of the services. Here we outline some possible reasons for the trends observed and potential areas for improvement.

Population changes are only part of the explanation...

The trend we observed in emergency admissions can be broken down into two periods of increase: 2007/08 to 2010/11 and 2013/14 to 2015/16. There was a 5 per cent increase in the emergency admission rate during each of these periods of increase, with an average annual rate of increase of 2 per cent. Previous research similar to ours (Chief Nursing Officer's Directorate, 2008) found that for the under 20s between 2002/03 and 2006/07, the emergency admission rate had been increasing by 3.5 per cent a year. So the trend we observed for the under 25s would suggest that this has slowed. Much of the increase in the number of emergency admissions we saw can be explained by population change, in particular an increasing number of births (see Figure A.2 on page 34 for the

number of live births in England and Wales between 2006 and 2015) (Office for National Statistics, 2015b).

However, pressures on the hospitals in the last few years seem to be intensifying, even though births have not been increasing. In the last year alone there has been a 4 per cent increase in the rate of A&E attendances for children and young people and a 3 per cent increase in the rate of emergency admissions, while births have remained stable. This raises additional concerns about how care is provided to children and young people both in and outside the hospital. This is especially important as at present there is a gap between the quality of care that adults receive compared with the quality of care that children and young people receive (Kossarova and others, 2016; Quality Watch, 2015).

What can we say about the quality of emergency hospital care?

The changing trends in emergency admissions are partially determined by the ease of access to and quality of emergency hospital care. Perceived good-quality care may attract patients but increasing use can have an impact on quality. No single indicator can provide a conclusive picture of the quality of emergency hospital care, so a selection can enable some understanding to be developed. In this research we studied three indicators. We did not find strong trends of deterioration over the 10-year period from 2006/07 to 2015/16, but there were some warning signs.

Similar to previous research (Chief Nursing Officer's Directorate, 2008; Saxena and others, 2009), we found a continued increase in same-day discharges and a decline in length of stay. This suggests that hospitals have been reducing the amount of time many children and young people stay in hospital, which may be a result of speeding up the discharge process. Alternatively, it may suggest that hospitals are increasingly admitting children and young people from A&E with less severe conditions, perhaps for observation in short-stay units, who then do not require a long stay in hospital. These units allow for short-term observation, which can lead to fewer full inpatient admissions and can provide a more efficient clinical service (RCPCH, 2017). This is perhaps supported by the trend we found of increasing numbers of admissions for viral infection and acute bronchitis, which can be severe conditions but sometimes also just require short-term observation. A different question is whether this observation should be based in the hospital, or whether it could be more appropriately provided in a non-hospital/community setting, under the assumption that the appropriate skills and resources to provide effective and safe care are available.

The increase in readmission rates across all lengths of stay, age groups and conditions (except fracture of the upper limb) also raises questions around the way hospitals are working. The slower increase in readmissions for same-day discharges potentially suggests that children and young people admitted for short periods are receiving the appropriate care. The increase in readmissions for lengths of stay of one day or two or more days may indicate issues around discharge planning, transitional care and post-discharge support. It could indicate the complex needs of these individuals or the trade-off between going home perhaps earlier by choice and not being ready for this, resulting in a readmission. The larger increase in readmissions we highlighted for acute and chronic tonsillitis and poisoning by other medications and drugs requires further research into care pathways for these conditions.

Whether or not a patient is discharged is determined by a range of factors and the interaction between them (Berry and others, 2013). They include those related to the patient's clinical condition, the patient's preferences, staff knowledge and experience, a range of other hospital factors, and the availability and quality of services in the community. In one recent study, half of readmissions were for a different primary diagnosis from the primary diagnosis recorded at the original admission and there were more recurrent admissions for those with chronic conditions (Wijlaars and others, 2015; 2016). This evidence suggests that, while in many cases a readmission may not be linked to the original admission, there are cases where additional care needs are not being met appropriately, especially for children and young people with chronic conditions.

Weighing up the costs and benefits of another day in hospital against the impact of a readmission is complex and needs to be further investigated as there may be an opportunity to learn lessons and limit the risk of readmissions. While the hospital may be simply reacting to the increase in the number of patients by reducing length of stay, it may also be generating unnecessary costs with the increase in readmissions.

This report has provided a broad overview of three aspects of the quality of emergency hospital care for children and young people. However, quality of care is a complex concept to measure and therefore further research is needed, especially for the conditions and ages where the most concerning trends have been identified. The cohort of children and young people, and their families, going to A&E and their motivations need to be better understood to see whether their needs could and should be addressed in another setting. In order to do so, diagnosis coding of A&E data should be improved and collecting additional information about the reason why the families decided to or had to seek care in the hospital should be considered. The indicators presented in this report could also be developed further – for example, by looking at readmissions occurring in shorter periods of time (e.g. within 48 hours or a week) or by focusing on readmissions for particular conditions. Other measures of the quality of emergency hospital care should be developed, including patient experience and the quality of care in A&E departments, as due to data quality issues this was largely excluded from our analysis. Findings from these measures could then be viewed together to create a more comprehensive picture of the quality of care that children and young people are receiving.

What about accessibility and quality of other forms of care?

A hospital emergency setting is not always the best place for delivering care to children and young people. Admissions can often be very stressful for the family and children/young people concerned (Diaz-Caneja and others, 2005), they can detract resources from hard-pressed emergency services and they are costly to the health system, as well as affecting its quality of care (DiFazio and Vessey, 2013). Emergency hospital care is just one form of care available to children and young people – other services include GPs, nurses, the ambulance service, the NHS 111 telephone helpline, urgent care centres, hospital-based short-stay paediatric assessment units and community-based walk-in clinics. The extent to which these other services are available locally and their quality has a direct impact on the use of emergency hospital care. At the same time, the quality of emergency hospital care will in part be driven by pressures on it, therefore reducing pressures could help quality of care. However, determining what

proportion of patients can safely be seen in the community is not straightforward. In fact, improving access and quality of care in the community may not result in a reduction in the use of emergency hospital care; or at least, not in the short run.

Yet a proportion of emergency admissions may certainly be better addressed in another setting. Our analysis found that some of the 10 most common causes of emergency admissions were 'ambulatory care sensitive (ACS) conditions' – those that can usually be managed with high-quality appropriate care outside of the emergency setting (Blunt, 2013). Our analysis found that asthma, epilepsy and acute tonsillitis continue to be among the common causes of emergency admission for children and young people, suggesting problems in how these are managed in the community. While the declining rates for asthma and epilepsy suggest that improvements have been made, continued efforts are needed to make emergency admissions for these less common. There is significant evidence that improved discharge planning for children and young people with asthma and effective management of their condition in the community can help avoid unnecessary admissions (Asthma UK, 2014; Charnock, 2015; Healthy London Partnership, 2016a; Paton, 2013) and that failure to provide this care in the community leads to unnecessary personal and financial costs to the patient, healthcare system and society (Asthma UK, 2014). It is also important to build on the experience gained from the epilepsy and diabetes audits to improve care for children and young people across other conditions (RCPCH, 2014; 2016b). Analysis of regional variations using the *Atlas of Variation in Healthcare* for children and young people (Public Health England, 2016b) can also highlight areas that seem to be safely and effectively managing ACS conditions for children and young people outside the hospital setting.

The large increases in emergency admissions for some of the other conditions highlighted in our analysis could also be a cause for concern about the quality of care outside the emergency hospital setting and need to be further understood – in particular, the large increase in emergency admissions for viral infection and acute bronchitis, as well as the increase in admissions for other perinatal conditions (feeding and respiratory problems) and haemolytic and perinatal jaundice in infants. These may be related to more children surviving with complex disabilities and requiring more intensive healthcare support. The quality of care in the community and the quality of maternity services may also be a factor (National Maternity Review, 2016), for example, the premature discharge of mothers and their babies after birth. Similarly, high numbers of emergency admissions and readmissions for young people (aged 15–24) for poisoning by other medications and drugs may partially reflect the quality of care in the community and mental health services for children and young people (Frith, 2016). Further research is needed to better understand what is leading to the increases in these conditions. For example, these increases may be due to changes in the way care is delivered or the quality of care across the various care settings, a change in admission procedures within hospitals, or a lack of support for deprived families across all areas of policy.

There is no nationally available data about the quality of primary care that children and young people receive, or about the quality of other forms of care available. Research has indicated that children and young people's contact with primary care has not changed greatly in recent years (Baird and others, 2016; Hippisley-Cox and others, 2007). However, the 2004 healthcare reforms that allowed GPs to opt out of providing out-of-hours care have been associated with changes in A&E attendances and emergency admissions for children and young people (Gill and others, 2013; Saxena and others, 2009). General practices with better access have

been associated with lower A&E attendances for children and young people (Cecil and others, 2014; Cowling and others, 2013). Coupled with this is the evidence about problems in the quality of services for children: GPs' lack of paediatric expertise (Kennedy, 2010; NHS Confederation, 2012); and issues with capacity (human and physical) and capability (knowledge, expertise, skills) to meet children's needs in primary care in general while most paediatricians are based in hospitals without community expertise (Kennedy, 2010; Kossarova and others, 2016).

Strengthening the quality of care in the community and our understanding of it is of particular importance, as parents and carers understand, trust and mostly wish to go to their GP or family doctor (Action for Sick Children, 2013). When parents choose to visit a healthcare provider, they are largely driven by the perceived expertise, competency and skill of that professional and they have a strong preference for continuity of care as a personal relationship can be developed. Research has shown that, among other suggestions, parents and carers would like it to be easier to speak to a doctor on the phone and get an appointment at short notice, extended opening hours and improved online content (Action for Sick Children, 2013). Thus, improving access to qualified and trusted doctors in the community is likely to have an impact on where families will seek care, and is an opportunity to reduce the use of emergency hospital care.

Short-stay paediatric assessment units (RCPCH, 2009) may also be a route to reducing emergency admissions and improving quality of care for children and young people as well as parental satisfaction (Blair and others, 2004; McCall and others, 2014). Similarly, walk-in clinics are an option for accessing care outside the hospital. Despite not being set up with the aim of providing care to children and young people, walk-in clinics have been shown to be more frequently used by this age group (Munro and others, 2000). Those that are set up specifically for young people, with youth-friendly, flexible and accessible services, demonstrate how appropriately designed services can be successful (Hagell and Lamb, 2016).

New models of care showing the way forward

Numerous new models of care for children and young people are showing the way forward by aiming to improve quality of care and offering a variety of potential solutions to the high activity in emergency hospital settings. These new care models seem to be centred around the following key principles (Kossarova and others, 2016):

- understanding the general and specific needs of children, young people and their families (including broader determinants), and organising care to meet these needs
- strengthening early and easy access to appropriate expert paediatric/child health assessment in the community
- linking up information, data, communication and care (different forms of integration)
- improving the health literacy and education of families as well as professionals.

Our literature review also identified additional examples that aim to improve the quality of care for children and young people overall, as well as reduce A&E attendance and hospital use (see page 39 for further details). The compendium of new models of care for acutely unwell children and young people is also a useful resource about different services and models that aim to provide out-of-hospital healthcare for children (Healthy London Partnership, 2016b).

Most of these models have not been formally evaluated and the evidence so far on what is successful at reducing A&E attendances is lacking and often subject to bias (Thompson Coon and others, 2012). However, some early evidence suggests that they may be successful in both reducing hospital use as well as improving the quality and experience of services (Montgomery-Taylor and others, 2015). It is important to appreciate the different objectives of these models, though, as they may be improving the quality of care but not necessarily reducing the use of hospital care, or at least not in the short term. Time is needed to allow these new services to develop and be appropriately evaluated – often a challenge as adequate resources and capacity are not available (Kossarova and others, 2016) – so that key lessons can be learned and shared more widely.

Conclusion

The ultimate goal should always be to keep children and young people healthy by intervening early and effectively – every contact counts. This report has shown that the previously growing pressures on emergency hospital care from increasing use by children and young people continue but not at the same rate of increase as before. While the small selection of indicators we looked at suggest that emergency hospital care quality has been maintained, of potential concern is the increase in A&E attendances and emergency admissions in the last few years, coupled with worrying trends for specific conditions and age groups.

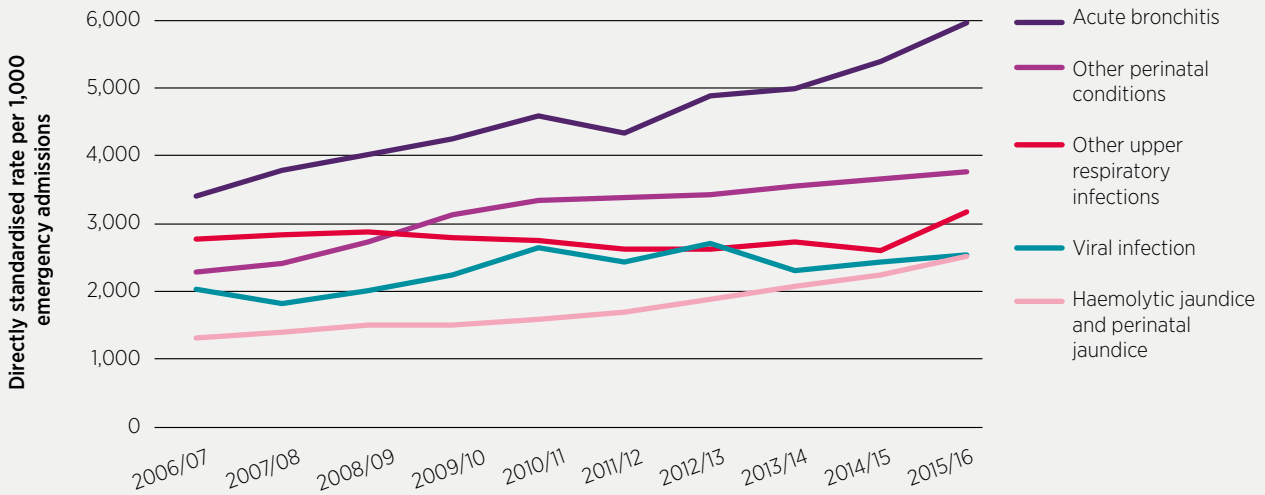
Hospital emergency care may be appropriate for many children and young people but there are also those who may, with appropriate support, be safely cared for outside an emergency care setting. This report has identified potential areas where improvements in care outside the hospital emergency care setting may lead to reductions in A&E attendances and emergency admissions.

However, if there are insufficient resources and alternatives to the emergency hospital care setting or other weak links in the system, it may become difficult to reduce hospital emergency care activity and improve quality of care for children and young people.

Appendix

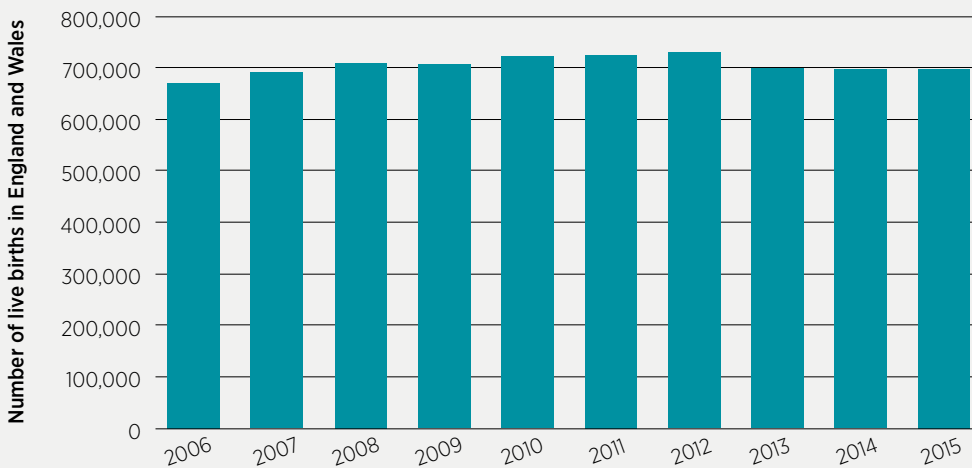
1. Supplementary graphs

Figure A.1: Emergency admission rates for the five most common conditions for infants, directly standardised rates per 100,000 population aged 0, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

Figure A.2: Total number of live births in England and Wales, 2006 to 2015



Source: Office for National Statistics 2015

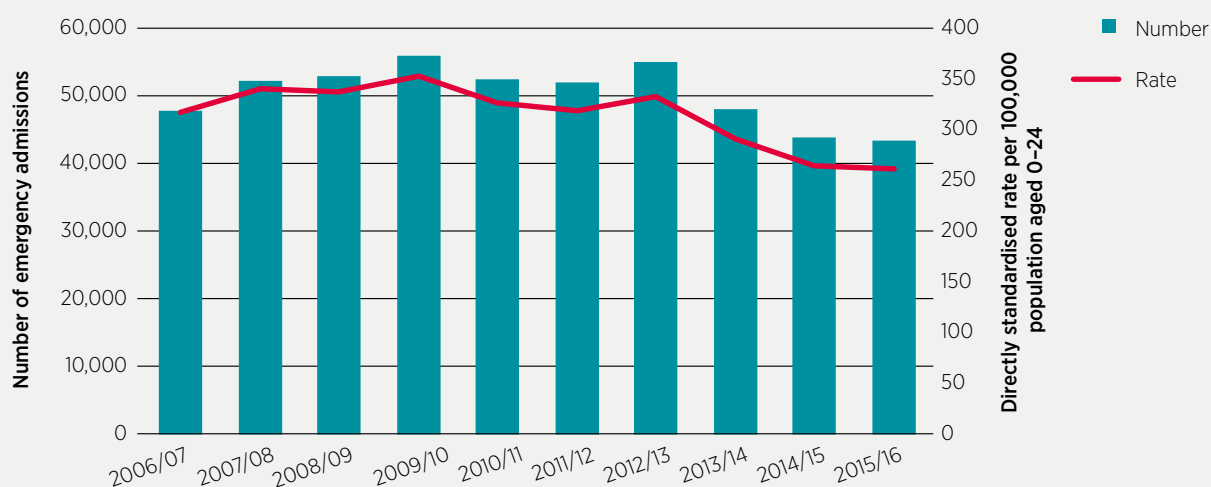
Changing diagnosis codes and their impact on analysis

Box A.1: 'Intestinal infections' and changing diagnosis code frequency – a word of caution

There was a large (57 per cent) increase in the number of emergency admissions for intestinal infection between 2006/07 and 2015/16. However, the increase was not gradual over this period; there was a sharp jump in the rate between 2011/12 and 2012/13 (see Figure 3.7 on page 20). This can be explained by the introduction of a new ICD-10 code – A09.9 (gastroenteritis and colitis of unspecified origin) – which features in the Clinical Classifications Software's (CCS) intestinal infection grouping (World Health Organization, 2010). Between 2006/07 and 2015/16, A09.9 became the most common diagnosis code for this condition grouping, accounting for 43 per cent of diagnoses in 2015/16 compared with 0 per cent in 2005/06. Essentially, all diagnoses that were previously classified as K52.9 (non-infectious gastroenteritis and colitis, unspecified) within the CCS grouping non-infectious gastroenteritis were moved to the new A09.9 code and, therefore, a new CCS group, intestinal infection.

The combined number of emergency admissions for intestinal infection and non-infectious gastroenteritis overall declined between 2006/07 and 2015/16 (see the graph below). Therefore, the majority of the increase for the intestinal infection condition grouping is an artefact of administrative changes.

Emergency admission numbers and rates for intestinal infection and non-infectious gastroenteritis combined, 2006/07 to 2015/16



Source: Hospital Episode Statistics 2006/07 to 2015/16

ICD-10 diagnosis codes for common CCS groups

Table A.1: Frequently used ICD-10 diagnosis codes for the 10 common conditions for 0 to 24-year-olds

ICD-10 code	ICD-10 code name	2015/16 Percentage of condition's emergency admissions attributable to ICD-10 code (>1%)
Viral infection		
B349	Viral infection, unspecified	89%
B019	Varicella without complication	3%
B279	Infectious mononucleosis, unspecified	2%
Acute bronchitis		
J219	Acute bronchiolitis, unspecified	46%
J22X	Unspecified acute lower respiratory infection	44%
J210	Acute bronchiolitis due to respiratory syncytial virus	8%
Abdominal pain		
R103	Pain localised to other parts of lower abdomen	47%
R104	Other and unspecified abdominal pain	41%
R101	Pain localised to upper abdomen	10%
Other upper respiratory infections		
J069	Acute upper respiratory infection, unspecified	68%
J050	Acute obstructive laryngitis [croup]	23%
J029	Acute pharyngitis, unspecified	3%
J00X	Acute nasopharyngitis [common cold]	2%
Intestinal infection		
A084	Viral intestinal infection, unspecified	47%
A099	Gastroenteritis and colitis of unspecified origin	43%
A090	Other and unspecified gastroenteritis and colitis of infections origin	3%
A080	Rotaviral enteritis	1%
A045	Campylobacter enteritis	1%
Acute and chronic tonsillitis		
J039	Acute tonsillitis, unspecified	88%
J36X	Peritonsillar abscess	7%
J038	Acute tonsillitis due to other specified organisms	2%

Asthma		
J459	Asthma, unspecified	87%
J46X	Status asthmaticus	9%
J450	Predominantly allergic asthma	4%
Fracture of the upper limb		
S525	Fracture of lower end of radius	19%
S424	Fracture of lower end of humerus	18%
S526	Fracture of lower end of radius and ulna	16%
S524	Fracture of shafts of both ulna and radius	13%
S626	Fracture of other finger	8%
S623	Fracture of other metacarpal bone	5%
S520	Fracture of upper end of ulna	4%
S527	Multiple fractures of forearm	3%
S521	Fracture of upper end of radius	2%
S625	Fracture of thumb	2%
S523	Fracture of shaft of radius	2%
Epilepsy, convulsions		
R568	Other and unspecified convulsions	37%
R560	Febrile convulsions	24%
G409	Epilepsy, unspecified	18%
G403	Generalised idiopathic epilepsy and epileptic syndromes	10%
G419	Status epilepticus, unspecified	4%
G401	Localisation-related (focal)(partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures	2%
G404	Other generalised epilepsy and epileptic syndromes	2%
Poisoning by other medications and drugs		
T391	4-Aminophenol derivatives	68%
T393	Other nonsteroidal anti-inflammatory drugs	10%
T509	Other and unspecified drugs, medicaments and biological substances	3%
T390	Salicylates	2%
T450	Antiallergic and antiemetic drugs	2%
T447	Beta-adrenoreceptor antagonists, not elsewhere classified	2%

2. Limitations

Data

It is important to remember that, as with any data collected for administrative purposes, the quality of HES data may vary as not all fields will have been validated. The quality of HES is known to be improving gradually, which will have an impact on time series analyses, as some of the change over time could simply be an artefact of shortfalls in previous years of the data (NHS Digital, 2015). In particular, the HES A&E data (initiated in 2007/08) had known issues with coverage up to and including 2013/14 (NHS Digital, 2013; 2016b).

The data will also be affected by changing care structures in the NHS. For example, the introduction of observation or medical assessment units to admit A&E patients for observation and tests will have had an impact on emergency admission rates (NHS Digital, 2015).

Coding

The accuracy of coding within the data will vary over time and place. Also, the ICD-10 codes themselves are not fixed and there were several updates to the classification over the period of study – codes will have been introduced and others will have been removed (World Health Organization, 2010). This may have had an impact on the change in the prevalence of the different conditions over the 10-year period.

The prevalence of the health conditions in the dataset could also be influenced by changing trends in the use of particular diagnosis codes. For example, as awareness increases of a particular condition it may be diagnosed more frequently. These trends may occur within individual hospitals or be a wider shift in the use of particular diagnoses (Greenfield and others, 2016). By using the CCS groupings for this analysis the impact of administrative changes or trends in popularity for particular diagnosis codes leading to large shifts in numbers of emergency admissions should have been reduced. Generally the new diagnosis code will fall under the same CCS grouping and the overall trend will be unaffected but not in all cases as occurred with the ‘intestinal infection’ CCS grouping (see Box A.1 on page 35).

The CCS groupings may disguise trends in individual conditions that are important, as well as disguising the use of the less stringent diagnosis codes such as ‘unspecified’. For example, approximately 80 per cent of the emergency admissions for viral infection in 2014/15 had an ‘unspecified’ code. An understanding of the diagnosis codes that underlie the 10 most common conditions for emergency admission was developed during this research but our analysis was conducted using the CCS groupings.

The different coding system for diagnoses in the A&E dataset and known issues with its completeness meant that an understanding of the types of conditions that children and young people use emergency hospital care for could only be presented with regard to emergency admissions (Heys and others, 2014; Jamrozik and others, 2008).

Measures

While emergency admissions rates and A&E attendance data allow for some understanding of how well primary, secondary and community care are interacting with each other (ISD Scotland, 2010), it should be recognised that the data contained within HES are ultimately a reflection of activity in hospitals.

Emergency readmissions, length of stay and in-hospital mortality are process measures that can provide some indication of the quality of emergency hospital care, but this is limited. Quality has multiple dimensions and is a complex thing to quantify. Indicators produced from HES can be consistently defined over time and space but these data do not cover all aspects of quality, for example, patient experience.

Meanwhile, each measure can be defined differently and while the definitions we used were appropriate for this report, other research may want to use different definitions. For example, emergency readmissions within 48 hours of the original emergency admission may be a more appropriate measure, to fully understand this aspect of care for children and young people.

Scope

The focus of this report is the use and quality of emergency hospital care by children and young people, but emergency care can be provided in a variety of other settings as well, which we did not have equivalent data for. Also, our findings are restricted to emergency care provided by NHS hospitals in England; therefore, emergency care provided by private hospitals is excluded.

Finally, looking at all the indicators that could be produced on emergency hospital care and the data that are available was beyond the scope of this research. Future research should aim to bring these together along with patient outcome measures to obtain a fuller picture.

3. Examples of opportunities to improve the quality of care provided to children and young people

We carried out a literature review^{*} as part of this research and we now highlight some examples of ways in which the quality of care for children and young people can be improved.

General

- Lower rates of admission have been associated with practice areas that have more health visiting hours (Hull and others, 2000).
- In one study, the use of GP-based child health multidisciplinary team meetings resulted in a shift of new-patient hospital appointments to the GP practice; a decrease in sub-specialty referrals, admissions and A&E attendances; as well as parents' preference to have appointments at the GP practice, with gained confidence that their child's needs were being met (Montgomery-Taylor and others, 2015).
- Cost modelling of expenditure on the treatment of routine childhood illnesses managed as short-stay hospital admissions, compared with children's walk-in centres embedded in general practice, found that routine illness is being

* Search terms available on request.

inappropriately treated in a hospital setting and alternative provision may be more appropriate (Barnes and others, 2013).

- There is a difference in the type of treatment provided if GPs refer patients to hospital consultants as opposed to community consultants. In one study, multiple diagnoses were more commonly made and recorded by the community-based paediatrician with a bias toward particular diagnoses, while the hospital clinic staff made more system- and disease-based diagnoses and more investigations than community staff; patients were more likely to be discharged from the hospital clinic than the community-based clinic; and costs per new-case consultation were substantially less in the community. While there are several advantages to the use of community paediatric clinics, these differences need to be considered carefully when different types of services are commissioned, and further assessments of the quality of care provided are required (Blair and others, 1997).
- It has been shown that pre-school children attending GP-led urgent care centres have a similar case mix to children presenting to hospital A&E departments and the majority of cases can be managed exclusively by GPs before being discharged (Gnani and others, 2016).

Asthma

- A Cochrane review provided evidence that asthma education aimed at children and their carers reduced A&E visits and hospital admissions, but there was no clarity on the type, duration and intensity of the educational package to most successfully reduce the use of acute care (Boyd and others, 2009).
- The 'smoke-free' legislation – legislation prohibiting smoking in workplaces and enclosed public places introduced in England in 2007 – is an example of a public health intervention that has been associated with a reduction in childhood hospitalisations for respiratory tract infections (Been and others, 2015). Housing and environmental factors are associated with children's demand for hospital admission for breathing difficulties and, therefore, also provide a potential opportunity for public health intervention (Kyle and others, 2011).
- One study highlighted the importance of nurse-led home visits in identifying potential changes that could be made to improve symptoms for children with problematic asthma (Bracken and others, 2009).
- Another study found that an A&E department with high repeat visitor rates for asthma was not discharging the majority of patients according to discharge guidelines from the British Thoracic Society (BTS). Repeat visitors were identified as a cost-effective opportunity for intervention to reduce asthma-related visits, with the objective to improve the A&E discharge planning process (Kular and Chodhari, 2013).

Other conditions

- Parents of children who were admitted to hospital with serious respiratory tract infection have highlighted the missed opportunities for earlier treatment, due to both parental factors (skills, fears and beliefs) and health service factors (access and consultation quality) (Francis and others, 2011). There are also opportunities for using a community respiratory service (advanced paediatric nurse practitioner) to reduce children's hospital admissions (Allcock, 2009).

- Accessible and continuous primary care has been associated with a decreased likelihood of pre-school-aged children with pneumonia presenting to A&E and an increased likelihood of hospital admission, implying more appropriate referral; at the same time, lower parental satisfaction has been associated with an increased likelihood of A&E presentation (Emery and others, 2015).
- When comparing the provision of the initial care for children diagnosed with type 1 diabetes in hospital with home-based care, one study found that home-based care may be just as safe, effective for the child and acceptable to parents as hospital-based care (Morgan-Trimmer and others, 2015; Tiberg, 2012).
- An evaluation of moving a hospital-based childhood obesity clinic to a nurse-led clinic in the community found that there was no significant difference in clinical effectiveness, treatment adherence, quality of life or satisfaction (Banks and others, 2012).

References

- Action for Sick Children (2013) *Action for Sick Children: First contact care survey*. Action for Sick Children.
- Agency for Healthcare Research and Quality (2016) *Clinical Classifications Software (CCS) for ICD-10-CM*. <https://www.hcup-us.ahrq.gov/toolssoftware/ccs10/ccs10.jsp>. Accessed 1 March 2017.
- Allcock D (2009) 'Using a community respiratory service to reduce children's hospital admissions', *Nursing Times*, 30 January.
- Appleby J (2016) *Nuffield Winter Insight. Briefing 1: Winter beds pressures*. Nuffield Trust. <https://www.nuffieldtrust.org.uk/resource/winter-hospital-bed-pressures>. Accessed 1 March 2017.
- Asthma UK (2014) *Time to Take Action on Asthma*. Asthma UK.
- Baird B, Charles A, Honeyman M and Maguire DD (2016) *Understanding Pressures in General Practice*. The King's Fund.
- Banks J, Sharp D, Hunt L and Shield J (2012) 'Evaluating the transferability of a hospital-based childhood obesity clinic to primary care: a randomised controlled trial', *British Journal of General Practice* 62(594), 6–12.
- Barnes K, Longfield P, Jones K, Littlemore G, McDonough C, McIntyre A, Robertson J, Turton N, Urdhin K and McLaughlin M (2013) 'Evidence based commissioning: calculating shift potentials for paediatric services', *Clinical Governance: An International Journal* 18(1), 39–48.
- Been JV, Millett C, Lee JT, van Schayck CP and Sheikh A (2015) 'Smoke-free legislation and childhood hospitalisations for respiratory tract infections', *European Respiratory Journal* 46(3), 697–706.
- Benbassat J and Taragin M (2000) 'Hospital readmissions as a measure of quality of health care: advantages and limitations', *Archives of Internal Medicine* 160, 1074–81.
- Berry JG, Toomey SL, Zaslavsky AM, Jha AK, Nakamura MM, Klein DJ and others (2013) 'Pediatric readmission prevalence and variability across hospitals', *Journal of the American Medical Association* 309(4), 372–380.
- Blair ME, Gore J, Malhotra AIF, Islam S, Martin J, Vigneswaran TV and Lachman PI (2004) 'Keeping young children out of hospital – paediatric ambulatory care (short stay) units reduce the proportion of children under 4 being admitted', *Archives of Disease in Childhood* 89(1), A23–A24.
- Blair M, Horn N and Polnay L (1997) 'General practitioners use of hospital and community based paediatric out-patient services in Nottingham', *Public Health Journal* 111(2), 97–100.
- Blunt I (2013) *Focus On: Preventable admissions*. QualityWatch. www.qualitywatch.org.uk/focus-on/preventable-admissions. Accessed 1 March 2017.
- Blunt I (2014) *Focus On: A&E attendances*. QualityWatch. www.qualitywatch.org.uk/focus-on/ae-attendances. Accessed 1 March 2017.
- Boyd M, Lasserson TJ, McKean MC, Gibson PG, Ducharme FM and Haby M (2009) 'Interventions for educating children who are at risk of asthma-related emergency department attendance', *Cochrane Database of Systematic Reviews* 15(2).
- Bracken M, Fleming L, Hall P, Van Stiphout N, Bossley C, Biggart E, Wilson NM and Bush A (2009) 'The importance of nurse-led home visits in the assessment of children with problematic asthma', *Archives of Disease in Childhood* 94(10), 780–4.
- Burger SA, Hargreaves D, Maconochie I, Magusin A, Pall K, Pope R, Steventon A, Tallett A, Walton E and Wolters A (2015) *The Use of Primary and Secondary Care Services by Children and Young People Following Contact with NHS 111 – Investigating the Patient Experience and Flow for Four Common Conditions*. Royal College of Paediatrics and Child Health.
- Care Quality Commission (2015) *Children and Young People's Inpatient and Day Case Survey 2014: Key findings*. Care Quality Commission.
- Cecil E, Bottle A, Cowling T, Majeed A, Wolfe I and Saxena S (2016) 'Primary care access, emergency department visits, and unplanned short hospitalizations in the UK', *Pediatrics* 137(2).

Cecil E, Bottle A, Cowling T and Saxena S (2014) 'Do children registered with English general practices with better patient reported access have fewer emergency department visits in and out of hours? A cross sectional study in 2011/12', *Journal of Epidemiology and Community Health* 38(1), A66–A67.

Charnock J (2015) *Primary Care Standards: Managing asthma in children and young people*. NHS Greater Manchester, Lancashire & South Cumbria Strategic Networks.

Chief Nursing Officer's Directorate (2008) *Trends in Children and Young People's Care: Emergency admission statistics, 1996/97 – 2006/07, England*. Department of Health.

Children and Young People's Health Outcomes Forum (2012) *Report of the Children and Young People's Health Outcomes Forum*. Department of Health.

Children and Young People's Health Outcomes Forum (2015) *Report of the Children and Young People's Health Outcomes Forum 2014/15*. Department of Health.

Clinical Indicators Team (2016) *NHS Outcomes Framework: Domain 3: Helping people to recover from episodes of ill health or following injury*. National Health Service. https://indicators.hscic.gov.uk/download/Outcomes%20Framework/Specification/NHSOF_Domain_3_S.pdf. Accessed 1 March 2017.

Cornish J (2015) 'Improving transition for children and young people', blog, 27 January. NHS England. <https://www.england.nhs.uk/2015/01/jacqueline-cornish-4/>. Accessed 1 March 2017.

Cowling TE, Cecil EV, Soljak MA, Lee JT, Millett C, Majeed A, Wachter RM and Harris MJ (2013) 'Access to primary care and visits to emergency departments in England: a cross-sectional, population-based study', *PLoS One* 8(6), e66699.

Davies A, Keeble E, Bhatia T and Fisher E (2016) *Focus On: Public health and prevention*. QualityWatch. www.qualitywatch.org.uk/public-health. Accessed 2 March 2017.

Department of Health (2016) *NHS Outcomes Framework: At-a-glance*. Department of Health. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/513157/NHSOF_at_a_glance.pdf. Accessed 2 March 2017.

Diaz-Caneja A, Gledhill J, Weaver T, Nadel S and Garralda E (2005) 'A child's admission to hospital: a qualitative study examining the experiences of parents', *Intensive Care Medicine* 31(9), 1248–54.

DiFazio R and Vessey J (2013) 'Non-medical out-of-pocket expenses incurred by families during their child's hospitalization', *Journal of Child Health Care* 17(3), 230–41.

Emery DP, Milne T, Gilchrist CA, Gibbons MJ, Robinson E, Coster GD, Forrest CB, Harnden A, Mant D and Grant CC (2015) 'The impact of primary care on emergency department presentation and hospital admission with pneumonia: a case-control study of preschool-aged children', *NPJ Primary Care Respiratory Journal* 25, 14113.

Fischer C, Lingsma H, Marang-van de Mheen P, Kringos D, Klazinga N and Steyerberg E (2014) 'Is the readmission rate a valid quality indicator? A review of the evidence', *PLoS One* 9(11), e112282.

Fisher E, Cooke O'Dowd N, Dorning H, Keeble E and Kossarova L (2016) *Quality at a Cost: QualityWatch annual statement 2016*. QualityWatch. www.qualitywatch.org.uk/quality-at-a-cost. Accessed 2 March 2017.

Francis N, Crocker J, Gamper A, Brookes-Howell L, Powell C and Butler C (2011) 'Missed opportunities for earlier treatment? A qualitative interview study with parents of children admitted to hospital with serious respiratory tract infections', *Archives of Disease in Childhood* 96(2), 154–9.

Frith E (2016) *Children and Young People's Mental Health: Time to deliver*. Education Policy Institute.

Gill P, Goldacre M, Mannt D, Heneghan C, Thomson A, Seagroatt V and Harnden A (2013) 'Increase in emergency admissions to hospital for children aged under 15 in England, 1999–2010: national database analysis', *Archives of Disease in Childhood* 98, 328–34.

Gnani S, Morton S, Ramzan F, Davison M, Ladbrooke T, Majeed A and Saxena A (2016) 'Healthcare use among preschool children attending GP-led urgent care centres: a descriptive, observational study', *BMJ Open* 6, e010672.

Greenfield G, Poots A, Hiles S and Blair M (2016) 'G345(P) changes in respiratory diagnoses in pre-schoolers – a 10 year observational study', *Archives of Disease in Childhood* 101, A201–A202.

- Hagell A and Lamb S (2016) 'Developing an integrated primary health care and youth work service for young people in Lambeth: learning from the Well Centre', *Journal of Children's Services* 11(3), 233–43.
- Hargreaves D and Viner R (2012) 'Children's and young people's experience of the National Health Service in England: a review of national surveys 2001–2011', *Archives of Disease in Childhood* 97, 661–6.
- Healthy London Partnership (2016a) *Asthma Audit: Understanding childhood asthma in London*. Healthy London Partnership. <https://www.healthylondon.org/children-and-young-people/asthma-audit>. Accessed 2 March 2017.
- Healthy London Partnership (2016b) *Compendium: New models of care for acutely unwell children and young people*. Healthy London Partnership.
- Heys M, Kwong H, Reed J and Blair M (2014) 'What do we really know about infants who attend Accident and Emergency departments?', *Perspectives in Public Health* 134(2), 93–100.
- Hippisley-Cox J, Fenty J and Heaps M (2007) *Trends in Consultation Rates in General Practice 1995 to 2006: Analysis of the QRESEARCH database*. QRESEARCH and The Information Centre.
- Horwitz L (2017) 'Self-care after hospital discharge: knowledge is not enough', *BMJ Quality & Safety* 26, 7–8.
- Hull S, Harvey C, Strudy P, Carter Y, Pereira F, Ball C and Parsons L (2000) 'Do practice-based preventive child health services affect the use of hospitals? A cross-sectional study of hospital use by children in East London', *British Journal of General Practice* 50(450), 31–6.
- Intercollegiate Committee for Standards for Children and Young People in Emergency Care Settings (2012) *Standards for Children and Young People in Emergency Care Settings*. Royal College of Paediatrics and Child Health.
- ISD Scotland (2010) *Quality Measurement Framework: Emergency admissions*. ISD Scotland: www.isdscotland.org/Health-Topics/Quality-Measurement-Framework/Emergency-Admissions/. Accessed 2 March 2017.
- Jamrozik K, Samarasundera E, Mircle R, Blair M, Sethi D, Saxena S and Bowen S (2008) 'Attendance for injury at Accident and Emergency departments in London: a cross-sectional study', *Public Health Journal* 122(9), 838–44.
- Kennedy I (2010) *Getting it Right for Children and Young People: Overcoming cultural barriers in the NHS so as to meet their needs*. Central Office of Information.
- Kossarova L, Devakumar D and Edwards N (2016) *The Future of Child Health Services: New models of care*. Nuffield Trust. <https://www.nuffieldtrust.org.uk/research/the-future-of-child-health-services-new-models-of-care>. Accessed 2 March 2017.
- Kular D and Chodhari R (2013) 'G164(P) local demographic of paediatric asthma visitors at Accident and Emergency at a district general hospital', *Archives of Disease in Childhood* 98, 75–6.
- Kyle R, Kukanova M, Campbella M, Wolfe I, Powell P and Callery P (2011) 'Childhood disadvantage and emergency admission rates for common presentations in London: an exploratory analysis', *Archives of Disease in Childhood* 96, 221–6.
- McCall G, Corrigan N, Bryson M, McBride K and McMonagle N (2014) 'Acute paediatric admission units (APAU) can reduce overall admissions and improve quality of care in a district general hospital (DGH) setting', *Archives of Disease in Childhood* 99(1), A100–A101.
- Montgomery-Taylor S, Watson M and Klaber R (2015) 'Child health general practice hubs: a service evaluation', *Archives of Disease in Childhood*, doi: 10.1136/archdischild-2015-308910.
- Morgan-Trimmer S, Chanon S, Gregory J, Townson J and Lowes L (2015) 'Family preferences for home or hospital care at diagnosis for children with diabetes in the DECIDE study', *Diabetic Medicine* 33(1), 119–24.
- Munro J, Nicholl JW and Paisley S (2000) *Walk-in Centres: A review of existing research*. Medical Care Research Unit, University of Sheffield.
- National Maternity Review (2016) *Better Births: Improving outcomes of maternity services in England*. NHS England.

- NHS Confederation (2012) *Children and Young People's Health and Wellbeing in Changing Times: Shaping the future and improving outcomes*. NHS Confederation.
- NHS Digital (2013) *HES 2011-12 A&E Data Quality Note*. NHS Digital. <http://content.digital.nhs.uk/catalogue/PUB09624/acci-emer-atte-eng-2011-12-dq.pdf>. Accessed 2 March 2017.
- NHS Digital (2015) *Hospital Episode Statistics (HES) Analysis Guide: March 2015*. NHS Digital. http://content.digital.nhs.uk/media/1592/HES-analysis-guide/pdf/HES_Analysis_Guide_Jan_2014.pdf. Accessed 2 March 2017.
- NHS Digital (2016a) *Hospital Admitted Patient Care Activity 2015-16*. NHS Digital. www.content.digital.nhs.uk/catalogue/PUB22378. Accessed 2 March 2017.
- NHS Digital (2016b) *A&E Data Quality Note: HES 2014-15 annual refresh*. NHS Digital. <http://content.digital.nhs.uk/catalogue/PUB19883/acci-emer-atte-eng-2014-2015-dq.pdf>. Accessed 2 March 2017.
- NHS Digital (2017a) *Hospital Accident and Emergency Activity 2015-16*. NHS Digital. <https://www.gov.uk/government/statistics/hospital-accident-emergency-activity-2015-to-2016>. Accessed 2 March 2017.
- NHS Digital (2017b) *Dataset: 2.3.ii Unplanned hospitalisation for asthma, diabetes and epilepsy in under 19s*. Retrieved from NHS Digital Indicator Portal. <https://indicators.hscic.gov.uk/webview/>. Accessed 2 March 2017.
- NHS Digital (2017c) *Dataset: 3.2 Emergency admissions for children with lower respiratory tract infections (LRTIs)*. Retrieved from NHS Digital Indicator Portal. <https://indicators.hscic.gov.uk/webview/>. Accessed 2 March 2017.
- OECD (Organisation for Economic Co-operation and Development) (2015) *Length of Hospital Stay*. OECD Data. <https://data.oecd.org/healthcare/length-of-hospital-stay.htm>. Accessed 2 March 2017.
- Office for National Statistics (2015) *Birth Summary Tables, England and Wales: 2014*. Office for National Statistics. www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesendlandandwales/2015-07-15. Accessed 2 March 2017.
- Office for National Statistics (2016) *Population Estimates for UK, England and Wales, Scotland and Northern Ireland*. Office for National Statistics. <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>. Accessed 2 March 2017.
- Paton J (2013) *Paediatric Wheeze/Asthma Audit Report 2013*. British Thoracic Society.
- Public Health England (2016a) *Public Health Outcomes Framework*, November. Public Health England. www.phoutcomes.info/. Accessed 2 March 2017.
- Public Health England (2016b) *NHS Atlas of Variation in Healthcare*. Public Health England. www.chimat.org.uk/variation. Accessed 2 March 2017.
- QualityWatch (2015) *Closer to Critical? QualityWatch annual statement 2015*. The Health Foundation and Nuffield Trust. www.qualitywatch.org.uk/annual-statement/2015-closer-critical. Accessed 1 March 2017.
- QualityWatch (2016) *A&E Waiting Times*. The Health Foundation and Nuffield Trust. www.qualitywatch.org.uk/indicator/ae-waiting-times. Accessed 1 March 2017.
- RCPCH (Royal College of Paediatrics and Child Health) (2009) *Short Stay Paediatric Assessment Units*. RCPCH.
- RCPCH (2014) *Epilepsy12: National report of Round 2 of the United Kingdom collaborative clinical audit of healthcare for children and young people with suspected epileptic seizures*. RCPCH.
- RCPCH (2015) *Facing the Future: Standards for acute general paediatric services*. RCPCH.
- RCPCH (2016a) *Service Level Quality Improvement Measures for Acute General Paediatric Services (SLQMAPS)*. RCPCH.
- RCPCH (2016b) *National Paediatric Diabetes Audit 2014-15 Report 1: Care processes and outcomes*. RCPCH.
- RCPCH (2017) *Standards for Short-Stay Paediatric Assessment Units*. RCPCH.

Rudge G, Mohammed M, Fillingham S, Girling A, Sidhu K and Stevens A (2013) 'The combined influence of distance and neighbourhood deprivation on emergency department attendance in a large English population: a retrospective database study', *PloS ONE* 8(7), e67943

Sachedina N and Donaldson LJ (2010) 'Paediatric mortality related to pandemic influenza A H1N1 infection in England: an observational population based study', *The Lancet* 376(9755), 1846–52.

Saxena S, Bottle A, Gilbert R and Sharland M (2009) 'Increasing short-stay unplanned hospital admissions among children in England; time trends analysis '97-'06', *PloS One* 4(10), e7484.

Thompson Coon J, Martin A, Abdul-Rahman A, Boddy K, Whear R, Collinson A, Stein K and Logan S (2012) 'Interventions to reduce acute paediatric hospital admissions: a systematic review', *Archives of Disease in Childhood* 97(4), 304–11.

Tiberg I (2012) 'The initial care when a child is diagnosed with type 1 diabetes', *Lund University, Faculty of Medicine Doctoral Dissertation Series 48*.

Wijlaars L, Hardelid P, Woodman J, Allister J, Cheung R and Gilbert R (2015) 'Contribution of recurrent admissions in children and young people to emergency hospital admissions: retrospective cohort analysis of hospital episode statistics', *Archives of Disease in Childhood* 100(9), 845–9.

Wijlaars L, Hardelid P, Woodman J, Allister J, Cheung R and Gilbert R (2016) 'Who comes back with what: a retrospective database study on reasons for emergency readmission to hospital in children and young people in England', *Archives of Disease in Childhood* 101(8), 714–8.

World Health Organization (2010) *Official ICD-10 Updates 2010*, October. World Health Organization. www.who.int/classifications/icd/ICD-10Updates2010.pdf?ua=1. Accessed 2 March 2017.

About the authors

Eilís Keeble joined the Nuffield Trust as a Research Analyst in October 2015 and is working on a range of quantitative projects relating to health and social care. Prior to joining the Trust, Eilís worked in the Census Transformation Programme at the Office for National Statistics. While there, she worked on developing methods to produce population statistics from administrative datasets. She was also seconded part time to HM Revenue & Customs as part of this project. Eilís holds an MSc in Demography and Health from the London School of Hygiene and Tropical Medicine and a BSc in Human Sciences from University College London.

Lucia Kossarova joined the Nuffield Trust in April 2014 and is involved in quality of care, child health and international comparisons projects. She has over 10 years of experience in international health policy and health systems research and analysis. She joined from the London School of Economics and Political Science (LSE), where she had been a Teaching Fellow. Prior to this, Lucia worked in the Quality Team at the Health, Nutrition and Population unit of the World Bank in Washington, DC. She also worked as senior consultant at a private healthcare consulting company involved in health system reform and HIV/AIDS projects in Central Asia, Eastern Europe and Central America. She continues to be a strategic adviser for the Provida Foundation which invests and provides advice to social ventures with social impact, as well as for project Buddy that focuses on disadvantaged children in Slovakia. Lucia obtained her PhD in Health Policy from the LSE.

Nuffield Trust

The Nuffield Trust is an independent health charity. We aim to improve the quality of health care in the UK by providing evidence-based research and policy analysis and informing and generating debate.

The Health Foundation

The Health Foundation is an independent charity committed to bringing about better health and health care for people in the UK. Our aim is a healthier population, supported by high quality health care.

QualityWatch

QualityWatch, a Nuffield Trust and Health Foundation research programme, is providing independent scrutiny into how the quality of health and social care is changing over time.

Download this publication from our website:

 www.qualitywatch.org.uk/cyp

Find out more:

 www.qualitywatch.org.uk

Subscribe to our newsletter:

 www.qualitywatch.org.uk/newsletter

Follow us at:

 twitter.com/Quality_Watch

Tell us your views:

 feedback@qualitywatch.org.uk

The Health Foundation

90 Long Acre
London WC2E 9RA

020 7257 8000
info@health.org.uk

www.health.org.uk

Nuffield Trust

59 New Cavendish Street
London W1G 7LP

020 7631 8450
info@nuffieldtrust.org.uk

www.nuffieldtrust.org.uk