What are the organisational factors that influence waiting times in Emergency Departments?

Report for the National Co-ordinating Centre for NHS Service Delivery and Organisation R & D (NCCSDO)

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prepared by

Suzanne Mason*

Thomas Locker*

Angela Carter†

Stephen Walters*

Chris Stride†

Joanne Casson*

*Health Services Research Section, School of Health and Related Research, University of Sheffield, Sheffield

†Institute of Work Psychology

Address for correspondence

Miss Suzanne Mason, Health Services Research Section, School of Health and Related Research, Regent Court, 30 Regent Street, Sheffield S1 4DA

Tel: 0114 2220694; e-mail: s.mason@sheffield.ac.uk

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Glossary

ancillary staff Non-health care staff working within the NHS; for example, portering staff.

Audit Commission/Healthcare Commission An independent body, set up to promote and drive improvement in the quality of health care and public health. The Healthcare Commission undertake reviews of Emergency Departments in England and Wales as part of the Acute Hospitals Portfolio. The responsibility for this moved from the Audit Commission to the Healthcare Commission in April 2004.

breach To exceed the national target for all patients attending the Emergency Department to be seen and treated within 4 hours of arrival.

DMC Decision-making clinician; a clinician who can assess and treat patients autonomously. Usually a doctor or an Emergency Nurse Practitioner.

ECG electrocardiograph

ENP Emergency Nurse Practitioner; a nurse in emergency medicine with extended skills to assess and treat patients autonomously with certain minor conditions according to protocols.

ERA ethnographic residual analysis

GP general practitioner

health care assistant An untrained member of staff providing nursing care within the NHS.

IT information technology

NHS Direct the national NHS telephone helpline

P&T Professional and technical staff in the NHS; for example, electrocardiograph technicians.

PAMs Professions allied to medicine within the NHS; for example, physiotherapy, radiography and occupational therapy.

Rapid Assessment and Treatment A method using senior medical staff to assess patients attending the Emergency Department with serious conditions.

rapid-response team A multi-disciplinary team aimed at facilitating patient discharge. May consist of social worker, physiotherapist, occupational therapist, specialist nurse. Often targeted at older people.

See and Treat A method used to rapidly assess and treat patients attending the Emergency Department with minor conditions.

SHO Senior House Officer

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staff grade non-career middle-grade doctor

triage Initial assessment and prioritisation of patients and their clinical condition as they attend the Emergency Department. Usually undertaken by a trained nurse.

TT Treatment time; the time from seeing a decision-making clinician until the patient leaves the Emergency Department.

type 1 Emergency Department An Emergency Department providing a consultant-led 24-hour service with full resuscitation facilities and designated accommodation for the reception of emergency patients.

waiting time The time from booking in to being seen by a decision-making clinician in an Emergency Department.

WTE whole-time equivalent

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Executive Summary

Definition and measurement of waiting times varies considerably between studies, making it difficult to identify developments or standards in this area of research. The definition of waiting time used in this study is the mean time from arrival to seeing a decision-making clinician. The Glossary gives definitions of all terms in this report.

The aim of the study was to answer the question: what are the organisational factors that influence waiting times in Emergency Departments and what mechanisms are available to improve waiting times?

A mixed-methods approach has been used to address this question. The study has a number of different components: a review of policy and published literature; a re-analysis of data from the Audit Commission review of Emergency Departments in 2000; and an analysis of data gathered from Emergency Departments in one large English city over an 11-year period. The main part of the study involved a national survey of Emergency Departments. This was performed in two phases.

Phase One involved structured interviews with the lead clinician, head nurse and business manager in each participating department; collection of routine patient-level data in each participating department and an analysis of Healthcare Commission data collected over the same time period.

Phase Two involved an in-depth study of eight Emergency Departments to identify additional organisational factors not accounted for in Phase One of the study.

Re-analysis of the Audit Commission data (2000) identified two variables; after correcting for department size and case-mix there are significant independent predictors of the percentage of patients seen within 1 hour of arrival. These are the percentage of senior nurses (Grade G+) and the percentage of unqualified nurses (Grades A–C). Perhaps the most notable finding is that the number of senior nurses has a negative impact upon performance whereas the number of unqualified nurses has a positive impact.

A detailed, 11-year study of attendance data of two adult Emergency Departments in England revealed changes in attendances and case-mix over the period. The average increase in attendances was 1.3% per annum. The profile of patients attending had changed, with proportionately more older people, more arrivals by ambulance, more acute illness than trauma and more so-called major cases. Median

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treatment time for patients categorised as 'majors' had increased considerably whereas 'minors' had remained static. Further, the proportion of patients subsequently admitted to hospital had also increased. When compared to the Audit Commission data for a similar period these data appear to mirror trends in departments elsewhere indicating increasing waiting time for major cases.

Phase One of the study involved a national study that was undertaken to identify further variables that may influence waiting time. Examination of 137 major Emergency Departments in England and Wales was undertaken. The first phase of the study involved structured interviews with the lead clinician, head nurse and business manager along with the collection of routine patient-level data together with data collected by the Healthcare Commission.

A stepwise regression technique was used to explore these variables. Mean waiting time (Healthcare Commission source) was used as the dependent variable. The first step was to regress case-mix and department size. These two factors accounted for 14.1% of the variability in mean waiting time. Each variable from the national data collected was then regressed separately following the previous step. The potentially predictive variables were then subsequently entered into a multivariable linear-regression model. The final model (hours lost to nursing sickness, amount of non-pay spend, management style of the lead clinician) accounted for a further 35.5% of the variability in mean waiting times.

The finding that management style of the lead clinician was important prompted a re-examination of the Phase One interview data, revealing that a participative management style was associated with inclusivity of staff at general team meetings, reduced role conflict of staff associated with the department, increased information on work performance and increased leader support and reduced autonomy and control for nurses, doctors and managers. Further, a participative management style of the lead clinician was associated with increased collaboration with other departments in the Trust and a more positive view of morale in the Emergency Department.

Phase Two of the study involved an in-depth analysis of eight Emergency Departments and was undertaken using interviews, focus groups, ethnographic observations and a staff questionnaire. While these departments were selected on the basis of a range of performance and situational variables, the research team undertaking this work were blind to the performance information. Qualitative analyses revealed that better-performing Emergency Departments were proactive in managing working relationships with different parts of the hospital, Trust, primary care and secondary care services. Poorly performing departments were reactive in their approach to managing bed shortages, issues within the Emergency Department and issues of presentation of patients to the department. In

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addition, qualitative examination of team working indicated that higher-performing departments are more proactive, prioritised work, described specialist areas where doctors and nurses work together (e.g. See and Treat) and demonstrated co-operative leadership strategies between the head nurse and lead clinician. These leaders empower others to take decisions at a local level in the department, facilitating effective working. Developmental activities take place in high-performing departments to increase staff skill and competence along with reflexive activities looking back at waiting-time breaches with the aim of improving performance.

As part of the in-depth study, a questionnaire survey of seven of the eight Emergency Departments revealed strong relationships between waiting time and stress (psychological strain), and between autonomy and control more specifically. This indicated that departments with longer waiting times are more likely to report higher-than-average levels of strain and higher-than-average levels of autonomy and control over work.

In summary, this study identifies that, after case-mix and department size are taken into consideration, less time lost to nursing sickness, lower non-pay spend within a department and a more participative management style of the lead clinician will all improve waiting times. Close examination of nursing sickness in relation to communication between medical and nursing staff in the department and also psychological strain on staff may help in understanding the importance of this factor in the model.

Spending less on facilities and clinical practice in a department may reflect the type of clinical behaviour if a department adheres strictly to protocols then the number and types of investigations and treatments provided may be limited, thereby reducing overall costs and speeding up processes. A participative management style is a broad term suggesting proactive leadership and boundary-spanning and developmental behaviour that will reduce role conflict and increase co-operation and collaboration within the department along with other agencies associated with emergency medicine. These activities may reduce individuals' autonomy and control, requiring people to work together in a co-operative way to reduce waiting times. A holistic approach viewing emergency medicine as an integral part of both primary and secondary services will enable proactive behaviours to develop.

Many emergency departments already report mechanisms they believe could reduce waiting times, or systems they have already put in place to reduce waiting times. These are varied and the evidence that they are effective is not available. None of the initiatives related to those found through our modelling process. However, there was evidence in several Emergency Departments of joined-up working and boundary-spanning practices.

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This study has mainly identified some important factors that require further investigation. The direction of causality between waiting times and the organisational factors identified is not clear. More work is needed in the form of intervention studies to identify the effect of changing the organisation or performance. Further recommendations include exploring the issue of safety and quality of care so that performance and change can be linked appropriately with patient outcome.

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The Report

Section 1 Introduction and background to the study

The Audit Commission (2001) previously have shown that Emergency Department waiting times in England and Wales vary substantially, but their work was able to account for only a small proportion of this variation. This, in conjunction with the findings of the SDO listening exercise identified the need for this study (Fulop and Allen, 2000).

The aim of the study was to answer the question: what are the organisational factors that influence waiting times in Emergency Departments and what mechanisms are available to improve waiting times?

A mixed-methods approach has been used to address this question. The study has a number of different components:

- a review of policy and published literature;
- re-analysis of data from the Audit Commission review of Emergency Departments in 2000;
- an analysis of data gathered from Emergency Departments in one large English city over an 11-year period;
- a national survey of Emergency Departments.

The national survey of Emergency Departments took place in two phases. Phase One consisted of the following:

- structured interviews with the lead clinician, head nurse and business manager in each participating department;
- collection of routine patient-level data in each participating department;
- analysis of Healthcare Commission data collected over the same time period.

Data collected through Phase One of the national survey of Emergency Departments was then used to identify important organisational factors that predict waiting times. A linear regression approach was taken to develop a model of factors from Phase One of the study.

Phase Two of the national survey consisted of an in-depth study of eight Emergency Departments to identify additional organisational factors not

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accounted for in Phase One of the study. Having identified organisational factors, the study used the findings from Phase Two to examine what mechanisms are available to improve waiting times.

Section 2 of this report contains the policy context and reviews the literature relevant to this study. The aims, methods, results and discussion regarding the findings from the re-analysis of the Audit Commission data and the analysis of the urban Emergency Department data are presented in Appendices A and B respectively. A national study of Emergency Departments was conducted in two phases. The first phase was undertaken by interviews with key staff in a large number of departments in England and Wales (the national survey). In the second phase a small number of departments were evaluated through further detailed investigation of how the departments worked together. The methods and results from Phase One of the study are outlined in Section 3. The methods and results of Phase Two of the study are outlined in Section 4. The mechanisms available to improve waiting times are outlined in Section 5. The discussion is presented in Section 6 and incorporates findings from all components of the study.

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Section 2 Policy context and literature review

2.1 Policy context

The Patient's Charter in 1991 (Department of Health, 1991) established two standards for waiting times in Emergency Departments in England. These were the time from arrival until initial assessment (triage) and the time from a 'decision to admit' being made to the actual admission time. The Audit Commission (2001) have highlighted a number of problems with these measures. The former gives no indication of the time patients subsequently wait to see a doctor, the Audit Commission having previously demonstrated that some departments with the shortest waits for initial assessment had some of the longest waiting times to see a doctor (Audit Commission, 1998). However, the second measure did not indicate a period that was meaningful to patients.

Edhouse and Wardrope (1996) demonstrated that there was no correlation between performance in relation to the former target and the quality of the initial assessment performed. In its assessment of Emergency Department performance the Audit Commission developed two performance measures, the time from arrival to seeing a doctor or nurse practitioner and the time from arrival to admission for patients admitted to hospital (Audit Commission, 1998). These measures have been used subsequently by the Audit Commission to collect waiting-time data.

The Audit Commission (2001) have previously shown that waiting times are a key determinant of patient satisfaction. As a result of the NHS Plan, published by the Department of Health in 2000, which outlined a plan for reform of the NHS, a new target was established for Emergency Departments in England, such that:

> *By 2004 no-one should be waiting more than four hours in Accident and Emergency from arrival to admission, transfer or discharge.*
>
> Department of Health (2000)

It was envisaged that as a result of meeting this target average waiting times would fall to 75 minutes, although waiting time itself never formed part of the target. Following establishment of this target, Emergency Departments worked towards its achievement via a series of incentive-backed intermediate targets. These are shown in Table 1 (Bacon, 2004).

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Table 1 Emergency Department targets and incentives

Proportion of patients seen within 4 h	From	To	Incentive amount
Average 94%	1 March 2004	31 March 2004	£100,000
Average 95%	1 April 2004	30 June 2004	£100,000
Average 96%	1 July 2004	30 September 2004	£100,000
Average 97%	1 Oct 2004	31 December 2004	£100,000
Average 98%	1 Jan 2005	31 March 2005	£100,000

As a consequence of these targets, Emergency Department performance in England has been under considerable scrutiny and has been shown to have improved when measured against the 4-hour standard (Department of Health, 2004; National Audit Office, 2004). However, concerns have been raised about how this has been achieved (British Medical Association, 2005; Locker and Mason, 2005).

2.2 Literature review

A number of different measures of Emergency Department performance are reported in the literature. In much of the North American and Australian literature a frequently reported measure is the number of episodes of ambulance diversion (Frank, 2001; Kelen *et al*., 2001; Fatovich and Hirsch, 2003). This often occurs in response to Emergency Department crowding, which is used as a further measure of performance (Feferman and Cornell, 1989; American College of Emergency Physicians, 1990; Gallagher and Lynn, 1990; Andrulis *et al*., 1991; Grumbach *et al*., 1993; Shih *et al*., 1999; Derlet and Richards, 2000; Miró *et al*., 2000; Richards *et al.*, 2000; Derlet *et al*., 2001; Frank, 2001; Kelen *et al*., 2001; Schull *et al.*, 2001; Espinosa *et al.*, 2002; Cardin *et al*., 2003; Fatovich and Hirsch, 2003; Liu *et al.*, 2003; Proudlove *et al.*, 2003; Schafermeyer and Asplin, 2003). Measures such as ambulance diversion are seldom used in relation to UK practice. A particular difficulty with measures is their lack of definition, often being applied subjectively by Emergency Department staff.

As outlined above, current national performance targets in England are based upon a patient's total length of stay in the Emergency Department (Department of Health, 2000). This measure is reported in studies from many different health-care systems (Abramowitz *et al*., 1989; Kilmarx *et al.*, 1991; Lane *et al*., 2000).

Waiting time is reported as a performance measure in studies from many different countries. However, its definition varies, in some instances

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describing a period whose endpoint is placement in an Emergency Department room and not assessment by a clinician. A widely reported measure of performance is the proportion of patients who leave the Emergency Department prior to being seen by a clinician. The cause is often multifunctional and has been shown to be related to other measures of performance, such as waiting time (Mohsin *et al*., 1998; Kyriacou *et al*., 1999).

The evidence relating to factors which affect waiting time is outlined below. Where such evidence is lacking for a particular factor, other appropriate evidence is presented. A systematic review of the literature in this area has recently been undertaken by Cooke *et al*. (2005) and the reader is directed to this for a more extensive appraisal of the literature.

2.2.1 Patient satisfaction

Waiting times have been shown to be important to patients, with those who see a doctor more quickly increasingly likely to rate the care they received as excellent or very good (Commission for Healthcare Audit and Inspection, 2005). A review by Trout *et al*. (2000) found that perceived waiting time, but not necessarily actual waiting time, was inversely associated with satisfaction. However, the authors conclude that as the reviewed studies were cross-sectional, causality could not be established. A more recent review, by Taylor and Benger (2004), examined the factors that influence patient satisfaction in the Emergency Department. They comment that the most frequently assessed factors in the literature were actual and perceived waiting time. Their review found that three 'service factors' influence patient satisfaction. These were the interpersonal skills and attitudes of staff, the provision of information or explanation to patients, and waiting times. However, they were unable to determine the relative importance of these factors.

2.2.2 Socio-demographic factors

A study of five Australian Emergency Departments examined the relation between waiting time and socio-demographic characteristics of patients (Mohsin *et al*., 1998). Waiting times were found to be significantly longer for female patients, patients of lower socio-economic status and patients with no health insurance. Waiting times were also significantly longer for patients born in non-English speaking countries and varied according to the age of the patient, being shortest for those aged less than 15 years (51.7 minutes) and longest for those aged 15–44 years (55.3 minutes). All of these factors were found to be significant, independent predictors of waiting time when assessed in a multivariate, linear-regression model.

A retrospective study of two American Emergency Departments has investigated the effect of race on total time spent in the department. The

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authors studied patients presenting with small lacerations that required suturing. They found no difference in total length of stay after differences in time of presentation had been taken into account (Kilmarx *et al.*, 1991).

Lambe and colleagues (2003), in a study of waiting times in Californian Emergency Departments, found that increased waiting time occurred in hospitals serving poor neighbourhoods, demonstrating that, when corrected for hospital and Emergency Department characteristics and case-mix, each $10,000 decrease in per-capita income of the population served was associated with an increase in waiting time of 10 minutes. No studies were found that examined the relation between socio-demographic factors and waiting times in UK Emergency Departments.

2.2.3 Case-mix

Patients with the least-serious illnesses have been shown to wait longest to see a doctor, but once seen spend only a short period of time undergoing assessment and treatment (Saunders, 1987). The author of this report concludes that waiting times are only important in relation to patient acuity.

Graff *et al*. (1993) have studied the length of time Emergency Department physicians were directly involved in providing care (the physician service time) to different categories of patients in the Emergency Department. The mean time was 9.8 minutes for walk-in patients, 25 minutes for laceration repair, 55.6 minutes for patients undergoing observation and 31.9 minutes for critical-care patients. The intensity of service (defined as physician service time divided by total length of stay in the Emergency Department) was greatest for patients undergoing laceration repair (0.23), similar for critical care (0.18) and walk-in patients (0.17), and lowest for patients undergoing observation (0.07). Although the study did not examine the effect of case-mix upon waiting time, it does provide evidence to support the hypothesis that performance is dependent upon case-mix. An observational study by Tham *et al*. (1995) provides further evidence. The authors observed the activities of Senior House Officers (SHOs) in an Emergency Department in the UK. The time spent with each patient was found to vary according to the area of the department to which the patient had been directed, being greater for patients in the 'trolley area' than the 'walking wounded' area. Case-mix was not related to waiting time but the authors conclude in general that case-mix should be considered in planning departmental staffing needs.

Although case-mix may be important, it is difficult to separate its influence from other department characteristics. This is illustrated in a study Byrne *et al*. (2000), which compared the management of patients

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with minor injuries in three settings: a traditional Emergency Department, a minor-injury unit based in an Emergency Department staffed by Emergency Nurse Practitioners (ENPs), and a nurse-led minor-injury unit separate to an Emergency Department. Mean waiting time as found to be highest in the traditional Emergency Department model (67 minutes) and lowest in the separate minor-injury unit (23.1 minutes).

2.2.4 Hospital characteristics

In one study from the USA waiting times have been shown to be significantly longer in teaching hospitals, public hospitals and trauma centres (Lambe *et al*., 2003). In Emergency Departments in England and Wales, the Audit Commission (2001) have shown waiting times to be longer in departments with a greater number of attendances and in those departments within London, whereas waiting times were shorter in departments set in rural areas. Little other literature exists to support these findings. The effect of reorganisation of emergency-care facilities in a UK city has been reported in one study (Simpson *et al*., 2001). The authors observed the effect of centralisation of two adult Emergency Departments to one site, with the centralisation of paediatric Emergency Department facilities to a separate site. In addition, a separate minor-injury unit was established on the site of the adult Emergency Department that closed. When the system was assessed as a whole, performance had deteriorated following the reorganisation, with the proportion of patients seeing a doctor within 1 hour decreasing from 76 to 71%. These studies suggest that the characteristics of the hospital in which the Emergency Department is based and the organisation of health services can impact upon Emergency Department performance.

Cooke *et al*. (2005) reviewed the literature regarding bed management and Emergency Department waiting times and concluded that there was a paucity of evidence. However, some evidence is provided from a study simulating the activities of a hospital. Lane *et al*. (2000) used system-dynamics modelling to examine the effect of alterations to the number of inpatient hospital beds. They investigated changes in bed capacity from 700 to 900 beds. This was found to have little effect upon mean waiting times, mean time until a decision to admit was made or the total time spent in the Emergency Department. However, the rate of cancellation of elective admissions was found to be highly sensitive to changes in bed capacity, increasing markedly with reductions in the number of available beds (Lane *et al*., 2000).

There is limited evidence that direct admission rights to wards by Emergency Department teams, rather than having each admission approved by the admitting specialty, can reduce waits in the Emergency Department (Cooke *et al*., 2005).

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2.2.5 Emergency Department facilities

Miró *et al*. (2003) studied the effect of reorganisation of staff and facilities in an Emergency Department. They demonstrated that by increasing the total number of cubicles from 38 to 57 and increasing the average number of personnel working in the Emergency Department each day from 22.5 to 30.2, mean waiting time was reduced from 87 to 24 minutes. This improvement occurred in spite of an increase in the number of attendances at the department. Further evidence for the benefits of increasing the number of available beds in an Emergency Department is provided by Kyriacou *et al*. (1999). They undertook a 7-year study of patients presenting to one US Emergency Department and found that the median time from arrival to initial medical assessment was significantly less when an Emergency Department bed was immediately available (1.9 compared with 2.8 hours; Kyriacou *et al*., 1999).

Another way to provide increased beds in an Emergency Department is to use an observation or clinical-decision unit to hold some patients. Cooke *et al*. (2005) reviewed the evidence with regard to such units and found that they can reduce admission and total length of stay in the Emergency Department. However, none of the studies reviewed reported changes in Emergency Department waiting time.

2.2.6 Working practices

There is limited evidence that bedside registration or only partial registration prior to triage may decrease waiting time (Cooke *et al*., 2005).

In recent years most Emergency Departments in the UK have performed some form of triage, particularly following a target established by the Patient's Charter that all patients should undergo an assessment of the severity of their complaint immediately upon arrival (Department of Health, 1991). A study by Edhouse and Wardrope (1996) of 151 English Emergency Departments found the process to be variable. In a review of triage, Wilkinson (1999) asserts that although the process may have some effect in reducing waiting times, for example by redirecting some patients to other appropriate health-care providers such as general practitioners (GPs), it may in fact extend the waiting time of patients who present with the most urgent conditions. These findings are supported by those of Cooke *et al.* (2005), who conclude that if the only purpose of triage is to prioritise patients then it may introduce delays but that it may also have the opposite effect if investigations or treatments are initiated.

Walley (2003) has reviewed the literature on manufacturing process design and relates this to Emergency Department workload and flow. Using data from two departments he concluded that triage beyond a

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simple urgent/non-urgent categorisation introduces delays but adds no value for non-urgent cases.

In a survey of 185 American Emergency Departments, Purnell (1991) found that the absence of fast-track systems was associated with a 25% increase in waiting times. However, neither waiting time nor what constitutes a fast-track system is defined in this paper and it is therefore difficult to relate this to UK practice. Cooke *et al*. (2005) have examined the literature on fast-track systems for patients with minor conditions and concludes that all the published studies showed improvement in waiting times for this group of patients although there were methodological weaknesses with many published studies. However, many of these studies have not examined the effect that such systems have on other patients in the Emergency Department; for those studies that did so, on the other hand, did not demonstrate any deterioration in waiting times. These findings are supported by Walley (2003), who concludes that 'See and Treat' provides the best method for dealing with minor cases from a manufacturing standpoint, providing a one-stage process that achieves 'quality and flexibility simultaneously'.

Lau and Leung (1997) investigated the effect of a 'small team consultation system'. In this system available medical staff were divided into two teams, each being assigned cases equally in terms of number and complexity. Previously patients waiting to be seen formed a single queue. Using this system the mean waiting time was reduced from 35.2 to 22.1 minutes, in spite of a 4% increase in attendances during the intervention phase. The authors suggest that the improvements result from improved staff motivation and clearer lines of responsibility. However, it is interesting to note that nursing staff did not form part of the teams, which were restricted to medical staff only (Lau and Leung, 1997). Hirshon *et al*. (1996) studied the effect of a similar system whereby patients were assigned in turn to a separate queue for each doctor working in an Emergency Department. When assessed 1 year later waiting time had decreased significantly for both medical and surgical patients. However, the period of time from being seen until disposition had fallen for medical cases but increased for surgical cases. Tham *et al*. (1995) observed the work of SHOs in a UK Emergency Department to determine the periods of time they spent on particular tasks. They found that on average 39.7% of their time was spent on patient contact and 18.7% on writing clinical notes. Some 18.5% of their time was classified as being involved in 'non-doctor' tasks such as waiting on the telephone, intravenous treatment and searching for notes.

Walley (2003) reported that manufacturing theory would suggest the need to decentralise services such as radiology and pathology, with high-volume processes being dealt with by dedicated small-scale technology. Cooke *et al*. (2005) reviewed the literature on laboratory tests in relation

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to the Emergency Department. The reported studies describe delays in turnaround time, the effect of point-of-care testing and the use of satellite laboratories. However, none of the studies reported examined the effect on waiting time, describing instead the effect on turnaround time for the test result or total length of stay in the Emergency Department. Cooke *et al*. (2005) found similar results with regard to radiology, with improvements in the total time spent in the department reported by several studies, but none examining changes in waiting time.

2.2.7 Staffing

In their review of Emergency Departments in 2001 the Audit Commission found that the level of nurse staffing varied considerably between departments, ranging approximately from 1000 to 2000 attendances per nurse per annum. However, they found that the level of nurse staffing was not related to waiting times. Similarly, they showed that the level of medical staffing ranged from 2000 to 6000 attendances per doctor per annum but this too was unrelated to waiting times (Audit Commission, 2001). This would suggest that working practices must adapt to staffing levels and case-mix to maintain performance.

The review by Cooke *et al*. (2005) reports a number of studies describing the use of GPs working in Emergency Departments but none related this to waiting times. This systematic review also found very limited evidence with regard to staffing levels, skill-mix or the use of nurse practitioners in the Emergency Department. However, there was some evidence that increased use of senior medical staff may reduce delays (Cooke *et al*., 2005). The role of other professional groups, such as paramedics and physiotherapists, working within the Emergency Department has yet to be adequately assessed.

2.2.8 Bonus payments

One study has examined the effect of bonus payments on Emergency Department performance (Cameron *et al*., 1999). The payments made to each hospital were reduced by episodes of ambulance diversion, failure to meet waiting-time targets and episodes where patients waited more than 12 hours for an inpatient bed. The authors demonstrated that following introduction of the bonus scheme performance against the targets improved with regard to all except the wait for inpatient beds.

A system of bonus payments has recently been used in England to improve Emergency Department performance against the '4-hour' target (Bacon, 2004). However, although performance has been shown to have improved (Department of Health, 2004), the contribution of bonus payments to this improvement has not been investigated.

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2.2.9 Emergency Department management

Spaite *et al*. (2002) describe a rapid process redesign in a university Emergency Department. A number of working practices were revised and staffing increased in response to a detailed analysis of sources of delay in the Emergency Department. These changes achieved a 90% reduction in median Emergency Department waiting time, although it is not possible from the data reported to assess the effect of individual components. Similarly, the results are unlikely to be generalisable. The authors subjectively ranked the changes implemented and suggested that the most effective measure was to have an Emergency Department physician appointed as administrative director of the department (Spaite *et al*., 2002).

Browne *et al*. (2000) studied the effect of a 'seamless model' of management in a paediatric Emergency Department. In this model Emergency Department staff and facilities were reorganised to provide smooth flow of patients through the department, moving away from the traditional 'assembly line' model where patients waited to be seen until a doctor was available. Doctors and nurses were assigned in teams, seeing groups of patients of similar acuity. This alteration to working practices reduced mean waiting time from 92.1 to 55.3 minutes.

2.2.10 Change management

Chinnis and White (1999) have applied concepts from chaos theory to describe elements of Emergency Department function. They describe Emergency Departments as complex adaptive systems and suggest that a number of beliefs form the 'dominant logic' of the department, this being a major influence upon the way in which the department adapts to changes in circumstances. The beliefs forming the dominant logic are that:

- waits are unavoidable and acceptable;
- the customer is captive;
- it is too expensive to deliver primary care;
- Emergency Departments are for life-threatening emergencies only
- providers must achieve proficiency in critical care only;
- pre-hospital emergency medical services are for emergencies only;
- more nurses and fewer ancillary providers means better care.

Chinnis and White (1999) state that these beliefs must be challenged for the status quo to alter. Although this paper relates to North American practice, many of the ideas are applicable internationally.

VanRooyen *et al*. (1999) undertook a survey of 100 US Emergency Departments to investigate the perceived effectiveness of Total Quality

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Management. Of the 60 Emergency Departments that responded, 60% reported using Total Quality Management as part of their quality-improvement initiatives. The authors found that the participation of Emergency Department staff in Total Quality Management projects was low. The study found that 61% of Emergency Department directors or administrators rated their Total Quality Management programmes as ineffective.

A study of Emergency Department staff involved in the Emergency Services Enhancement Program in Victoria, Australia, identified a number of factors thought by staff to be important in bringing about improvement in Emergency Department services (Cobelas *et al*., 2001). The five factors identified were changes in staff profile, managing patient flow in the Emergency Department, changes in administrative policies, changes in work practices and changes in staff numbers. The programme achieved a 20% improvement in waiting time as perceived by participants of the study.

2.2.11 Work factors

Working in a health-care environment can be as difficult and stressful as it can be rewarding and challenging depending on individual perception and cognition (Lazarus and Folkman, 1984; Payne, 1999). The Emergency Department is an area of complex and challenging work where different health-care professionals are required to work together to achieve effective patient outcomes. There is good evidence that working in teams enables people to more effectively meet the challenges of this type of work (Carter and West, 1999). A large-scale survey of stress in health-care organisations in England (Wall *et al*., 1997; Borrill *et al*., 1998a) identified that individuals who work together in well-defined teams have clear, shared objectives, need to work with each other to achieve those objectives, have different roles for team members and recognise a team as performing a specific function. These individuals are more likely to report lower levels of psychological stress and better job satisfaction than those who work in less clearly defined teams (teams that do not share the above criteria; Carter and West, 1999). However, in this study, the number of teams working in an Emergency Department were few, making the evaluation of effective work grouping in that context limited.

Emergency working crosses both professional and organisational boundaries involving various members of secondary and primary health care teams, GPs, social workers, and mental health and ambulance services. Structures and processes that enable people to work together effectively across boundaries are not common. Studies show there is little appreciation of roles and responsibilities of other professionals (Poulton, 1995) and role ambiguity and role conflict are common experiences

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(Spaite *et al*., 2002). These difficulties were recognised in national reports (Miró *et al*., 2003) identifying separate lines of control, payment systems, diverse objectives, professional barriers and perceived inequalities in status limiting efficient team working. In particular, the piecemeal development of health care over its history has led to a lack of an agreed model of leadership (West and Slater, 1996) that might lead to proactive management strategies encouraging effective working in these complex environments.

Managers have a critical role, and are central to organisational effectiveness (Cameron *et al*., 1999), particularly as they create the climate for working together. Key is the extent to which managers encourage or discourage subordinates to become involved in, or take responsibility for, decisions relevant to their own work activity. Research examining the concept of participation is extensive, originating from the Hawthorne studies (Roethlisberger and Dickson, 1939) and developed by Argyris (1964), Likert (1967) and McGregor (1960). More recent studies of health-care staff demonstrate that major causes of stress for staff are high work demands, low influence on decisions, conflicting job demands, poor feedback on work performance and lack of clarity about job roles (Borrill *et al*., 1998a). Taken together, this literature provides key work factors valuable for exploring the context of effective working in Emergency Departments.

The next section presents the first phase of the study examining the factors influencing Emergency Department waiting times. This phase is the national survey of Emergency Departments where interviews with lead clinicians, head nurses and business managers of participating departments took place.

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Section 3 National survey of Emergency Departments

3.1 Aims

This part of the study aimed to identify organisational factors that predict waiting times in Emergency Departments in England and Wales. The first phase aimed to examine these factors in a large number of departments and develop a model to predict waiting times. The second phase aimed to identify further factors, not identified in Phase One, by in-depth study of a small number of departments.

3.2 Phase One methods

The Healthcare Commission was due to undertake a review of Emergency Departments in England and Wales coincident with the data collection for this part of the study. Following discussion with representatives from the Healthcare Commission and with the project steering committee it was decided to work in collaboration with the Healthcare Commission on this phase of the study thus avoiding any duplication of data collection and effort. Data collection for this phase of the study was therefore undertaken by three methods; data collected by the Healthcare Commission, structured interviews with key Emergency Department staff and abstraction of data from Emergency Department information technology (IT) systems. Each method is outlined below.

3.3.1 Ethics and Research Governance approval

Multi-centre research ethics committee approval was obtained prior to commencement of the study (Eastern MREC reference 03/5/072). Research Governance approval was obtained for the 137 Emergency Departments consenting to participate in the study, which were from 112 NHS Trusts. Further detail is given in Appendix C.

3.2.2 Healthcare Commission data

The Healthcare Commission undertake reviews of Emergency Departments in England and Wales as part of the Acute Hospital Portfolio. The responsibility for this moved from the Audit Commission to the Healthcare Commission in April 2004. It is mandatory for departments to participate in these reviews.

The data-collection tool for this part of the study was developed jointly by staff from the Healthcare Commission with input from the study team. It

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was based upon those used previously by the Audit Commission, with a number of questions added for the purpose of this study. Data collection is undertaken in the following way.

Auditors from the Healthcare Commission met with key personnel from each Trust to train them in the use of the data-collection tool. Each Trust completed the electronic data-collection tool, which had inbuilt validation. This was subsequently returned to the Healthcare Commission where the results were extracted and reviewed. The data were then checked and returned to the submitting department for final validation. Upon completion of validation these data were passed to the study team for analysis (see Appendix D for the data-collection tool).

3.2.3 Interviews with key Emergency Department staff

Structured interviews were undertaken with the lead clinician, head nurse and business manager of each department. The interviews each consisted of two sections. Section 1 contained items related specifically to the interviewee's role within the Emergency Department. This section was developed with input from the following sources:

- review of published literature;
- Audit Commission reports on Emergency Departments;
- key stakeholders: patient's representatives, Emergency Department clinicians, nurses and managers, and senior managerial staff from acute NHS Trusts providing emergency care;
- academics with expertise in the field of emergency-care research.

Section 2 was common to all three interviews and sought information regarding:

- management style[1];
- inclusivity of various staff groups working in the Emergency Department;
- work characteristics (such as autonomy and control, work demands, role clarity, role conflict, professional compromise[2] and leader support[3]);

[1] Work by Sadler (1970) suggests that there are four distinct management styles: telling, selling, consulting and joining, indicating an increasing level of participation in decision-making.

[2] The level of professional compromise refers to the extent to which individuals believe staff in the Trust have to compromise professional standards in carrying out their work to meet conflicting objectives, such as reducing financial costs or coping with inadequate staff levels.

[3] Leader support is the extent to which staff can count on their immediate supervisor to listen when they need to talk about problems at work.

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- ratings comparing their Emergency Department with others in terms of collaboration among staff groups, morale and effectiveness.

This section was developed from the literature review by occupational psychologists in the research team (see Appendix E for the interview schedules).

The interviews were undertaken by individuals recruited from a number of geographical areas, all of whom were either Emergency Department clinicians or academic staff with experience of emergency-care research. Each interviewer underwent training in the data-collection methods prior to undertaking the interviews.

The interviews were predominantly undertaken face to face in the Emergency Department where the interviewees worked and at a time convenient to them. However, in the later stages of the study a small number of interviews were conducted by telephone to maximise the number of departments in which all three interviews were completed. Telephone interviews were only undertaken by experienced researchers with prior experience of telephone-interview techniques.

3.2.4 Abstraction of data from Emergency Department IT systems

Each participating department was asked to provide a sample of data detailing all new attendances occurring during April 2004. For each attendance the following patient information was collected:

- age,
- sex,
- mode of arrival,
- time of arrival, time seen by a clinician and time leaving the Emergency Department,
- disposal from the Emergency Department.

3.2.5 Phase One recruitment

All 211 type 1 Emergency Departments in England and Wales were invited to participate in this study. The lead clinician of each department and the Chief Executive of each Trust containing an Emergency Department were contacted by letter inviting them to participate. The letter contained information about the study and a consent form. Where no response was received, a follow-up letter was sent to them on two further occasions, at 1-month intervals, seeking consent to the study. Of the departments approached, 137 (64.9%) consented to participate in the study and 16 (7.6%) refused. No response was received from the remaining 58 (27.5%) departments. Participating departments were recruited from 112

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acute NHS Trusts in 31 Strategic Health Authorities in England and Wales. Details of the Strategic Health Authorities are given in Appendix C.

3.3 Phase One data analysis

3.3.1 Sample of new attenders in April 2004

As previously mentioned the mean waiting time was calculated for each of the departments submitting data. Agreement between the mean waiting time from these data and that reported in the Healthcare Commission data was examined using methods described by Bland and Altman (1995). Where Healthcare Commission data on mean waiting time were not available, the sample-data mean waiting time was used as a proxy in the subsequent analyses.

3.3.2 Data from structured interviews

Interviews with the lead clinician, head nurse and business manager were examined with descriptive statistics. For the second section of these interviews, it was particularly important to look at the match of responses from the three parties to see whether they agreed or disagreed on the various aspects of departmental working. Intra-class correlation coefficients were calculated for key variables. Following development of the multivariate model, chi square (X^2) analyses were used to examine trends in relationships among variables identified by the model.

3.3.3 Data from the Healthcare Commission instrument

The information collected and provided by the Healthcare Commission were examined using descriptive statistics.

3.3.4 Development of the regression model

A stepwise linear-regression approach was taken to analysing all these data. In the first step of the regression analysis the variation in mean waiting time arising from differences in case-mix and department size was controlled for. The variables used to reflect these in each department were:

- percentage of patients aged 65 years or over,
- percentage of patient aged less than 16 years,
- percentage of patients arriving by ambulance,
- percentage of patients admitted,
- percentage of patients referred the Emergency Department by a GP,
- department size.

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Each of the variables from the Healthcare Commission and section 1 of the structured interview data were then regressed individually upon the residual waiting time. Those showing potentially significant associations ($P<0.1$) were subsequently entered into a multivariate linear-regression model using a stepwise elimination algorithm.

Following development of the model in the preceding step potentially predictive variables from section 2 of the structured interview data were entered into the model to determine whether they could explain any of the remaining variability.

3.4 Results

3.4.1 National survey data: section 1

Staff interviews

Interviews with lead clinician, head nurse and business manager were undertaken from May 2004 to May 2005. A total of 351 interviews were completed during this time. All three interviews were completed in 109 (79.6%) of the 137 participating departments. In a further 14 (10.2%) departments at least one interview was completed. In the remaining departments it was not possible to complete any of the interviews during the period studied. It can be seen from Table 2 that there were no differences in the characteristics of the departments where no interviews were completed and those where at least one interview was undertaken.

Table 2 Characteristics of departments in which at least one interview was completed compared with departments where no interviews were completed

Characteristic	No interviews completed			One or more interviews completed		
	Mean	*95% CI*		*Mean*	*95% CI*	
		Lower	*Upper*		*Lower*	*Upper*
Aged 65+ (%)	17.57	15.81	19.33	18.12	17.33	18.92
Children (%)	23.20	19.22	27.19	21.49	20.63	22.34
Admitted (%)	6.53	5.04	8.03	6.98	6.13	7.84
GP referrals (%)	20.88	18.59	23.18	19.90	18.80	21.01
Arriving by ambulance (%)	25.48	23.20	27.76	24.34	23.04	25.64
No. of attendances	64,054	53,697	74,411	62,449	58,657	66,241

CI, confidence interval.

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Healthcare Commission data

Of the participating departments, 136 (99.3%) submitted data to the Healthcare Commission as part of the Acute Hospital Portfolio, which was then also made available to the study for further analyses.

Emergency Department sample-month data

A total of 122 (89.1%) departments returned data as requested. Five (3.6%) departments were unable to abstract the information from their IT systems. The remaining departments did not return data.

Quality of waiting-time data

An assessment of the quality of waiting-time data collected by Emergency Departments was made using the 1-month sample data obtained from the participating sites. The proportion of episodes of missing or erroneous data was determined. The recorded data were considered erroneous if the time seen by a decision-making clinician (DMC) preceded the time of arrival or if the calculated waiting time was greater than 24 hours. Characteristics of those episodes with and those without valid waiting-time data were compared.

A total of 122 sites returned the sample month's routine data, detailing 648,203 patient episodes. Of these, the time of arrival was missing in 17 (0.003%) episodes and the time seen by a clinician was missing in 101,458 (15.7%) episodes. The recorded time seen was erroneous in 3116 (0.5%). In total, the data were missing or erroneous in 104,591 (16.1%) episodes. The most likely reason for missing or erroneous time data was failure by the DMC to record accurately the time the patient was seen in the Emergency Department. This amount of missing data is comparable with that found during the profiling exercise of a large urban Emergency Department undertaken earlier in this study (see Appendix A). In this Emergency Department, we found that time data were missing in 15.2% of patient episodes.

Table 3 Comparison of episodes with and without valid waiting-time data

Characteristic	Data valid (*n*=543,629)	Data not valid (*n*=104,574)
Mean age (years)	37.7 (37.7–37.8)	38.6 (38.4–38.7)
Male (%)	52.5 (52.4–52.7)	43.2 (42.9–43.5)
Arriving by ambulance (%)	21.0 (20.9–21.1)	28.2 (27.9–28.5)
Admitted (%)	19.9 (19.8–20.0)	25.3 (25.0–25.6)

Note: 95% confidence intervals are shown in parentheses.

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As can be seen from Table 3, the characteristics of episodes with and without valid waiting-time data show considerable differences.

The number of participating sites with a mean waiting time collected as part of the Healthcare Commission data or calculated from the sample-month data is shown in Table 4. Although 122 sites submitted a sample month of patient-level data, information sufficient to calculate the mean waiting time was only available in 114 (93.4%).The mean waiting time was unavailable from either source in five (3.7%) departments.

Table 4 Source of data regarding mean waiting time

		Healthcare Commission Data	
		Yes (%)	***No (%)***
Sample-month data	***Yes***	108 (78.8)	6 (4.4)
	No	18 (13.1)	5 (3.7)

To compare the two different measures of waiting time in the 108 departments where both measures were available, the difference in the two measures was compared using the means of the two measures according to the methods described by Bland and Altman (1995). The results are shown in Figure 3F in Appendix F.

The mean difference in waiting time (sample-month data minus Healthcare Commission data) was –7.4 minutes (the 95% limits of agreement were –48.0 to 33.1 minutes). It was therefore decided that where waiting-time data from the Healthcare Commission survey was available (n=126) this would be used as the outcome measure. In the remaining cases, where information regarding the waiting time was available from the sample month data this was used (n=6).

Mean waiting time ranged from 10 to 178 minutes (mean 65.1 minutes, standard deviation (SD) ±25.3). Figure 4F in Appendix F shows how the mean waiting time varies with total attendances.

3.4.2 Routine data and Healthcare Commission data

Characteristics of participating Emergency Departments

The following characteristics of departments are described below:

- attendances and case-mix,
- presenting complaints and disposition from the Emergency Department,
- facilities,
- Emergency Department beds,

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- minor-injury units/walk-in centres/minor-illness units,
- GP staffed primary care centres.

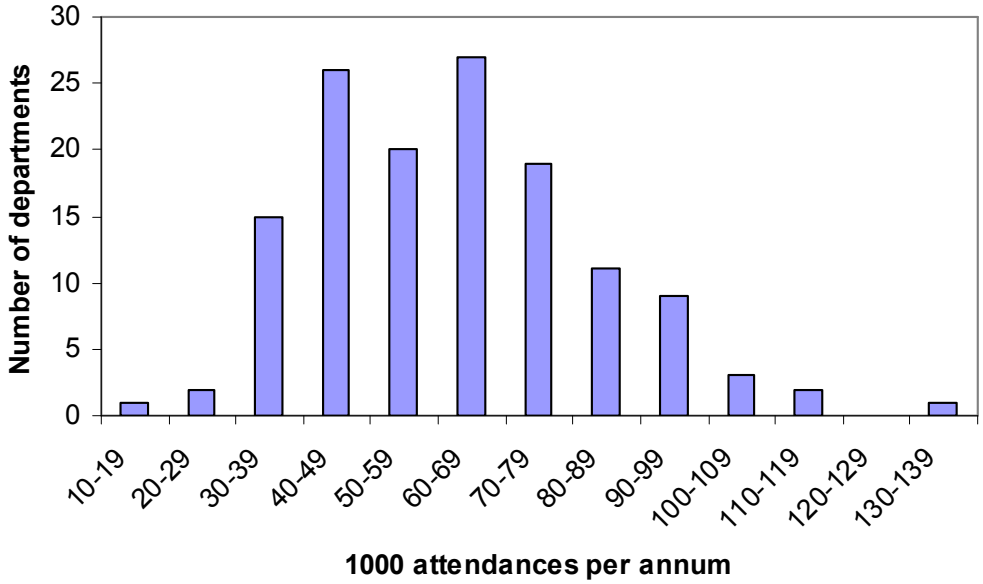

Figure 1 Distribution of total attendances per annum (*n*=136)

Attendances and case-mix

The distribution of the total number of attendances per annum is shown in Figure 1. Annual attendances ranged from 15,824 to 132,750 per annum (mean 62,614, SD ±20,791 attendances per annum).

The percentage of cases arriving by ambulance ranged from 1.2 to 38.6% (mean 24.8%, SD ±6.4%). The distribution of proportion of cases arriving by ambulance is shown in Figure 1F in Appendix F.

The proportion of patients aged less than 16 years ranged from 0.1 to 36.7% (mean 21.7%, SD ±5.1%). Similar variations occurred in the proportion of patients aged 65 years or over, 10.0–40.2% (mean 18.2%, SD ±4.3%).

Presenting complaint and disposition from the Emergency Department

A total of 120 departments reported information regarding cause of presentation. The proportion of patients presenting as the result of an injury ranged from 10.7 to 78.7% (mean 50.8%, SD ±12.1%). There was a corresponding variation in the proportion of patients presenting with medical problems, this varying between 2.1 and 88.4% (mean 38.8%, SD ±15.66%).

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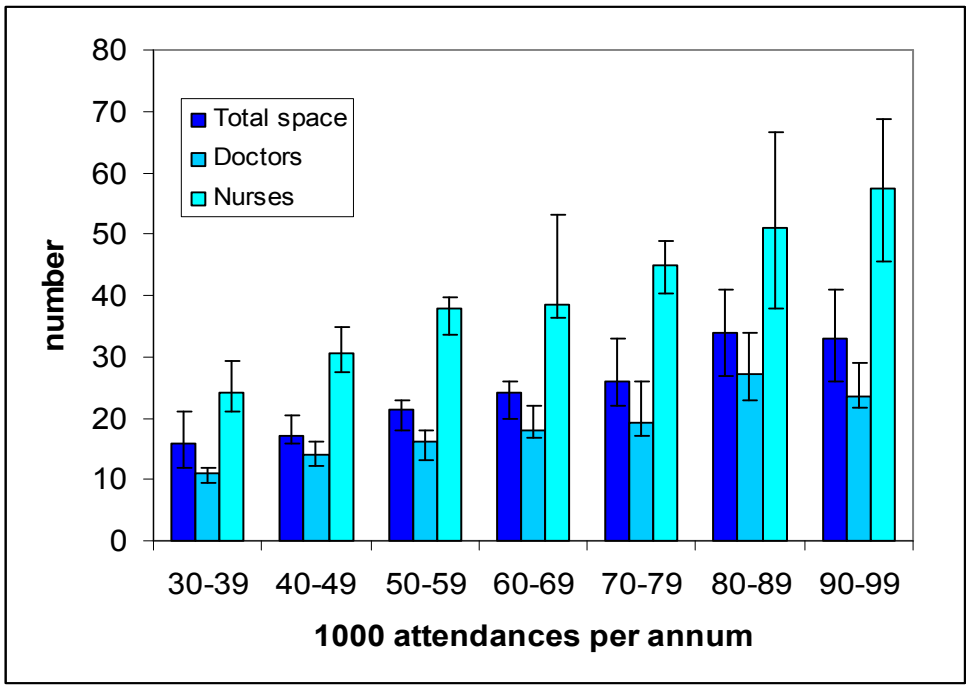
One hundred and thirty-five departments reported the percentage of patients admitted from the Emergency Department. This showed considerably less variation than might be expected from the variations in case-mix described above, ranging from 3.7 to 42.4% (mean 20.2%, SD ±7.7%). The distribution of percentage of cases admitted is shown in Figure 2F in Appendix F.

Facilities

Of the 110 departments for which data were available, 64 (58.2%) were managed in directorates in combination with other specialties.

The total number of cubicles, including resuscitation bays and treatment rooms, ranged from 9 to 70 (mean 24.9, SD ±10.0) per department. Figure 2 demonstrates how the number of cubicles available varies with the number of attendances.

Figure 2 Graph to demonstrate the median number of cubicles, doctors WTE and nurses WTE per 1000 attendances per annum



The data shown are limited to departments seeing 30,000–99,999 attendances per annum, n=127. Bars represent interquartile ranges. WTE, whole-time equivalent.

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Emergency Department beds

Departments were questioned on whether they had observation wards, a clinical-decision unit or a chest-pain-observation unit. In addition, they were asked whether any other facility was available to them for investigating or observing patients. Information was available on 114 departments.

Forty two (36.8%) departments had observation wards or beds. The number of beds available ranged from 1 to 26 (mean 7.8). In 37 departments this facility was available 24 hours a day.

Nineteen (16.6%) departments had a clinical-decision unit, ranging in size from 4 to 27 beds (mean 10.7). In 17 departments the clinical-decision unit was open 24 hours a day.

Six departments had a chest-pain-observation unit with between two and five beds (mean 4.2). Three units were open 24 hours a day.

Minor-injury units/walk-in centres/minor-illness units

Thirty (26.3%) departments had a minor-injury unit on the same site as the Emergency Department, of which 28 were part of the same NHS Trust and managed by the Emergency Department. Of the remaining two departments, both were managed by the Emergency Department with which they were co-located.

Twelve (10.5%) departments had a co-located walk-in centre or minor-illness unit. Six were part of the same Trust as the Emergency Department, with three exclusively and one jointly managed by the Emergency Department. The Emergency Department was not involved in the management of the remaining two units. One unit was a joint scheme between the Trust that operated between the Emergency Department and another Trust. In four cases the unit was in a separate Trust to the Emergency Department which had no involvement in its management.

Staffing: nurses

The number of qualified nurses in post in each department ranged from 10.5 to 131.2 WTEs (mean 42.0, SD ±17.9; see Figure 2). The number of qualified nurses in post ranged from 4.1 to 11.6 WTEs per 10,000 attendances (mean 6, SD ±1.5). If both qualified and other nursing staff are considered together, the total number of nursing staff per 10,000 attendances ranges from 4.8 to 14.3 WTEs (mean 7.7, SD ±1.8). This suggests that in departments that have relatively fewer qualified nurses, the shortfall is not being compensated for with other nursing staff (see Figure 2).

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Staffing: doctors

The total number of doctors in posts ranged from 4.0 to 54.0 WTEs (mean 18.7, SD ±7.9). The number of doctors in post is shown in relation to the total number of attendances in Figure 2 and ranges from 1.3 to 4.7 WTEs per 10,000 attendances (mean 2.9, SD ±0.7).

Staffing: ENPs

Of the departments for which data were available, 16 (11.8%) did not employ ENPs. The remaining departments employed between 0.2 and 24 WTE ENPs, representing 0.6–44.1% (mean 15.6%) of the total number of WTE qualified nurses. In the 102 departments reporting the proportion of cases first seen by ENPs this ranged from 0.1 to 93.6% (mean 12.9%).

Availability of an experienced doctor

An experienced doctor was defined as someone with at least 6 months prior experience of emergency medicine. Information was available for 114 departments. Of these, 53 (46.5%) had an experienced doctor who was on site 24 hours a day and able to respond within 5 minutes. Of the remaining departments, an experienced doctor was available on average 16 hours per day from Monday to Friday and 15 hours per day at weekends.

Sickness absence

The percentage of nursing hours lost to sickness absence ranged from 0.2 to 15.6% (mean 5.6%, n=128). Of the 112 departments where information was available, 24 (21.4%) reported having incentive schemes in place to reduce sickness absence. These included prize draws for staff with no absence, 1 day's extra annual leave after 4 years without absence and increased study leave. However, few of these incentives were proactive in nature, with many requiring 100% attendance for long periods.

Working practices

Triage

Of 120 departments where information was available, 56 (46.7%) triaged all patients, 51 (42.5%) triaged some patients and 12 (10.0%) triaged none. The interviewee in the remaining site did not know the current triage policy. Of those sites undertaking triage, the patient could be directed, following triage, to health-care services other than the Emergency Department in 82 (76.3%) cases.

Queuing of patients prior to registration

A total of 49 (40.8%) departments reported deliberately queuing patients prior to registration. The frequency with which deliberate queuing was

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reported for minor and major cases is shown in Table 5. This table shows that most departments never operative deliberate queuing of patients or holding patients in ambulances. However, daily deliberate queuing occurred in one-third of departments for minor cases and over 10% of departments for major cases.

Table 5 Reported frequency of deliberate queuing of patients and holding in ambulances prior to registration

Frequency	Minor cases, *n* (%)	Major cases, *n* (%)
Deliberate queuing		
Never	67 (57.8)	98 (82.4)
Daily	39 (33.6)	14 (11.8)
Weekly	7 (6.0)	5 (4.2)
Monthly	2 (1.7)	2 (1.7)
Less then monthly	1 (0.9)	0
Total	116	119
Holding in ambulances		
Never	107 (89.9)	100 (84.0)
Daily	2 (1.7)	3 (2.5)
Weekly	2 (1.7)	5 (4.2)
Monthly	5 (4.2)	5 (4.2)
Less then monthly	3 (2.5)	6 (5.0)
Total	119	119

Holding patients in ambulances

A total of 21 (17.5%) departments reported holding patients in ambulances. The frequency with which this occurred is shown in Table 5.

See and Treat

Data were available regarding See and Treat (see Glossary) in 120 (5%) departments; 105 (87.5%) departments performed See and Treat, of which 89 (74.2%) did so daily, 12 (10%) weekly and the remaining departments less frequently. The frequency with which different staff groups were involved in See and Treat is shown in Table 6.

Rapid Assessment and Treatment

Data were available regarding Rapid Assessment and Treatment (see Glossary) in 120 departments. Eighty-eight (73.3%) departments undertook Rapid Assessment and Treatment or Executive Triage, of which 69 (57.5%) did so daily, 13 (10.8%) weekly and the remainder less

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frequently. The frequency with which different staff groups undertook Rapid Assessment and Treatment is shown in Table 6.

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Table 6 Number of departments reporting the frequency that different staff groups undertook See and Treat and Rapid Assessment and Treatment

Frequency	Senior medical staff, *n* (%)	Junior medical staff, *n* (%)	ENPs, *n* (%)
See and Treat			
Never	10 (8.7)	48 (41.7)	10 (8.6)
Daily	69 (60.0)	44 (38.3)	88 (75.9)
Weekly	24 (20.9)	12 (10.4)	15 (12.9)
Monthly	8 (7.0)	8 (7.0)	2 (1.7)
Less then monthly	4 (3.5)	3 (2.6)	1 (0.9)
Total	115	115	116
Rapid Assessment and Treatment			
Never	49 (41.5)	78 (65.5)	72 (62.1)
Daily	47 (39.8)	30 (25.2)	35 (30.2)
Weekly	13 (11.0)	6 (5.0)	5 (4.3)
Monthly	2 (1.7)	0	1 (0.9)
Less then monthly	7 (5.9)	5 (4.2)	3 (2.6)
Total	118	119	116

Clinical scenarios

During working hours lead clinicians stated that their departments would manage between 7 and 92.3% (mean 48.0%) of the cases in the department. Outside normal working hours this reduced to a range of 7.7 to 84.6% (mean 45.2%). A copy of the scenarios used to derive this information is found in Appendix H.

Practices to manage waiting times

In a majority of departments the senior nurse co-ordinatior was responsible for managing waiting times.

In 61 (52.6%) departments computerised systems were used to alert staff when patients had reached predetermined limits of waiting time.

Forty-five departments (39.5%) reported that there were incentives for staff to reduce waiting times. However, in 27 of these departments the only incentive referred to was the national incentive scheme for departments outlined in Table 1. Twelve departments reported incentives operating at a department level such as improvements in quality of care, new equipment, and improving the profile of the department. Six departments reported incentives at a personal level, such as gifts, meals or nights out and increased leave for courses.

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Seventy-nine departments had policies to deal with exceptionally long waiting times; these included ambulance diversion (41 sites), calling in extra medical staff (49 sites) and calling in extra nursing staff (51 sites).

3.4.3 National survey data: section 2

The second part of the interview focused on aspects of working in the Emergency Department. The lead clinician, head nurse and business manager were asked questions about working in their department (see Appendix C).

There were 137 responses to these questions in total, but there were several cases of missing variables. The data collected related to frequency of staff meetings, contribution to general meetings, team working, work characteristics and managements.

The areas of particular interest described below.

Frequency of general staff meetings

There were differing views on the frequency of staff meetings. Business managers thought these occurred more frequently (approaching twice a month, mean 1.84, SD 3.27; note that SD here is in the positive direction only), than lead clinicians (once or twice a month, mean 1.58, SD 2.99) or head nurses (a little over once a month, mean 1.24, SD 1.17).

Contribution to general meetings

Interviewees were asked which staff groups were able to contribute to these meetings. Doctors and nurses were included by all parties but overall head nurses and business managers were more inclusive of administrative staff, managers, professions allied to medicines (PAMs), professions and technical staff (P&T) and ancillary staff than lead clinicians. Lead clinicians were less likely to include managers and administrative staff in general meetings.

Several other groups of staff were included in certain departments, such as domestics, mental health liaison staff, security, rapid-response teams, porters and ambulance representatives.

Team working

Interviewees were asked whether there was team working in the Emergency Department using a five-point response scale ranging from 'none' to 'a great deal'. Eleven parties perceived that there was 'a lot' of team working but responses varied with lead clinicians perceiving the most team working (mean 4.11, SD ±0.89), compared to head nurses (mean 4.04, SD ±1.05) and business managers (mean 3.93, SD ±0.93) perceiving the least team working. All interviewees perceived that doctors

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and nurses were included in the Emergency Department team. Administrative staff were also included, but at least one in four required prompting for this answer. Ancillary staff (e.g. cleaners) were more likely to be included by the head nurse. P&T staff (e.g. electrocardiograph (ECG) technicians) were less likely to be included by lead clinicians and business managers, whereas the head nurse was least likely to include managers.

Others, such as radiographers and health care assistants, were likely to be included by lead clinicians; discharge co-ordinators, plaster technicians and child-protection nurses were likely to be included by head nurses; and support services, social workers and housekeeping were likely to be included by business managers.

Interviewees were asked who makes decisions in the team. They responded using a five-point response scale ranging from 'none' to 'a very great deal'. All agreed that doctors, nurses and managers were the most likely to make decisions in the Emergency Department team. P&T and ancillary staff were the least likely to make decisions.

Interviewees were asked to what extent staff groups contributed to the team working. They responded using a five-point response scale ranging from 'none' to 'a very great deal'. All agreed that doctors and nurses contributed 'a lot' to the Emergency Department team. However, head nurses and business managers also felt that managers contributed 'a lot' to the team whereas lead clinicians felt managers contributed 'a fair amount'.

Work characteristics

A variety of work characteristics were examined (such as autonomy and control, role conflict, leader support and feedback on performance). Only autonomy and control was found to be related to waiting time in the in-depth study.

Management style

Interviewees were asked to rate their own management style as either 'tell', 'sell', 'consult' or 'join' (Sadler, 1970). The findings are shown in Figure 3.

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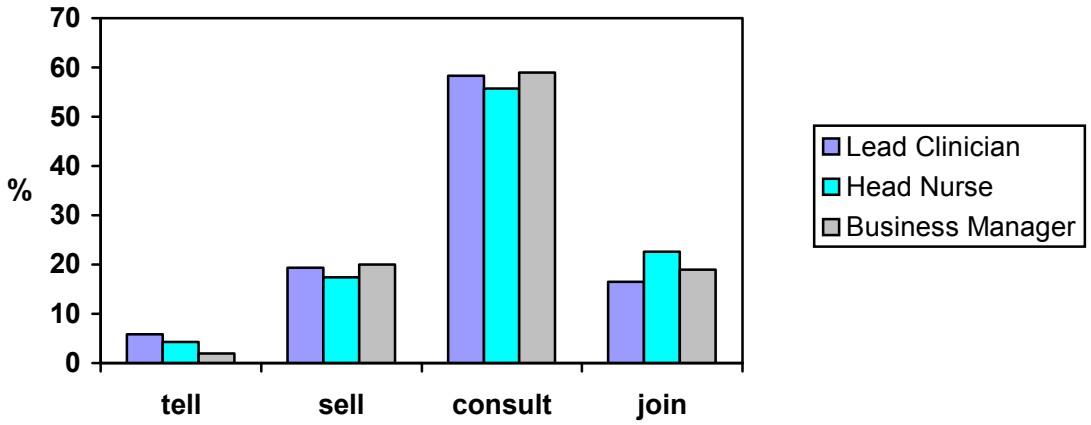

Figure 3 Percentage response to management styles

A large majority of interviewees favour a consultative management style. However, the head nurse may also choose to join the group in order to make a decision.

3.4.4 Summary

This section has described the Phase One national survey of Emergency Departments that was undertaken. It involved interviews with the lead clinician, head nurse and business manager of participating departments.

The first section of the interview involved collecting information about departments that was specific to those individuals, such as departmental budget, nursing issues and clinical management. The second section focused on aspects of working in the Emergency Department, such as frequency of staff meetings, team working and management.

The results presented describe the findings from these interviews which were subsequently used as factors in the linear regression to identify a model of factors predicting waiting time.

The next subsection describes the development of a model to predict waiting time.

3.5 Developing a model of organisational factors predicting mean waiting time

To identify significant organisational factors affecting waiting times, a multivariable linear-regression technique was used. The analysis is explained in Section 3.3 of this report. A stepwise approach was taken, as outlined here.

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Initially, variation in mean waiting time arising from differences in case-mix was controlled for; these factors accounted for 14.1% of the variability in mean waiting time.

Second, each variable from the Healthcare Commission data collection and Phase One of the national survey was regressed separately upon the residuals from the previous step. The potentially predictive variables ($P<0.1$) are shown in Table 1F in Appendix F, and were subsequently entered into a multivariate linear-regression model. Those variables found to be significant independent predictors of the residual waiting time are shown in Table 1F in Appendix F.

These factors were percentage of work hours non-pay spend per 10,000 patients, presence of See and Treat and percentage of nursing hours lost through sickness. These factors explained a further 33.5% of the remaining variability in mean waiting time.

Third, key variables from Phase Two of the national survey were then examined to determine whether they made any further contribution to the model.

The variables were:

- frequency of staff meetings,
- presence of team working,
- self-reported management style of the interviewee.

These were selected as they were thought to provide a summary representing the notion of inclusion and participation, and co-operation. This reflects the organisational ethos of the department and represents the differences between directive and participative management style.

For the first two variables, responses were potentially available from three interviewees (lead clinician, head nurse and business manager) in each department. To determine whether these individuals were consistent in their views, the intra-class correlation coefficient (ICC; James *et al*., 1984) was used. Neither the responses on frequency of staff meetings (ICC 0.121) nor the presence of team working (ICC 0.005) appeared consistent across interviewees. Therefore, data from each of the interviewees were considered separately for these variables. All were examined for their relation to the mean waiting time (corrected for department size and case-mix). No significant associations were found for either variable in relation to waiting time.

Data regarding self-reported management style were collected with four possible responses, tell, sell, consult or join, as described by Sadler (1970), reflecting increasingly participative management styles (Figure 3). Few respondents described their management style as tell or sell. These were therefore combined into one category for the purpose of analysis. The management style of each group of respondents was then

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examined separately for its ability to predict mean waiting time (corrected for case-mix and department size). Management style was treated as a categorical variable, with consult being the reference category. The results are shown in Table 2F in Appendix F.

Management styles of both the lead clinician and head nurse were found to be potentially predictive.

Finally, management-style variables were examined to determine whether they could enhance the model described in Table 2F in Appendix F. The head-nurse management style was not found to be predictive. The final model is shown in Table 7. This model explains 35.3% of the variation in mean waiting time. The presence of See and Treat was no longer a significant contributory factor to the model but was replaced by the management style of the lead clinician.

Table 7 Final model of factors predictive of mean waiting time

		Unstandardized coefficient, *B*	95% confidence interval for *B*		Significance, *P* value
			Lower bound	*Upper bound*	
Nursing hours lost through sickness (%)		2.67	0.96	4.37	0.00
Non-pay spend per 10,000 patients		0.00	0.00	0.00	0.04
Lead-clinician management style	Tell or sell	12.56	2.03	23.09	0.02
	Join	−1.67	−14.98	11.63	0.80

The stepwise regression revealed that a substantial proportion of the variance in waiting times can be explained by the management style of the lead clinician. If the lead clinician's style was participative (either consultative or joining compared to telling or selling) then mean waiting time was lower (with over 10 minutes' reduction).

To explore the contribution that leadership style makes to waiting times further interview data were examined again. Relationships were inspected for agreement by all parties and congruence of direction of relationships. Table 3F in Appendix F describes the relationships of the responses from

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lead clinician, head nurse and business manager across the sites (n=137) with study variables.

While the findings described in Table 3F in Appendix F are far from conclusive, there are strong suggestions that a participative management style (either consulting or joining) of the lead clinician is associated with:

- inclusivity of such groups as PAMs and ancillary staff in meetings in the Emergency Department;
- reduced role conflict for doctors, nurses, managers and ancillary staff in the Emergency Department;
- increased feedback on work performance for doctors, nurses, administrative staff and managers;
- increased leader support for doctors, nurses, administrative staff and managers;
- collaboration with other departments within the Trust;
- a more positive view of the morale of staff in the department.

These findings are particularly relevant as they represent the agreement of the views of three parties (lead clinician, head nurse and business manager) regarding leadership style and are not self-reported data.

In addition, there is a suggestion in the data that a participative leadership style of the lead clinician is associated with reduced autonomy and control for doctors, nurses, administrative staff and managers in the department. This suggests that these individuals are reducing the level of autonomy in their own work in the interest of co-operating with others to reduce waiting times. The realtionship with autonomy and control was examined in more detail in the in-depth survey in Phase Two of the study.

One-third of the variability in mean waiting time has been accounted for by this phase of the study. The second phase moves on to look in more depth at further factors that may not have been explored so far, but are important when considering mechanisms available to improve performance.

3.6 Summary

Phase One of this study involved a national survey of Emergency Departments in England and Wales. One hundred and thirty seven Emergency Departments consented to participate in this part of the study.

Data were collected from interviews with the lead clinician, head nurse and business manager of consenting departments. Altogether, 351 interviews out of a possible 411 (85.4%) were completed. In addition, further data were collected by obtaining a sample month of routine data of patient attendances from each Emergency Department. A total of 122

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Emergency Departments (89.1%) returned data for analysis. Finally the Healthcare Comission data (being collected at the same time for the Acute Hospitals Portfolio) was also submitted for use by the research team.

Mean waiting time was the dependent variable used. Organisational factors from the data collected that contributed to mean waiting time were identified using multivariable linear-regression techniques.

Initially departments' case-mix and site were controlled for. These factors were found to contribute to 14.1% of the variability in mean waiting time. The further factors found to significantly contribute to mean waiting times were percentage of nursing hours lost to sickness, non-pay spend per 10,000 patients and the management style of the lead clinician. When taken together these factors contribute to a further 35.3% of the variation in mean waiting time.

The next section describes the second phase of the national survey. This in-depth evaulation was undertaken to identify additional factors that were important in predicting waiting times.

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Section 4 Phase Two: in-depth evaluation of Emergency Departments

4.1 Methods

To gain an in-depth understanding of work within Emergency Departments and identify additional, as-yet-unexplored, factors that may contribute to the variability in waiting times, an in-depth mixed-methods study was undertaken.

4.1.1 Selection of sites

Originally, it was intended that sites invited to take part in the in-depth study would be based upon the findings of the statistical modelling from data collected. However, significant delays were experienced in obtaining Research Governance approval. Selection of sites for Phase Two of the study was therefore based on an interim analysis only utilising the data collected by the Healthcare Commission up to December 2004. This is outlined in Appendix G.

Following this analysis, departments were ranked according to their unstandardised residual waiting time. Of departments that participated in the Phase One survey, the 10 with the highest and lowest residuals and the 10 with residuals closest to zero (reflecting departments with waiting times that were predicted well, under-predicted and over-predicted by the model) had their characteristics reviewed. From each group of 10 departments, five were invited to participate in the in-depth study. Those invited were chosen to give a spread of geographical location, size and case-mix. These 15 departments therefore represent those in which the model under- or over-predicts waiting time or in which the model fits well.

Throughout the interim analysis and selection of sites, those researchers involved in the collection of data for this part of the study were blind to the performance of each of the departments.

4.1.2 Recruitment

All 15 sites identified by the above process were invited by letter to participate in further study. Research Governance was sought in all sites. Eight sites were finally involved in Phase Two of the study. A full description of the eight sites and a summary of the data collected are given in Appendix I.

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The survey methods used were developed following input from the academic staff and key stakeholders. The initial data-collection model was piloted and ran over a 4-day period covering weekdays and weekends with observations being undertaken both during the day and at night. The components of this model were as follows:

- interviews with Emergency Department staff and staff from other areas of acute care;
- tracking of patients through their Emergency Department attendance;
- structured observations within the Emergency Department;
- ethnographic observations;
- focus groups with Emergency Department staff and staff from primary and secondary care.

This method was piloted in two sites. The results of the pilot studies showed that the methods used provided a large amount of very informative data, but that there was some duplication in the data gathered. There was little additional information gathered by observation at night-time and weekends and by patient tracking that was not gathered by other methods during the weekday activities. The data-collection methods were therefore revised and subsequently conducted over a 2-day period. The individual components are discussed separately below and are summarised in Table 8.

4.1.3 Structured staff interviews

Two different types of structured interview were conducted, focusing on organisational factors and team working. The schedules used for the interviews are reproduced in Appendix J.

4.1.4 Organisational-factors interviews

At each site six interviews were conducted, involving staff from within the Emergency Department, the Trust and primary care services. In addition, a GP was also interviewed if they were unable to attend a focus group. The interviews and focus group looked at the specific factors that caused individuals difficulty in performing their duties in relation to the Emergency Department.

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Table 8 Summary of methods of data capture in the in-depth survey

Method of data collection	Type of data	People involved	Content
Organisational-factors interviews	Qualitative	Emergency Department: consultant, senior nurse (G or H grade), porter and receptionist. Hospital: bed/site manager and consultant physician in charge of acute medical admissions. GP (if unable to attend focus group).	Specific factors that cause individuals difficulty in performing their duties in relation to the Emergency Department.
Team-working interviews	Qualitative	Emergency Department: consultant, one SpR or SHO, senior nurse (F or G grade) and junior nurse (D or E grade) who had not been involved in organisational-factors interviews.	The way in which teams of staff worked together, the characteristics of teams in terms of who was in the team, their shared objectives, roles and, interdependence (site 106) and team leadership, how these teams are organised. Suggest other ways of organising work to increase throughput in the department.
Focus groups: Emergency Department	Qualitative	Separate focus groups were held for doctors (four SHOs and a SpR or staff grade) and nurses (two each of D grade, E grade and support workers grades A–C) working in the Emergency Department.	Difficulties experienced at work and potential solutions.
Secondary care interface	Qualitative	Laboratory staff (from biochemistry or haematology), radiographer (senior 1), and SHOs from General Medicine (two), General Surgery and Orthopaedics.	Difficulties experienced at work and potential solutions.
Primary care interface	Qualitative	Representatives from ambulance service/paramedic, mental health services, social worker (senior 1), physiotherapist (senior 1), occupational therapist (senior 1) and a GP.	Difficulties experienced at work and potential solutions.
Ethnographic observations	Qualitative	Observations in main areas of the Emergency Department such as by the nurse co-ordinator's desk.	Three 1-hour periods of unstructured observation were conducted in key areas of each department and examined how staff and patients interacted and the influence of the environment upon these interactions.
Staff	Qualitative and	Self-completion questionnaire was sent to all staff in each Emergency Department in the	Developed from previous studies of health care organisations (e.g. Borrill *et al*. 1996; Carter and West,

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questionnaire	quantitative	in-depth study. This included doctors, nurses, receptionists, porters and, in some departments, staff such as play specialists and occupational therapists.	1999; Carter *et al.*, 2001). The questionnaire (see Appendix H) looked at work characteristics, dimensions of departmental climate, psychological strain, job satisfaction and work grouping, and explored which of these factors were associated with waiting time.

SHO, Senior House Officer; SpR, Specialist Registrar.

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4.2 Data analysis

Both qualitative and quantitative data were available for sites participating in the in-depth study. This rich mix of data provides a more in-depth understanding of what it is like to work in an Emergency Department and the everyday issues that staff face. Qualitative data were collected from focus groups, organisational factors and team-working interviews, and ethnographic observations. Six of the eight sites from which data were collected included focus groups or interviews with five different groups of participants: primary care, secondary care, doctors, nurses and administrative staff. At the remaining two sites (sites 207 and 208) it was not possible to collect data from all groups; therefore, the data relate to a limited sample for these sites.

Qualitative data were analysed using a template based on an initial model of factors that prevent patients from leaving the Emergency Department and those that encourage patients to attend the Emergency Department (an so-called out and in boundary-spanning model). Categories in the model were developed from subject-matter experts and data from one of the sites which formed the basis of a template. Data from all sites were coded using the template, and themes that did not fit the model were examined and a final template was derived (see Table 4F in Appendix F).

Following coding of data from eight sites against this template, themes were ranked for each site according to the number of different perspectives provided by the different participant groups that highlighted that factor (if a factor was mentioned by more than one of the staff groups this increased the salience of the theme). The themes were inspected to see in which ways they were the same or different.

The top three themes reported from multiple perspectives were noted for each site. Finally an independent rater coded data from three sites using the template to examine inter-rater reliability. Eighty-six per cent of comments were rated in exactly the same manner by the independent coder, indicating a high level of inter-rater reliability. Discrepant items were examined, looking at reasons for different ratings and the descriptions of the themes were subsequently made more explicit. Four per cent of comments were rated with minor differences between sub-categories within a major theme. The other items (10%) were discussed and a primary code agreed by the two coders.

On the basis of the content of these themes, with no knowledge of performance ratings for each department, the sites were ranked in order of high, medium and low perceived performance. The findings from these analyses are described in Section 4.3.

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4.2.1 Analyses of team-working interviews

An initial template was drawn up using the main themes from the questions as a guide. Information from four interviews per site was aggregated using template headings and an overall summary was produced which described the working methods on each site briefly. Next the aggregated information was compared across the eight sites to examine what themes were considered common and what were considered different.

On the basis of the content and number of themes described by each department (the more themes described implying greater inclusivity and proactive behaviours) sites were ranked in order of high, medium and low perceived performance.

4.2.2 Analyses of questionnaire data

Questionnaire responses were collected from various sites and data were aggregated at the level of each Emergency Department. When exploring phenomena at an aggregated level of analysis it is important to see if there is intra-departmental agreement (suggesting that the aggregated measure is a meaningful construct). To establish whether team members share common perceptions the within-group coefficient (rwg; James *et al*., 1984) was used. This is a widely used measure of inter-rater agreement. This index 'addresses the extent to which raters make essentially the same ratings' (Kozlowski and Hattrup, 1992) and a high score (in excess of 0.7) provides justification for data aggregation.

Descriptive and correlation analyses were undertaken to explore relationships between work characteristics, departmental climate, psychological strain, job satisfaction and mean waiting time. Findings from the questionnaire study will be described in Section 4.3.

4.2.3 Ethnographic residual analysis

To link the findings from the national survey of Emergency Departments in Phase One of this study with the in-depth evaluation in Phase Two, a technique called ethnographic residual analysis (ERA) was employed. A detailed description of this technique is given in Appendix K. ERA is a variation of extreme-case sampling which is a well-known approach to combining qualitative and quantitative methods. In extreme-case sampling, qualitative researchers identify extreme cases of a phenomenon to explore in order to gain a better understanding of the phenomenon, for example, using a survey to highlight extreme cases for qualitative research. The unusual thing about ERA is that cases with large residuals, rather than cases with high or low values of an outcome variable, form a sampling base for the qualitative research. Thus qualitative research is focused on uncovering unexplained variance from quantitative research; that is,

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reaching the variance which the quantitative component has failed to reach. The stages used in ERA are outlined in Table 9.

Table 9 Stages in ERA

Stage	Description
1	To define the dependent variable.
2	To undertake multiple regression with the available independent variables.
3	To compare the predicted outcome with the actual outcome for each case to identify cases with large residuals. Study cases with large residuals are used to explore further issues which may be important but which have not been considered in the original regression using ethnography, where investigators are blinded to the quantitative findings for each case in order to minimise the potential for preconceived bias. Regression equations are rerun, if possible, to incorporate new insights or variables discovered during the qualitative phase.

As outlined in Appendix K, sites for in-depth study in Phase Two of this study were selected on the basis of their residuals. Two new issues were introduced into this study as a result of ERA: blending between the qualitative and quantitative research, and rerunning the regression equations, incorporating new insights from the in-depth study. The research team made the explicit decision that the qualitative researchers would be blind to the quantitative findings in that they would not be told whether the statistical model had overestimated, underestimated or accurately predicted the mean waiting times of the Emergency Departments which had been selected, until they had analysed their data. Findings from the in-depth study were placed alongside the residuals from the regression analysis from Phase One to identify further factors which would then be tested in the original quantitative data-set.

ERA has the potential to be more powerful than other combinations of statistical residuals with qualitative research because there is a formal step of returning to the quantitative data-set with insights from the qualitative data-set. That is, ERA forces the researcher to make links between the qualitative and quantitative data and findings.

4.3 Results of Phase Two: the in-depth study

Having described the methods and analyses of these data we will describe the findings from the various aspects of the in-depth study using focus groups, organisational-factors interviews and ethnographic observations.

4.3.1 Sites that perceived boundary issues to be important

Some sites considered that boundary issues were important. These are issued relating to things that occur where Emergency Department

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activities abut those of the hospital or wider community. This subject featured a combination of local Emergency Department issues with wider hospital issues and issues related to the provision of other primary and secondary care services. The presence of these three major themes from multiple perspectives represents a holistic approach that considers the management of boundaries between different levels of service provision and is likely to result in a higher level of performance. The content of these themes is summarised here.

Management of Emergency Department

Every site except one mentioned Emergency Department management in their top three themes. Emergency Department management is seen as boundary management in the context of themes related to hospital management, access to primary and secondary care and self-presentation, and therefore how the department fits into the wider health care picture.

Hospital management

Hospital Management represents a boundary between other departments, the Trust and other Trusts or hospitals in the area. In general, wider issues such as communication with other departments and the Trust and the lack of a holistic approach to management of Emergency Department within the Trust were raised, suggesting a wider perspective considering how the Emergency Department fits into the wider health community.

Access to primary and secondary care

Access to primary and secondary care was considered by several sites as they formed a picture of the things that influenced the throughput of patients seen and subsequently discharged by the Emergency Department. An element of this theme was the activities of rapid-response teams in the community that enabled elderly patients to return to their homes supported by care or be admitted to community care resources. Mental health support services were another example of this interface between emergency care and the community. This theme provides evidence of the consideration of issues as part of the wider community of health care provision.

Self-presentation

This theme (examining why patients attend Emergency Departments) can be considered from both the boundary-spanning and non-boundary-spanning perspectives.

This theme was boundary-spanning when combined with hospital management and Emergency Department management considering the reasons why people attend the department unnecessarily. However, if this theme replaced access to primary and secondary care

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services in the top three themes the department was perceived to be reactive rather than proactive and were placed in the non-boundary-spanning group as they lacked the recognition that issues related to primary and secondary care are likely to impact on the number of people attending the Emergency Department.

4.3.2 Sites that did not perceive boundary-spanning issues to be important

The non-boundary-spanning perspective was seen when there was a focus on local issues (management of Emergency Department, bed management and bed shortages) rather than consideration of wider hospital issues and the management of margins between different levels of service provision. This perspective is likely to result in a poorer level of performance. These themes will now be described.

Emergency Department management

A focus on Emergency Department Management was seen to lack the perspective of boundary spanning when combined with bed-management issues. This suggests a focus on day-to-day issues rather than more strategic consideration of how the Emergency Department fits into the bigger picture of health care provision.

Bed management and bed shortages

Several sites focused on issues of bed management and shortages. Commonly this was a key theme, along with Emergency Department management, that indicates a strong focus on internal affairs rather than a broader consideration of health care provision. Therefore, sites where all participant groups mentioned bed management, placing it in the top three issues reported, were perceived to have non-boundary-spanning activities and were more likely to have a lower level of performance.

Hospital management

Most sites, with the exception of one, mentioned hospital management issues in their top three themes. Failing to mention this was perceived as a narrow, unicentric approach showing less consideration of boundaries between other departments, the Trust and other Trusts or hospitals in areas such as communication.

Using the classification above, where researchers identified that a boundary-spanning strategy seemed likely to indicate high performance, and a more narrow non-boundary-spanning perspective likely to indicate poor performance, departments were allocated into rank order in three performance categories (poor, medium and high). Table 10 demonstrates these findings and describes the major themes. These analyses was undertaken blind to information about various performance indicators for each Emergency Department.

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Table 10 Rank ordering of performance based on organisational-factors interviews, focus groups and ethnographic observations

Site	Comments
Poor performance	
40	This site was considered to have poor performance due to the inclusion of bed management and Emergency Department management in the top three issues and absence of hospital management in the top three issues.
Medium performance	
85, 24, 207	These sites were similar as they demonstrated reactive notions of working with bed management within their top three issues.
109, 164	Evidence of some proactive behaviours but focus on self-presentation rather than access to primary and secondary care services.
High performance	
154, 208	Evidence of proactive behaviours and a holistic approach with insight into managing boundary issues of primary and secondary care.

It is evident from information presented above that two sites stand out as high performers (154, 208), demonstrating clear evidence of boundary-spanning behaviours and an holistic approach showing insight into issues of management of the Emergency Department within the context of primary and secondary health care provision.

In a broad sense the differences between these sites can be represented as a reactive strategy where the department focuses on local issues and shows little awareness of the connections with other specialties, secondary and primary care resources. A strategy of this type is likely to be associated with poorer performance. In contrast, other sites demonstrated boundary-spanning activities aware of the need to work together with secondary care agencies (such as pathology and X-ray) and specialities within the Trust as well as agencies within primary health care enabling the expedient discharge of patients. A proactive strategy is likely to be associated with a higher level of performance.

4.3.3 Team-working interviews

Findings from the interview study in Phase One indicated that there was 'a lot' of team working in Emergency Departments. However, the in-depth study of eight departments did not support this and revealed many different perceptions of team working.

Most participants described the Emergency Department as a whole as the team and then went on to describe doctors and nurses working separately and often individually. Nurses' work allocation is commonly by area of department and appears more organised than that of doctors. However, in some departments a medical shift leader was identified to co-ordinate the work of doctors. These are described as 'new arrangements' and are not fully operational. Teams formed when

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a major trauma presented in the department and then dispersed when the episode ceased. Doctors and nurses described different leaders to whom they are responsible (nurse co-ordinator and lead clinician).

Using the template described in the previous section themes from the qualitative data analyses were ranked for each site in relation to a proactive, inclusive style (the more themes indicating focused working, inclusive and co-operative working strategies and developmental behaviours are likely to be associated with higher performance) in three performance categories (poor, medium and high). Table 5F in Appendix F summarises these findings. The evidence presented below is based on increasing numbers of themes appearing in qualitative data ranking the Emergency Departments in order of performance (the researchers were blind to performance measures of these departments).

More proactive departments prioritise work, describe specialist areas where doctors and nurses work together (e.g. See and Treat) and co-operative leadership strategies between the head nurse and lead clinician. These leaders empower others to take decisions at a local level in the department, increasing speed of response. Developmental activities take place in these departments to increase skill and competence along with reflexive activities looking back at waiting-time breaches with the aim of improving performance.

Three sites feature in the high performance category (208, 154 and 109). Two of these sites (208 and 154) had similar ratings from the organisational-factors interviews, focus groups and ethnographic observations. One site (109) moved from a previously rated 'medium' performance category into high performance as more team-working themes were included in their coding. However, inspection of these themes reveals that no leadership themes are included in these data, raising doubt in their categorisation as a high-performing Emergency Department.

Analyses of team-working interviews support two sites (154 and 208) to be considered as high-performing Emergency Departments confirming the findings from the organisational factors, focus groups and ethnographic observations in terms of performance.

4.3.4 Findings from the questionnaire study

Responses were received from seven of the eight departments invited to take part in the questionnaire study (only one response was received from site 109). Response rates varied across the sites from 18 to 56% (see Table 11). Further details of descriptive data from each department are given in Appendix H.

Departments described levels of psychological strain (or stress) ranging from 20% (i.e. 20% of people in the department report levels of strain over the threshold and likely to be of concern) to 28% caseness. This case rate is similar for staff at other NHS Trusts (a

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sample of over 22 000) where the mean rate was 26.7% (Mullarkey *et al*., 1999).

Departments described levels of job satisfaction ranging from 3.8 to 5 measured with a seven-item response. This suggests a fairly wide range of job satisfaction from slightly dissatisfied (3.5 being between 'moderately dissatisfied' and 'not sure' and 5 being 'moderately satisfied'). Aggregated levels of job satisfaction are described for each site in Table 11.

Departments describe mean levels of autonomy and control ranging from 2.90 to 3.37 (using a five-point scale where two represents 'just a little', three a 'moderate amount' and four 'quite a lot'). This value is difficult to benchmark as other large-scale studies describe autonomy and control for each staff group (e.g. nurses have a mean score of 3.54, n=3420, and doctors have a mean score of 3.47, n=1068). These mean scores vary considerably with grade and job role (Haynes *et al*., 1999).

Correlation analyses looked at mean waiting time per department against individual variables aggregated to department level. Two relationships stand out. Strong relationships were found between waiting time and psychological strain (r=0.79) and autonomy and control (r=0.54), indicating that departments with longer waiting times are more likely to report higher average levels of strain and higher average levels of autonomy and control over work.

The questionnaire asked participants about the way they worked with others (in clearly defined teams, less clearly defined teams or alone). Inspection of Table 11 reveals that a variety of work groupings are described:

- clearly defined team working, 32–71%;
- less clearly defined team working, 19–54%;
- working alone, 6–27%.

This wide variation of work grouping combined with evidence of independent working provided by the team-working interviews describes a confused pattern of working arrangements with the Emergency Departments studied.

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Table 11 Variation of response rate and average psychological strain, autonomy and control, and work grouping in Emergency Departments

Site	Response rate (%)	Stress, % (GHQ caseness, %)	Mean autonomy and control per department	Work grouping factors (%)		
				Working in a team	***Working in a pseudo-team***	***Working individually***
85	47	24, $rwg_{(j)\ 0.97}$	3.28, $rwg_{(j)\ 0.77}$	71	19	10
208	56	28, $rwg_{(j)\ 0.98}$	3.13, $rwg_{(j)\ 0.54}$	65	21	15
40	44	23, $rwg_{(j)\ 0.97}$	3.10, $rwg_{(j)\ 0.77}$	60	23	17
207	35	22, $rwg_{(j)\ 0.97}$	3.02, $rwg_{(j)\ 0.78}$	32	43	25
164	31	25, $rwg_{(j)\ 0.97}$	3.37, $rwg_{(j)\ 0.70}$	71	24	6
154	32	20, $rwg_{(j)\ 0.98}$	2.90, $rwg_{(j)\ 0.67}$	54	39	7
24	18	20, $rwg_{(j)\ 0.97}$	3.15, $rwg_{(j)\ 0.68}$	35	38	27

Note: insufficient data were received from site 109 to include in these analyses. rwg, Within-group coefficient.

$rwg_{(j)}$ >0.7 is generally considered acceptable (James et al., 1984).

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4.4 Conclusion

Table 12 reveals that the in-depth work has accurately predicted departments with extreme waiting-time performance, with department 40 being identified by the Phase Two research team as having a poor performance and departments 109 and 154 as having high performance levels. This indicates that the work done in this phase of the study has identified further important factors that influence performance. The next section will use the technique of ERA to evaluate whether these additional factors alter the amount of variability in waiting times that has been explained thus far.

Table 12 Level of proactiveness demonstrated comapred with residual waiting-time values

Site	Mean waiting time (min)	Rank on mean waiting time	Residual	Rank on residual	Proactiveness
109	37	2	−22.1	1	3
24	89	7	−20.7	2	2
154	28	1	−18.3	3	4
85	61	5	−14.3	4	2
207	55	3	−12.4	5	2
164	75	6	−4.0	6	3
208	60	4	23.4	7	4
40	135	8	66.1	8	1

Ranking on mean waiting time and residual: 1, good performer; 8, poor performer.

Proactiveness: 1, poorly proactive; 2, below-average proactiveness; 3, average proactiveness; 4, above-average proactiveness.

4.5 ERA

The findings from Phase Two of the study demonstrated that the greater the degree to which a department exhibited proactive boundary-spanning management characteristics the better its performance. Using the ERA methodology described in Appendix K we attempted to investigate whether evidence of proactive management behaviours would explain any of the variability in mean waiting time not accounted for in a linear-regression model of organisational factors described in Section 6.

Three investigators independently reviewed all of the quantitative variables about which data was collected in Phase One of the study, to determine whether any could be used as proxy markers for proactive management. Six variables were identified by all three investigators as being proxy markers of proactive behaviours and were included in the subsequent analysis. These were:

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- the presence of a computer system capable of alerting staff when patients reach acceptable limits of waiting time;
- contingencies for providing cover in the event of medical staff sickness absence;
- contingencies for providing cover in the event of nursing staff sickness absence;
- the presence of incentives for staff to reduce waiting times;
- the presence of an Emergency Department policy to deal with shortages of inpatient beds;
- the presence of an Emergency Department policy to deal with exceptionally long waiting times.

Each of these variables was regressed separately upon the unstandardised residuals obtained from the final model of organisational factors predicting waiting time described in Section 3. However, the analysis failed to identify any variable that was significantly associated with the residual values of the model shown in Table 7. The analysis is shown in Table 3F in Appendix F.

4.6 Summary

The findings of the in-depth survey of eight Emergency Departments suggests that high-performing departments are associated with proactive behaviours that manage boundaries between different departments within the hospital, other secondary care services and with primary care services within the broader community.

Team-working interviews indicate a lesser degree of team working than previously indicated from the Phase One interviews. Doctors and nurses commonly work separately, only coming to work together at times of major trauma or emergency. When these episodes cease team working subsides and independent working resumes. High-performing departments will tend to be more active when prioritising work, allocating a doctor and nurse(s) to work together (e.g. See and Treat). High-performing departments describe co-operative leadership strategies between the lead clinician and the head nurse, empowering others to take decisions at a local level. Developmental activities take place to increase the skill and competence of staff and promote reflexive practice.

Findings from the questionnaire survey suggest strong relationships with waiting time and psychological strain and autonomy and control. This indicates that departments with longer waiting times are more likely to report higher average levels of strain and higher average levels of autonomy and control over work. However, as this is a cross-sectional survey the direction of causality is unclear.

As part of the in-depth analyses of eight departments we asked participants what mechanisms would improve waiting times. The next section explores these findings.

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Section 5 What mechanisms are available to improve waiting times?

As part of the detailed examination of eight Emergency Departments we asked participants in interviews and focus groups what activities they thought would reduce waiting times in their department and what initiatives were taking place in the Trust to reduce waiting times. The following description is a summary of participants' comments of what activities/actions could reduce waiting times. This list is ordered by the most common area of discussion.

Following this description and discussion there will be a second, shorter list of activities taking place in these Trusts.

5.1 Actions or activities to help reduce waiting times

5.1.1 Different ways of working

This was a major area of discussion mentioned by participants from all eight Emergency Departments.

Several themes were discussed in terms of how work was structured and allocated, such as having a senior doctor and nurse working together to increase patient flow (See and Treat, mentioned by three Trusts); extend See and Treat to out-of-hours working; improve the management of critically ill and injured patients so that the Emergency Department continues to work effectively in other areas; and streaming patients on arrival or use of triage to pick up urgent cases. Several departments considered extended roles for nurses, such as to requesting investigations against agreed protocols (three Trusts), and assessing ambulant patients in waiting room. Several Emergency Departments considered more structure in the way medical staff worked, such as consultants to see all patients, and acute physician working alongside Emergency Department doctors to avoid duplication of effort. Further, these roles were extended to offering more support to SHOs, and having a middle-grade doctor co-ordinate SHOs according to workload. Key to these considerations of how people worked was for staff to appreciate their own job role and to understand the job roles of others. Leadership was an important issue. Participants urged that only *one* person should have a co-ordinating role over an Emergency Department, supported by a deputy. To be effective, it was critical that the co-ordinating role was distinguished from a caring role.

In terms of process, reflexive practice was advocated to deal with issues and suggest improvements (two Trusts) along with improving decision-making processes and developing the Emergency Department team. In terms of targets a dedicated role to focus on targets or

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patient flow was suggested. Staff were urged to be mindful in the use of resources such as porters (three Trusts; e.g. to co-ordinate their use across the department and have the patient ready for transfer with their notes). Certain practices caused problems, such as only having one designated key-holder for the drugs cupboard.

5.1.2 Reduction of inappropriate use of the Emergency Department

This was a major area of discussion mentioned by participants from all eight Emergency Departments.

Primarily discussion was about activities that would educate the public in the appropriate use of Emergency Department, GP practices, and emergency services and provide information about the primary care facilities available in the local area (NHS Direct, walk-in centres and other out-of-hours services). Constructing barriers to inappropriate use were mentioned, such as screening calls to Emergency Department by switchboard and fewer open doors for patients to wander into the Emergency Department. Payments were suggested as deterrents for inappropriate use and charges made for assessment of patients for insurance and compensation claims.

Participants noted that inappropriate use would be reduced if GPs provided more services in surgeries (such as minor-injury services) and could refer directly to specialities or for investigations. It was suggested that public confidence in GPs needs to be improved so that patients don't immediately present at an Emergency Department and that this should be supported by training GPs to triage patients effectively.

5.1.3 Training, development and maintaining staff skills

This was a key area of discussion mentioned by participants from all eight Emergency Departments.

A wide range of staff skills were described. For nurses it was important to maintain basic nursing skills with regular training and auditing, to gain a greater understanding of what investigations would be needed for different conditions, to take blood, administer drugs and to understand the issues of drug and alcohol abuse. Ward nurses should be trained in Emergency Department practices to increase co-operation between the departments.

Junior doctors were urged to appreciate the importance of the waiting time targets and to have greater confidence to discharge patients or request fewer investigations. Improvements in the training for junior doctors were requested (five Trusts), along with a greater provision of reference sources (one Trust).

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More generally doctors and nurses require education and training of the needs of elderly patients and diseases associated with the elderly, mental health issues and aggressive patients.

Participants suggested that ambulance staff could be trained to take blood and work to standard protocols of investigations to be requested.

It was suggested that porters were upskilled to become generic health care workers. Reception staff require training to prioritise and route patients to appropriate areas of Emergency Department. All staff need to understand how the Emergency Department tracking systems work.

5.1.4 How the Emergency Department fits with other specialities

This was a major area of concern mentioned by all eight Emergency Departments.

The aim of this strategic arrangement would be to facilitate so-called joined-up working between Emergency Departments and medical and surgical specialities so that the whole Trust owns the problem of waiting-time targets. Juxtaposition and management of intensive care units, Clinical Decision Unit and observation wards and Emergency Department are key to the success of this type of initiative.

5.1.5 Proactive co-ordination with primary care services

This was a popular area of discussion mentioned by participants from all eight Emergency Departments.

Improved co-ordination would be achieved by the development and alignment of out-of-hours services (e.g. with GPs, occupational health services, dental services), provision of on-site assessment support (e.g. by psychiatric services) and provision of inter-professional services (e.g. walk-in centres for the public staffed by GPs and ENPs), more integrated assessment services (e.g. elderly care, social services) and development of services provided at home by ENPs.

5.1.6 Proactive co-ordination with secondary care services

This was another popular area of discussion mentioned by participants from all eight Emergency Departments.

The discussion mainly focused on increasing secondary care capacity and flexibility of out-of-hours provision (particularly in radiology, pharmacy, pathology, occupational therapy, stores), using single-assessment processes and protocol-defined care, dedicated services for the elderly, resource sharing across primary care boundaries (e.g. ENPs working in the community), improved communication between secondary care providers (e.g. radiology), electronic provision of

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investigation results (e.g. pathology) and greater support from speciality firms making themselves more readily available to see referred patients. These processes would be assisted greatly by greater understanding of the role of Emergency Department in the Trust and increased co-operation with hospital wards. Many of these activities are critical to the efficient discharge of patients.

5.1.7 Quicker access to information

This was a common theme mentioned by participants from all eight Emergency Departments.

Quicker and more efficient access of patient information was required in Emergency Department. Access was mainly to patients' notes, although systems that offered other services such as printing labels for investigations and the provision of electronic X-ray images were described. One site used electronic records extensively and it was suggested that they develop a system to share this information more effectively with other agencies (e.g. GPs and NHS Direct). One Trust mentioned the need for more information to be provided to patients about waiting times.

5.1.8 Access to beds and an efficient referral process

This was a common theme mentioned by participants from all eight Emergency Departments.

Increased provision of hospital beds, particularly of a short-stay nature, or social admission supported by a more efficient discharge process, was advocated. However, it was noted that to make effective use of increased beds better communication must exist between Emergency Department and other divisions of the Trust facilitating more effective collaboration. Breaches due to a protracted time taken before referral for hospital beds were frequently described and participants called for the development of protocols to allow Emergency Department consultants to be able to admit patients (or develop direct access to an Admissions Unit in the Trust). However, there were restrictions in several Trusts on medical admissions.

Bed capacity could be better utilised if more staff were available to facilitate discharge at peak times (e.g. Monday morning), there were more frequent ward rounds, greater collaboration with ward staff, more active working with discharge planners, efficient provision of drugs and easier discharge to community services (e.g. mental health services) and increased transport provision (particularly out-of-hours for elderly patients).

It was noted that several Trusts had discharge lounges where patients waited for drugs and/or discharge letters; it was suggested that these worked out of hours.

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5.1.9 Increase in staff and matching staffing to patient flow

This was mentioned by participants from all eight Emergency Departments but was not a major area of discussion.

Most commonly additional staff mentioned were ancillary and administrative staff. Extra staff required were porters (five Trusts), reception staff to discharge patients (especially out-of-hours), administrative staff to monitor breaches out-of-hours, good cleaners, more pharmacy staff and radiographers, more health care assistants, more nurses available between 9 pm and 4 am, ENPs out of hours or in other areas of the Emergency Department (four Trusts), more senior medical staff on the shop floor (especially out of hours; two Trusts) and more speciality staff available to admit patients.

5.1.10 Improved efficiency of working practices and processes within the Trust

These comments came from five Emergency Departments, of which three were high-performing[4] Emergency Departments.

It was suggested that a number of standard practices or protocols were developed across the Trust regarding requesting a standard set of investigations for particular conditions. A single point of entry for pathology and radiology was suggested along with efficient tracking systems allowing progress of investigations to be known. These systems would be supported by better direction of information between departments and standardised recording of clinical information for investigations.

5.1.11 Effective management

This was mentioned by participants from four Emergency Departments.

Effective management was considered in terms of staff performance, control of levels of sickness absence and provision of staff development. Particular management activities mentioned were the active matching of staff resources with peak patient flow, clarifying the roles of senior nurses and separating patient care and co-ordination activities, and the presence of co-ordinators who worked with people from outside Emergency Department. Reflexive activities of monitoring 4-hour targets and examining reasons for breaches were advocated.

5.1.12 More physical resources

This was mentioned by participants from four Emergency Departments.

[4] Three trusts were classed as high performers: 109,154 and 208.

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Surprisingly little was mentioned under this category. Resources described were equipment to test alcohol and drug levels, provision of more space (particularly in the area of the department dealing with more major cases; one Trust), and better refreshment facilities for patients.

5.1.13 Discussion at an NHS level regarding funding between primary and secondary care providers

Mentioned by participants from three Emergency Departments.

Participants urged for activities to promote co-operative, quality-based ways of working across funding boundaries (e.g. develop protocol-based care where blood is taken for investigations in the ambulance).

5.1.14 More staff-support services

Only one Trust mentioned the need for Emergency Department nurses to have stress counselling.

5.1.15 Summary

Thirteen areas of improvement were described by participants of the study. Principally these covered different ways of working in the Emergency Department, training and development of staff, consideration of where the Emergency Department fits in the structure of the Trust, proactive co-ordination of primary and secondary care services, quicker access to patient information, increased access to hospital beds and a more efficient referral process supported by an increase in Emergency Department staff matched with patient flow.

Participants were also asked to described initiatives that were in place (or being actively discussed) within their Trusts which aimed to reduce waiting time. This list is ordered in the same way as the previous one to allow matching of suggestions to activities.

5.2 Initiatives or activities that are in place to reduce waiting times

5.2.1 Different ways of working

This was the most popular area of comment and several changes in working practices were noted.

Principally, Emergency Departments had considered who greeted patients on their arrival and how they were streamed for treatment. Five Emergency Departments described using a See and Treat service that is consultant-led, staffed by a nurse and a health care assistant. In one Emergency Department the receptionist decides who goes to See and Treat, another used 'meet and greet' nurses as patients entered the department, another used a triage system and another gave children priority out of hours.

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A high-performing Emergency Department described priority streaming of patients at a 'pit stop' facility where patients are seen on arrival by a senior doctor. Another Trust has a registrar seeing all patients and a further Emergency Department noted that a consultant was on the shop floor between 8 am and 9 pm. One Emergency Department described the practice of having a staff-grade doctor co-ordinate SHOs according to the department workload. Two Emergency Departments described having a GP working in the department.

Four Emergency Departments described having ENPs treating minor injuries. ENPs were also taking histories, examining and requesting investigations in three Emergency Departments. Two Emergency Departments described having co-ordinators track patient progress through the department. A further Emergency Department described a 'nurse navigator' role to track patients through the department effectively (however, this is not a popular role with nurses).

One Emergency Department described the use of protocols to fast-track cardiac patients and another had developed a walk-in centre that was co-located with the Emergency Department.

It was noted that such activities (particularly See and Treat) allowed the minor-injury side of the Emergency Department to continue to run when there are also a number of sick cases to manage. Further, reducing waiting time was described as having reduced patient aggression. However, the downside of these developments is that there is a greater uptake of Emergency Department services as they are seen as more efficient than the local GP services. It was also noted that many of these developments were not available out of hours.

Two Emergency Departments described the process of reflection as to why breaches occur and taking steps to stop this happening again.

5.2.2 Reduction of inappropriate referral

One high-performing Trust had developed a video playing on Emergency Department screens showing the type of condition that should or should not be seen in the Emergency Department. Another Emergency Department reschedules primary care patients attending at night by giving them return appointments for the morning.

5.2.3 Training, development and maintaining staff skills

One Trust described increasing the length of SHO secondment to the Emergency Department to train junior doctors more effectively and training staff in Emergency Department in the use of ultrasound. More support for junior doctors was noted by another Trust with the employment of more middle-grade staff to supervise. A further Trust had trained nurses to assess and refer mental health patients.

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5.2.4 How the Emergency Department fits with other specialities

One high-performing Emergency Department was joined with the medical directorate and acute medical admissions of the Trust. This means that patients can be referred directly to wards from the Emergency Department and to out-patients' clinics. Four other Trusts have established a Medical Admissions Unit where patients are transferred after a 3-hour waiting period or a Clinical Decision-making Unit to stop the 4-hour clock. A further Trust moves patients to wards to avoid a breach of the 4-hour target.

5.2.5 Proactive co-ordination with primary care services

High-performing Emergency Departments were associated with the appointment of a mental health co-ordinator based in the Emergency Department to improve access to mental health services (out of hours a named psychiatrist takes calls from the Emergency Department), GP referrals straight to speciality, on-site assessments by occupational therapists and physiotherapists, a rapid-response team to assess elderly patients and facilitate discharge to community beds, provision of intermediate elderly care in the community, and provision of ENPs working in the community. Another Trust has a psychiatric liaison post working with Emergency Department and a further Trust has developed an intermediate discharge team to speed up hospital discharge.

Three Trusts have developed a doctors' drop-in centre (one provides ambulance transport to the centre) and in another GP care was provided by a co-operative out of hours. One Trust has developed a service located next to the Emergency Department where patients are diverted after 6 pm to see a GP and primary care nurses. Further co-operation has been achieved with GPs seeing minor-injury patients at the weekends, GPs having direct access to admission on wards, and a rapid-response team seeing patients at home reducing the need for admission (two Trusts). Whereas it was noted these services have limited capacity they successfully free up the Emergency Department for major patients.

One Trust had plans for paramedics to work in the community providing services like NHS Direct and another had employed an Emergency Care Practitioner to work in the community to reduce the need for Emergency Department attendance (in association with the ambulance service).

5.2.6 Proactive co-ordination with secondary care services

One Emergency Department noted improved relationships with the local X-ray department. Another described how the Emergency Department doctor is released quickly from the hospital trauma team.

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5.2.7 Quicker access to information

Three Emergency Departments have made progress in this area. Two high-performing Trusts have removed written records; all notes were audio-typed and added to the electronic patient record. This provision enables a database of patient information to be available at See and Treat and admissions can be highlighted and prioritised. Another Trust has a plan to integrate a shared IT service between Emergency Department and X-ray, offering online images in the next 2 years. Most Trusts provided information to patients about waiting times.

5.2.8 Access to beds and an efficient referral process

Several Trusts have made strategic plans or appointments to improve bed congestion and plan effective discharge. One high-performing Trust has gained funding from the local Primary Care Trust for more acute beds and short-stay beds. Another Trust has increased its medical beds. Two other Trusts have developed a short-stay ward, or a receiving ward where Emergency Department patients are transferred (another is in discussion about this provision). One Trust has appointed a bed manager within their directorate (another Trust is in discussion) who liaises with wards to free up beds. Another Trust has increased inter-ward and inter-hospital transfers to free up beds. A further Trust has appointed a consultant acute physician to improve medical-assessment-unit throughput to ease congestion.

In terms of referral only one Trust mentioned implementing a direct admission policy from the Emergency Department to medicine and a second had developed protocols enabling Emergency Department doctors to admit to surgery and orthopaedic beds.

In order to increase the speed of discharge one Trust has a private ambulance available (between 12.30 and 7.30 pm) to discharge patients home, supported by the use of a taxi service for those who do not need an escort. Discharge lounges were available in three Trusts.

5.2.9 Increase in staff and matching staffing to patient flow

Two Trusts reported more portering services. Three Trusts reported employing more doctors (specifically a surgical registrar, and middle-grade doctors working out of hours), with more doctors available at weekends. One Trust had a GP mentor available in the Emergency Department to assist junior doctors in their decision-making.

Two Trusts are planning to employ two new consultants in the Emergency Department.

One Trust had appointed more physiotherapists and a flow co-ordinator to track patients. With regard to nursing appointments one Emergency Department had a cardiac chest-pain nurse to assess patients with chest pain and another had appointed more ENPs.

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5.2.10 Improved efficiency of working practices and processes within the Trust

No direct comments were made in this area.

5.2.11 Effective management

Two Trusts described active discussion of patient breaches and planning of solutions (one Trust has a weekly meeting with the Trust's Chief Executive to review performance). One Trust described the use of discharge lounges where patients waited for drugs on discharge; however this was not available out of hours.

5.2.12 More physical resources

Only one Trust mentioned increasing the number of cubicles available in the area of the department dealing with more major cases. Other Emergency Departments described different uses of existing resources, such as having colour-coded Emergency chairs (and cubicles) kept only for emergencies, and removing seats from the nurses' station, thus reducing staff time in that location.

5.2.13 Discussion at an NHS level regarding funding between primary and secondary care providers

No direct comments were made in this area.

5.2.14 More support services

No direct comments were made in this area.

5.3 Summary

It has been instructive to examine participants' suggestions to improve waiting times and compare these with action within the Emergency Departments and participating Trusts. The establishment of waiting-time targets has been associated with changed ways of working in most Emergency Departments and the greater efficiencies in bed management, the development of short-stay beds or holding areas within Trusts where patients await the outcome of examinations or investigations. Our comparison would suggest that high-performing Emergency Departments owe their success to improved strategic positioning of the Emergency Department within the Trust structure, improved access to patient information and greater co-ordination of services with primary care providers easing discharge.

Our comparison shows that with the limited examples of developments in medical training there has been little or no investment in the development of leadership, effective management and training and development of staff in Emergency Departments. These are important areas that should be addressed and a role of this report is to highlight this situation.

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Given that lower waiting times (and high performance of Emergency Departments) are associated with a participative management style of the lead clinician it is unsurprising that improvements in strategic positioning within the Trust and strategic alliances within primary care have been demonstrated. A participative leader including a wide group of staff within these discussions, viewing the service of the Emergency Department proactively and broadly, within the community context and an appreciation of others' roles will have helped these developments. Clearly these are key areas of management development to be considered along with the effective co-ordination of the Emergency Department.

It is clear that a number of initiatives are being tried. What is not clear, is the persistence with which these initiatives are pursued, or whether they are tried and dropped rapidly if no immediate gain is made. Many of the initiatives suggested and tried were not shown from our modelling process to be significant contributory factors to the variance in waiting times. However, some of them may reflect proactive leadership styles that we have endorsed. Further research is required in many of these areas to identify causal relationships with waiting times.

The next section will discuss the findings from the study.

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Section 6 Discussion

6.1 Summary and introduction

This study is concerned with Emergency Departments and the factors that influence the time patients wait to be seen by an appropriate decision-maker. It is not surprising to see the wide variation in demographics of the Emergency Departments in the study. One hundred and thirty seven departments from 112 Acute Trusts, representing 65% of the major Emergency Departments in England and Wales, participated in the first phase of the study. The participating departments covered a wide geographical area, from large teaching-hospital Emergency Departments in urban settings to smaller departments in more rural district general hospitals. It is therefore likely that the participating departments are representative of all Emergency Departments in England and Wales.

Even though only Type I departments were included in this study, it is clear that there are no standard components of a major Emergency Department in England and Wales, beyond those stated. In our study we found that attendances varied between 15,824 to 132,750 per annum (mean 62,614 attendances per annum, SD ±20,791). The percentage of cases arriving by ambulance ranged from 1.2 to 38.6% (mean 24.8%, SD ±6.4). These variations have implications both for trying to standardise performance, and also in predicting performance. Given the wide variation, perhaps a standard measure of performance is inappropriate as the variability between Emergency Departments should be adjusted for prior to making any comparison. Equally, the development of a model of factors that predicts performance may be difficult without making certain adjustments. With this in mind, the approach taken to analysing the data we collected was a stepwise one to enable factors such as case-mix and size to be accounted for prior to examining the contribution that other organisational factors make.

A quantity of data has been collected from the Healthcare Commission, an 11-year study of changes in waiting times at a major teaching hospital and a large-scale interview study of lead clinicians, head nurses and business managers in 137 departments in England and Wales. The findings of these studies tell us that after accounting for case-mix and size variables the amount of time lost to nursing sickness, along with the non-pay spend of the department and the management style of the lead clinician account for over a third of the variability in mean waiting time between departments.

In addition to this, in-depth study of eight Emergency Departments further identified boundary-spanning proactive management behaviours, psychological strain, staff autonomy and control issues to be important in influencing performance. However, with all these factors, the direction of causality is unclear. Our findings will be

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discussed in more depth in this section. We will then go on to discuss what mechanisms are available to reduce waiting times.

6.2 Justification for mean waiting time as the dependent variable

The measure of waiting time under investigation was the interval from the first recorded time of arrival in the Emergency Department to the time recorded when the patient sees a DMC. While being aware that there are many different measures of waiting time referred to, such as 'total department time', 'trolley time' and 'time to admission', it was felt that the time most under the influence of organisational factors within the Emergency Department is the time taken to see a DMC. Other times measured are heavily influenced by the wider hospital and community setting, such as number and availability of acute beds, discharge rates from acute beds and response of other specialties to Emergency Department patients. Investigation of these additional factors in addition to 'time to see a DMC' was beyond the time and resources allocated for this study. Waiting times, defined as the time from arrival to being seen by a DMC, have never formed a performance target for Emergency Departments in England and Wales (unlike the present 4-hour imposed target). They do however have a number of characteristics that make them useful in this respect.

Waiting times in Emergency Departments have been shown to be a key determinant of patient satisfaction (Trout *et al*., 2000; Taylor and Benger, 2004). As stated in the Audit Commission report patients would most like to change the length of time they wait in Emergency Departments. The measure chosen for the study therefore was thought to be the most patient-focused one. In addition, the report also stated that there was a tendency for departments with long waiting times to see a DMC also to have long times for admission to a hospital bed (Audit Commission, 2001).

Waiting time is also a useful measure of the process of care within the Emergency Department, although measuring only part of the patient journey. Waiting time has also been shown to be related to other measures of performance, such as the proportion of patients who leave prior to seeing a DMC (Mohsin *et al*., 1998; Kyriacou *et al*., 1999).

Recording waiting time is relatively simple, requiring only the recording of time of arrival and time seen by a DMC, the former being done routinely on arrival of patients. Waiting time therefore appears to be a useful measure of Emergency Department performance, being meaningful to both patients and clinicians.

The Healthcare Commission had not previously collected waiting time as a measure of performance, preferring to collect data on the 'proportion of patients seen within 1 hour'. However, negotiations prior to the 2004 data collection enabled this additional information to be

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collected for both the Healthcare Commission and the purposes of this study.

6.3 Emergency Department data quality

6.3.1 Reasons unrelated to patient care and flows

No Emergency Department measures true waiting time (the time when the patient walks through the door to the time of being seen by a DMC). The commonest measure will be the time of arrival (as measured by registration) and time seen by a DMC. Obviously if triage takes place before registration then the triage waiting time and triage time will not be counted in the waiting time. Previous studies (Edhouse and Wardrope, 1996) show that triage after registration added an average of 15 minutes to waiting times. Problems may also depend on how a department treats 'time not known' and 'did not wait'. There is evidence from the data abstracted from Emergency Department IT systems that waiting time cannot be calculated for up to 16% of patient episodes. It would appear that patients whose waiting time cannot be calculated are older and more likely to be female, arrive by ambulance and be admitted to hospital. A possible explanation might be that in those patients who are more unwell, requiring immediate treatment upon arrival in the Emergency Department, priority is given to their clinical care and errors or omissions therefore arise in the recording of administrative data. Alternatively, the episodes with missing waiting-time data may represent patients who have been referred directly to an inpatient speciality and thus do not have the time seen recorded by the doctor who assesses them. These explanations are purely speculative as there is no evidence from the data collected to support any particular explanation.

Data quality must be a central concern. It is impossible that an Emergency Department can see 100% of patients in 1 hour. Equally it is almost impossible that an Emergency Department is taking longer than 1 hour to see all its patients (or it would be breaking all the rules of dealing with resuscitation cases). Figures reporting data in this way are obviously errors. Any study of variation in Emergency Department waits must take data quality into account.

6.3.2 Consistency of measuring waiting times

As previously noted, whether patients are seen in triage first or booked in by reception first could have a major effect on reported waiting times. This may also be an important factor in quality of care. Extending triage time to include giving analgesia and ordering investigations, as well as carrying out triage assessment, was, until most recently, considered good practice. However, if booking in occurs before triage, the good practice will apparently lead to longer waiting times.

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For this study, we decided to use the data collected by the Healthcare Commission on mean waiting times. We validated this data with our own sample month's data collected independently in 122 of the Emergency Departments participating in the study. When compared, we found little difference between the Healthcare Commission data and the data submitted for the study, indicating that Emergency Departments were not manipulating data prior to submission to the Healthcare Commission, and that this measure was probably robust enough to be used as our main outcome variable. In six cases, Healthcare Commission waiting-time data was not available for use, and here we substituted our waiting-time measure from the sample data collected for the study.

The reliability in the times recorded due to missing or invalid data, but also due to the points in the patient journey times, make interpretation of waiting time and other time data difficult. Research findings should therefore be treated with some caution. A standard approach to recording times nationally would be ideal, but probably unrealistic. In addition, making international comparisons would be even more fraught with complications. Perhaps the most we can hope for is awareness of the possible effects that the quality of routinely collected data can have on this type of study. In the longer term, data quality may be improved as IT systems improve and staff become more familiar and aware of the importance of good-quality data.

6.4 Factors influencing waiting times

6.4.1 Case-mix and size

Previously published literature highlights a number of factors that have been shown to be related to waiting time, although in many studies these have been assessed in isolation and must therefore be interpreted with some caution. This study has identified case-mix and department size as primary factors associated with waiting times. This supports the work and recommendations of Graff *et al*. (1993) and Tham *et al*. (1995). However, what these studies were unable to do is to differentiate whether these factors are more or less important than the way individuals work together or manage across health care boundaries. By using a stepwise analytical technique we were able to explain that a significant amount of the variance in waiting time across departments is accounted for by factors of non-pay spend, time lost to nursing sickness and management style of the lead clinician. This contributes new knowledge to the field of emergency medicine.

A number of characteristics of the Emergency Department and the hospital in which it is based, such as increasing department size (Audit Commission, 2001), being a teaching hospital (Lambe *et al*., 2003) and geographical location (Audit Commission, 2001), have previously been shown to be associated with increased waiting times. These studies provide important evidence that Emergency Department performance is influenced by a number of external factors and that

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such influences should be taken into account when comparing the effect of factors within the department upon performance. Waiting times have also been shown to be longer for certain socio-economic groups (Mohsin *et al*., 1998) and in Emergency Departments serving poorer neighbourhoods (Lambe *et al*., 2003). It has been demonstrated that patients with the least-serious illnesses wait longest to be seen (Saunders, 1987). Two studies have demonstrated that different clinical presentations require differing durations of input from clinicians (sites 289 and 206). Although neither study examined the impact of case-mix upon waiting time, they offer support to the logical assumption that waiting time must in part be determined by case-mix.

Analysis of changes in performance of a large urban Emergency Department described in Appendix B showed a progressive increase in waiting time over time. The factors most adversely affecting this include time, with a year on year deterioration experienced. This is likely to be because of changes seen in relation to case-mix of patients seen. Proportionately more older people and major cases present to the Emergency Department. These cases are more resource-intensive. Finding ways of dealing with these cases more effectively using the whole urgent-care system may provide some answers. There are examples of where this is happening with the introduction of more community-based services aimed at taking urgent care to the patient. Emergency Care Practitioners now provide emergency responses for patients with more minor conditions and community-support teams for chronic conditions try to prevent the need for hospital attendance among certain groups of patients.

6.4.2 Emergency Department Staff

Re-analysis of data collected by the Audit Commission in 2000 has given some insight into factors that might be responsible for variations in Emergency Department performance. When differences in department size and case-mix are taken into account, the number of nurses on grades A–C and the percentage of qualified nurses who are grade G or above were found to be predictive of the percentage of patients seen within 1 hour of arrival. However, this analysis should be interpreted cautiously as over 15% of the departments included did not report data for this particular performance measure. Chinnis and White (1999) examined the dominant beliefs within Emergency Departments, concluding that more nurses and fewer ancillary providers is believed to equate to better care. Interestingly, the data created from Phase One of our study did not support this finding as being a significant contributor to performance.

Our own study identified the amount of time lost to nursing sickness to be an issue adversely affecting waiting times. Departments with a higher proportion of nursing time lost to sickness had a higher mean waiting time. When investigating the issue of staff sickness, it is important to look at the broader picture of both nursing and medical

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staff, how they work together, and the context of management and leadership styles within the department. It may be obvious that losing staff to sickness means that departments operate on inadequate numbers of staff, inappropriate staff ratios or staff who may be drafted in from agencies or other areas of the hospital who are therefore unfamiliar with working practices. Inevitably this may lead to performance deteriorating. Several studies have looked at staff sickness absence in the NHS (e.g. McKevitt *et al.*, 1997; Hardy *et al.*, 2003), finding anomalies in sickness absence data recording (Hardy *et al.*, 2003) and inconsistent findings in relation to medical staff (McKevitt *et al.*, 1997). Clear relationships were found between psychological health (using the GHQ-12; Goldberg, 1972) and sickness absence of nurses and other health care staff with the exception of doctors. The authors conclude that doctors may avoid absence by 'working through' illness, but that this behaviour many have a detrimental effect on their performance at work.

Hardy and her colleagues (2003) carried out three studies in the NHS looking at psychological health and performance. Two out of three studies demonstrated a relationship between psychological health and performance, suggesting that staff with poorer psychological health report worse performance (self- and externally rated) than staff with good psychological health. This relationship held true in all the studies for nurses but not for managers. Doctors were not included in these studies.

6.4.3 Emergency Department facilities

Whereas one might assume that the facilities available in an Emergency Department might influence its performance, only a limited number of studies have examined this. The availability of beds in an Emergency Department has been shown to be associated with reduced waiting time (Kyriacou *et al*., 1999; Liu *et al.*, 2003). Our study provides evidence that the non-pay spend of a department is negatively associated with waiting times. In short, spending less money on department facilities is associated with reduced waiting times. This supports the work of Miró and colleagues (2003). It may be that our findings reflect the culture of a department. They may either spend less because they have planned their practice to apply managed care protocols which are more prescriptive in the number and types of investigations and treatments ordered for certain presenting clinical conditions. Alternatively, they may have a general philosophy that does not encourage 'staying and playing' with patients, rather, 'triage and refer' to the appropriate facility. With either of these scenarios, it is possible to see how using fewer facilities and thereby performing fewer investigations and interventions within the department could lead to shorter waiting times overall. However, further work here is required to investigate this relationship and its impact on clinical outcome.

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6.4.4 Team working and working practices

To examine the way people work together specialist team-working interviews revealed less team working than had been expected from the Phase One interview survey when 'a lot' of team working was described. The predominant theme was of individual working that was separate for doctors and nurses punctuated with a number of people coming together to form a team to cope with a specific emergency event (such as a patient having a cardiac arrest). Once the event was completed, staff returned to individual working. This describes a high level of autonomy and control in the way individuals work that may be associated with longer waiting times. In addition, differing lines of leadership and control are described for doctors and nurses, suggesting difficulties in co-ordination of staff.

Qualitative examination of team working indicated that higher-performing departments are more proactive in that they prioritise work and describe specialist areas where doctors and nurses work together (e.g. See and Treat). It may be that dyadic working between a doctor and nurse may be more beneficial to complete a patient episode. If we take, for example, the patient who has a fracture and abdominal pains on presentation. An ENP can only manage the fracture and must wait for a doctor to decide on the management or investigation of the abdominal pain. If these two individuals worked together and saw this patient simultaneously the patient episode is likely to be much shorter and more effective. See and Treat and so-called Greet and Treat services that are offered by a doctor and nurse in order to prioritise a patient's path though the Emergency Department are likely to be more effective than doctors and nurses working separately. This finding is supported by a previous study of Browne and colleagues (2000) who describe a model of doctors and nurses working in small teams that reduced waiting times. Given the nature of independent working in Emergency Departments a pairing arrangement of a doctor and nurse would seem more practical than a team.

Higher-performing Emergency Departments not only describe incidences of doctors and nurses working together but illustrate co-operative leadership strategies between the head nurse and lead consultant. These strategies are likely to increase the number of joint-working practices and these leaders empower others to take decisions at a local level in the department, increasing speed of response and local accountability. Our study demonstrates that in association with co-operative leadership strategies developmental activities also take place in these departments to increase skill and competence along with reflexive activities looking back at waiting-time breaches with the aim to improve performance.

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6.4.5 Psychological strain and autonomy and control

A questionnaire survey of seven Emergency Departments as part of the in-depth study revealed strong relationships between waiting time and stress (or more correctly described as psychological strain measured by the GHQ-12; Goldberg, 1972) and autonomy and control, indicating that departments with longer waiting times are more likely to report higher-than-average levels of strain and higher-than-average levels of autonomy and control over work.

The GHQ is a valid (Bacon, 2004) and reliable (Browne *et al*., 2000) measure of psychological strain supported by a large amount of normative data from health care populations (Chinnis and White, 1999). The GHQ examines the ability of individuals to carry out their 'healthy' functioning as well as cope with new distressing phenomena (VanRooyen *et al*., 1999). The relationship between psychological strain and waiting time is logical and understandable. Individuals who are experiencing high levels of strain are less able to make decisions and prioritise their work. Interestingly, lead clinicians with a participative management style are more positive about the morale in their departments, suggesting that they may be aware that their style and subsequent activities are likely to influence levels of strain. Activities such as providing feedback on performance, offering leader support and guidance, clarifying roles and reducing role conflict in the workplace are all activities likely to reduce levels of strain (Lazarus and Folkman, 1984; Borrill *et al*. 1996, 1998b).

Initially, the finding that autonomy and control is associated with longer waiting times is puzzling. Freedom, independence and discretion in the scheduling and determining of procedures used in carrying out work are associated with decreased mental strain (Payne, 1999). The measure of autonomy and control is based on that of Method Control (Carter and West, 1999) and has been used with manufacturing, administrative, managerial (Borrill *et al*., 1998a) and health care samples (e.g. Borrill *et al*. 1996, 1998b). This work suggests that the greater autonomy and control an individual experiences the better they can cope with work demands. However, working with one's immediate superior can be a medium through which employees experience autonomy and gain advice and support to clarify roles and determine appropriate behaviour (Carter and West, 1999). The finding that a participative management style is associated with reduced autonomy and control with some staff groups (and increased autonomy and control for others) suggests that a participative manager is able to encourage autonomous individuals to reduce their autonomy (and enable others increase their autonomy) while working together with others to achieve broader performance goals.

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6.4.6 Mechanisms available to improve waiting times

Comparing the 'wish list' of activities that could reduce waiting times with those activities that have been implemented is useful. Many Emergency Departments have changed the way they greet and assess patients with senior medical staff leading this process. Extended roles for nurses have been developed and junior doctors have a greater degree of supervision and instruction in some Trusts. However, there were no comments on developments regarding overall leadership in Emergency Department. Our modelling found that changing working practices had no effect on improving waiting times, but previous studies have shown some effect on waiting times for higher-acuity patients seen by an experienced Emergency Department doctor usually as part of a team (Subash *et al.*, 2004; Choi *et al*., 2006). However, further research is needed in this area to identify the most appropriate way to deploy staff, especially experienced staff, who are a valuable resource.

Whereas inappropriate referral to the Emergency Department was a large source of comment, few activities had addressed this situation. It may be the case that alternative methods of service delivery had not been tested because there are few viable alternatives currently to Emergency Departments. At present, the Department of Health discussion document *Direction of Travel for Urgent Care* (Department of Health, 2006) states that people want more responsive services that avoid duplication of information. The drive is to develop more community-based services that are faster and more convenient than the Emergency Department. However, as yet, these services are patchy. Further research is needed to evaluate the effectiveness of such services before widespread development. It is interesting to note that there have been considerable efforts to co-ordinate the activities of Emergency Department and primary care and community services. Much of this activity is associated with high-performing Emergency Departments, suggesting that these are valuable activities to reduce waiting times. Principally these activities provide rapid assessment of elderly and mental health patients in the Emergency Department, facilitating more immediate discharge or move to intermediate facilities in the community.

Several activities had taken place at a strategic level to reposition Emergency Departments within Trusts, with one high-performing department joining the medical directorate facilitating medical admissions. Several other Trusts had developed holding areas for patients while they are being assessed (e.g. Medical Admissions Units, Clinical Decision Units). However, little activity has reflected the co-ordination of Emergency Department and secondary care services. The lack of joined-up working may reflect the conflicts of interest that other specialties have in addressing the emergency-medicine waiting-time target at the expense of their own specialty target. It seems hard therefore to achieve a corporate ownership of waiting times. Although,

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during Phase One of our national survey, 58.2% of departments (n=64) reported being in directorates with other specialties, the type of specialty that emergency medicine is paired with may be the key. Simply including the Emergency Department within a directorate without careful thought as to which specialties already exist there may be insufficient. It seems clear that to develop a corporate ownership of waiting times, meaningful inter-specialty relationships need to develop; so, for example, a directorate containing emergency medicine and acute medicine may be more fruitful in tackling some of the boundary issues that exist than a directorate containing emergency medicine and orthopaedics.

In terms of quicker and more efficient access to patient information the development of electronic services may be effective in reducing waiting times, with two high-performing Emergency Departments having removed written records. Many departments cited the need for improved access to diagnostic facilities 24 hours a day and 7 days a week. It must be realised that emergency medicine is not a 9 am–5 pm specialty and support services need to be configured to meet the demand out of hours. However, this is more expensive and requires staff prepared to work such unsociable hours.

There have been considerable developments in access to beds, bed management, efficiencies in referral processes and discharge, either gaining funding internally to the Trust, or, as in the case of one high-performing Emergency Department, gaining funds from the Primary Care Trust. However, only two Trusts mentioned implementing a direct referral process.

In terms of increasing staff to match patient flows there was little evidence of a matching process. In several Trusts, more senior medical staff had been employed and in one Trust more ENPs had been employed. Two Trusts reported an increase in portering services. Our re-analysis of the Audit Commission data indicated that the proportion of nurses at a lower grade improved waiting times. Our own modelling process did not find this, but did find that nursing sickness is an important factor. It seems clear that attention needs to be given to addressing what is the most appropriate mix of staff and maintaining a healthy workforce.

In terms of improving efficiency of working practices within the Trust there were some examples of protocol-led practice but these were few. However, our model indicated that non-pay spend may be a factor in improving waiting times. The less spent, the better for waiting times. It may be the case that a more protocol-led service is more cost-effective and time-efficient. Further research is required to explore this hypothesis.

An active area of discussion had been more effective management of Emergency Department. While reflexive practices with regard to waiting-time targets were described there were no initiatives describing management development, or the effective management of sickness absence or leadership.

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Finally, there were few activities regarding increasing physical resources although more effective use of current resources was described. There were no activities with regard to initiating funding discussion or developing support services for staff.

6.4.7 How to develop participative leadership

An obvious recommendation from this study is to develop proactive and participative leadership skills with emergency-medicine lead clinicians, or another nominated manager in this field. It is apparent from this study that some lead clinicians are ably operating in this style already. However, it is clear that many are not. Management and leadership are often not the most common areas of development for specialists in emergency medicine. Many years of clinical training are unlikely to equip emergency-medicine specialists with these skills.

Initially, dissemination of this report will be helpful to raise the profile of these skills and abilities and new lead clinicians can be recruited on this basis. Some clinicians may want to develop their skills further and mentoring by another manager who models proactively and boundary-spanning abilities would be good ways forward to develop and shape these styles. The NHS undertakes a wide variety of development strategies for leaders and a programme specifically for emergency-medicine practitioners may be an obvious choice. However, such a programme runs of risk of another 'one-off' programme that further isolates groups of managers. Our suggestion would be that a broader programme that focused on the management of primary and secondary care services would be a valuable vehicle to foster and develop co-operative and proactive behaviours.

It is apparent from this study that the management style of the head nurse and business manager were not related to waiting time. Further, it is clear that doctors and nurses identify and are led by different people in an Emergency Department. This finding is not unique to Emergency Departments but prevalent throughout the NHS. This differentiation is not helpful and is likely to lead to role conflict and confusion. High-performing departments demonstrated co-operative leadership strategies where head nurse and lead clinician worked together. This will be an important development and one that would foster more dyadic working between doctors and nurses at the point of patient contact. Clearly, teams of staff that come together at times of emergencies have proven their effectiveness. The suggestion to develop dedicated pairs of doctors and nurses to work at other points of patient contact develops this notion further. In addition, further work is needed into how leadership translates into improving performance of specialties and departments.

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6.5 Recommendations for ways to reduce avoidable variation: future research

It is recommended that all Emergency Departments examine the important factors found by this study to influence mean waiting time. This should be done in the context of their own working practice with a view to identifying areas that would be amenable to change. We recommend exploring how changing these organisational factors may affect waiting times and develop hypotheses for empirical testing. Following this, recommendations for future empirical research that will address waiting time issues will be made along with the rationale for their selection. Conducting primary research into the findings suggested by this study will be key in determining a causal relationship between factors identified and their ability to influence waiting times. There is no doubt that any intervention study will be challenging and costly to set up and execute given that the intervention will mean changing the way that departments operate and deliver their service. However, this should not deter future research in this area from being undertaken and encouraged.

A number of measures of waiting time have been introduced in recent years. This study's use of the mean waiting time to see a DMC has been useful and successful in examining some relationships hitherto not explored in relation to emergency medicine. This large-scale study has placed emergency medicine firmly on the interface of primary and secondary care and has probably achieved its usefulness. Other measures, such as the 4-hour waiting-times target are now being achieved by a majority of departments. While some on-going measure of performance is useful to provide feedback to departments, little further development of services is likely to take place. It may be the case that any further improvement in relation to one standard is not possible due to the marked heterogeneity of departments to which it is being applied. One of the next areas of effectiveness to explore is that of cross-boundary working between primary and secondary care services and improving service quality. Work that is commencing looking at pathways of care in relation to individual conditions is likely to be useful in this area (Goldberg, 1972). It must be remembered that for the patient, the journey does not begin on arrival at the Emergency Department, but at the point when they decide to seek help for a health problem. Therefore taking a patient-centred perspective will not only include the experience of the Emergency Department, but that of contact with local health services in general.

Finally, the Healthcare Commission have started to examine quality of care more recently in conjunction with the British Association for Emergency Medicine. A number of clinical standards were audited in the recent round of data collection to try and compare departments not only in relation to the environment, but also to the service provided. It will remain to be seen how useful these measures are, but they are an important step in acknowledging quality as a key measure of service to patients. However, it is clear that other quality issues

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require study, not least how quality is measured effectively and then linked with performance and patient outcomes. This is a major piece of work that should be recommended for future research.

This study also found that proactive, participative leadership style is important. The ability of a leader to work inclusively across a number of boundaries has been described. Developmental activities should be examined to support the development of proactive and participative leadership styles. It is also important to be able to identify these behaviours and measure them. This would suggest a fruitful area of research developing from this work, examining the transfer of leadership within health care and specifically examining leadership across primary and secondary care boundaries.

6.6 Limitations

Although this study has examined a large number of Emergency Departments across England and Wales along with an in-depth study of eight departments, it has several limitations. Chiefly, it is a cross-sectional study that has identified several factors associated with waiting times. However, the direction of causality of these factors is unknown. For example, high-performing departments exhibit proactive behaviours that manage the relationships across the Trust and primary care. This suggests that proactive behaviours result in subsequent high performance. A cross-sectional study cannot distinguish this level of causality as it may be that, because these Trusts are high performers, proactive behaviours will develop. Therefore we must be careful to talk about an association between proactive behaviour and high performance and urge for longitudinal studies to determine the direction of causality.

Whereas a model of factors that predicted waiting times was identified, the mechanisms available to reduce avoidable variation in waiting times are less clear. It is apparent from our in-depth work that departments have a number of mechanisms in place, but few of them relate to those found to be important from our modelling. Therefore, the mechanisms to reduce variation in waiting times are as yet to be defined. Further work will be required to identify effective mechanisms that can be transferred to the broad, different configurations of Emergency Departments that exist throughout the country. However, some have been suggested and warrant further investigation.

This study only examined factors influencing waiting times within Emergency Departments themselves. The time and funding available did not allow the scope of the study to extend to the wider Trust or community. Further work should focus on this, given that in-flow and exit block are acknowledged as being key challenges when tackling waiting times. In addition, a proactive and participative management approach should incorporate the wider health community as well as the Emergency Department itself.

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6.7 Concluding remarks

This study provides strong evidence from multiple perspectives that, after controlling for case-mix and size of department, time lost to nursing sickness, non-pay spend and lead clinician management style are factors likely to affect waiting times. In addition, proactive, participative leadership style is important. Further work needs to focus on designing appropriate interventions to test this model, examine different ways of evaluating Emergency Department performance, and evaluating the effect that the wider health community has on Emergency Department performance.

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Appendices

Appendix A Audit Commission data re-analysis

Aims

This part of the study aimed to re-examine the findings of the Audit Commission's review of Emergency Departments undertaken in 2000 and explore whether any further conclusions can be drawn from the data collected at that time (Audit Commission, 2001). An investigation of factors that affect waiting times was undertaken.

Methods

Analysis was undertaken using data from the Microsoft Excel file named 'ae database 2000 v1_38' taken from the *Acute Hospital Portfolio* CD. The Audit Commission have confirmed that this is the data-set upon which their original analysis was based. The waiting-time measure collected by the Audit Commission was the proportion of patients seen by a doctor or nurse practitioner within 1 hour of arrival.

Data analysis

For the purposes of the analysis only those departments in England and Wales identified by the Audit Commission as general Accident and Emergency Departments were included. Linear-regression analysis of waiting times data was undertaken. The percentage of patients seen by a doctor or Emergency Nurse Practitioner (ENP) within 1 hour of arrival was used as the dependent variable as this is the closest approximation to waiting time available in this data-set.

To correct for variations in the percentage of patients seen within 1 hour, arising from differences in case-mix between departments, the following variables were regressed upon the dependent variable:

- percentage of new attendances admitted in a year,
- percentage of new patients referred by GP,
- percentage of patients arriving by ambulance,
- percentage of patients under 16 years old.

To control for variations in department size, the total number of attendances per annum was regressed on the unstandardised residuals from the preceding step.

It was considered appropriate to control for variations in case-mix and department size as these factors reflect differences in local health care

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services and would be difficult for an individual Emergency Department to influence.

Each of the remaining variables was then examined in turn for its ability to predict the residual percentage of patients seen within 1 hour. Variables found to be potentially significant ($P<0.1$) were subsequently entered into a multivariate linear-regression model to identify those variables that were independently predictive.

Results

Data were reported from 209 Emergency Departments, of which 15 (7.2%) were located in Wales. The included departments showed considerable variation in both case-mix and the total number of attendances per year. The key characteristics of the included departments are summarised in Table 1A.

Thirty-two (15.3%) departments did not report data regarding the percentage of patients seen in 1 hour. Of the remaining departments the mean percentage of patients seen within 1 hour of arrival was 56.1% (range, 3.2–100%). The distribution is shown in Figure 1A.

To control for variations in case-mix and department size, the variables outlined in Table 1A were regressed upon the percentage of patients seen within 1 hour. Doing so accounted for 30.4% of the variability in the percentage of patients seen in 1 hour.

Each remaining variable was then regressed in turn upon the unstandardised residuals from the preceding step. Those variables found to be potentially predictive of the percentage of patients seen within 1 hour ($P<0.1$) are shown in Table 2A.

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Table 1A Characteristics of included departments

Variable	Minimum	Maximum	Mean	SD
Percentage of new attendances admitted (year)	4.1	34.2	18.5	5.2
Percentage of new patients referred by GP	0	85.7	9.8	8.3
Percentage of patients arriving by ambulance	5.9	37.7	23.4	6.1
Percentage of patients under 16 years old	0	38.9	22.3	9.1
Total attendances per year	17,749	139,921	59,220	20,328

Figure 1A Distribution of the percentage of patients seen within 1 hour (*n*=177)

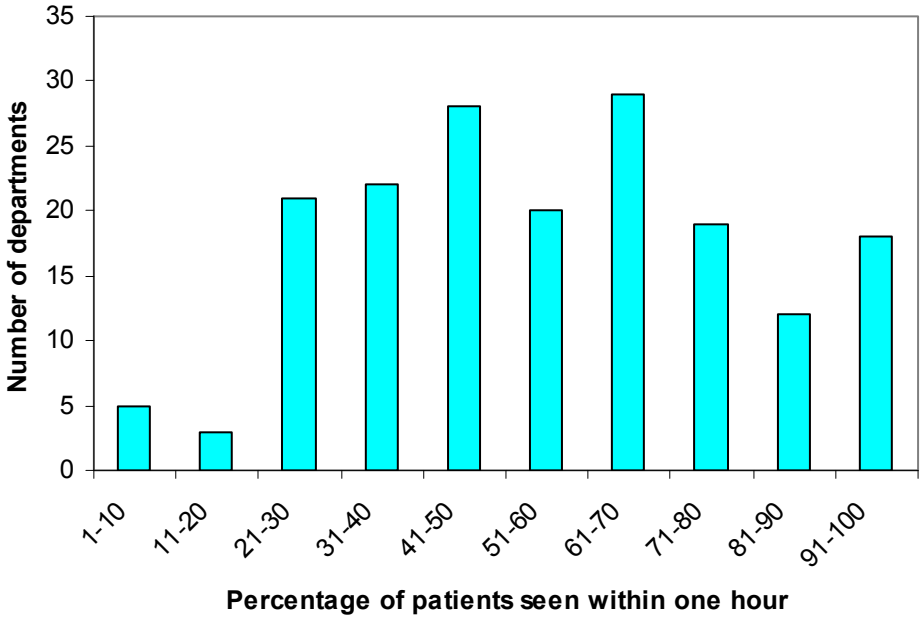

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Table 2A Potentially predictive variables identified by univariate linear regression

Audit Commission variable	Unstandardized coefficients, *B*	95% confidence interval for *B*		Significance, *P*
		Lower bound	*Upper bound*	
Ambulance arrivals per major cubicle	0.003	0.0008	0.006	0.010
Arrivals seen by nurse practitioner	0.008	0.0003	0.01	0.001
D-grade Emergency Department staffed ward WTEs	−1.62	−3.19	−0.05	0.044
F-grade Emergency Department staffed ward WTEs	−4.52	−9.47	0.43	0.073
F-grade Emergency Department WTEs	−1.35	−2.42	−0.29	0.013
Minor-illness-unit referrals	0.0006	−0.000 08	0.001	0.081
Minor-injuries-unit referrals	0.0004	0.00	0.0007	0.050
Number of ward nurses	−0.62	−1.18	−0.07	0.028
Nunber of Emergency Department staffed beds	−0.54	−1.16	0.08	0.088
Number of attendances per cubicle	0.003	0.0006	0.005	0.013
Number of cubicles	−0.39	−0.81	0.02	0.064
Number of major cubicles	−0.88	−1.51	−0.25	0.007
Number of staff-grade Associate Specialist WTEs	1.58	−0.26	3.41	0.092
Grades A–C Emergency Department WTEs	0.84	0.24	1.45	0.006
Percentage of qualified Emergency Department nurses on G+ grade	−0.52	−1.05	0.01	0.053
Support staff Emergency Department staffed ward WTEs	−11.21	−23.72	1.30	0.079

WTE, whole-time equivalent.

All the variables in Table 2A were subsequently entered stepwise into a multivariate linear-regression model. The results of this model are shown in Table 3A.

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Table 3A Results of the multivariate linear-regression model

Audit Commission variable	Unstandardized coefficients, *B*	95% Confidence interval for *B*		Significance, *P*
		Lower bound	*Upper bound*	
Percentage of qualified Emergency Department nurses on G+ grade	−1.75	−3.14	−0.37	0.016
Grades A–C Emergency Department WTEs	2.16	0.38	3.93	0.020

WTE, whole-time equivalent.

This model explained 48.4% of the remaining variability in the percentage of patients seen within 1 hour.

Discussion

Two variables have been identified which, after correcting for department size and case-mix, are significant independent predictors of the percentage of patients seen within 1 hour of arrival. These are the percentage of senior nurses (Grade G+) and unqualified nurses (Grade A-C). Perhaps the most notable finding is that the number of senior nurses has a negative impact upon performance whereas the number of unqualified nurses has a positive effect. Although this may seem counterintuitive, there are a number of possible explanations.

It is likely that a proportion of senior nurses' time will be spent on managerial and administrative tasks. Although these are important for the functioning of a department, such tasks may do little to influence waiting time directly. It is conceivable therefore that those departments with relatively high numbers of G+ grade nurses have a greater amount of time devoted to such activities and hence performance is adversely affected. A further possible explanation is that in departments with a high proportion of senior nurses some may be undertaking extended or nurse-specialist roles and that the adverse effect on performance derives from this role.

The proportion of nurses on grades A to C has a positive impact upon performance. It may be the case that through supporting the work of other staff members and contributing to the general running of the department, waiting times are improved. Additionally, if such nurses were trained to undertake tasks such as phlebotomy or to perform ECGs then this would potentially expedite the patient's journey time through the department. However, such explanations are speculative as none of the collected data relate to such activity.

In their report, the Audit Commission (2001) found no relation between the nursing workload (the number of attendances per nurse per annum) and waiting times.

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Taken together with the above findings, this would suggest that nursing skill mix and not the total number of nursing staff is a key determinant of performance. Similarly, the Audit Commission found no relation between doctors' workload and waiting time and this is confirmed by this analysis. The Audit Commission demonstrated that department size was related to waiting time. Consequently, differences in department size were controlled for in this analysis. This approach was taken as the number of attendances is not under the direct control of the department. Differences in case-mix were also controlled for, as these again are beyond the control of the department itself. This approach allows examination of the effect of department characteristics, such as staffing and facilities, beyond that which would be explained by differing size and case-mix. It can be seen from Table 1A that such an approach is necessary, as the departments studied vary considerably in their characteristics.

Summary

- Audit Commission data were re-examined to identify factors that affect waiting times.
- Linear-regression analysis was used, first controlling for the case-mix and size of each emergency department.
- Once controlled for, the nursing skill mix of an Emergency Department seems to be important. Senior nurses (G grade and above) having a detrimental effect on performance and unqualified support staff (grades A–C) having a positive effect. This explained 48.4% of the remaining variability in waiting times.

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Appendix B Analysis of changes in performance and profile in a large urban Emergency Department, 1993–2003

Aims

This section of the study aims to describe changes in the case-mix, demographics and waiting times of patients over the age of 16 years presenting to Emergency Departments in one city in England over an 11-year period from 1993 to 2003.

This study was undertaken to provide further information for the survey to be undertaken in Phase One of this study. The information analysed was from a large city in the north of England and could be viewed as a microcosm of the problems faced by Emergency Department services nationally. Factors identified from its more detailed evaluation were therefore fed into the development of the national survey for the next stage of the study.

Methods

The adult Emergency Departments have collected data on attendances since 1993. Data collected from 1993 to 2003 were analysed. At the start of the period studied there were two Emergency Departments treating adults, one of which also treated children. In addition, there existed a separate paediatric Emergency Department. These services were reconfigured in 1997 to leave one 'major' adult Emergency Department, a nurse-led minor-injuries unit and a paediatric Emergency Department. This reconfiguration has been described in detail elsewhere and has not been shown to have caused any deterioration in Emergency Department performance (Simpson *et al*., 2001).

For the period 6 April to 5 July of each year from 1993 to 2003, information regarding all Emergency Department episodes was abstracted from the Emergency Department database. This time period was chosen to avoid changeover times of junior medical staff. All new Emergency Department episodes were included if the participant was either aged over 16 years at the time of presentation or no age was recorded and the patient presented to one of the adult Emergency Departments. All episodes that were neither planned nor unplanned follow-up episodes from a previous attendance at the Emergency Departments under investigation were considered to be new episodes. Data retrieved included the following:

- Emergency Department booking-in time,
- time seen by a decision-making clinician (DMC),
- time leaving the Emergency Department,

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- date of birth,
- method of arrival,
- presenting complaint,
- disposal.

The DMC was seeing patients independently at the time within each of the departments. The Emergency Department booking-in time is recorded automatically when a patient registers in the Emergency Department. The time seen by DMC and the time leaving the Emergency Department are recorded in the patient's Emergency Department notes and these times are then routinely entered into the Emergency Department database once the episode is concluded.

Outcome measures

Waiting time (WT) The time from arrival in the Emergency Department until a patient is seen by a DMC[5].

Treatment time (TT) The time from seeing a DMC until a patient leaves the Emergency Department.

Case-mix

To identify differences in the WT and TT for patients with different urgencies of presenting complaint, two groups of patient were defined, 'minor' cases and 'major' cases. A 'minor' case did not arrive by emergency ambulance and was subsequently discharged from the Emergency Department. A 'major' case arrived by emergency ambulance and was admitted to hospital from the Emergency Department. These definitions were chosen as it was thought that they would provide the greatest consistency year on year.

Data analysis

Median and 90th percentile values were calculated for the WT and TT for each year. Linear regression was used to analyse differences in the rate of increase of Emergency Department attendances in the city being studied compared with changes occurring throughout England. Changes in demographics and case-mix over time were analysed using linear regression to determine their significance. Changes in the median WT and TT were examined using linear regression to determine whether these were related to year of presentation or clinical group (major or minor). For patients with complete and incomplete WT and TT data the difference in mean age between these

[5] Where the WT exceeded 12 hours a null value was recorded as WTs of this length had never occurred in the Emergency Department and were therefore most likely to represent errors in the recording of such information at the time of the episode. Similarly, null values were recorded where the TT exceeded 24 hours.

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groups was assessed using Student's *t* test. Differences in the proportion of males, proportion of major cases and proportion presenting as a result of trauma were assessed using chi square (X^2) tests.

Episodes with missing variables were excluded from each linear-regression model where the missing data referred to the variable being tested. Patients were not completely removed from the analysis due to missing data and no attempt was made to extrapolate values for missing variables.

To investigate the trends in median waiting times over the 11-year data period and to correct for differences in age, gender and the proportions presenting with trauma in each year we used a two-stage linear-regression procedure. In the first stage, the individual patient's age, sex and whether or not they were presenting with trauma were regressed on the patient's original WT (or TT) and the median unstandardised residuals for each year were then calculated. The second stage used the median residual as the dependent variable, and linear regression was again used to assess whether WT (or TT) was related to year of attendance. This two-stage procedure has the effect of adjusting the median waiting time for any differences in case-mix over the study period, and still allows us to use the more appropriate median WT (rather than the mean) as our outcome measure. The regression coefficient *b* referred to below represents the rate of change in the parameter estimate (i.e. median waiting time) over the 11-year period.

To allow comparison with figures published by the Audit Commission (2001), the percentage of patients waiting less than 1 hour to see a DMC and the percentage of admitted patients spending less than 4 hours in the Emergency Department were calculated for each year.

Results

During the period studied there were 252,156 new patient episodes. The average increase in total attendances in the city during the period studied was 1.3% per annum (95% confidence interval (CI), –4.2 to 6.8%). This is less than the average national increase of 1.7% per annum (Sadler, 1970).

Considering the annual percentage change in the city under investigation and across England, linear regression demonstrates that the percentage change each year is related to neither year of attendance (*b*, −0.6%; 95% CI, –0.91 to 0.79%; *P*=0.88) nor site (city under investigation or England; *b*, 0.86%; 95% CI, −4.03 to 5.74%; *P*=0.72), showing that there has been no significant alteration in the percentage change in attendances each year and no difference between the rate of increase in the city being studied and England.

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Missing WT and TT data

Patients with complete data for WT and TT accounted for 84.8% (*n*=213,911) of the sample studied. The mean age of patients with complete data was 44.4 years compared to 41.5 years for patients with incomplete data (WT or TT missing) and this difference was statistically significant (*t*=25.09; df=53,911.8; *P*<0.001). The differences in the proportions of males, cases resulting from trauma and proportion of major cases between these groups are shown in Table 1B for patients with complete and incomplete WT and TT data. These findings may reflect the way young males use Emergency Departments. They are more likely to leave without being seen, or leave prior to formal discharge. It was not felt that these differences would adversely affect analysis of the remaining data.

Table 1B Characteristics of cases with complete and incomplete data

	Complete, %	Incomplete, %	X^2	*P*
Males	55.3	58.0	103.1	<0.001
Major cases	13.3	8.6	649.0	<0.001
Cases due to trauma	59.6	39.8	5181.2	<0.001

Patient age

The age profile has changed with the proportion of attendees aged 16–29 years, falling from 38.7% in 1993 to 28.8% in 2003 (*b*, −1.10%; 95% CI, −1.20 to −0.82%; *P*<0.001). There has been a corresponding increase in the proportion of patients in older age groups, most notably in those aged 80–99 years of age, this age group accounting for 6.2% of attendances in 1993 and 10.4% in 2003 (*b*, 0.37%; 95% CI, 0.29–0.45%; *P*<0.001). These changes are illustrated in Figure 1B. For clarity, only the years 1993, 1998 and 2003 are shown.

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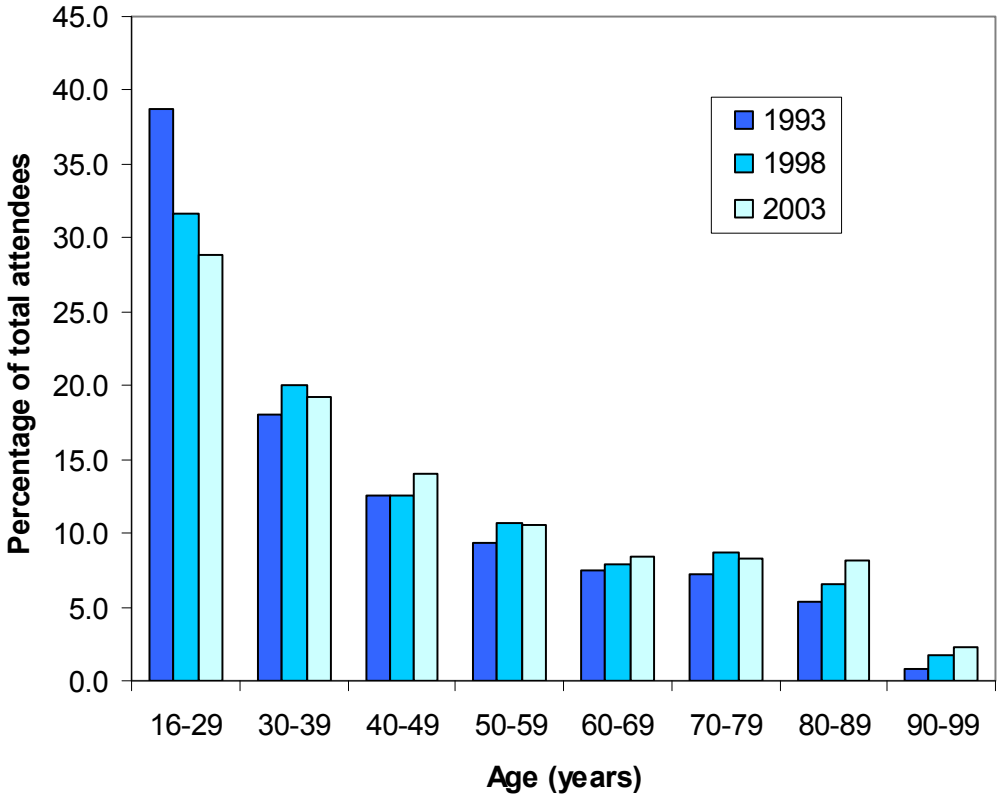
Figure 1B Age distribution of attendees, 1993–2003



Mode of arrival

The proportion of new patients arriving by emergency ambulance has increased significantly from 22.7% in 1993 to a peak of 31.6% in 2002 (*b*, 0.93%; 95% CI, 0.62–1.24%; *P*<0.001).

Presenting complaint

The reasons why patients attend an Emergency Department can be divided broadly into problems arising due to trauma and those due to other causes. Trauma is responsible for the majority of attendances, accounting for a maximum of 59.4% of episodes in 1997 and falling to 52.9% in 2003 (*b*, −0.46%; 95% CI, −8.7 to −0.04%; *P*=0.04). This pattern of a reduction in the proportion presenting due to injuries is apparent in all age groups but most marked among older patients.

The proportion of cases defined as minor has fallen from 71.1% in 1993 to 60.8% in 2003 (*b*, −1.04%; 95% CI, −1.36 to −0.73%; *P*<0.001). Correspondingly, major cases accounted for 9.2% of episodes in 1993, increasing to 14.0% in 2003 (*b*, 0.53%; 95% CI, 0.3 to 0.76%; *P*=0.01).

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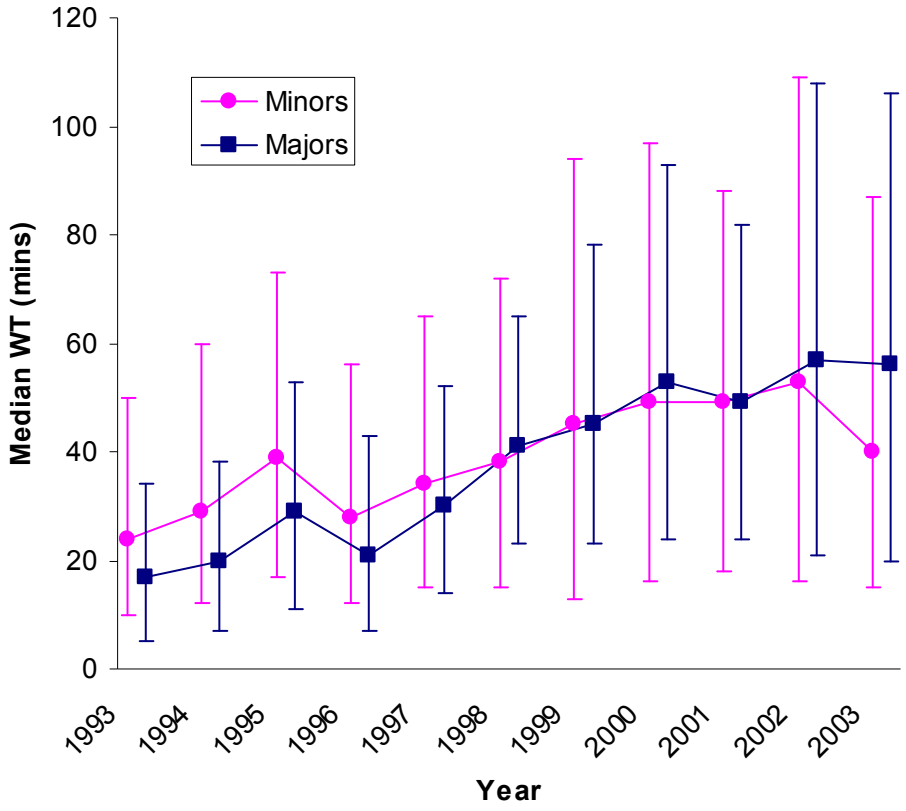
Waiting time (WT)

Waiting times have altered considerably, with a median of 21 minutes and a 90th percentile WT of 83 minutes in 1993, rising to 48 and 165 minutes respectively in 2003 (*b*, 3.5 minutes; 95% CI, 2.23–4.77 minutes; *P*<0.001). Figure 2B better demonstrates the change in the median WT for minor and major cases.

Figure 2B Changes in median waiting time (WT)



Vertical bars represent the inter-quartile range of WTs.

In 1993 the median WT for a minor case was 24 minutes and for a major case was 19 minutes. In 2003 this pattern was reversed, with the median WT increasing to 40 and 58 minutes respectively for minor and major cases. Correcting for changes in age, sex and the proportion of patients, presenting as a result of trauma, linear regression demonstrates that changes in median WT are related to year of attendance (*b*, 3.41 minutes; 95% CI, 2.60–4.23; *P*<0.001) but not to clinical group (major or minor; *b*, 0.43 minutes; 95% CI, –10.89 to 11.74; *P*=0.94).

Treatment time (TT)

The distribution of treatment times has also changed markedly. The median TT in 1993 was 30 minutes with a 90th percentile TT of

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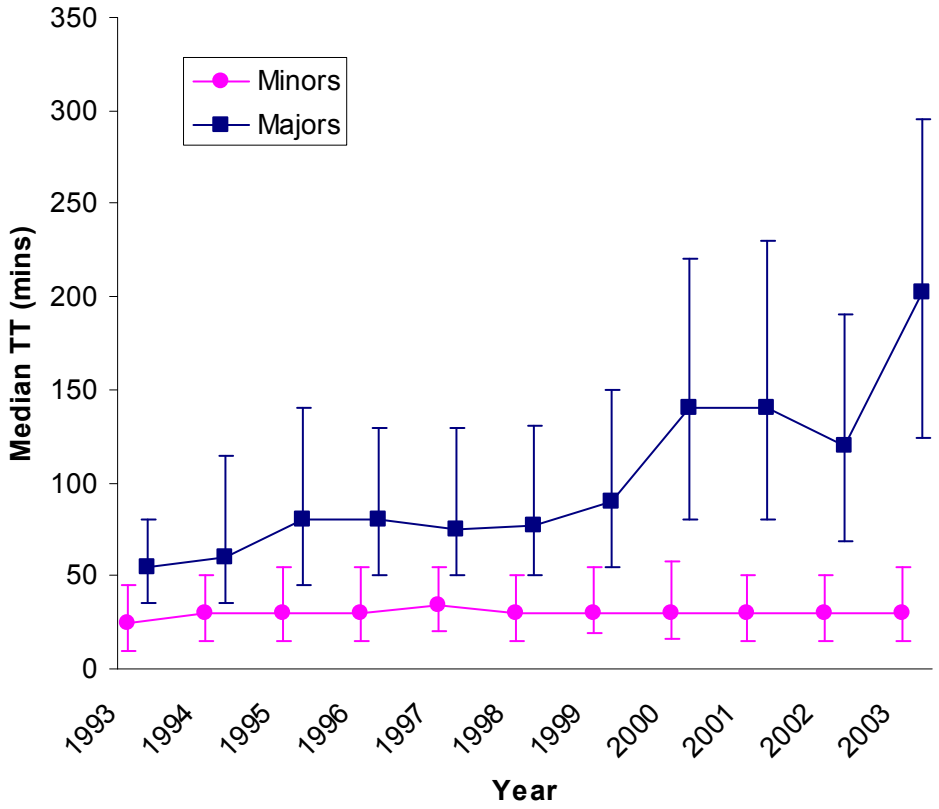
90 minutes. In 2003 these parameters had both increased, with a median TT of 45 minutes but most notably a 90th percentile TT of 242 minutes (*b*, 0.96 minutes; 95% CI, 0.33–1.60 minutes; *P*=0.007). The median TT for major and minor cases differs. Figure 3B demonstrates that the median TT for minor cases has changed little from 1993 to 2003, varying between 25 and 34 minutes. In contrast, the median TT for major cases has almost quadrupled, from 55 minutes in 1993 to 205 minutes in 2003.

Figure 3B Changes in median treatment time (TT)



Vertical bars represent the inter-quartile range of TTs.

Correcting for changes in age, sex and the proportion of patients presenting as a result of trauma, linear regression shows that for minor cases median TT is not related to year of attendance (*b*, 0.13 minutes; 95% CI, –0.38 to 0.65; *P*=0.58) but a relationship between median TT and year does exist for major cases (*b*, 11.46 minutes; 95% CI, 6.68–16.24 minutes; *P*<0.001).

Outcome

The disposal of patients from the Emergency Department is shown in Table 2B. The number of patients admitted to hospital during the 3-month period studied increased from 3358 (15.0%) in 1993 to 5629 (22.7%) in 2003 (*b*, 0.64%; 95% CI, 0.38–0.89%; *P*<0.001).

Table 2B Disposal from the Emergency Department

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Year	Not known, *n* (%)	Discharged, *n* (%)	Admitted, *n* (%)	Died, *n* (%)	Total
1993	105 (0.5)	18,795 (83.8)	3358 (15.0)	160 (0.7)	22,418
1994	199 (0.8)	19,036 (81.1)	4106 (17.5)	142 (0.6)	23,483
1995	143 (0.6)	19,150 (80.9)	4277 (18.1)	113 (0.5)	23,683
1996	477 (2.1)	18,711 (81.5)	3666 (16.0)	111 (0.5)	22,965
1997	537 (2.8)	14,923 (76.4)	4006 (20.5)	58 (0.3)	19,524
1998	211 (0.9)	17,687 (79.0)	4435 (19.8)	61 (0.3)	22,394
1999	25 (0.1)	17,319 (79.6)	4363 (20.1)	53 (0.2)	21,760
2000	191 (0.8)	17,395 (77.4)	4845 (21.6)	42 (0.2)	22,473
2001	246 (1.0)	18,555 (77.9)	4976 (20.9)	52 (0.2)	23,829
2002	254 (1.0)	19,356 (78.1)	5109 (20.6)	68 (0.3)	24,787
2003	267 (1.1)	18,872 (76.0)	5629 (22.7)	72 (0.3)	24,840

The percentage of total new attendances is shown in parentheses.

Comparison with findings of the Audit Commission

Our study showed that the percentage of patients seeing a DMC within 1 hour of arrival (PC1) fell from 75.2% in 1996 to 56.4% in 2003. The percentage of admitted patients admitted within 4 hours of arrival (PC4) declined from 88.2 to 64.1% over the same time. Figure 4B shows how these changes compare with changes in the median percentage of patients seeing a DMC within 1 hour of arrival and percentage of admitted patients admitted within 4 hours of arrival found by the Audit Commission in their reviews of Emergency Departments in England and Wales (Audit Commission, 2001).

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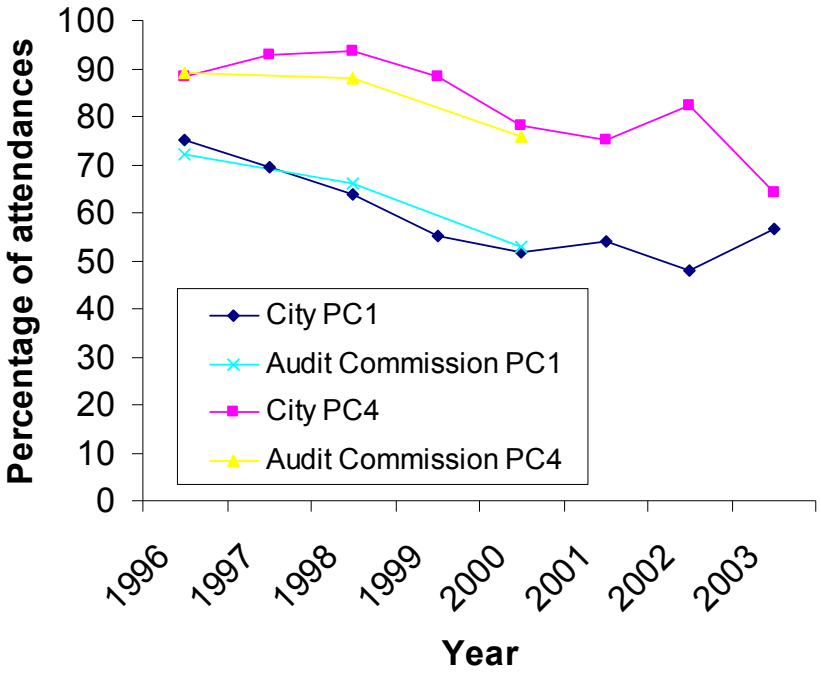
Figure 4B Comparison of this study with the Audit Commission's findings



Shown are data for changes in the percentage of patients waiting less than 1 hour to be seen (PC1) and the percentage of patients admitted within 4 hours (PC4). Comparison is made between patients included in this study (City PC1 and PC4) and the findings of the Audit Commission (Audit Commission PC1 and PC4)

Resources available

The numbers of medical staff and ENPs working in the Emergency Departments in the city under investigation in 1993 and 2003 are shown in Table 3B. The number of acute hospital beds available in the city has fallen from 2900 in 1993 to 2074 in 2003.

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Table 3B Changes in Emergency Department staffing

Staffing	1993	2003
Consultants	4	4.3
Registrars	3	4
Senior House Officers	19	18
Pre-registration house officer	0	1
GP clinical assistant (sessions)	13	12
Trust-grade/clinical Fellows	0	4
ENPs	0	9.64

Staffing figures shown are for numbers of whole-time equivalents unless stated otherwise. Data were not available on the change in numbers of nursing staff over this period of time.

Discussion

The findings of this study demonstrate that there have been significant changes in the demographics and case-mix of patients attending the Emergency Departments in the city studied. Marked changes have also occurred in both the waiting time and treatment time. Waiting times have increased for both minor and major patients but only recently has the median waiting time for a minor case been less than that for a major one. A number of strategies have been implemented nationally to improve waiting times for minor cases, including the establishment of minor-injury units, allied health professionals seeing patients with minor complaints and See-and-Treat streaming strategies.

Summary

The factors that appear to most adversely affect waiting and treatment times in the city studied since 1993 are time, with a year-on-year deterioration being experienced. This is presumably because of changes to the case-mix of patients being seen as well as the response of the wider hospital to emergency cases.

Treatment times are most affected for patients in the major category of cases. This again may be due to the adequacy of the wider hospital response in processing the patient's journey.

This analysis has proved useful as a precursor to the main part of the study and has highlighted the importance of ensuring that factors such as department size and case-mix are accounted for in future analyses when identifying factors that affect waiting times. In addition, taking the wider hospital response into account it is a vital issue as emergency cases cannot be handled by a department in isolation.

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Appendix C Strategic Health Authorities and participating departments

Table 1C Number of participating sites by Strategic Health Authority

Strategic Health Authority	Number of participating departments
Avon, Gloucestershire and Wiltshire	6
Bedfordshire and Hertfordshire	2
Birmingham and The Black Country	5
Cheshire and Merseyside	6
County Durham and Tees Valley	7
Coventry, Warwickshire, Herefordshire and Worcester	3
Cumbria and Lancashire	8
Dorset and Somerset	2
Essex	3
Greater Manchester	9
Hampshire and Isle Of Wight	1
Kent and Medway	4
Leicestershire, Northamptonshire and Rutland	3
Norfolk, Suffolk and Cambridgeshire	5
North and East Yorkshire and Northern Lincolnshire	6
North Central London	3
North East London	6
North West London	6
Northumberland, Tyne and Wear	5
Shropshire and Staffordshire	4
South East London	2
South West London	1
South West Peninsula	2
South Yorkshire	5
Surrey and Sussex	9
Thames Valley	4
Trent	6
West Yorkshire	6
England Total	**129**

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Mid and West Wales	4
North Wales	3
South East Wales	1
Wales Total	**8**

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Appendix D Healthcare Commission Emergency Department services data-collection tool

Activity

		a financial year	b quarter: 1 April to
1.1	Total number of A&E attendances		
1.2	of which, number of first attendances		
	Of these first attenders during 1 April to 30 June 2004, how many were primarily for:		
2.1	an injury		
2.2	a medical problem		
2.3	neither of these (e.g. social or psychological problems)		
2.4	not recorded		0
	Also, of these first attenders during 1 April to 30 June 2004, how many:		
3.1	arrived by ambulance		
3.2	were referred by a General Medical Practitioner		
3.3	had taken a deliberate overdose		
3.4	did not wait for treatment		
3.5	were first seen in A&E by an emergency nurse practitioner (ENP)		
4	Do the A&E attendance numbers entered in Q1 include most (at least 9 out of		

Waiting times (first attendances - quarter: 1 April to 30 June 2004)

		Minutes
5.1	What was the mean (average) time in minutes from arrival until patients were	
5.2	What was the mean (average) time in minutes from arrival until patients left	

	Age group:		a Admitted	b Discharged	c Transferred/Other	d Totals
6.1	0-15	Total:				0
6.2		Saw Dr/ENP <1hr				0
6.3		Left dept <4hrs				0
6.4	16-64	Total:				0
6.5		Saw Dr/ENP <1hr				0
6.6		Left dept <4hrs				0
6.7	65+	Total:				0
6.8		Saw Dr/ENP <1hr				0
6.9		Left dept <4hrs				0
6.10	All ages	Total:	0	0	0	0
6.11		Saw Dr/ENP <1hr	0	0	0	0
6.12		Left dept <4hrs	0	0	0	0

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Staffing (30 June 2004)

	Doctors	a Funded establishment WTEs	b Honorary contracts WTEs	c Staff in post WTEs
7.1	Consultants			
7.2	Associate specialists			
7.3	Specialist Registrars			
7.4	SHOs (recognised)			
7.5	SHOs or similar (unrecognised)			
7.6	Staff grade or similar			
7.7	GPs or other sessional doctor			

	Nurses	a Funded establishment WTEs	c Staff in post WTEs
8.1	I grade		
8.2	H grade		
8.3	G grade		
8.4	F grade		
8.5	E grade		
8.6	D grade		
8.7	A,B,C,HCA grade		

			c Staff in post WTEs
9.1	Of which:	ENPs	
9.2		Clinical nurse specialists	
9.3		Nurse consultants	
9.4		Mental health nurses	
9.5		Children's nurses	

	Other professional staff posted in the A&E department	b Part of A&E staff? yes, no, n/a	c Staff in post WTEs
10.1	Occupational therapists		
10.2	Physio-therapists		
10.3	Social workers		
10.4	Play specialists		
10.5	Other		

	Non clinical staff posted in the A&E department	b Part of A&E staff? yes, no, n/a	c Staff in post WTEs
11.1	Managerial		
11.2	Clerical		
11.3	Porters		
11.4	Other		

Staff turnover data: nursing staff (2003/04)

12.1	How many nursing staff were in post in the department on 31 March 2004	
12.2	How many permanent nursing staff left the department during the financial	

Sickness and absence: nursing staff (2003/04)

13	How many hours were lost to sickness/absence during the financial year 1 April 2003 - 31 March 2004 (including only nursing staff on the department's	

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Factors influencing Emergency Department waiting times

Budgets

Financial year 2003/04 - provisional outturn

		Outturn (£000s)
14.1	Trust (total)	
14.2	A&E department total	

Quarter: 1 April to 39 June 2004 - budget and provisional outturn

		a Quarterly	b Quarterly
15.1	A&E department total		
15.2	of which: Medical pay		
15.3	Nursing Pay		
15.4	Other Pay		
15.5	Non pay		

Facilities (as at 30 June 2004)

Cubicles

16.1	Number of cubicles	
16.2	of which majors	
16.3	Number of resuscitation bays	
16.4	Treatment or consulting rooms	

Children's facilities

17.1	Do you have dedicated facilities for examining and treating children?	

If yes:

for how many hours a day on average are these dedicated facilities staffed and open?

		a Monday to Friday	b Saturday	c Sunday
17.2				

A&E wards

18.1	Do you have a ward under A&E management and staffed by A&E nurses?	

If yes:

18.2	How many beds does it have?	
18.3	Do these beds meet SITREP standards? *[Please use* (	
18.4	Are A&E ward patients formally admitted (on PAS)? *drop-down lists]* (	
18.5	How many patients were admitted to this ward during April-June 2004?	
18.6	How many of these patients stayed on this ward for less than 2 nights?	
18.7	How many were transferred from the A&E ward to another in the hospital?	

Computer systems in A&E

19.1	Please select the make of your **A&E computer system** (or 'no system' or 'in-house') from the drop down list	
19.2	Can it track patients in real time through stages in A&E?	
19.3	Is it used for this purpose?	
19.4	Can it produce routine reports on numbers waiting less than 4 hours in the department?	
19.5	If question 6 was fully completed (times in department/to doctor by age), did this require specialist help from outside the A&E department?	
19.6	Can it import patient information from your PAS system?	
19.7	Can it export patient information to your PAS system?	
20.1	Does your department have access to electronic reporting of pathology results?	
20.2	Does your department have PACS (for electronic access to radiology images)?	

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Appendix E Surveys

Lead clinician survey

Section 1

If a computer system is present in A&E:

1.1 Does your department routinely collect additional data to the emergency department minimum data-set?

1.2 What are the purposes for collecting additional data?

1.3 If other please specify purpose.

1.4 Is time seen/discharged etc. recorded manually or automatically by computer?

1.5 Does the computer system alert staff when patients are approaching acceptable limits of waiting time?

1.6 Is the computer system used for ordering investigations?

1.7 Are results of investigations available by computer?

1.8 If results of investigations are available by computer, does the computer alert staff when the results are ready?

X-ray

2.1 Does A&E have its own X-ray room?

2.2 If yes - number of rooms?

2.3 Is the X-ray facility used by A&E adjacent to/part of the department?

Availability of experienced A&E doctor

Record the hours a doctor with at least 6 months previous A&E experience is available. Use 24 hour clock.

3.1	Monday	On site: From	To	On call: From	To
3.2	Tuesday				
3.3	Wednesday				
3.4	Thursday				
3.5	Friday				
3.6	Saturday				
3.7	Sunday				

4.1 Does the department have any contingencies for covering medical staff sickness?

4.2 If yes please give details:

For each of the following clinical scenarios please indicate whether you would investigate and treat the patient entirely in A&E, with the intention of discharging them where appropriate (with follow-up if necessary) or whether you would refer the patient for further inpatient investigation. Assume results of any investigations undertaken are normal.

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Your answers should reflect the usual clinical practice within your department during and outside of normal working hours.

For example, a 19-year-old woman presents having taken a witnessed overdose of paracetamol 3 hours ago. She is alert and orientated and haemodynamically normal.

If during normal working hours all investigations and mental health assessment would be undertaken in A&E and the patient discharged, tick 'A&E'.

If outside working hours paracetamol levels were below that which required treatment, but the patient was admitted overnight to await mental health assessment the next day tick 'Refer'.

35-year-old man who experienced a 1-hour episode of cardiac-sounding chest pain immediately prior to presentation but who is now pain free. ECG normal.

5.1 During 'normal working hours'

5.2 Outside of 'normal working hours' □

27-year-old women with pleuritic chest pain and normal observations who is suspected of having a pulmonary embolism.

6.1 During 'normal working hours' □

6.2 Outside of 'normal working hours' □

40-year-old man with suspected renal colic.

7.1 During 'normal working hours' □

7.2 Outside of 'normal working hours' □

54-year-old man with unilateral swollen leg suspected of having a deep-vein thrombosis.

8.1 During 'normal working hours' □

8.2 Outside of 'normal working hours' □

39-year-old woman with sudden onset of severe headache.

9.1 During 'normal working hours' □

9.2 Outside of 'normal working hours' □

73-year-old man who collapsed while shopping, losing consciousness for 2 minutes.

10.1 During 'normal working hours' □

10.2 Outside of 'normal working hours' □

26-year-old male with frank haematuria after being kicked in the flank. Heamodynamically normal. No other injuries.

11.1 During 'normal working hours' □

11.2 Outside of 'normal working hours' □

64-year-old man with known ischaemic heart disease who had a 6-hour episode of chest pain 8 hours ago.

12.1 During 'normal working hours' □

12.2 Outside of 'normal working hours' □

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32-year-old woman with a spontaneous pneumothorax, <20%. No underlying respiratory problems.

13.1 During 'normal working hours' □

13.2 Outside of 'normal working hours' □

73-year-old women with a closed, displaced distal radial fracture that requires manipulation.

14.1 During 'normal working hours' □

14.2 Outside of 'normal working hours' □

If the department treats children as well as adults please complete the following three scenarios, otherwise go to question 15.1

A four-year-old child presenting with a painful hip and limping

P1.1 During 'normal working hours' □

P1.2 Outside of 'normal working hours' □

A 12-year-old child with a moderately severe exacerbation of asthma. PEFR 60% of predicted.

P2.1 During 'normal working hours' □

P2.2 Outside of 'normal working hours' □

A 2-year-old child who is systemically unwell and has a temperature of 39.6^0.

P3.1 During 'normal working hours' □

P3.2 Outside of 'normal working hours' □

Section 2

15.1 How often do general staff meetings occur?

Are all staff able to contribute to these meetings?

Please tick yes or no on the items below:

		Yes	No
15.2	Doctors		
15.3	Nurses		
15.4	Admin staff		
15.5	Managers		
15.6	PAMS		
15.7	P&T		
15.8	Ancillary staff		
15.9	Other; please specify		

Specify other

16.1 Do you have teamworking in the A&E department? (circle appropriate answer)

1=None	2=Little	3=A fair amount
4=A lot	5=A very great deal	

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Who is included in the A&E team?

		Generated	Prompted
17.1	Doctors	[1]	[2] Yes [0] No
17.2	Nurses		
17.3	Admin Staff		
17.4	Managers		
17.5	PAMS		
17.6	P&T		
17.7	Ancillary Staff		
17.8	Others (please specify) Specify		

Instructions to interviewer: If the interviewee answers spontaneously tick the box marked generated. If you have to prompt tick the box in the 'Prompted' column appropriate to the interviewee's answer

To what extent does each of the following make decisions in the A&E team?

		None	***Little***	***A fair amount***	***A lot***	***A very great deal***
18.1	Doctors					
18.2	Nurses					
18.3	Admin Staff					
18.4	Managers					
18.5	PAMS					
18.6	P&T					
18.7	Ancillary Staff					
18.8	Others Specify others					

To what extent are staff able to contribute to team working in the A&E team?

		None	***Little***	***A fair amount***	***A lot***	***A very great deal***
19.1	Doctors					
19.2	Nurses					
19.3	Admin Staff					
19.4	Managers					
19.5	PAMS					
19.6	P&T					
19.7	Ancillary					

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Staff

19.8 Others

Specify others

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Answer the following questions for each of the staff groups listed using a number from the following scale.

1=not at all

2=just a little

3=moderate amount

4=quite a lot

5=a great deal

		Doctors	***Nurses***	***Admin staff***	***Managers***	***PAMS***	***P&T***	***Ancillary staff***
20.1	To what extent can these staff carry out their work in the way they think best?							
20.2	How often do these staff have enough time to carry out their work?							
20.3	Do these staff have clear, planned goals and objectives for their jobs?							
20.4	How often do these staff receive conflicting instructions from two or more people?							
20.5	How often do these staff have to do an acceptable minimum of work rather than doing the best-quality work possible?							
20.6	To what extent do these staff have a good idea of how well they are performing in their work?							

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Answer the following questions for each of the staff groups listed using a number from the following scale.

1=not at all

2=just a little

3=moderate amount

4=quite a lot

5=a great deal

		Doctors	***Nurses***	***Admin staff***	***Managers***	***PAMS***	***P&T***	***Ancillary staff***
20.7	To what extent do these staff feel able to work flexible hours when they need to?							
20.8	To what extent are these staff encouraged to develop new skills?							
20.9	To what extent can these staff count on their immediate supervisor to listen when they need to talk about problems at work?							
20.10	To what extent can these staff count on their colleagues in A&E to listen to them when they need to talk about problems?							

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Please rate your A&E department using the scale relative to other A&E departments on the following.

1=most worse

2=worse

3=same

4=better

5=much better

		Your view	***Trust view***
21.1	Confidence and trust in colleagues		
21.2	Collaboration amongst staff groups in A&E		
21.3	Collaboration with other departments in the Trust		
21.4	Morale		
21.5	Effectiveness		

Using the scale, how does the Trust view the A&E department with regard to the following?

1=very poor

2=poor

3=adequate

4=good

5=very good

		Rating
22.1	Confidence and trust in colleagues	
22.2	Collaboration amongst staff groups in A&E	
22.3	Collaboration with other departments in the Trust	
22.4	Morale	
22.5	Effectiveness	

23.1 Which of the following best describes your management style? Tick one response, ✓.

Tell

Sell

Consult

Join

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24.1 If you feel there any are circumstances peculiar to your department that influence its performance in relation to waiting times and these have not been covered in the above questions, please give details here. Include factors that decrease as well as increase waiting times.

Head nurse survey

Section 1

Triage

25.1 Do you triage patients?

If answer to 25.1 is 'None', go to question 27.1.

Does triage usually occur (tick as appropriate):

25.2 Ambulance arrivals

25.3 Non-ambulance arrivals

25.4 From triage can patients be directed away from the A&E department to other health care services or only to the A&E department?

Ordering of investigations from triage

26.1 Is there a formal policy for the ordering of X-rays from triage by the triage nurse?

If yes, list types of X-rays that can be requested:

26.2 If not, are X-rays ordered from triage *ad hoc*?

26.3 Are formal polices for ordering other investigations from triage in place?

26.4 If yes, list types of investigations:

Shift management

With regarding to the nurse in charge on each shift:

27.1 Is the department managed as one area or separate smaller areas?

27.2 What grades of nursing staff regularly take charge?
(Tick as many as appropriate)

27.3 Who has overall responsibility for waiting times on each shift?

27.4 Does the department have any contingencies for covering nursing staff sickness?

27.5 If yes, please give details.

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Current practices for minors and majors

Which of the following practices are currently used in the routine management of minor and major cases and how often are they used? Include practices that are only used at certain times of day. Tick the box that most closely reflects the frequency with which that practice is used.

	Minors
28.1	Deliberate queuing prior to registration.
28.2	Holding of patients in ambulances, i.e. patients not taken into A&E immediately upon arrival.
28.3	See and Treat/streaming using senior medical staff.
28.4	See and Treat/streaming using junior medical staff.
28.5	See and Treat/streaming using Emergency Nurse Practitioners.
28.6	Streaming to community pharmacist.
28.7	Give details of any other initiatives not listed above and the frequency with which they are used.
	Majors
28.8	Deliberate queuing prior to registration.
28.9	Holding of patients in ambulances, i.e. patients not taken into A&E immediately upon arrival.
28.10	Rapid assessment and treatment/executive triage using senior medical staff.
28.11	Rapid assessment and treatment/executive triage using junior medical staff.
28.12	Rapid assessment and treatment/executive triage using Emergency Nurse Practitioners.
28.13	Streaming to community pharmacist.
28.14	***Give details of any other initiatives not listed above and the frequency with which they are used.***

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Business manager survey

Department reference: «Index»

Trust: «Site_Name»

Hospital: «Address1»

Date completed_____

Interviewee's name_____

Researcher_____

Section 1

39.1 Total Trust budget per annum (2003/04). £

For each of the following questions please give figures for all facilities on the main A&E site but do not include budget/expenditure for facilities that are on separate sites.

39.2 Total A&E budget per annum (2003/04). £

39.3 Total A&E expenditure per annum (2003/04). £

39.4 Total expenditure on staff in A&E per annum (2003/04). £

39.5 Total expenditure on medical staff locums per annum (2003/04). £

39.6 Total expenditure on bank/agency nurses per annum (2003/04). £

39.7 Total number of staff in the Trust.

Staff turnover/sickness

For questions 41.1 to 41.3 enter N/C if this data is not collected.

For turnover figures do not include staff employed on fixed term/rotational contracts who would be expected to leave.

	% Turnover of staff in A&E per annum (2003/04)	**% Turnover of staff in the Trust per annum (2003/04)**	**Total days lost to sickness in A&E (2003/04)**	**Total days lost to sickness in the Trust (2003/04)**
40.1 Medical				
40.2 Nursing				
40.3 Admin/support staff				

41.1 Is the trust on one site? [1] Yes

[2] No

[99] Don't know

41.2 Is A&E in its own directorate? [1] Yes

[2] No

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		[99]	Don't know
41.3	How long has the department existed in its current physical form?		
41.4	How long has the department existed in its current management structure?		
41.5	Are there any incentives for staff to reduce sickness absence?	[1]	Yes
		[2]	No
		[99]	Don't know
41.6	If yes, please give details		
41.7	Are there any incentives for staff to reduce waiting times?	[1]	Yes
		[2]	No
		[99]	Don't know
41.8	If yes, please give details		

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A&E beds

Include only those facilities that form part of, or are staffed by, A&E.

							Hours of opening						
		No. of beds	***Counted as admitted?***		***Conforms to Sitrep guidelines?***		***Mon***	***Tues***	***Wed***	***Thu***	***Fri***	***Sat***	***Sun***
42.1	Observation ward		[1]	Yes	[1]	Yes	From	From	From	From	From	From	From
			[2]	No	[2]	No							
							To	To	To	To	To	To	To
			[99]	Don't know	[99]	Don't know							
42.2	Clinical Decision Unit		[1]	Yes	[1]	Yes	From	From	From	From	From	From	From
			[2]	No	[2]	No							
							To	To	To	To	To	To	To
			[99]	Don't know	[99]	Don't know							
42.3	Chest pain observation unit		[1]	Yes	[1]	Yes	From	From	From	From	From	From	From
			[2]	No	[2]	No							
			[99]	Don't know	[99]	Don't know	To	To	To	To	To	To	To
42.4	Other beds (please specify)		[1]	Yes	[1]	Yes	From	From	From	From	From	From	From
			[2]	No	[2]	No							
			[99]	Don't know	[99]	Don't know	To	To	To	To	To	To	To
	Specify other beds												

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Other on-site facilities

Answer joint if a facility is part of more than one Trust or managed only in part by A&E.

		Present on same site as A&E		***Is this facility part of the same Trust as A&E?***		***Is this facility managed by A&E?***	
43.1	Minor-injury unit	[1]	Yes	[1]	Yes	[1]	Yes
		[2]	No	[2]	Joint	[2]	Joint
				[3]	No	[3]	No
				[99]	Don't know	[99]	Don't know
43.2	Minor-illness unit/walk-in centre	[1]	Yes	[1]	Yes	[1]	Yes
		[2]	No	[2]	Joint	[2]	Joint
				[3]	No	[3]	No
				[99]	Don't know	[99]	Don't know
43.3	GP-staffed primary care unit	[1]	Yes	[1]	Yes	[1]	Yes
		[2]	No	[2]	Joint	[2]	Joint
				[3]	No	[3]	No
				[99]	Don't know	[99]	Don't know

Bed shortages

44.1 Does the A&E department have any policies for dealing with shortages of in-patient beds? (Do not include Trust policies)

[1] Yes
[2] No
[99] Don't know

44.2 If yes, please give details:

44.3 Does the Trust have any policy for dealing with shortages of in-patient beds?

[1] Yes
[2] No
[99] Don't know

44.4 If yes, please give details

Prolonged waits

45.1 Does the department have any policy for dealing with exceptionally long waiting times in A&E?

[1] Yes
[2] No
[99] Don't know

45.2 If yes does this included:

(tick as many as apply)

[1] Diversion of ambulances
[2] Calling in extra medical staff
[3] Calling in extra nursing staff
[4] Other measures

45.3 Patients who leave without being seen

46.1 Is an estimated time leaving recorded?

[1] Yes

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	[2]	No
	[99]	Don't know
46.2 Are these patients removed routinely from data analysis when submitting waiting times figures?	[1]	Yes
	[2]	No
	[99]	Don't know

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Appendix F Figures and tables

Figure 1F Distribution of cases arriving by ambulance (*n*=134)

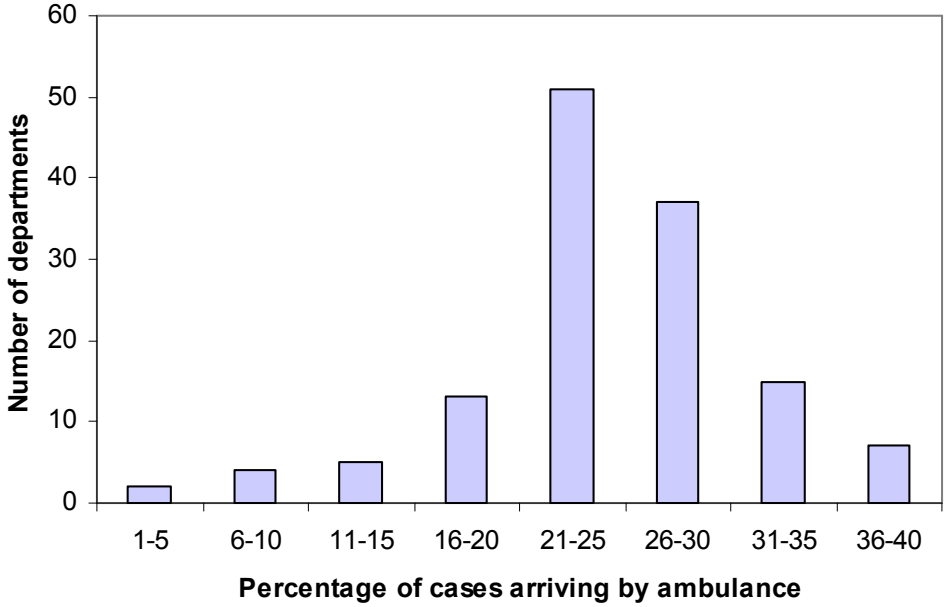

Figure 2F Distribution of cases admitted from the Emergency Department (*n*=135)

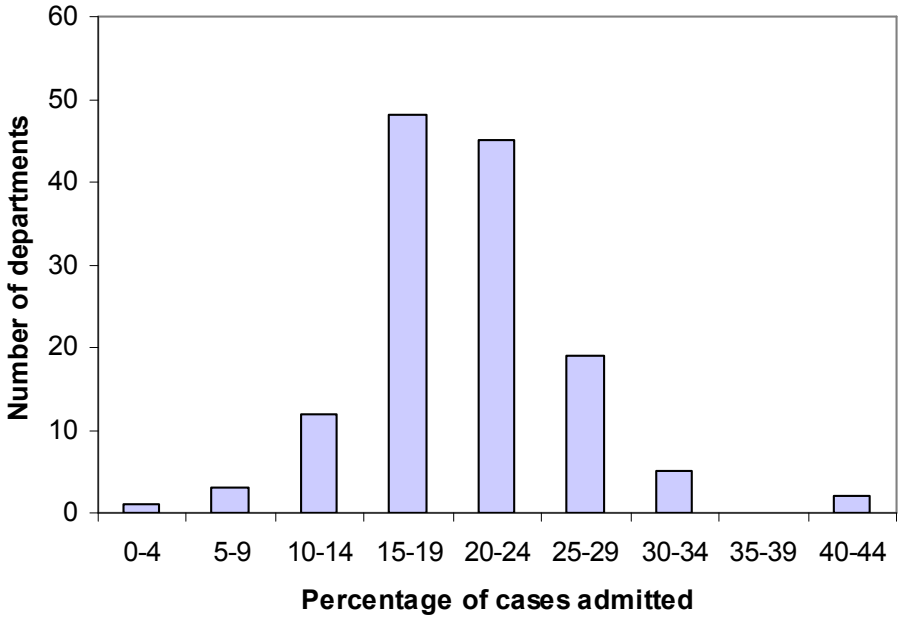

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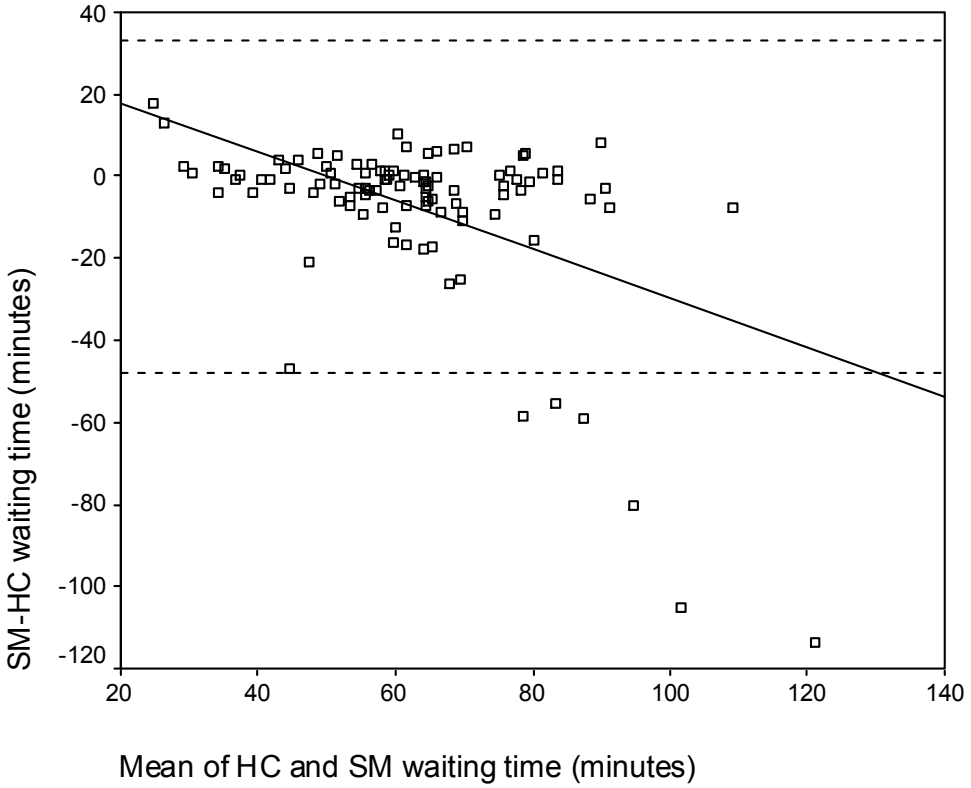
Figure 3F Comparison of waiting-time measures from the Healthcare Commission (HC) and sample-month data (SM)



Dashed line, 95% limits of agreement; solid line, regression line.

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Figure 4F Total attendances per annum against mean waiting time

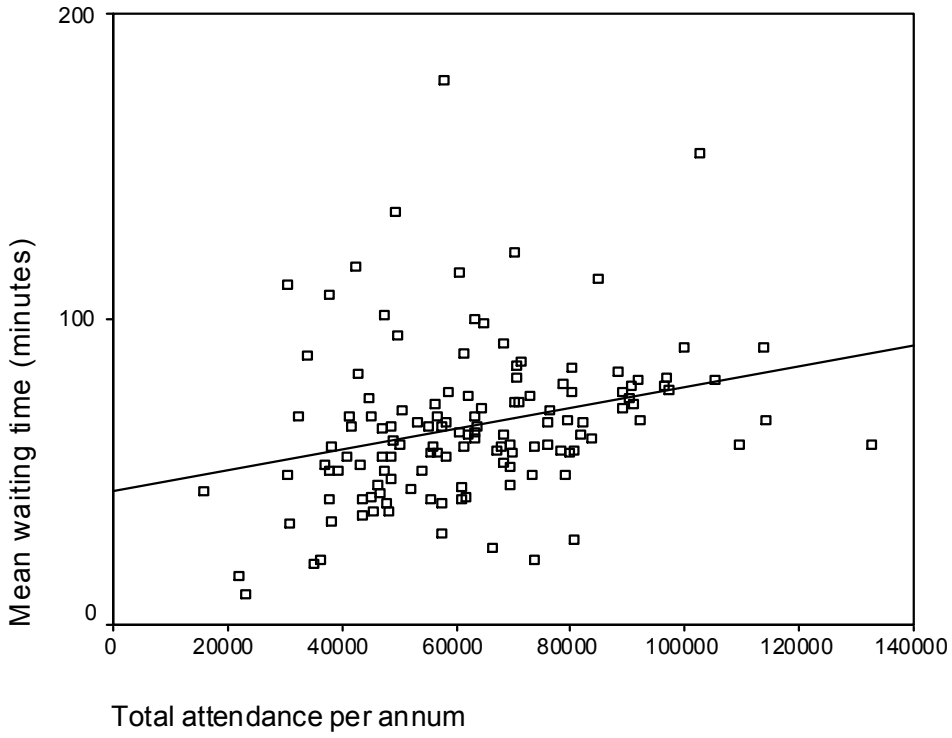

Table 1F Results of multivariate linear regression

Model	Unstandardized coefficients, *B*	95% Confidence interval for *B*		Significance, *P*
		Lower bound	*Upper bound*	
(Constant)	−1.81	−31.95	28.33	0.90
Non-pay spend per 10,000 patients	0.00037	0.00016	0.00059	0.00097
Presence of See and Treat	−35.21	−58.61	−11.82	0.0040
Percentage of nursing hours lost through sickness	2.47	0.12	4.81	0.040

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Table 2F Results of regression of management style on corrected waiting time

	Management style	Unstandardized coefficients, *B*	95% Confidence interval for *B*		Significance, *P*
			Lower bound	*Upper bound*	
Lead clinician	Tell or sell	10.44	0.68	20.21	0.04
	Join	−4.68	−16.97	7.61	0.45
Head nurse	Tell or sell	11.47	0.20	22.73	0.05
	Join	−10.04	−21.15	1.06	0.08
Business manager	Tell or sell	8.18	−4.10	20.46	0.19
	Join	4.58	−8.41	17.58	0.49

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Table 3F Relationships seen where the lead clinician is described as having a participative management style

Relationship	Lead clinician	Head nurse	Business manager	Overall
Inclusivity of				
PAMs in meetings	X^2=0.014 +ve slope	X^2=0 +ve slope	X^2=3.287* +ve slope	Out of 24 possible relationships between variables 18 match the trend of inclusivity being positively associated with a participative management style.
Ancillary staff in meetings	X^2=11.34¶ +ve slope	X^2=0.075 +ve slope	X^2=5.674 † +ve slope	
Reduced role conflict for				
Doctors	X^2=0.705 -ve slope	$X^{2=}$6.149‡ -ve slope	X^2=1.859 -ve slope	Out of 21 possible relationships between variables 19 match the trend of participative management style being associated with less role conflict for various staff groups.
Nurses	X^2=0.917 -ve slope	X^2=4.779† -ve slope	X^2=0.747 -ve slope	
Administrative staff	X^2=1.164 -ve slope	X^2=1.924 -ve slope	X^2=0.012 -ve slope	
Managers	X^2=3.993† -ve slope	X^2=2.435 -ve slope	X^2=0.233 -ve slope	
PAMs	X^2=0.386 -ve slope	X^2=6.335† -ve slope	X^2=2.674 +ve slope	
Ancillary staff	X^2=0.053 -ve slope	X^2=7.371‡ -ve slope	X^2=0.173 -ve slope	
Increased feedback on work performance for				
Doctors	X^2=0.007 +ve slope	X^2=1.894 +ve slope	X^2=2.649 +ve slope	Out of 21 possible relationships between variables 17 match the trend of participative management style being associated with increased feedback on performance for various staff groups.
Nurses	X^2=0.237 +ve slope	$X^{2=}$0.004 +ve slope	X^2=2.33 +ve slope	
Administrative staff	X^2=0.577 +ve slope	$X^{2=}$0.08 +ve slope	X^2=2.024 +ve slope	
Managers	X^2=2.365 +ve slope	X^2=0.575 +ve slope	X^2=7.743 +ve slope	

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Ancillary staff	X^2=2.206 +ve slope	X^2=1.047 -ve slope	X^2=3.95* +ve slope	
Increased leader support for				
Doctors	X^2=0.939 +ve slope	X^2=0.327 +ve slope	X^2=1.451 +ve slope	Out of 21 possible relationships between variables 18 match the trend of participative management style being associated with increased leader support for various staff groups.
Nurses	X^2=0.134 +ve slope	$X^{2=}$1.106 +ve slope	X^2=3.529* +ve slope	
Administrative staff	X^2=0.287 +ve slope	X^2=0.476 +ve slope	X^2=3.742† +ve slope	
Managers	X^2=0.214 +ve slope	X^2=0.655 +ve slope	X^2=3.829† +ve slope	
Ancillary staff	X^2=0.102 +ve slope	X^2=0.357 +ve slope	X^2=5.85‡ +ve slope	
Reduced autonomy and control for				
Doctors	X^2=1.441 -ve slope	X^2=0.244 +ve slope	X^2=0.025 +ve slope	Out of 21 possible relationships between variables 11 match the trend of participative management style being associated with *decreased* autonomy and control for various staff groups. In 10 of the possible relationships, 21 describe the reverse trend with management style being associated with *increased* autonomy and control for various staff groups.
Nurses	X^2=5.003† -ve slope	X^2=0.224 -ve slope	X^2=0.203 -ve slope	
Administrative staff	X^2=0.756 -ve slope	$X^{2=}$1.717 -ve slope	$X^{2=}$0.39 +ve slope	
Managers	X^2=0.016 -ve slope	X^2=6.303‡ -ve slope	X^2=0.216 -ve slope	
Collaboration outside the department				
Collaboration with other departments in the Trust	X^2=9.076¶ +ve slope	X^2=4.825‡ +ve slope	X^2=1.468 +ve slope	A participative management style is associated with increased collaboration with other departments in the Trust.
Morale in department				
View of morale in department compared to other emergency departments	X^2=4.179‡ +ve slope	X^2=9.23¶ +ve slope	X^2=1.878 +ve slope	A participative management style is associated with a more positive view of the moral within the department.

P<0.10, P<0.05†, P<0.01‡, P<0.001¶; -ve, negative; +ve, positive.*

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Table 4F Final template for qualitative analysis

1 Things that prevent people leaving emergency department
- a Access
  - 1 Access to primary care
    - i Social services
    - ii Mental health
    - iii GP
  - 2 Access to secondary care
    - i Pathology
    - ii X-ray
    - iii Other services
- b Hospital management
  - i IT system
  - ii Communication
  - 1 Communication of patient information
  - 2 Communication and co-operation between agencies and departments
- c Absence of services
- d Transfers out of the hospital (by ambulance)
  - i Elderly patients
  - ii Availability of services
  - iii Funding for Emergency Department paramedic teams
- e Bed shortages and bed management
  - i Discharges from wards
  - ii Lack of beds
  - iii Lack of porters
  - iv Obtaining specialist opinion
- f Management of Emergency Department
  - i Sickness absence
  - ii Appropriate allocation of staff to meet demand
  - iii Conflict between nurses and doctors
  - iv Physical issues, e.g. space, equipment, food and drink
  - v Lack of experience/training/leadership
  - vi Lack of role clarity
- g Working practices associated with the 4-hour targets
  - i Moving people into wards to meet targets

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ii The target itself

2 Arrivals at the Emegency Department

a Self-presentation (people who turn up at the Emergency Department)

i Free medication and prescriptions

ii Social issues, i.e. drugs/alcohol/homelessness/regular attenders

iii Unrealistic expectations of the public

iv No GP/dentist appointments

b Inappropriate referrals from

i GPs

ii Ambulance service

iii NHS Direct/walk-in centres

iv Insurance claims

v Other departments within the hospital/other hospitals

vi Care homes

c General increase in patient numbers

Table 5F Rank ordering of performance based on team-working interviews

Site	Comment
Poor performance	
40, 85	These sites were similar, as they demonstrated reactive notions of working.
Medium performance	
207	Evidence of external exclusivity, additional objectives and aspects of co-operative working.
24	Evidence of external exclusivity, co-operative working, additional team objectives and developmental behaviours.
164	Evidence of co-operative working, additional objectives, developmental behaviours, flexible working and empowerment.
High performance	
208	Evidence of additional objectives, empowerment, operational and strategic leadership and proactive behaviour.
154	Evidence of clear work allocation, inclusive allocations, prioritising work, additional objectives, empowerment, reflexivity and co-operative leadership strategies.
109	Evidence of broad staff grouping, external inclusivity, up-skilling staff, flexible working, prioritising work, trauma team inclusivity, additional objectives and developmental behaviours.

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Table 6F Univariate linear regression of proxy proactive variable upon the unstandardised residuals of the organisational factors model

	Unstandardized coefficients, *B*	**95% Confidence interval for *B***		**Significance, *P***
		Lower bound	***Upper bound***	
Computer alert	1.44	−6.57	9.45	0.72
Medical sickness	−3.71	−9.71	2.29	0.22
Nursing sickness	−1.58	−9.21	6.05	0.68
Waiting-time incentives	1.07	−5.82	7.96	0.76
Bed-shortage policy	2.67	−6.07	11.41	0.55
Prolonged-waiting-time policy	1.75	−9.06	12.56	0.75

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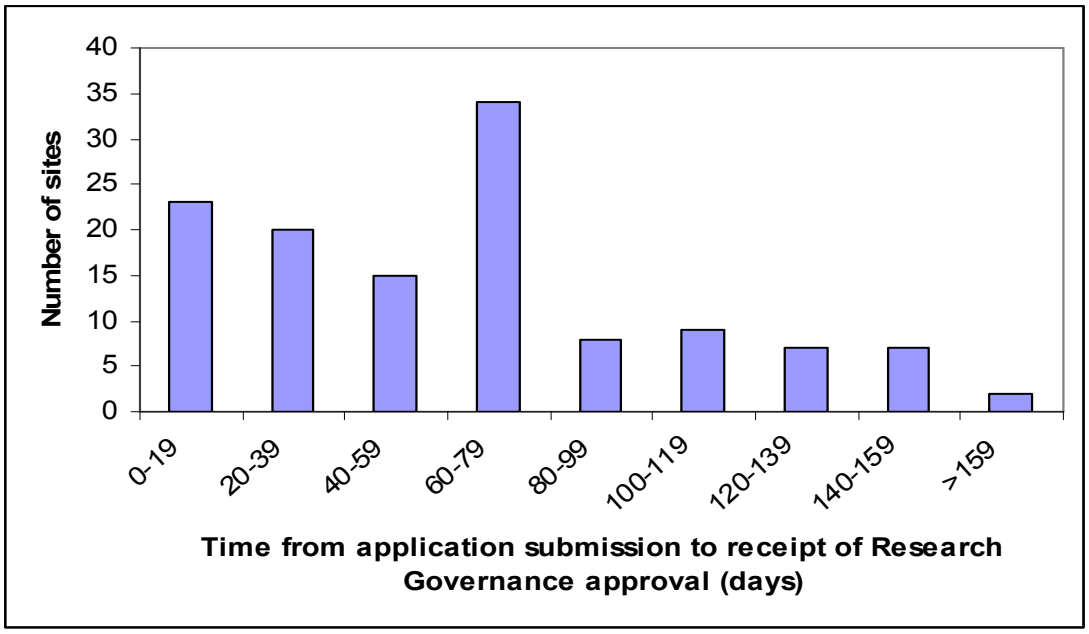
Appendix G Research Governance delays

Research Governance approval was obtained in the 112 sites participating in Phase One of the study. This process caused considerable delays in some sites. The mean time from submission of an application to receipt of Research Governance approval was 63 days, with a maximum of 182 days. The distribution of the time taken to receive approval is shown in Figure 1G.

Figure 1G Distribution of time from application submission to receipt of Research Governance approval



Interim analysis

As a result of the delays experienced in obtaining Research Governance approval in some sites participating in Phase One of the study it was decided to perform an interim analysis in order to select the sites to be invited to participate in Phase Two of the study.

At the time the interim analysis was undertaken only two-thirds of the Phase One interview data were available. It was therefore decided to base this analysis on the data collected by the Healthcare Commission, as this was almost complete at the time of the analysis.

To generate the most generalisable model possible, data from all potential sites were included, not just those that had consented to the study.

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To maintain the focus upon only organisational factors that might influence the mean waiting time, the analysis was undertaken in the following way.

Step 1 Controlling for variations in case-mix and size

To control for variations in performance arising from differences in case-mix and department size, the following factors were controlled for:

- percentage arriving by ambulance,
- percentage of GP referrals,
- percentage aged over 65,
- percentage of children,
- percentage with deliberate overdose,
- percentage of medical cases,
- percentage of injuries,
- percentage admitted,
- percentage discharged,
- total attendances per annum.

Step 2 Univariate analysis of organisational factors

Having controlled for the above variables, each remaining variable recorded by the Healthcare Commission was assessed for its ability to predict the dependent variable.

Step 3 Multivariate analysis of organisational factors

Those factors shown to be potentially predictive ($P<0.1$) in the preceding step were then entered into a linear regression model using a stepwise elimination algorithm. The factors shown to be predictive in this model are listed in Table 1G.

Table 1G Results of the multivariate model

		95% Confidence interval		Significance, *P*
	B	***Lower bound***	***Upper bound***	
Non-Pay over-/under-spend	0.13	0.03	0.23	0.01
Emergency Department ward present	11.38	0.17	22.58	0.05
Emergency Nurse Practitioners (whole-time equivalents per 10,000 patients)	9.47	1.19	17.75	0.03
Percentage of child nurses	−0.83	−1.63	−0.04	0.04

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Step 4 Selection of departments to be invited to participate in Phase Two

Each department was ranked in descending order of the unstandardised residuals obtained from the model in step 3. The top, middle and bottom 10 departments according to the model were then selected, to provide a sample of sites in which the models predicted well or over-/under-predicted the mean waiting time.

Of these 30 sites nine did not participate in the study (four from the top 10, two from the middle 10 and three from the bottom 10). Sites showing an extreme of a particular characteristic (for example, department size) were also excluded as these were likely to be unrepresentative. Five departments from each group were then invited to participate.

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Appendix H A survey on working in the Accident and Emergency Department

ID_____

This identification number will be kept separately from your name.

A survey on working in the Accident and Emergency department

What is this survey?

This is a survey of your views and opinions of the job that you do, and of the Accident and Emergency department where you work. This is not a test. There are no right or wrong answers.

We want to know *your* personal views on the issues raised in the questionnaire. Please read each question carefully, but give your immediate response by ticking the box ☑ that best matches your views.

Who will see my answers?

The information you give is totally confidential. Findings will be made available to all who participate, but in such a way that it is not possible for individuals to be identified. The Trust/department will *at no time* have access to any of the questionnaires completed by individuals.

How do I fill in this survey?

Please complete the questionnaire for your *current job or the job you do most of the time.* Please complete this at work, should you wish. The survey will take about 15 minutes to complete.

What is covered by this survey?

The questionnaire is divided into five sections.

Section A

This section asks for background details about you and the work you do. It is particularly important to us to have this information when we analyse the questionnaire so that we can represent the views of different groups of staff.

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Section B

This section is concerned with your views of your job, and the department where you work.

Section C

This section is concerned with working relationships.

Section D

This section is concerned with the A&E Department as a whole.

Section E

This section is concerned with your feelings towards your job and your well-being and health more generally.

How should I respond?

For each statement you are asked to tick ☑ one response that best fits your views. Please answer all the questions as openly and honestly as possible. Respond according to your first reaction. Do *not* spend too long on one question.

For example, the question below is about who plans your work. If you plan quite a lot of your own work, you would answer like this:

	Not at all	Just a little	Moderate amount	Quite a lot	A great deal
To what extent do you plan your own work?				✓	

Now that you have read the instructions, please begin the survey. Please read every question carefully before responding and answer every question. Thank you.

Section A Background details

It is important that we know some of your background details. This will enable us to represent the views of different groups of staff.

About your job

1.	Length of time as an NHS employee:	.....	years	.....	months
2.	Length of time as an employee in this A&E Department:	.....	years	.....	months
3.	Length of time in current post:	.....	years	.....	months

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Factors influencing Emergency Department waiting times

The following questions require you to think of a typical full working week. Include your on-call hours.

4. In your last full working week, how many hours were you contracted to work? ……. hours

5. What was the total number of extra hours worked in your last full working week? ……. hours *please go to Question 6*

   Not applicable ☐ *please go to Question 7*

6. Were you able to choose whether or not you worked those extra hours? Yes ☐ No ☐

7. Are you on a fixed-term contract? Yes ☐ No ☐

8. Do you work: Full-time ☐ Part-time ☐ In a job share ☐

About you

9. Age: ……. years

10. Are you? Male ☐ Female ☐

11. Dependants: a) Do you have any children? Yes ☐ No ☐

    b) Number of children and/or other dependants living at home: ……..

12. Were you born in Britain? Yes ☐ *please go to Question 14* No ☐ *please go to Question 13*

13. Approximately how long have you lived in Britain? ……. years

14. **What is your ethnic background?** ***(Please tick the one box that best describes your ethnic background)***

White Mixed Asian or Asian British

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British	☐	White & Black British	☐	British	☐
Irish	☐	White & Black Caribbean	☐	Chinese	☐
Other	☐	White & Black African	☐	Indian	☐
		White & Asian	☐	Pakistani	☐
Black or Black British		Any other mixed background	☐	Bangladeshi	☐
British	☐			Any other Asian background	☐
Caribbean	☐	Any other ethnic group			
Africa	☐	Please specify:	.....		
Any other Black background	☐				

Section B Your job

The following questions ask you to describe your job. Please answer all the questions ticking the answer which best describes the job you do *most of the time*.

15. The following questions concern the amount of choice you have in your job. To what extent do you:

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
a.	Determine the methods and procedures you use in your work?	☐	☐	☐	☐	☐
b.	Choose what work you will carry out?	☐	☐	☐	☐	☐
c.	Decide when to take a break?	☐	☐	☐	☐	☐
d.	Vary how you do your work?	☐	☐	☐	☐	☐
e.	Plan your own work?	☐	☐	☐	☐	☐
f.	Carry out your work in the way you think best?	☐	☐	☐	☐	☐

16. How often do you find these issues arising in carrying out your job?

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
a.	I receive conflicting instructions from two or more people.	☐	☐	☐	☐	☐
b.	Professionals make conflicting demands on me.	☐	☐	☐	☐	☐

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c.	Managers make conflicting demands on me.	☐	☐	☐	☐	☐
d.	I do things at work, which are accepted by one person, but not by another.	☐	☐	☐	☐	☐

17. How often do you find yourself meeting the following problems in carrying out your job?

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
a.	I do not have enough time to carry out my work.	☐	☐	☐	☐	☐
b.	I cannot meet all the conflicting demands made on my time at work.	☐	☐	☐	☐	☐
c.	I never finish work feeling I have completed everything I should.	☐	☐	☐	☐	☐
d.	I am asked to do work without adequate resources to complete it.	☐	☐	☐	☐	☐
e.	I cannot follow best practice in the time available.	☐	☐	☐	☐	☐
f.	I am required to do basic tasks, which prevent me completing more important ones.	☐	☐	☐	☐	☐

18. How true are the following of your job?

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
a.	I have clear, planned goals and objectives for my job.	☐	☐	☐	☐	☐
b.	I know that I have divided my time properly.	☐	☐	☐	☐	☐
c.	I know what my responsibilities are.	☐	☐	☐	☐	☐
d.	Explanation is clear of what has to be done.	☐	☐	☐	☐	☐
e.	I know exactly what is expected of me.	☐	☐	☐	☐	☐

19. In your opinion, how often do staff in the Department meet the following problems in carrying out their work?

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
a.	Having to make trade-offs between quality of patient care and cost savings.	☐	☐	☐	☐	☐
b.	Lack of clarity/agreement about the different responsibilities of doctors and nurses.	☐	☐	☐	☐	☐
c.	Being unable to achieve quality in their work because there are staff shortages.	☐	☐	☐	☐	☐

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d.	Having to do an acceptable minimum of work rather than doing the best quality work possible.	☐	☐	☐	☐	☐

20.	The following statements concern the information you get about your work performance.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a.	I usually know whether or not my work is satisfactory in this job.	☐	☐	☐	☐	☐
b.	I often have trouble figuring out whether I'm doing well or poorly on this job.	☐	☐	☐	☐	☐
c.	Most people on this job have a pretty good idea of how well they are performing their work.	☐	☐	☐	☐	☐
d.	Most people on this job have trouble figuring out whether they are doing a good or bad job.	☐	☐	☐	☐	☐

Would you please continue to the next section.

Section C Working relationships

The following questions ask you about the relationships you have at work. Please answer all the questions, ticking the answer which best describes *how you feel.*

21.	The following questions deal with your working relationship with your immediate superior, that is, the person who most immediately supervises you and to whom you are responsible for your work. How much does your immediate supervisor:	To very little extent	To a little extent	To some extent	To a great extent	To a very great extent
a.	Encourage you to give your best effort?	☐	☐	☐	☐	☐
b.	Set an example by working hard him/herself?	☐	☐	☐	☐	☐
c.	Offer new ideas for solving job related problems?	☐	☐	☐	☐	☐
d.	Encourage those who work for him/her to work as a team?	☐	☐	☐	☐	☐

22.	To what extent can you count on your immediate supervisor:	Not at all	To a small extent	Neither great nor small extent	To a great extent	Completely
a.	To listen to you when you need to talk about problems at work?	☐	☐	☐	☐	☐
b.	To help you with a difficult task at work?	☐	☐	☐	☐	☐

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23. This question concerns the influence you have over decisions at work. To what extent:

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
a.	Can you influence what goes on in your work area as a whole?	☐	☐	☐	☐	☐
b.	Does your immediate superior ask for your opinion before making decisions affecting your work?	☐	☐	☐	☐	☐
c.	Do you have the opportunity to contribute to meetings on new work developments?	☐	☐	☐	☐	☐
d.	Are you allowed to participate in decisions, which affect you?	☐	☐	☐	☐	☐

24. To what extent can you:

		Not at all	To a small extent	Neither great nor small extent	To a great extent	Completely
a.	Count on your colleagues to listen to you when you need to talk about problems?	☐	☐	☐	☐	☐
b.	Count on your colleagues to back you up at work?	☐	☐	☐	☐	☐
c.	Count on your colleagues to help you with a difficult task at work?	☐	☐	☐	☐	☐
d.	Really count on your colleagues to help you in a crisis situation at work, even though they would have to go out of their way to do so?	☐	☐	☐	☐	☐

25. The following questions are about teamworking. To what extent:

a.	Do you work as part of a clearly defined team?	Yes	☐	No	☐
b.	Does your team have relatively clear objectives?	Yes	☐	No	☐
c.	Do you frequently work with other team members in order to achieve these team objectives?	Yes	☐	No	☐
d.	Are there different roles for team members within this team?	Yes	☐	No	☐
e.	Is your team recognised by others in the Trust as a clearly defined work team to perform a specific function?	Yes	☐	No	☐

26. The following questions are about safety in the workplace.

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Factors influencing Emergency Department waiting times

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a.	I am involved in improving safety policy and practices.	☐	☐	☐	☐	☐
b.	If I think it will make work safer I initiate steps to improve work procedures.	☐	☐	☐	☐	☐
c.	If I see something unsafe, I go out of my way to address it.	☐	☐	☐	☐	☐
d.	I voluntarily carry out tasks or activities that help to improve workplace safety.	☐	☐	☐	☐	☐
e.	I always carry out my work in a safe manner.	☐	☐	☐	☐	☐
f.	I always report all safety-related incidents.	☐	☐	☐	☐	☐
g.	I sometimes cut corners if it makes the task easier.	☐	☐	☐	☐	☐
h.	I work as safely as I possibly can.	☐	☐	☐	☐	☐
i.	I do not take risks that could result in an accident.	☐	☐	☐	☐	☐
j.	I often make suggestions to improve how safety is handled around here.	☐	☐	☐	☐	☐
k.	I often try new approaches to improving workplace safety.	☐	☐	☐	☐	☐
l.	I often try to solve problems in ways that reduce safety risks.	☐	☐	☐	☐	☐

27.

a.	In the past 12 months, how many times have you witnessed violence and aggression in the A&E department?	……number of times
b.	In the past 12 months how many of these incidents were officially reported?	……number of incidents

28. These questions concern types of work-related injuries you have sustained while working in the A&E department.

	Never	Once	2–3 times	4–5 times	More than 5 times

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a.	A work-related strain or sprain.	☐	☐	☐	☐	☐
b.	A work-related scratch or abrasion (superficial wound).	☐	☐	☐	☐	☐
c.	A work-related cut, laceration, or punctures (open wound).	☐	☐	☐	☐	☐
d.	A work-related burn or scald.	☐	☐	☐	☐	☐
e.	A work-related bruise or contusion.	☐	☐	☐	☐	☐
f.	A work-related fractured bone/dislocated joint	☐	☐	☐	☐	☐
g.	A work-related back injury.	☐	☐	☐	☐	☐
h.	A work-related needle stick injury.	☐	☐	☐	☐	☐
i.	A work-related concussion.	☐	☐	☐	☐	☐
j.	A work-related hernia or rupture.	☐	☐	☐	☐	☐
k.	A work-related injury not listed above.	☐	☐	☐	☐	☐

Section D The A&E Department

The following questions are about different features of the A&E Department (A&E) where you work. Please answer all the questions, ticking the answer which best matches your views about *the Department as a whole*.

29. This section concerns attitudes to change in the A&E Department.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
A&E is quick to respond when changes need to be made.	☐	☐	☐	☐	☐
New ideas are readily accepted in A&E.	☐	☐	☐	☐	☐
A&E is very quick to spot the need to do things differently.	☐	☐	☐	☐	☐
Quick decisions and actions are characteristic of A&E.	☐	☐	☐	☐	☐
There is a lot of support for new ideas in A&E.	☐	☐	☐	☐	☐
A&E is very flexible; it can quickly change procedures to meet new conditions and solve problems as they	☐	☐	☐	☐	☐

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arise.

Please remember to answer these questions with your views of the A&E Department as a whole.

30. This section concerns measurement and feedback on job performance in the A&E Department.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Staff usually receive feedback on the quality of work they have done.	☐	☐	☐	☐	☐
The way people do their jobs in A&E is rarely assessed.	☐	☐	☐	☐	☐
In general it is hard for someone to measure the quality of their performance in A&E.	☐	☐	☐	☐	☐
Staff performance is measured on a regular basis.	☐	☐	☐	☐	☐
Staff don't have any idea how well they're doing in their jobs.	☐	☐	☐	☐	☐

31. This section concerns how much freedom people in the A&E Department have to do their jobs in their own way.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The management let people make their own decisions much of the time.	☐	☐	☐	☐	☐
The management tightly control the work of those below them.	☐	☐	☐	☐	☐
The management keep too tight a rein on the way things are done around here.	☐	☐	☐	☐	☐
The management allow people to get on with their work without interfering.	☐	☐	☐	☐	☐
The management trust people to take decisions.	☐	☐	☐	☐	☐
The management allow people to carry out their work in the way they think best.	☐	☐	☐	☐	☐

32. This section examines the amount of conflict and co-operation in the A&E Department.

	Strongly	Agree	Neither agree nor	Disagree	Strongly

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	agree		disagree		disagree
There are a lot of petty rivalries in A&E.	☐	☐	☐	☐	☐
People can rely on others to help out when they are overloaded with work in A&E.	☐	☐	☐	☐	☐
There always seem to be quarrels going on in A&E.	☐	☐	☐	☐	☐
People in A&E support one another.	☐	☐	☐	☐	☐
People all pull together in A&E.	☐	☐	☐	☐	☐
People can rely on one another in A&E.	☐	☐	☐	☐	☐

Please remember to answer these questions with your views of the A&E Department as a whole.

33. This section concerns the provision of training in the A&E Department.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. The skills of staff are developed so that they can improve their job performance.	☐	☐	☐	☐	☐
b. A&E strongly believes in the importance of training.	☐	☐	☐	☐	☐
c. People are not properly trained in A&E when new procedures are introduced.	☐	☐	☐	☐	☐
d. Staff are strongly encouraged to develop their skills in A&E.	☐	☐	☐	☐	☐
e. Staff can only develop skills if they're prepared to do it in their own time.	☐	☐	☐	☐	☐
f. A&E only gives people the minimum amount of training they need to do their jobs.	☐	☐	☐	☐	☐

34. This section examines the provision of resources in the Trust.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Staff in A&E are well supplied with equipment.	☐	☐	☐	☐	☐
There is inadequate work-space in A&E.	☐	☐	☐	☐	☐

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A&E is never short staffed.	☐	☐	☐	☐	☐
Staff in A&E can't do their jobs properly because of insufficient resources.	☐	☐	☐	☐	☐
Staff in A&E often have to do the jobs of two people.	☐	☐	☐	☐	☐
Staff in A&E are always running out of supplies.	☐	☐	☐	☐	☐
There is a shortage of trained staff in A&E.	☐	☐	☐	☐	☐

35. This section examines how good communication is in the A&E Department.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Communication in A&E is very good.	☐	☐	☐	☐	☐
Information is readily passed to all staff by A&E management.	☐	☐	☐	☐	☐
There are many opportunities to inform A&E management of staff views.	☐	☐	☐	☐	☐
Communication between management and staff is excellent in A&E.	☐	☐	☐	☐	☐
Different sections of A&E do not keep each other informed about what's going on.	☐	☐	☐	☐	☐

Please remember to answer these questions with your views of the A&E Department as a whole.

Section E Your well-being

The following questions ask you to describe things you like and dislike about your work and your general well-being. Please answer all the questions, ticking the answer which best describes what you do *most of the time.*

36. The statements below concern how satisfied you feel with different aspects of your job. How satisfied are you with:

		Extremely dissatisfied	Very dissatisfied	Moderately dissatisfied	Not sure	Moderately satisfied	Very satisfied	Extremely satisfied
a.	The physical work conditions?	☐	☐	☐	☐	☐	☐	☐
b.	The freedom to choose your own	☐	☐	☐	☐	☐	☐	☐

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	method of working?							
c.	Your fellow workers?	☐	☐	☐	☐	☐	☐	☐
d.	The recognition you get for good work?	☐	☐	☐	☐	☐	☐	☐
e.	Your immediate boss?	☐	☐	☐	☐	☐	☐	☐
f.	The amount of responsibility you are given?	☐	☐	☐	☐	☐	☐	☐
g.	Your rate of pay?	☐	☐	☐	☐	☐	☐	☐
h.	Your opportunity to use your abilities?	☐	☐	☐	☐	☐	☐	☐
i.	Relations between management and other workers in the Department?	☐	☐	☐	☐	☐	☐	☐
j.	Your chance of promotion?	☐	☐	☐	☐	☐	☐	☐
k.	The way the Department is managed?	☐	☐	☐	☐	☐	☐	☐
l.	The attention paid to suggestions you make?	☐	☐	☐	☐	☐	☐	☐
m.	Your hours of work?	☐	☐	☐	☐	☐	☐	☐
n.	The amount of variety in your job?	☐	☐	☐	☐	☐	☐	☐
o.	Your job security?	☐	☐	☐	☐	☐	☐	☐
p.	The in-service training you receive?	☐	☐	☐	☐	☐	☐	☐
q.	Your physical security/safety?	☐	☐	☐	☐	☐	☐	☐

The following questions ask you about your general well-being and feelings towards your job. Please answer all the questions.

It is possible that completing some questions may draw your attention to problems you experience. If you are worried that these are serious, we would advise you to contact your GP.

37. Below are some questions, which deal with your *health in general* over the *past months*. Please circle the most appropriate answer for each question. Remember to concentrate on present and recent complaints, not those that you have had in the distant past.

Have you recently:

a.	Been able to concentrate on	Better than	Same as	Less than	Much less

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	whatever you are doing?	usual	usual	usual	than usual
b.	Lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
c.	Felt that you are playing a useful part in things?	More so than usual	Same as usual	Less than usual	Much less than usual
d.	Felt capable of making decisions about things?	More so than usual	Same as usual	Less than usual	Much less than usual
e.	Felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
f.	Felt that you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
g.	Been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less than usual	Much less than usual
h.	Been able to face up to your problems?	More so than usual	Same as usual	Less than usual	Much less than usual
i.	Been feeling unhappy or depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
j.	Been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
k.	Been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
l.	Been feeling reasonably happy, all things considered?	More so than usual	Same as usual	Less than usual	Much less than usual

Many thanks for completing this questionnaire. Please place the questionnaire in the pre-paid envelope provided, seal it and post back to the researcher in Sheffield within 14 days.

If you have any further comments to make, please feel free to write them in the next page.

Thank you for your co-operation

Dr A. Carter, Prof. T.D. Wall, Ms S. Mason, Mr. T. Locker

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Appendix I Eight Emergency Departments contributing to Phase Two data collection

Format

The following scenarios have been compiled using information about departments gathered from interviews, focus groups and observation with primary and secondary care, doctors, nurses and administrative staff, team-working interviews with two doctors and nurses, and qualitative comments from questionnaires to create a story about each Emergency Department examined in the second phase of the study. Each will be referred to by an identification number to maintain anonymity.

Qualitative data sample

Data were collected from focus groups, organisational-factors interviews and ethnographic observations. Six of the eight sites from which data were collected included focus groups or interviews with five different groups of participants: primary care, secondary care, doctors, nurses and administrative staff. At the remaining two sites (sites 207 and 208) it was not possible to collect data from all groups and therefore the data relate to a limited sample for these sites.

Analyses

Data were analysed using a template based on an initial model of factors that prevent patients from leaving the Emergency Department and those that encourage patients to attend the Emergency Department (the out-and-in model). Categories in the model were developed from subject-matter experts and data from one of the sites which formed the basis of a template. Data from all sites were subsequently coded using the template, and themes that did not fit the model were examined and a final template was derived.

Performance

Several measures of performance were available for each site. Firstly the Trust's star rating is given. This is followed by other performance ratings and finally ranking from in-depth qualitative analyses based on interview, focus groups, ethnographic observation and team-working interviews.

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Emergency Department 85

Attendances	60,000–69,999
Case-mix	
Percentage of patients aged 65 years or over	10.0–14.9
Percentage of patients aged less than 16 years	20.0–24.9
Percentage of patients arriving by ambulance	20.0–24.9
Percentage of patients admitted	20.0–24.9
Percentage of patients referred to the Emergency Department by a GP	0.0–4.9
Non-pay spend per 10,000 patients (£)	5.0–9.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	5.0–9.9
Lead clinician's management style	Consult
Performance	
Mean total time (min)	125
Mean waiting time (min)	61
Ranking according to Phase One model out of 8 Phase Two sites	2
Overall WT rank out of Phase Two sites	5

WT rank, waiting-time rank.

Phase Two qualitative ranking: 2 (1–8, poor to good)

About the department

The top three salient factors were hospital management, access to primary and secondary care and bed management and shortages, indicating a reactive strategy and low performance level. Particular comments relate to barriers in communication and animosity between the Emergency Department and other departments, with impolite behaviour fostering poor working relationships, including conflict between doctors and nurses within Emergency Department and with porters creating problems with transferring patients. A lack of shared vision between health and social services professionals and a reactive approach to discharge planning results in bottlenecks in Emergency Department while beds become available elsewhere in the hospital. There was a lack of role clarity in nursing roles, represented by Emergency Nurse Practitioners (ENPs) performing a regular nursing role (their extended nursing role perceived as preventing basic nursing care) and differences in the

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capacity of nurses to prescribe medication, being dependent on the doctor they work with.

Observations from the department

A nurse asks a doctor to prescribe medication for a patient. The doctor states this has already been done and is written up on the Emergency Department card. The nurse in charge informs both that it is no longer policy to do this routinely but neither seems aware.

Groups of nurses and doctors sat at separate desks, the two groups showing no interaction.

Suggested solutions from the department

Multidisciplinary working was perceived by several participants from all disciplines as the way forward but can only work if a shared vision of the service is created with the necessary funding in place. This needs to be supported by an evidence base to justify initiatives and proposed solutions. It is also necessary to communicate and build working relationships and co-operation between different agencies and departments in the hospital to keep each other informed. It was important to have support among the Board of the Trust for these activities.

Other solutions were better discharge processes (and to discharge in the morning), address the division between nurses and doctors to present a united front, a core group of experienced staff to help support rotating junior doctors, public education regarding the role of an Emergency Department and improvements in the availability of primary care services, such as GP appointments. Initiatives mentioned that have already been introduced included moving patients at 3-hour breach, monitoring of breach statistics, and See and Treat with ENPs.

Questionnaire

A 47% response was received from 32 nurses, 17 doctors, 11 administrative staff and three staff in professions allied to medicine. A majority were women (62%), with children (64%), a mean age of 38, who had worked, on average, in the department for 6 years (and 13 years in the NHS).

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Well-being

Twenty-four per cent of the Emergency Department are classified as probable cases of stress[6] (variation across the sites is between 20 and 28% caseness in line with other health care organisations; Mullarkey *et al.*, 1999). The average level of job satisfaction is 4.8[7], close to 'moderately satisfied', indicating a mildly positive level of job satisfaction (the range across Emergency Departments surveyed was 3.8–5).

Teams

Participants described the department as a whole as a team but were unclear about its exact composition. Work was allocated individually and according to grade. Groups of people came together 'when something serious happens' and returned to individual working when the event was over. Objectives were seen as waiting-time targets. While interdependence was espoused work roles were described in terms of occupational groups with separate leaders (consultants and co-ordinating nurse) and there was little evidence of proactive, inclusive working.

Questionnaire responses suggest that individuals perceive work is mainly undertaken in clearly defined teams (71%) and less frequently in less clearly defined teams (19%) or alone (10%).

Comments (1)

There is variation of work enjoyment depending on shift composition and support depending on shift supervisor; concern and frustration about quality of patient care in the rush to meet waiting-time targets and irritation at the time spent using IT rather than talking to patients, changing the job role.

Suggestions to improve the way people work together: assessment by a senior doctor and nurse on ambulance arrival; more space in the department; easier referral to GP for minors; more guidance for Senior House Officer (SHOs) to make quicker clinical decisions; increased number of consultants working out of hours; and more porters to move patients from the department.

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6 The questionnaire contained a standardised measure of stress. This was the GHQ-12; a self-administered screening test designed for use in the general population. It measures feelings of strain, depression, inability to cope, anxiety-based insomnia and other symptoms. It is scored to distinguish between probable cases and non-cases (validated by prior research against clinical assessments; 3/4 threshold), where a case indicates a level of distress sufficiently severe to be of concern.

7 Satisfaction was measured by a 16-item scale covering various areas of work. Items were answered on a seven-point response scale running from 'extremely satisfied' to 'extremely dissatisfied', and the overall score calculated as a mean over all 16 items.

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Emergency Department 208

Attendances	40,000–49,999
Case-mix	
Percentage of patients aged 65 years or over	10.0–14.9
Percentage of patients aged less than 16 years	25.0–29.9
Percentage of patients arriving by ambulance	10.0–14.9
Percentage of patients admitted	15.0–19.9
Percentage of patients referred to the Emergency Department by a GP	0.0–4.9
Non-pay spend per patient (£)	0.0–4.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	0.0–4.9
Lead clinician's management style	N/A
Performance	
Mean total time (min)	107
Mean waiting time (min)	60
Ranking according to Phase One model out of 8 Phase Two sites	N/A
Overall WT rank out of Phase Two sites	4

Phase Two qualitative ranking: 8 (interviews and focus groups)/7 (team working) (1–8, poor to good)

About the department

There were no secondary care participants in this sample which may limit the relevance of the data. The top three salient factors were Emergency Department management, hospital management and access to primary and secondary care, indicating a proactive strategy and high performance level. The hospital has a lack of services available and often patients must be transferred to the larger hospital nearby. This appeared as a higher issue than in most other hospitals. Particular comments related to the new IT system which is seen to increase waiting times, particularly since it was launched in the X-ray department. Furthermore, other services are on different systems and IT has been slow to make recommended changes.

There is a lack of communication and different working practices between different areas of the hospital, and between management and people 'on the ground', although communication between the medical assessment

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unit and Emergency Department has improved recently. It was recognised that although 50% of cases could be discharged in the morning only 10% actually are. Middle-grade doctors have been assigned a leadership role on a shift but some are reluctant to organize SHOs or seek out complex cases. There was a lack of role clarity identified between major and minor injuries with staff reluctant to help in other areas even when quiet in their own area.

Observations from the department

12.20: a patient waiting to go to coronary care unit can now be sent.
12.52: co-ordinator chases up why coronary care unit patient has not been transferred and arranges with porter for transfer but patient has breached.

There appeared to be three separate queues of patients; staff seemed allocated to a particular queue and did not alter when queues changed.

Suggested solutions from the department

The introduction of See and Treat with ENPs has improved waiting times from 6% discharged at 3 hours to 14% discharged at 3 hours. Further suggestions involved improving the interaction between nurses in major and minor cases to build flexibility in who they will treat and development of See and Treat for major cases. It was also suggested to develop forums for communication between different agencies involved in patient care involving primary and secondary care services and develop IT systems to align with other Trusts and agencies so that initial assessment and patient time could appear on the patient card. A long-term suggestion is to create a combined Emergency Assessment Area consisting of Emergency Department, medical assessment unit and speciality admissions units. Initiatives mentioned that have already been introduced included patient flow co-ordinator, See and Treat with ENPs and moving to a 3-hour breach time.

Questionnaire

There was a 56% response from 27 nurses, five administrative staff and three staff in professions allied to medicine. All of this group were women, with children (86%), a mean age of 41, who had worked, on average, in the department for 6 years (and 13 years in the NHS).

Well-being

Twenty-eight per cent of the sample are classified as probable cases of stress (sample varies between 20 and 28% caseness in line with other health care organizations; Mullarkey *et al.*, 1999). The average level of

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job satisfaction is 4.7, close to 'moderately satisfied', indicating a mildly positive level of job satisfaction (the range across the departments surveyed was 3.8–5).

Teams

Participants used the word team as a descriptive term and mostly only talked about occupational groups working separately (nurses and doctors). Participants were vague about the composition of the work group, complicated because doctors worked between this and another site (85). Work was allocated according to shift and area for nurses and grade for doctors. Objectives were seen as waiting-time targets, keeping people happy, caring for patients like a member of the family, offering correct treatment and protecting specialist teams from inappropriate referrals. While working together and sharing tasks was espoused most people appeared to work alone unless working with a specific SHO. Work roles were described in terms of tasks allocated by the nurse co-ordinator. Decisions are made by senior nurses in each area and ENPs. Doctors have a new 'leader' to co-ordinate the work of the doctors in the department. This is currently enjoying limited success. There was evidence of external inclusivity, operational and strategic leadership, additional team objectives and proactive behaviour.

Questionnaire responses suggest that individuals perceive work as mainly undertaken in clearly defined teams (65%) and less frequently in less clearly defined teams (21%) or alone (15%).

Suggestions to improve the way people work together

Suggestions include developing See and Treat for major cases with a team of doctors and nurses and to formalise See and Treat for minor cases; increase ENPs in Emergency Department at peak times; focus the nurse co-ordinator role with a mid-grade doctor to oversee workload of department; discourage self-presentation with old injuries and educate patients (a video is being made that will be shown in the waiting room); develop GP-led unit; redirect patients to GPs; make staff grades more productive and educate doctors about breach times; formalise discussions between doctors and nurses and encourage inpatient specialists to consult without admission; and to direct ambulance transfers to correct departments. It was noted that current monitoring of targets is helping to achieve realistic targets.

Emergency Department 40

Attendances	40,000–49,999
Case-mix	

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Percentage of patients aged 65 years or over	15.0–19.9
Percentage of patients aged less than 16 years	20.0–25.9
Percentage of patients arriving by ambulance	20.0–24.9
Percentage of patients admitted	15.0–19.9
Percentage of patients referred to the Emergency Department by a GP	5.0–9.9
Non-pay spend per patient (£)	5.0–9.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	10.0–14.9
Lead clinician's management style	Tell
Performance	
Mean total time (min)	146
Mean waiting time (min)	135
Ranking according to Phase One model out of 8 Phase Two sites	6
Overall WT rank out of Phase Two sites	8

Phase Two qualitative ranking: 1 (1–8, poor to good)

About the department

There were no primary or secondary care participants in this sample, which may affect the relevance of this data. The top three salient factors were Emergency Department management, bed management and bed shortages and access to primary and secondary care services, which indicated a reactive strategy and low performance level. Particular comments related to X-ray being obstructive and refusing to do investigations, long waits for psychiatric assessment as this is not a Trust priority and has taken years of pressure to make improvements. There is incorrect patient information on samples and X-rays and a general aggressive culture between departments which affects communication. Primary care participants believed the NHS has a culture where acute wards would rather refer patients to Emergency Department than primary care services due to issues of speed and trust. Issues with beds were unavailability due to lack of cleaning of ward side rooms, slow referral procedures between Emergency Department and specialties where patients often 'ping-pong' between referrals to medicine or surgery. Within Emergency Department there is a lack of clinical space to see patients and role-clarity issues relate to the use of receptionists to determine who to send to See and Treat, causing stress, wrong patient

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allocation and issues of prioritization between clinical roles and managerial roles.

Observations from the department

Doctor is looking for someone in all the cubicles, doesn't seem to find who she wants.

See and Treat doctors and nurse are talking. Doctor says this patient is not a See and Treat patient, why did you bring her? Nurse says we had no-one else to see, we might as well see her. Doctor seems unhappy.

I heard the staff discussing a GP referral in disbelief. The GP in question had told one of his patients to come to Emergency Department because it would be quicker.

Suggested solutions from the department

Emergency Department should improve communication regarding who needs beds at an earlier stage. The tracking system should be updated regularly and staff trained in how to use it. A more holistic service would place assessment wards next to Emergency Department. It was also suggested that Emergency Department should be able to charge to the Primary Care Trust if a patient is not referred directly to a specialty. Bed numbers in other Trusts should be incorporated into Emergency Department plans for this hospital. There should be training to help receptionists determine which patients should go to See and Treat and reorganisation of the department so that consultants see Emergency Department patients. Nurses' roles could be up-skilled to perform whole tasks rather than fragmented tasks and they should have access to stress counselling. Initiatives mentioned that have already been introduced included: See and Treat, increase in numbers of consultants and ENPs, and discharge lounges.

Questionnaire

There was a 44% response from 13 nurses, seven doctors, 10 administrative staff and one manager. A majority were women (71%), without children (58%), a mean age of 38, who had worked, on average, in the department for 4 years (and 11 years in the NHS).

Well-being

Twenty-three per cent of the sample are classified as probable cases of stress (sample varies between 20 and 28% caseness in line with other health care organizations; Mullarkey *et al.*, 1999). The average level of job satisfaction is 4.7, close to 'moderately satisfied', indicating a mildly

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positive level of job satisfaction (the range across the departments surveyed was 3.8–5).

Teams

Perceptions of team working varied widely (in terms of area, shift or the department as a whole) and people were unclear about team composition. Objectives were seen as patient care and the 4-hour targets. Work roles were allocated according to shift, grade and occupational group. Interdependence was acknowledged but doctors and nurses only described coming together during major incidents and then returned to flexible working when the incident was over. Work in the department was described in terms of separate occupational groups with mid-grade doctors taking an overview of the workload with a view to troubleshooting to reduce waiting times. Doctors and nurses describe separate leaders (consultants and co-ordinating nurse) and there was little evidence of proactive, inclusive working.

Questionnaire responses suggest that individuals perceive work is mainly undertaken in clearly defined teams (60%) and less frequently in less clearly defined teams (23%) or alone (17%).

Suggestions to improve the way people work together

Assessment by a doctor who delegates activity; quicker assessment of urgent cases in waiting room; a rapid-assessment bay staffed by a senior doctors is being implemented; keeping minor cases separate from the rest of the department; senior nurse and doctor should take time to reflect on what happened after an incident to stop recurrence; increase out-of-hours staff; porter assigned to Emergency Department; better handover to on-call specialties and assessments; and observation beds out of Emergency Department.

Emergency Department 207

Attendances	40,000–49,999
Case-mix	
Percentage of patients aged 65 years or over	15.0–19.9
Percentage of patients aged less than 16 years	20.0–24.9
Percentage of patients arriving by ambulance	20.0–24.9
Percentage of patients admitted	20.0–24.9
Percentage of patients referred to the Emergency Department by a GP	0.0–4.9

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Non-pay spend per patient (£)	10.0–14.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	0.0–4.9
Lead clinician's management style	Consult
Performance	
Mean total time (min)	125
Mean waiting time (min)	55
Ranking according to Phase One model out of 8 Phase Two sites	4
Overall WT rank out of Phase Two sites	3

Phase Two qualitative ranking: 4 (interviews and focus groups)/3 (team working) (1–8, poor to good)

About the department

The top three salient factors were Emergency Department management, bed management and bed shortages, and hospital management, indicating a reactive strategy and low–mid performance level. Particular comments related to resistance within the Trust to ideas and uncertainty as to who to communicate ideas to, petty politics getting in the way of people working together and communication difficulties between porters and Emergency Department staff.

Issues between the Trust and Primary Care Trust are preventing equal distribution of funding between primary and secondary care services. Specialties, while providing vocal support for Emergency Department, do not provide practical day-to-day support. The hospital night team is not functioning well as it is run traditionally and leaves a backlog of patients for the morning shift, especially at the start of the week, which 'messes up' the rest of the day. Whenever major clinical cases occur, staff are drawn away from the rest of the department. There is no triage system. This has been replaced by a navigator role where a qualified nurse streams patients between majors and minors but does not physically touch the patient. The role is felt to under-utilize nurses' skills and causes issues around patient privacy, with the divulging of personal details in the middle of the waiting room.

Observations from the department

Doctors from other specialties come and go without communicating.

Health care assistant tries to contact the plaster room for a knee dislocation but seems not very hopeful that they will attend. Health care

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assistant returns as cannot locate any plaster technicians. Nurses will have to plaster the patient which will take two members of staff.

Patient seen by ENP, heard to refer to himself as the navigator. Patient is taken to small area immediately adjacent to waiting room where brief history is taken; fully audible from where I am sat in the waiting room.

The consultant is satisfied that only one Emergency Department patient needs to be seen and leaves the area muttering about 'they just need organizing'.

The computer system is not always up to date, which causes confusion.

Suggested solutions from the department

There should be better co-ordination of staff and communication between staff, including those from Emergency Department acknowledging staff from other areas of the hospital and specialties providing more practical support. A holistic approach should consider different Emergency Department services offered locally and it was suggested to co-locate Emergency Department and create a Medical Investigation Unit. Inter-professional working between primary and secondary care is believed to produce better results and there should be a more even split of funds between them. Specialties should be trained to take account of breach times.

Within the department, doctors could be allocated to major or minor cases to increase role clarity and their work structured better, with patients seen by referral or appointment. Nurses could be rotated through different areas to improve or maintain their skills. It was also suggested that the navigator role should revert back to triage.

Initiatives that have already been introduced include: new walk-in centre based in Emergency Department, medical assessment unit/acute admission unit and ENPs working on minors.

Questionnaire

There was a 35% response from 14 nurses, seven doctors and seven administrative staff. A majority were women (68%), with children (75%), a mean age of 40, who had worked, on average, in the department for 5 years (and 9 years in the NHS).

Well-being

Twenty-two per cent of the sample are classified as probable cases (sample varies between 20 and 28% caseness in line with other health care organizations; Mullarkey *et al.*, 1999). The average level of job satisfaction is 4.2, close to 'not sure', indicating a level of job satisfaction

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that is neither positive nor negative (the range across the departments surveyed was 3.8–5).

Teams

Participants considered a team to be either the department or a shift. There was some clarity about team composition including receptionists. Some participants did not think work was allocated in teams. Objectives were seen as 4-hour targets, optimal patient care, pain relief, safety and development. Work roles were allocated according to occupational group and grade; X-ray, laboratories and physiotherapy were mentioned by one participant. Interdependence was acknowledged in terms of trauma and cardiac arrest while acknowledging independent working. Doctors and nurses describe separate leaders (consultant/senior doctor and nurse in charge). There was evidence of external inclusivity, effective communication between doctors and nurses and additional team objectives.

Questionnaire responses suggest that individuals perceive work is carried out in a variety of work groupings (less clearly defined teams, 43%; clearly defined teams, 32%; alone, 25%).

Comments (2)

Frustration about quality of patient care in rush to meet waiting time makes work feel like a conveyor belt; nurses are urged to perform beyond their abilities by management; bed co-ordinator only focuses on what has not been done and never offers extra help when busy; management is bullying, exposing all breaches and allocating blame to Emergency Department staff when it may be the fault of wards or porters; more paper work is expected that consumes nurse time; many senior colleagues are off sick with stress and depression. There have been four different managers in the last 2–3 years who were not Emergency Department nurses and set conflicting demands. The new manager (previously Emergency Department nurse) is improving the way the department is managed.

Suggestions to improve the way people work together

Shorter waiting times for occupational therapy; record all patient information in a document on the patient's bed; improve bed management; lose the navigator role and replace it with triage by ENP; nurse in charge should be in reception (as in original department plan), manage long-term sickness; allocate doctors to major or minor cases to give clarity to their roles; increase staff in See and Treat; set up a surgical assessment unit and acute admission ward; influence patients'

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expectations regarding waiting times; and discourage GPs from telling patients they will have a bed when this is not true.

Emergency Department 164

Attendances	70,000–79,999
Case-mix	
Percentage of patients aged 65 years or over	15.0–19.9
Percentage of patients aged less than 16 years	20.0–24.9
Percentage of patients arriving by ambulance	30.0–34.9
Percentage of patients admitted	30.0–34.9
Percentage of patients referred to the Emergency Department by a GP	0.0–4.9
Non-pay spend per patient (£)	5.0–9.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	0.0–4.9
Lead clinician's management style	Consult
Performance	
Mean total time (min)	133
Mean waiting time (min)	75
Ranking according to Phase One model out of 8 Phase Two sites	3
Overall WT rank out of Phase Two sites	6

Phase Two qualitative ranking: 6 (interveiws and focus groups)/5 (team working) (1–8, poor to good)

About the department

The top three salient factors were self-presentation, hospital management and Emergency Department management, indicating a proactive strategy and mid performance level. Information received from the department concerned 67 breaches due to awaiting beds (42), awaiting first assessment in Emergency Department (10), delayed referral by Emergency Department (6), waiting for specialist opinion (4), waiting for transport (1) and clinical exception (4). Particular comments related to the main objectives of primary care staff not being related to Emergency Department, a lack of communication regarding patient needs when arriving by ambulance, and difficulties finding basic secondary care information; for example, opening times of the dedicated X-ray service. Emergency Department was seen as a separate unit with special

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requirements by the rest of the hospital and that staff outside Emergency Department do not want to take responsibility for the target. There is poor discharge planning and when beds are unavailable on wards patients are left on trolleys in Emergency Department with no-one to look after them as they are not Emergency Department patients. Doctors also believed that the nurses were overstretched and needed better support in their roles and skilled employees are often used to doing unskilled work due to a lack of administrative staff. Furthermore, it is difficult for the senior nurse to maintain patient flow when the department becomes busy due to clinical pressure. There is a lack of support from business managers. A particular issue raised here was that immigrants attend because they do not know their right to be registered with a GP.

Observations from the department

Emergency Department doctor tries to view X-rays of patient on PC but gets the films of the wrong patient.

Paramedics arrive with orthopaedics referral. Emergency Department have not been notified and the ward has no beds. The patient is placed in a cubicle.

Sister thinks the patient needs an X-ray but is unsure of criteria for requesting this. She is heard to state that she has not done this before.

Emergency Department doctors seem oblivious to urgency. Senior nurse interrupts doctor to ask for direction about a patient.

Suggested solutions from the department

There needs to be better communication and a referral policy between Emergency Department and the wards so that all parties are aware of the role of Emergency Department within the system. Different approaches were suggested to deal with this, ranging from amalgamation of emergency and acute medicine into one division to encourage closer working relationships and shared objectives to separate but allied directorates with a voice on the Trust board and separate hospitals for emergency and elective patients.

Flexible capacity in other parts of the hospital would help relieve pressure on Emergency Department. Another suggestion was that the Emergency Department should work in multidisciplinary teams to discuss treatments and solutions to improve the decision-making processes and responsibilities and increase team-building.

Effective shift leaders could be trained to run a shift and there was recognition of a need for an Emergency Department business manager. Public education could inform immigrants of their right to a GP and how to register.

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Initiatives that have already been introduced included: See and Treat with ENPs, progress co-ordination, monitoring of breaches and a walk-in centre.

Questionnaire

There was a 31% response (from 23 nurses, 14 doctors, 14 administrative staff). A majority were women (84%), with children (57%), a mean age of 39, who had worked, on average, in the department for 7 years (and 13 years in the NHS).

Well-being

Twenty-five per cent of the sample are classified as probable cases of stress (sample varies between 20 and 28% caseness in line with other health care organizations; Mullarkey *et al.*, 1999). The average level of job satisfaction is 5, 'moderately satisfied', indicating a positive level of job satisfaction (the range across the departments surveyed was 3.8–5).

Teams

Participants described the Emergency Department as the team but there were varied perceptions of team composition. The clerical team were acknowledged as part of Emergency Department. Work was allocated by occupational group, shift, skill and grade with doctors mentioning working with nurses and only one participant saw work allocated into teams. A fixed team was Resus, where doctors and nurses have assigned roles. All agreed that team objectives were patient care, and then there was some variation about different objectives between major and minor cases, working within departmental guidelines and 4-hour targets and supporting each other.

Team roles were not clear and flexibility was valued will acknowledging interdependence. Doctors and nurses describe separate leaders (consultant/senior doctor and nurse in charge) and leaders in areas (i.e. major cases). There was evidence of co-operative working, additional team objectives, developmental behaviour, flexible working and empowerment of local decision-making. Questionnaire responses suggest that individuals perceive work is carried out mainly in clearly defined teams (71%) and less frequently in less clearly defined teams (24%) and alone (6%).

Comments (3)

The department is under-managed (manager is not positive and involved); there is a 'them and us' feel between ward and Emergency Department staff with little respect or understanding for the Emergency

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Department role; little communication between wards and Emergency Department; staff feel undervalued (hard work is not recognised) and under pressure; long service is not appreciated; local colleagues acknowledge your work but a 'thank you' is never received from the hierarchy.

Suggestions to improve the way people work together

Increase access to primary care resources (occupational therapy and Rapid Response); dedicated access to secondary care (CT and bloods; improve communication with all specialties in the Trusts and understand others' roles; discharge patients earlier (elderly care); run with spare capacity; allocate minors to ENPs, keep department flexible; have a larger area for major cases; involve senior doctors in major cases earlier to support SHOs; identify patients (such as major cases) for whom the 4-hour target is inappropriate; reduce inappropriate referrals.

Emergency Department 154

Attendances	80,000–89,999
Case-mix	
Percentage of patients aged 65 years or over	15.0–19.9
Percentage of patients aged less than 16 years	20.0–24.9
Percentage of patients arriving by ambulance	20.0–24.9
Percentage of patients admitted	15.0–19.9
Percentage of patients referred to the Emergency Department by a GP	5.0–9.9
Non-pay spend per patient (£)	0.0–4.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	0.0–4.9
Lead clinician's management style	N/A
Performance	
Mean total time (min)	91
Mean waiting time (min)	28
Ranking according to Phase One model out of 8 Phase Two sites	N/A
Overall WT rank out of Phase Two sites	1

Phase Two qualitative ranking: 7 (interviews and focus groups)/8 (team working) (1–8, poor to good)

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About the department

The top three salient factors were access to primary and secondary care, hospital management and Emergency Department management, indicating a proactive strategy and high performance level.

Suggested solutions from the department

Initiatives mentioned that have already been introduced included: See and Treat with ENPs, progress co-ordination monitoring breaches and a walk-in centre.

Questionnaire

There was a 32% response from 21 nurses, 10 doctors, 11 administrative staff, one manager and one ancillary staff. A majority were women (73%), with children (61%), a mean age of 38, who had worked, on average, in the department for 5.7 years (and 11 years in the NHS).

Well-being

Twenty per cent of the sample are classified as probable cases of stress (sample varies between 20 and 28% caseness in line with other health care organizations; Mullarkey *et al.*, 1999). The average level of job satisfaction is 4.6, close to 'moderately satisfied', indicating a mildly positive level of job satisfaction (the range across the departments surveyed was 3.8–5).

Teams

Teams were described as being the department as a whole or area teams. However, there was little evidence of team working among staff except in the See and Treat area. The composition of the department was clear and clerical staff (reception, audio typists) were included. Work was allocated by area or shift with consultants having allocated time in See and Treat.

Objectives varied; providing necessary treatment of (and caring for) patients, to work together to best of ability and help each other, and treating people as quickly as reasonable. Roles were allocated according to hierarchy, skill, grade or occupational group (e.g. clerical, receptionist). People needed to work together and communication is critical (and critical incidents can be traced to failure of communication and team working. Key leaders were the consultant on duty and the nurse in charge (clerical staff recognise the clinical matron as their leader), in addition to section leaders (nurses) and SHO leaders (registrars). There was evidence of clear work roles and inclusive allocations, prioritising work, additional objectives, empowerment, reflexivity and co-operative leadership strategies.

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Questionnaire responses suggest that individuals perceive that work is carried out mainly in clearly defined teams (54%) and less-clearly defined teams (39%), but less frequently alone (7%).

Suggestions to improve the way people work together

Bloods and cannulations can be done by health care assistants before being seen by a doctor; pain relief should be given immediately; extra nursing staff, porters and health care assistants; have more experienced staff; senior nursing staff can decide where patients need to go and what assessments are needed (some don't need blood tests); hoping to fund a nurse consultant; time taken to organise a bed is long; clinical pathways and protocols can be helpful; Greet and Treat run by registrars has been successful in major cases.

Emergency Department 109

Attendances	40,000–49,999
Case-mix	
Percentage of patients aged 65 years or over	10.0–15.9
Percentage of patients aged less than 16 years	25.0–29.9
Percentage of patients arriving by ambulance	15.0–19.9
Percentage of patients admitted	15.0–19.9
Percentage of patients referred to the Emergency Department by a GP	0.0–4.9
Non-pay spend per patient (£)	5.0–9.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	0.0–4.9
Lead clinician's management style	Consult
Performance	
Mean total time (min)	89
Mean waiting time (min)	37
Ranking according to Phase One model out of 8 Phase Two sites	1
Overall WT rank out of Phase Two sites	2

Phase Two qualitative ranking: 5 (interviews and focus groups)/6 (team working) (1–8, poor to good)

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About the department

The top three salient factors were hospital management, self-presentation and Emergency Department management, indicating a proactive strategy and mid–high performance level.

Suggested solutions from the department

Initiatives mentioned that have already been introduced included: See and Treat with ENPs, progress co-ordination, monitoring breaches and a walk-in centre.

Questionnaire

Only one questionnaire was returned so there are no data to report from this site.

Teams

In general, participants referred to the department as a whole as a team or to the nursing team. In addition there were nursing teams for developmental purposes. Staff were moderately clear about the composition of the department and there was evidence of inclusion of other staff groups such as occupational therapists, physiotherapists and play specialists. Work was allocated into areas for nurses and by demand (and shift) for doctors. Individuals work flexibly, and usually independently, unless a team is required (in cases of trauma, cardiac arrest) or when a doctor and nurse work together in See and Treat. Participants agreed that the main team objective was quality patient care and to meet the 4-hour targets; there was evidence of additional objectives such as to provide pain relief, get patients to wards and provide specialist care. These objectives were linked with the Emergency Department business plan.

Individuals took on tasks within the department and adopted roles in trauma teams as allocated by the co-ordinator. Effective communication between doctors and nurses was emphasised in the way people worked together. The department leader was the consultant in charge and the nurse in charge co-ordinated the department but individuals were seen to lead areas and co-ordinate trauma teams. There is evidence of broad staff grouping, external exclusivity, up-skilling staff, flexible working, prioritising work, trauma team inclusively, additional objectives and developmental behaviours.

Suggestions to improve the way people work together

Better discharge planning enabling beds to be available; 4-hour targets provide a focus for staff; wards should have targets for assessment to

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increase throughput; wards should focus on more complex acute cases and focus on assessment rather than admission; See and Treat has been successful but may be challenged by more complex problems that need intervention in major cases; primary care referrals reduce the efficiency of department; need to increase primary care services, especially out of hours and GPs should see only acutely ill patients; more doctors at night and more nurses; and to see only genuine Emergency Department patients.

Emergency Department 24

Attendances	60,000–69,999
Case-mix	
Percentage of patients aged 65 years or over	15.0–19.9
Percentage of patients aged less than 16 years	10.0–14.9
Percentage of patients arriving by ambulance	30.0- 34.9
Percentage of patients admitted	15.0–19.9
Percentage of patients referred to the Emergency Department by a GP	0.0–4.9
Non-pay spend per patient (£)	15.0- 19.9
See and Treat present?	Yes
Percentage of nursing hours lost through sickness	5.0–9.9
Lead clinician management style	Consult
Performance	
Mean total time (min)	140
Mean waiting time (min)	89
Ranking according to Phase One model out of 8 Phase Two sites	5
Overall WT rank out of Phase Two sites	7

Phase Two qualitative ranking: 3 (interveiws and focus groups)/4 (team working) (1–8, poor to good)

About the department

The top three salient factors were hospital management, self-presentation and Emergency Department management indicating a proactive strategy and mid performance level.

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Suggested solutions from the department

Initiatives mentioned that have already been introduced included: See and Treat with ENPs, progress co-ordination, monitoring breaches and a walk-in centre.

Questionnaire

There was an 18% response from 16 nurses, six doctors and 15 administrative staff. A majority of responses were from women (81%), with children (57%), aged 40 (mean) who had worked, on average, in the department for 7 years (and 11 years in the NHS).

Well-being

Twenty per cent of the sample are classified as probable cases (sample varies between 20 and 28% caseness in line with other health care organizations; Mullarkey *et al.*, 1999). The average level of job satisfaction is 3.8, close to 'not sure', indicating a level of job satisfaction that is tending towards dissatisfaction (the range across the departments surveyed was 3.8–5).

Teams

Participants varied in their descriptions of teams from specialist assessment team to the department as the team. There was a lack of clarity of composition, but paramedics were acknowledged. Work was allocated by occupational group and area (nurses) and shifts (doctors). Fixed teams were Resus and assessment where doctors and nurses have assigned roles. Team objectives varied, including optimal patient care, building a positive working environment and helping to keep the department 'afloat'. Team roles were unclear while acknowledging interdependence. Doctors and nurses describe separate leaders (consultant and nurse in charge) and leaders in areas (i.e. major cases). There was evidence of external exclusivity, co-operative working, additional team objectives, and developmental behaviours. Questionnaire responses suggest that individuals perceive work is carried out in a variety of work groupings (less clearly defined teams, defined teams and alone).

Comments (4)

There is an improving climate in the department over the last 5 years; allocation of new manager who does not appreciate my role; and pressure from management to corrupt waiting-time figures.

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Suggestions to improve the way people work together

It was suggested to involve registrars and consultants in regular 'board' checks to ensure effective patient management; increase medical beds; use See and Treat and triage only at peak times; employ a phlebotomist to cannulate and take bloods; increase staff numbers (and skills mix); employ extra middle grades and consultants; stop unnecessary breaks; better use of space in minor cases; improve space for patients; develop a central equipment store as looking for equipment wastes time; improve staff motivation; and reduce inappropriate referrals from other hospitals.

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Appendix J Phase Two interview, focus-group and team-working interview schedules

Organisational factors interview schedule

Good morning/afternoon, my name is XXXXX and I would like to thank you for giving me some of your valuable time for this interview.

This is one of a series of interviews we are conducting with staff in this A&E department to examine organisational factors that may influence waiting times. In other words we are looking at 'things that make your work hard' and that may contribute to extending A&E waiting times. This work is part of a larger study that will examine ALL the A&E departments in England and Wales. From this sample 10 departments are contributing to a more in-depth study of how A&E departments work. So, many thanks for your co-operation in this work.

This is a supportive study, no-one is here to criticise what you do. There are no right or wrong answers to the questions. The aim of the project is to explore work-demand issues, methods of working across departments to work toward improving waiting times in A&E. The interview will take about 1 hour to complete and I hope that won't cause you any problems.

Anything that you say to me/us today will be treated in confidence and NO individual will be identified. I only have your name to note that I have completed my interviews as planned. You will be considered as a 'site manager' or 'receptionist' with no Trust connection so the data will not be traceable to you. We will examine issues today and ask for your suggestions that will be put in our report along with the information we gain from focus groups we are holding later today and tomorrow.

Further, no feedback will be given to anyone in the department about the content of this interview. The study will conclude early next year and a copy of the final report will be made available to all participants.

The interview will take about 50 minutes and I have a copy of the questions for you to have a look at to help you. Is there anything you would like to ask before we begin? Are you happy to continue?

Here are the questions:

1 What things cause you difficulties in your working day that may contribute to extending the waiting time for patients in A&E? (note in all questions we will consider if there are differences between working in or out of hours)

2 What potential solutions can you see to the problems that you have described to me?

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2a Have you suggested any of these ideas? And if so, what happened?

3 What initiatives have been tried in the Trust to reduce A&E waiting times and what effect did they have on working practice and waiting time?

4a To what extent is understaffing, attendance or staff sickness absence a problem in this work area?

4b How is sickness absence managed?

5 How would you like to see the A&E speciality managed?

6 That is all our questions. Is there anything you would like to add to our information gathering about how to reduce waiting times in A&E?

Organisational factors focus group for nurses and doctors

As people come in ask them to complete the consent form.

Introduction 10 minutes

Good afternoon, my name is XXXXX and I am a researcher working on the 'A&E waiting time study' and this is my colleague XXXXX.

This is one of four planned focus groups to discuss with A&E staff work demands, in other words 'things that make your work hard'. The aim of the project is to explore appreciate the things that contribute to waiting time in A&E departments and examine your ideas of how these may be reduced. This is part of a larger study that will examine ALL the A&E departments in England and Wales. From this sample 10 departments will contribute to the process of in-depth examination of how an A&E department works. So, many thanks for your co-operation in this work.

This is a supportive study no-one is here to criticise what you do. We will examine issues together and ask for your suggestions that will be put in our report.

Anything that you say to us today will be treated in confidence and NO individual will be identified. Identities will be protected and individuals will not be named. Further, no feedback will be given to anyone in the department about the content of this interview. The study will conclude early next year and a copy of the final report will be made available to all participants.

It is intended that we work together for 75 minutes. The first 25-minute part will be about identifying problems that you face in your day-to-day work the second part will be to come up with some solutions to the problems you raise.

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Are you happy to continue? Let anyone leave who is not happy to contribute to the study.

RECORD ANY MATERIAL ON A FLIP CHART THAT CAN BE REMOVED FOR ANALYSIS

Brainstorm 20 minutes

The first part of our session this afternoon is to think of all the things that cause you difficulties in your working day that may contribute to extending patients waiting times and to list these. We will consider if there any differences between out-of-hours working in a minute.

Can I suggest you think about this for a few minutes and then we will go around the group so that we can record these on the flip chart?

Two minutes' thought and encourage people to be precise and describe how these things cause them difficulties at work.

Go round group to get out ideas (2 minutes each) put these on one page and note the number of repeats.

ASK TO NOTE SOLUTIONS BUT THAT THE NEXT SESSION WILL WORK ON THIS

Any differences in out-of-hours working? 5 minutes

Any differences between different areas of A&E? 5 minutes

Note any suggestions as you go along to come back to when looking at solutions.

Summarise points that have come from the session and wish to examine solutions 40 minutes

What can be done with these issues?

Can I suggest you think about this for a few minutes and then we will go around the group so that we can record these on the flip chart?

NOTE ON CHART THE ISSUE AND A POSSIBLE SOLUTION

Go round group to get out ideas (2 minutes each) put these on one page and note the number of repeats. ENCOURAGE A DEBATE AND WORKABLE SOLUTIONS LOOKING FOR THE RESOURCES THAT WILL BE REQUIRED TO CARRY THIS THROUGH 15 minutes

DEBATE AND DISCUSS SOLUTIONS SUGGESTING THAT IF JUST ONE GOOD IDEA COMES FROM THIS GROUP THAT WILL BE SUFFICIENT so work it through in some detail 15 minutes

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Conclusion 5 minutes

We have reached the end of our time now and would like to thank you for your participation. Many thanks for your time; a copy of our report will be made available to all who have participated in this study.

Organisational factors focus group for Primary and Secondary care staff

Ask people to complete consent form as they arrive

Introduction 10 minutes

Good afternoon, my name is XXXXX and I am a researcher working on the 'A&E waiting time study' and this is my colleague XXXXX.

This is one of four planned focus groups to discuss with staff working with A&E staff/department, in other words 'things that make your work hard'. The aim of the project is to explore appreciate the things that contribute to waiting time in A&E departments and examine your ideas of how these may be reduced. This is part of a larger study that will examine ALL the A&E departments in England and Wales. From this sample 10 departments will contribute to the process of in-depth examination of how an A&E department works. So, many thanks for your co-operation in this work.

This is a supportive study no-one is here to criticise what you do. We will examine issues together and ask for your suggestions that will be put in our report.

Anything that you say to us today will be treated in confidence and NO individual will be identified. Identities will be protected and individuals will not be named. The study will conclude early next year and a copy of the final report will be made available to all participants.

It is intended that we work together for 75 minutes. This group is running in parallel with a group of A&E staff and primary and secondary care staff (*delete as appropriate*) associated with the department. We will use a two-stage process of getting your ideas and then see if we can come up with some solutions.

Are you happy to continue? Let anyone leave who is not happy to contribute to the study.

RECORD ANY MATERIAL ON A FLIP CHART THAT CAN BE REMOVED FOR ANALYSIS

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Brainstorm 20 minutes

The first part of our session this afternoon is to think of all the things that cause you difficulties in your working day that may contribute to extending A&E patients waiting times and to list these. We will consider if there any differences between out of hours working in a minute.

Can I suggest you think about this for a few minutes and then we will go around the group so that we can record these on the flip chart?

Two minutes' thought and encourage people to be precise and describe how these things cause them difficulties at work.

Go round group to get out ideas (2 minutes each) put these on one page and note the number of repeats.

ASK TO NOTE SOLUTIONS BUT THAT THE NEXT SESSION WILL WORK ON THIS 5 minutes

Any differences in out-of-hours working? 5 minutes

Any differences between different areas of A&E?

Note any suggestions as you go along to come back to in the last session.

Summarise points that have come from the session and explain that we are going to join the other group to work together to come up with some solutions.

MAKE A SUMMARY FLIP CHART OF POINTS FOR THE NEXT SESSION TO LOOK FOR SOLUTIONS 40 minutes

What can be done with these issues?

Can I suggest you think about this for a few minutes and then we will go around the group so that we can record these on the flip chart?

NOTE ON CHART THE ISSUE AND A POSSIBLE SOLUTION

Go round group to get out ideas (2 minutes each) put these on one page and note the number of repeats.

ENCOURAGE A DEBATE AND WORKABLE SOLUTIONS LOOKING FOR THE RESOURCES THAT WILL BE REQUIRED TO CARRY THIS THROUGH
15 minutes

DEBATE AND DISCUSS SOLUTIONS SUGGESTING THAT IF JUST ONE GOOD IDEA COMES FROM THIS GROUP THAT WILL BE SUFFICIENT
15 minutes

Conclusion 5 minutes

We have reached the end of our time now and would like to thank you for your participation.

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Many thanks for your time; a copy of our report will be made available to all who have participated in this study.

Questions asked in the team-working interviews

Team working in Emergency Departments

Good morning/afternoon, my name is XXXXX and I would like to thank you for giving me some of your valuable time for this interview.

This is one of a series of interviews we are conducting with staff in this A&E department to examine organisational factors that may influence waiting times. Particularly I am interested in the way the department works together and team working.

This work is part of a larger study that will examine all Emergency Departments in England and Wales. From this sample 10 departments are contributing to a more in-depth study of how A&E departments work. So many thanks for your co-operation in this work.

This is a supportive study, no-one is here to criticise what you do. There are no right or wrong answers to the questions. The aim of the project is to explore work-demand issues, methods of working across departments to work toward improving waiting times in A&E. The interview will take about 1 hour to complete and I hope that won't cause you any problems.

Anything that you say to me/us today will be treated in confidence and NO individual will be identified. I only have your name to note that I have completed my interviews as planned. You will be considered as a 'nurse' or a 'doctor' so the data will not be traceable to you. We will examine issues today and ask for your suggestions that will be put in our final report. Further, no feedback will be given to anyone in the department about the content of this interview. The study will conclude early next year and a copy of the final report will be made available to all participants.

The interview will take about 1 hour and I have a copy of the questions for you to have a look at to help you. Is there anything you would like to ask before we begin? Are you happy to continue?

How many people work in the A & E department? (2 minutes)

How is work allocated? You may wish to draw this? (8 minutes)

Is work allocated in teams? What are the teams called? (3 minutes)

Do you work in a team? Describe that team to me. Who is in the team? (7 minutes)

What are the objectives of the team/s? (or individuals) (10 minutes)

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What roles do people take within the teams? (5 minutes)

Do people need to work together to achieve their tasks? (5 minutes)

Do the teams have team leaders and who are they? (10 minutes)

Can you suggest any other way of organising work to increase throughput in the department? (10 minutes).

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Appendix K Ethnographic residual analysis: the use of an innovative design from educational research for use in health services research

This mixed-methods study used an innovative design described in educational research as ethnographic residual analysis (ERA; Fry *et al*., 1981).

The basic steps of ERA

In 1981, while assessing the combination of qualitative and quantitative methods in three studies of school performance, a group of researchers devised the concept of ERA (Fry *et al*., 1981). They explained how it worked in the context of assessing school performance. A multiple regression of factors affecting school performance was undertaken, each school's expected performance was compared with its actual performance, and schools with unusually high and low performance were then examined using qualitative methods to find factors accounting for any statistical deviance. The design draws on the strength of quantitative research to explain variation and the strength of qualitative research to uncover lesser-known or -understood issues. Fry *et al*. (1981) described the following stages in ERA.

Stage 1 Define the dependent variable.

Stage 2 Undertake multiple regression with the available independent variables.

Stage 3 Compare the predicted outcome with the actual outcome for each case to identify cases with large residuals. Study cases with large residuals to explore further issues that may be important, but which have not been considered in the original regression, using ethnography where investigators are blinded to the quantitative findings for each case in order to minimise the potential for preconceived bias. Rerun regression equations, if possible, incorporating new insights or variables discovered during the qualitative phase.

The potential benefits of ERA

ERA is a variation of extreme-case sampling which is a well-known approach to combining qualitative and quantitative methods. In extreme-case sampling, qualitative researchers identify extreme cases of a phenomenon to explore to gain a better understanding of the

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phenomenon; for example, using a survey to highlight extreme cases for the qualitative research. The unusual thing about ERA is that cases with large residuals, rather than cases with high or low values of an outcome variable, form a sampling base for the qualitative research. Thus qualitative research is focused on uncovering unexplained variance from quantitative research; that is, 'reaching the variance which the quantitative component has failed to reach'.

Although Fry *et al*. (1981) developed the design, they did not use it in practice. A search of electronic databases for ERA failed to uncover examples of its use in practice or its further development. However, it has been described as an innovative approach to analysing data in mixed-methods studies (Caracelli and Greene, 1983), and similar approaches have been discussed as 'qualitative residual analysis' (Onwuegbuzie and Teddlie, 2003) or extreme-case sampling in qualitative research using cases which do not fit a statistical regression (Qureshi, 1992; Rogers and Nicolaas, 1998). ERA has the potential to be more powerful than other combinations of statistical residuals with qualitative research because there is a formal step of returning to the quantitative data-set with insights from the qualitative data-set. That is, ERA forces the researcher to make links between the qualitative and quantitative data and findings. This overcomes a common failure of mixed-methods studies whereby qualitative and quantitative components tend to be undertaken separately rather than exploiting links between data-sets for further insights (O'Cathain and Thomas, 2006).

How ERA worked in this study

The design of this study of Emergency Department waiting times was planned without knowledge of ERA. The use of qualitative research to explore Emergency Departments with large residuals in the quantitative analysis emerged within team discussions as a powerful way of exploring factors affecting waiting times. Emergency Departments with small residuals were also included in the sampling strategy for the qualitative research. In the early stages of the study, the work of Fry *et al*. was identified and shaped the way in which the study was actually undertaken.

The design of the study followed the first two stages, and part of the third stage, of ERA. During the early stages of the study, prior to the qualitative data sampling and data collection, the paper on ERA was identified. Two new issues were introduced into the study: blinding between the qualitative and quantitative research, and rerunning the regression equations incorporating new insights from the qualitative case studies. The research team made the explicit decision that the qualitative researchers would be blind to the quantitative findings, in that they would not be told whether the statistical model had overestimated,

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underestimated or accurately predicted the waiting times of Emergency Departments which had been selected, until they had analysed their data. Towards the end of the study, findings from the qualitative case studies were placed alongside the residuals from the regression analysis to identify further factors which were then tested in the original quantitative data-set.

The future of ERA in health services research

ERA encouraged researchers in this study to make links between the quantitative and qualitative data-sets. However, it was not without its problems. Issues arose that were challenging to deal with, such as the best way of placing the qualitative data and residuals side by side to identify hypotheses for testing in the large data-set. Additionally, research bureaucracy limited the extent to which ERA operated as planned. For all this, it is an innovative design which the health services research community may benefit from knowing more about. To this end we intend to publish a paper about ERA to explain the design and its use in practice, with this project as a case study.

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Addendum:

This report was amended on 13th February 2012 to update the correct copyright statement and/or correct the publication date. The content of the report has not been changed.