

SAMBA18 Report - A National Audit of Acute Medical Care in the UK

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Abstract

SAMBA18 took place on Thursday 28th June 2018 with follow up data at 7 days.

Acute medical teams from 127 Acute Medical Units (AMUs) across the UK collected data relating to operational performance, clinical quality indicators and standards from NHS Improvement.

Data was collected from 6114 patients.

Key Findings

Structure and staffing of AMUs

- AMUs had a median of 39 beds, with 8.9% of AMUs having level 2 HDU beds
- 24.2% of hospitals have a separate admission process for older patients with frailty and complexity
- 60% of AMUs do not have social workers and 45% do not have advanced nurse practitioners
- 21.8% of AMUs have physician associates.

Patients

- 6% of patients were living in care homes
- 28.5% of patients were aged 80 years or older
- 20.4% of patients were in hospital within the previous 30 days

Flow of patients through Acute Medicine

- 60.3% of patients were referred by the Emergency Department (ED) and 31.7% by a General Practitioner
- 20.1% of patients were initially seen in Ambulatory Emergency Care (AEC)
- AEC units sent home 79.5% of the patients they assessed.

Performance against Clinical Quality indicators

- CQI 1: 84.1% of patients had their first NEWS measured within 30 minutes of arrival in hospital
- CQI 2: 91.4 % of patients were seen by a competent clinical decision maker within four hours of arrival in hospital.
- CQ 3: 62.7% of patients were seen by a consultant within 12 hours of arrival in hospital

Outcomes at 7 days

- 2% of patients died
- 23.2% of patients were in hospital
- 72.2% of patients were discharged back to their place of residence.

The future of SAMBA

SAMBA needs to move beyond a 24-hour time period to generate longitudinal data that can deliver a more precise estimate of performance of acute medical teams. These teams are increasingly multidisciplinary and work across acute care environments such as ED, AMU and AEC.

In addition, SAMBA needs to provide data from acute care delivery at times of intense and sustained pressure during winter months. This will require a change in the data collection mechanism and increasing use of electronic health records. This will provide accurate time data and minimise the impact on teams on the ground during periods of very high activity.

SAMBA

The Society for Acute Medicine Benchmarking Audit (SAMBA) provides a comprehensive snapshot of the delivery of care in Acute Medicine. The audit is conducted over a 24- hour period in June each year. SAMBA

is recognised within the UK as providing a global assessment of the care provided for adult patients who present to hospital

Founding Aims and Objectives

To provide a national audit of care delivered on AMUs against standards set out by the Society for Acute Medicine in 2011, known as Clinical Quality Indicators for AMUs (CQIs) (Figure 2.1).¹

To enable individual AMUs to benchmark their performance against other contributors, identify areas of good practice, which might be shared, or where improvement is required.

Progress in the First Six years

This year was the largest SAMBA ever (Figure 2.2). The depth of data collected in the audit affords us insight into other aspects of Acute Medical care to interpret performance on the CQIs, including:

- A detailed understanding of the route into and out of AMU

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- Information to capture the diversity of units
- Staffing levels
- The influence of ambulatory emergency care
- The contribution of consultant Acute Physicians to the medical take.

Disseminating SAMBA Data

Results are used to inform contributors of their individual unit's performance against the CQIs. Unit Reports have evolved to compare outcomes against anonymised results from other participating units, thus providing direct benchmarking. In addition, the national picture is analysed. In previous years there have been several publications in peer reviewed journals,³⁻⁸ presentations at SAM conferences and National SAMBA Reports.^{9,10}

How?

SAMBA18 was promoted via e-mail to all SAM members, the Society newsletter and at our spring conference in Amsterdam (May 2018).

Units were asked to register via an online portal. To assist units in running SAMBA18, there was a dedicated e-mail and supporting documents:

1. Study protocol
2. How to guide
3. Caldicott approval
4. Unit data
5. Patient Masterlist
6. Unified data collection tool
7. Frequently asked questions

Who and When?

Recruitment to SAMBA18 was open to all hospitals in the UK receiving acutely unwell medical patients. Non-acute and community hospitals were excluded from participating. The AMUs in participating hospitals were asked to register with their local audit office and Caldicott Guardian. The audit took place on Thursday June 28th 2018 between 00:00 to 23:59.

Data Collection

Patient data was anonymised on entry to an online portal. Units were advised to:

- Collect raw data on paper for future reference, before uploading to the online portal.
- To securely store anonymised raw data and a Masterlist of study codes, the later stored securely and independently from the raw data.
- There were two questionnaires:
- Data regarding the staffing and structure of participating units
- Patient related data

As well as the CQIs, acuity of illness was assessed using the National Early Warning Score (NEWS)

Table 1 Performance Indicators for Acute Medical Units³

Figure 1 Number of Patients and Participating Units

For SAMBA18 time zero was taken as the time of arrival to hospital (ED, AMU or other ports of entry, Figures 2.3 and 2.4). The original CQIs were created with the expectation that the majority of acute medical referrals would be admitted directly to AMU. However, several years of SAMBA data have shown that the majority of medical admissions start their patient journey in ED. Furthermore, many medical patients will not reach the AMU, they may be discharged from ED or redirected to AEC. SAMBA18 measures performance from the moment a patient arrives at hospital. This is a more robust measurement of the quality of care a hospital provides for its patients. The CQIs measured in SAMBA18 are shown in Table 2. For consultant review, please see sections below describing how this was undertaken.

Table 2 CQIs reported in SAMBA18

Structure & Staffing of Acute Medical Units

In SAMBA18, 127 units submitted data describing their hospitals and acute trusts, structure, staffing and patient level data.

In Chapters 3 & 4 data is quoted for complete data sets and hence denominators may vary.

SAMBA17 results are shown in light grey

AMU Structure

- All hospitals had an AMU
- There was wide variation in AMUs across the UK, both in terms of size and structure
- The median number of total hospital beds was 546, range 94-1700 SAMBA17: 529 beds
- The median number of AMU beds was 39, range 10-93 SAMBA17: 36 beds
- The median number of patients assessed in the 24 hour period per AMU bed was 1.15 (range 0.19 to 4.5)
- 40.3% of hospitals had a separate Short-Stay Ward with median 24 beds, range 6-70 SAMBA17: 45.5% hospitals, median 23 beds
- 48.3% of hospitals had an Acute Frailty Unit SAMBA17: 43.2% hospitals
- 71.7% were separate from AMU SAMBA17: 57.9%

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- 28.3% were co-located within AMU
SAMBA17: 42.1%
- 79.8% of hospitals had a Surgical Assessment Unit SAMBA17: 84.0%
- 85.9% were separate from AMU
SAMBA17: 86.7%
- 14.1% were co-located with AMU
SAMBA17: 13.3%
- 24.2% of hospitals had a separate admission process (take) for older patients (Geriatric Medicine) SAMBA17 25.8%
- 43.3% on age-based criteria
SAMBA17: 44.1%
- 33.3% on needs-based criteria
SAMBA17: 38.2%
- 23.3% used a combined age and needs, including younger patients on a case-by-case basis
SAMBA17: 17.6%
- 8.1% of hospitals units had Level 2 high dependency unit (HDU) beds on AMU
SAMBA17 (8.3%)
- Within these AMUs, median of 7 beds, range 3–14 SAMBA17: 5
- There was a variation in the proportion of total hospital beds that were dedicated to the AMU. A median of 7.1% of total beds were in AMUs (range 2.4%–24.9%) (Figure 3.1) SAMBA17: 7.0%

Figure 2. The Variation in % of Total Hospital Beds Dedicated to the AMU

Ambulatory Emergency Care (AEC)

- 103 hospitals had an AEC service as part of acute medicine (83% of total hospitals, 95.3% of hospitals submitting complete data for this question)
SAMBA17: 119 (90.8%) hospitals
- The majority of AEC units use a combination of trolleys, chairs and separate clinic rooms.
- The median number of trolleys and chairs per unit was 8 (range 1 – 54)
- The median number of clinic rooms per unit was 3 (range 1 – 9)

Table 3. Clinical Areas in AEC units

	% of AEC units
Trolleys/Chairs Only	16% 12.6%
Clinic Rooms Only	1% 4.2%
Both Trolleys/Chairs and Clinic Rooms	81% 81%

Flexible Beds on AMU	6% 8.4%
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- 68% of AEC units SAMBA 17: 62.2% were separate from AMU
- 49.6% (46.8%) of hospitals had access to speciality 'hot' clinics

AMU Staffing

- The median time at which the last consultant left the AMU was 21:00 (earliest 17:00, latest 23:00)
- 45% of AMUs do not have Advanced Nurse Practitioners
- 21.8% of AMUs have Physician Associates
- 40% of AMUs have access to a social worker
SAMBA17: 36.4%

Table 4. Composition of Daytime AMU Medical Team at 11:00

	Median (IQR) SAMBA17
Consultant	3 (2-3) 3
Specialist Trainee	1 (1-2) 1
Core Trainee	2 (1-3) 2
Foundation Year 1	2 (1-3) 2

Table 5. Composition of Acute Take Team. Numbers shown as median (IQR)

Time of day (hrs) Time	11:00	19:00	03:00
Consultant	2 (1-3)	1 (1-2)	0 (0-0)
Specialist trainee	1 (1-2)	1 (1-2)	1 (1-1)
Core Trainee	2 (1-2)	2 (2-3)	2 (1-2)
FY1	1 (1-2)	1 (1-2)	1 (0-1)

Table 6. Composition of AMU Team
Numbers Shown as Median (IQR) SAMBA17

Time of day (hrs) Time	11:00	19:00	03:00
Matron/Ward Manager	1 (1-1) 1	0 (0-1) 0	0 (0-0) 0
ANP	1 (0-2)	0 (0-1)	0 (0-0)
Ward Sister	2 (1-2) 2	2 (1-2) 1.8	1 (0-2) 1
Staff Nurse	7 (5-9) 7	7 (5-9) 7	6 (5-8) 6
Pharmacist	2 (1-2) 2	0 (0-0) 0	0 (0-0) 0

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Physician Associates	0 (0-0)	0 (0-0)	0 (0-0)
Physiotherapist	1 (1-2) 1	0 (0-0) 0	0 (0-0) 0
Occupational Therapist	1 (1-2) 1	0 (0-0) 0	0 (0-0) 0
Social Worker	0 (0-1) 0	0 (0-0) 0	0 (0-0) 0 0

Readmissions

20.4% of patients had been in hospital in the 30 days prior to assessment on SAMBA day SAMBA:17: 12% SAMBA16: 13%

Figure 3 Age Distribution of SAMBA17 and SAMBA18 Patients

Patients and Outcomes

Patient and Admission Data

- Data was collected from 6114 patients
SAMBA17: 4918 patients
- 52.4% patients were female SAMBA17 53%
- 28.5% of patients were aged 80 years and above (Figure 4.1) SAMBA17 30%

Admission to Hospital

- Units registering for SAMBA18 assessed a median of 45 patients (range 4-107)

Where were patients residing prior to hospital?

- Own home 92.5% SAMBA17: 87.6%
- Care home 6% SAMBA17 6.2%
- Another hospital 1.5% SAMBA17: 1.3%

Who referred the patient to Acute Medicine?

- ED 60.3% (unit median 62%, interquartile range 50-74)
SAMBA 17 58.4%
- GP/Primary Care 31.7% (unit median 27.5%, interquartile range 16-42) SAMBA17 30.2%
- Paramedic direct referral 1.4% SAMBA17: 1.9%
- Own Hospital 5.3% (2.6% from out-patients, 2.7% elsewhere) SAMBA17: 2.1%

Where was the first Acute Medicine assessment?

- 60.0% in ED SAMBA17: 33%
- 20.1% in AEC SAMBA17: 16.5%
- 19.5% in AMU SAMBA17: 41%
- 1.4% in other locations
- 19.1% of patients admitted through ED went direct to a medical ward or medical outlying ward, bypassing AMU.
- 51.9% of patients had multiple clerkings

What were the same day discharge rates from the different initial assessment locations?

- 5.6% from ED
- 20.1% from AMU
- 79.5% from AEC
- 9.1% of patients were discharged prior to consultant review 9.9% in SAMBA 17

CQI Outcomes SAMBA18

Table 6 Overall Success in Achieving CQIs

Table 7. Attainment of CQIs by Initial Assessment Location Percentage of Patients (% SAMBA 17)			
	ED	AMU	AEC
CQI 1	84.9% (83%)	85.4% (83%)	82.1% (85%)
CQI 2	91.4% (59%)	88.9% (68%)	94.5% (85%)
Composite CQIs 1,2	77.2%	75.1%	75.7%

Acuity of Illness

- Acuity at presentation was assessed using the National Early Warning Score (NEWS) (Figure 4.2). NEWS was used in 75 of hospitals, MEWS in 11% a Hospital's own scoring system in 8%, NEWS 2 in 2.5%,
- The median NEWS on arrival was 1 [IQR 0-3],
- Patient outcomes are shown by NEWS (Figure 4.3)
- After initial assessment
- 23 patients were transferred to ICU
- 28 to HDU
- 34 to acute stroke unit
- 69 to CCU.

Figure 4 Distribution of NEWS SAMBA18 and SAMBA 17

Time to consultant review

i. When should the clock start?

Acute medicine sees patients across the ED, AMU and AEC and times for review need to take this into account. The current SAM quality indicators are based on time of arrival on AMU but SAMBA data has shown that many patients are initially assessed in ED. Seeing patients in ED rather than waiting until transfer to AMU is the most timely route to assessment and treatment by acute medical teams. However, patients referred by ED may not have had

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a consultant review prior to referral to medicine and so if we start the clock at the time of referral, we will not capture waiting time from arrival. Patients who are directly referred from the community to AMU and ED will have their waiting time to consultant review start from arrival time.

The challenge for SAMBA is to have consistent assessment of waiting times to see a consultant in the acute care pathway so we understand how consultant review is delivered during a critical time for patients. We recognise that for patients referred from ED, the total waiting time from arrival reflects both the function of ED and acute medicine and its interpretation is therefore different to the interpretation of wait times in AMU and AEC. We also need to use data that is reliably collected and arrival time is usually electronically stamped in the ED.

For these reasons, we have included time from arrival at all portals of entry to acute medicine in SAMBA18.

ii. What is the right time interval?

There is variation among national bodies about appropriate times for consultant review for patients treated by acute medicine. There is no evidence base to guide optimal time to review. However, if this time interval is too short then results of critical investigations will not be available which will impede decision making and if it is too long, then patients may have deteriorated without optimal management.

There are different time targets for consultant review set out by various national bodies

SAM:

For patients arriving on AMU between 08.00-18.00, consultant review should usually be undertaken within 8 hours of the patient’s arrival with provision for earlier review according to clinical need. Otherwise, patients should be seen within 14 hours.

NHS Improvement:

All acute admissions: patients should have a consultant approved care plan within 12 hours

All patients with a predicted mortality of 10% should have a consultant review within 1 hour

During daytime hours, review within 3 hours is recommended.

NICE Quality Standards:

All acute medical admissions should have a consultant review within 6 hours of arrival during daytime hours.

As there is no accepted single time interval for review, we took a pragmatic approach of using the NHS Improvement target of 12 hours (by definition, a consultant review will deliver a consultant approved care plan). Previously in SAMBA data collection, the precise times have been difficult to collect and analyse and therefore in SAMBA18 we asked if a 12 hour review time was met or not. We recognize that this also reflects time to referral for patients who are seen in ED.

Overall, 62.8% of patients had a consultant review within 12 hours of arrival in hospital; within AEC this was 73.8%; for patients in AMU this was 65.3%; for patients in ED this was 59%.

Locations of care and transfers after admission

Data on 5167 patients were available (those with outcome data and pathway data who were initially assessed in ED, AMU or AEC). Table 8 shows the total numbers of patients who were assessed and discharged the same day by place of initial assessment, as well as the numbers of patients who had progressively more complex journeys as measured by changes in locations of care for the 7 days after initial assessment. Two or more transfers of care location within the hospital were rare.

Death in the first week

The severity of illness as measured by the National Early Warning Score was higher in patients initially assessed in the ED (Median 2. IQR 0 - 4) than in the

Table 8. Initial discharges and number of changes in locations of care during the in hospital journey, by initial assessment location				
Hospital acute care journey	Total (n=)	Initial assessment location		
		ED	AMU	AEC
Assessment and same day discharge	1676	302	347	1027
Hospital admission, no subsequent ward transfers	1530	1201	159	170
Admission, one transfer	1880	1240	579	61
Admission, two or more transfers	81	50	28	3

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AMU (Median 1, IQR 0 – 3) and AEC (Median 0, IQR 0 – 1). Of the 118 patients who died in the first seven days, 94 were initially assessed in the ED, 17 in the AMU and 3 in AEC. In addition, 4 patients died who were seen by the acute medical team but were already in patients on other wards. 64 patients who died were more than 80 years old. Of patients who died 68 were admitted with a NEWS of 5 or more, 18 with a NEWS of 3-4 and 30 with a NEWS of less than 3. Two patients who died did not have a NEWS recorded in SAMBA18.

Summary & Discussion

What has SAMBA18 shown?

The increase in the number of patients with acute medical needs is accelerating. This year we had 14% more units taking part but 25% more patients in total. In spite of this, the times to EWS and initial competent decision maker were met or improved compared with last year which is impressive. Overall mortality at 7 days is low and three quarters of all patients are discharged by this time point as well.

The patient cohort is becoming more complex. 20% of patients who were seen by teams in SAMBA 18 were in hospital 30 days previously, with large variation between hospitals. Whilst we can speculate about the reasons for this variation, it shows that the work of acute medicine is not carried out in isolation – there is an impact of community medical activity and prior hospital activity on the acute front door.

There has also been an increase in the proportion of the acute take that is assessed through ambulatory care. This cohort is being well selected as evidenced by the low rate of conversion to admission and the very low rates of death or need for in patient care at 7 days.

Our preparations this year for SAMBA demonstrated the difficulties in matching an appropriate consultant review time with the changing constraints in day to day acute medical care (we were also mindful of the data collection burden and difficulty in validating time data). Many patients are seen by medical teams in ED and so a ‘time to review’ that starts on AMU doesn’t capture a critical time in the patient journey. There are also different time standards for consultant review depending on time of day, NEWS and a time standard for a consultant approved care plan – some of these contradict each other and more work is needed to get a set of clear measures that are clinically meaningful and simple to collect, however well they are initially achieved.

Efficiency and the ED Interface

Over half of the patients in this year’s SAMBA had multiple clerkings, reflecting the high proportion of the medical take that is referred from ED. This represents an opportunity for innovation in assessment to streamline the collection and recording of healthcare data, and is already a focus for change in several units.

Table 8. Outcomes at 7 days	
Alive in hospital	23.2%
Died	2.0%
Discharged from hospital	72.2%
Transferred to another Hospital	1.3%
Self-discharged	1.3%

Ambulatory Emergency Care (AEC)

- 23% of units did not see patients in a dedicated AEC for their first assessment.
- 65.3% (SAMBA17 58.6%) of units undertook 10% or more of their total initial assessments on AEC
- 46.5% (SAMBA 17 35.1%) of units undertook 20% or more of their total initial assessments on AEC
- The median percentage of total patients initially assessed on AEC was 18.1 % (SAMBA17 16.5%)

Demographics of patients who came to AEC

- 32.7% of patients were 70 years or older
- 83% (SAMBA17 93.5%) of patients had a NEWS of less than 2
- 1.4% of AEC patients (SAMBA17 3.1%) had a NEWS of 5 or more.

7-day outcomes among AEC patients

- 20.5% of patients were admitted for in patient care.
- 4.7 % of patients initially seen in AEC were in hospital at 7 days after initial assessment (91.6% were at home)
- 0.2% of patients died in hospital.

Table 9. Patient Outcomes at 7 days by NEWS (Percentage of Patients)					
NEWS	Died in hospital	Alive in hospital	Medically discharged	Self-discharged	Transferred
0 to 4	0.99	21.68	74.73	1.32	1.28
5 to 6	4.14	33.12	61.44	0.44	0.87
7 +	12.89	36.84	46.05	2.11	2.11

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The future for SAMBA

One of the major limitations of SAMBA is that it is a single day of care survey, and performance can be influenced by many factors that are outside the control of the acute medical team on that day. A stable assessment of performance over time is a fairer reflection of the impact of local structures and processes on performance measures, but this is hard to collect given the human resource implications of the current SAMBA data collection platform. Furthermore, learning about the performance of the acute care 'system' during periods of relentless and intense pressure, and how to improve it, is an extremely high priority in healthcare policy and practice. SAMBA should deliver answers in winter as well as summer and for longer periods of time to estimate 'true' performance.

We have been exploring different methods to take this forward through SAM Council and through national audit bodies (RCP and HQIP) so that SAMBA can help acute hospital trusts as well as their clinicians and patients. Acute Medicine remains a specialty in its infancy and, as such, faces many challenges associated with developing new ways of working. A reasoned and cogent reflection of the impact of Acute Medicine over the last decade necessitates a conclusion that much has been achieved and the infrastructure is in place to ensure future innovative, high quality and adaptive acute medical care. Early international adopters of the specialty demonstrate its increasing traction.

The evidence for Acute Medicine is growing. However, even its most ardent supporter would struggle to argue that sufficient progress has been made in the research aspect of the specialty but undoubtedly the foundations are being established.

SAMBA, initially focused on the Society for Acute Medicine's key quality indicators, has flourished and evolved to analyse other fundamental aspects of acute medical care. There has been rapid expansion both in terms of participating AMUs and patient numbers and this continues reflecting that SAMBA's reputation as the primary national Acute Medicine audit. SAMBA has established a significant dataset. This leaves SAMBA perfectly positioned to help guide research priorities, drive understanding of the practice of Acute Medicine and underpin practice changing studies that are needed to further embed the specialty. SAMBA has the opportunity to set international standards of acute medical care, an iterative process which benefits patient care. The ability to do this is reliant on the continued hard work and support of dedicated Acute Medicine practitioners both in terms of data collection and implementation of the changes SAMBA highlights to achieve this goal.

There is an expectation and desire that SAMBA will continue to grow incorporating international involvement as countries adopt the model of Acute Medicine. SAMBA not only benchmarks performance but can guide the development of future clinical quality measures in the UK and set international standards of acute medical care, an iterative process which benefits patients care.

As we consider SAMBA18 we, as Acute Medicine practitioners, need to reflect on what we are achieving and what there is to accomplish. We need to be excited both about the increasing national and international footprint of Acute Medicine as a specialty and the opportunity this offers to improve acute care of medical patients. SAMBA, owned by Acute Medicine clinicians, is primed to help achieve this.

Acknowledgments

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Appendix: Units & Participants

The list below shows the 127 units that submitted data. Named participants are those people who registered to enter data or who have contacted us this year. The SAMBA team apologise if we have omitted any names or made any errors. We would be happy to amend the on-line version of the SAMBA18 report. If we can help, please contact us at www.acutemedicine.org.uk

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Thorpe, Grainne Buggy

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Alison Dawson

Bristol Royal Infirmary

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Glasgow Royal Infirmary

Colin Muir, Zoe Harzeli, Allan Cameron

Gloucester Royal Hospital

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Good Hope Hospital

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Great Western Hospital, Swindon

Siyum Catherine Strait, Rachel Anjali Rajadurai, Renata Bartucz, Timea Novak

Hairmyres Hospital

Gillian Evans, Karen Morrow, Lise Axford, Claire McDougall

Hereford County Hospital

Sarah Weale, Faye Davies, Jayne Davies-Morris, Helen Maylor

Hinchingbrooke Hospital

Chris Tuplin, Waseem Abdullah, Kirsty Harvey

Homerton University Hospital

Mohamed Soliman

Horton General Hospital

Nicola de Savary

Huddersfield Royal Infirmary

Suneeta Teckchandani, Katie Broadbent

Ipswich Hospital

Mohandas Dasan, Shahid Main, Steve Hirwa

James Cook University Hospital

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John Radcliffe Hospital, Oxford University Hospitals

Anuja Bambaravanage, Mirdula Rajwani, Lucy Dunn, Ajay Gupta, Sumeer Mittal, Sabahat Ahmad

Kings Mill Hospital

Mohamed Kamal Naser, Habib Ahmad, Mohammed Ashfaul Ghani, Dina Idris

Kingston Hospital

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Leicester Royal Infirmary

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Nottingham University Hospital

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Pilgrim Hospital

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