Society for Acute Medicine Benchmarking Audit

SAMBA19 Report

A National Audit of Acute Medical Care in the UK



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Welcome to SAMBA19

The 8th Society for Acute Medicine Benchmarking Audit (SAMBA19) provides a snapshot of the care provided for acutely unwell medical patients over a 24-hour period on Thursday 27th June 2019. This was the biggest SAMBA to date, with two international units participating for the first time.

This report is written for the benefit of everyone involved in acute medical care, including healthcare professionals, commissioners of healthcare, governments and, most importantly, patients and the public.

The report has been sponsored by the Society for Acute Medicine. Everyone involved in conducting the audit and writing the report have provided their time voluntarily. Collecting data and running SAMBA in participating hospitals is a massive undertaking and therefore both the Society and the SAMBA team extend a huge thank you to all those who made a contribution.

The aim of SAMBA is to improve the care we provide for acute medical patients and we hope this report will help to achieve this goal.

Abbreviations

ACP	Advanced Care Practitioner
AEC	Ambulatory Emergency Care
AFU	Acute Frailty Unit
AIM	Acute Internal Medicine
AMU	Acute Medical Unit
CPD	Continuing Professional Development
CQI	Clinical Quality Indicator
ED	Emergency Department
ICU	Intensive Care Unit
MDT	Multi-Disciplinary Team
NEWS	National Early Warning Score
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
PA	Physician Associate
RCP	Royal College of Physicians of London
RCPE	Royal College of Physicians of Edinburgh
SAM	Society for Acute Medicine
SAMBA	Society for Acute Medicine Benchmarking Audit

Executive Summary

SAMBA19 took place on Thursday 27th June 2019, with follow up data collected at 7 days. Acute medical teams from 142 AMUs and frailty units across the UK collected data relating to operational performance, clinical quality indicators and standards set by SAM, NICE, NHS Improvement and RCPE. For the first time, two international units participated.

This was the biggest SAMBA so far with data from 7170 patients.

Key Findings

Structure of Acute Medicine Services

The provision for AEC continued to increase, 99.3% of hospitals now provide AEC with 7.5% of units open for 24 hours. However, only 29.6% of units manage to see the recommended one third of acute medicine patients in AEC for their first clinical assessment.

Staffing of AMUs

Work traditionally undertaken by doctors is increasingly undertaken by ACPs and PAs, now present in 72.8% and 32.0% of units respectively.

The Acute Medical Pathway

The majority of patients, 61.8%, are initially seen in ED and the majority of referrals to Acute Medicine, 60.1%, are from ED. The 6% of patients from care homes, who we know to be older and frailer, typically self-present to ED.

Performance against Clinical Quality indicators

Year on year comparison of performance against CQIs is becoming increasingly difficult, with changing standards and variation in the acute medical pathway. Based on the analysis of complete data sets, it appears that overall performance is maintained in the face of an increasing number of patients seeking acute medical services.

- CQI 1: 84.5% of patients had their first NEWS measured within 30 minutes of arrival in hospital
  - 84.1% in SAMBA18
- CQI 2: 90.4% of patients were seen by a competent clinical decision maker within four hours of arrival in hospital.
  - 91.4 % in SAMBA18
- CQ 3: 68.6% of patients were seen by a consultant within the timeframe standard (see text)
  - 62.7% in SAMBA18.

Outcomes at seven days

Overall outcomes for death rates and planned discharge rates were unchanged.

Overall Message

SAMBA continues to provide a valuable snapshot of acute medical care in the UK. At the time of writing this report, the first winter SAMBA has just taken place. SAMBA identifies changing patterns in care, for example the increasing use of NEWS2 in the UK, from 2.5% to 59.2% of hospitals in a single year. SAMBA19 afforded an early audit of the joint SAM/RCPE AEC standards. The challenge for SAMBA now is to expand from being a single, annual snapshot of acute medical care. SAMBA can start to inform clinical practice and shape the research agenda for Acute Medicine.

1 Setting the Scene

Acute Medicine

Acute Medicine is defined as:

> '*that part of general internal medicine (GIM) concerned with the immediate and early specialist management of adult patients suffering from a wide range of medical conditions who present to, or from within, hospitals, requiring urgent or emergency care*'.[1]

Acute Medicine differs from other medical specialties as it is not based on a body system, disease or patient characteristic, such as age. A rich description of the specialty can be found in the RCP web resource Medical Care.[2]

In very simple terms, Acute Medicine is the care process for unwell adults (usually age 16 years and above) who attend hospital with a medical (non-surgical) condition. The term Acute Internal Medicine (AIM) was first used in 2009 to describe the specialist training programme for Acute Physicians.[3] Colloquially, AIM and Acute Medicine are used interchangeably.

Patients presenting to Acute Medicine show a wide variation in age and social background, as well as in the type and severity of their illness; the challenge for Acute Medicine is to provide a range of high-quality services for all these patients. Acute medical care must be timely, organised, well-led and delivered by the right staff. The core processes of acute medical care are:

- Initial assessment by a competent clinician
- Early review by a senior clinician (consultant)
- Diagnosis, with early access to diagnostic tests
- Assessment of illness severity and physiological instability
- Stabilising unwell patients or undertaking resuscitation
- Care delivered by the MDT in a dedicated AMU.

Since the first units were created in the 1990s the specialty has expanded significantly, with around 225 AMUs across the UK. Acute Medicine has now spread outside the UK, including the Republic of Ireland, the Netherlands, Denmark, Australia, Singapore and Malaysia.

The Society for Acute Medicine

The Society was founded in 2000. As of September 2019, there were 1281 members, including 557 consultants, 514 trainees and 210 non-trainee doctor or MDT members. SAM's roles include:

- Promoting and supporting education
- Encouraging and supporting the development of the MDT
- Conducting SAMBA
- Facilitating collaborative research
- Promoting models of acute care that provide the best care for patients
- Sharing good practice
- Working collaboratively with other organisations
- Organising twice yearly fully accredited CPD conferences.

2 SAMBA

The Society for Acute Medicine Benchmarking Audit (SAMBA) provides a comprehensive snapshot of acute medical care. The audit has been conducted over a 24-hour period in June each year since 2012. In the UK, SAMBA is recognised by the Healthcare Quality Improvement Partnership (HQIP).[4] SAMBA18 data pertaining to AEC is included in The NHS Long Term Plan.[5]

Aims and Objectives

The original aims and objectives of SAMBA were:

1. To provide a national audit of the care delivered on AMUs against the Clinical Quality Indicators (CQIs) for AMUs set by the Society for Acute Medicine in 2011 (Figure 1).[6]
2. To enable individual AMUs to benchmark their performance against their peers, identify areas of good practice, which might be shared, or identify areas where improvement is required.

Figure 1 Clinical Quality for Acute Medical Units

1. All patients admitted to AMU should have an early warning score measured upon arrival
2. All patients should be seen by a competent clinical decision maker within 4 hours* of arrival on AMU who will perform a full assessment and instigate an appropriate management plan
3. All patients should be reviewed by the admitting consultant physician or an appropriate specialty consultant physician within 14 hours of arrival on AMU.
4. All AMUs should collect the following data:
   - Hospital mortality rates for all patients admitted via AMU
   - Proportion of admitted patients who are discharged directly from AMU
   - Proportion of patients discharged from AMU and readmitted within 7 days of discharge

**In most cases, clinical assessment and initiation of a management plan should be undertaken in much less time, and prioritised in accordance with clinical need.*

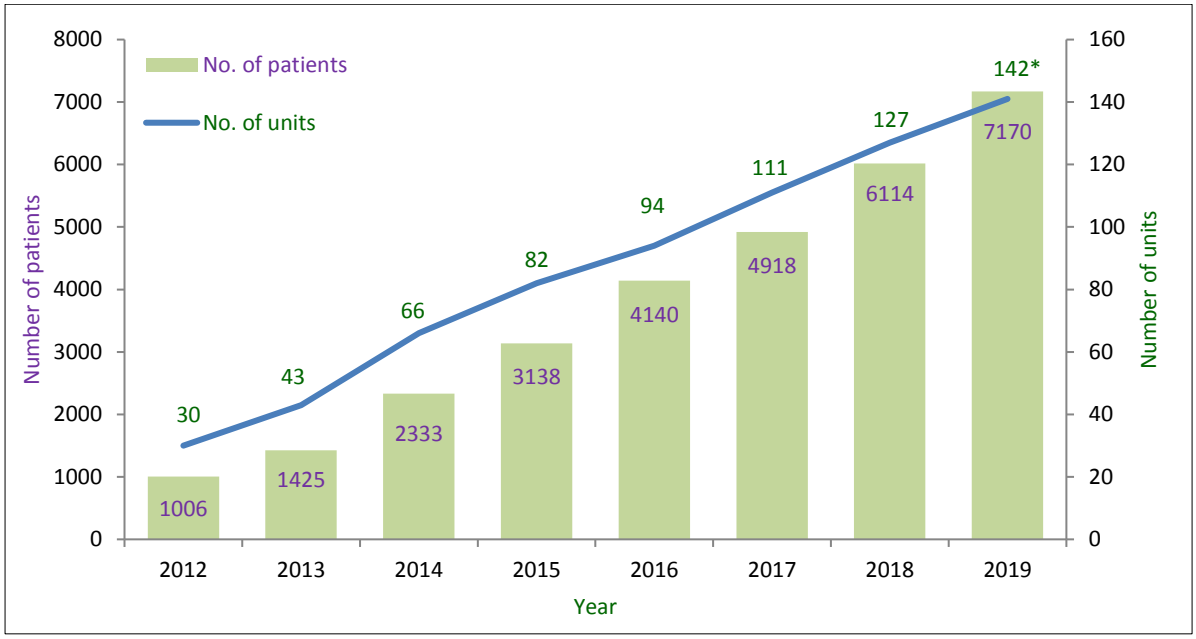
Over time the CQIs have been adapted to reflect the experience of previous SAMBAs, changes in the acute medical workforce and new national guidelines (see below).

Progress in the First 7 Years

SAMBA19 was the largest SAMBA to date (Figure 2). The depth of data collected in the audit affords an insight into some of the components of acute medical care that might help explain the performance of individual units against the CQIs, including:

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

Figure 2 Number of Patients and Participating Units



* 142 units, including two AFUs, in 140 hospitals.

Disseminating SAMBA Data

Results are used to inform units of their performance against the CQIs. Unit Reports have evolved to compare individual unit 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, presentations at SAM conferences and National SAMBA Reports (see Bibliography).[a-l]

Your Hospital

Joining SAMBA is voluntary for Acute Medical Units (AMUs), although it is now recognised by HQIP. You can see if your hospital took part from the list of participants in the Appendices. Participating units will have received a bespoke report.

Organisation & Methods

SAMBA is planned and run by the SAMBA Academy. Membership of the Academy is open to all SAM members. For SAMBA19, the Academy met in Birmingham on Saturday 8th December 2018 (Appendix 3). SAMBA19 was promoted to all SAM members via email and the Society's e-newsletter. Units were asked to register via an online portal. To assist units in running SAMBA19, there was a dedicated email and supporting documents for:

- Study protocol
- 'How To' guide
- Caldicott approval
- Unit data
- Patient Masterlist
- Unified data collection tool
- Frequently asked questions.

Who and When?

Recruitment to SAMBA19 was open to all hospitals in the UK receiving acutely unwell medical patients. Non-acute and community hospitals were excluded. AMUs in participating hospitals were asked to register with their local audit office and Caldicott Guardian. The audit included all new patient referrals to acute medicine on Thursday June 27th 2019 between 00:00 to 23:59 hours and all patients seen in AEC, including returning patients. The data for patients returning to AEC is not used in all the analyses below and the reader is guided through the data included in each section.

Data Collection

For SAMBA19, SAM commissioned a new suite of online software for data entry, generating reports and data analysis. Patient data were anonymised when entered into the online portal. Units were advised to:

- Collect raw data on paper for future reference, before uploading to the online portal
- Securely store anonymised raw data and a Masterlist of study codes, with the later stored securely and independently from the raw data.

There were two questionnaires to complete:

1. Data pertaining to the staffing and structure of participating units
2. Patient level data.

Acuity of illness was assessed using the National Early Warning Score 2 (NEWS2).[7]

Clinical Quality Indicators for SAMBA19

Figure 3 Definitions of compliance with Clinical Quality Indicators for SAMBA19

Clinical Quality Indicator 1
Compliance defined as a full set of physiological observations within 30 minutes of arrival at hospital.

Clinical Quality Indicator 2
Compliance defined as time of less than 4 hours to see a competent clinical decision maker measured from the time of arrival at hospital to the time of first contact (in ED, AEC or AMU).

- The competent clinical decision maker is synonymous with the person performing the first medical assessment (clerking). For SAMBA19 we took this to be either an ACP (Advanced Care Practitioner), PA (Physician Associate) or any grade of doctor.

Clinical Quality Indicator 3
Compliance defined as a time of less than 6 (daytime admissions) or 14 hours (outside working hours) to see a consultant physician measured from the time of arrival at hospital to the time of the first consultant physician contact (in ED, AEC or AMU).

- This indicator is different from the definition used for SAMBA18 (12 hours to see a consultant physician measured from the time of arrival at hospital to the time of the first contact, see *What is the right time interval to wait to see a consultant?*).

What is the right time interval to wait to see a consultant?

There is no clear empirical evidence base to guide the optimal time for a consultant to review an acute medical patient. If the time interval is too short, results and critical investigations may not be available, which will impede decision making; if too long, patients may deteriorate or time critical decisions might be delayed. In addition to SAM, other bodies have published their opinions on the maximum time patients should wait to see a consultant (Figure 4).[8-10]

For SAMBA19, the audit standards were expanded to include quality standards included in the NICE guideline, Emergency and Acute Medical Care in Over 16s: Service Delivery and Organisation (NG94), and the accompanying quality standards, Emergency and Acute Medical Care in Over 16s [QS174].[8,9] The standard adopted from NICE was the time to wait to see a consultant. NICE define this standard as:

- *'Evidence of consultant availability during daytime working hours to assess adults who have a medical emergency within 6 hours of the time of admission to hospital.'*
  - The measurement standard is that the first consultant review is within a maximum of 6 hours from the time a patient is admitted to hospital. Daytime working hours are 08.00 to 20.00.
- *'Evidence of consultant availability to assess adults who have a medical emergency within 14 hours of the time of admission to hospital.'*
  - The measurement standard is that the first consultant review is within a maximum of 14 hours from the time a patient is admitted to hospital outside working hours.

Figure 4 Standards for Time to Wait to See a Consultant

SAM[6]

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.

NICE Quality Standards[8,9]

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

NHS Improvement[10]

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.

When should the clock start?

For SAMBA19 time zero was taken as the time of arrival to hospital (ED, AMU, AEC or other ports of entry). SAM's original CQIs were created with the expectation that the majority of acute medical patients 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. SAMBA19 measures performance from the moment a patient arrives at hospital. Whilst this is a contentious issue,[11] measuring time zero at the point a patient arrives at hospital provides a true reflection of their

hospital experience. That said, taking time zero as the time when a patient arrives at hospital poses further challenges to the validity of SAMBA. We recognise that for patients referred from the ED, the total waiting time from arrival at hospital reflects the function of both the ED and Acute Medicine, and its interpretation is therefore different to the interpretation of waiting times for patients who are admitted directly to AMU or AEC. A consistent and reliable measurement of the waiting time to see a consultant in the acute care pathway is also necessary to understand how the consultant review is delivered.

AEC Standards

SAMBA19 asked units to benchmark their AEC against some of the AEC standards taken from the RCPE/SAM publication 'Standards for Ambulatory Emergency Care'.[12]

How the Data is Presented

Results are only based on full data sets, unless otherwise stated. Units with missing data on a related item are excluded; therefore, for each item the denominator may vary.

Results are expressed as percentages or medians with interquartile ranges, unless otherwise indicated. For the CQIs and the SAM/RCPE ambulatory standards, results are quoted for incomplete and full data sets. We took the view that by interpreting missing data as 'no', we can provide a worst-case scenario result, akin to presenting results on an intention to treat basis.

Only UK hospitals, including the Isle of Man, are included. The two international units that participated, in Singapore and Australia, are excluded to allow year on year comparison between UK hospitals.

3 Structure & Staffing of Acute Medical Units

In the UK, 134 units registered to provide hospital level data, including two frailty units and one unit which ultimately did not submit hospital level data. Nine hospitals provided only patient level data. Therefore, 142 units from 140 hospitals ultimately participated by submitting data.

AMU Size

All hospitals had an AMU. There was variation in the size of AMUs (Tables 1 to 2, Figure 5).

Table 1 Number of Beds by Hospital and AMU

		Number of Beds		
		Median	Minimum	Maximum
Hospital	SAMBA19	567	76	1500
	SAMBA18	546	94	1700
	SAMBA17	529	-	-
AMU	SAMBA19	39	13	93
	SAMBA18	39	10	93
	SAMBA17	36	-	-

Figure 5 Variation in Percentage of Total Hospital Beds Dedicated to the AMU

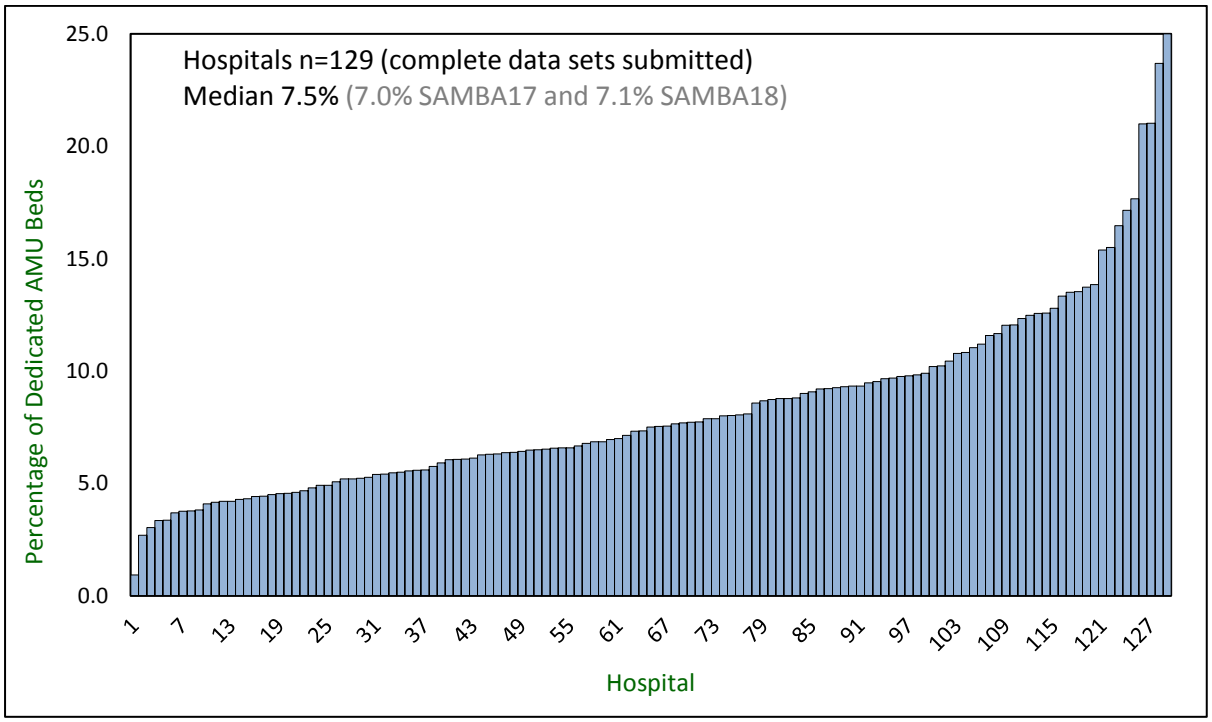


Table 2 Number of Admissions per AMU Bed per 24-hours

	Admissions per AMU Bed per 24-Hours		
	Median	Minimum	Maximum
SAMBA19	1.2 (IQ Range 0.9 to 1.6)	0.5	7.0
SAMBA18	1.2	0.2	4.5

Care for Older People

The UK has an increasingly ageing population,[13] with an increasing number of older patients requiring acute NHS services.[14] SAMBA data consistently shows that older people are the main users of acute medical care (Figure 8). In 2019 there was an increase in the percentage of hospitals having frailty beds (Table 3). 71.8% of hospitals have a frailty in-reach service to the Emergency Department.

Table 3 Distribution of Acute Frailty Unit Beds per Hospital

	Overall Percentage		
	Hospitals with an AFU	Location of AFU (where AFU present)	
		Separate from AMU	*Located in AMU*
SAMBA19	70.1	53.4*	21.6
SAMBA18	48.3	71.7	28.3
SAMBA17	43.2	57.9	42.1

* In 2019 the questions of whether AFU was separate from AMU or located in AMU were answered independently, whereas in previous years the single question was whether AFU was located in AMU, with the assumption being that AFU was separate from AMU if it was not stated as being in AMU. The apparent ambiguity, of AFU being separate from AMU or in AMU and not adding up to 100%, can be explained as some hospitals with AFU in AMU also have a separate AFU, whilst other hospitals with AFU that is neither separate from AMU or in AMU were actually referring to their frailty service in ED. This highlights the heterogeneity of the acute medical care pathway.

There was variation in the mode of delivery of care for older people (Table 4). In 11 hospitals with an age-based take (complete data sets), the median cut-off was 80 years (absolute range of 74 to 82 years).

Table 4 Admission Processes for Older People When Separate from Acute Medicine

	Percentage			
	Separate Process	Structure of Admission Process if Separate		
		Age Based	*Needs Based*	*Combined Criteria Including Young*
SAMBA19	18.1	45.8	41.7	12.5
SAMBA18	24.2	43.3	33.3	23.3
SAMBA17	25.8	44.1	38.2	17.6

Level 2 Beds

There was a small increase in the number of units with Level 2 beds on the AMU (Table 5).

Table 5 Level 2 High Dependency Beds on AMU

	Percentage of Hospitals with Level 2 Beds	Structure if Level 2 Beds Present	
		Median	Total Range
SAMBA19	10.2	8	4-20
SAMBA18	8.1	7	3-14
SAMBA17	8.0	5	-

Ambulatory Emergency Care (AEC)

The provision of AEC increased. In units reporting complete data, AEC is now almost universal. However, there is scope to increase and improve the service:

- 99.3% of hospitals submitting complete data provide AEC
  - SAMBA18 95.3%
  - SAMBA17 90.8%

There is variation in the location of AECs:

- 75.9% of AECs are located separately from AMU
  - SAMBA18 68.0%
  - SAMBA17 62.2%
- 38.3% of hospitals said there was an AEC within AMU

There is variation in the coding of activity in AEC units:

- 54.6% of AECs code as an inpatient
- 23.8% of AECs code as an outpatient
- 46.2% have a separate AEC code
- 67.4% of units code patients returning to AEC as outpatients.

Of the units that close, there is variation in opening and closing times and the length of time the unit remains open (Figure 6 to 7):

- 7.5% of AECs are open for 24 hours
- 24.3% of AECs are open for at least 12 hours[5]
- The median opening time is 08:00 (absolute range 07:00 to 12:30, IQ range 08:00 to 09:00)
- The median closing time is 18:00 (absolute range 14:30 to 23:59, IQ range 18:00 to 20:00)
- The median time open is 10 hours (absolute range 4.5 to 16 hours, IQ range 9 to 12 hours).

Figure 6 Opening and Closing Times of Ambulatory Care Units

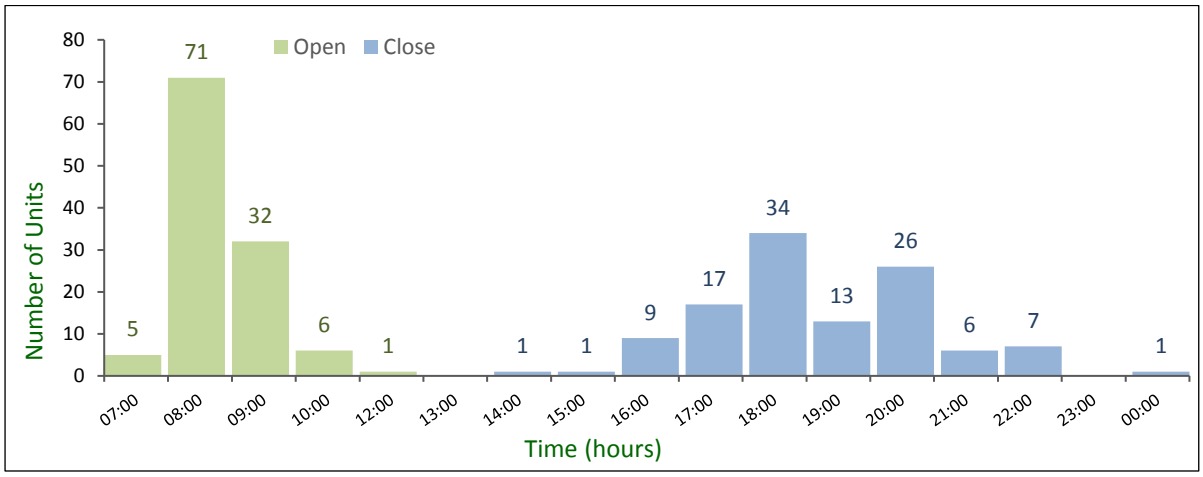
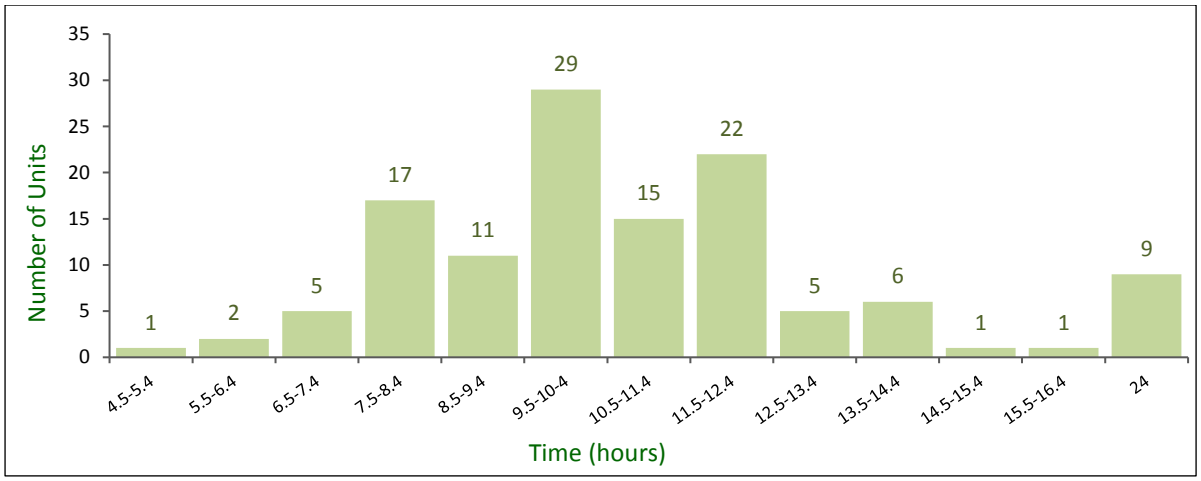


Figure 7 Length of Time Ambulatory Care Units Are Open



Against the Royal College of Physicians of Edinburgh and Society for Acute Medicine AEC standards[12], the following questions were asked (figures in brackets are whole population including missing data):

1. If patients do not attend appointments at AEC, do you have an agreed standard procedure to follow?
   a. No action taken 10.4% (10.4%)
   b. Call the patient 75.4% (72.1%)
   c. Inform the GP 62.7% (60.0%)
2. Do you give AEC patients an information sheet telling them how to seek care if they become unwell at home?
   Yes 38.6% (36.4%)
3. During periods of high demand, is your AEC unit used to provide inpatient care?
   Yes 47.4% (45.0%)
4. Do you have a private area in your AEC unit where confidential discussions are not overheard?
   Yes 85.0% (80.7%)
5. Do you undertake surveys of patients in AEC to ask about their experience of the care they receive?
   Yes 85.0% (80.7%)

Staffing

Data for staffing levels was collected differently compared to previous SAMBAs,[j,k] and so a year on year comparison is not possible.

Medical Staffing

Usual weekday daytime staffing by doctors was measured between 08:00 – 20:00 (Table 6). Each four hours of consultant time is measured as a programmed activity (PA). During working hours (07:00 – 19:00) a PA is four hours and out-of-hours a PA is three hours.

Table 6 Total Time Allocated to Usual Weekday Working for Doctors

		AMU	AEC
Consultants (PAs)	mean	5.8	3.0
	median	4.0	2.0
	lower quartile	3.0	2.0
	upper quartile	6.0	3.0
Middle grade doctors - including specialty doctors/specialty trainees (hours)	mean	15.0	8.4
	median	10.0	8.0
	lower quartile	8.0	0.0
	upper quartile	19.5	10.0
Core Trainees - including trust grade (hours)	mean	25.2	10.7
	median	16.0	8.0
	lower quartile	8.0	0.0
	upper quartile	40.0	12.0
Foundation doctors (FY1 and FY2) (hours)	mean	16.9	4.4
	median	12.0	0.0
	lower quartile	8.0	0.0
	upper quartile	20.0	0.0

The on-call medical team was measured separately from the AMU team (Table 7), representing usual shift patterns.

Table 7 Number of Personnel in the On-Call Medical Team

		Number		
		08:00 – 20:00	20:00 – 00:00	00:00 – 08:00
Consultants	mean	1.7	0.6	0.2
	median	1.0	0.0	0.0
	lower quartile	1.0	0.0	0.0
	upper quartile	2.0	1.0	0.0
Registrars	mean	1.4	1.4	2.0
	median	1.0	1.0	1.0
	lower quartile	1.0	1.0	1.0
	upper quartile	2.0	2.0	1.0
CT/FY2 or similar	mean	2.7	2.4	1.8
	median	2.0	2.0	2.0
	lower quartile	2.0	1.0	1.0
	upper quartile	3.5	3.0	2.0
FY1	mean	1.4	1.0	0.6
	median	1.0	1.0	1.0
	lower quartile	1.0	1.0	0.0
	upper quartile	2.0	1.0	1.0
Advanced Clinical Practitioner	mean	0.5	0.1	0.1
	median	0.0	0.0	0.0
	lower quartile	0.0	0.0	0.0
	upper quartile	1.0	0.0	0.0

Nurses and the Multidisciplinary Team

The structure of the nursing team and MDT by time of day and for AEC is shown in Table 8. Across Acute Medicine, there has been a rise in the number of ACPs and PAs, although their contribution is mainly during the daytime.

- 72.8% of units now have ACPs
  - SAMBA18 – 55% of units had ACPs.
- 32.0% of units now have PAs
  - SAMBA18 – 21.0% of units had PAs.

Overall, there was a small reduction in the number of units with access to a social worker:

- 32.3% of units now have access to a social worker
  - SAMBA17 36% and SAMBA18 40%.

Nurses' Work Patterns

- 57.6% of units have 12-hour shifts for nurses
- 41.6% of units have a mixture of 12-hours and shorter days
- One unit (0.8%) only had short days.

Access to Specialty Services

- 109 (85.6%) of hospitals have on on-site maternity services.
- 102 (80.3%) of hospitals have 24-hour access to liaison psychiatry.

Table 8 Structure of MDT

		Number (unless otherwise stated)		
		AMU		AEC
		08.00-20-00	20.00-08.00	
Ward Managers / Matrons	percentage of units where present	96.8	7.9	49.2
	mean	1.3	0.1	0.6
	median	1.0	0.0	1.0
	lower quartile	1.0	0.0	0.0
	upper quartile	2.0	0.0	1.0
Ward Sisters	percentage of units where present	98.4	79.4	61.1
	mean	2.0	1.4	0.8
	median	2.0	1.0	1.0
	lower quartile	1.0	1.0	0.0
	upper quartile	2.0	2.0	1.0
Staff Nurses	percentage of units where present	100.0	100.0	81.1
	mean	7.4	6.5	2.0
	median	6.0	6.0	2.0
	lower quartile	5.0	4.0	1.0
	upper quartile	9.0	8.0	2.0
Non-Registered Nurses	percentage of units where present	88.0	84.1	71.4
	mean	4.6	3.8	2.0
	median	4.0	4.0	2.0
	lower quartile	2.0	2.0	1.0
	upper quartile	6.0	5.0	2.0
Advanced Clinical Practitioners	percentage of units where present	38.1	7.1	63.0
	mean	0.6	0.1	1.2
	median	0.0	0.0	1.0
	lower quartile	0.0	0.0	0.0
	upper quartile	1.0	0.0	2.0
Physician Associates	percentage of units where present	27.0	2.4	13.3
	mean	0.5	0.0	0.2
	median	0.0	0.0	0.0
	lower quartile	0.0	0.0	0.0
	upper quartile	1.0	0.0	0.0
Pharmacist	percentage of units where present	97.6	7.9	23.8
	mean	1.9	0.1	0.3
	median	2	0.0	0.0
	lower quartile	1	0.0	0.0
	upper quartile	2	0.0	0.0
Physiotherapist	percentage of units where present	81.1	2.4	14.4
	mean	1.4	0.0	0.1
	median	1	0.0	0.0
	lower quartile	1	0.0	0.0
	upper quartile	2	0.0	0.0
Occupational Therapist	percentage of units where present	78.0	0.0	8.7
	mean	1.2	0.0	0.1
	median	1	0.0	0.0
	lower quartile	1	0.0	0.0
	upper quartile	2	0.0	0.0
Social Worker	percentage of units where present	32.3	0.0	3.1
	mean	0.3	0.0	0.0
	median	0	0.0	0.0
	lower quartile	0	0.0	0.0
	upper quartile	1	0.0	0.0

4 Patients and Outcomes

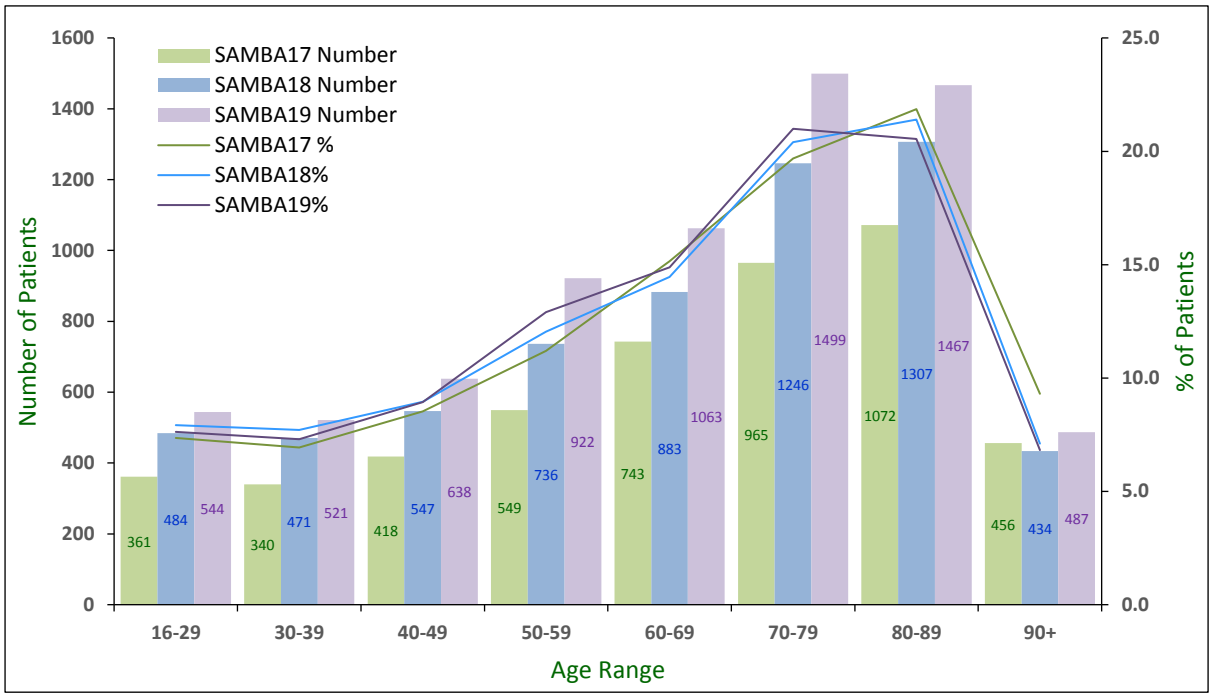
For outcome data, figures with and without patients who were scheduled to return on Thursday 27th June 2019 are included. Patients who were scheduled to return represent a slightly different population who are less unwell than patients presenting for the first time.

Patient and Admission Data

Patient level data was collected for 7170 patients.

- 53.3% of patients were female (SAMBA18 52.4%, SAMBA17 53%)
- 27.4% were aged 80 years and above (SAMBA18 28.5% of patients, SAMBA17 31.2%, Figure 8)
- 9% (644 patients) of patients were scheduled returns
  - 78.9% (508 patients) to AEC
  - 14.4% (93 patients) to ED
  - 5.4% (35 patients) to AMU.

Figure 8 Age distribution of SAMBA17, SAMBA18 and SAMBA19 patients*



* The denominator populations are SAMBA17 4904 patients, SAMBA18 6108 patients and SAMBA19 7141 patients.

Admission to Hospital: The Acute Medicine Patient Journey

Units registering for SAMBA19 assessed a median of 49 patients (IQ range 34-67)

- Units registering for SAMBA18 assessed a median of 45 patients

The majority of patients were living at home prior to an acute medical admission, a stable trend over the three years (Table 9).

Table 9 Where Were Patients Residing Prior to Coming to Hospital?

	Overall Percentage		
	Own Home	Care Home	Another Hospital
SAMBA19	92.7	6.0	1.4
SAMBA18	92.5	6.0	1.5
SAMBA17	87.6	6.2	1.3

The majority of referral to Acute Medicine are from ED (Table 10).

Table 10 Who Referred Patients to Acute Medicine?

	Overall Percentage (Unit Median Percentage, IQ Range)			
	ED	GP / Primary Care	Paramedic Direct	Own Hospital*
SAMBA19	60.1 (63.0, 51.0-74.1)	28.1 (25.6, 16.1-36.5)	1.8 (3.0, 1.7-8.7)	8.8 (4.5, 2.6-82.2)
SAMBA18	60.3 (62, 50-74)	31.7 (27.5, 16-42)	1.4	5.3
SAMBA17	87.6	30.2	1.9	2.1

* Own hospital includes outpatient clinics.
1.1% of patients came from another hospital.

SAM's CQIs were written to audit the performance of AMU. However, it is now clear that Acute Medicine is undertaken in ED and AEC, as well as AMU. From a patient's perspective, the time of their first assessment is what matters to them, not necessarily who performs the assessment. Successive SAMBAs have shown that many first clinical assessments for Acute Medicine patients are undertaken by ED clinicians, for example those patients referred to Acute Medicine by ED. Hence, data is presented to show where the first clinical assessment is performed (by either ED or Acute Medicine clinician) and where the first assessment by an Acute Medicine clinician is performed.

The first clinical assessment can be by any specialty or competent clinician, e.g. doctor, ACP, PA. The first clinical assessment in SAMBA19 for Acute Medicine patients took place in:

- ED 61.8%
- AMU 12.3%
- AEC 23.6%
- Other 2.4%

In contrast, the first Acute Medicine assessment is that first performed a competent Acute Medicine clinician. Table 11 shows that Acute Medicine clinicians were seeing the majority of patients after they had been moved out of ED. This apparent discrepancy is explained by patients who have two clerking assessments, one by ED clinicians and one by Acute Medicine clinicians. Over three years, SAMBA has

consistently shown that around half of all Acute Medicine patients are assessed (clerked) by two clinicians before seeing a consultant:

- 48.6% of SAMBA19 patients had more than one clerking before seeing a consultant
  - SAMBA18 51.9%
  - SAMBA17 50.8%.

Table 11 Where was the First Acute Medicine Assessment?

	Overall Mean Percentage			
	ED	AMU	AEC	Other
SAMBA19	34.6	33.7	27.8	3.7
SAMBA18*	60.0	19.5	20.1	1.4
SAMBA17	33.0	41	16.5	2.1

* In SAMBA18 only data for first clinical assessment was collected.

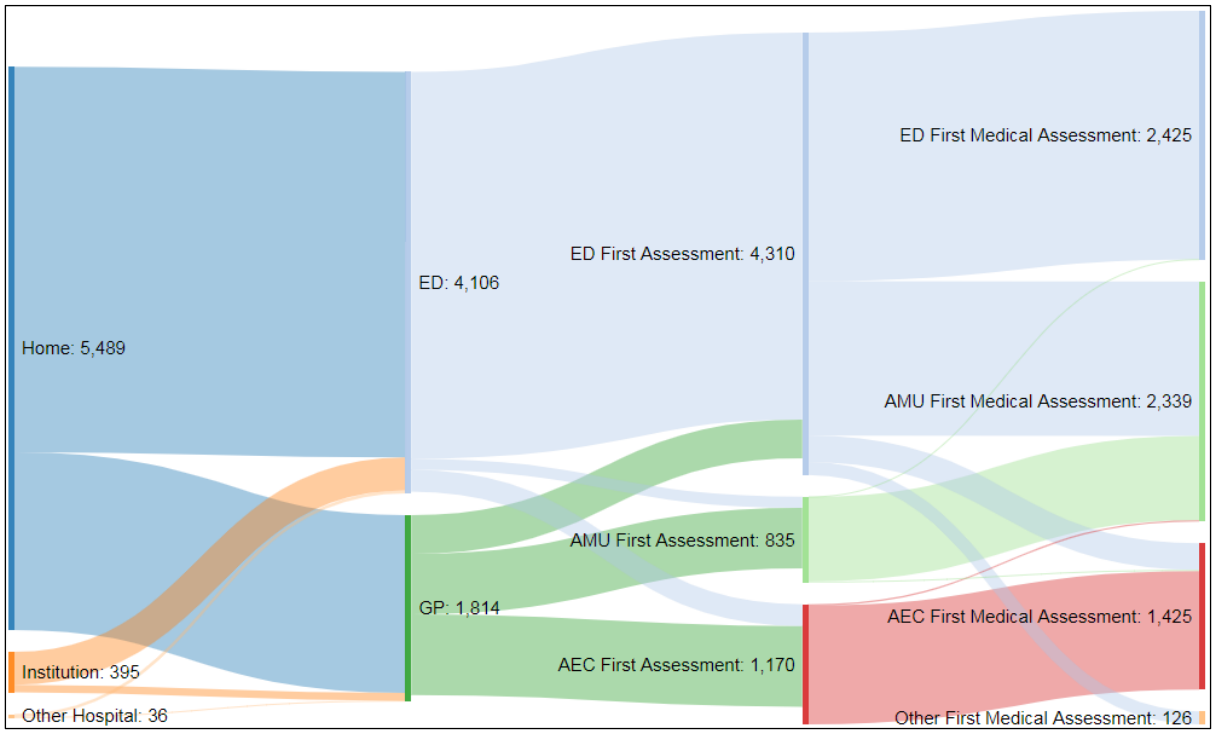
The patient journey is summarised in a Sankey Diagram (Figure 9). For the sake of simplicity, some small volume points in the journey are omitted, for example patients referred directly by paramedics.

For those readers not familiar with Sankey Diagrams, the vertical bars represent a flow point in the patient journey. Starting on the left is where patients were residing prior coming to hospital. Moving across, the next bar is who referred the patient to Acute Medicine, followed by the site of the first clinical assessment. The numbers represent how many patients are in each group. Lastly on the right is the site of the first medical assessment.

As an example, follow the peach coloured line of patients who come from an institution, such as a care home; the majority of these patients arrive in ED. We know that the majority of patients from institutions are older and that older patients would be best served arriving in AMU or a frailty unit. Hence, the Sankey Diagram is useful in showing where there is room to improve the patient journey. The Sankey Diagram also confirms the view that the acute medical care pathway is complex and the initial expectation of SAM's CQIs that patients will be seen by the Acute Medicine team in AMU is no longer true.

Not shown in the Sankey Diagram is that 19.1% of patients admitted through ED went direct to a medical ward or medical outlying ward, bypassing AMU.

Figure 9 Sankey Diagram to Summarise the Acute Medicine Patient Journey



12.5% of patients were discharged prior to a consultant review

- SAMBA18 9.1%
- SAMBA17 9.9%.

Of all patients seen on Thursday 27th June 2019, 18.9% had been discharged from hospital in the last 30 days, although not necessarily by Acute Medicine or another medical specialty:

- SAMBA18 20.4%
- SAMBA17 12.0%
- SAMBA16 13.0%.

Clinical Quality Indicator Outcomes SAMBA19

Table 12 Success in Achieving Clinical Quality Indicators 1 and 2

	Overall Percentage		
	SAMBA19	SAMBA18	SAMBA17
Clinical Quality Indicator 1 *All patients should have their NEWS measured within 30 minutes of arrival*	84.5 (85.0)* 79.8 (80.7)**	84.1	83.0
Clinical Quality Indicator 2 *All patients should be seen by a competent clinical decision maker within four hours of arrival on the AMU*	91.0 (90.4) 87.7 (86.9)	91.4	65.0 arrival at hospital 93.0 arrival on AMU
Composite of Clinical Quality Indicators 1&2	78.2 (78.2) 72.0 (72.3)	76.1	-

* Figures in brackets are acute admissions only with scheduled returns excluded.

** Figures in blue are for whole population including missing data, with acute admissions only in brackets.

CQI 2 was achieved in 97.3% of patients who were scheduled to return.

Table 13 Success in Achieving Clinical Quality Indicator 3

	Overall Percentage		
	SAMBA19	SAMBA18	SAMBA17
Clinical Quality Indicator 3 *All patients should be seen by a consultant within specified quality indicator timeframe**	69.6 (68.6.)** 66.4 (66.6)+	62.8	73 arrival at hospital 92 arrival on AMU
Night 00.00 to 08:00++ Patient seen within 14 hours	91.5 (91.4) 87.5 (87.6)	-	-
Day 08:00 to 20:00++ Patient seen within 6 hours	62.7 (60.8) 59.7 (59.1)	-	-
Evening 20:00 to 00:00++ Patient seen within 14 hours	85.9 (86.0) 84.4 (84.5)	-	-

* In SAMBA17 the CQI was 14 hours (8 hours if arrival was between 08:00 and 18:00) and in SAMBA18 the CQI was 12 hours.

** Figures in brackets are acute admissions only with scheduled returns excluded.

+ Figures in blue are for whole population including missing data, with acute admissions only in brackets.

++ There were 8 night, 401 daytime and 9 evening scheduled returns respectively.

73.1% of daytime scheduled returns were seen within 6 hours by a consultant.

Table 14 Success in Achieving Clinical Quality Indicators 1 & 2 by Location of Initial Assessment

		Overall Percentage		
		SAMBA19	SAMBA18	SAMBA17
Clinical Quality Indicator 1 All patients should have their NEWS measured within 30 minutes of arrival	ED	85.2 (85.3)* 81.5 (81.7)**	84.9	83.0
	AMU	83.1 (83.2) 79.6 (80.0)	85.4	83.0
	AEC	83.3 (85.2) 77.9 (81.2)	82.1	82.1
Clinical Quality Indicator 2 All patients should be seen by a competent clinical decision maker within four hours of arrival on AMU	ED	90.1 (89.9) 86.8 (86.7)	91.4	59.0
	AMU	84.5 (83.9) 82.5 (81.9)	88.9	68.0
	AEC	96.7 (96.5) 94.9 (94.7)	94.5	85.0
Composite of Clinical Quality Indicators 1&2	ED	77.9 (77.8) 72.3 (72.3)	77.2	-
	AMU	73.0 (72.6) 68.6 (68.5)	75.1	-
	AEC	81.4 (83.2) 74.9 (77.9)	75.7	-

* Figures in brackets are acute admissions only with scheduled returns excluded.

** Figures in blue are for whole population including missing data, with acute admissions only in brackets.

Table 15 Success in Achieving Clinical Quality Indicators 3 by Location of Initial Assessment

	Overall Percentage		
	ED	AMU	AEC
Clinical Quality Indicator 3 *All patients should be seen by a consultant within specified quality indicator timeframe*	63.6 (63.4)* 62.2 (62.1)**	74.9 (74.8) 74.5 (74.3)	88.7 (89.1) 87.5 (88.0)
Night 00.00 to 08:00 Patient seen within 14 hours	91.5 (91.5) 88.2 (88.4)	91.8 (91.8) 88.2 (88.2)	100.0 (100.0)+ 88.9 (85.7)
Day 08:00 to 20:00 Patient seen within 6 hours	50.8 (50.3) 49.9 (49.6)	70.1 (69.7) 70.0 (69.7)	88.8 (89.3) 87.8 (88.4)
Evening 20:00 to 00:00 Patient seen within 14 hours	84.6 (84.6) 83.1 (83.2)	94.2 (94.2) 93.4 (93.3)	78.9 (76.5)+ 75.0 (72.2)

* Figures in brackets are acute admissions only with scheduled returns excluded.

** Figures in blue are for whole population including missing data, with acute admissions only in brackets.

+ The number of patients seen at night or in the evening in AEC was small, range 12 to 24.

Early Warning Score and Acuity

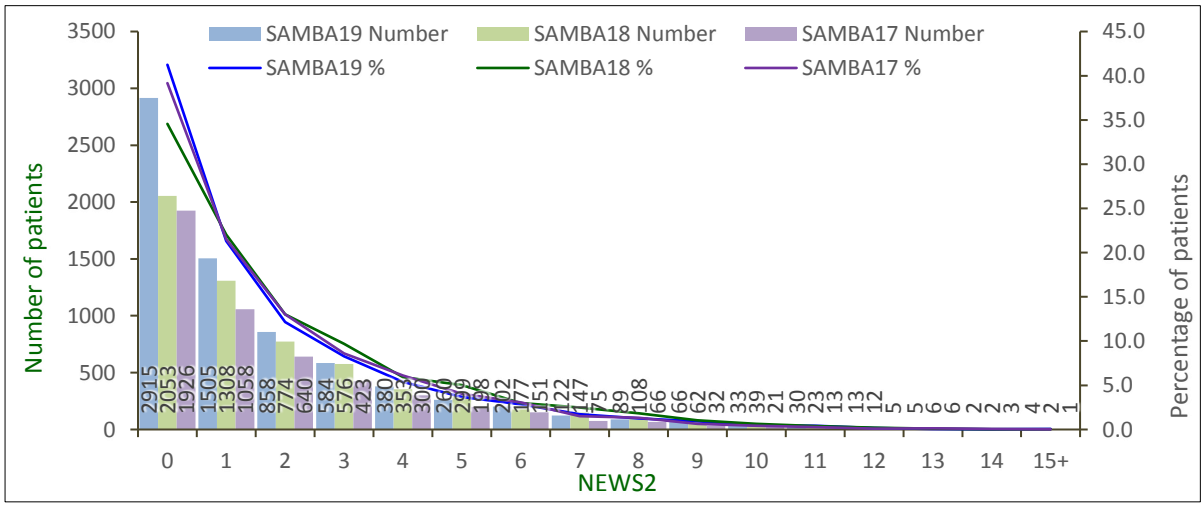
Acuity at presentation was assessed using the National Early Warning Score 2 (NEWS2).

- All hospitals use an early warning score
- In SAMBA19 there was an increase in the use of NEWS2 (Table 16)
- Even if hospitals did not use NEWS2, units were asked to calculate a NEWS2 for each patient.
  - 98.6% of patients had a NEWS2 score submitted
- The median NEWS2 on arrival was 1 (absolute range 0 to 19 and interquartile range 0 to 3)
- The variation in the range of NEWS2 scores is shown in Figure 10.

Table 16 Variation in Early Warning Scores Used Between Hospitals

	Overall Percentage			
	NEWS	NEWS2	MEWS	Other including Local EWS
SAMBA19	32.3	59.2	2.3	6.2
SAMBA18	75.0	2.5	11.0	8.0

Figure 10 Distribution of NEWS2



Patient Outcomes

Table 17 Patient Outcomes at 7 Days for SAMBA18 & SAMBA19

	Overall Percentage	
	SAMBA19	SAMBA18
Same Day Discharge	34.2 (29.1)*	-
After Day of Admission Discharge	38.5 (41.3)	-
Total Discharges	**72.7 (70.4)**	**72.2**
Alive in Hospital at One Week	21.6 (23.5)	23.2
Discharged but Readmitted Within Seven Days	1.6 (1.7)	-
Self-Discharged	1.2 (1.2)	1.3
Died	1.7 (1.9)	2.0
Transferred to Another Hospital	1.3 (1.4)	1.3

* Figures in brackets are acute admissions only with scheduled returns excluded.

Table 18 Patient Outcomes at 7 Days by Location of Initial Assessment

	Overall Percentage		
	ED	AMU	AEC
Same Day Discharge	17.5 (16.6) *	24.0 (22.1)	84.2 (81.3)
After Day of Admission Discharge	47.7 (48.1)	44.4 (45.4)	10.4 (12.1)
Total Discharges	**65.2 (64.7)**	**68.4 (67.5)**	**94.6 (93.4)**
Alive in Hospital at One Week	27.3 (27.7)	26.6 (27.3)	3.4 (4.4)
Discharged but Readmitted Within Seven Days	1.9 (1.9)	1.2 (1.2)	1.1 (1.3)
Self-Discharged	1.4 (1.4)	1.0 (1.1)	0.5 (0.5)
Died	2.4 (2.5)	1.6 (1.7)	0.1 (0.0)
Transferred to Another Hospital	1.7 (1.7)	1.3 (1.3)	0.2 (0.3)

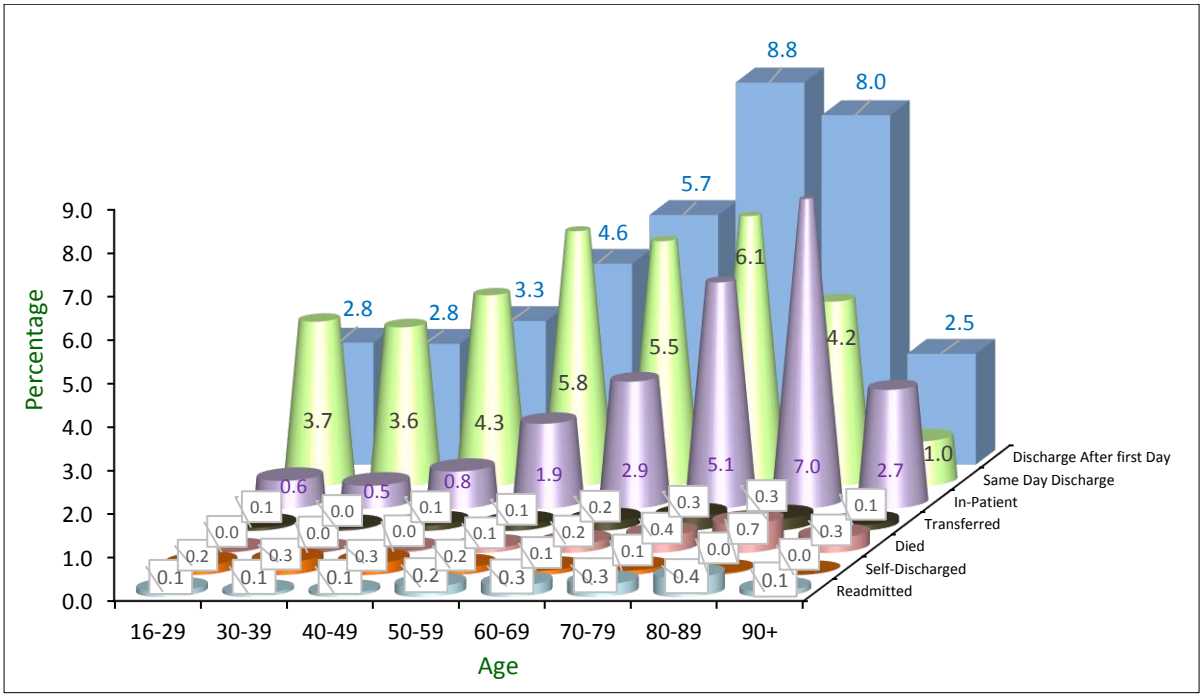
* Figures in brackets are acute admissions only with scheduled returns excluded.

Table 19 Patient Outcomes at 7 Days by NEWS2

		Overall Percentage					
	NEWS	**Died**	**Alive in Hospital**	**Same Day Discharge**	**Discharge Day 2 to 7**	**Self-Discharge**	**Transferred**
SAMBA19	0 to 4	1.0 (1.1)*	20.1 (22.1)	37.8 (32.5)	37.1 (40.1)	1.2 (1.3)	1.2 (1.4)
				74.9 (72.6) combined discharges			
	5 to 6	3.7 (3.7)	30.2 (30.4)	7.0 (6.4)	54.1 (54.5)	0.9 (0.9)	2.1 (2.2)
				61.1 (60.9) combined discharges			
	7 +	12.4 (12.4)	37.2 (37.3)	4.7 (4.7)	42.7 (42.5)	0.6 (0.6)	1.1 (1.1)
				47.4 (47.2) combined discharges			
SAMBA18	0 to 4	1.0	21.7	74.7 combined discharges		1.3	1.3
	5 to 6	4.1	33.1	61.4 combined discharges		0.4	0.9
	7 +	12.9	36.8	46.0 combined discharges		2.1	2.1

* Figures in brackets are acute admissions only with scheduled returns excluded.

Figure 11 Outcomes at 7 Days by Age (Percentage of Patients by Population Overall)



Ambulatory Emergency Care

There was an increase in AEC activity in SAMBA19:

- The median percentage of patients initially clerked on AEC was 22.4%:
  - SAMBA18 18.1%, SAMBA17 16.5%
- 14.3% of units did not see patients in a dedicated AEC for their first assessment:
  - SAMBA18 23.0%
- 70.7% of units saw 10% or more of patients in AEC for their first assessment:
  - SAMBA18 65.3%, SAMBA17 58.6%
- 55.0% of units saw 20% or more of patients in AEC for their first assessment:
  - SAMBA18 46.5%, SAMBA 17 35.1%
- 35.0% of units saw 30% or more of patients in AEC for their first clinical assessment
- 29.6% of units saw 33.3% of acute medical patients in AEC for their first clinical assessment (Figure 12).

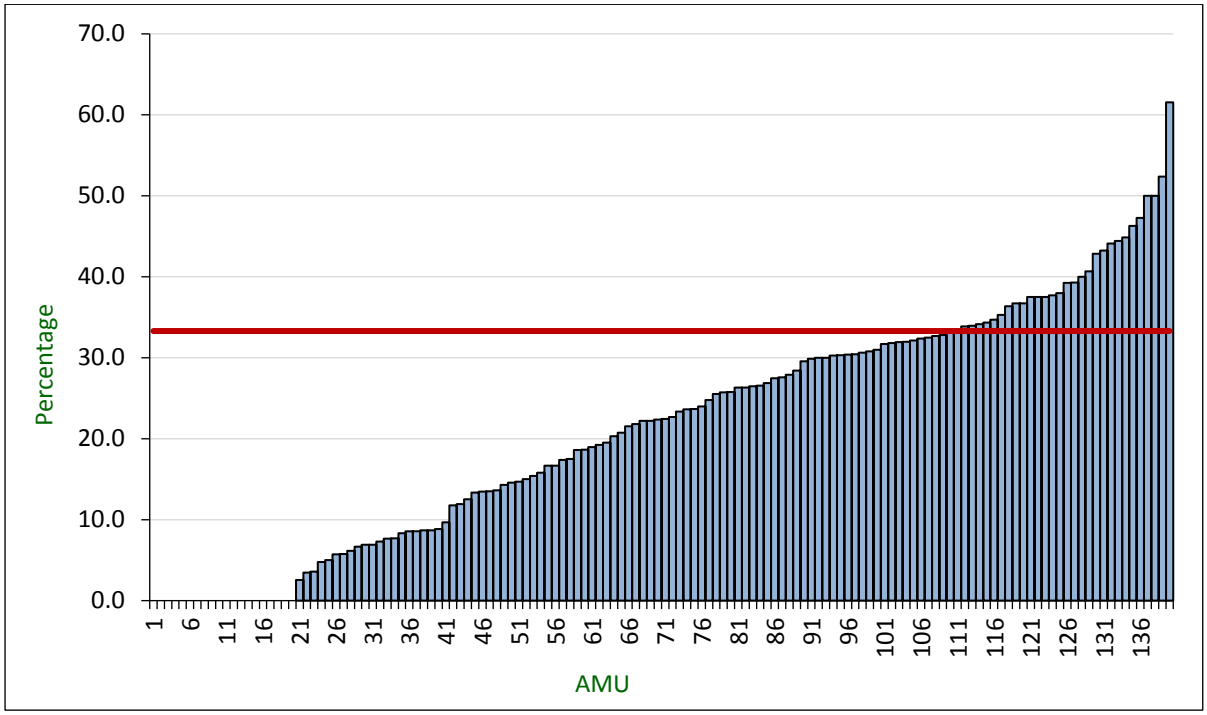
The age distribution of patients having their first clinical assessment in AEC is younger than the whole population (Figure 13).

58.0% of patients having their first clinical assessment in AEC were female.

Patients having their first clinical assessment in AEC have lower NEWS2 scores than the whole population (Figure 14):

- 86.0% of patients seen in AEC for their first assessment had a NEWS2 of less than 2
- 62.5% of the whole population had a NEWS2 of less than 2
  - SAMBA18 NEWS 83%, SAMBA17 NEWS 93.5%.
- 1.4% of patients seen in AEC for their first assessment had a NEWS2 of 5 or more
- 11.7% of the whole population had a NEWS2 of 5 or more
  - SAMBA18 NEWS 1.4%, SAMBA17 NEWS 3.1%.

Figure 12 Distribution of Percentage of Patients with First Clinical Assessment in AEC



* The red line represents 33.3% of patients who have their first clinical assessment in AEC, the quoted target for same day emergency care (SDEC) in the NHS Long Term Plan[5]

The distribution of age and NEWS2 in the population of patients who had their first clinical assessment in AEC, are shown in Figures 13 and 14 respectively.

Figure 13 Percentage Distribution of Age of Patients with First Clinical Assessment in AEC

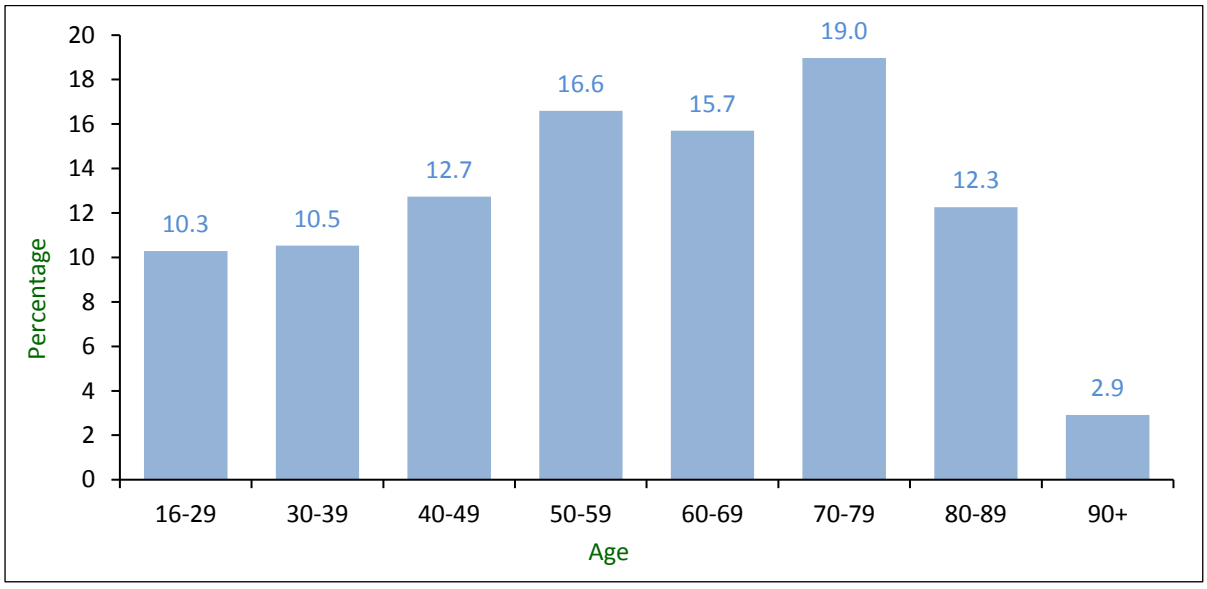
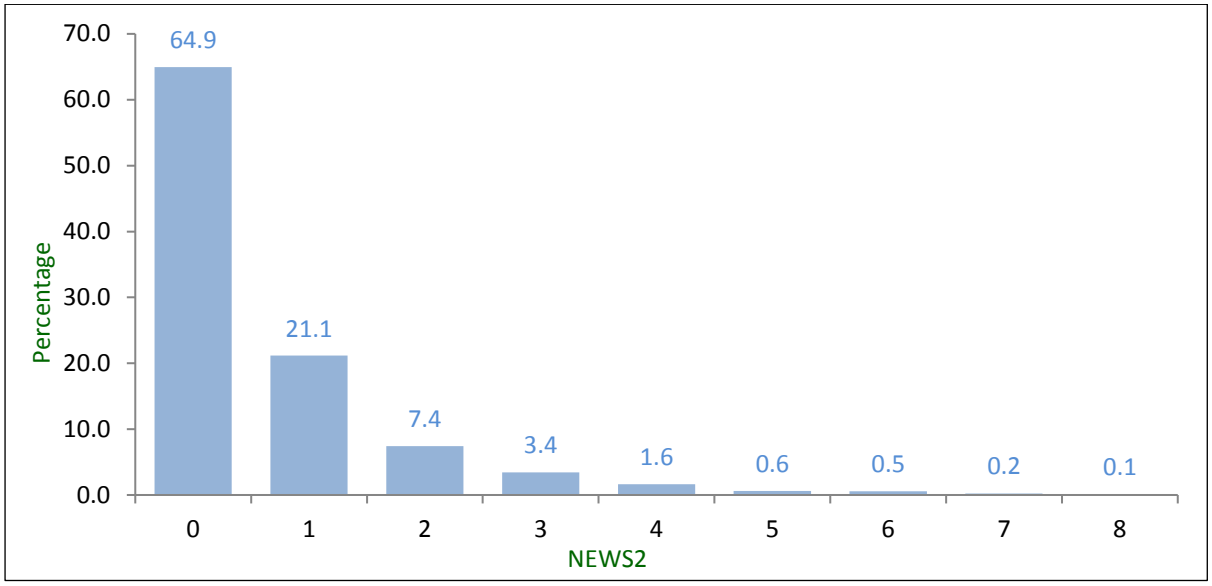


Figure 14 Percentage Distribution of NEWS2 for Patients with First Clinical Assessment in AEC



5 Summary & Discussion

What has SAMBA19 shown?

SAMBA19 was the largest audit to date. As with SAMBA18, the increase in the number of units (11.0%) was proportionately smaller than the increase in the number of patients (14.7%). Although SAMBA is a single day snapshot audit, we feel these figures do represent increasing activity in acute medical patients attending hospital. Reassuringly, although the CQI data is stagnant, performance is not deteriorating with this increasing demand. Furthermore, patient outcomes at seven days are unchanged.

The obvious changes in practice identified in SAMBA19 were the increased uptake of NEWS2 over NEWS, an increase in acute frailty services and an increase in AEC activity. The NHS Long Term Plan aspires to a third of acute admissions being discharged on the same day,[5] with Same Day Emergency Care (SDEC) a key component in achieving this target. In simple terms, SDEC is an expansion of AEC, both in terms of numerical activity and the types of patient seen. Figure 12 shows that the majority of hospitals do not see a third of patients in AEC; some hospitals still see no patients in AEC. However, with only a minority of hospitals having AEC open 24 hours per day, there is scope to expand the service further.

SAMBA is not designed to identify which components of acute medical care provide the best outcomes. However, there is a trend for the least unwell patients being seen in AEC but more quickly than patients initially assessed in ED or AMU, for both their initial clerking and consultant review. Although AEC plays a significant role in creating day of admission discharges, we must be mindful that Acute Medicine has an important role in caring for the sickest patients.

The Acute Medicine Patient Journey

The pathway for acute medical patients is more complex than that for which SAM's 2011 CQIs were designated.[6] The majority of acute medical care starts in ED; indeed we are fully aware that many aspects of SAMBA are an ED, as opposed to an AMU or AEC, audit. There are aspects of the acute care pathway which can be improved, for example, avoiding older patients from care homes going direct to ED. Building on the last point in the previous section, patients arriving in ED during the daytime wait the longest for review by a medical consultant. This may be because these patients are under the care of ED and wait for a referral to medicine, building a delay into the time before they see a medical consultant. However, it may also be the case that acute medical consultant time is being prioritised to AEC. We feel this later question should be studied in future SAMBAs.

New for SAMBA19 was differentiating patients who presented for the first time on the audit day and the 9.0% of patients who were scheduled returns, predominantly to AEC. This provided a further complication to data collection and analysis. However, we feel it is important to recognise that this works is being undertaken by Acute Medicine, again highlighting the ever-changing complexity of the acute medical pathway.

Efficiency & the Emergency Department Interface

In SAMBA18, we made reference to the fact that over half all medical patients have at least two clerkings. In SAMBA19, this figure remains high at 48.6%. We again argue that this represents an

opportunity for innovation in the assessment of patients, by streamlining the collection and recording of healthcare data.

The Future for SAMBA

At the time of writing this report, the first winter SAMBA is being conducted. We feel that expanding the data we collect, across seasons and hopefully soon at weekends too, will give an increasingly accurate account of acute medical care in the UK.

We are aware that regional studies are already underway looking at how SAMBA influences care at a local level. Whilst SAMBA provides all participating units with a bespoke report benchmarking against the performance of their peers, there is a place for units to share data and collaborate on quality improvement projects.

At a national level, trends uncovered by SAMBA in how care is delivered need to be explored in greater detail. For example, instead of asking for a binary categorical measurement of how soon a patient is seen by a medical consultant, such as within six hours during the daytime, we should be asking a more explicit question, such as exactly how many hours are patients waiting. In this way we will obtain an even greater understanding of acute medical care, for example, whether patients with the highest NEWS2 scores are being seen the soonest (as one would hope). The flip side to collecting data with this degree of granularity is the burden placed on our army of data collectors, or 'SAMBAnisters'. However, with the new software commissioned by SAM for SAMBA19, we hope that an abbreviated and focused minimum SAMBA dataset will allow units to collect and upload SAMBA data at their convenience and outside of traditional SAMBA days.

We were greatly heartened by the participation of two units from outside the UK. We already know that there is heterogeneity within Acute Medicine models of care in the UK,[15] and whilst some international units have adopted processes that mirror the UK, for now we have chosen not to incorporate data from non-UK units in the national report, as our current objective is to provide a year on year comparison of UK data. As the two international units are identifiable, we wish to maintain the anonymity of their data and hence it has not been published separately here. However, going forward, we see SAMBA19 as an important step in moving towards an international report.

Lastly, while we stress again that SAMBA is designed as an audit, it must feed into quality improvement and speak to Acute Medicine's research agenda. We have identified areas of practice that can improve or be made more efficient. Some critics may deride SAMBA as purely voyeuristic, lacking teeth or the ability to have a meaningful influence on acute medical care. We contend that SAMBA, especially an expanded SAMBA, provides a platform for Acute Medicine practitioners to collect robust, meaningful data and ultimately improve patient care. Now that we have established the process for SAMBA in well over half of UK hospitals, supported by high quality software, we must rise to the challenge and transcend simply reporting data by triangulating our depth of understanding with SAM's policy agenda and the wider Acute Medicine research agenda.

Appendix 1 Glossary of Terms & Abbreviations

Terms Relating to Acute Medicine

Acuity

This is a measure of how unwell patients are. In SAMBA19 this is assessed with the NEWS.

Acute Medicine

This is discussed in detail on page 6. In simple terms, Acute Medicine is the care process for unwell adult patients (usually age 16 years and above) who attend hospital with a medical (non-surgical) condition.

Acute Internal Medicine

This is the specialism that medical trainees enter if they want to become Acute Physicians. This training pathway has been available since 2009. The term AIM is sometimes used synonymously with Acute Medicine

Acute Medical Unit

The area of a hospital where Acute Medicine is based, sharing some similarities with a traditional hospital ward.

Acute Physician

A doctor who specialises in, and is dedicated to, the practice of Acute Medicine. In addition, physicians from other specialties contribute to the care of acutely unwell medical patients, including participating in the admission process or 'medical take'.

Ambulatory Emergency Care

AEC provides care for patients with acute medical problems but in an outpatient setting. Patients are selected for AEC by their condition and physiological stability. AEC provides the same level and standard of care as patients admitted to hospital but with the advantage of getting patients home more quickly.

Medical Patient

A medical patient is an adult, usually age 16 years and above, and who does not have a surgical condition at the time they are referred to Acute Medicine (although some will subsequently be diagnosed with conditions that need an operation).

Medical Take

Or simply the 'take', is the summative term used to describe the process of assessing and admitting non-elective (emergency) medical patients to hospital. For example, doctors might refer to the take as being busy or refer to their on-call shift as being 'on take' if it involves admitting patients.

Patient Outcomes

There are many markers of patient outcomes. Of course, for patients this means getting better. However, to objectively measure outcomes, healthcare professionals use a number of parameters including readmission rates to hospital, length of stay in hospital and death rates, to name but a few.

Physiological Parameters and Stability[4]

In SAMBA19 this was assessed using the NEWS2. NEWS2 provides a cumulative score of physiological parameters (blood pressure, pulse rate, respiratory rate, temperature, oxygen levels in the blood (saturations), use of oxygen therapy and level of consciousness). Patients with higher scores are more unwell and have less good outcomes.

Appendix 2 References and Bibliography

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Appendix 3 Acknowledgments

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Appendix 4 Units & Participants

The SAMBA team apologise if we have omitted your hospital. We would be happy to amend the on-line version of the SAMBA19 report. If we can help, please contact us at samba@acutemedicine.org.uk

International

Fiona Stanley Hospital, Murdoch, Western Australia

National University Hospital, Singapore.

Northern Ireland

Antrim Area Hospital	Northern Health and Social Care Trust
Lagan Valley Hospital	South Eastern Health and Social Care Trust
South West Acute Hospital	Western Health and Social Care Trust
Ulster Hospital	South Eastern Trust

Isle of Man

Noble's hospital	Noble's hospital

England

Aintree University NHS Foundation Trust

Airedale Hospital	Airedale Foundation NHS Trust
Alexandra Hospital	Worcestershire Acute NHS Trust
Arrowe Park Hospital	Wirral University Teaching Hospital NHS Foundation Trust
Ashford St Peters	Ashford and St. Peter's Hospitals NHS Foundation Trust
Barnet Hospital	Royal Free NHS Trust
Barnsley Hospital	Barnsley Hospital NHS Foundation Trust
Basildon Hospital	Basildon and Thurrock University Hospitals NHS Foundation
Basingstoke and North Hampshire Hospital	Hamphire Hospitals NHS Trust
Bradford Royal Infirmary	Bradford Teaching Hospital NHS Foundation Trust
Brighton and Sussex University Hospital	Brighton and Sussex University Hospital
Bristol Royal Infirmary	University Hospitals Bristol NHS Foundation Trust
Broomfield Hospital	Mid-Essex Hospitals NHS Trust
Calderdale Royal Hospital	Calderdale and Huddersfield NHS Foundation Trust
Chelsea and Westminster Hospital	Chelsea and Westminster NHS Trust
Cheltenham General Hospital	Gloucestershire NHS Foundation Trust
Chesterfield Royal Hospital	Chesterfield Royal Hospital NHS Foundation Trust
Conquest Hospital	East Sussex Healthcare Trust
Countess of Chester Hospital	Countess of Chester Hospital NHS Foundation Trust
County Hospital	University Hospital of North Midlands NHS Trust
Darent Valley Hospital	Dartford and Gravesham NHS Trust
Darlington Memorial Hospital	County Durham and Darlington NHS Foundation Trust

Derriford Hospital	University Hospitals Plymouth NHS Trust
Diana Princess of Wales Hospital	Northern Lincolnshire & Goole NHS Trust
Dorset County Hospital Dorset	Dorset County Hospital NHS Foundation Trust
Ealing Hospital	London North West University Healthcare NHS Trust
East Surrey Hospital	Surrey and Sussex NHS Trust
Fairfield General hospital	Pennine Acute NHS Trust
Friarage Hospital	South Tees Foundation NHS Trust
Frimley Park Hospital	Frimley Health Foundation Trust
George Eliot Hospital	George Eliot Hospital NHS Trust
Gloucestershire Royal Hospital	Gloucestershire Hospitals NHS Foundation Trust
Good Hope Hospital	University Hospitals Birmingham NHS Foundation Trust
Great Western Hospital Great	Western Hospital NHS Foundation Trust
Heartlands Hospital	University Hospitals Birmingham NHS Foundation Trust
Hereford County Hospital	Wye Valley NHS Trust
Hillingdon Hospital	Hillingdon Hospitals NHS Foundation Trust
Hinchingbrooke Hospital	North West Anglia NHS Foundation Trust
Homerton University Hospital	Homerton University Hospital Foundation Trust
Horton General Hospital	Oxford University Hospital Foundation Trust
Huddersfield Royal Infirmary	Calderdale & Huddersfield NHS Foundation Trust
Hull Royal Infirmary	Hull University Hospitals NHS Trust
Ipswich Hospital	North Essex and East Suffolk NHS Foundation Trust
James Paget University Hospital	James Paget University Hospitals NHS Foundation Trust
John Radcliffe Hospital	Oxford University Hospitals NHS Foundation Trust
Kingston Hospital	Kingston Foundation Hospital NHS Trust
Leicester Royal Infirmary	University Hospitals of Leicester NHS Trust
Luton and Dunstable Hospital	Luton and Dunstable University Hospital NHS Foundation Trust
Macclesfield District General Hospital	East Cheshire NHS Trust
Tunbridge Wells Hospital	Maidstone & Tunbridge Wells NHS Trust
Manchester Royal Infirmary	Manchester University NHS Foundation Trust
Leighton Hospital	Mid Cheshire Hospitals NHS Foundation Trust
Milton Keynes University Hospital	Milton Keynes University Hospital NHS Foundation Trust
Musgrove Park Hospital	Taunton and Somerset NHS Foundation Trust
New Cross Hospital	The Royal Wolverhampton NHS Trust
Norfolk and Norwich University Hospital	Norfolk and Norwich University Hospital NHS Foundation Trust
Northampton General hospital	Northampton General Hospital Trust
Northern Devon District Hospital	Northern Devon Healthcare NHS Trust

Northwick Park Hospital	London North West University Hospitals NHS Trust
North Middlesex University Hospital	North Middlesex University Hospital NHS Trust
Peterborough City Hospital	North West Anglia NHS Foundation Trust
Pinderfields Hospital	The Mid Yorkshire Hospitals NHS Trust
Poole Hospital	Poole Hospital NHS Trust
Queen Alexandra Hospital	Portsmouth Hospitals NHS Trust
Queen Elizabeth Hospital	Lewisham and Greenwich NHS Trust
Queen Elizabeth Hospital	Gateshead NHS Foundation Trust
Queen Elizabeth Hospital Birmingham	University Hospitals Birmingham NHS Foundation Trust
Queen Elizabeth Queen Mother Hospital	East Kent Hospitals University NHS Foundation Trust
Royal Albert Edward Infirmary	Wrightington, Wigan and Leigh NHS Foundation Trust
Royal Berkshire Hospital	Royal Berkshire NHS Foundation Trust
Royal Blackburn Teaching Hospital	East Lancashire Hospitals Trust
Royal Bolton Hospital	Bolton NHS Foundation Trust
Royal Bournemouth General Hospital	Royal Bournemouth and Christchurch Hospital Trust
Royal Derby Hospital	University Hospitals of Derby and Burton NHS Foundation Trust
Royal Devon and Exeter Hospital	Royal Devon and Exeter Hospitals Trust
Royal Free Hospital	Royal Free London NHS Foundation Trust
Royal Hampshire County Hospital	Hampshire Hospitals NHS Foundation Trust
Royal London Hospital	Barts Health NHS Trust
Royal Oldham Hospital	Northern Care Alliance (Pennine Acute NHS Trust))
Royal Preston Hospital	Lancashire Teaching Hospitals NHS Foundation Trust
Royal Stoke University Hospital	University Hospitals of North Midlands NHS Trust
Royal Surrey County Hospital	Royal Surrey County Hospital NHS Foundation Trust
Royal United Hospital Bath	Royal United Hospitals Bath NHS Foundation Trust
Salford Royal Hospital	Salford Royal NHS Foundation Trust
Salisbury District Hospital	Salisbury NHS Foundation Trust
Sandwell General Hospital	Sandwell and West Birmingham NHS Trust
Scarborough Hospital	York Teaching Hospital NHS Foundation Trust
Sherwood Forest	Sherwood Forest Hospitals NHS Foundation Trust
Solihull Hospital	University Hospitals Birmingham NHS Foundation Trust
Southend University Hospital	Southend University Hospital NHS Foundation Trust
Southmead Hospital	North Bristol NHS Trust
Southport District General Hospital	Southport and Ormskirk NHS Trust
St Georges University Hospital	St Georges University Hospitals NHS Foundation Trust
St Helier Hospital	Epsom and St Helier University Hospitals NHS Trust

St James Hospital	Leeds Teaching Hospitals Trust
St Mary's Hospital	Isle of Wight NHS Trust
St Richard's Hospital	Western Sussex NHS Foundation Trust
Stepping hill hospital	Stockport NHS foundation trust
Tunbridge Wells Hospital	Maidstone and Tunbridge Wells NHS Trust
Tameside General Hospital	Tameside and Glossop Integrated NHS Foundation Trust
University Hospital Southampton	University Hospital Southampton NHS Foundation Trust
University Hospital Coventry & Warwickshire	University Hospitals Coventry & Warwickshire NHS Trust
University Hospital of North Durham	County Durham & Darlington NHS Foundation Trust
University College Hospital	University College London Hospitals NHS Foundation Trust
Walsall Manor Hospital	Walsall Healthcare NHS Trust
Wexham Park Hospital	Frimley Health NHS Foundation Trust
Whipps Cross University Hospital	Barts Health NHS Trust
Whiston Hospital	St Helens and Knowsley NHS Trust
Whittington Hospital	Whittington Health NHS Trust
William Harvey Hospital	East Kent Hospitals University Foundation Trust
Worcestershire Royal Hospital	Worcestershire Acute NHS Trust
Worthing Hospital	Western Sussex Hospitals NHS Trust
Wythenshawe Hospital	Manchester University NHS Foundation Trust
Yeovil District Hospital	Yeovil District Hospital Foundation Trust
York Teaching Hospital	York Teaching Hospital NHS Foundation Trust

Scotland

Aberdeen Royal Infirmary	NHS Grampian
Raigmore Hospital	NHS Highland
Royal Infirmary of Edinburgh	NHS Lothian
Dumfries and Galloway Royal Infirmary	NHS Dumfries and Galloway
Queen Elizabeth University Hospital	NHS Greater Glasgow and Clyde

Wales

Nevill Hall Hospital	Aneurin Bevan University Health Board
Prince Charles Hospital	Cwm Taf Morgannwg University Health Board
Princess of Wales	Cwm Taf Morgannwg University Health Board
Royal Glamorgan Hospital	Cwm Taf Morgannwg University Health Board
University Hospital Wales	Cardiff and Vale University Health Board
University Hospital Llandough	Cardiff and Vale University Health Board
Ysbyty Gwynedd	Betsi Cadwaladar University Health Board