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SICS

scottish intensive care society audit group

Audit of Critical Care in Scotland 2020 Reporting on 2019

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Foreword

The Scottish Intensive Care Society Audit Group (SICSAG) is the national adult critical care audit and quality assurance programme. SICSAG seeks to improve the quality of care that is delivered to critical care patients across Scotland using data to continuously monitor and transparently report outcomes. The audit also seeks to inform healthcare professionals, the public and Scottish Government about critical care activity and provides ongoing quality assurance and national benchmarking for our critically ill patients.

The 2020 SICSAG report describes the activities, interventions and outcomes for over 45,000 critically ill patients who were treated in Scotland in 2019. It is a continuing development of the original critical care outcomes audit that has produced an ever expanding national dataset since 1995. SICSAG benefits from a close collaboration between the Scottish Intensive Care Society and Public Health Scotland (PHS).

At the time of writing, Scotland is in the midst of the COVID-19 pandemic. The impact on the critical care services and staff has been significant, necessitating a rapid expansion in bed provision, sourcing of additional ventilators, training new staff, and developing different ways of working. SICSAG has transformed its systems to play a key role in the response to the pandemic in Scotland, leveraging its unique position as a source of accurate data, combined with close clinical involvement by front line clinicians and the data expertise brought as part of the Scottish National Audit Programme (SNAP) and PHS. SICSAG has produced regular reports during 2020 relating to the pandemic to inform clinicians, government and the public of patients being treated in critical care units[1].

Despite this increased COVID-19-related activity, the SICSAG steering group was keen to ensure the annual report on 2019 activity was published. We have, therefore, produced a streamlined version of the annual report, acknowledging the more limited resource available due to the team focussing on COVID-19 related work. For the same reason, the chapter on Healthcare Associated Infection (HAI) surveillance, produced in collaboration with Health Protection Scotland (HPS), is not included in this year's report.

A key focus of the audit is to seek a reduction in variation across Scotland through the transparent benchmarking of professionally agreed Minimum Standards and Quality Indicators (MSQI)[2]. In this year's report, we are pleased that year-on-year, more units are achieving these indicators. We encourage units that do not meet these indicators to provide feedback and develop an action plan for improvement. This feedback, which is compiled in this year's report, highlights the role the audit has in raising standards and driving continued improvement in both patient care and patient experience in critical care units across Scotland.

This is my first report as Chair of SICSAG. I am grateful to the past Chair, Dr Stephen Cole, and Vice-Chair, Dr Charles Wallis. Their energy and commitment has allowed SICSAG to flourish under their leadership. I would like to thank the many health care professionals and colleagues who collect SICSAG audit data on a daily basis whilst caring for critically ill patients. SICSAG benefits from an engaged, multidisciplinary steering group. Particular thanks are due to Dr Neil Stewart (Vice-Chair and Consultant in Critical Care), Ros Hall (Clinical Coordinator), Paul Smith (past Clinical Coordinator), Lorraine Donaldson (Senior Information Analyst), Clare McGeoch (Quality Assurance Manager), and the network of Local Audit Coordinators.

This world-renowned, critical care audit is only made possible through the enthusiasm, commitment, and hard work of the entire Scottish critical care clinical community. By ensuring

high quality data are collected every day, in every critical care unit, we can continue to reassure patients and families of the high quality care they receive, and continuously drive improvement in the quality of critical care provision across Scotland.

Dr Nazir Lone

Senior Clinical Lecturer and Honorary Consultant in Critical Care

Chair, SICSAG

Contents

Unit Key

Letter	Abbreviation	Unit Name	NHSBoard
A	IRH ICU	Inverclyde Royal Hospital ICU	Greater Glasgow & Clyde
A2	IRH HDU	Inverclyde Royal Hospital HDU	Greater Glasgow & Clyde
AA1	Dr Grays HDU	Dr Gray's Hospital HDU	Grampian
AB1	WIH HDU	Western Isles Hospital Stornoway	Western Isles
AC1	Belford HDU	Belford Hospital HDU	Highland
AD1	GJNH CICU/CHDU	Golden Jubilee Hospital ICU/HDU	National Waiting Times Centre
AE1	Balfour HDU	Balfour Hospital, Orkney HDU	Orkney
B	VHK ICU	Victoria Hospital Kirkcaldy ICU	Fife
B2	VHK MHDU	Victoria Hospital Kirkcaldy Medical HDU	Fife
B3	VHK SHDU	Victoria Hospital Kirkcaldy Surgical HDU	Fife
B4	VHK RHDU	Victoria Hospital Kirkcaldy Renal HDU	Fife
C	PRI ICU	Perth Royal Infirmary ICU	Tayside
C2	PRI HDU	Perth Royal Infirmary HDU	Tayside
E	Ayr ICU	University Hospital Ayr ICU	Ayrshire & Arran
E2	Ayr HDU	University Hospital Ayr HDU	Ayrshire & Arran
G	CRH ICU	University Hospital Crosshouse ICU	Ayrshire & Arran
G2	CRH MHDU	University Hospital Crosshouse Medical HDU	Ayrshire & Arran
G3	CRH SHDU	University Hospital Crosshouse Surgical HDU	Ayrshire & Arran
G9	CRH OHDU	University Hospital Crosshouse Obstetrics HDU	Ayrshire & Arran
H	DGRI ICU	D&G Royal Infirmary ICU	Dumfries & Galloway
H2	DGRI MHDU	D&G Royal Infirmary Medical HDU	Dumfries & Galloway
H3	DGRI SHDU	D&G Royal Infirmary Surgical	Dumfries & Galloway
H4	DGRI ICU/HDU	D&G Royal Infirmary Combined Unit	Dumfries & Galloway
I3	MDGH MHDU	University Hospital Monklands Medical HDU	Lanarkshire
I4	MNK ICU/HDU	University Hospital Monklands Combined Unit	Lanarkshire
I5	MNK level 1 HDU	University Hospital Monklands Level 1	Lanarkshire
J	RAH ICU	Royal Alexandra Hospital ICU	Greater Glasgow & Clyde
J2	RAH HDU	Royal Alexandra Hospital HDU	Greater Glasgow & Clyde

Letter	Abbreviation	Unit Name	NHSBoard
K	GRI ICU / HDU	Glasgow Royal Infirmary ICU	Greater Glasgow & Clyde
K2	GRI SHDU	Glasgow Royal Infirmary Surgical HDU	Greater Glasgow & Clyde
K3	GRI MDU	Glasgow Royal Infirmary Medical HDU	Greater Glasgow & Clyde
K4	PRM OHDU	Princess Royal Maternity Hospital	Greater Glasgow & Clyde
M	SJH ICU/HDU	St Johns Hospital, Livingston	Lothian
M2	SJH OHDU	St Johns Hospital, Livingston	Lothian
N	NWD ICU	Ninewells Hospital ICU	Tayside
N2	NWD MHDU	Ninewells Hospital Medical HDU	Tayside
N3	NWD SHDU	Ninewells Hospital Surgical HDU	Tayside
N5	NWD OHDU	Ninewells Hospital Obstetric HDU	Tayside
P	RGM ICU	Raigmore Hospital ICU	Highland
P2	RGM MHDU	Raigmore Hospital Medical HDU	Highland
P3	RGM SHDU	Raigmore Hospital Surgical HDU	Highland
Q3	FVRH ICU/HDU	Forth Valley Royal Hospital	Forth Valley
QE1	QEU ICU	Queen Elizabeth University Hospital ICU 3&4	Greater Glasgow & Clyde
QE2	QEU HDU1	Queen Elizabeth Univeristy Hospital HDU 1	Greater Glasgow & Clyde
QE3	QEU HDU2	Queen Elizabeth Univeristy Hospital HDU 2	Greater Glasgow & Clyde
QE4	QEU HDU6	Queen Elizabeth Univeristy Hospital HDU 6	Greater Glasgow & Clyde
QE5	QEU MHDU	Queen Elizabeth University Hospital Medical HDU 5	Greater Glasgow & Clyde
QE6	QEU OHDU	Queen Elizabeth University Hospital Obstetrics HDU	Greater Glasgow & Clyde
R	WGH ICU/HDU	Western General Hospital, Edinburgh ICU/HDU	Lothian
R3	WGH SHDU	Western General Hospital, Edinburgh Surgical (Level 1)	Lothian
R4	WGH NHDU	Western General Hospital, Edinburgh Neuro HDU	Lothian
R5	WGH NHDU (Level 1)	Western General Hospital, Edinburgh Level 1 Neuro HDU	Lothian

Letter	Abbreviation	Unit Name	NHSBoard
S	HRM ICU/HDU	University Hospital Hairmyers ICU/HDU	Lanarkshire
S2	HRM MHDU	University Hospital Hairmyers Medical HDU	Lanarkshire
U	BGH ICU/HDU	Borders General Hospital ICU/HDU	Borders
V	WSH ICU	University Hospital Wishaw ICU	Lanarkshire
V2	WSH SHDU	University Hospital Wishaw Surgical HDU	Lanarkshire
V3	WSH MHDU	University Hospital Wishaw Medical HDU	Lanarkshire
W	ARI ICU	Aberdeen Royal Infirmary ICU	Grampian
W14	ARI SHDU	Aberdeen Royal Infirmary Surgical HDU	Grampian
W2	ARI SHDU (31/32)	Aberdeen Royal Infirmary Surgical HDU	Grampian
W4	ARI SHDU (35)	Aberdeen Royal Infirmary Surgical HDU	Grampian
W7	ARI CICU	Aberdeen Royal Infirmary Cardiothoracic ICU	Grampian
W8	ARI MHDU	Aberdeen Royal Infirmary Medical HDU	Grampian
W9	ARI OHDU	Aberdeen Royal Infirmary Obstetric HDU	Grampian
X	Royal Infirmary Edinburgh ICU/ HDU	Royal Infirmary Edinburgh ICU/HDU (118)	Lothian
X13	Royal Infirmary Edinburgh RTHDU	Royal Infirmary Edinburgh joint Renal Transplant HDU	Lothian
X14	Royal Infirmary Edinburgh OHDU	Royal Infirmary Edinburgh Obstetrics HDU	Lothian
X2	Royal Infirmary Edinburgh HDU	Royal Infirmary Edinburgh HDU (116)	Lothian
X6	Royal Infirmary Edinburgh CICU	Royal Infirmary Edinburgh Cardiothoracic ICU (111)	Lothian
X7	Royal Infirmary Edinburgh CHDU	Royal Infirmary Edinburgh Cardiothoracic HDU (112)	Lothian
Y	SGH NICU	Queen Elizabeth University Hospital Campus Neuro ICU	Greater Glasgow & Clyde
Y2	SGH NHDU	Queen Elizabeth University Hospital Campus Neuro HDU	Greater Glasgow & Clyde
Z1	GBH HDU	Gilbert Bain Hospital, Shetland	Shetland

List of Abbreviations

ACP	Augmented Care Period
AF	Atrial Fibrillation
APACHE	Acute Physiology and Chronic Health Evaluation
CAM	Confusion Assessment Method in the Intensive Care Unit
CHDU	Cardiothoracic High Dependency Unit
CICU	Cardiothoracic Intensive Care Unit
CVC	Central Venous Catheter
ELC	End of Life Care
GDPR	General Data Protection Regulation
GPICS	Guidelines for the Provision of Intensive Care Services
HAI	Healthcare Associated Infection
HDU	High Dependency Unit
HIS	Health Improvement Scotland
HPS	Health Protection Scotland
HQIP	The Healthcare Quality Improvement Partnership
IAP	Intubation Associated Pneumonia
ICU	Intensive Care Unit
ICU/HDU	Combined Intensive Care Unit and High Dependency Unit
IQR	Interquartile Range
MHDU	Medical High Dependency Unit
MSQI	Minimum Standards and Quality Indicators
M & M	Morbidity and Mortality
NEWS	National Early Warning Score
NHDU	Neurological High Dependency Unit
NICU	Neurological Intensive Care Unit
MNPA	National Maternity and Perinatal Audit
OHDU	Obstetric High Dependency Unit
PHS	Public Health Scotland
PVC	Peripheral Venous Cannula

RASS	Richmond Agitation-Sedation Scale
RHDU	Renal High Dependency Unit
RRT	Renal Replacement Therapy
RTHDU	Renal Transplant High Dependency Unit
SEAN	Scottish ECT Accreditation Network
SD	Standard Deviation
SG	Scottish Government
SHDU	Surgical High Dependency Unit
SICS	Scottish Intensive Care Society
SICSAG	Scottish Intensive Care Society Audit Group
SIHCG	Sharing Intelligence for Heath and Care Group
SLT	Speech and Language Therapy
SMaCC	Scottish Maternity Critical Care Group
SMR	Standardised Mortality Ratio
SNAP	Scottish National Audit Programme
UKCCNA	UK Critical Care Nursing Alliance
WTE	Whole Time Equivalent

Key findings

- Two units were shown to have a mortality rate of significantly below the Scottish average. No unit was found to have a significantly higher mortality rate compared to the rest of Scotland.
- Overall night time discharges were at a similar level to previous years. However, there is still a wide range of average night time discharges between the units.
- Early discharges remain consistently low; however, variation is seen across the units with some having an average significantly above the Scottish average.
- Delayed discharges from critical care continue to be a challenge for units, with patients experiencing delays mainly due to a shortage of beds in other areas of the hospital. One unit was shown to have statistically significant lower delays than the Scottish average.

Introduction

Critical care underpins emergency and elective work in all acute hospitals. Annually, more than 45,000 of the most severely ill or injured patients require specialist care and treatment in Scottish critical care units. SICSAG's aim is to improve the quality of care delivered to these patients by monitoring and comparing activities and outcomes across Scottish critical care.

Data were collected prospectively from all general adult Intensive Care Units (ICU), Combined Units (ICU/HDU) and the majority of High Dependency Units (HDU) using the WardWatcher system developed for this purpose. In February 2020, an initial extract of 2019 data was sent to PHS. Validation queries relating to discharges, outcomes, ages and missing treatment information were then issued and fed back to individual units for checking by local and regional audit coordinators. A final validated extract of 2019 data was submitted to PHS in March 2020, which has been used for this report. Along with the measures taken to ensure data validity, the comprehensiveness of the data, incorporating data on all patients receiving care in participating units during 2019, ensures that the findings included in this report have a high degree of reliability at the national, health board and individual unit level.

This report follows a patient's journey through critical care focusing on: outcomes, quality indicators, activity and interventions. Due to the COVID-19 pandemic this report is smaller than planned and does not include the HAI data. HPS will be reporting later this year and will include the HAI data from critical care. All data are presented in tables and charts, with accompanying text to alert the reader to points of interest. When interpreting the unit-level charts it is very important to remember that each unit is unique in terms of case load, patient case-mix and geographical factors. These may all contribute to any differences seen. In addition, this is the third year of reporting the revised MSQIs. Whilst they remain stretching and ambitious, SICSAG have developed the reporting of these standards and indicators to reflect better the amount of work that units are doing to achieve them.

Please refer to the SICSAG website (www.sicsag.scot.nhs.uk) for information on the methodology of the audit and for Data Protection GDPR (General Data Protection Regulation) information.

New Chairperson and Clinical Coordinator

As stated in the SICSAG 2019 report Dr Stephen Cole and Dr Charles Wallis have come to the end of their time as Chair and Co-Chair. In November 2019 Dr Naz Lone was elected as the new Chair. Dr Lone works as a Consultant at the Royal Infirmary of Edinburgh and is a Senior Clinical Lecturer in Critical Care at the Usher Institute, University of Edinburgh. Dr Neil Stewart is the new Co-Chair, Dr Stewart is a Consultant in Anaesthesia and Intensive Care Medicine at Forth Valley Royal Hospital.

Paul Smith, after 5 years as the clinical coordinator for SICSAG has moved to become the Clinical Coordinator for the Scottish ECT Accreditation Network (SEAN), he has been succeeded by Ros Hall who has been the regional coordinator for the SICSAG audit for the last 5 years. We would like to express our gratitude to Paul for his leadership over the last 5 years and wish him the very best in his new role.

Funnel Plots

Throughout the report, funnel plots are used to allow comparisons to be made between different service providers. These control charts can help guide quality improvement activities by flagging up areas where there is evidence of variation. It should be recognised that in a comparison of 25 units, there is a reasonable chance of an outlier at the 2SD (5% or 1 in 20) level. Where there are significant statistical differences with the units and the Scottish mean, it may warrant further local investigation. Differences may arise from many sources for example, in data accuracy, case-mix, service provision or practice. Sometimes a difference will be just a random variation caused by chance alone. SICSAG encourage readers to use the data to examine practice in the context of the factors listed.

Spring WardWatcher Workshop

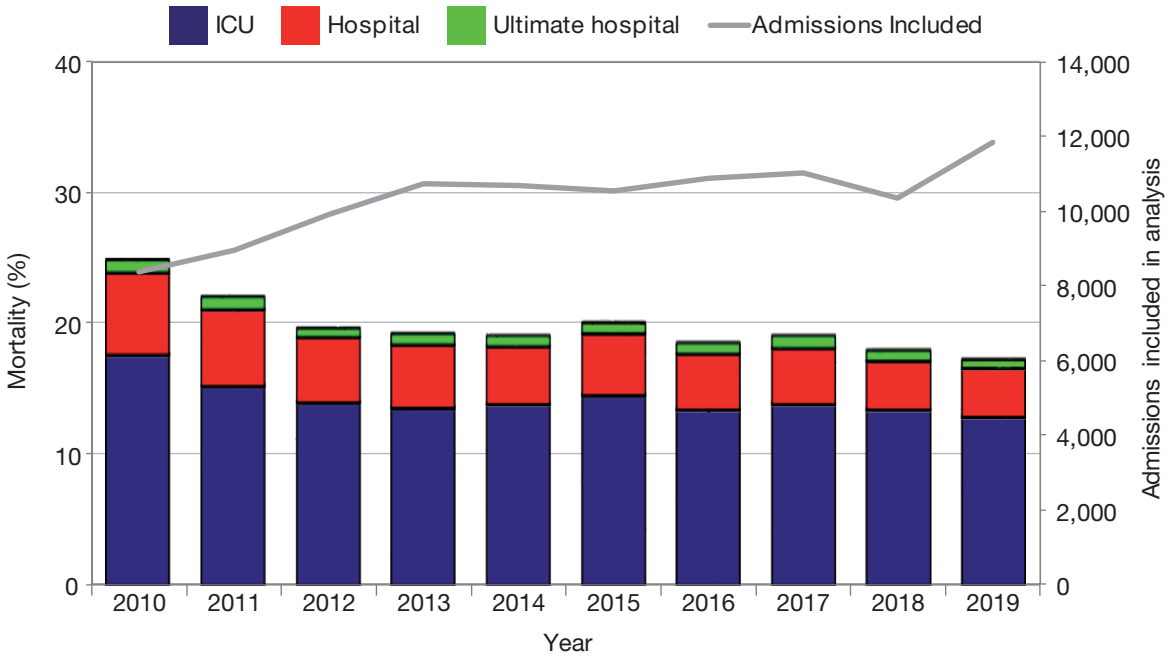
Due to the COVID-19 pandemic the spring workshop was unfortunately cancelled, we are hopeful this will run in 2021 when we plan to use it to start the next revision of the Minimum Standards and Quality Indicators (MSQI).

Ros Hall

Clinical Coordinator

Section 1 Outcomes

Figure 1 Scottish crude mortality of patients in ICU and combined units (2010-2019)



Note:
Only includes patients with mortality predictions.

The solid grey line shows a general increase in admissions to ICUs and combined units in Scotland since 2010. While admissions have increased, overall crude mortality has decreased since 2010 with further smaller decrease in more recent years. In 2019 17% of patients died before ultimate hospital discharge, compared to 19% in 2017 and 18% in 2018.

Hospital mortality relates to patients dying post ICU discharge in the same hospital as the unit. The ultimate hospital mortality relates to mortality of patients transferred from the original admitting hospital. It should be remembered that the above data are not adjusted for illness severity or case-mix, which can change over time.

Figure 2 **Scottish Standardised Mortality Ratios in ICU and combined units, using the Standard APACHE II model (2010-2019) and Recalibrated APACHE II model (2010-2019)**

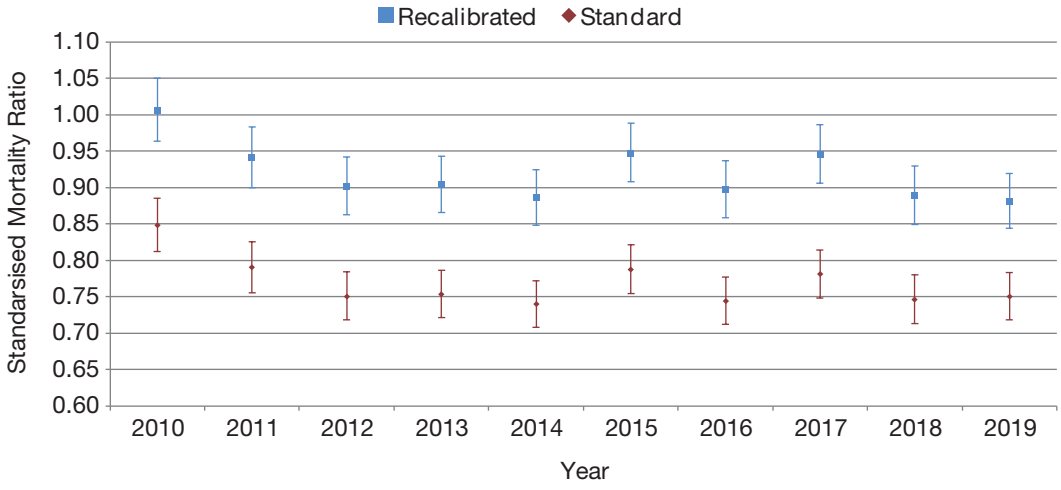


Figure 2 shows the Standardised Mortality Ratios (SMR) using both the standard and recalibrated APACHE models. The SMRs are calculated by dividing observed mortality by the expected mortality using APACHE II methodology (see www.sicsag.scot.nhs.uk). This allows a better comparison of mortality over time as illness severity and case-mix are adjusted.

The APACHE II scoring system was recalibrated to better reflect a Scottish population rather than an external reference population; however the standard is included here for international comparison. Both models follow a similar pattern over time and in 2019, the SMR remains at a similar level to previous years. The standard SMR was 0.75 and the recalibrated model was 0.88. The lower SMR produced using the standard APACHE II model is expected, as this model was derived using historic, international cohorts. For this reason, the standard model consistently over predicts mortality for patients admitted to Scottish ICU and Combined Units.

Figure 3 Standardised Mortality Ratios using recalibrated APACHE II model in ICU and combined units (2019)

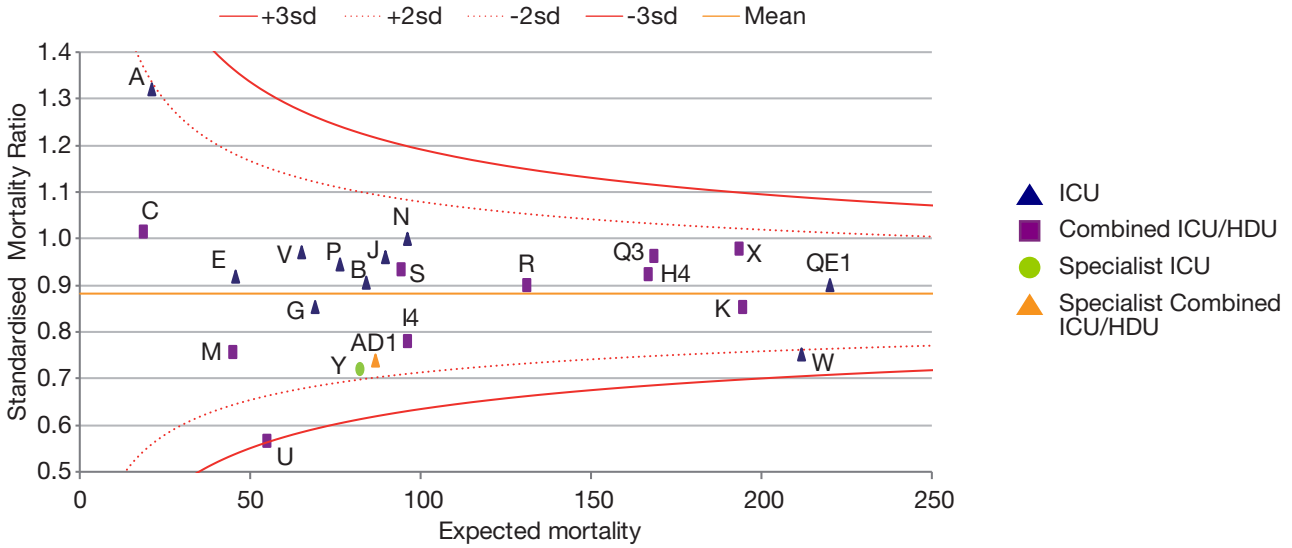
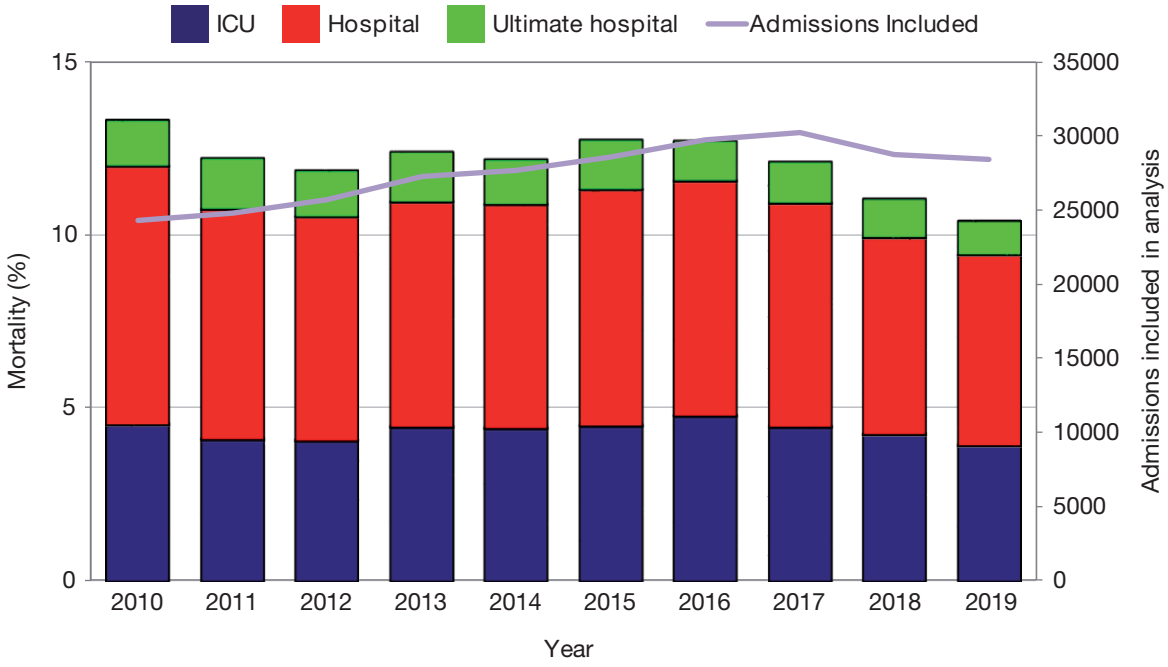


Figure 3 shows the SMR for ICU and combined units and is calculated using the recalibrated APACHE II model. No units were outside the control limit at 2 standard deviations above overall SMR. The SMRs for Unit W (Aberdeen Royal Infirmary) and Unit U (Borders General Hospital) were 2 standard deviations below the overall SMR.

"Since mid-2018, we have identified and corrected an issue with the collection of severity data for patients suffering out of hospital cardiac arrest, which may have lead to under estimation of predicted mortalities. We have worked with our local teams to ensure accurate data is collected. During 2019 we also instituted weekly reviews of local quality indicators such as use of lung protective ventilation, sedation breaks and early mobilisation."

Unit W (ARIICU)

Figure 4 Scottish crude mortality of patients in HDUs (2010-2019)

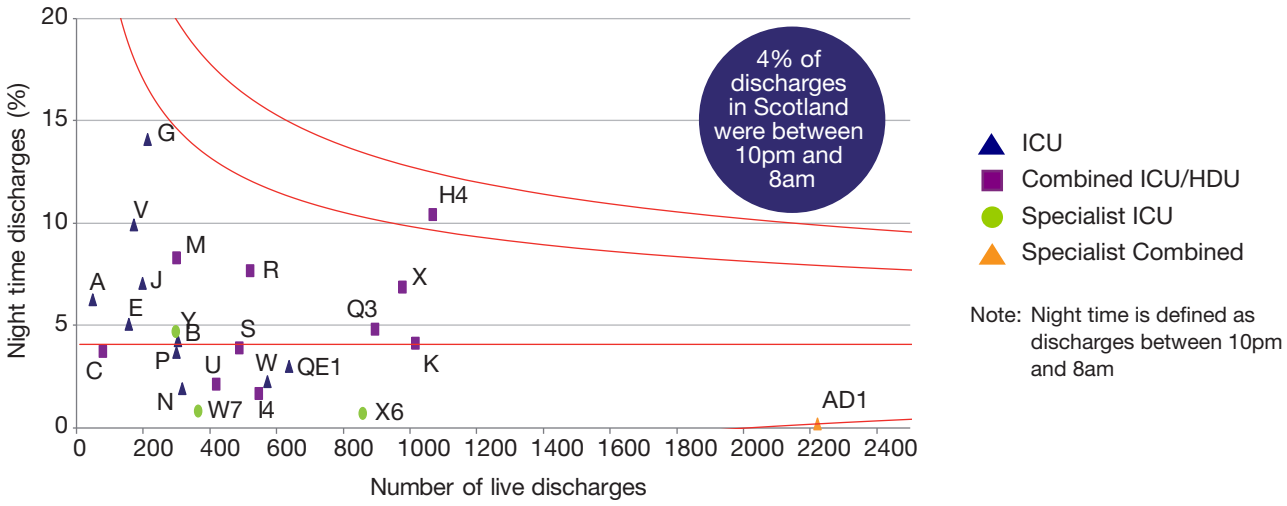


Crude mortality in patients admitted to HDUs has decreased in recent years. In 2019 10% of HDU patients died before their ultimate discharge from hospital as compared with 17% for ICU/ combined units. It should be remembered that the above data are not adjusted for illness severity or case-mix, which can change over time.

Section 2 Quality Improvement

2.1 Night time discharges

Figure 5 Night time discharges from ICU and combined units (2019)



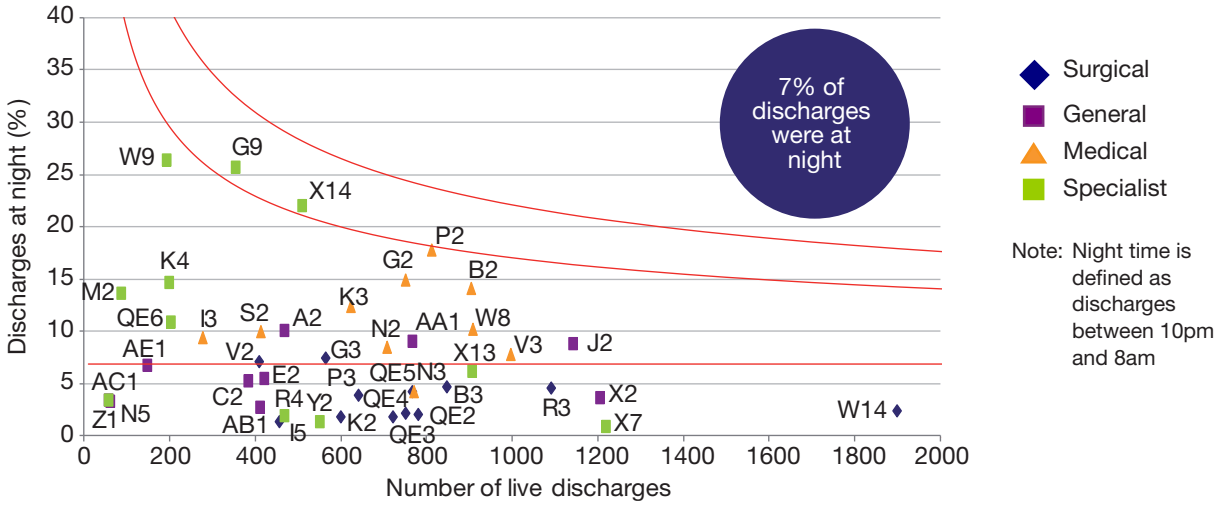
Night time discharges have been associated with worse outcomes for patients and should be avoided where possible[3,4,5]. The average discharge at night in 2019 was 4%. This is consistent with previous years.

Unit H4 (DGRI ICU/HDU) is an outlier over the 2SD line, providing some evidence that night time discharges are significantly higher in this unit compared to the average in Scotland.

"Following last year's outlier status, we met with the site capacity team to see if we could improve night time discharge rates. Priority is always given to front of house (ED and Combined assessment) so CCU discharges then move late in the day. We are organising a meeting with CCU Charge Nurses and Capacity Team to discuss. Our HDU/Level 2 patients of the combined unit are managed in an `open` fashion by referring/ parent clinicians so discharging during the day for these patients is not as proactive as ideal. During the COVID crisis we 'closed' the whole unit and it was felt that bed management was more efficient. We are exploring ways of achieving this in the longer term but this would need more Medical staff. 7 of the 161 patients discharged at night were classified as `early discharges`. We are going to undertake a case note review of these. The majority (85%) were level zero or 1 on their last day. We are not an outlier for readmission rate. This offers some reassurance but more work is required to understand the data better. We have added a prompt at our daily huddle."

Unit H4 (DMG ICU/HDU)

Figure 6 Night time discharges in HDUs (2019)



In 2019 6% of discharges from HDUs were between 10pm and 8am.

Units G9 (CRH OHDU) and X14 (Royal Infirmary Edinburgh OHDU) are outliers above the 2SD line, providing some evidence that the percentage of night time discharges in these units is significantly higher compared to the Scottish average.

"In AMU we have a consultant obstetrician-led ward round every evening at 21:00, with all patients on labour ward (including OHDU) having a consultant review at that time. We use this as an opportunity for decision making regarding fitness for discharge to the obstetric inpatient ward, so any women assessed as being ready for step down to the ward can then be safely discharged. No patient is discharged from OHDU without senior medical review. The same team look after patients on both labour ward and the inpatient ward thus ensuring continuity of care. Midwifery staff on the inpatient ward, which is geographically close to labour ward, can easily contact the obstetric team for review at any time."

Unit G9 (CRH09 OHDU)

"The obstetric HDU in the Royal Infirmary Edinburgh (X14) is once again an outlier for night time discharges with a value of just over 20%. We know from previous year's data that the unit is busy (highest number of admissions of any Scottish obstetric HDU) and approximately a third of those admissions are overnight (10pm to 8am).

All discharges from the HDU are made following a consultant led ward round which occurs after each medical handover, in our case that is 8.30am and 8.30pm. Therefore these patients are deemed fit for HDU discharge at 9/9.30pm which often translates into an actual discharge after 10pm even without bed pressures.

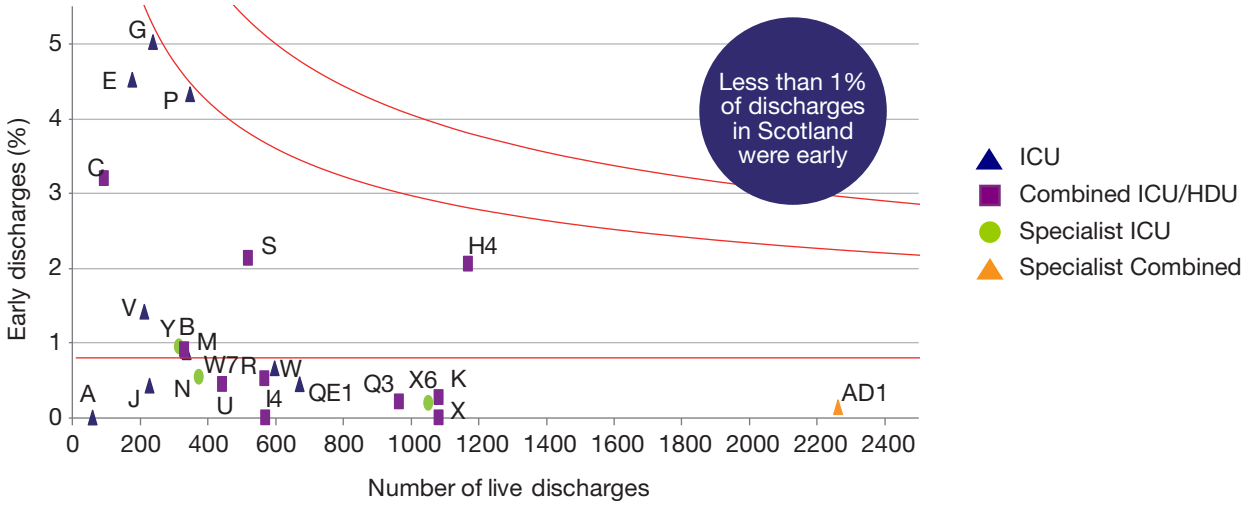
We are comfortable with discharging these patients to the ward area overnight for several reasons: the altered physiology of pregnancy allows women to rapidly normalise after their initial insult, babies are born at all times of the day, but preferentially at night and maternity units reflect that fact, and as a result there is no expectation that the postnatal ward will 'go to sleep' unlike other wards in the hospital and are resourced as such.

Night time discharges are quite rightly a quality indicator for the general critical care population as studies have shown harm but this is not translatable to the obstetric or the obstetric HDU population."

Unit X14 (RIE OHDU)

2.2 Early discharges and readmissions

Figure 7 Early discharges in ICUs and combined units (2019)

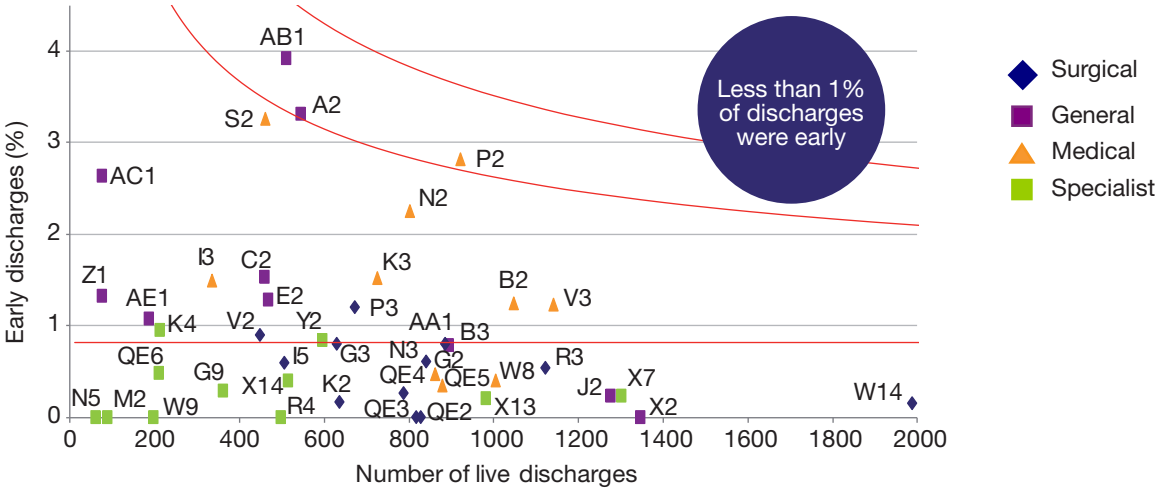


Note: Early discharge is defined as a transfer that is not in the best interest of a patient but necessary due to pressure on beds or staffing. From ICU, patients are usually discharged to another area in the hospital. The definitions have changed since 2016, with discharges to another area at the same level of care excluded from the figures.

Unit P (RGM ICU) despite not being an outlier for early discharges felt their percentage was higher than they would expect. They have subsequently reviewed all of the early discharges and found a significant number were in fact not early but have been labelled as such due to staff misunderstanding the term. The data for 9 patients has been corrected and teaching arranged to ensure all staff understand the meaning of the term early discharge. Any updates to WardWatcher are not reflected in the graph as no changes can be made to the final data after 31/03/2020.

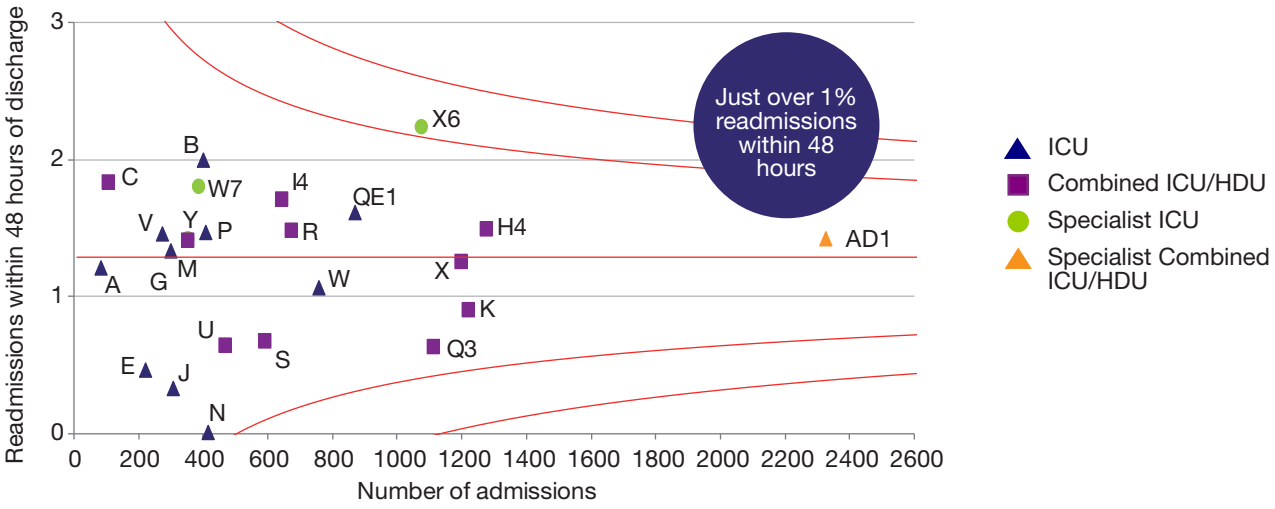
The vast majority (over 95%) of patients that are marked as an early discharge from ICUs and combined units are discharged to another area in the same hospital. However, an early discharge is defined as a transfer that is not in the best clinical interest of the patient and should be avoided. In 2019 there were no outliers on the funnel plot.

Figure 8 Early discharges in HDUs (2019)



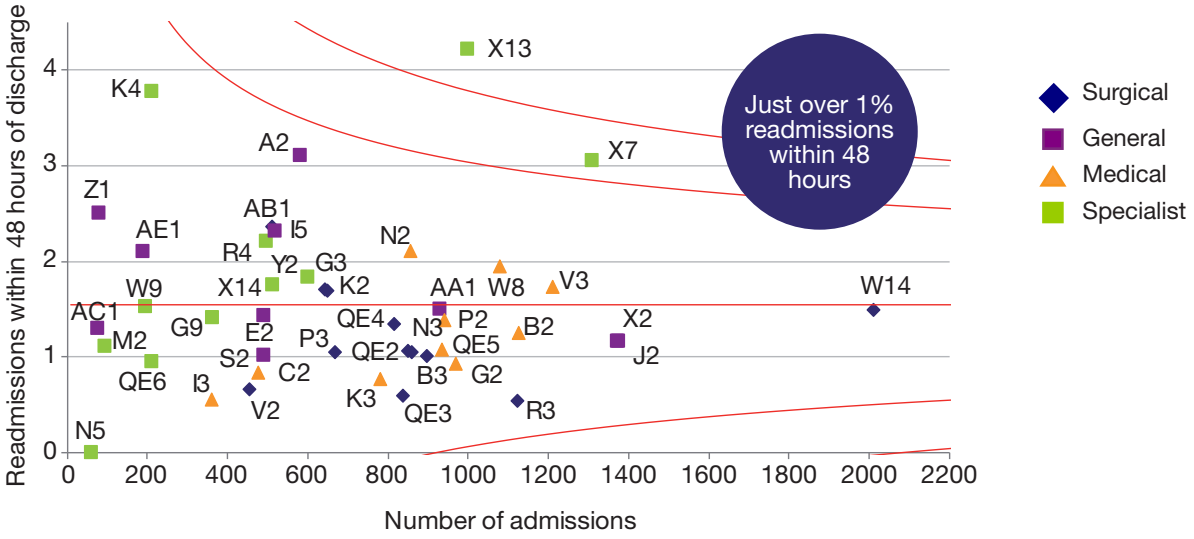
In 2019 the percentage of early discharges from HDUs remained consistently low. Units AB1 (WIH HDU), P2 (Raigmore MHDU) and A2 (IRH HDU) are outliers above the 2SD line, providing some evidence that the percentage of early discharges in these units is significantly higher than the Scottish average.

Figure 9 Readmissions within 48 hours of discharge to ICUs and combined units (2019)



In 2019 just over 1% of discharges from ICUs and combined units were readmitted to the same unit within 48 hours of discharge from the same unit. Readmissions can be an indication that a patient was discharged to a downstream bed too soon. Unit X6 (Royal Infirmary Edinburgh CICU) is an outlier over the 2SD line.

Figure 10 Readmissions within 48 hours of discharge to HDUs (2019)



In 2019 1.5% of admissions to HDUs were readmissions for patients that had been discharged from the unit less than 48 hours previously. Units X13 (Royal Infirmary Edinburgh RTHDU) is an outlier above 3SD and X7 (Royal Infirmary Edinburgh CHDU) is an outlier above 2SD.

"Ward 215 is a combined renal and transplant ward. The HDU beds are also used for provision of haemodialysis out-of-hours (emergency / pre-transplant etc), patients initiating haemodialysis in the acute setting and providing monitored haemodialysis to patients in other HDUs. A significant proportion of the re-admissions within 48 hours is accounted for by these haemodialysis admissions."

Unit X13 (Royal Infirmary Edinburgh RTHDU)

"We have an 'open' ICU/HDU where the surgeons have admitting rights, there is a low threshold for the surgical team to readmit from the ward to the HDU due to a combination of reasons:

The Hospital At Night Team cover our cardiothoracic ward out of hours, there is a low threshold for transferring the cardiothoracic patients to HDU.

Approximately a third of our cardiac patients get delirium in the post-operative period. Due to the higher nursing ratios on the HDU, this group of patients are often transferred back.

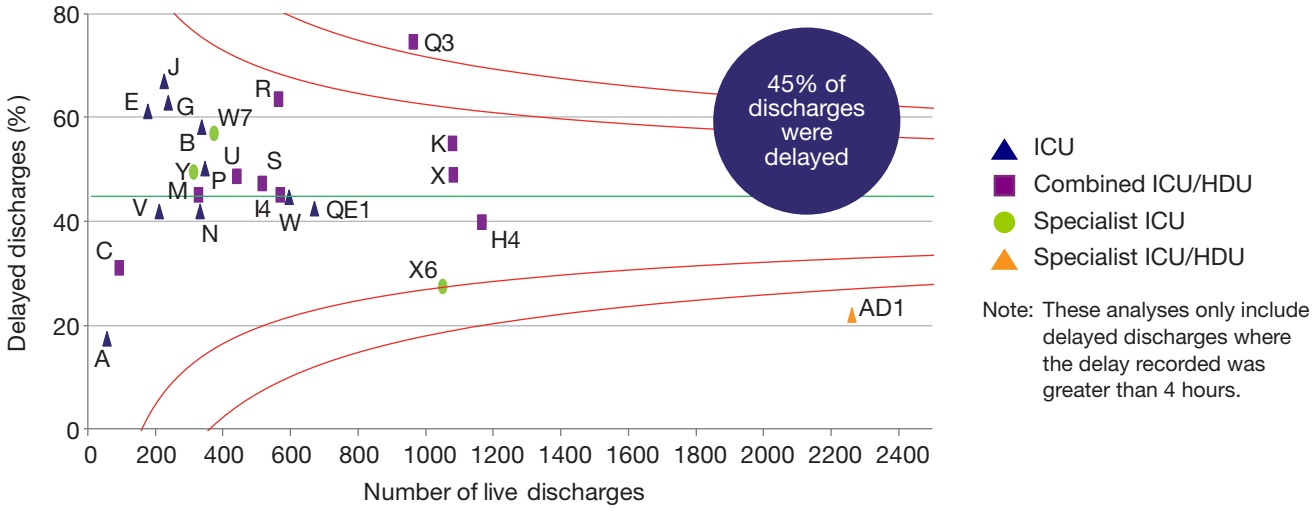
Atrial Fibrillation (AF) is also a common affair, patients are transferred for monitoring and administration of intra-venous amiodarone."

Unit X7 (Royal Infirmary Edinburgh CHDU)

2.3 Delayed discharges

Delayed discharges are instances where patients are deemed clinically ready for discharge, but there is a delay or "gap" before actual discharge. The most common reason for delayed discharge is a shortage of available ward or HDU beds. This in turn can be due to delayed discharge of patients from acute hospital beds, often caused by lack of social care in the community. In times of peak demand, this effect can back up into critical care areas.

Figure 11 Delayed discharges of greater than 4 hours from ICU and combined units (2019)



Note: These analyses only include delayed discharges where the delay recorded was greater than 4 hours.

In 2019, almost half of patient-episodes had a delay in their discharge of over 4 hours from ICUs/ combined units in Scotland.

Q3 (FVRH ICU/HDU) is an outlier 3SD above the Scottish mean, with 74% of discharges having a delay of over 4 hours. They were also an outlier above 3SD in the last three years.

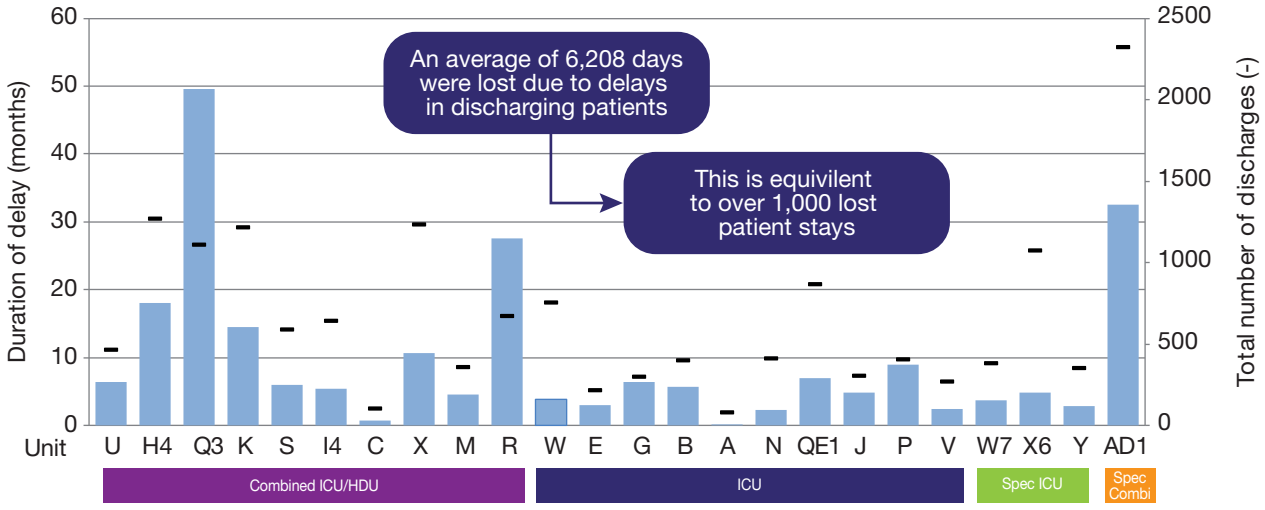
"This is a result of capacity and flow issues across the hospital. Reassuringly local data confirms delayed admissions to critical care are extremely rare. There is ongoing work to improve patient flow across all areas of NHS Forth Valley."

Unit Q3 (FVRH ICU/HDU)

"We report as a combined unit, and so the data predominantly relates to discharges from HDU. The majority of these are to the ward. We were aware of delays in bed availability on the ward, and a ward based 'discharge team' was implemented in the middle of the year to facilitate efficient discharge of patients. When we interrogated our local data by discharge destination, it confirmed that the delays have reduced for these patients since the implementation of the change. Over the next year there are plans to introduce a bed manager across the floor, rather than individual areas managing their bed resource. One of the outcome measures will be a further reduction in delayed discharges from critical care. The data collected through WardWatcher has been accurate and valuable in the identification of the delays and assessment of the improvement work."

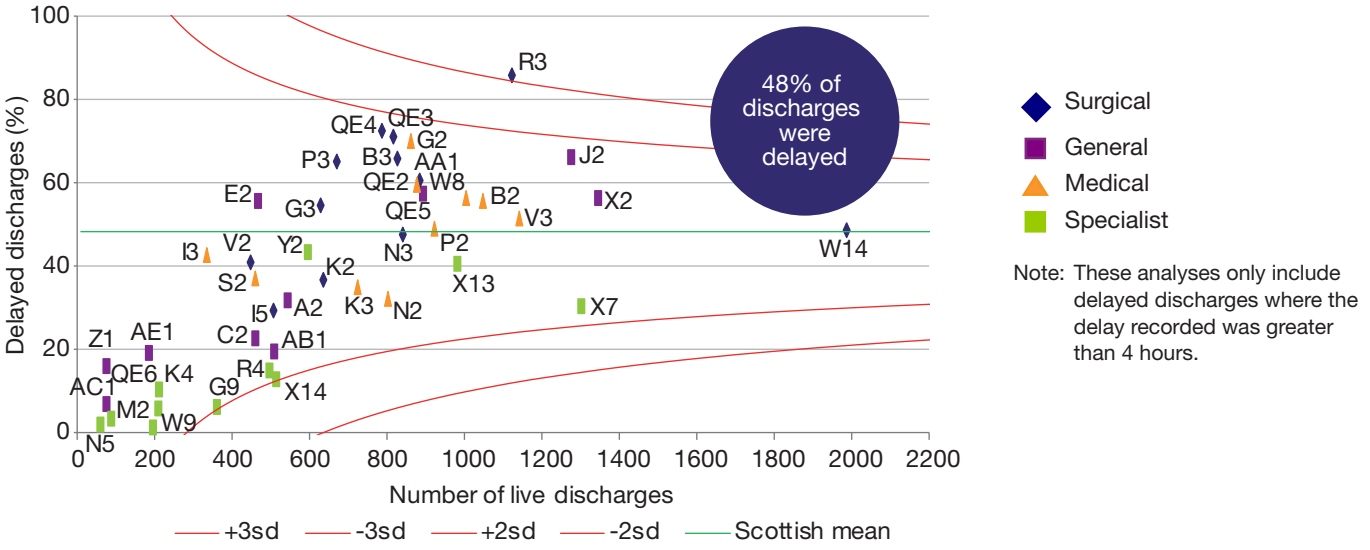
Unit AD1 (GJNH ICU/HDU)

Figure 12 Sum total of delayed discharges from ICU and combined units (2019)



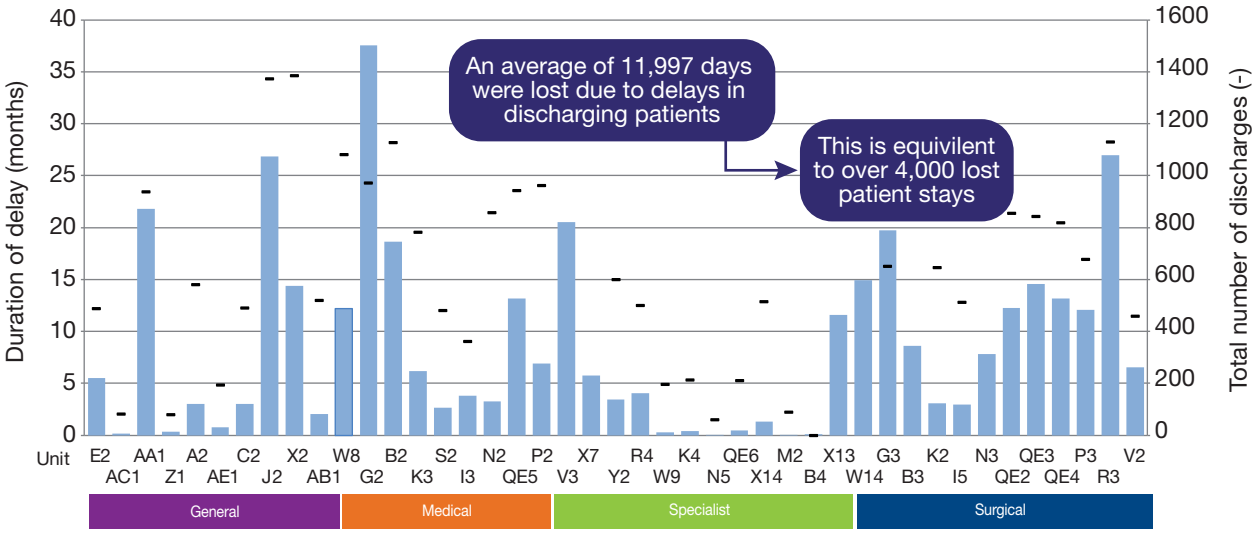
Unit Q3 (FVRH ICU/HDU) had the highest sum total of delayed discharges in ICUs and combined units. As seen in Figure 11, they are also an outlier for the number of delayed discharges of longer than 4 hours at 3SD above the Scottish mean. This delay is mainly due to a lack of available ward beds at the hospital. Overall in Scotland, 6,208 bed-days were occupied due to delays in discharging patients. Using the mean length of stay as a reference, this would be equivalent to over 1,000 additional patient stays that could have been accommodated. This is very similar to previous years, indicating a continuing trend of high delayed discharges from ICUs in Scotland.

Figure 13 Delayed discharges of greater than 4 hours to HDUs (2019)



In 2019 48% of episodes in Scotland had a delay in their discharge of over 4 hours. Unit R3 (WGH SHDU) had significantly higher delayed discharges compared to the Scottish mean, with 86% of episodes having a delay of 4 hours or more. This is a reflection of the capacity issues in the wards in this hospital.

Figure 14 Sum total of delayed discharges from HDUs (2019)

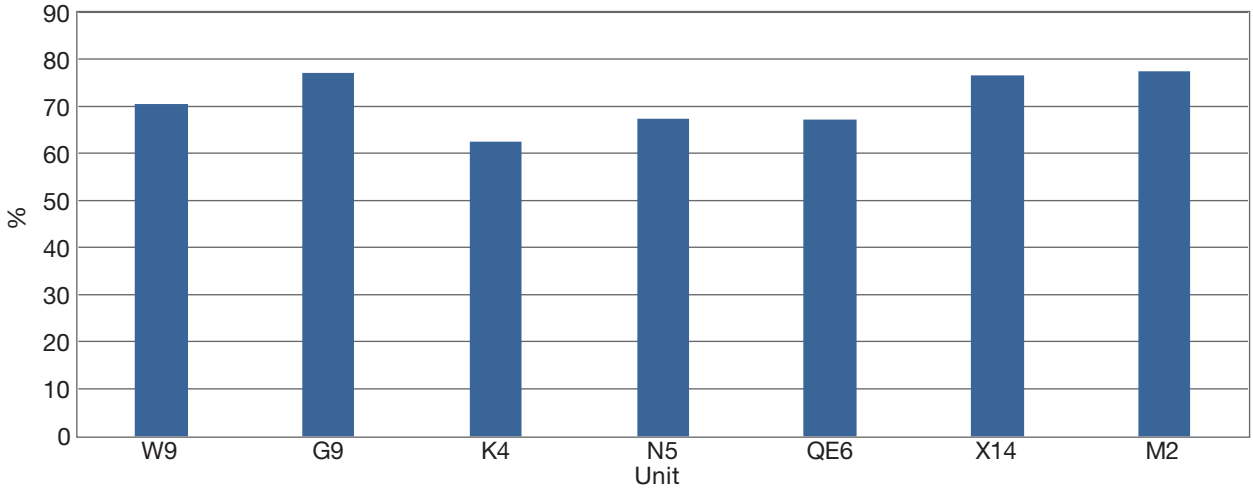


Unit G2 (CRH MHDU) had the highest sum total of delayed discharge for HDUs in Scotland. Overall in Scotland 11,997 days were lost due to delays in discharging patients. Using the median length of stay as a reference, this would be equivalent to over 4,000 lost patient stays. This is very similar to previous years, indicating a continuing trend of high delayed discharges from critical care in Scotland.

2.4 Obstetrics

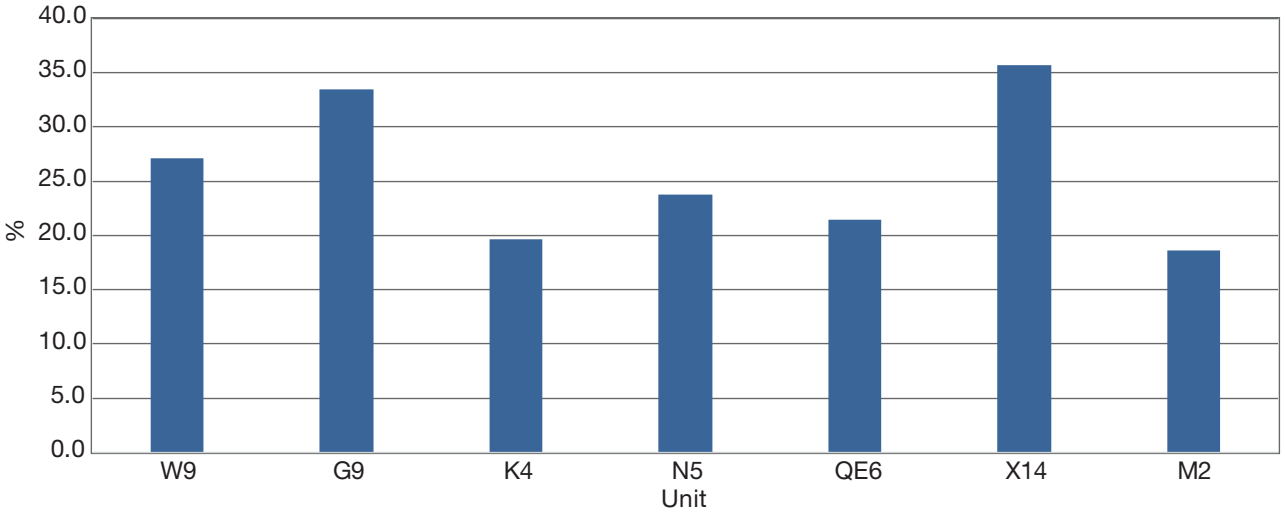
Following on from the expanded obstetric section in the 2018 report, SICSAG continues to report on obstetric specific quality indicators in obstetric high dependency units but also, on obstetric specific data from intensive care units across Scotland. It is SICSAG's aim to do so on a rolling annual basis.

Figure 15 Percentage days in 2019 where babies were looked after with the mother



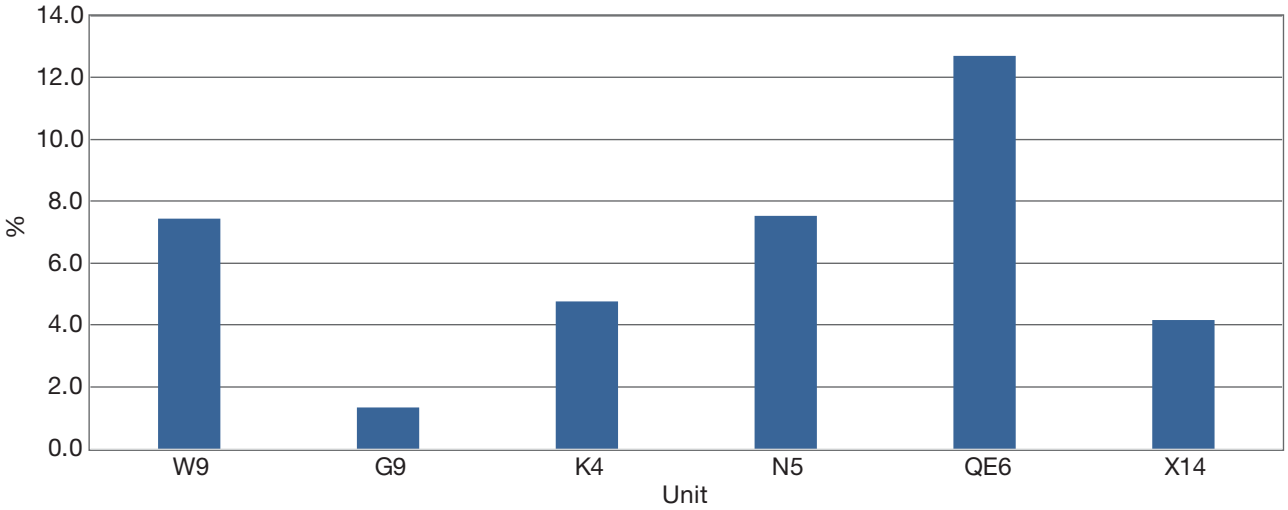
Maintaining contact between a mother and her newborn baby is vitally important, even if the mother needs additional care. These figures illustrate the majority of delivered women in an obstetric HDU have their baby with them. Under normal circumstances approximately 1 in 10 babies (10%) will need to be cared for in the neonatal unit, 54% of those are born at term and 46% will have been born preterm (<37 weeks gestation). In Scotland's obstetric HDUs covered by the audit, 20 – 40% of babies are not with their mothers reflecting how the health of the mother affects the health of her baby.

Figure 16 Percentage days in 2019 where the baby required extra care



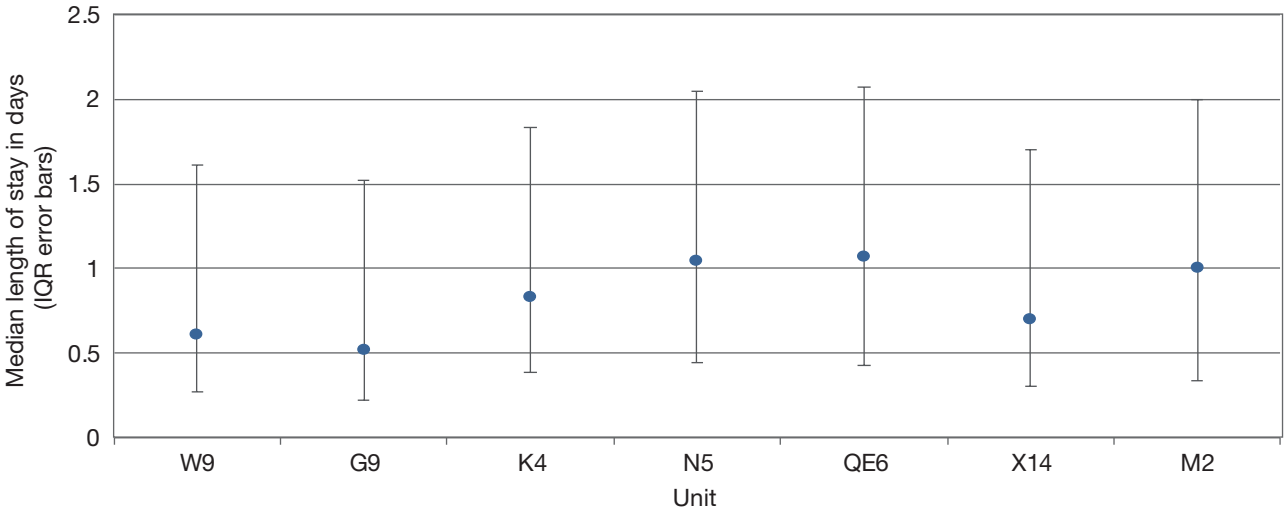
This additional question was added in order to quantify the additional workload for midwifery staff in obstetric HDUs where there is not only a sick mother but also a newborn baby needing extra care (defined as baby on a National Early Warning Sore (NEWS) chart for any reason). There is currently no agreed staffing ratio for obstetric HDUs which take into account this additional workload.

Figure 17 Percentage days for all patients in an obstetric HDU with use of bakri uterine balloons (2019)



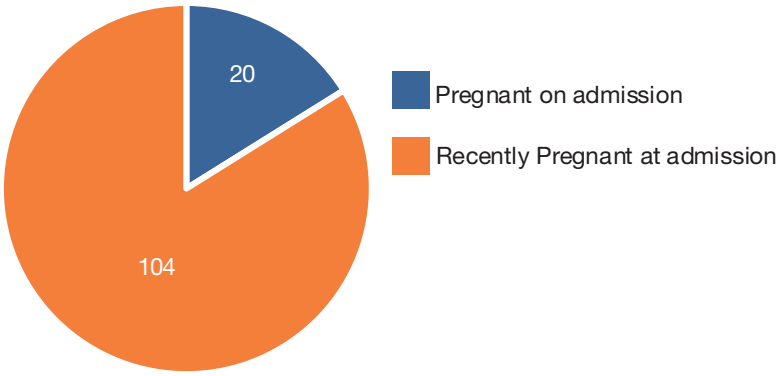
A bakri balloon is used in cases of uterine atony where the uterus is not adequately contracted post delivery. It exerts internal pressure to tamponade bleeding areas from the placental bed. Its increased use has correlated with a decreased peripartum hysterectomy rate according to the Scottish Confidential Audit of Severe Maternal Morbidity[6]. The wide variation in use has been seen in previous years with other audits.

Figure 18 Median length of stay in Obstetric HDUs (2019)



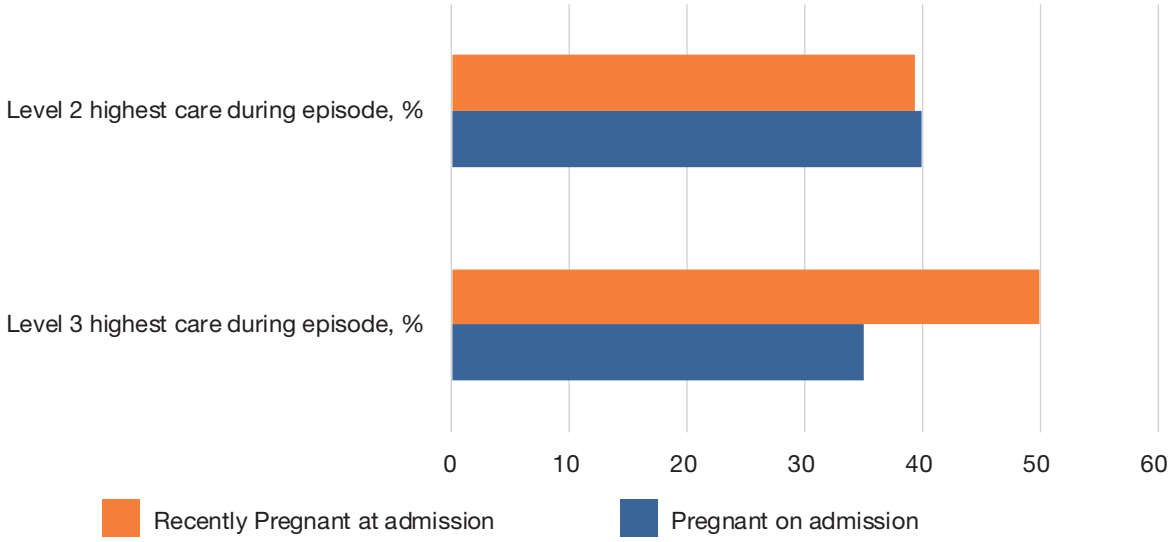
The average length of stay in an obstetric HDU is short. Patients are younger and recover rapidly from haemorrhage and pregnancy induced hypertension related pathologies, the two most common reasons for admission.

Figure 19 Pregnant and recently pregnant episodes of care in ICUs and combined units (2019)



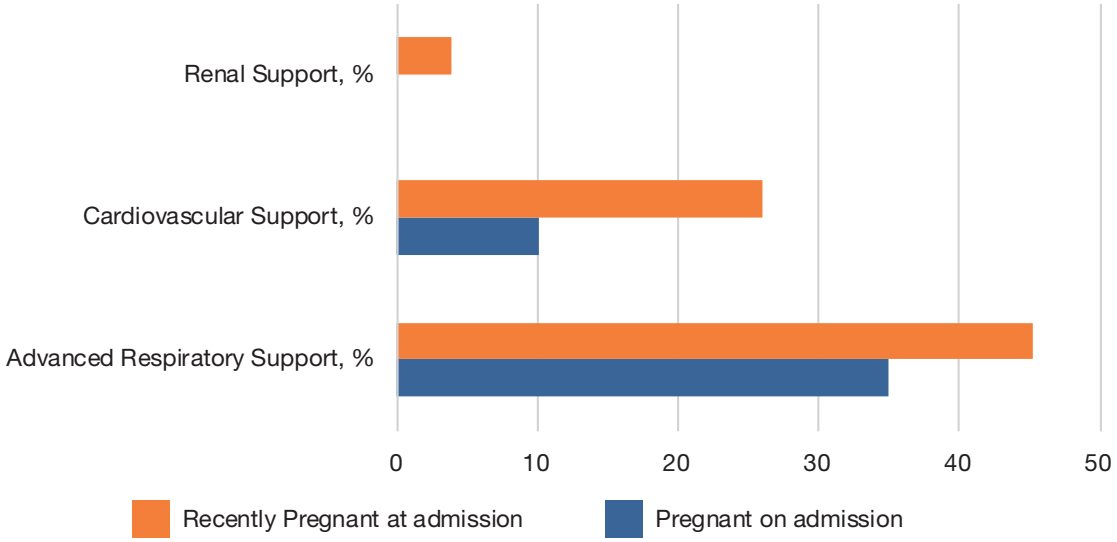
Consistent with previous studies by the Intensive Care National Audit and Research Centre and National Maternal and Perinatal Audit the majority of critical care utilisation by maternity services is in the postpartum period – major obstetric haemorrhage is the main reason for admission to critical care.

Figure 20 Level of care for recently pregnant episodes of care in ICUs and combined units (2019)



The high rates of level 2 critical care use may reflect the cautious nature of those looking after critically unwell maternity patients or that the smaller maternity units do not have HDU facilities/ HDU trained midwives and are using critical care to look after the sicker patients.

Figure 21 Organ support for currently pregnant and recently pregnant patients with episodes of care in ICUs and combined units (2019)



The intervention rates reflect the split between level 2 and level 3 in critical care, respiratory support is most commonly required, renal support is rarely required in obstetric patients.

2.5 Quality indicators and staffing summary

Minimum Standards & Quality Indicators (MSQI)

During 2019 the SICSAG audit became part of the Scottish National Audit Programme (SNAP) formerly known as the Scottish Healthcare Audits. SNAP have a nationally agreed governance process which will be applied to all of the audits. As with previous years any units who are not achieving the MSQI have been contacted and the replies are published in this report.

The current MSQIs can be viewed at the following link; https://www.sicsag.scot.nhs.uk/quality/indicators.html. There are plans to review the MSQI during 2020/2021.

Table 1 Summary of ICUs and combined units compliance with SICSAG Quality Indicators (2019)

Table key

1 Not implemented and no plans to implement.
2 Not implemented but a plan is in place to implement in the next 6 months.
3 The unit complies with this indicator in some patients but not all OR it is implemented but not documented in the majority of cases.
4 Unit complies with this indicator in the vast majority of patients OR is implemented and documented in the vast majority of cases.
5 This is fully embedded into unit practice, and can evidence this fully if required.

Unit Name	Daily Review	Consultant led review	Pharmacist	Physiotherapist	Care bundles	Tracheostpmy assessment	Delirium	Rehabilitation	End of life policy	M&M meetings	Patient/family survey
University Hospital Wishaw ICU	5	5	4	5	5	5	5↑	5	5	5	5
Victoria Hospital Kirkcaldy ICU[1]	5	5	3↑	5	4	4	4	5	4	5	5
Royal Alexandra Hospital ICU	5	5	4	5	5	5	5	5↑	5	5	5
Raigmore Hospital ICU[2]	5	3↑	4	5	5	4↓	4↓	5	5	5	4↑
Queen Elizabeth University Hospital ICU3&4	5	4↓	4	5	5	5	4↓	5	5	5	5
Ninewells Hospital ICU	5	5	4	5	5	4	4	4	4	5	5
Inverclyde Royal Hospital ICU[3]	4	3	4	4↓	5	5	5	5	5	4	3↑
University Hospital Crosshouse ICU[4]	4↓	4	4	5↑	5	3	5↑	4↑	5	5	5
University Hospital Ayr ICU[5]	4	3	4	4	5	4	4	4	5↑	4	5
Aberdeen Royal Infirmary ICU[6]	5	5	4	5	5	5	3↓	4	5	4	5
Dumfries & Galloway Royal Infirmary ICU/ HDU[7]	5↑	3	2↓	5	5	5	5↑	5↑	4↑	4	5
Western General Hospital Edinburgh ICU/ HDU[35]	5	5	4	5	5	4↓	3↓	4	5	5	4
St Johns Hospital ICU/HDU Livingston	5↑	5↑	4	5	5	4	4↓	4	5	5	5
Royal Infirmary of Edinburgh ICU/ HDU	5	5	4	5↑	5	4	5	4	5	5	5
University Hospital Monklands ICU/ HDU[8]	5	5	4	5	5	5	5	5	5	5	2↓

Table key

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5 This is fully embedded into unit practice, and can evidence this fully if required.

Unit Name	Daily Review	Consultant led review	Pharmacist	Physiotherapist	Care bundles	Tracheostpmy assessment	Delirium	Rehabilitation	End of life policy	M&M meetings	Patient/family survey
University Hospital Hairmyres ICU/ HDU	5	4	4	5	5	5	5	5	5	5	5↑
Glasgow Royal Infirmary ICU/ HDU	5	5	4	5	5	5↑	5	5	5	5	5
Forth Valley Royal Hospital ICU/ HDU	5	3	4	5	5	5	5	4	5	5	5
Borders General Hospital ICU/ HDU	5	5	4	5↑	5	5	4	4	5	5	5
Golden Jubilee Hospital ICU/ HDU[9]	5	5	4	5	5	5	5	5	4↑	5	5
Perth Royal Infirmary ICU/ HDU[10]	5	3	4	5	5	5	4↓	4	5	5	5
Queen Elizabeth University Hospital Neuro ICU	5	5	4	5	5	5	5	4	5	5	5
Royal infirmary of Edinburgh Cardiothoracic ICU[11]	5	5	4	5	5	5	5	4	4↑	5	2
Aberdeen Royal Infirmary Cardiothoracic ICU	5	4	4	5	5	5	3	4	3	5	5

* These units have commented on their quality indicators, please see section 2.7.

Table 2 Summary of HDUs compliance with SICSAG Quality Indicators (2019)

Table key

1 Not implemented and no plans to implement.
2 Not implemented but a plan is in place to implement in the next 6 months.
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4 Unit complies with this indicator in the vast majority of patients OR is implemented and documented in the vast majority of cases.
5 This is fully embedded into unit practice, and can evidence this fully if required.
* Crosshouse obstetrics are a new unit opened on 1st June 2019 are working on achieving the required MSQI.

Unit Name	Daily consultant review and written management plan	Consultant-led twice daily ward rounds	Pharmacist	Physiotherapist	Care bundles in place for; IAP, CVC, and PVC	Screening for Delirium in Critical Care	Rehabilitation needs in Critical Care	End of life care policy in place	Deaths and adverse events discussed at regular clinical governance meetings	A regular patient/family experience survey is undertaken in the unit
Western Isles Hospital HDU Stornoway[12]	5↑	4↑	1	1	5	3	4↓	4↓	5↑	2
Royal Infirmary of Edinburgh HDU	5	4	4	5	5	5	3	5	5	5
Royal Alexandra Hospital HDU[13]	4	1	4	5	5	4	5	5	3	5
Perth Royal Infirmary HDU[14]	5	3↓	4	5	5	4	4	4	2↓	5↑
Inverclyde Royal Hospital HDU	4	3	4	5	5	5	4	4	3	5
Gilbert Bain Hospital HDU, Shetland[15]	5	5	4	5	5	4	4	3↓	5	1↓
Dr Gray's Hospital HDU Elgin[16]	4	4↑	4↑	4	5	5	1↓	1	3↓	5
Belford Hospital HDU[17]	5	5	4	4	5	4↑	4	5	5	3↑
Balfour Hospital, Orkney HDU[18]	5	4	4	4	5	3↑	4	4	4	2
University Hospital Ayr HDU[19]	4	3	4	4	5	3	4	5↑	3	5
University Hospital Wishaw CCU/MHDU[20]	5↑	3↑	4↑	5	5	5↓	4	5↑	3↑	5
Victoria Hospital Kirkcaldy MHDU[1]	5	5	2	5	5	3	5	5	5	5
Raigmore Hospital MHDU[21]	4↓	4	4	4	5	4	4	2	3	5
Queen Elizabeth University Hospital MHDU Unit 5	5↑	4↓	4	5	5	5	3↓	4↓	5	5
Ninewells Hospital MHDU[22]	5	3	4	4	5	5	3	5	5	5

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Unit Name	Daily consultant review and written management plan	Consultant-led twice daily ward rounds	Pharmacist	Physiotherapist	Care bundles in place for; IAP, CVC, and PVC	Screening for Delirium in Critical Care	Rehabilitation needs in Critical Care	End of life care policy in place	Deaths and adverse events discussed at regular clinical governance meetings	A regular patient/family experience survey is undertaken in the unit
University Hospital Monklands MHDU[23]	5	4	4	5	4	4	4↑	4	4	5
University Hospital Hairmyres MHDU[24]	5	1↓	4	5	4	3↓	5	4↑	4↑	4↑
Glasgow Royal Infirmary MHDU[25]	5	5	4	5	5	4↓	4	2↓	5	5
University Hospital Crosshouse MHDU	5	4	4	4	5	5	4	5	5	5
Aberdeen Royal Infirmary MHDU	5	5	4	5	5	5	4	5	5	5
Western General Hospital Neuro HDU[26]	4↓	3↓	4↑	5	5	5↑	5	3↓	5↑	5
Queen Elizabeth University Hospital Neuro HDU	5	5	4	5	5	4	4	4↑	5	5
Royal infirmary of Edinburgh joint Renal Transplant HDU	5	4	4	5	4	4↑	4	4	5	5
Royal Infirmary of Edinburgh Cardiothoracic HDU[11]	5	5	4	5	5	5	4	4↑	5	2
Queen Elizabeth University Hospital HDU 1,2 and 6	5	4	4	5	4	4↑	5	5	5↑	5
University Hospital Wishaw SHDU	5	4	4	5	5	4↑	5	5	5	5

Table key

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* Crosshouse obstetrics are a new unit opened on 1st June 2019 are working on achieving the required MSQI.

Unit Name	Daily consultant review and written management plan	Consultant-led twice daily ward rounds	Pharmacist	Physiotherapist	Care bundles in place for; IAP, CVC, and PVC	Screening for Delirium in Critical Care	Rehabilitation needs in Critical Care	End of life care policy in place	Deaths and adverse events discussed at regular clinical governance meetings	A regular patient/family experience survey is undertaken in the unit
Western General Hospital Edinburgh SHDU[30]	4	4	4↑	4	5	5	4	4↑	4↓	4
1Victoria Hospital Kirkcaldy SHDU[1]	4	4	1↓	5↑	5	4	4	4	5	5
Raigmore Hospital SHDU[31]	5	4	4	4	5	3	5↑	5↑	5	5
Ninewells Hospital SHDU[32]	5	5	4	5	5	5	4	5	4↑	5
University Hospital Monklands Level 1 beds	4↓	3	4	4	4	4	5	3↓	4↓	4
Glasgow Royal Infirmary SHDU	5	4	4	4	5	5	4	5	4	5
University Hospital Crosshouse SHDU[33]	5↑	5↑	4	5↑	5	4	5	2	4	5
Aberdeen Royal Infirmary SHDU[34]	4	4	4	5	4↓	4	4	4	4	5

Note: Units with superscript numbers have commented on their quality indicators, please see section 2.7.

Table 3 Summary of Obstetric HDUs compliance with SICSAG Quality Indicators (2019)

Table key

1 Not implemented and no plans to implement.
2 Not implemented but a plan is in place to implement in the next 6 months.
3 The unit complies with this indicator in some patients but not all OR it is implemented but not documented in the majority of cases.
4 Unit complies with this indicator in the vast majority of patients OR is implemented and documented in the vast majority of cases.
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* Crosshouse obstetrics are a new unit opened on 1st June 2019 are working on achieving the required MSQI.

Unit Name	Daily consultant review and written management plan	Consultant-led twice daily ward rounds	Pharmacist	Physiotherapist	Care bundles in place for; IAP, CVC, and PVC	Deaths and adverse events discussed at regular clinical governance meetings	A regular patient/family experience survey is undertaken in the unit
Royal Infirmary of Edinburgh Obstetrics HDU joined 2017	5	5	4	4	3	5	5↑
Queen Elizabeth University Hospital Obstetrics HDU[27]	5	5	1↓	4	5	5	5↑
Princess Royal Maternity Hospital[28]	4↓	4	4	4↓	4	4↓	4↓
Ninewells Hospital Obstetric HDU	5	5	3	5	5	5	5
Aberdeen Royal Infirmary Obstetric HDU	5	5	4	4	5	5	5
St Johns Hospital, Livingston OHDU[29]	5	5↑	1↓	4	5↑	5	5
University Hospital Crosshouse Obstetric HDU*	5	5	2	5	5	5	2

* Joined July 2019.

2.7 Unit feedback on the quality indicators

These comments have been received from the audit leads.

Footnote number	Unit	Comments
1	Victoria Hospital Kirkcaldy ICU, SHDU, MHDU	Pharmacy staffing remains a major issue despite significant efforts to recruit to posts in NHS Fife. Pharmacologist input is available when requested on a named-patient basis but at present there is still not enough resource available to allow for routine involvement in ICU patients.
2	Raigmore Hospital ICU 1. Pharmacy 2. Delirium Screening	1. Note from our unit pharmacist: All patients on the unit are seen (fully reviewed) by a recognised critical care pharmacist each working day (Monday-Friday). No patients are currently reviewed on bank holidays, or Saturdays/Sundays. 2. Poorly documented on ICU charts where it should be recorded twice daily. However, a local ACP question relating to patient's CAM ICU score is answered daily on WW. This question was added to WW in an attempt to prompt nursing staff to score patients if they hadn't already done so. A process to improve compliance with this Indicator during bi-daily Consultant-led Ward Rounds has been started.
3	Inverclyde Royal Hospital ICU Patient family experience	The information is being collected but has not yet been analysed.
4	University Hospital Crosshouse ICU Tracheostomy,swallowing and communication	We have taken steps to improve and develop this area of our service. We have developed a protocol to facilitate a nurse led screening process for all patients. We have developed and provided a training programme for our nursing staff. Progress with meeting this MSQI has been the limited Speech and Language Therapy (SLT) resource allocated to ICU. This has been reviewed and we anticipate some SLT resource being allocated to improve our service and better meet this MSQI. We have incorporated SLT service development into our QI work-stream with the expectation that this will drive improvement.
5	University Hospital Ayr ICU Twice daily ward rounds	Currently our ICU struggles with unfilled posts of ICM consultants.
6	Aberdeen ICU Delirium	We believe that practice on the unit has not changed significantly in the last 12 months. Due to the recent implementation of a new electronic patient record system however, we are less confident about our ability to evidence this. A quality improvement programme to ensure that this can be evidenced is currently in place.
7	Dumfries & Galloway Royal Infirmary Critical Care Unit ICU/HDU 1. Twice daily ward rounds 2. Pharmacy	1. HDU patients are seen daily by parent specialty but if stable will not be seen again unless deteriorating or requested by CCU Nursing staff. We are unlikely to achieve systematic twice daily rounds for these patients unless we achieve substantial uplift in numbers of Anaesthetic/Intensivist staff. Due to upcoming retirements we MUST maintain our good care for level 3 patients and keep our parent teams comfortable and confident assessing and treating level 2 CCU patients. 2. Staffing constraints in an organization over budget means that this will not be achievable in the near future. There is access to on call Pharmacy for difficult cases. 5-day service is now reliable.
8	University Hospital Monklands ICU/HDU Patient family experience	This somewhat stalled over the last year demonstrating to us that it was not as firmly embedded as we would have liked. We therefore have a plan in place to review and re-introduce our patient and family surveys. We currently have a white board in place in our relative's room for comments and add a new question every week. This is photographed and reviewed and will be collated with any actions being considered.

Footnote number	Unit	Comments
9	Golden Jubilee Hospital ICU End of life care feedback from the 2019 report when end of life care was not being met	We now have an overarching policy that is being implemented currently. We are still fulfilling all the components of the End of Life Care QI.
10	Perth Royal Infirmary ICU 1. Twice daily ward rounds 2. Pharmacy 3. Delirium Screening	1. Twice daily ward rounds: These are done but the 5pm is not always documented in medical notes to evidence this. 2. Critical care pharmacist is based in Ninewells so ITU pharmacist will liaise across sites for specific guidance when required. 3. Due to turnover of ITU nursing staff we have had a series of short education sessions focusing on CAM ICU scoring for delirium. We also have a higher proportion of level 2 patients following service redesign so there is less focused opportunity for nursing team to practice patient assessment for delirium.
11	Royal Infirmary of Edinburgh Cardiac ICU & HDU Patient and family experience	We have enrolled in “Care opinion”, this is now functional and should show as an improvement in the 2020 annual report.
12	Western Isles Hospital 1. Pharmacist 2. Physiotherapist 3. Patient and family surveys	1. General Pharmacist reviews at least once daily – Pharmacy Department and Board too small for a dedicated Critical care pharmacist. 2. General physio reviews on request/following referral – Physiotherapy Department and Board too small for a dedicated Critical care physiotherapist. 3. Annual general patient satisfaction surveys undertake – Not currently critical care specific. HDU patients are included in survey.
13	Royal Alexandra Hospital HDU Twice daily ward rounds	RAH HDU is an open access busy mixed unit. Patients are managed and reviewed by parent specialties. There is a daily consultant review of all patients. It is the second daily review in which there are variations. Maintaining high quality care within this busy unit is fundamental. Consultant expansion and workforce planning are key considerations for clinical leaders and management.
14	Perth Royal Infirmary HDU 1. End of life care 2. M&M meetings 3. Twice daily ward rounds	1. Hospital policy used, plan to develop/implement unit policy in next 6 months. 2. Due to consultant retirals and maternity leave during the last 6 months this has not been carried out, plan to restart within the next 6 months once medical staffing gaps filled. 3. Medical team look to devise ways to achieve this once there staffing gaps are filled.
15	Gilbert Bain Hospital Comment on all MSQI not achieved	The Unit relies on consultant anaesthetic staff for clinical leadership. Currently only one of the four posts is occupied. Those quality standards not achieved will be dealt with when substantive staffing is in place.
16	Dr Gray’s Hospital Elgin 1. Rehabilitation 2. End of life care	1. We do not have a rehab tool in HDU as ongoing patient care and rehab is generally carried out on the wards when the patient is stepped down, however if a patient is requiring physio for any reason then they will be seen but not routinely as part of their discharge from critical care. 2. No HDU specific indicator or policy but end of life is taken very seriously and we pride ourselves in end of life care to ensure patient comfort.

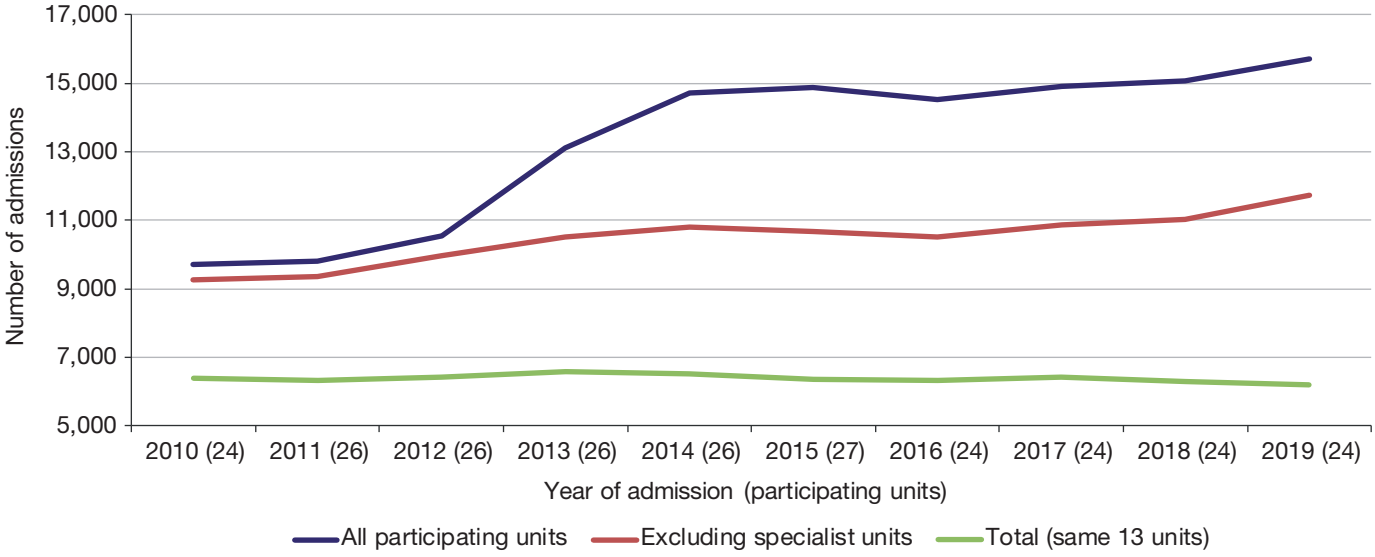
Footnote number	Unit	Comments
17	Belford Hospital Fort William HDU Family patient surveys	HDU patient satisfaction survey has been developed and is now in use. Results have not yet been analysed or displayed for the public. Data will be available by end December 2019.
18	Balfour Hospital Orkney HDU 1. Patient and family survey 2. Delirium screening	1. I am currently putting together a patient satisfaction survey that I hope to implement before the end of the year. 2. Daily delirium screening has recently been added to the ACP daily checklist on WardWatcher to prompt nursing staff to complete this daily.
19	University Hospital Ayr HDU Twice daily ward rounds	HDU patients primarily looked after by their teams (medical or surgical). ICM consultant input as required.
20	University Hospital Wishaw Feedback from 2019 report Daily review Twice daily ward rounds Pharmacist Delirium screening End of life care policy M&M meetings	All five standards previously not achieved are now established within CCU/MHDU – University Hospital Wishaw for 2019. This improvement has been achieved through established consultant ward rounds, Morbidity and Mortality meetings and the introduction and utilisation of the RELC end of life care policy. Focus work locally has embedded delirium screening into practice.
21	Raigmore Hospital MHDU End of life care policy	We have not finalized the End of Life Care (ELC) policy as one of the staff members involved has been on maternity leave. We have 2 other staff members working on the policy and we hope to have completed this by the end of 2019.
22	Ninewells Hospital MHDU Rehabilitation	Rehabilitation in Critical Care – this is a challenging MSQI to achieve as there is no recognised tool which can track progression and certainly nothing which allows a formal AHP discharge letter to primary care. I am unsure how this is achieved in other unit in the hospital or country.
23	University Hospital Monklands MHDU Feedback from 2019 report on rehabilitation	Comment on improvement of rehab indicator: The median length of stay remains at 2 days, patients are then stepped down to appropriate wards to continue their care and rehabilitation (if required). If rehabilitation is commenced on MHDU, progress is documented in medical notes which transfers with the patient to the step-down ward. Information is also passed to primary care rehabilitation teams for all relevant patients. Work has been completed to provide all ward staff with information regarding mobility in MHDU. Regular teaching sessions are available with the ward Physiotherapist to promote rehabilitation in MHDU and encourage early identification of rehab needs.
24	University Hospital Hairmyers MHDU 1. Twice daily ward rounds 2. End of life care	1. Although there is agreement that there should be twice daily ward rounds there is currently insufficient MHDU staff to deliver this. 2. An end of life care pathway has been introduced and we are now working on reliably embedding the process.
25	Glasgow Royal infirmary MHDU End of life care	Re End of life policy; Since discontinuing use of Liverpool Care Pathway, we have been adopting Greater Glasgow and Clyde (GGC) symptomatic relief policy which encompasses Care of the Dying patient. (GAEL-Guidance at end of life). This provides written guidance for nursing and medical staff although formal documentation for the case notes is not routinely completed. We are liaising with Palliative Care to ensure that we are adopting all guidance appropriately and will look at whether we need to develop our own MHDU specific written information for patients, relatives and staff.
26	Western General Hospital Neuro HDU	Pharmacy services had improved in 2019 with an appointment of a junior pharmacist and senior pharmacist specifically for the department of Neurosciences. The pharmacist attends the HDU area daily to review patient's medication.

Footnote number	Unit	Comments
27	Queen Elizabeth University Hospital Obstetric HDU Pharmacist in critical care	Women and Children General Manager Michelle MacLauchlan advised no funding for a Pharmacist post at Queen Elizabeth University Hospital and that 2 bids have been submitted to the Scottish Government - minutes from Obs Clinical Governance meeting August 2019.
28	Glasgow Royal Infirmary Obstetric HDU Patient and family surveys	Patient and family survey: with change in support for the current ongoing follow up and inability for clinicians to access data entered into the electronic patient record this will become increasingly difficult to do and alternative solutions will need to be sorted.
29	St John's Hospital Obstetric HDU Pharmacist in critical care	"No pharmacists review the obstetric HDU patients but there is access to a critical care pharmacist that medical staff can contact by phone during weekday working hours."
30	Western General Hospital SHDU 1. Pharmacy 2. Twice daily ward rounds	1. Pharmacy provision is much improved from last year. 2. Twice daily ward rounds are undertaken by the colorectal team, Urology ward rounds are on an as required basis but are not usually twice daily.
31	Raigmore Hospital SHDU Delirium	Ongoing work to implement this process.
32	Ninewells Hospital SHDU M&M progress update from 2019 report	We have been unable to implement the 'end of life care policy' as yet, there has been some organisational changes in the past year. We have very recently merged wards into a new combined SHDU/General surgical ward where we aim to have one implemented within the next 6 months now that we have merged.
33	Aberdeen Royal Infirmary SHDU End of life care	Ongoing work to implement this process.
34	Raigmore Hospital SHDU Care bundles	Due to the change in critical care paperwork we have found that our compliance with recording PVC/ CVC maintenance has reduced. This is a facet of the change in recording paperwork at the bedside but not the core documented SHDU policy. We are putting in place measures to improve this in the coming year through an education package for the nursing staff highlighting the new method of documentation.
35	Western General Infirmary ICU/HDU 1. Delirium 2. Tracheostomy	1. "Since this data was submitted we have carried out quality improvement work such that use of Richmond Agitation-Sedation Scale (RASS) and Confusion Assessment Method (CAM) ICU is now fully embedded in unit practice". 2. "We have undertaken significant quality improvement work with physiotherapy and Speech and Language Therapy to integrate communication and swallowing needs into individualised weaning plans".

Section 3 Activity

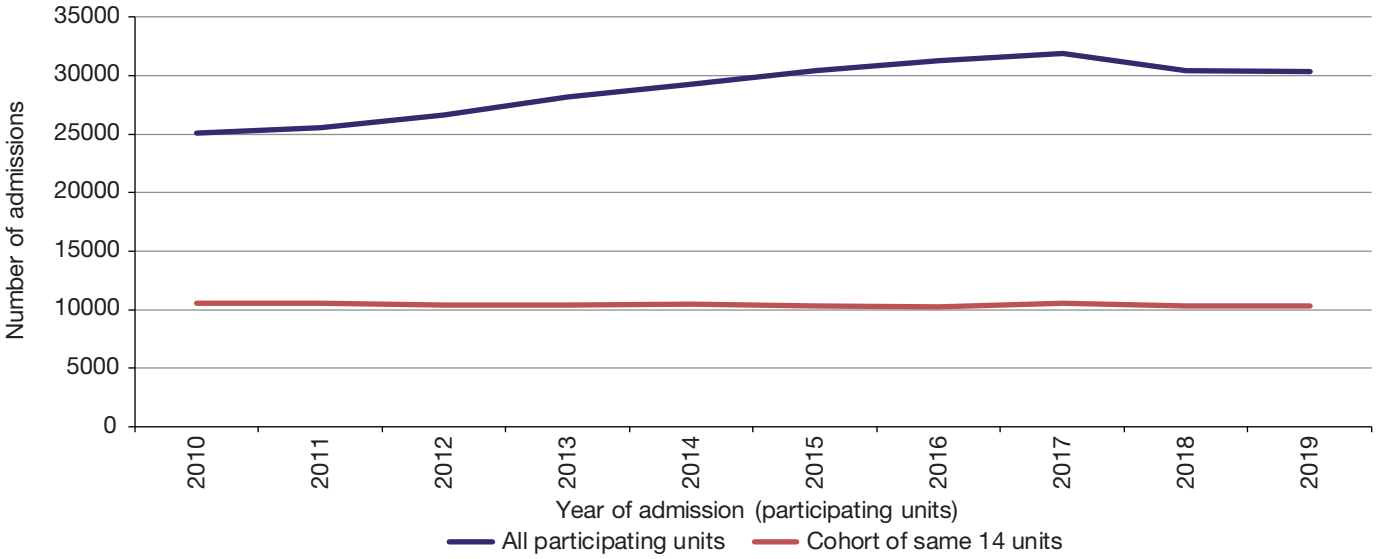
3.1 Number of admissions

Figure 22 Annual admissions to ICUs and combined units (2010-2019)



Over the last 10 years there has been an increase in the number of patients admitted to ICUs and combined ICU / HDUs from less than 10,000 to greater than 15,000 per year. Much of this increase has come from the addition of specialist ICUs to the audit and the reconfiguration of standalone ICUs and HDUs into combined ICU / HDUs. HDU patients admitted to combined units are included in these figures. The number of patients admitted to the 13 ICUs which have participated throughout this period remains consistent.

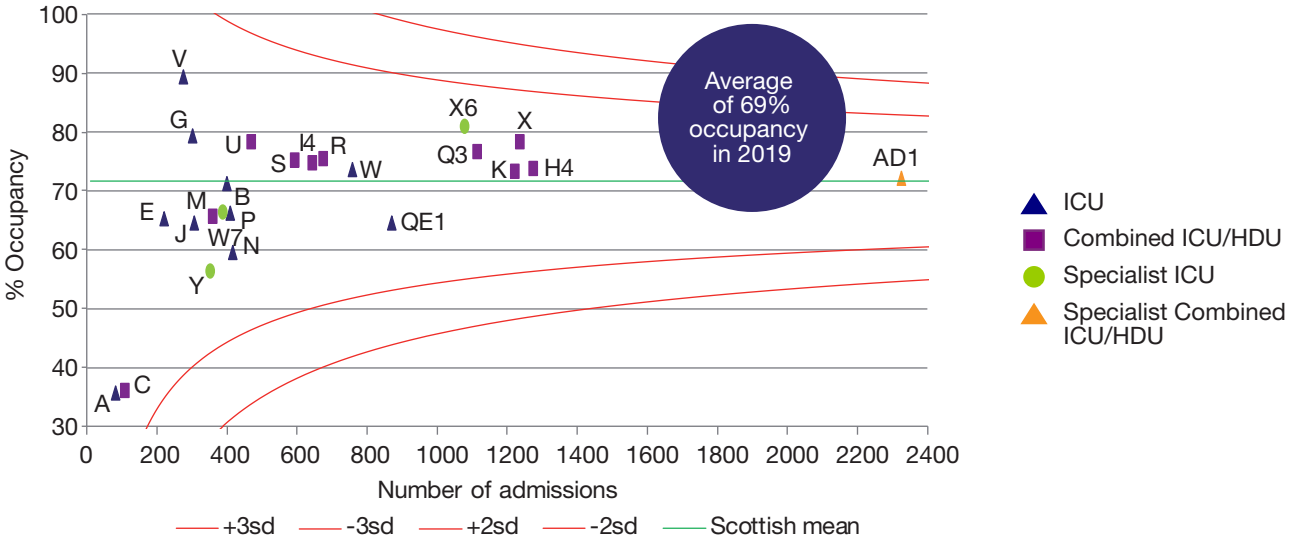
Figure 23 Annual admissions to HDU (2010-2019)



Over the last 10 years there has been an increase in the number of patients admitted to HDUs from around 25,000 to greater than 30,000 per year. Much of the increase in HDU admissions is accounted for by an increase in the number of HDUs participating in the audit. There appears to have been a decline in the number of patients admitted to HDUs since 2017, much of this can be attributed to the reconfiguration of critical care units into combined ICU / HDUs. The number of patients admitted to the 14 units which have participated throughout this period remains consistent.

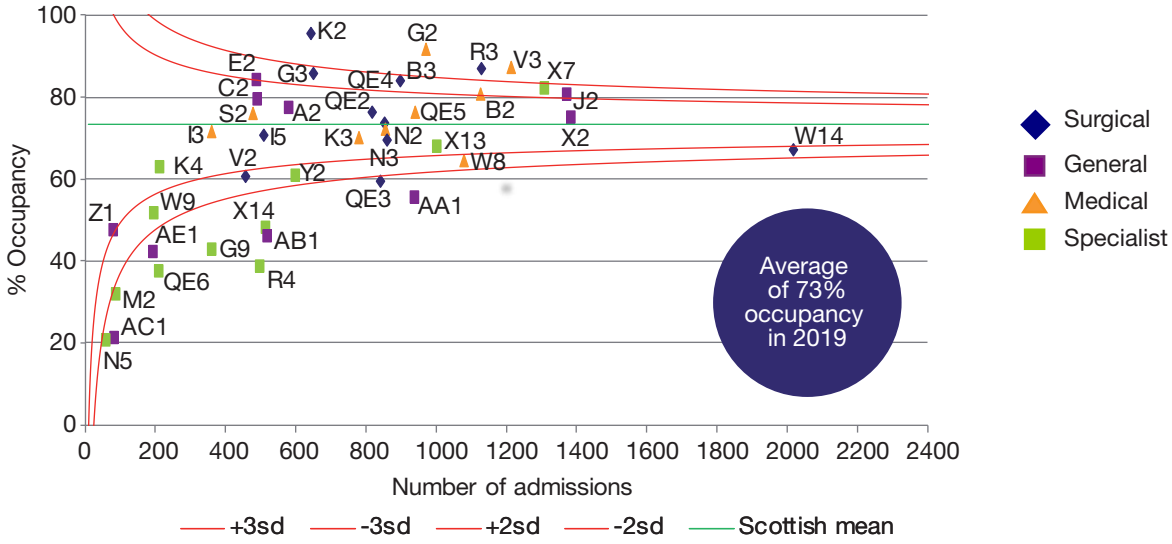
3.2 Bed occupancy

Figure 24 Bed occupancy rates for ICU and ICU/HDU units (2019)



During 2019 the mean occupancy in Scottish ICUs and combined ICU / HDUs was 69%. This is similar to previous years. No units were outliers for occupancy.

Figure 25 Bed occupancy rates for HDUs (2019)



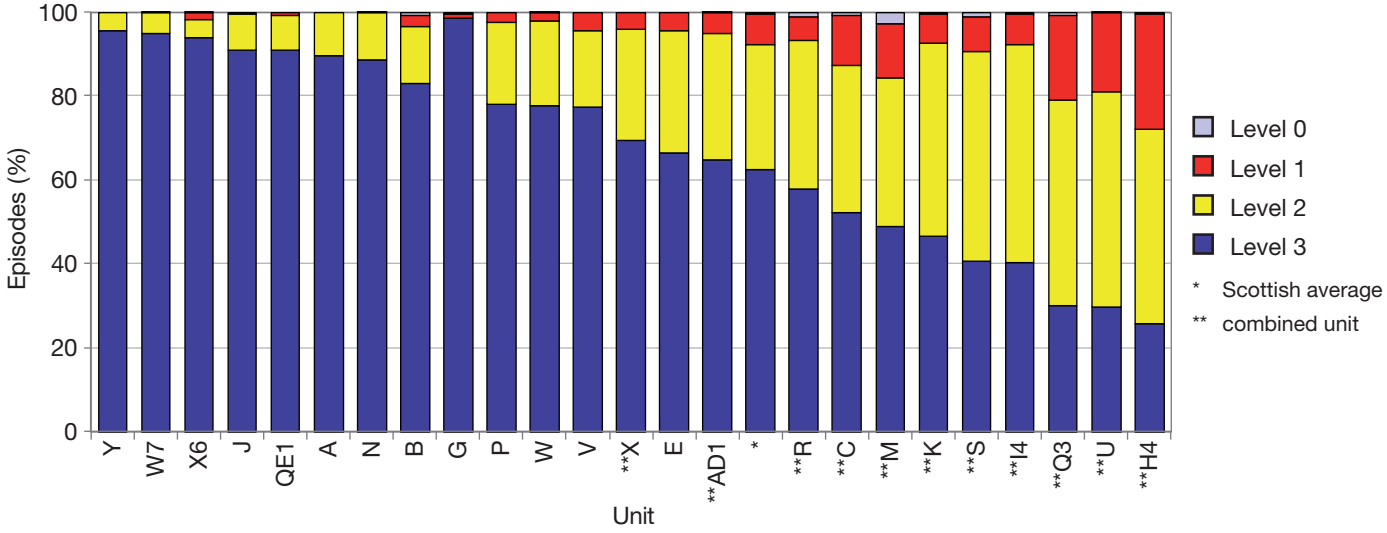
During 2019 the mean occupancy in Scottish HDUs was 73%. This is the same as 2018 and similar to previous years. As in previous years there is considerably greater variation in HDU occupancy compared to ICUs & combined ICU / HDUs with the range from around 20% to around 95%. As in previous years many of the units with very low occupancy are specialist obstetric HDUs or HDUs located in rural district general hospitals. Further information regarding specialist obstetric HDUs can be found in section 2.5.

Section 4 Interventions

4.1 Level of care

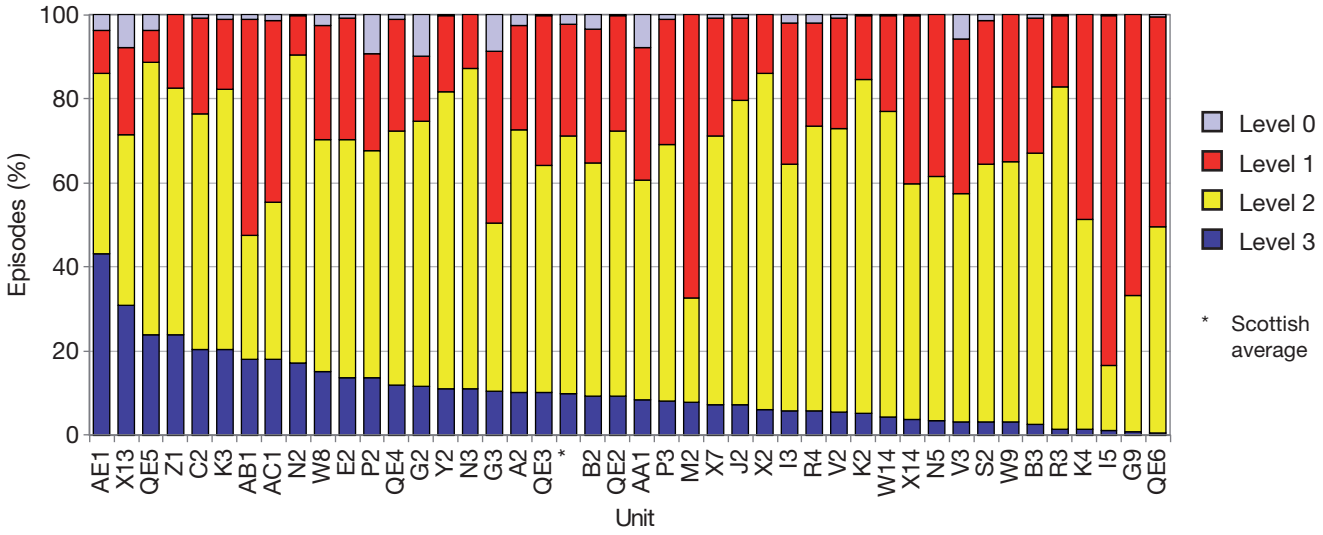
Level of care data are collected from the WardWatcher Augmented Care Period (ACP) page. It allows direct comparisons of interventions and levels of care to be made between critical care units. Some differences in the levels of care will be due to the differing specialty between hospitals. Level of care is defined in the methodology section of the SICSAG website (www.sicsag.scot.nhs.uk).

Figure 26 Highest level of care in ICUs and combined units (2019)



As in previous years the data are presented in order of descending proportion of level 3 care. In 2019 the highest level of care, level 3, was required in 62% of patient episodes in ICU and combined units and indicates the significant resource and skill-mix implications required by each unit in Scotland.

Figure 27 Highest level of care in HDU (2019)

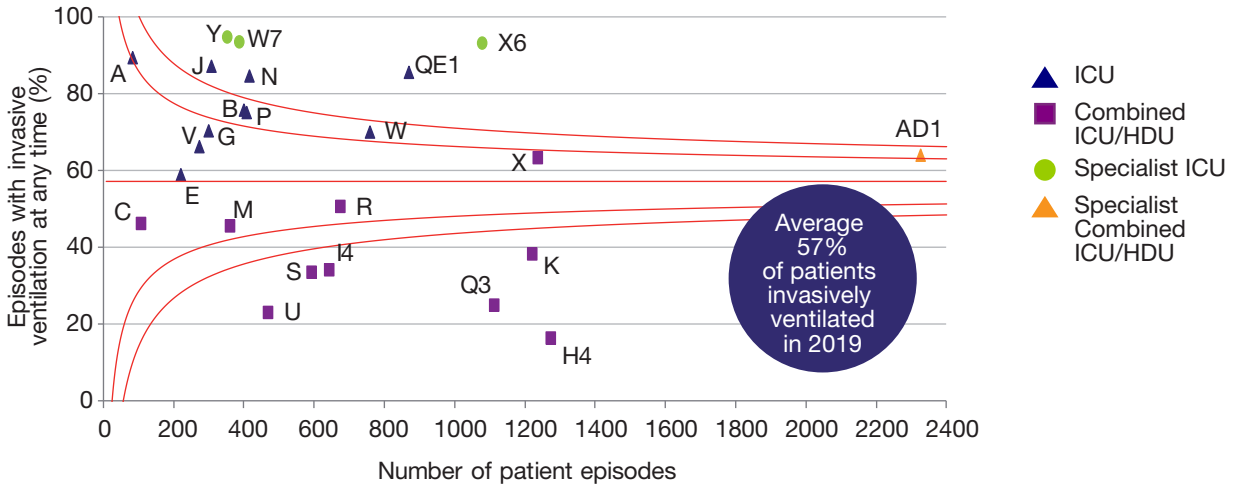


It is reassuring that this graph shows that the highest level of care required for the majority of HDU episodes is at the appropriate level (level 2), with 71% of patients at level 2 or higher.

There is variation in the pattern of the highest level of care demonstrating the heterogeneous nature of HDUs. Patients in critical care at level 0 likely represent downstream bed availability issues.

4.2 Respiratory support

Figure 28 Invasive ventilation at any time in ICU and combined units (2019)



The Scottish percentage average of patients requiring invasive ventilation was 57% in 2019.

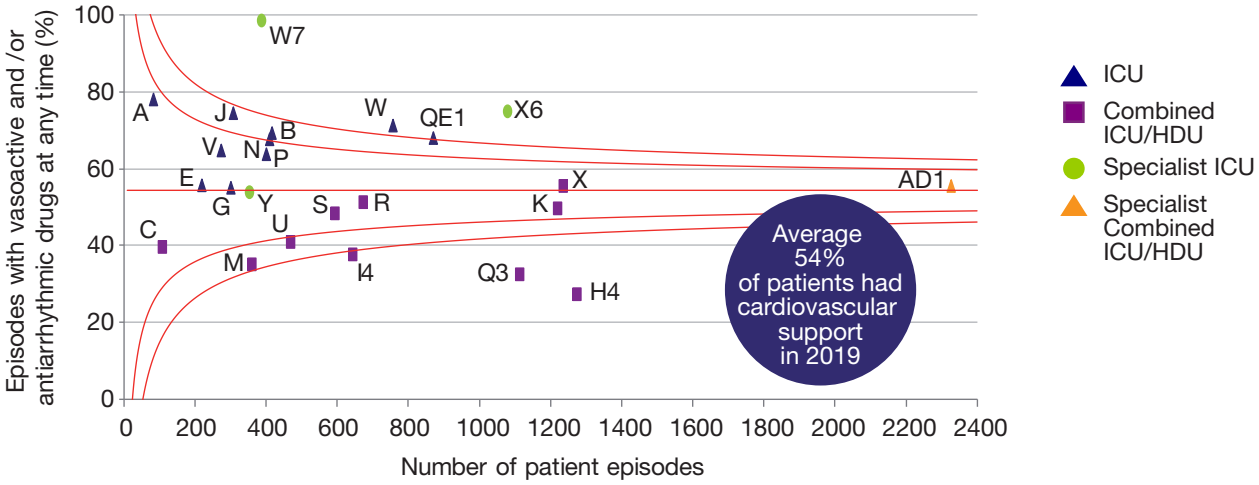
The specialist cardiac and neuro units continue to show high levels of invasive ventilation which is expected and reflects the nature of the patients being cared for.

The general units (RAH ICU), N (NWD ICU) and QE1 (QEU ICU) continue to have an invasive ventilation rate in excess of 80% and remain 3SD above the mean as in previous years. This might reflect the necessary level of intervention being higher for these patients at admission and might be a marker of pressure upon the unit, especially if supported by other parameters such as cardiovascular support and renal replacement therapy showing similarly high levels of intervention.

The lower area of the graph is dominated by the combined units where the case mix is generally more level 2 and level 3 patients.

4.3 Cardiovascular support

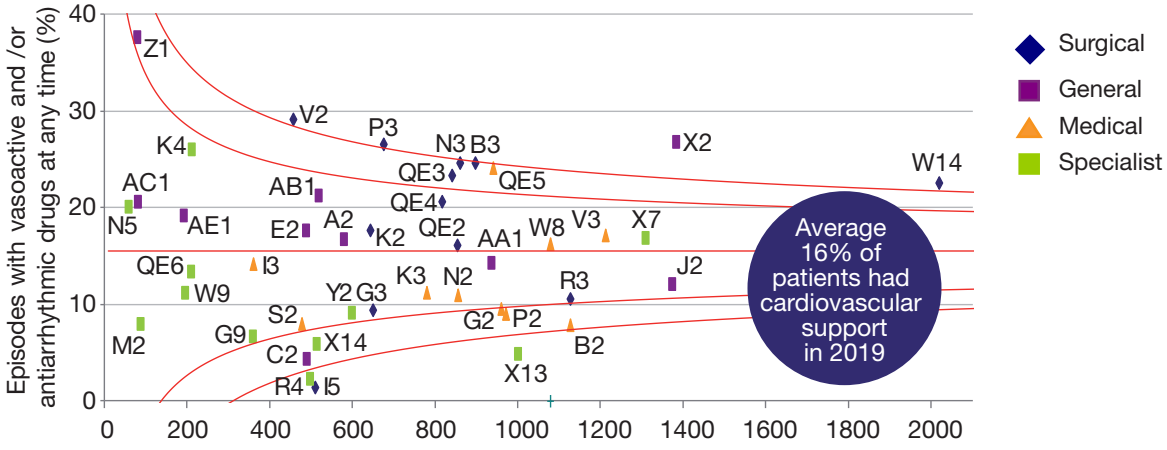
Figure 29 Use of vasoactive and/or antiarrhythmic drugs in ICU and combined units (2019)



The proportion of patient episodes with vasoactive and/or antiarrhythmic drugs in ICU and combined units in 2019 is 54%, similar to the percentage reported in previous years.

Unit W7 (CICU) is an outlier on this chart as expected, this is a specialised Cardiac ITU where the vast majority of patients admitted to this unit, require the use of vasoactive drugs during their stay.

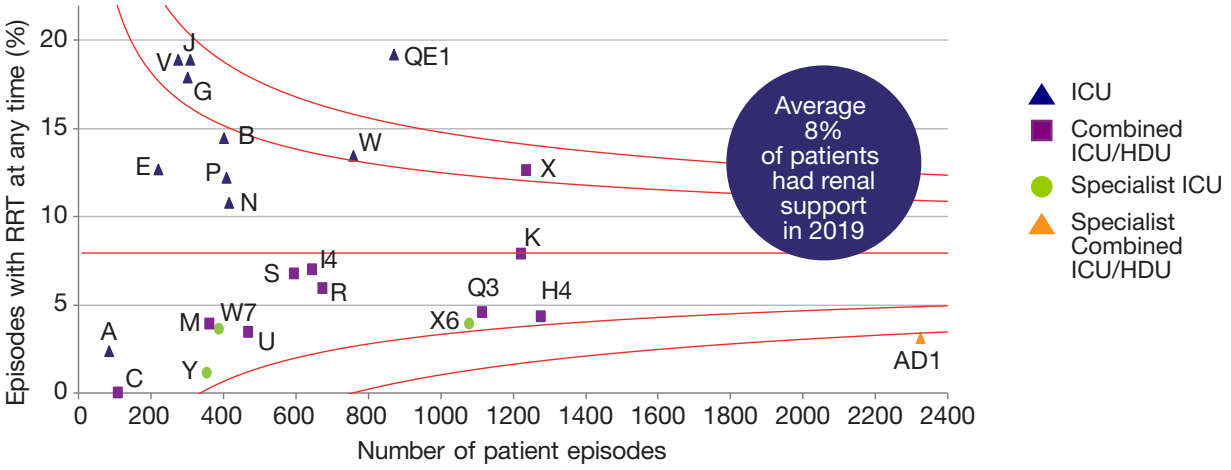
Figure 30 Use of vasoactive and/or antiarrhythmic drugs in HDU (2019)



Use of vasoactive and/or antiarrhythmic drugs in HDU has remained at a similar level to the last few years at 16%.

4.4 Renal support

Figure 31 RRT in ICUs and combined units (2019)



The provision of Renal Replacement Therapy (RRT) across Scotland appears static at 8% since 2014. Unit QE1 (QEU ICU) has significantly more episodes with RRT compared to the Scottish mean. There is no evidence to suggest that differences in practice for RRT have any impact on outcomes.

Conclusion

Critical care is central to emergency and elective work in all acute hospitals in Scotland. The SICSAG audit provides an accurate, comprehensive and transparent report of the activity, interventions and outcomes of patients who require critical care in Scotland.

Detailed individual unit level information is presented for scrutiny and to inform the public, health care professionals and managers about the quality of Scottish Critical Care. The audit has developed into an efficiently co-ordinated, process driven, quality improvement programme that provides data, analysis and feedback. The impact of this scrutiny is evident in this year's report, demonstrated by increasing numbers of units developing local quality improvement strategies to meet professional Minimum Standards and Quality Indicators.

Critical care and the wider health and social care systems will face challenges in the coming years as a result of the COVID-19 pandemic. The intelligence provided by the national audit database, in combination with strong clinician engagement provided through the steering group, will be vital to help the country understand the ongoing impact on people and services. It puts Scotland in a strong position to develop and support the ongoing management of, and ultimately recovery from, the COVID-19 pandemic.

The enthusiasm, engagement and sense of ownership of the SICSAG audit felt by local nurses, doctors and health care professionals is evident across the Scottish critical care community. The audit would cease to exist without critical care staff finding time in their busy clinical workloads to collect the data presented within this report. The Scottish public should be reassured that the quality of critical care provided within Scotland continues to be of a high standard.

Dr Nazir Lone

Senior Lecturer and Honorary Consultant in Critical Care

SICSAG Chair

Appendix A Unit Profiles 2019

Table A1 ICUs and combined units Unit Profiles (2019)

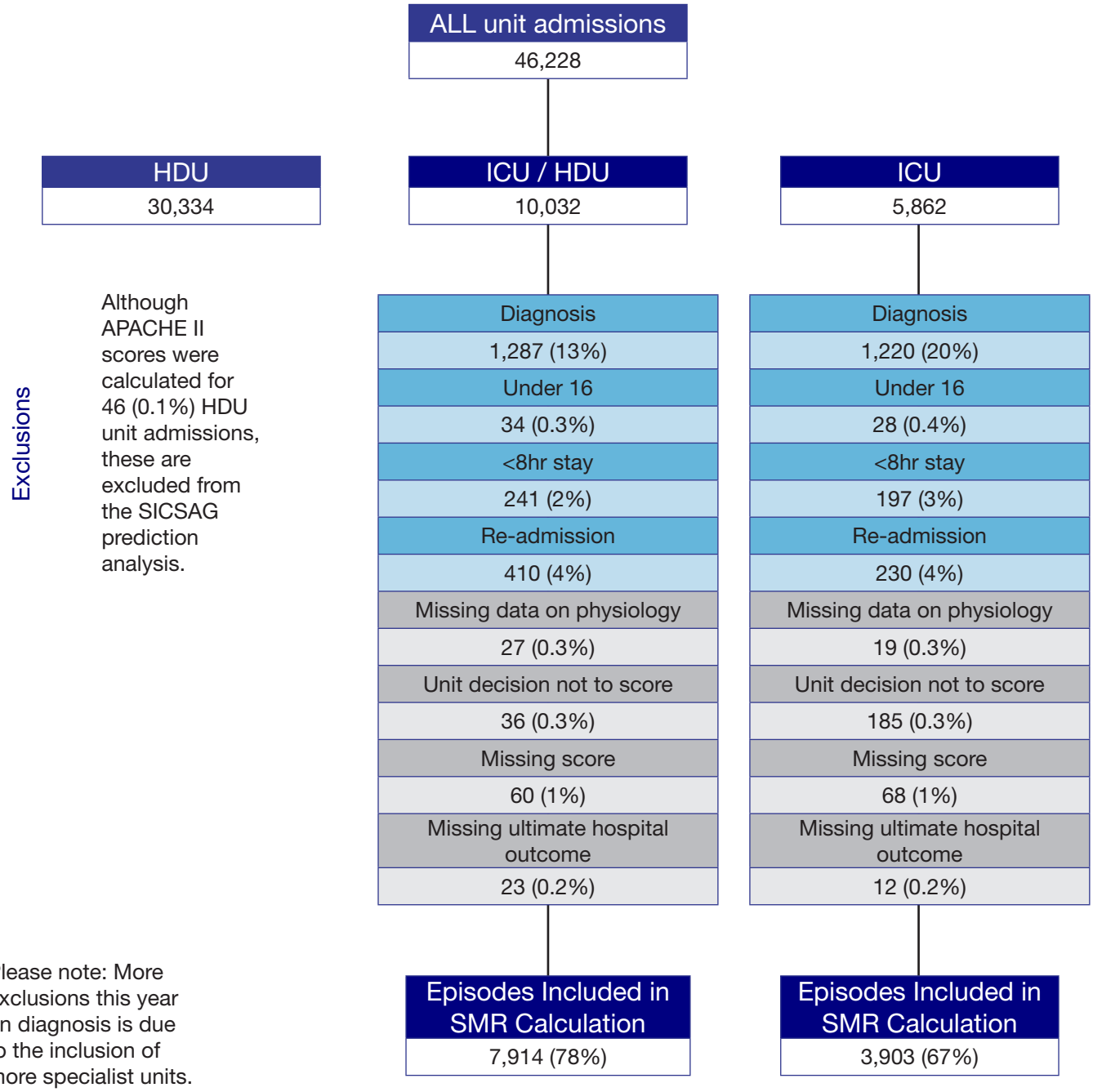
Unit	Actual beds	Funded beds (Level 3/2)	Trained Nurse WTE per level 3 bed*	Percentage of total nursing are post registration trained in critical care	The period in weeks of supernumerary for new nursing starts in the unit	Microbiologist	Dietetic review available
ARI01	16	14/2	97.45	50%	14 shifts	1	2
AYR01	5	4	27.51	81%	4	1	2
CRH01	7	6	39.27	33%	2/12	1	2
DMG04	17	4/11	64.07	30%	4	1	2
FIF01	10	9	55.40	22%	7	1	2
QEU01	20	18	111.00	66%	4	1	2
IRH01	2	2	34.21	45%	4	REMOTE COVER	2
RAH01	9	7	43.10	47%	3/6	1	2
RGM01	8	7	42.87	35%	4	1	2
WSH01	5	5.3	27.90	29%	4	1	2
NWD01	9	8	50.80	88%	4	1	2
PRI01	4	3 level 3	17.00	76%	4	2	2
BGH01	9	4/2	30.30	40%	4	1	2
FVH01	19	7/10	98.24	not answered	4.00	1	2
GRI01	20	12/8	102.00	78%	3	1	2
HRM01	10	5/4 APR-NOV 6/2 DEC-MAR	36.00	47.00%	6	1	2
MNK04	10	10 flexible	43.68	30%	2	1	2
Royal Infirmary Edinburgh01	18	16/2	160.00	45%	3	1	2
SJH01	7	3/2	25.40	100%	4	1	2
WGH01	16	10/6	82.00	70%	2	1	2
ARI07	6	5	24.31	50%	4	1	2
Royal Infirmary Edinburgh07	11	9	59.52	85%	4/5	1	2
SGH03	9	6	35.90	64%	12	1	2
GJH01	22	19/12	105.00	50%	4	1	2

Table A2 HDUs Unit Profiles (2019)

Unit	Actual beds	Funded beds (Level 2/1)	Trained Nurse WTE per level 2 bed*	Percentage of total nursing are post registration trained in critical care	The period in weeks of supernumerary for new nursing starts in the unit	Microbiologist	Dietetic review available
AYR02	4	4	9.56	73%	4	1-by phone	2
DRG01	6	under review	23.54	aiming for all staff to attending the 2 day HDU and 3 day cc course in ARI to ensure 100% compliance	4	REMOTE COVER	2
QEU99	30	26	87.96	75%	4	1	2
IRH02	4	4	34.21	45%	4	REMOTE COVER	2
RAH02	12	12	38.28	31%	4	1	2
BEL01	2	2	5.25	92%	2	1	2
Royal Infirmary Edinburgh02	11	11	160.00	45%	3	1	2
ORK01	2 can go to 3	2 can go to 3	10.00	58%	2	1	2
GBH01	2	0	13.00	75%	2	REMOTE COVER	2
PRI02	4	4	13.00	70%	4	1	2
WIH01	WESTERN ISLES						
CRH02	12	8/4	27.34	78%	13 shifts	1	2
FIF03	8	8	25.17	40%	4/6	1	2
ARI08	14	10	33.19	93%	6	1	2
GRI03	8	8	25.27	70%	1	1	2
QEU05	9	9	24.43	30%	4	1	2
RGM02	6	6	18.40		1	1	2
HRM03	4	4	10.72	19%	6	1	2
MNK03	4/6/12	6/12	27.00	0%	2	1	2
WSH03	12	6/6	29.00		4	1	2
NWD02	6	4	19.10	90%	2	1	2
CRH03	10	6/4	28.02	58%	4	1	2
FIF02	8	8	26.12	14%	4	1	2
ARI14	18	18	52.24	81%	4	1	2
GRI02	8	8	26.85	90.00%	2/3	2	2
RGM03	8	8	22.85	0%	2/3	2	2
MNK05	6	6	24.00	9%	2	1	2
WSH02	7	6.7	17.60	29%	4	1	2
WGH03	10	6/4	23.50	57.00	2	1	2

Unit	Actual beds	Funded beds (Level 2/1)	Trained Nurse WTE per level 2 bed*	Percentage of total nursing are post registration trained in critical care	The period in weeks of supernumerary for new nursing starts in the unit	Microbiologist	Dietetic review available
NWD03	10	10	32.12	32%	4	1	2
ARI09	2	0	12.60	100%	2	1	2
CRH09	3	0	44.51	13%	4	1	2
GRI04	2	0	0.00	46%	n/a not a stand alone unit	1	2
QEU06	2	2	106.00	56%	5	1	2
SJH09	2	0	n/a	0%	0	1	2
SGH04	6	6	20.40	64%	8	1	2
Royal Infirmary Edinburgh13	16	12	37.00	75%	2/4	1	2
Royal Infirmary Edinburgh14	3	0	80.00	100%	1/2	1	2
Royal Infirmary Edinburgh08	10	8	30.25	55%	4	1	2
WGH04	6	3/3	11.2/4 mat leave/4 vacancies	80% NEUROSCIENCES MODULE/ 32%CDM	2	1	2
NWD05	2	0	0.00	100%	2	1	2

Appendix B Eligibility for APACHE II scores and selection for analysis (2019)



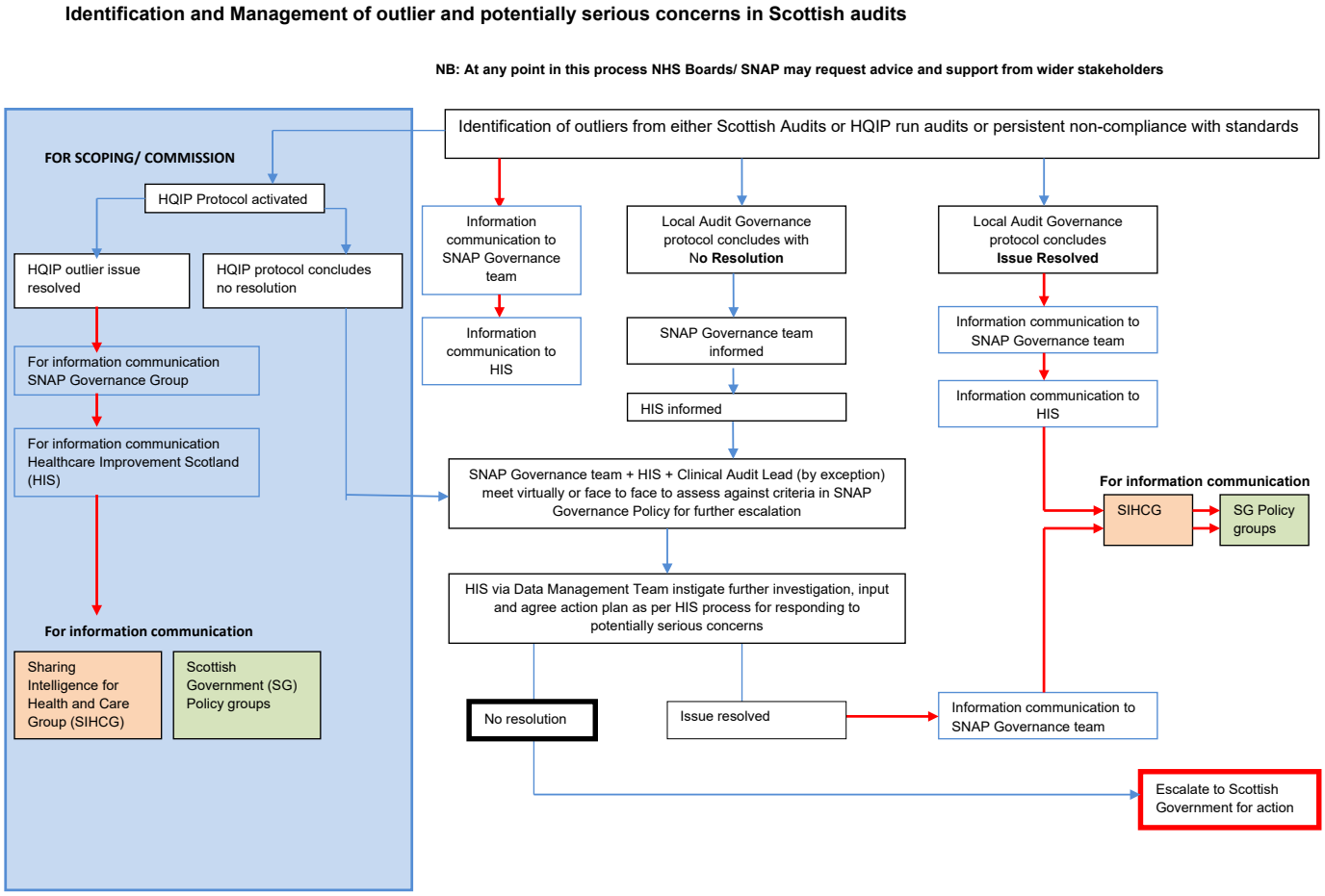
Please note: More exclusions this year on diagnosis is due to the inclusion of more specialist units.

Appendix C Unit Key (2019)

Health Board	Funnel Plot Label	ICU or HDU
Ayrshire & Arran	E Ayr ICU	ICU
Ayrshire & Arran	E2 Ayr HDU	HDU
Ayrshire & Arran	G Crosshouse ICU	ICU
Ayrshire & Arran	G2 Crosshouse MHDU	HDU
Ayrshire & Arran	G3 Crosshouse SHDU	HDU
Ayrshire & Arran	G9 CRH OHDU University Hospital Crosshouse Obstetrics	HDU
Borders	U BGH ICU/HDU	ICU/HDU
Dumfries & Galloway	H4 DGRI ICU/HDU	ICU/HDU
Fife	B VHK ICU	ICU
Fife	B3 VHK SHDU	HDU
Fife	B2 VHK MHDU	HDU
Fife	B4 VHK RHDU	HDU
Forth Valley	Q3 FVRH ICU/HDU	ICU/HDU
Grampian	W ARI ICU	ICU
Grampian	W7 ARI CICU	ICU
Grampian	W8 ARI MHDU	HDU
Grampian	W9 ARI OHDU	HDU
Grampian	AA1 Dr Grays HDU	HDU
Grampian	W14 ARI SHDU	HDU
Greater Glasgow & Clyde	K GRI ICU / HDU	ICU/HDU
Greater Glasgow & Clyde	K2 GRI SHDU	HDU
Greater Glasgow & Clyde	K3 GRI MDU	HDU
Greater Glasgow & Clyde	K4 PRM OHDU	HDU
Greater Glasgow & Clyde	A IRH ICU	ICU
Greater Glasgow & Clyde	A2 IRH HDU	HDU
Greater Glasgow & Clyde	QE1 QEU ICU	ICU
Greater Glasgow & Clyde	QE2 QEU HDU1	HDU
Greater Glasgow & Clyde	QE3 QEU HDU2	HDU
Greater Glasgow & Clyde	QE4 QEU HDU6	HDU
Greater Glasgow & Clyde	QE5 QEU MHDU	HDU
Greater Glasgow & Clyde	QE6 QEU OHDU	HDU
Greater Glasgow & Clyde	J RAH ICU	ICU
Greater Glasgow & Clyde	J2 RAH HDU	HDU
Greater Glasgow & Clyde	Y QEU NICU	ICU
Greater Glasgow & Clyde	Y2 QEU NHDU	HDU
Highland	AC1 Belford HDU	HDU
Highland	P Raigmore ICU	ICU

Health Board	Funnel Plot Label	ICU or HDU
Highland	P2 Raigmore MHDU	HDU
Highland	P3 Raigmore SHDU	HDU
Lanarkshire	S Hairmyres ICU/HDU	ICU/HDU
Lanarkshire	S2 Hairmyres MHDU	HDU
Lanarkshire	I3 MDGH MHDU	HDU
Lanarkshire	I4 MNK ICU/HDU	ICU/HDU
Lanarkshire	I5 MNK level 1 HDU	HDU
Lanarkshire	V Wishaw ICU	ICU
Lanarkshire	V2 Wishaw SHDU	HDU
Lanarkshire	V3 Wishaw MHDU	HDU
Lothian	X Royal Infirmary Edinburgh ICU/HDU	ICU/HDU
Lothian	X2 Royal Infirmary Edinburgh HDU	HDU
Lothian	X6 Royal Infirmary Edinburgh CICU	ICU
Lothian	X7 Royal Infirmary Edinburgh CHDU	HDU
Lothian	X13 Royal Infirmary Edinburgh RTHDU	HDU
Lothian	X14 Royal Infirmary Edinburgh OHDU	HDU
Lothian	M SJH ICU/HDU	ICU/HDU
Lothian	M2 SJH OHDU	HDU
Lothian	R WGH ICU/HDU	ICU/HDU
Lothian	R3 WGH SHDU	HDU
Lothian	R4 WGH NHDU	HDU
National Waiting Times Centre	AD1 GJNH CICU/CHDU	ICU/HDU
Orkney	AE1 Balfour HDU	HDU
Shetland	Z1 GBH HDU	HDU
Tayside	N Ninewells ICU	ICU
Tayside	N2 Ninewells MHDU	HDU
Tayside	N3 Ninewells SHDU	HDU
Tayside	N5 Ninewells OHDU	HDU
Tayside	C PRI ICU/HDU	ICU/HDU
Tayside	C2 PRI HDU	HDU
Western Isles	AB1 WIH HDU	HDU

Appendix D Scottish National Audit Programme (SNAP) Escalation Policy



SICSAG is part of SNAP which maintains a wide range of national clinical audits, many of which are specialty-based and involve a wide range of clinical, government and voluntary sector stakeholders.

The SNAP governance policy involves other agencies such as:

- Healthcare Improvement Scotland, which provides public assurance about the quality and safety of healthcare through the scrutiny of NHS hospitals and services, and independent healthcare services.
- Healthcare Quality Improvement Partnership (HQIP), which was established in April 2008 to promote quality in healthcare, and in particular to increase the impact that clinical audit has on healthcare quality improvement. HQIP is an independent organisation led by the Academy of Medical Royal Colleges, The Royal College of Nursing and National Voices.
- The Sharing Intelligence for Health & Care Group is a mechanism that enables seven national agencies to share, consider, and respond to intelligence about care systems across Scotland (in particular NHS boards).

Further information on these groups can be found at:

https://www.hqip.org.uk/

http://www.healthcareimprovementscotland.org

http://www.healthcareimprovementscotland.org/our_work/governance_and_assurance/sharing_intelligence.aspx

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