



*Scottish Intensive Care Society
Audit Group*

<http://www.scottishintensivecare.org.uk>

HDU Audit Report 2006

An Audit of High Dependency Units in Scotland, 2002-2004.

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**Scottish Intensive Care Society Audit Group
Audit of High Dependency Units in Scotland 2002-2004**

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D. ABBREVIATIONS

ACP	Augmented Care Period
HDU	High Dependency Unit
ICU	Intensive Care Unit
ICU/HDU	Combined ICU & HDU
ISD	Information Services Division, NHS Scotland
LOS	Length of stay
SICS	Scottish Intensive Care Society
SICSAG	Scottish Intensive Care Society Audit Group



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E. INTRODUCTION.

1. This is the first report produced by the Scottish Intensive Care Society Audit Group (SICSAG) dedicated to High Dependency Unit (HDU) audit in Scotland and is indicative of the expansion of SICSAG from an Intensive Care Unit (ICU)-only audit into a much more comprehensive audit of critical care activity in Scotland. It follows a similar format to the Annual Reports produced on the ICU audit and available to read at http://www.scottishintensivecare.org.uk/sicsag_report.htm.

2. The expansion into HDU audit followed recommendations made in *Better Critical Care* in August 2000, a report produced by a Short-life Working Group on Intensive Care and High Dependency Care, chaired by the Chief Medical Officer [1]. Early in 2000, SICSAG conducted a telephone survey of Scottish hospitals in an attempt to determine the location and type of HDUs. The results of this survey contributed to the working group's awareness of facilities at that time and subsequent recommendations made in its Report. Following *Better Critical Care's* publication, SICSAG contacted the units once more and sought their interest in participating in audit, based on the national ICU software (Ward Watcher, Critical Care Audit Ltd, Yorkshire). A multi-disciplinary Steering Group met twice during 2001 to take the initiative forward.

3. With no central funding, the initial creation of the HDU audit was financed by money generated previously by SICSAG and the Scottish Intensive Care Society (SICS). Late in 2001, two nurses obtained a secondment to the SICSAG from their HDUs. Half of their time was to facilitate the implementation of HDU audit. These nurses had already a good insight into the constraints on HDU beds and recognised the applicability of the audit to HDUs. They were trained in the use of the software, the hardware requirements and in the technical aspects required to install the software on local PCs. By March 2002, the software had been installed, training had been given to local staff and data collection had begun on consecutive HDU admissions in 22 HDUs in Scotland.



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4. Initial steering group meetings for the HDU audit recommended that a number of variables should be incorporated as outcome measures and workload indicators, e.g., length of stay, intra-arterial blood pressure monitoring. As the software is now used in both ICUs and HDUs and in combined ICU/HDUs, the dataset has been revised in the last couple of years. Extraneous datafields have been removed and the interventions recorded in the Augmented Care Period (ACP) dataset modified to objectively classify levels of care as 2 (HDU) or 3 (ICU). The Audit Group will attempt to have all units using this updated version of the software as quickly as possible. Staffing issues have meant that its rollout has not been as quick as would have been liked.

5. Inherent in the HDU audit is the problem of having a clearly defined clinical lead to support the audit and data collection locally. Despite numerous attempts, few consultants who admit patients into HDUs have demonstrated any great interest in the audit; the audit group and the local HDU staff greatly appreciate their continued support and advice. Nursing staff bear the burden of data entry onto the audit software, Ward Watcher (Critical Care Audit Ltd); a workload which is in addition to their other duties. That the staff have continued to collect data demonstrates the recognition of the importance of such data to them. It is important that data are collected in both an accurate and timely manner and the audit group want to pay tribute to the staff who do this.

6. The ICU audit has been a success, not just in a narrow field, but also, in its contribution to the development of intensive care services, organisation and research in Scotland. It has been a source of information for planning of services by Health Boards, the Scottish Medicines Consortium, the Scottish Executive Health Department and the Chairs of Critical Care Delivery Groups. It is anticipated that the HDU audit will continue to mature and generate similar outcomes.

7. Piece-meal funding, budgetary limitations and unavoidable staff absences have resulted in there being no increase in staffing within the Audit Group since the HDU audit commenced despite the responsibility for the project in more than 50 HDUs and



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ICUs around the Country. The staffing lacks the critical mass to give long-term security and has been particularly stretched since February 2003. Unlike the ICU audit budget, which annually comes top-sliced from NHS Scotland to South Glasgow University Hospitals NHS Division for administering, participation by the HDUs is dependent on payment by local hospitals. Delayed payment and/or invoicing prevents the Audit Group developing longer-term strategies. Closer links have been developed with the Information Services Division (ISD) of NHS Scotland and there has been a decision in principle by SICS Council that the long-term future of the SICSAG would be best secured within that organisation.

8. During 2004, individual unit reports were generated by SICSAG staff and distributed to each site. The results have also been presented at the Annual Audit Meetings. Reported here are data on HDU activity and outcome for the period 2002-2004.



F. RESULTS

F.1. Audit participation.

9. Table 1 demonstrates the extent of participation in the audit during 2002 – 2004. A total of 26 HDUs collected data for at least part of 2002. Of the 22 units which had begun doing so by March 2002, a hardware problem in St. John's Hospital's HDU resulted in no data collection from April 2002 until August 2003; in Crosshouse Hospital's Medical HDU, data were collected for the first three months of 2002 only. SICSAG staff made a number of visits in an attempt to establish regular participation in Crosshouse's MHDU, which began in earnest in December 2004. A 27th HDU came on board in 2003 (Neurosurgical HDU at the Southern General Hospital), a year in which 25 HDUs collected data throughout. In 2004, data were complete in 24 units: in Thoracic HDU at Hairmyres, reinstallation of the operating system on the local PC unfortunately led to loss of data; in the Neurosurgical HDU at Aberdeen, there was only limited data collected for 2004.

F.2. Admission rates.

10. Figure 1 shows the trend in annual HDU admissions onto the audit databases in all units which have contributed data over the period 2002-2004. It must be remembered that 2002 was an incomplete year for a number of units (Table 1). In both 2003 and 2004 there were approximately 16,000 admissions recorded. In a cohort of 23 units, which participated throughout 2003 & 2004, there was an increase in admissions of 2.8%.

11. Table 2 and Figure 2 demonstrate the annual number of admissions to individual HDUs. The increase in the number of combined ICU/HDUs that enter patients of both levels of dependency into the ICU audit has made raw HDU admission numbers difficult to interpret.

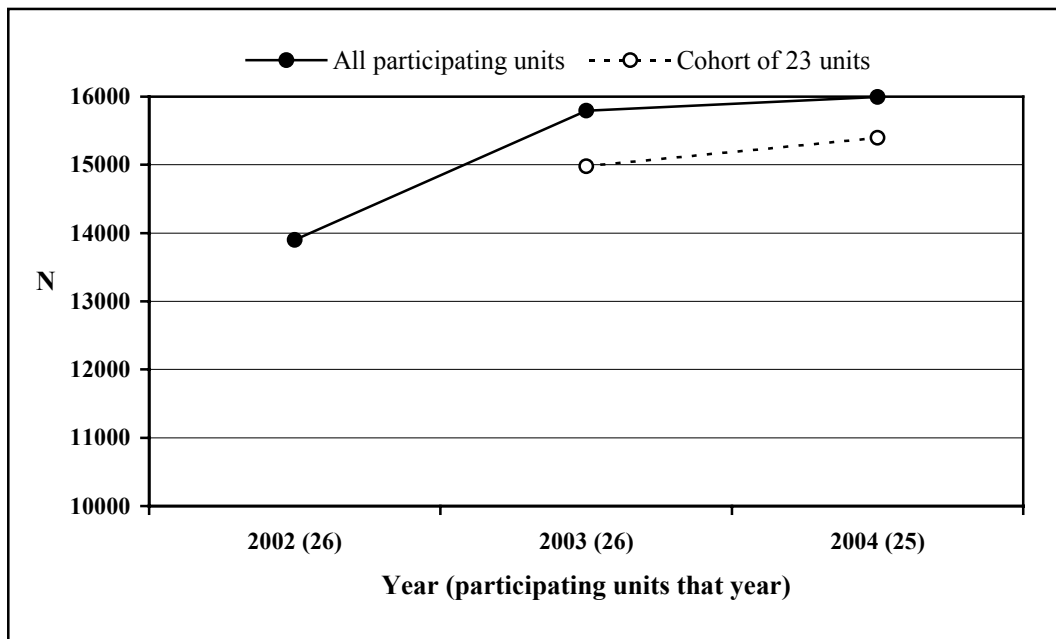


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Table 1. Participating High Dependency Units.

High Dependency Unit		Number of months and periods of data collection <i>per annum</i>		
		2002	2003	2004
ARI_N	Aberdeen Royal Infirmary, Neurosurgical HDU, Ward 40	10 (Mar-Dec 02)	12 (Jan-Dec 03)	NO DATA
ARI_S	Aberdeen Royal Infirmary, Surgical HDU, Ward 51	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
BH	Belford Hospital, Fort William, HDU	11 (Feb-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
CH_M	Crosshouse Hospital, Kilmarnock, Medical HDU, Ward 3F	3 (Jan-Mar 02)	NO DATA	NO DATA
CH_S	Crosshouse Hospital, Kilmarnock, Surgical HDU, Ward 4C	7 (June-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
DGRI_M	Dumfries & Galloway Royal Infirmary, Medical HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
DGRI_S	Dumfries & Galloway Royal Infirmary, Surgical HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
GGH	Gartnavel General Hospital, Glasgow, HDU	11 (Feb-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
GRI_S	Glasgow Royal Infirmary, Surgical HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
HM_T	Hairmyres Hospital, East Kilbride, Thoracic HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	3 (Jan, Feb & Dec 04)
LIDGH	Lorn & Islands District General Hospital, Oban, HDU	11 (Feb-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
MK	Monklands Hospital, Airdrie, HDU	1 (Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
NW_S	Ninewells Hospital, Dundee, Surgical HDU	11.5 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
PRI_S	Perth Royal Infirmary, Surgical HDU	11 (Feb-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
QMH_S	Queen Margaret Hospital, Dunfermline, Surgical HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
RAH_S	Royal Alexandra Hospital, Paisley, Surgical HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
RIE	Royal Infirmary of Edinburgh, HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
RM_M	Raigmore Hospital, Inverness, Medical Special Care Unit	11 (Feb-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
RM_S	Raigmore Hospital, Inverness, Surgical HDU	10 (Mar-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
SGH_N	Southern General Hospital, Glasgow, Neurosurgical HDU	NO DATA	12 (Jan-Dec 03)	12 (Jan-Dec 04)
SGH_S	Southern General Hospital, Glasgow, Surgical HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
SH_S	Stobhill Hospital, Glasgow, Surgical HDU	8 (May-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
St. J	St. John's Hospital, Livingston, Surgical HDU	3 (Jan-Mar 02)	4 (Aug-Dec 03)	12 (Jan-Dec 04)
VIG_S	Victoria Infirmary, Glasgow, Surgical HDU	11 (Feb-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
WGH_21	Western General Hospital, Edinburgh, HDU, Ward 21	4 (Sept-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
WGH_N	Western General Hospital, Edinburgh, Neurosurgical HDU	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)
WGH_S	Western General Hospital, Edinburgh, Surgical HDU, Ward	12 (Jan-Dec 02)	12 (Jan-Dec 03)	12 (Jan-Dec 04)

Figure 1. Annual admission rates to Scottish HDUs in a) all participating units and b) a cohort of 23 units which participated throughout 2003 & 2004. Note, 2002 was an incomplete year for a number of units.





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Table 2. Number of admissions entered onto audit software in Scottish HDUs, 2002 – 2004.

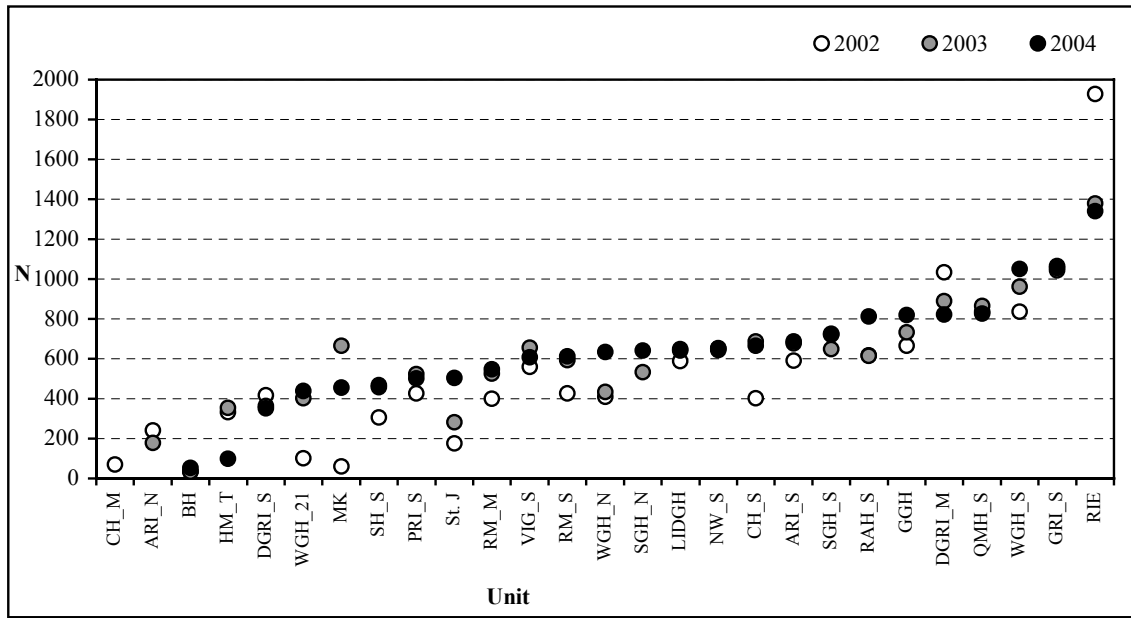
(Refer to Table 1 for time period of data collection for each unit.)

UNIT	Admission rate (N)		
	2002	2003	2004
ARI_N	242	178	-
ARI_S	590	677	687
BH	34	34	52
CH_M	71	-	-
CH_S	402	687	666
DGRI_M	1033	890	821
DGRI_S	416	365	353
GGH	666	733	820
GRI_S	1064	1043	1055
HM_T	333	354	99
LIDGH	588	641	648
MK	60	665	456
NW_S	654	644	651
PRI_S	427	524	502
QMH_S	836	864	826
RAH_S	616	614	811
RIE	1928	1378	1340
RM_M	399	525	546
RM_S	427	592	612
SGH_N	-	532	642
SGH_S	726	649	720
SH_S	307	468	457
St. J	176	282	504
VIG_S	558	655	608
WGH_21	101	403	438
WGH_N	410	433	633
WGH_S	837	962	1050
TOTAL	13,901	15,792	15,997



Figure 2. Trends in annual admission rates: 2002-2004. 2002 was an incomplete year in a number of units.

(Refer to Table 1 for time period of data collection for each unit.)



F.3. Bed availability and utilisation.

12. The minimum dataset requires the date and time of consecutive admissions and discharges to be recorded in each unit. From this information can be derived the number of bed days utilised and the bed occupancy for each unit. Table 3 displays the utilised bed days in each unit during 2002 – 2004. In the cohort of 23 units which participated throughout 2003 & 2004, there was a decrease in bed days from 42,673 to 41,790 (2.1%) despite a 2.8% increase in admissions in the same 2-year period (Figure 1).



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Table 3. Total bed days utilised, *per annum*.

UNIT	2002	2003	2004
ARI_N	1091.43	1044.99	-
ARI_S	2080.26	2327.97	2338.42
BH	71.22	96.63	103.34
CH_M	374.01	-	-
CH_S	1815.21	2932.15	3029.38
DGRI_M	1885.21	1949.59	2600.14
DGRI_S	1043.59	1060.9	1126.57
GGH	1888.04	2066	1971.29
GRI_S	3960.58	3954.95	3932.51
HM_T	1158.87	1194.03	368.1
LIDGH	1125.6	1043.13	1037.49
MK	249.52	3084	1310.11
NW_S	1691.16	1877.52	1986.27
PRI_S	906.27	1034	1061.85
QMH_S	2296.61	2210	2209
RAH_S	1834.74	1785	2320.85
RIE	4540.80	3027.21	2566.06
RM_M	905.37	1001	1009.54
RM_S	1412.91	1719	1686.13
SGH_N	-	880.6	1049.3
SGH_S	1725.78	1692	1782.27
SH_S	839.78	1344	1172.75
St. J	521.64	716	1242
VIG_S	1979.61	2407.31	2444.8
WGH_21	325.83	1188	1260.05
WGH_N	1338.64	1635	1424.67
WGH_S	2199.36	2357	2367.10
TOTAL	39,262	45,628	43,400

13. To determine bed occupancy as accurately as possible, SICSAG must know the correct number of available funded beds and relies on senior staff in each HDU providing details of any changes; obtaining reliable information can be surprisingly difficult. Table 4 identifies the fluctuation in funded bed numbers during 2002 – 2004, in some instances monthly. The bed numbers in Table 4 were used to generate subsequent occupancy results.



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Table 4. Number of HDU funded beds used to calculate occupancies in 2002 - 2004.

UNIT	2002	2003	2004
ARI N	4	4	-
ARI S	10	10	10
BH	2	2	2
CH M	-	-	-
CH S	12	12	12
DGRI M	6	6	6
DGRI S	4	4	4
GGH	12	12	9
GRI S	12	12	12
HM T	4	4	4
LIDGH	4	4	4
MK	12	12	6
NW S	6	6	6
PRI S	4	4	4
QMH S	8	8	8
RAH S	6	6	8
RIE	16 (Jan-Jul); 14 (Aug-Dec)	16 (Jan-Mar); 12 (Apr); 8 (May-Dec)	8
RM M	4	4	4
RM S	6	6	6
SGH N	-	4	4
SGH S	6	6	6
SH S	4	6	6 (Jan-Jul), 4 (Aug-Dec)
St. J	8	8	8 (Jan-Sept); 1.5 (mid-Sept-Dec)
VIG S	8	8	8
WGH 2I	4	4	4 (Jan-Sept); 6 (Oct-Dec)
WGH N	4	4	4
WGH S	8	8	8 (Jan-Sept); 10 (Oct-Dec)

14. In the participating HDUs, the number of funded beds appears to have dropped, from 186.3 in 2003 to 175.6 in 2004 (Table 5). Re-distribution of some HDU beds into combined ICU/HDUs has occurred (e.g., the Western Infirmary, Glasgow & Royal Infirmary of Edinburgh). To assist in understanding the distribution of HDU beds, Table 6 provides a breakdown of participating HDUs and bed numbers by NHS Board. Included in Table 6 are the location of the combined ICU/HDUs and the HDU bed numbers in these units. Admissions to the combined ICU/HDUs have been reported in the Audit Group's Annual Report 2005 [2]. Table 7 identifies NHS Boards with other HDUs known to the Audit Group.



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Table 5. Average number of HDU beds (funded) in each unit, *per annum*.

UNIT	2002	2003	2004
ARI N	4	4	4
ARI S	10	10	10
BH	2	2	2
CH M	12	12	12
CH S	12	12	12
DGRI M	6	6	6
DGRI S	4	4	4
GGH	12	12	9
GRI S	12	12	12
HM T	4	4	4
LIDGH	4	4	4
MK	12	12	6
NW S	6	6	6
PRI S	4	4	4
QMH S	8	8	8
RAH S	6	6	8
RIE	15.2	10.3	8
RM M	4	4	4
RM S	6	6	6
SGH N	-	4	4
SGH S	6	6	6
SH S	4	6	5.2
St. J	8	8	6.4
VIG S	8	8	8
WGH 21	4	4	4.5
WGH N	4	4	4
WGH S	8	8	8.5
TOTAL	185.2	186.3	175.6



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Table 6. Location of funded HDU beds known to exist in Scotland during 2002 - 2004.

NHS BOARD	HOSPITAL	Mean number of funded HDU beds		
		2002	2003	2004
Argyll & Clyde	Lorn & Islands DGH	4	4	4
	Royal Alexandra Hospital	6	6	8
	Vale of Leven DGH ICU/HDU <i>*unit functioned as 2 ICU beds OR up to 4 HDU beds at any one time. Care required not to double count the number of beds in this unit. 2 ICU beds are included in the ICU Audit Reports.</i>	*	*	*
	Total for Health Board	10	10	12
Ayrshire & Arran	Crosshouse Hospital MHDU	12	12	12
	Crosshouse Hospital SHDU	12	12	12
	Total for Health Board	24	24	24
Dumfries &	Dumfries Royal Infirmary MHDU	6	6	6
	Dumfries Royal Infirmary SHDU	4	4	4
	Total for Health Board	10	10	10
Fife	Queen Margaret Hospital	8	8	8
	Total for Health Board	8	8	8
Forth Valley	Falkirk Royal Infirmary ICU/HDU	3	3	3
	Total for Health Board	3	3	3
Grampian	Aberdeen Royal Infirmary ICU/HDU <i>*Apr-Dec '02</i>	4*	4	4
	Aberdeen Royal Infirmary, Wd 40, NHDU	4	4	4
	Aberdeen Royal Infirmary, Wd 51, SHDU	10	10	10
	Total for Health Board	18	18	18
Greater Glasgow	Gartnavel General Hospital HDU	12	12	9
	Glasgow Royal Infirmary SHDU	12	12	12
	Southern General Hospital NHDU	4	6	4
	Southern General Hospital SHDU	6	6	6
	Stobhill Hospital SHDU	4	6	5.2
	Victoria Infirmary SHDU	8	8	8
	Western Infirmary ICU/HDU <i>*Apr-Dec '02</i>	2*	2	2
Total for Health Board	48	52	46.2	
Highland	Raigmore Hospital MSCU	4	4	4
	Raigmore Hospital SHDU	6	6	6
	Total for Health Board	10	10	10
Lanarkshire	Hairmyres Hospital THDU	4	4	4
	Hairmyres Hospital ICU/HDU	2	2	1.75
	Monklands Hospital	12	12	6
	Wishaw Hospital ICU/HDU	7	7	6.5
	Total for Health Board	25	25	18.25
Lothian	Royal Infirmary of Edinburgh HDU	15.2	10.3	8
	Royal Infirmary of Edinburgh ICU/HDU <i>*May-Dec'03</i>	0	6	5.75
	St. John's Hospital	8	8	6.4
	Western General Hospital NHDU	4	4	4
	Western General Hospital Wd 21 HDU	4	4	4.5
	Western General Hospital Wd 58 SHDU	8	8	8.5
Total for Health Board	39.2	40.3	37.15	
Tayside	Ninewells Hospital	6	6	6
	Perth Royal Infirmary	4	4	4
	Total for Health Board	10	10	10
TOTAL		205.2	210.3	196.6



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Table 7. Location of other known HDUs.

NHS BOARD	HOSPITAL
Argyll & Clyde	Inverclyde Royal Hospital, HDU. Has requested to join the audit.
	Vale of Leven DGH. With redistribution of services, the ICU/HDU was downgraded to a Medical HDU mid-2005. Ward Watcher has been installed in this MHDU.
Ayrshire & Arran	Ayr Hospital, HDU. Has requested to join the audit.
Fife	An HDU did exist at Victoria Hospital Kirkcaldy for a period of time prior to reorganisation of services in Fife. No other details available.
Forth Valley	Stirling Royal Infirmary did have HDU beds prior to the amalgamation of Falkirk and Stirling. This unit did not participate in the audit. Following the amalgamation in 2005, there are 2 HDUs in Stirling: 'Medical' and 'Surgical'.
Grampian	Dr. Gray's Hospital, HDU
Highland	Caithness General Hospital, HDU
Orkney	Current HDU bed status unknown.
Shetland	Gilbert Bain Hospital HDU. Ward Watcher <i>in situ</i> since mid-2005.
Western Isles	Current HDU bed status unknown.

15. Although the average occupancy over the last few years has remained stable (Figure 3), it is important to note the extreme pressure a number of HDUs appear to be under (Figure 4 and Table 8). Importantly, bed occupancy is measured on a minute-to-minute basis. A further caution is that occupancy is over 7 days and where units support significant, elective surgical activity, this tends to increase Monday to Friday occupancy disproportionately.

16. The demand for HDU at Belford Hospital (BH) means that the beds are opened infrequently, when needed. This unit's occupancy has not been included in the generation of the mean occupancies of all units in order to not bias the results.



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Figure 3. Annual HDU bed occupancies, 2002 - 2004.

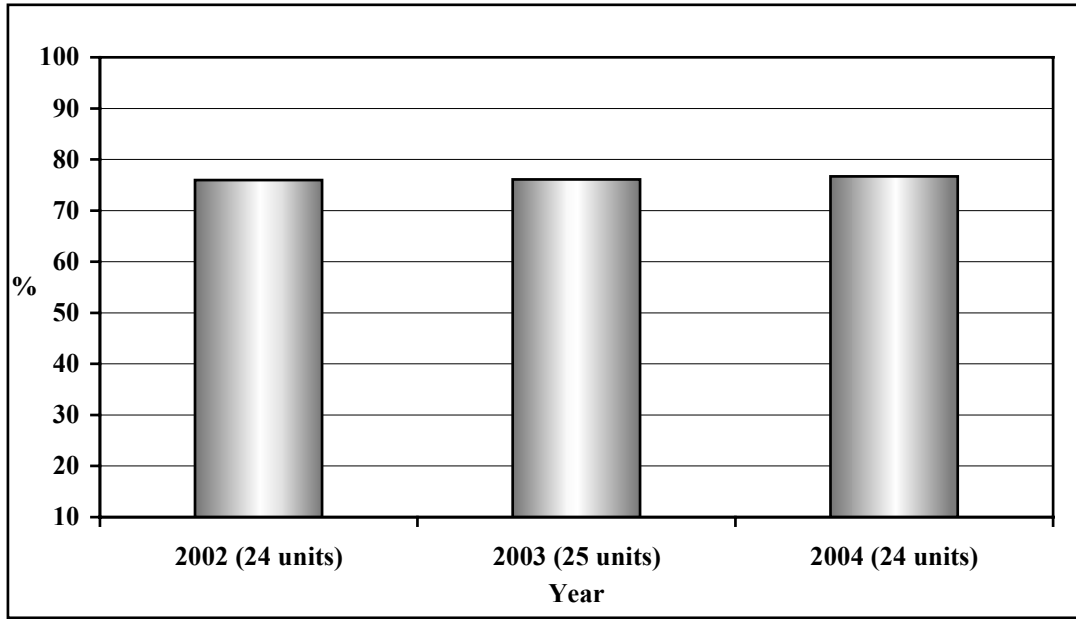
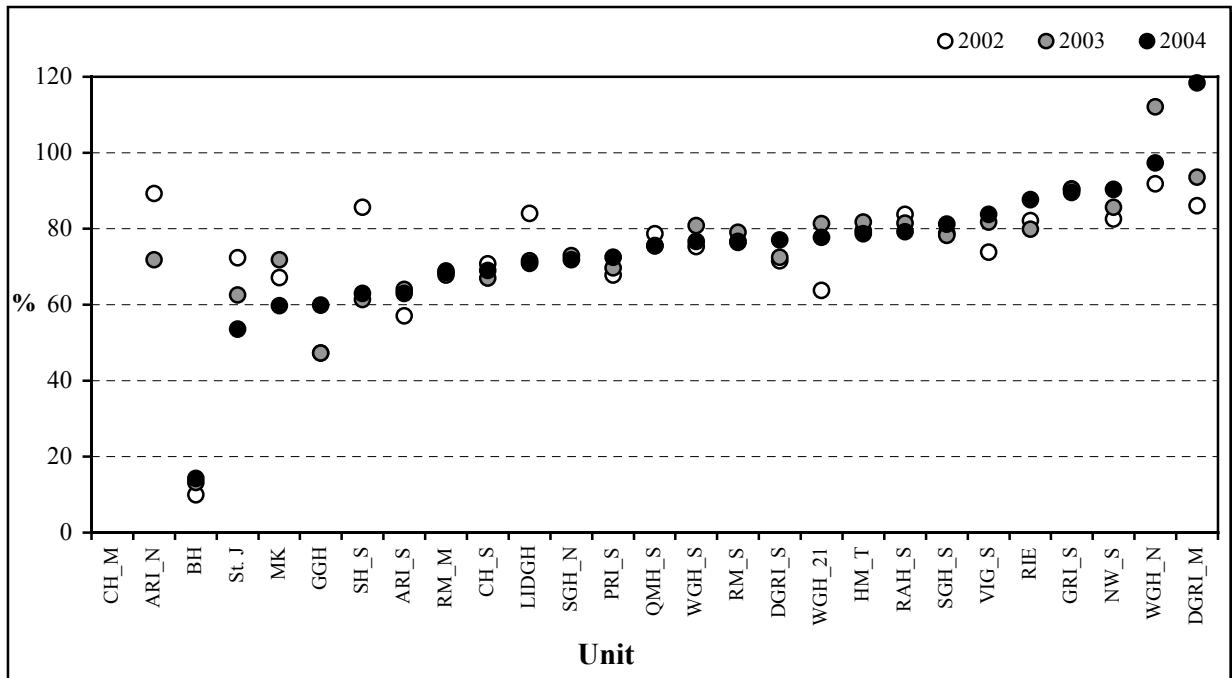


Figure 4. Trends in bed occupancies (%) in Scottish HDUs, 2002 - 2004.





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Table 8. HDU bed occupancies (%), 2002-2004.

UNIT	2002	2003	2004
ARI_N	89.3	71.8	-
ARI_S	57.1	64.0	63.0
BH	10.0	13.2	14.2
CH_M	-	-	-
CH_S	70.7	67.0	69.0
DGRI_M	86.0	93.5	118.4
DGRI_S	71.5	72.5	77.0
GGH	47.2	47.3	59.9
GRI_S	90.5	90.3	89.5
HM_T	79.4	81.7	78.6
LIDGH	84.0	71.6	70.9
MK	67.1	71.8	59.7
NW_S	82.6	85.7	90.4
PRI_S	67.8	69.6	72.5
QMH_S	78.6	75.6	75.5
RAH_S	83.8	81.5	79.2
RIE	82.1	79.8	87.6
RM_M	67.8	68.5	68.9
RM_S	76.4	79.1	76.7
SGH_N	-	72.9	71.8
SGH_S	78.8	78.2	81.2
SH_S	85.7	61.3	63.0
St. J	72.4	62.5	53.5
VIG_S	73.8	81.8	83.7
WGH_21	63.7	81.4	77.7
WGH_N	91.8	112.1	97.3
WGH_S	75.3	80.8	76.7

17. Figure 5 details the trends in winter occupancies from 2002 – 2004. Figure 6, however, demonstrates the continuous pressure on HDU resources throughout the year.



Figure 5. Trends in HDU winter bed occupancies: December - March.

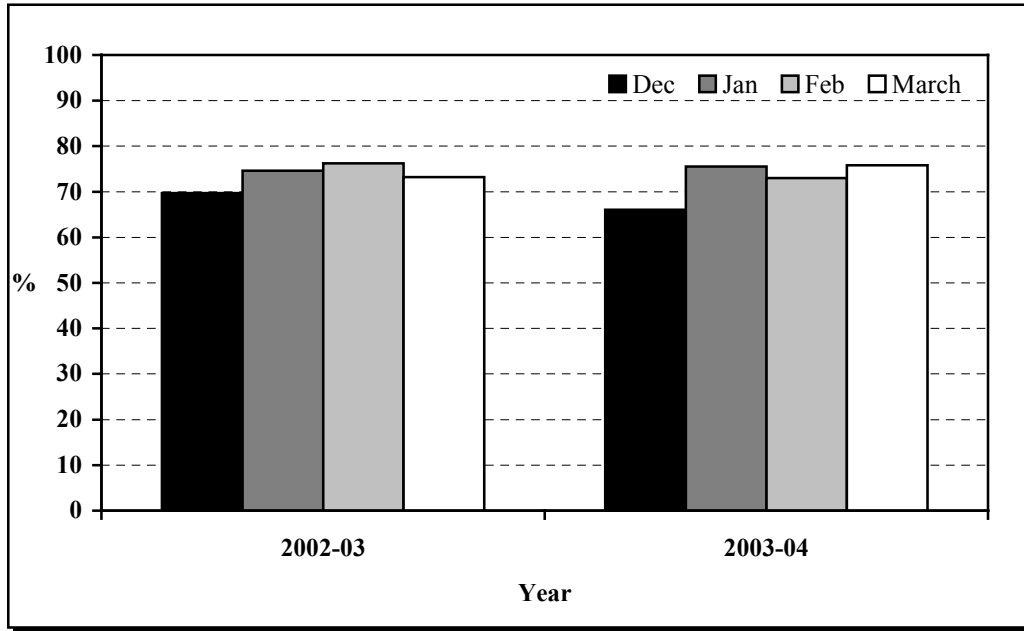
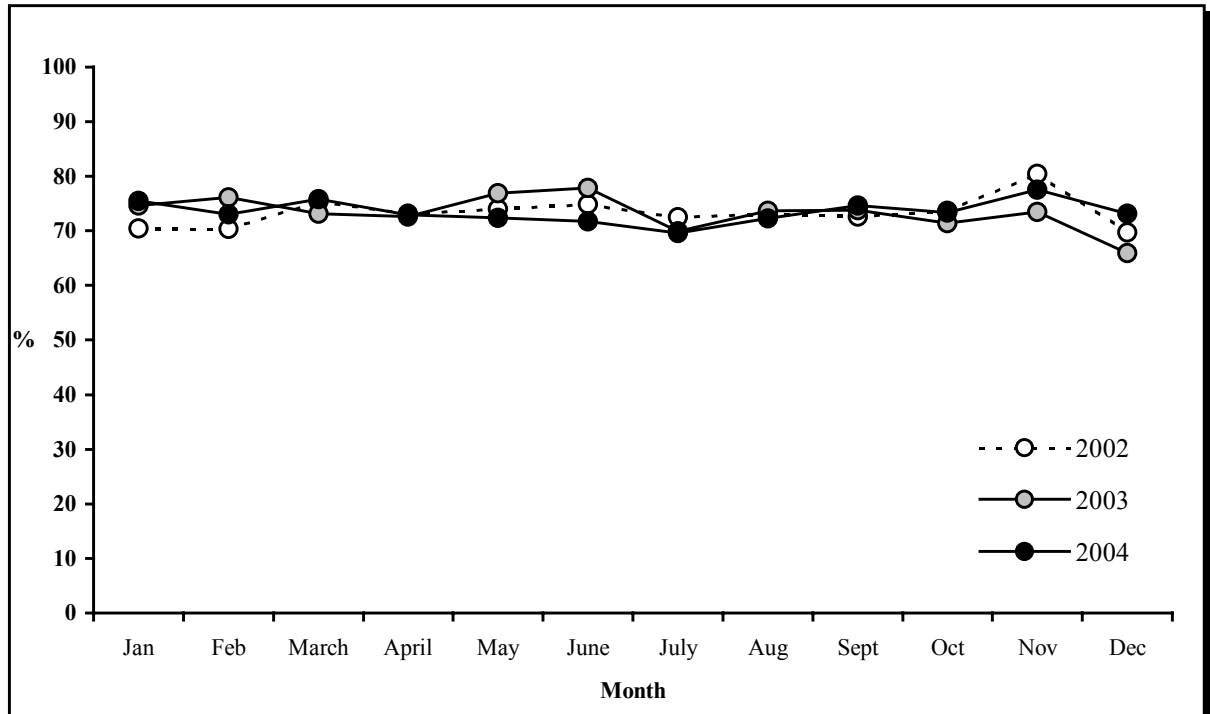


Figure 6. Trends in monthly bed occupancies: 2002-2004.





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F.4. Age.

18. The average age of admissions to the HDUs is 61 years. There is, however, variation between the units with younger admissions, on average, to the three neurosurgical HDUs (Aberdeen Royal Infirmary, Southern General Hospital & Western General Hospital). Table 9 and Figures 7 & 8 demonstrate the similarities and differences between 2002 and 2004.

Table 9. Age of HDU admissions.

UNIT	Mean Age (Y)			Median Age (Y)		
	2002	2003	2004	2002	2003	2004
ARI N	52.2	53.8	-	55	56	-
ARI S	62.2	61.7	63.2	66	65	67
BH	63.3	58.3	55.5	64	60	57
CH M	53.8	-	-	55	-	-
CH S	59.9	60.7	60.8	64	65	64
DGRI M	67.2	66.6	66.6	70	70	70
DGRI S	66.8	66.8	67.4	70	70	70
GGH	62.7	60.8	61.6	66	65	64
GRI S	60.0	60.5	59.2	64	63	63
HM T	61.2	61.2	64.3	65	64	66
LIDGH	62.2	65.6	64	66	69	66
MK	54.8	59.6	60	60	63	62
NW S	67.1	66.8	65	70	70	68
PRI S	66.2	65.8	66.7	69	68	70
QMH S	63.8	65.1	64.6	67	68	68
RAH S	61.5	61.7	62.7	66	66	67
RIE	61.8	61.2	62.4	65	65	66
RM M	59.4	58.8	58.6	63	62	62
RM S	62.2	64.5	64.8	67	68	68
SGH N	-	50.4	50.8	-	50	52
SGH S	58.5	59.8	64.1	62	63	67
SH S	60.6	61.1	61.2	64	63	64
St. J	61.3	57.5	59.5	61	61	63
VIG S	57.0	60.8	60.6	61	65	66
WGH 21	62.2	63.9	62	66	68	66
WGH N	51.2	52.5	51.3	52	55	52
WGH S	64.3	64.4	63.3	68	68	67



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Figure 7. Mean age of HDU admissions.

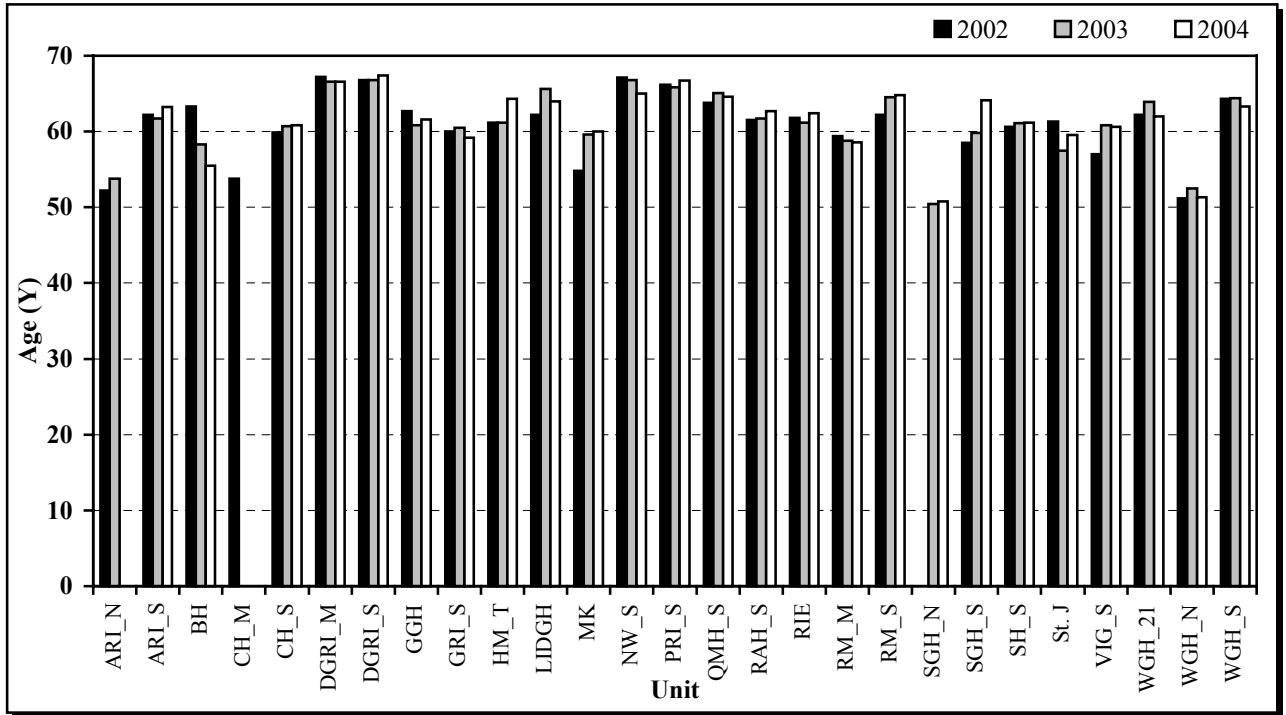
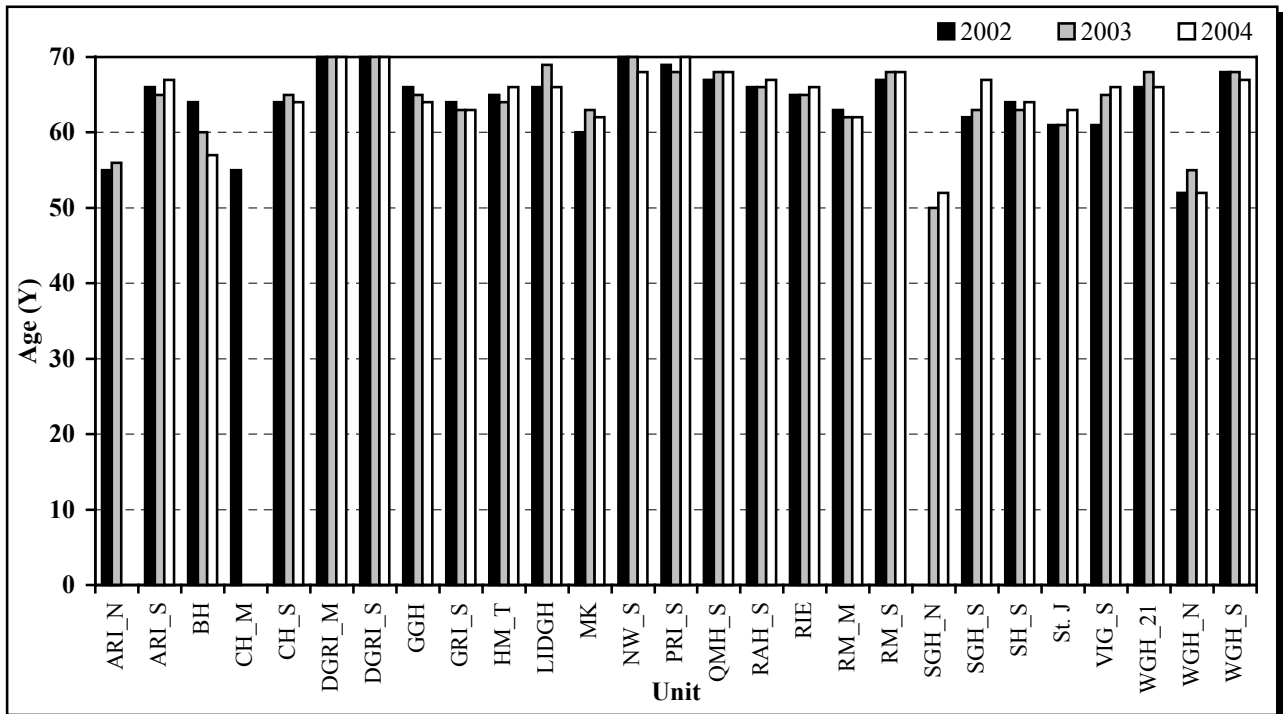


Figure 8. Median age of HDU admissions.

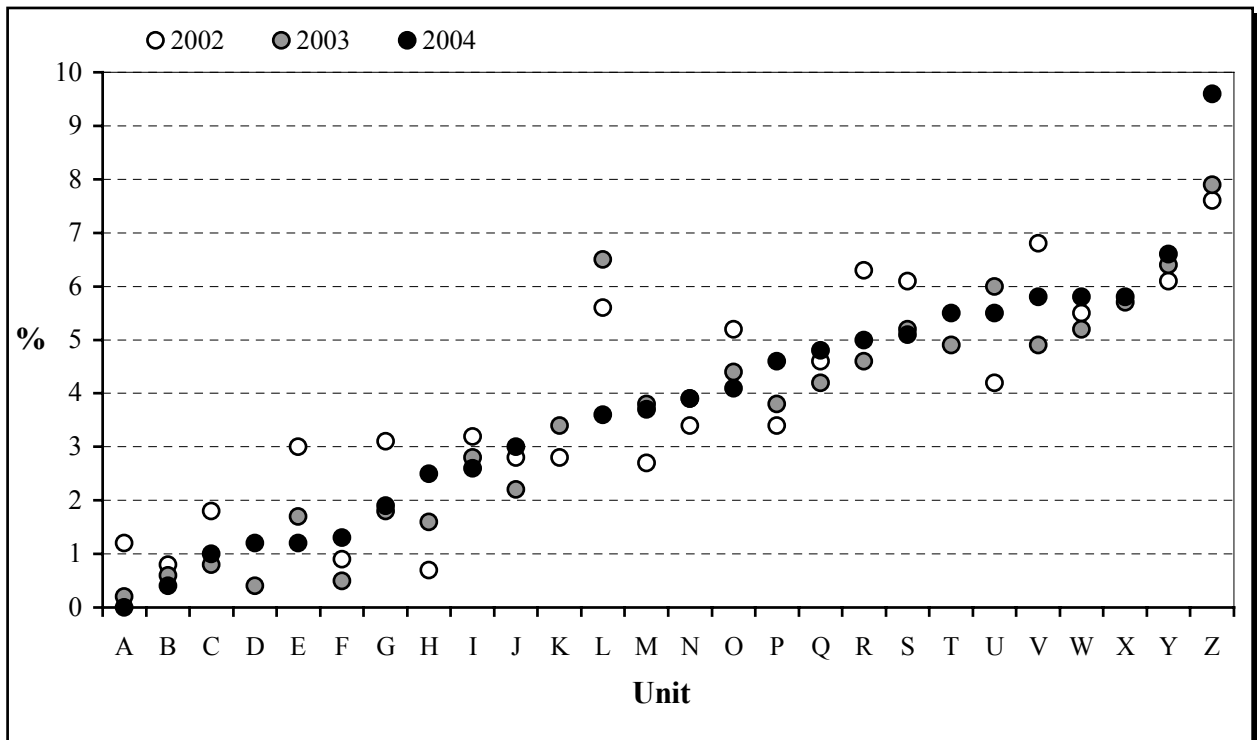




F.5. HDU outcome.

19. Case-mix adjustment tools have been used by the Audit Group for many years to adjust mortality for variation in case mix in ICU admissions. Similar tools are less-well developed for HDU admissions and only raw mortality figures at discharge from HDU are available (Figure 9). On average, 96% of admissions are alive at HDU discharge. No comparisons can be made between units with these type of data due to lack of case mix adjustment. As yet, no outcome beyond HDU discharge is available.

Figure 9. HDU mortality rates (%).





F.6. Source of admissions.

20. The dataset requires source of admission to be recorded for every admission as follows (datafield = “Admitted from (type)”):

- 01. A&E in this hospital
- 02. Recovery/theatre in this hospital
- 03. Recovery only, in this hospital
- 04. Ward in this hospital
- 05. ICU in this hospital
- 06. HDU in this hospital
- 07. Other intermediate care area (not ICU or HDU) in this hospital
- 08. X-Ray, endoscopy suite, CT scanner or similar in this hospital
- 09. ICU in another hospital
- 10. HDU in another hospital
- 11. Other area in another hospital (not ICU or HDU)
- 12. Normal residence

The sources 03, 04, 07 & 08 above have been amalgamated into the category “Ward this hosp.”. Source 11 is “Ward other hosp.” and 12 is “Home”.

21. Figures 10 and 11 demonstrate the trends in absolute numbers and proportions of admissions from the various sources to the HDUs in general. There continues to be a large variation in admission sources between hospitals (Figures 12 - 16 and Tables 10-12).



Figure 10. Trend over time of the source of admissions to HDUs (N).

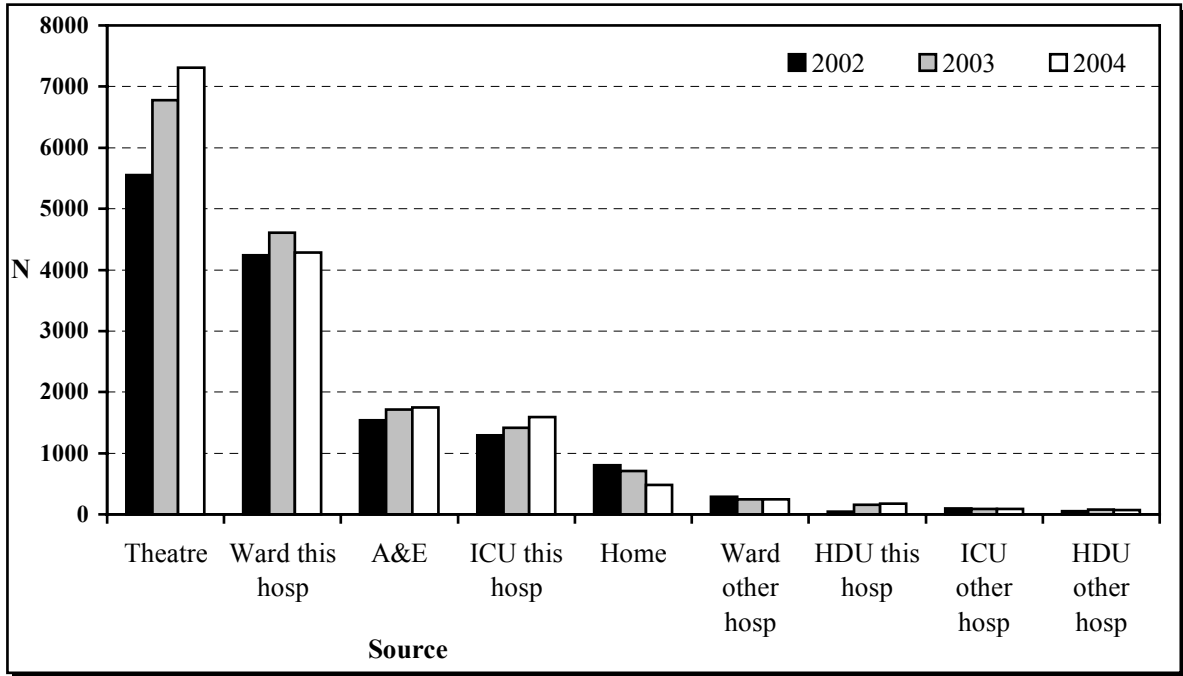
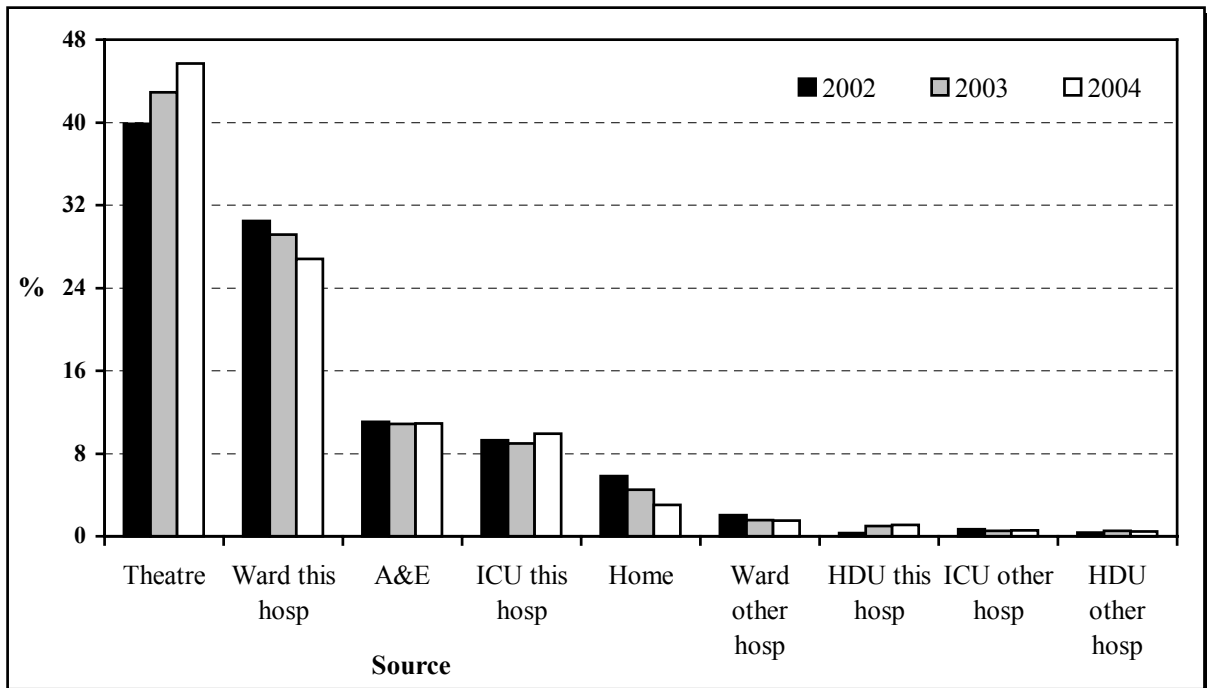


Figure 11. Trend over time of the source of admissions to HDUs (%).





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Figure 12. Proportion of admissions to each HDU from Theatre: 2002-2004.

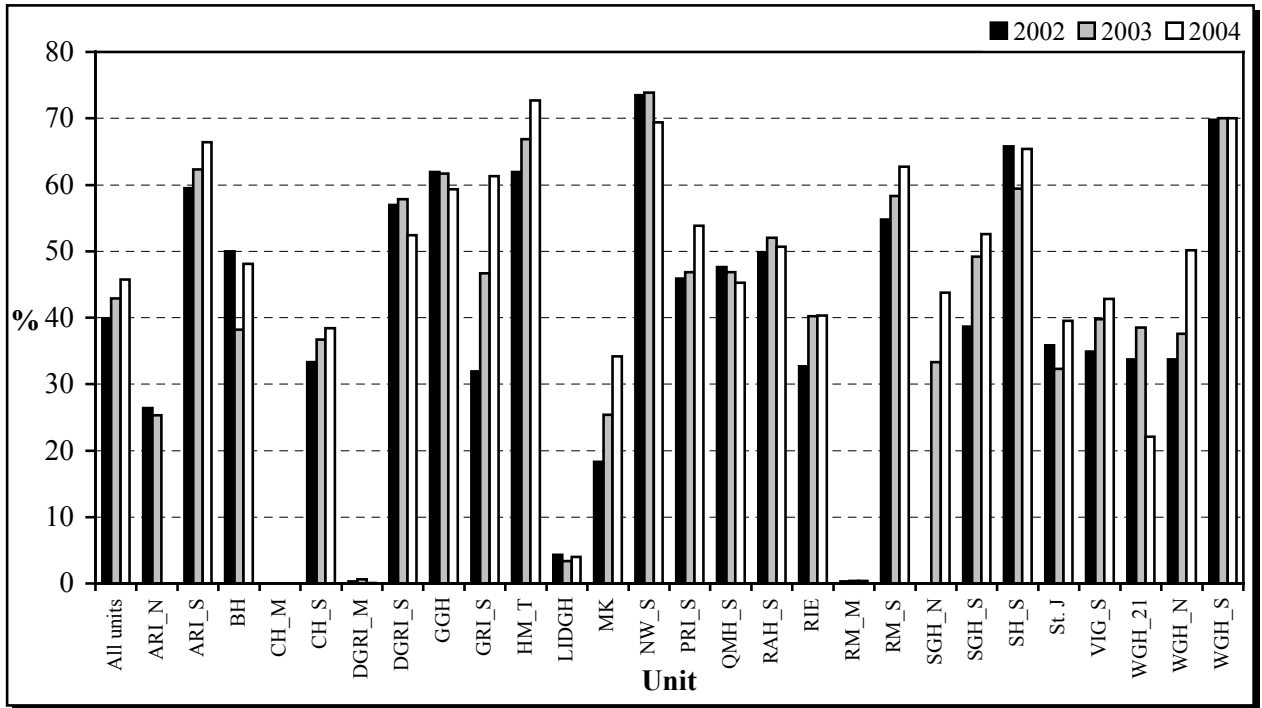
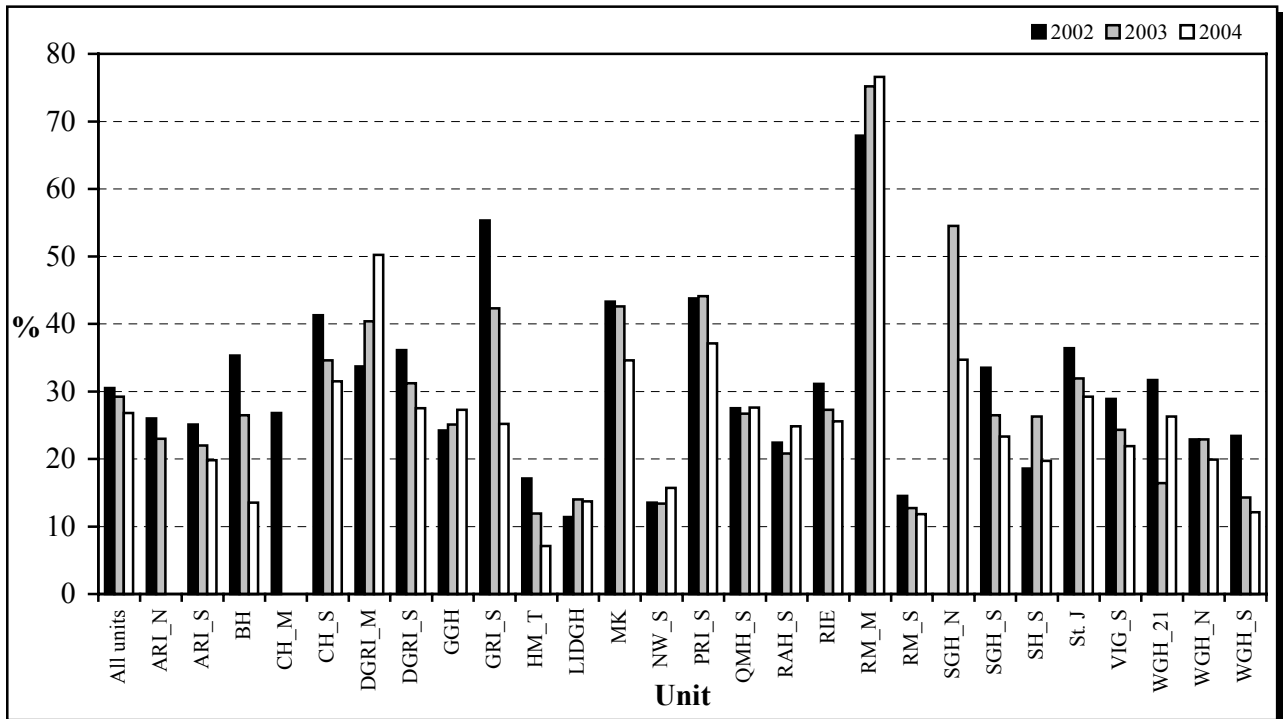


Figure 13. Proportion of admissions to each HDU from Ward in same hospital: 2002-2004.





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Figure 14. Proportion of admissions to each HDU from A&E: 2002-2004.

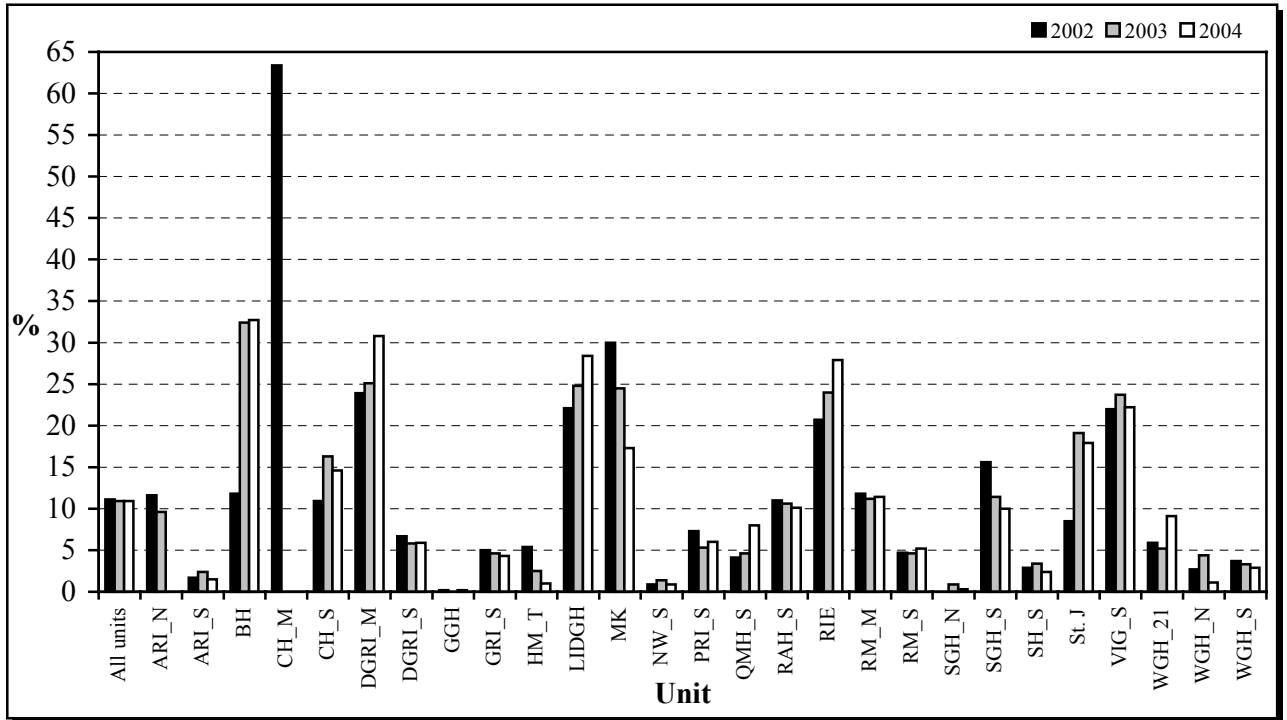
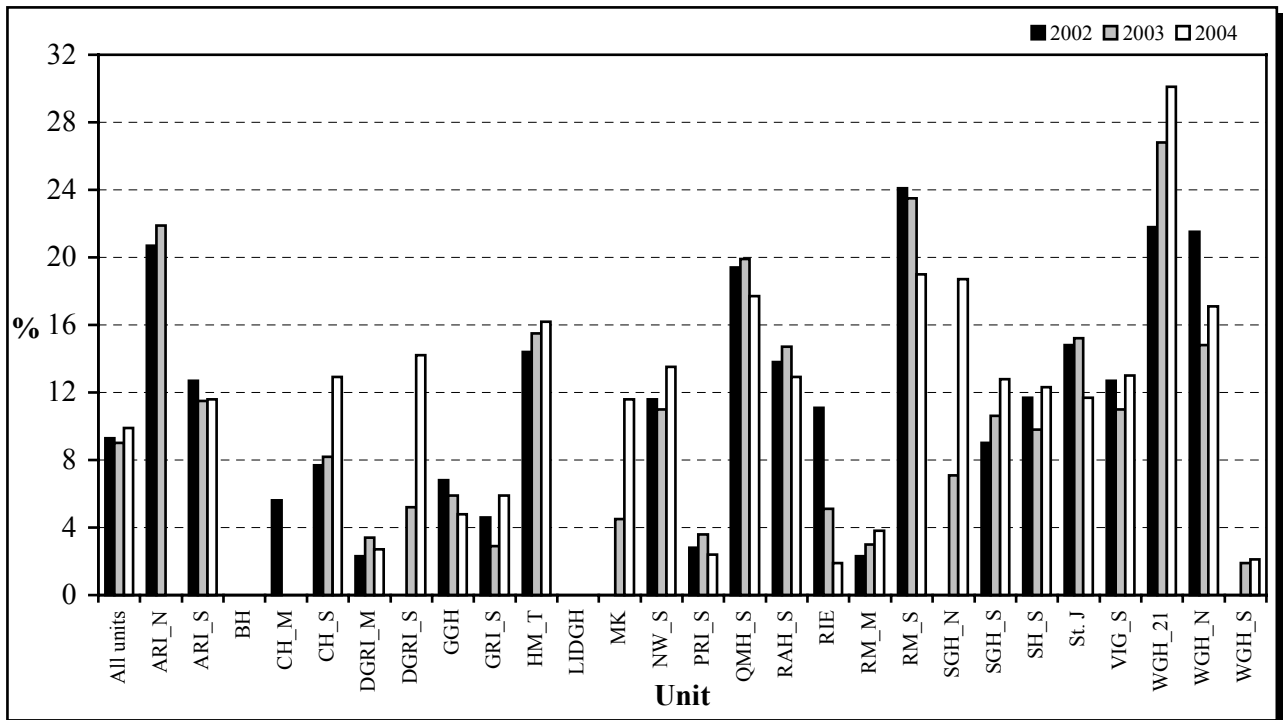


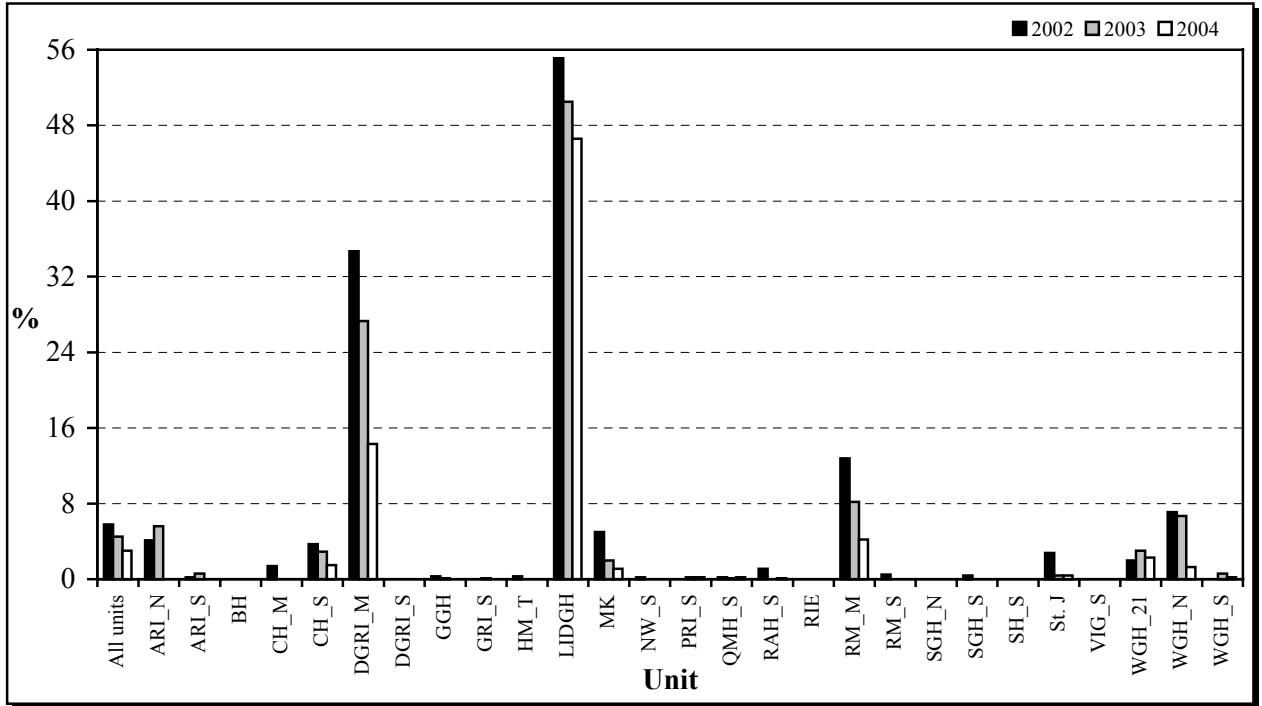
Figure 15. Proportion of admissions to each HDU from ICU in same hospital: 2002-2004.





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Figure 16. Proportion of admissions to each HDU from Home: 2002-2004.





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Table 10. Source of admissions to HDUs in 2002.

	Theatre		Ward this hosp.		A&E		ICU this hosp.		Home		Ward other hosp.		HDU this hosp.		ICU other hosp.		HDU other hosp.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
ARI_N	64	26.4	63	26.0	28	11.6	50	20.7	10	4.1	24	9.9	0	0.0	1	0.4	2	0.8
ARI_S	351	59.5	148	25.1	10	1.7	75	12.7	1	0.2	4	0.7	1	0.2	0	0.0	0	0.0
BH	17	50.0	12	35.3	4	11.8	0	0.0	0	0.0	1	2.9	0	0.0	0	0.0	0	0.0
CH_M	0	0.0	19	26.8	45	63.4	4	5.6	1	1.4	1	1.4	0	0.0	1	1.4	0	0.0
CH_S	134	33.3	166	41.3	44	10.9	31	7.7	15	3.7	5	1.2	3	0.7	3	0.7	1	0.2
DGRI_M	3	0.3	348	33.7	247	23.9	24	2.3	358	34.7	43	4.2	6	0.6	2	0.2	2	0.2
DGRI_S	237	57.0	150	36.1	28	6.7	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	0	0.0
GGH	412	61.9	161	24.2	1	0.2	45	6.8	2	0.3	13	2.0	1	0.2	25	3.8	6	0.9
GRI_S	339	31.9	588	55.3	53	5.0	49	4.6	0	0.0	7	0.7	0	0.0	15	1.4	13	1.2
HM_T	206	61.9	57	17.1	18	5.4	48	14.4	1	0.3	1	0.3	2	0.6	0	0.0	0	0.0
LIDGH	25	4.3	67	11.4	130	22.1	0	0.0	324	55.1	41	7.0	1	0.2	0	0.0	0	0.0
MK	11	18.3	26	43.3	18	30.0	0	0.0	3	5.0	2	3.3	0	0.0	0	0.0	0	0.0
NW_S	481	73.5	88	13.5	6	0.9	76	11.6	1	0.2	1	0.2	0	0.0	0	0.0	1	0.2
PRI_S	196	45.9	187	43.8	31	7.3	12	2.8	0	0.0	1	0.2	0	0.0	0	0.0	0	0.0
QMH_S	398	47.6	230	27.5	34	4.1	162	19.4	2	0.2	7	0.8	0	0.0	2	0.2	1	0.1
RAH_S	307	49.8	138	22.4	68	11.0	85	13.8	7	1.1	5	0.8	1	0.2	3	0.5	2	0.3
RIE	630	32.7	600	31.1	400	20.7	214	11.1	0	0.0	53	2.7	5	0.3	11	0.6	15	0.8
RM_M	1	0.3	271	67.9	47	11.8	9	2.3	51	12.8	16	4.0	4	1.0	0	0.0	0	0.0
RM_S	234	54.8	62	14.5	20	4.7	103	24.1	2	0.5	6	1.4	0	0.0	0	0.0	0	0.0
SGH_N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SGH_S	281	38.7	243	33.5	113	15.6	65	9.0	3	0.4	2	0.3	0	0.0	16	2.2	3	0.4
SH_S	202	65.8	57	18.6	9	2.9	36	11.7	0	0.0	0	0.0	0	0.0	2	0.7	1	0.3
St. J	63	35.8	64	36.4	15	8.5	26	14.8	5	2.8	2	1.1	0	0.0	1	0.6	0	0.0
VIG_S	195	34.9	161	28.9	123	22.0	71	12.7	0	0.0	2	0.4	1	0.2	5	0.9	0	0.0
WGH_21	34	33.7	32	31.7	6	5.9	22	21.8	2	2.0	0	0.0	5	5.0	0	0.0	0	0.0
WGH_N	138	33.7	94	22.9	11	2.7	88	21.5	29	7.1	42	10.2	1	0.2	6	1.5	1	0.2
WGH_S	584	69.8	196	23.4	31	3.7	0	0.0	0	0.0	6	0.7	14	1.7	1	0.1	5	0.6
ALL UNITS	5543	39.9	4228	30.4	1540	11.1	1295	9.3	817	5.9	285	2.1	45	0.3	95	0.7	53	0.4



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Table 11. Source of admissions to HDUs in 2003.

	Theatre		Ward this hosp.		A&E		ICU this hosp.		Home		Ward other hosp.		HDU this hosp.		ICU other hosp.		HDU other hosp.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
ARI_N	45	25.3	41	23.0	17	9.6	39	21.9	10	5.6	22	12.4	1	0.6	0	0.0	3	1.7
ARI_S	422	62.3	149	22.0	16	2.4	78	11.5	4	0.6	6	0.9	1	0.1	0	0.0	1	0.1
BH	13	38.2	9	26.5	11	32.4	0	0.0	0	0.0	1	2.9	0	0.0	0	0.0	0	0.0
CH_M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CH_S	252	36.7	238	34.6	112	16.3	56	8.2	20	2.9	4	0.6	1	0.1	1	0.1	3	0.4
DGRI_M	5	0.6	360	40.4	223	25.1	30	3.4	243	27.3	23	2.6	2	0.2	2	0.2	2	0.2
DGRI_S	211	57.8	114	31.2	21	5.8	19	5.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
GGH	452	61.7	184	25.1	0	0.0	43	5.9	1	0.1	16	2.2	0	0.0	32	4.4	5	0.7
GRI_S	487	46.7	441	42.3	48	4.6	30	2.9	1	0.1	8	0.8	1	0.1	5	0.5	22	2.1
HM_T	237	66.9	42	11.9	9	2.5	55	15.5	0	0.0	2	0.6	9	2.5	0	0.0	0	0.0
LIDGH	22	3.4	90	14.0	159	24.8	0	0.0	324	50.5	46	7.2	0	0.0	0	0.0	0	0.0
MK	169	25.4	283	42.6	163	24.5	30	4.5	13	2.0	3	0.5	0	0.0	1	0.2	3	0.5
NW_S	476	73.9	86	13.4	9	1.4	71	11.0	0	0.0	1	0.2	0	0.0	0	0.0	1	0.2
PRI_S	245	46.8	231	44.1	28	5.3	19	3.6	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0
QMH_S	404	46.8	231	26.7	40	4.6	172	19.9	1	0.1	9	1.0	0	0.0	6	0.7	1	0.1
RAH_S	319	52.0	128	20.8	65	10.6	90	14.7	0	0.0	2	0.3	0	0.0	6	1.0	4	0.7
RIE	554	40.2	376	27.3	331	24.0	70	5.1	0	0.0	19	1.4	5	0.4	9	0.7	14	1.0
RM_M	2	0.4	395	75.2	59	11.2	16	3.0	43	8.2	9	1.7	1	0.2	0	0.0	0	0.0
RM_S	345	58.3	75	12.7	27	4.6	139	23.5	0	0.0	4	0.7	1	0.2	0	0.0	1	0.2
SGH_N	177	33.3	290	54.5	5	0.9	38	7.1	0	0.0	6	1.1	11	2.1	3	0.6	2	0.4
SGH_S	319	49.2	172	26.5	74	11.4	69	10.6	0	0.0	3	0.5	1	0.2	6	0.9	5	0.8
SH_S	278	59.4	123	26.3	16	3.4	46	9.8	0	0.0	2	0.4	0	0.0	2	0.4	1	0.2
St. J	91	32.3	90	31.9	54	19.1	43	15.2	1	0.4	0	0.0	0	0.0	2	0.7	1	0.4
VIG_S	261	39.8	159	24.3	155	23.7	72	11.0	0	0.0	3	0.5	1	0.2	2	0.3	2	0.3
WGH_21	155	38.5	66	16.4	21	5.2	108	26.8	12	3.0	2	0.5	33	8.2	3	0.7	3	0.7
WGH_N	163	37.6	99	22.9	19	4.4	64	14.8	29	6.7	53	12.2	2	0.5	3	0.7	1	0.2
WGH_S	673	70.0	138	14.3	32	3.3	18	1.9	6	0.6	2	0.2	88	9.1	1	0.1	4	0.4
ALL UNITS	6777	42.9	4610	29.2	1714	10.9	1415	9.0	709	4.5	246	1.6	158	1.0	84	0.5	79	0.5



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Table 12. Source of admissions to HDUs in 2004.

	Theatre		Ward this hosp.		A&E		ICU this hosp.		Home		Ward other hosp.		HDU this hosp.		ICU other hosp.		HDU other hosp.	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
ARI_N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARI_S	456	66.4	136	19.8	10	1.5	80	11.6	0	0.0	4	0.6	0	0.0	0	0.0	1	0.1
BH	25	48.1	7	13.5	17	32.7	0	0.0	0	0.0	2	3.8	0	0.0	0	0.0	1	1.9
CH_M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CH_S	256	38.4	210	31.5	97	14.6	86	12.9	10	1.5	3	0.5	2	0.3	2	0.3	0	0.0
DGRI_M	1	0.1	412	50.2	253	30.8	22	2.7	117	14.3	14	1.7	2	0.2	0	0.0	0	0.0
DGRI_S	185	52.4	97	27.5	21	5.9	50	14.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
GGH	486	59.3	224	27.3	2	0.2	39	4.8	0	0.0	20	2.4	0	0.0	46	5.6	3	0.4
GRI_S	647	61.3	266	25.2	45	4.3	62	5.9	0	0.0	12	1.1	0	0.0	9	0.9	14	1.3
HM_T	72	72.7	7	7.1	1	1.0	16	16.2	0	0.0	0	0.0	2	2.0	0	0.0	1	1.0
LIDGH	26	4.0	89	13.7	184	28.4	0	0.0	302	46.6	45	6.9	0	0.0	0	0.0	2	0.3
MK	156	34.2	158	34.6	79	17.3	53	11.6	5	1.1	2	0.4	2	0.4	0	0.0	1	0.2
NW_S	452	69.4	102	15.7	6	0.9	88	13.5	0	0.0	0	0.0	0	0.0	0	0.0	3	0.5
PRI_S	270	53.8	186	37.1	30	6.0	12	2.4	1	0.2	1	0.2	0	0.0	0	0.0	2	0.4
QMH_S	374	45.3	228	27.6	66	8.0	146	17.7	2	0.2	6	0.7	1	0.1	3	0.4	0	0.0
RAH_S	411	50.7	201	24.8	82	10.1	105	12.9	1	0.1	2	0.2	0	0.0	3	0.4	6	0.7
RIE	540	40.3	343	25.6	374	27.9	26	1.9	0	0.0	26	1.9	13	1.0	1	0.1	17	1.3
RM_M	2	0.4	418	76.6	62	11.4	21	3.8	23	4.2	14	2.6	4	0.7	2	0.4	0	0.0
RM_S	384	62.7	72	11.8	32	5.2	116	19.0	0	0.0	7	1.1	0	0.0	0	0.0	1	0.2
SGH_N	281	43.8	223	34.7	2	0.3	120	18.7	0	0.0	10	1.6	1	0.2	3	0.5	2	0.3
SGH_S	379	52.6	168	23.3	72	10.0	92	12.8	0	0.0	0	0.0	1	0.1	5	0.7	3	0.4
SH_S	299	65.4	90	19.7	11	2.4	56	12.3	0	0.0	0	0.0	1	0.2	0	0.0	0	0.0
St. J	199	39.5	147	29.2	90	17.9	59	11.7	2	0.4	3	0.6	0	0.0	3	0.6	1	0.2
VIG_S	260	42.8	133	21.9	135	22.2	79	13.0	0	0.0	1	0.2	0	0.0	0	0.0	0	0.0
WGH_21	97	22.1	115	26.3	40	9.1	132	30.1	10	2.3	3	0.7	29	6.6	4	0.9	8	1.8
WGH_N	317	50.1	126	19.9	7	1.1	108	17.1	8	1.3	60	9.5	0	0.0	7	1.1	0	0.0
WGH_S	735	70.0	127	12.1	30	2.9	22	2.1	2	0.2	10	1.0	116	11.0	1	0.1	7	0.7
Scotland	7310	45.7	4285	26.8	1748	10.9	1590	9.9	483	3.0	245	1.5	174	1.1	89	0.6	73	0.5



22. A high rate of inter-hospital transfers may be a quality indicator. It can be seen from Figure 17 that 2.5% of HDU admissions were admitted from other hospitals in 2004. This is a relatively low figure. Transfers between hospitals may be required for a number of reasons, for example, admission to neurosurgical HDU following tertiary referral from local hospital (Figure 18).

Figure 17. Rate of admitting patients in to HDUs from other hospitals.

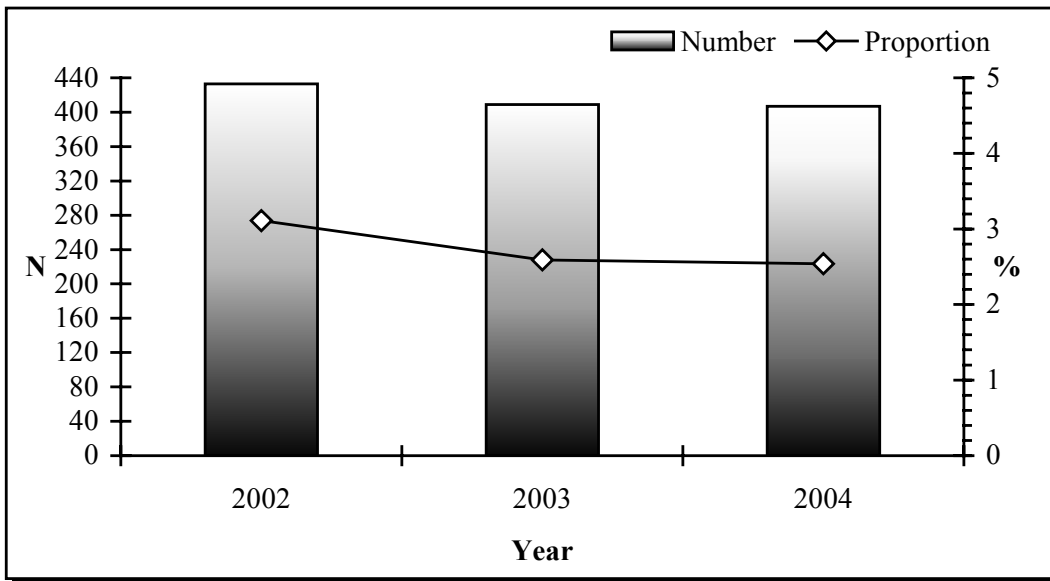
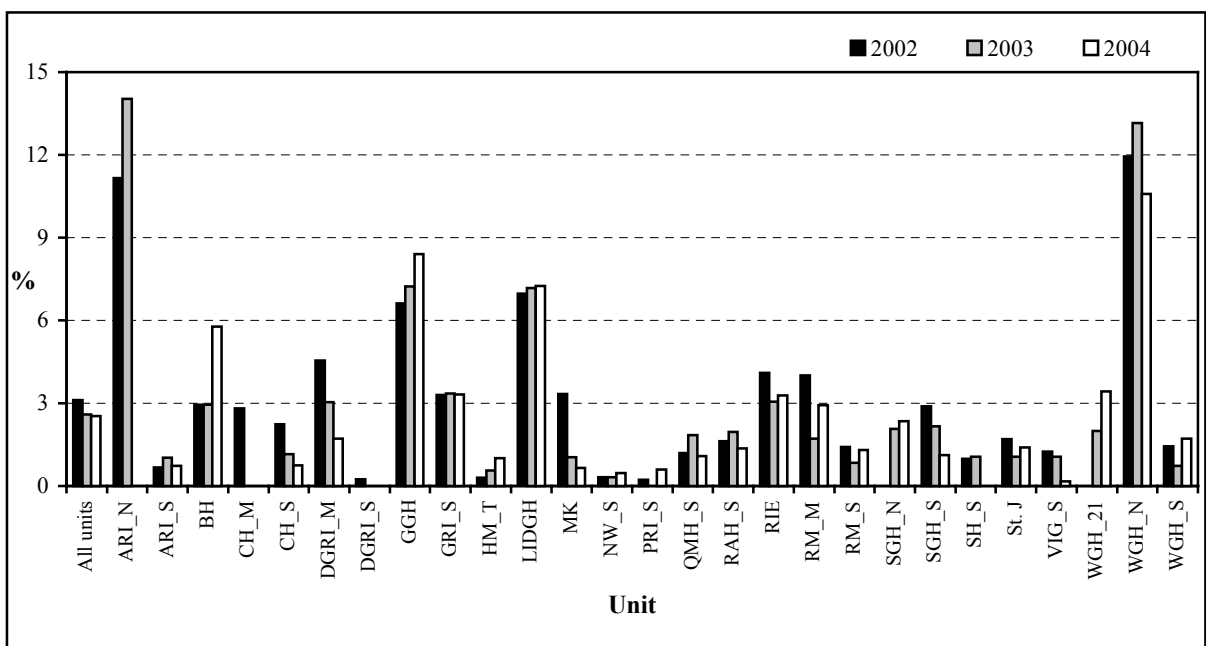


Figure 18. Proportion of admissions to each HDU from other hospitals.





F.7. Readmissions.

23. One of the possible quality indicators identified by the HDU Audit Steering Group in 2001 was the rate of readmissions to HDUs. The database contains a field “Readmission to this Unit during this hosp stay”. Table 13 demonstrates marked variation in the proportion of admissions who are readmitted. The Audit Group would encourage units to consider these figures. There may be many reasons for readmission, but clearly one question is whether a high rate reflects premature initial discharge due to bed pressures or other reasons. It is recognised that some readmissions to HDU may be step down from ICU and here individual hospital practice may affect the data.

Table 13. Rates of readmitting to HDU (%).

UNIT	Readmissions (%)	
	2003	2004
ARI_N	6.7	-
ARI_S	7.2	7.9
BH	0.0	0.0
CH_M	-	-
CH_S	6.7	11.4
DGRI_M	2.1	4.5
DGRI_S	29.6	25.8
GGH	7.2	5.0
GRI_S	5.8	2.9
HM_T	2.5	2.0
LIDGH	1.1	1.7
MK	3.3	6.8
NW_S	0.8	2.3
PRI_S	3.1	4.8
QMH_S	8.1	7.0
RAH_S	11.1	15.0
RIE	4.6	3.8
RM_M	4.0	4.4
RM_S	8.8	4.2
SGH_N	5.5	3.7
SGH_S	8.2	10.1
SH_S	9.6	7.0
St. J	8.9	6.9
VIG_S	6.1	3.5
WGH_21	6.2	10.0
WGH_N	0.5	1.9
WGH_S	7.0	5.5



F.8. Length of stay.

24. The average lengths of stay (LOS) of patients who were discharged during 2002, 2003 & 2004 were 3.1d, 3.0d & 2.7d respectively. Figures 19 to 23 and Table 14 present the LOSs for each unit over time. Although median LOS is the more appropriate way to describe the data (LOS is not normally distributed), both measures have value. The mean LOS can be heavily influenced by a small number of patients with a prolonged HDU stay.

25. In the ICU audit data [2], it is known that LOS varies with source of admission: patients admitted to ICU from A&E have the shortest LOS followed by admissions from theatre, while patients transferred from other ICUs have the longest. The variation in LOS means that differences in case mix could explain the variations in length of stay between the HDUs as well as the ICUs, although this requires further investigation.

Figure 19. Lengths of stay in HDUs of patients discharged in 2002.

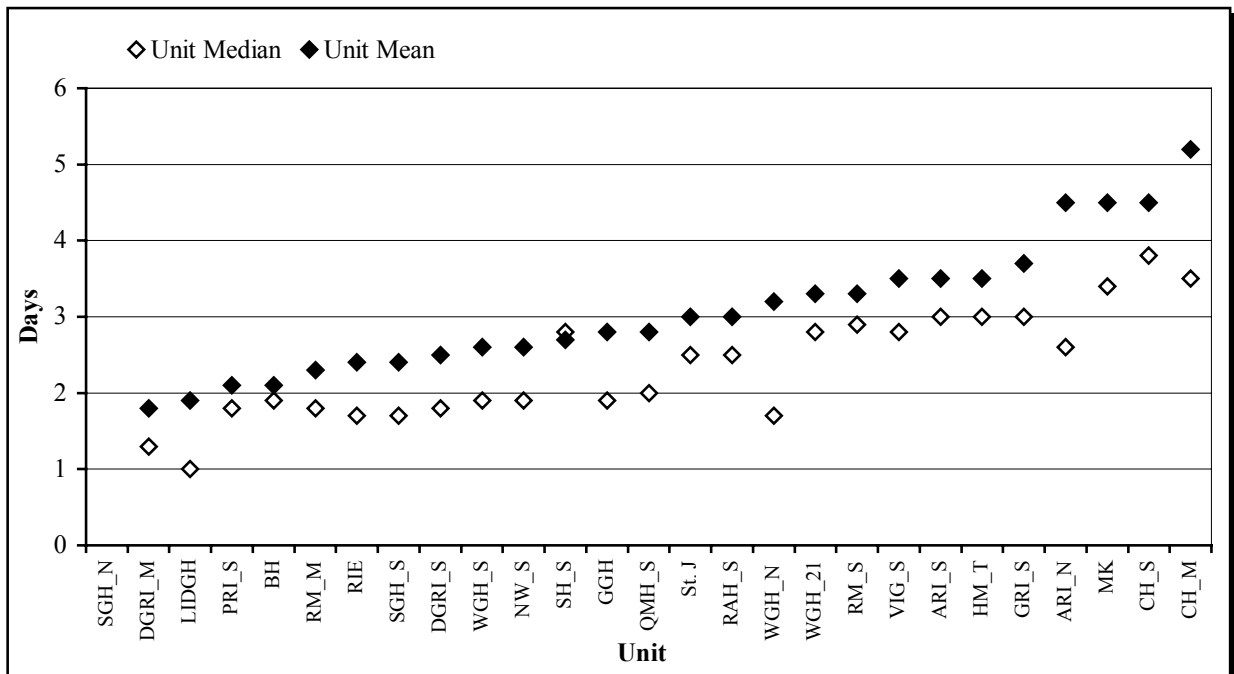




Figure 20. Lengths of stay in HDUs of patients discharged in 2003.

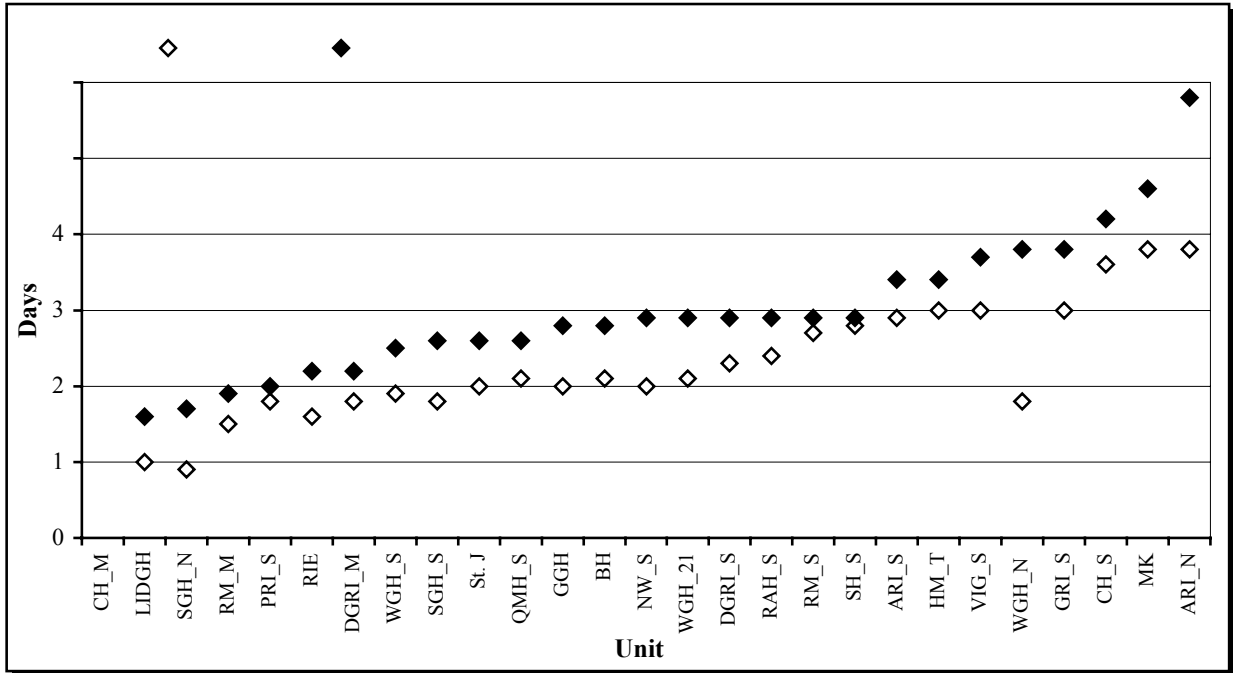
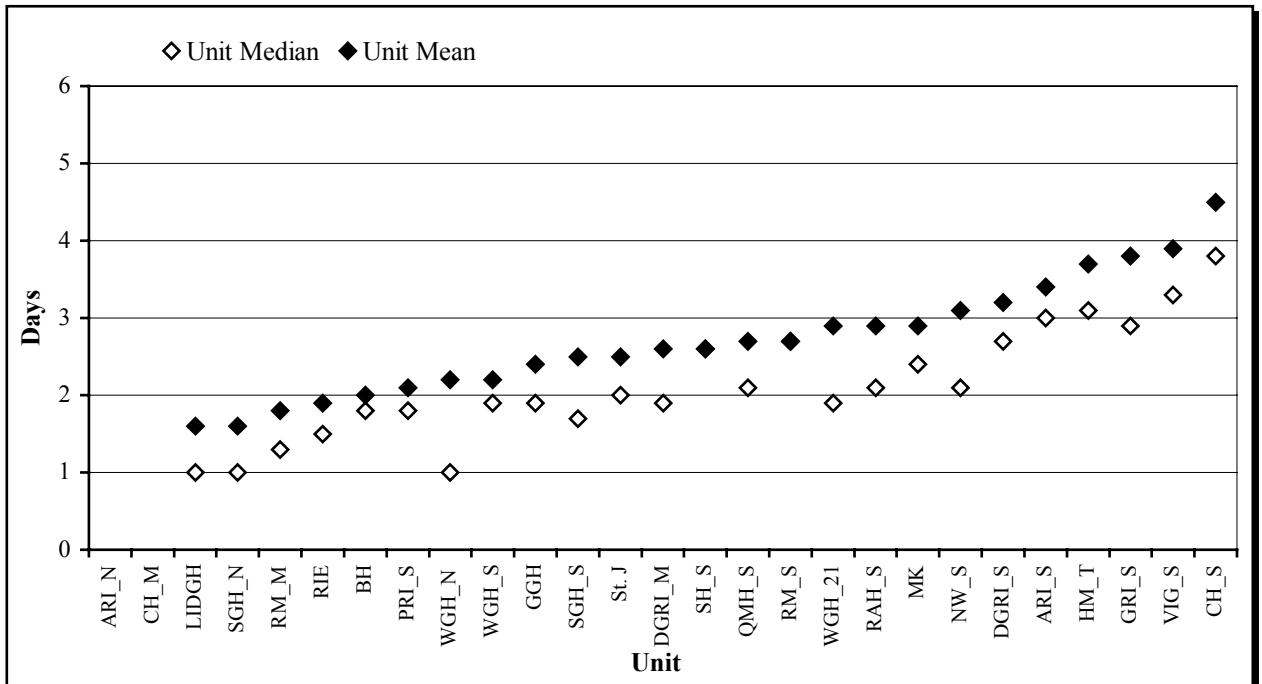


Figure 21. Lengths of stay in HDUs of patients discharged in 2004.





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Table 14. Tabulated mean and median lengths of stay (LOS) in HDU of patients discharged in 2002, 2003 & 2004.

UNIT	2002		2003		2004	
	Mean LOS (d)	Median LOS (d)	Mean LOS (d)	Median LOS (d)	Mean LOS (d)	Median LOS (d)
ARI_N	4.5	2.6	5.8	3.8	-	-
ARI_S	3.5	3.0	3.4	2.9	3.4	3.0
BH	2.1	1.9	2.8	2.1	2	1.8
CH_M	5.2	3.5	-	-	-	-
CH_S	4.5	3.8	4.2	3.6	4.5	3.8
DGRI_M	1.8	1.3	2.2	1.8	2.6	1.9
DGRI_S	2.5	1.8	2.9	2.3	3.2	2.7
GGH	2.8	1.9	2.8	2	2.4	1.9
GRI_S	3.7	3.0	3.8	3.0	3.8	2.9
HM_T	3.5	3.0	3.4	3.0	3.7	3.1
LIDGH	1.9	1.0	1.6	1.0	1.6	1.0
MK	4.5	3.4	4.6	3.8	2.9	2.4
NW_S	2.6	1.9	2.9	2	3.1	2.1
PRI_S	2.1	1.8	2	1.8	2.1	1.8
QMH_S	2.8	2.0	2.6	2.1	2.7	2.1
RAH_S	3.0	2.5	2.9	2.4	2.9	2.1
RIE	2.4	1.7	2.2	1.6	1.9	1.5
RM_M	2.3	1.8	1.9	1.5	1.8	1.3
RM_S	3.3	2.9	2.9	2.7	2.7	2.7
SGH_N	-	-	1.7	0.9	1.6	1.0
SGH_S	2.4	1.7	2.6	1.8	2.5	1.7
SH_S	2.7	2.8	2.9	2.8	2.6	2.6
St. J	3.0	2.5	2.6	2	2.5	2.0
VIG_S	3.5	2.8	3.7	3	3.9	3.3
WGH_21	3.3	2.8	2.9	2.1	2.9	1.9
WGH_N	3.2	1.7	3.8	1.8	2.2	1.0
WGH_S	2.6	1.9	2.5	1.9	2.2	1.9



Figure 22. Median HDU LOS of patients discharged in 2002, 2003 & 2004.

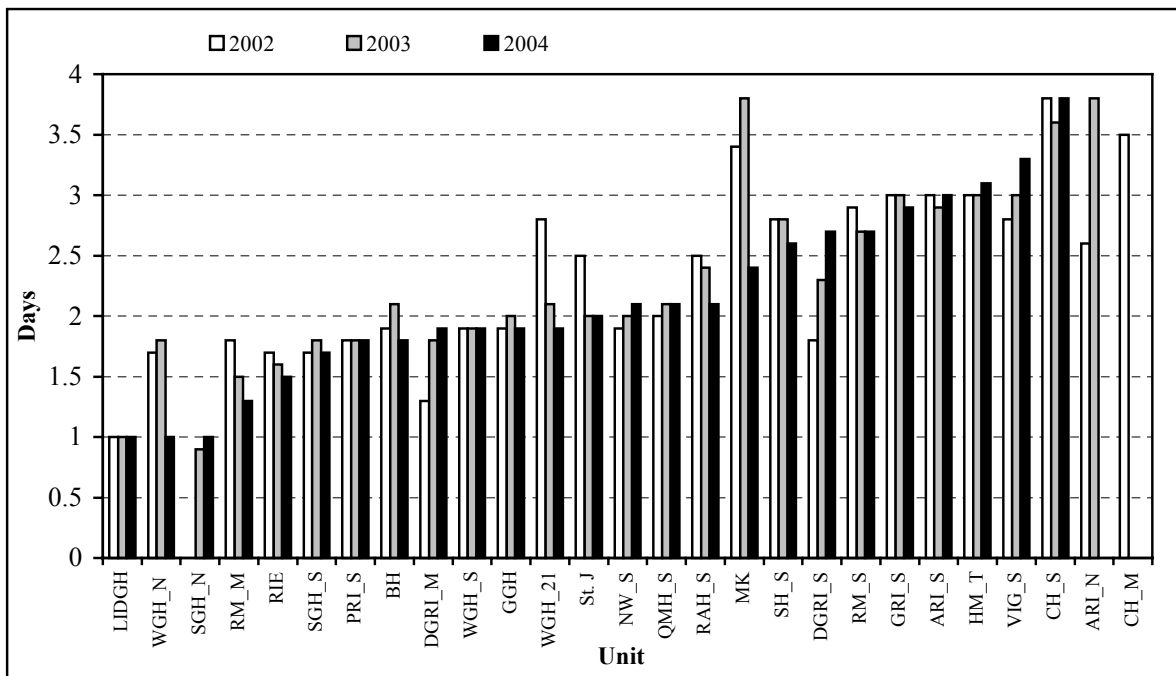
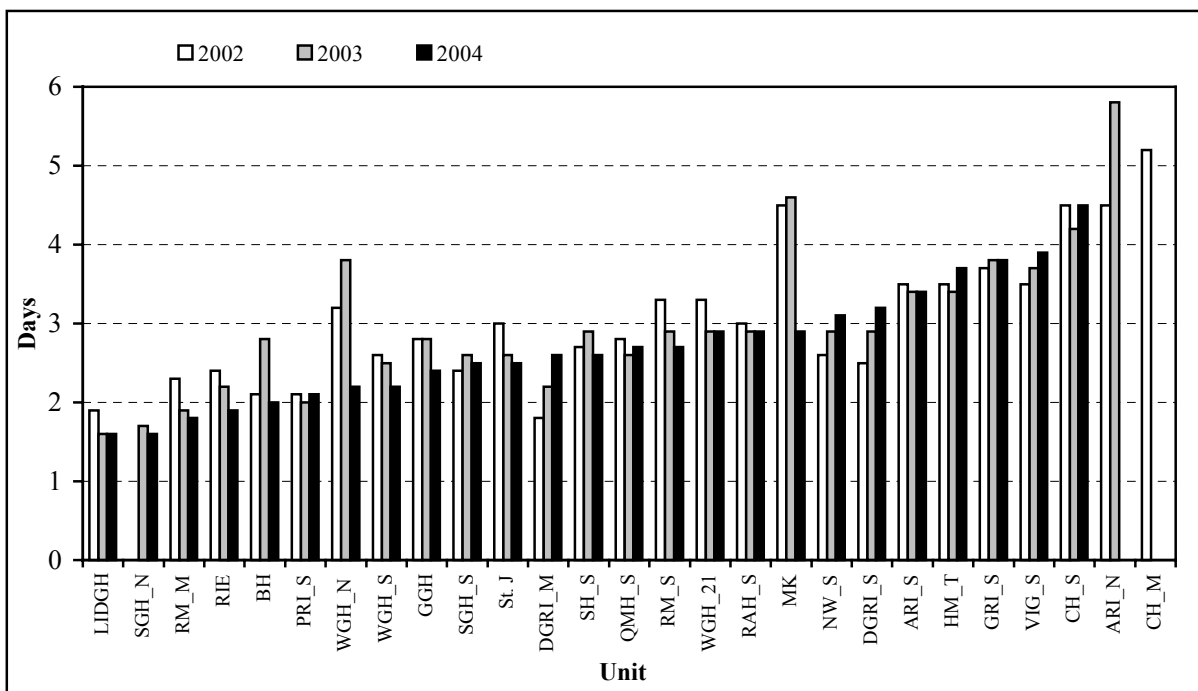


Figure 23. Mean HDU LOS of patients discharged in 2002, 2003 & 2004.





F.9. Levels of care / Interventions.

26. The Scottish Augmented Care Period (ACP) dataset was developed in 1998 for the ongoing ICU audit and is similar to that used in England. Figure 24 displays the dataset as collected in Scotland on Ward Watcher (Critical Care Audit Ltd, Yorkshire).

Figure 24. ACP dataset 1999 – 2005.

The screenshot shows the WWatcher software interface. The title bar reads 'WWatcher' and the menu bar includes 'File Edit Help'. The main window is titled 'ACP Details' and 'TEST, Record'. The form contains the following fields:

Endotracheal tube in situ (Y/N)	<input type="checkbox"/>	Active control of ICP with monitoring (Y/N)	<input type="checkbox"/>	Date	21/02/2005
Tracheostomy (NOT Minitrach) in situ	<input type="checkbox"/>	Intermittent or cont. haemofiltration/dialysis	<input type="checkbox"/>	Data collected by	
Face mask CPAP (Y/N)	<input type="checkbox"/>	Creatinine ($\mu\text{mol/L}$)	<input type="checkbox"/>	Day	1
Connected to a ventilator (Y/N)	<input type="checkbox"/>	Other system (please specify below)	<input type="checkbox"/>		
Highest non ventilated resp rate	<input type="checkbox"/>				
Gases available on ventilator (Y/N)	<input type="checkbox"/>	Pulmonary artery catheter (Y/N)	<input type="checkbox"/>		
Latest PaO ₂ Values in kPa	<input type="checkbox"/>	Inotropes/vasopressors (NOT renal dopamine)	<input type="checkbox"/>		
Corresponding O ₂ %	<input type="checkbox"/>	Lowest systolic/paired diastolic BP	<input type="checkbox"/>		

Buttons: Next day, Delete, Cancel, OK

27. The intention of the dataset was primarily to characterise patients according to the interventions required, e.g., ventilation. With an increase in the number of combined ICU/HDUs, the ICU data have demonstrated a general decrease in the rate of ventilation in these units (Table 15) [2].



Table 15. Six-year trend in ICU ventilation rates (1999-2004).

Year	Proportion of patients ventilated on 1st ACP day (%)	Proportion of patients ventilated at any time (%)
2004	62.2	65.8
2003	62.4	66.2
2002	63.8	68.1
2001	66.6	70.4
2000	68.2	72.2
1999	67.2	70.6

28. Table 16, which identifies the annual variations in the rates of ventilation in each ICU from 1999 to 2004, demonstrates the effect of changes to the status of a number of individual 'ICUs'. For example, there is a decrease in the ventilation rate in the Royal Infirmary of Edinburgh in 2003, a result of its re-location and integration of HDU beds into a large ICU/HDU. In other units, there have been increases in ventilation rates, a result of the opening of separate HDUs, e.g., Inverclyde Royal Hospital and Royal Alexandra Hospital.

29. With the increase in the number of combined ICU/HDUs and SICSAG now managing both the HDU and ICU audits, the ACP dataset has been modified to meet better the needs of these areas.

30. SICSAG has also received requests to demonstrate resource utilisation by the dependency levels: 3 (ICU), 2 (HDU) and 1 (least dependent) [1]. The modifications to the ACP dataset have included a mapping of key interventions to these levels of dependency.

31. The updated ACP dataset is demonstrated in Figures 25 & 26. The software has been upgraded in approximately 20 ICUs and HDUs at time of reporting. It will be some time before every one of the HDUs and ICUs has the new software and before the data are available on which reports can be produced nationally.



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Table 16. Six-year trend in proportion (%) of patients ventilated at any time in Scottish ICUs (1999-2004).

Note, ^ indicates combined ICU/HDU during 2004. The status of other units has changed in the preceding years.

Unit	1999	2000	2001	2002	2003	2004
ARI^	87.9	85.3	85.3	79.4	79.8	82.4
Ayr*	65.2	77.2	77.4	79.8	76.9	75.1
BGH*	50.8	59.5	52.5	49.7	49.2	N/A
CH*	65.4	69.1	75.4	74.4	79.1	74.3
DGRI*	35.8	47.2	58.7	60.6	61.3	56.7
FDRI*^	N/A	N/A	23.3	28.3	24.6	26.9
GRI	91.9	92.0	90.9	92.2	94.4	94.3
HM*^	32.4	35.3	42.5	43.4	43.9	47.1
IRH*	52.1	77.9	85.1	89	91.8	89.7
MK*	83.1	81.1	82	83.5	85.3	80.4
NW	N/A	N/A	88.9	87.7	84.5	80.4
PRI*	49.5	40.3	50	53.5	50.3	55.3
QMH*	54.7	62.6	63	63	62.9	69.6
RAH*	57.5	71.9	80.6	82.4	82.1	85.9
RIE^	89.4	86.0	83.3	82.3	60.4	53.8
RM*	N/A	N/A	N/A	72.9	73.5	65.3
SGH	79.5	79.6	87.7	84.2	86.8	85.3
SH	91.6	89.0	93.1	92.7	88.9	92.2
SRI*	66.7	67.3	67.2	74	71.7	75
St. J*	84.6	78.2	66.1	77.3	74.1	83
VHK*	53.5	73.5	65	66.3	68.5	63.7
VIG	83.3	77.3	85.5	86.8	82.2	83.9
VOL*^	34.0	42.4	39.9	38.4	39.1	32.3
WGH	89.4	89.3	88.5	90.7	89.2	87.6
WIG^	88.2	81.9	84.7	76.1	84.4	78.1
Wish*^	69.5	78.2	44.1	30	26	22.9



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Figure 25. Updated ACP dataset.

WWatcher File Edit Help

ACP Details ? **RECORD, Test**

Respiratory Management	ETT	Trache	Mask/ Cannulae	Nil
Connected to a ventilator	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
OR, if never connected to a ventilator during this calendar day				
CPAP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
O2 50% or more	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
O2 less than 50%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Nil	<input type="radio"/>	<input type="radio"/>		<input checked="" type="radio"/>

Potential need for ventilation via ETT or Trache (Y/N) N

Recently extubated/airway control uncertain (Y/N) N

CNS depression/seizures sufficient to prejudice airway (Y/N) N

Invasive Monitoring

Arterial line (Y/N) Y

Central venous catheter (including dialysis catheter) (Y/N) Y

Pulmonary artery flotation catheter (Y/N) N

Other cardiac output monitoring (Y/N) N

Therapy

Inotropes/vasopressors (NOT renal dopamine) (Y/N) N

Intermittent or continuous haemofiltration/dialysis (Y/N) N

Circulatory instability due to hypovolaemia (Y/N) N

Invasive neuro monitoring (eg ICP, jugular bulb) (Y/N) N

Nutrition

Parenteral nutrition (Y/N) N

Enteral nutrition (Y/N) N

Analgesia

Epidural (Y/N) N

Other regional analgesic therapy (Y/N) N

Other Monitoring

General observation/monitoring (Y/N)
(more than could be provided safely on a general ward) Y

Potential for deterioration (Y/N) Y

Locally defined ACP (Y/N)

<No questions>

Date: 12/01/2005

Date collected by: fm

Day: 1

Figure 26. Updated ACP screen: Display of number of days at levels 1, 2 or 3.

WWatcher File Edit Report Help

TISS/ACP **RECORD, Test**

TISS			ACP			
Highest TISS	0		Ventilation days	1	Days at Level 3	1
Total TISS	0		Renal support days	0	Days at Level 2	0
Mean TISS	0		PA catheter days	0	Days at Level 1	0
£0						
Date	Day	Score	Date	Intubated	Traché	Ventilator
			12/01/2005	X		X

Drotrecogin Alfa Weight kg
Height cm

Date & time assessed SIRS Infection status Organs failing APACHE Administered

Admit History Diagnose Severity Therapy Labs Local Research Daily HAI Discharge Follow Notes Help List Beds Log Off



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- All IT staff.
- Brian Millar, Critical Care Audit Ltd., Yorkshire



Scottish Intensive Care Society Audit Group
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H. REFERENCES.

1. Scottish Executive Health Department. *Better Critical Care – Report of a Short-Life Working Group on ICU and HDU issues*. Scottish Executive Health Department, 2000.
2. Scottish Intensive Care Society Audit Group, *Annual Report 2005*, Scottish Intensive Care Society Audit Group, 2005. [online] Available at: <http://www.scottishintensivecare.org.uk> [Accessed 12 June 2005]



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I. APPENDIX.

Appendix I. List of participating HDUs, lead nurses and consultants who maintained participation in their units during the period of reporting.

Unit ID	Unit Name	Lead Nurse	Consultant Input
ARI_N	Aberdeen Royal Infirmary, Neurosurgical HDU, Ward 40	CN C. McIntosh	
ARI_S	Aberdeen Royal Infirmary, Surgical HDU, Ward 51	CN C. Scott	
BH	Belford Hospital, Fort William, HDU	CN A. Boyd-Mackay	Dr C. Leeson-Payne
CH_M	Crosshouse Hospital, Kilmarnock, Medical HDU, Ward 3F	CN L. Harvey	
CH_S	Crosshouse Hospital, Kilmarnock, Surgical HDU, Ward 4C	CN K. Harrison	
DGRI_M	Dumfries & Galloway Royal Infirmary, Medical HDU	CN M. McKeown	
DGRI_S	Dumfries & Galloway Royal Infirmary, Surgical HDU	CN S. Thomson	Drs W. Peel/D. Williams
GGH	Gartnavel General Hospital, Glasgow, HDU	CN C. Paterson	
GRI_S	Glasgow Royal Infirmary, Surgical HDU	CN D. Burnett	Miss R. McKee
HM_T	Hairmyres Hospital, East Kilbride, Thoracic HDU	CN J. Gilbert	
LIDGH	Lorn & Islands District General Hospital, Oban, HDU	CN E. Graham	
MK	Monklands Hospital, Airdrie, HDU	CN J. Prentice	
NW_S	Ninewells Hospital, Dundee, Surgical HDU	CN S. Larkin	
PRI_S	Perth Royal Infirmary, Surgical HDU	CN P. McKinley	
QMH_S	Queen Margaret Hospital, Dunfermline, Surgical HDU	CN K. Spurgeon	
RAH_S	Royal Alexandra Hospital, Paisley, Surgical HDU	CN C. Guild	
RIE	Royal Infirmary of Edinburgh, HDU	CN J. MacDonald	Dr B. Cook
RM_M	Raigmore Hospital, Inverness, Medical Special Care Unit	CN P. Hodgson	
RM_S	Raigmore Hospital, Inverness, Surgical HDU	CN D. Smith	
SGH_N	Southern General Hospital, Glasgow, Neurosurgical HDU	CN K. McGhee	
SGH_S	Southern General Hospital, Glasgow, Surgical HDU	CN L. Moores	
SH_S	Stobhill Hospital, Glasgow, Surgical HDU	CN B. Davidson	
St. J	St. John's Hospital, Livingston, Surgical HDU	CN D. Haggart	
VIG_S	Victoria Infirmary, Glasgow, Surgical HDU	CN M. MacDonald	
WGH_21	Western General Hospital, Edinburgh, HDU, Ward 21	CN J. Alexander	Dr J. Stuart
WGH_N	Western General Hospital, Edinburgh, Neurosurgical HDU	CN F. Price	Dr P. Andrews
WGH_S	Western General Hospital, Surgical HDU, Ward 58	CN S. Jackson	Dr C. Wallis