



The United Kingdom Cardiac Surgical Register

The UK Cardiac Surgical Register was established in 1977, by Sir Terence English and Dr Alan Bailey, under the auspices of the Society of Cardiothoracic Surgeons of Great Britain and Ireland¹. The Register collects annual cardiac surgical activity and mortality data from each NHS cardiothoracic surgical unit. The register is divided into three sections:

1. *Surgery for Acquired Heart Disease* with just over 450 categories.
2. *Surgery for Congenital Heart Disease* - discontinued from 2000.
3. *Surgeon specific activity and mortality data* for index procedures.

A nominated individual within each unit enters the required data from each unit onto a form. The form is then returned to the Secretary of the Society who passes the data to Dr Alan Bailey for aggregation and analysis. Each member of the Society is then sent a copy of the collated data for their own use. Over the years this data has provided useful information on national trends in cardiac surgery, but it makes no allowance for variations in casemix.

The data includes:

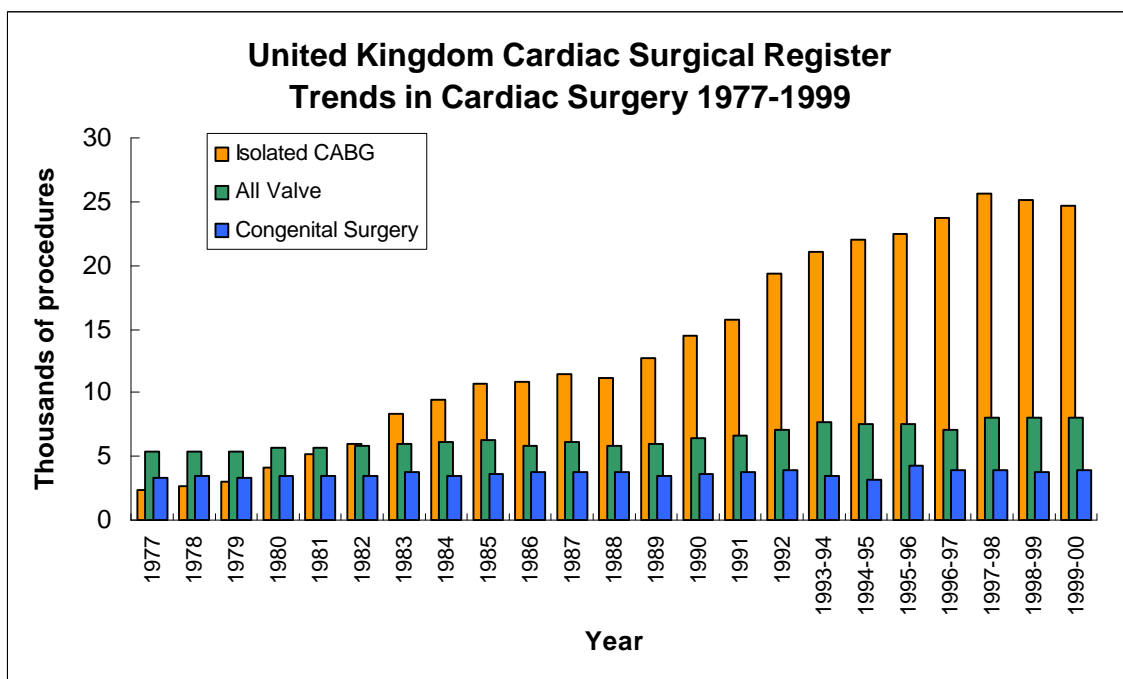
- All cardiac operations performed in NHS hospitals
- All NHS or privately funded operations within NHS hospitals

The data excludes:

- All patients operated upon within the private sector.

Mortality is defined as mortality in the hospital where the surgery was conducted.

Trends in Cardiac Surgical Activity and Mortality

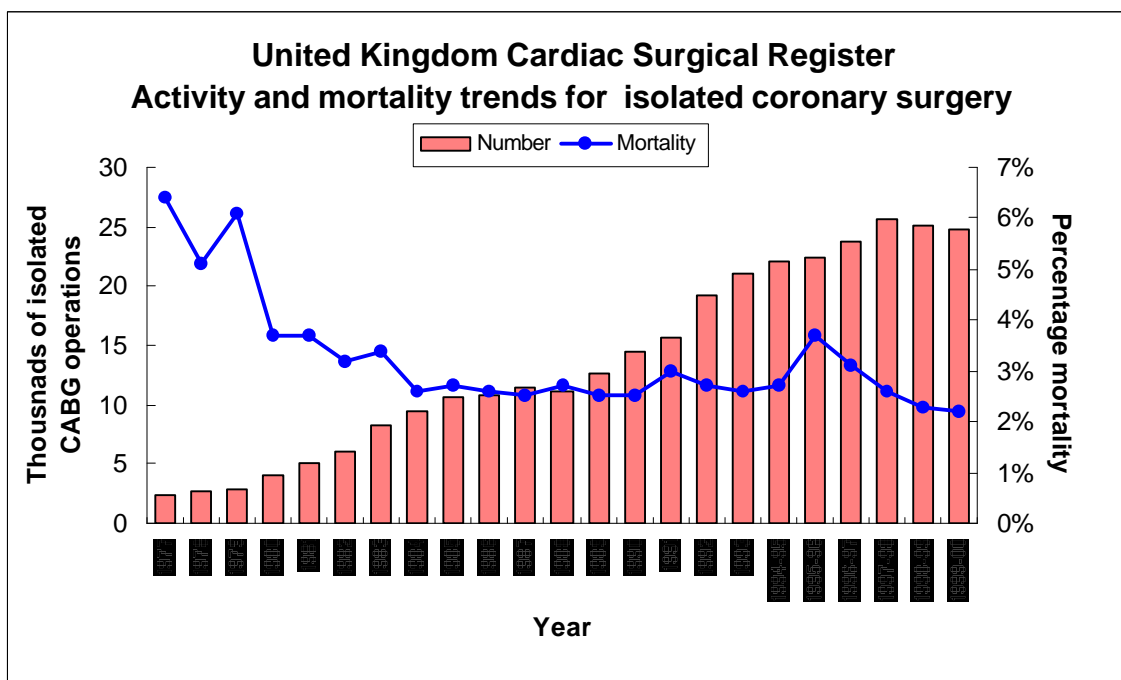


The provision of cardiac surgery has grown steadily in the United Kingdom over the last twenty years with a plateau over the last two years.



This growth is largely confined to surgery for coronary artery disease (ischaemic heart disease). This is the result of growing evidence demonstrating the efficacy of coronary artery surgery for both relief of symptoms and prolongation of life. Professional confidence in benefits of cardiac surgical procedures has resulted in sicker patients being referred for surgery⁴. Despite this the operative mortality for all types of surgery has fallen over the years, as illustrated in the following graph which demonstrates a steady decrease in operative mortality for coronary surgery from 1977 to 1985 after which the mortality has remained relatively constant.

In 1996-97 two large centres did not send in their data to the register. For these centres data has been averaged from the previous and following years. The adult cardiac surgical data returns are complete for 1999-2000.



In keeping with the Society's commitment to clinical governance, the Register was extended in 1997-98 to include activity and outcome data on individual surgeons for isolated, first time coronary surgery in adult cardiac surgery.

The United Kingdom Cardiac Surgical Register 1999-2000

The preceding graphs represent the first level of analysis but hide the relatively comprehensive nature of procedural data that is collected. By way of illustration the section for acquired heart disease from the 1999-2000 report for the U.K. Cardiac Surgical Register is summarised below.

U.K. Cardiac Surgical Register 1999-2000: Summary Data

	<i>Number</i>	<i>Died</i>	<i>% Mortality</i>
<i>Isolated valve surgery</i>	5,393	295	5.5
<i>Isolated coronary artery bypass surgery</i>	24,728	547	2.2
<i>Combined coronary and valve surgery</i>	2,641	207	7.8
<i>Other operations for ischaemic heart disease</i>	462	79	17.1
<i>Congenital</i>	3,876	162	4.2
<i>Miscellaneous</i>	1,409	223	15.8
Total	38,509	1,513	3.9



The types of valve surgery performed in 1999-2000 are tabulated below.

Single Open Valve Operations 1999-2000

	WITHOUT CABG									WITH CABG		
	Initial			Repeat			Total			Total		
	No.	Died	%	No.	Died	%	No.	Died	%	No.	Died	%
Aortic												
-Valvotomy/repair	12	0	0.0	3	0	0	15	0	0	6	1	16.7
-Mechanical valve	1,502	33	2.2	149	13	8.7	1,651	46	2.8	738	34	4.6
-Bioprosthesis	1,356	54	4.0	88	8	9.1	1,444	62	4.3	1,081	90	8.3
-Homograft	40	2	5.0	26	2	7.7	66	4	6.1	17	4	23.5
-Autograft	37	2	5.4	8	0	0.0	45	2	4.4	1	0	0
Aortic total	2,947	91	3.1	274	23	8.4	3,221	114	3.5	1,843	129	7.0
Mitral												
-Valvotomy/repair	426	12	2.8	26	2	7.7	452	14	3.1	245	22	9.0
-Mechanical valve	796	39	4.9	193	26	13.5	989	65	6.6	320	29	9.1
-Bioprosthesis	148	20	13.5	53	11	20.8	201	31	15.4	105	7	6.7
-Homograft	3	1	33.3	0	0	0	3	1	33.3	1	0	0
-Other	0	0	0	0	0	0	0	0	0.0	0	0	-
Mitral total	1,373	72	5.2	272	39	14.3	1,645	111	6.7	671	58	8.6
Tricuspid												
-Valvotomy/repair	6	0	0	5	4	80.0	11	4	36.4	1	0	0
-Mechanical valve	4	0	0	1	1	100.0	5	1	20.0	0	0	-
-Bioprosthesis	5	0	0	2	2	100.0	7	2	28.6	0	0	-
-Other	1	0	-	0	0	-	1	0	0	0	0	-
Tricuspid total	16	0	0	8	7	87.5	24	7	29.2	1	0	0
Total single valve	4,336	163	3.8	554	69	12.5	4,890	232	4.7	2,515	187	7.4

Multiple Open Valve Operations 1999-2000

	WITHOUT CABG									WITH CABG		
	Initial			Repeat			Total			Total		
	No.	Died	%	No.	Died	%	No.	Died	%	No.	Died	%
Double valves												
-Mitral & Aortic	309	24	7.8	71	14	19.7	380	38	10.0	98	17	17.3
-Mitral & Tricuspid	59	13	22.0	24	4	16.7	83	17	20.5	20	0	0
-Aortic & Tricuspid	7	0	0.0	3	1	33.3	10	1	10.0	2	2	100.0
-Other double valves	2	0	0.0	1	1	100.0	3	1	33.3	0	0	-
Double total	377	37	9.8	99	20	20.2	476	57	12.0	120	19	15.8
Triple total	21	3	14.3	6	3	50.0	27	6	22.2	6	1	16.7
Total multiple	398	40	10.1	105	23	21.9	503	63	12.5	126	20	15.9
Total single	4,336	163	3.8	554	69	12.5	4,890	232	4.7	2,515	187	7.4
Total valve	4,734	203	4.3	659	92	14.0	5,393	295	5.5	2,641	207	7.8



The table below documents the number of coronary bypass operations that were carried out in the financial year 1999 – 2000 and the associated operative mortality.

Isolated Bypass Grafts For Ischaemic Heart Disease 1999-2000

	Initial			Repeat			Total		
	No.	Died	%	No.	Died	%	No.	Died	%
Single graft									
Venous	199	9	4.5	69	6	8.7	268	15	5.6
Arterial	754	14	1.9	62	1	1.6	816	15	1.8
Total single grafts	953	23	2.4	131	7	5.3	1,084	30	2.8
Double grafts									
Venous ^2	882	36	4.1	110	4	3.6	992	40	4.0
Venous + arterial	3,049	38	1.2	124	12	9.7	3,173	50	1.6
Arterial ^2	820	8	1.0	32	2	6.3	852	10	1.2
Total double grafts	4,751	82	1.7	266	18	6.8	5,017	100	2.0
Triple grafts									
Venous ^3	1,207	67	5.6	96	8	8.3	1,303	75	5.8
2 Venous + 1 arterial	8,407	138	1.6	180	13	7.2	8,587	151	1.8
1 Venous + 2 arterial	931	20	2.1	29	1	3.4	960	21	2.2
Arterial ^3	748	11	1.5	16	0	0.0	764	11	1.4
Total triple grafts	11,293	236	2.1	321	22	6.9	11,614	258	2.2
Quadruple grafts									
Venous ^4	366	29	7.9	18	1	5.6	384	30	7.8
3 Venous + 1 arterial	4,564	80	1.8	67	11	16.4	4,631	91	2.0
2 Venous + 2 arterial	532	6	1.1	7	0	0.0	539	6	1.1
1 Venous + 3 arterial	150	3	2.0	4	0	0.0	154	3	1.9
Arterial ^4	157	1	0.6	1	0	0.0	158	1	0.6
Total quadruple grafts	5,769	119	2.2	97	12	12.4	5,866	131	2.6
Quintuple grafts									
Venous ^5	54	3	5.6	5	0	0.0	59	3	5.1
4 Venous + 1 arterial	706	19	2.7	6	0	0.0	712	19	2.7
3 Venous + 2 arterial	153	4	2.6	7	0	0.0	160	4	2.5
2 Venous + 3 arterial	29	0	0.0	1	0	0.0	30	0	0.0
1 Venous + 4 arterial	18	0	0.0	0	0	-	18	0	0.0
Arterial ^5	16	0	0.0	0	0	-	16	0	0.0
Total quintuple grafts	976	26	2.7	19	0	0.0	995	26	2.6
Total sextuple grafts	125	1	0.8	1	0	-	126	1	0.8
Other (7 or more)	25	1	4.0	1	0	0.0	26	1	3.8
Total isolated CABG	23,892	488	2.0	836	59	7.1	24,728	547	2.2



Cardiac surgeons perform several other operations for acquired heart disease some of which are detailed below.

Miscellaneous Operations for Ischaemic Heart Disease 1999-2000

	No.	Died	%
<i>Grafts and other procedures</i>			
-Excision infarct/aneurysm	205	16	7.8
-Repair VSD	62	24	38.7
-Other	105	13	12.4
Total	372	53	14.2
<i>Procedures without grafts</i>			
-Excision infarct/aneurysm	36	6	16.7
-Repair VSD	54	20	37.0
Total	90	26	28.9

Miscellaneous Operations for Acquired Heart Disease 1997-98 (Excluding operations for trauma)

	No.	Died	%	
<i>Cardiopulmonary bypass operations</i>				
<i>Aortic surgery</i>	Replace ascending aorta without valve	166	33	19.9
	Replace ascending aorta and valve	80	10	12.5
	Replace ascending aorta, valve & coronary root	275	39	14.2
	Replace aortic arch	51	9	17.6
	Replace descending aorta	53	18	34.0
<i>Transplant surgery</i>	Heart transplant	226	25	11.1
	Heart & lung transplant	47	11	23.4
	One lung transplant	45	3	6.7
	Two lung transplant	58	6	10.3
<i>Tumour surgery</i>	Myxoma	77	4	5.2
	Other	14	2	14.3
<i>Valve surgery</i>	Repair paraprosthetic leak	20	2	10.0
<i>Dysrhythmias</i>	Ventricular	2	1	50.0
	Atrial +/- valve replacement	15	2	13.3
<i>Pulmonary embolectomy</i>		15	7	46.6
<i>HOCM / ASH without valve replacement</i>		14	2	14.3
<i>Pericardectomy</i>		18	1	5.6
<i>Other</i>		157	30	19.1
Total	1,333	205	15.4	
<i>No cardiopulmonary bypass</i>				
<i>Replace descending thoracic aorta</i>		12	3	25.0
<i>Pericardectomy</i>		36	4	11.1
<i>Other</i>		98	8	8.2
Total	146	15	10.3	



Cardiac Surgical Unit Activity financial year 1999-2000

(excluding heart and lung transplants, and other pulmonary and oesophageal procedures)

CITY	HOSPITAL	Operations for acquired heart disease	Operations for congenital conditions	Total heart operations
Aberdeen	Royal Infirmary	538	5	543
Belfast	Royal Victoria Hospital	824	94	918
Birmingham	Queen Elizabeth	970	14	984
Birmingham	Children's Hospital	0	490	490
Blackpool	Victoria Hospital	723	0	723
Brighton	Royal Sussex Count Hospital	358	2	360
Bristol	Royal Infirmary	1,054	265	1,319
Cardiff	University Hospital Wales	728	8	736
Coventry	Walsgrave Hospital	1,114	1	1,115
Edinburgh	Royal Infirmary	894	114	1,008
Glasgow	Children's Hospital	0	152	152
Glasgow	Royal Infirmary	968	24	992
Glasgow	Western Infirmary	1,066	12	1,078
Hull	Castle Hill Hospital	856	7	863
Leeds	General Infirmary	1,229	262	1,491
Leicester	Glenfield Hospital	1,183	219	1,402
Liverpool	Cardiothoracic Centre	1,471	15	1,489
Liverpool	Alder Hey	0	414	414
London	Great Ormond Street	0	452	452
London	Guy's Hospital & St Thomas' Hospital	1,533	234	1,767
London	Hammersmith Hospital	708	6	714
London	Harefield Hospital	787	145	932
London	King's College Hospital	678	2	680
London	Middlesex Hospital	669	37	706
London	Royal Brompton Hospital	949	369	1,318
London	Royal Free	65	0	65
London	Bart's and The London Chest	1,379	0	1,379
London	St George's Hospital	893	1	894
London	St Mary's Hospital	802	0	802
Manchester	Royal Infirmary	905	6	911
Manchester	Wythenshawe Hospital	970	4	974
Middlesborough	South Cleveland Hospital	1,160	2	1,162
Midhurst	King Edward VII	232	0	232
Newcastle	Freeman Hospital	1,051	163	1,214
Nottingham	City Hospital	457	4	461
Oxford	Oxford Heart Centre	1,053	110	1,163
Papworth	Papworth Hospital	1675	11	1,686
Plymouth	Derriford Hospital	1,050	6	1,056
Sheffield	Northern General Hospital	844	8	852
Southampton	Southampton General Hospital	1,206	224	1,430
Stoke-on-Trent	North Staffordshire Royal Infirmary	671	2	673
Swansea	Morrison Hospital	609	6	615