



## List of Contributors to the Register and the Database

CITY	HOSPITAL	CONTRIBUTOR	
		Cardiac Surgical Register	Adult Cardiac Surgical Database
Aberdeen	Royal Infirmary	Yes	Yes
Belfast	Royal Victoria Hospital	Yes	No
Birmingham	Queen Elizabeth Hospital	Yes	Yes
Blackpool	Victoria Hospital	Yes	Yes
Brighton	Royal Sussex County Hospital	Yes	Yes
Bristol	Royal Infirmary	Yes	Yes
Cardiff	University Hospital of Wales	Yes	Yes
Cork	Cork University Hospital	Yes	No
Coventry	Walsgrave Hospital	Yes	Yes
Dublin	Mater Misericordiae	Yes	No
Dublin	St James's Hospital	Yes	Yes
Edinburgh	Royal Infirmary	Yes	Yes
Glasgow	Royal Infirmary	Yes	Yes
Glasgow	Western Infirmary	Yes	Yes
Hull	Castle Hill Hospital	Yes	Yes
Leeds	General Infirmary	Yes	Yes
Leicester	Glenfield Hospital	Yes	Yes
Liverpool	Cardiothoracic Centre	Yes	Yes
London	Guy's Hospital & St Thomas's Hospital	Yes	Yes
London	Hammersmith Hospital	Yes	Yes
London	Harefield Hospital	Yes	Yes
London	King's College Hospital	Yes	Yes
London	London Bridge Hospital	N/A	Yes
London	Middlesex Hospital	Yes	Yes
London	Royal Brompton Hospital	Yes	Yes
London	Bart's and the London Chest	Yes	Yes
London	St George's Hospital	Yes	Yes
London	St Mary's Hospital	Yes	Yes <sup>i</sup>
Manchester	Royal Infirmary	Yes	Yes
Manchester	Wythenshawe Hospital	Yes	Yes
Middlesbrough	South Cleveland Hospital	Yes	Yes
Newcastle	Freeman Hospital	Yes	Yes
Nottingham	City Hospital	Yes	Yes
Oxford	Oxford Heart Centre	Yes	No
Papworth	Papworth Hospital	Yes	Yes
Plymouth	Derriford Hospital	Yes	No
Sheffield	Northern General Hospital	Yes	No
Southampton	Southampton General Hospital	Yes	Yes
Stoke-on-Trent	North Staffordshire Royal Infirmary	Yes	Yes
Swansea	Morrison Hospital	Yes	Yes

<sup>i</sup> Data submitted and imported for previous data harvests; data not merged for current data harvest.



## The United Kingdom Cardiac Surgical Register (UKCSR)

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 Ireland<sup>52</sup>. The Register collects annual cardiac surgical activity and mortality data from each NHS cardiothoracic surgical centre and until recently was divided into three sections:

- **Surgery for Acquired Heart Disease** with detailed breakdown by operation sub category
- **Surgery for Congenital Heart disease:** discontinued from 2000
- **Surgeon specific activity and mortality** data for index procedures

A nominated individual within each centre takes responsibility for entering the required data onto a form. This form is then returned to the Secretary of the Society who passes the data to Dr Alan Bailey, an independent physician, 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 collected includes:

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

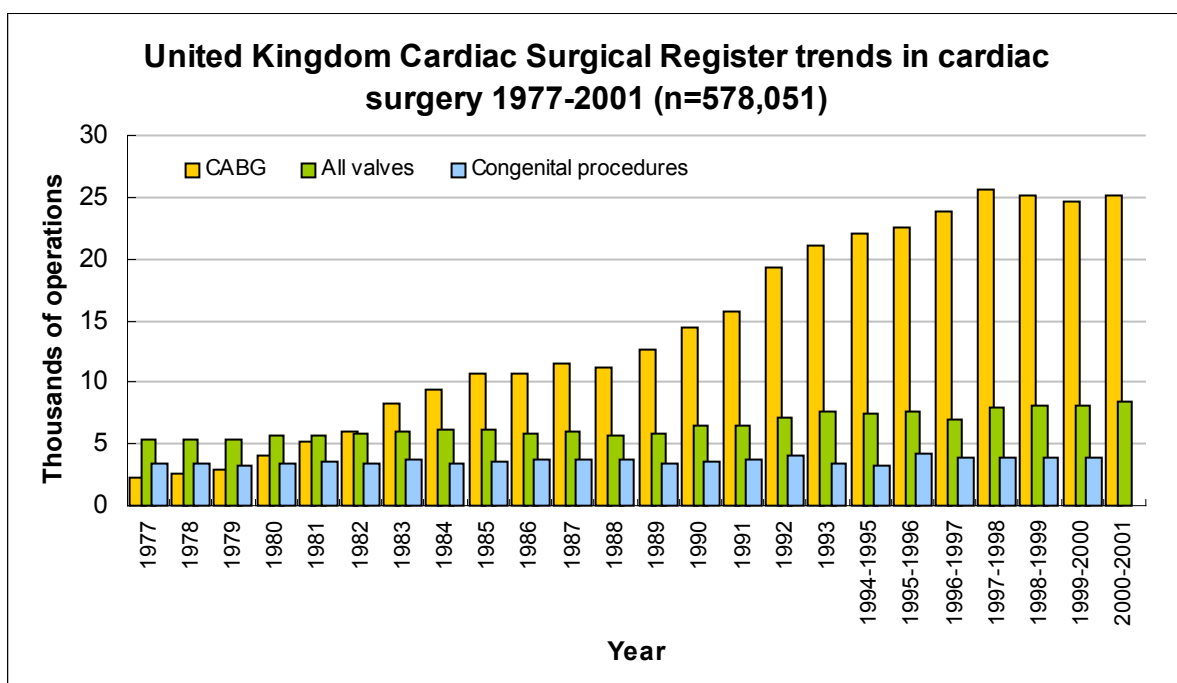
The data excludes:

- All patients, NHS or private, operated on within the private sector.

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

### Overall trends in cardiac surgery since 1977

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

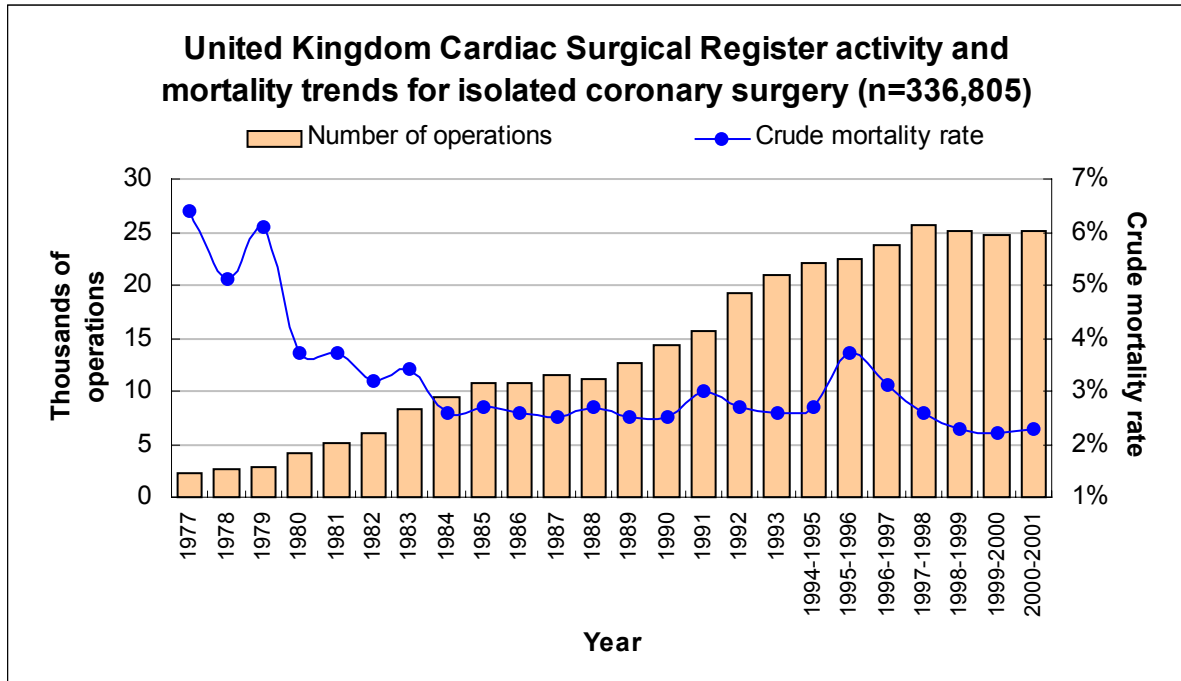


Professional confidence in the benefits of cardiac surgical procedures has resulted in sicker patients being referred for surgery<sup>53</sup>. Despite this, the operative survival for all types of surgery has improved over the years, as illustrated in the following graphs, which demonstrate a steady decrease in operative mortality for coronary and valve surgery from 1977 to the late 1980's, after which the mortality and survival rates have remained relatively constant.

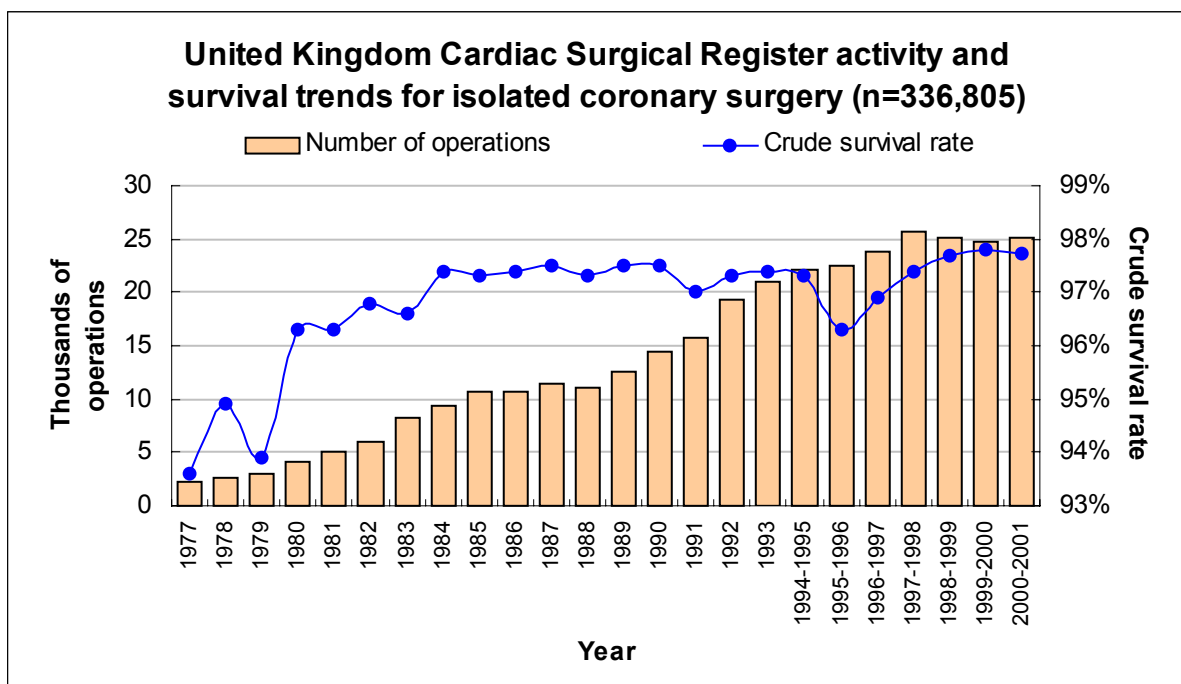


*Trends in coronary artery bypass surgery activity and outcomes since 1977*

Over the last few years in the UK ninety-seven in every hundred patients has survived their coronary bypass operation and the vast majority of these people will have enjoyed a substantial improvement in lifestyle. Many will have had their life prolonged.



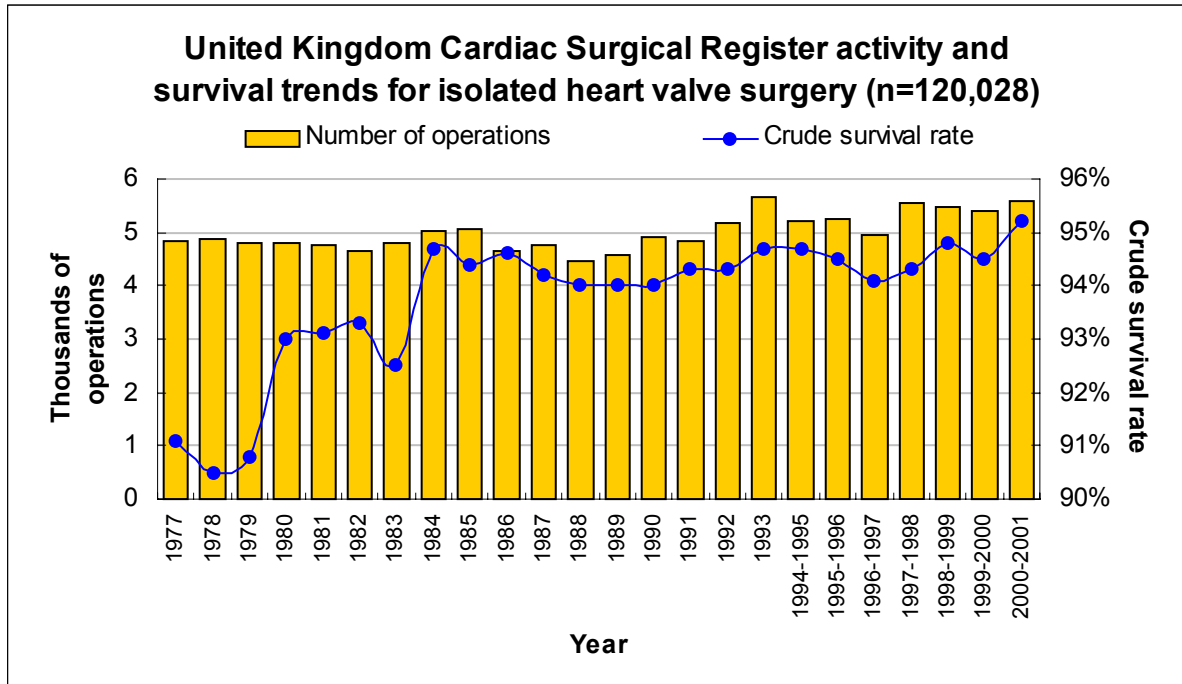
In 1996/7 two large centres did not send in their data to the register. An estimate has been employed using activity data from these centres for the preceding and following years. The adult cardiac surgical data returns are complete for the following years, including 2000 - 2001.



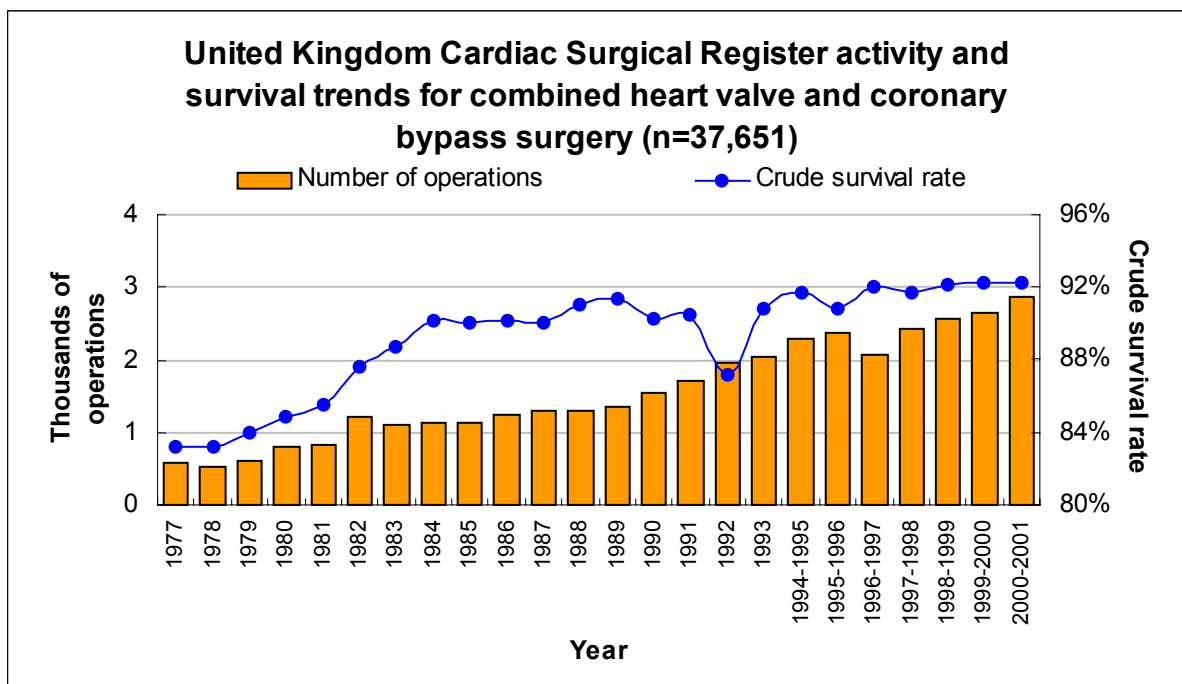


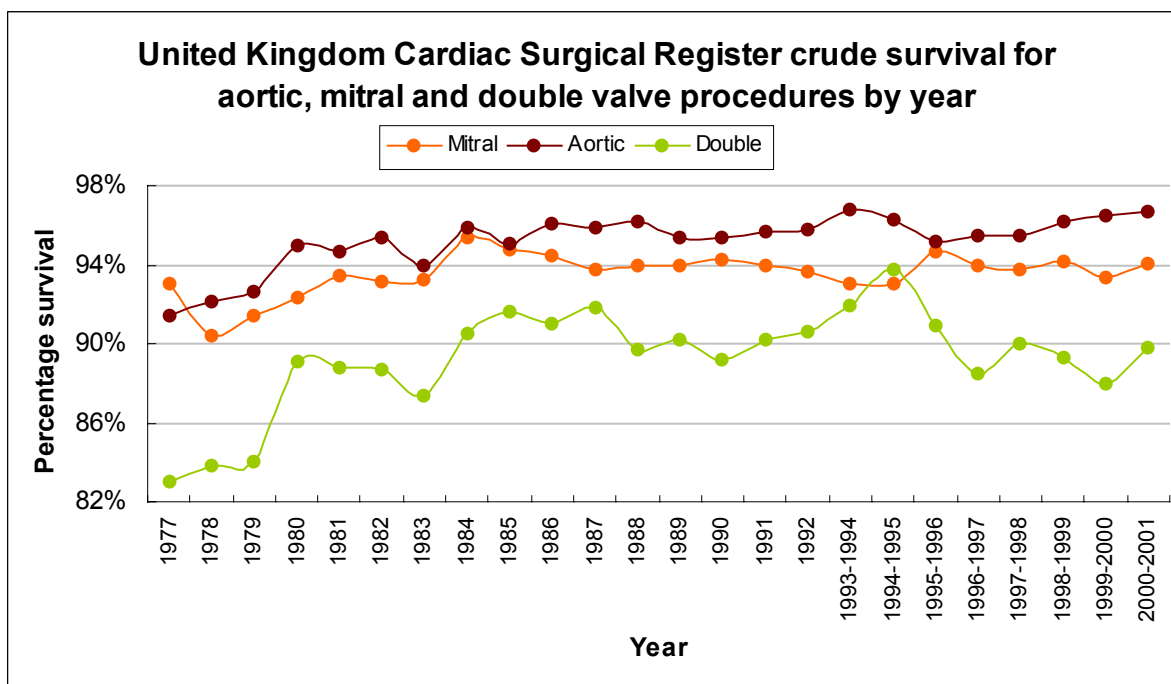
*Trends in valve surgery activity and outcomes since 1977*

Operations for heart valve disease, where the defective valve is either repaired or replaced, also produce dramatic improvements, because the heart can pump more effectively. Because hearts with valve disease are often sicker and the valves are deep within the heart the operations tend to carry a higher risk than isolated coronary bypass operations. Nevertheless, the survival rate for such an operation is about 95%.



Because we are operating on older patients, the number of patients with heart valve disease who need a simultaneous coronary bypass operation has dramatically increased over the years. Although the survival rate of 92% is good, the mortality is three times greater than for an isolated coronary bypass operation.





### *The United Kingdom Cardiac Surgical Register for the financial year ending 2001*

The preceding graphs represent the first level of analysis but hide the relatively complex nature of procedural data that is collected. By way of illustration the section for acquired heart disease from the 2000-2001 report for the UK. Cardiac Surgical Register is summarised below:

#### *UKCSR: summary data financial year ending 2001*

	<i>Number</i>	<i>Died</i>	<i>% Survival</i>	<i>% Mortality</i>
<i>Isolated coronary artery bypass surgery</i>	25,127	574	97.7	2.3
<i>Isolated valve surgery</i>	5,571	269	95.2	4.8
<i>Combined coronary and valve surgery</i>	2,881	224	92.2	7.8
<i>Other operations for ischaemic heart disease</i>	447	91	79.6	20.4
<i>Congenital</i>	460	9	98.0	2.0
<i>Miscellaneous</i>	1,493	243	83.7	16.3
<b>Total</b>	<b>35,979</b>	<b>1,410</b>	<b>96.1</b>	<b>3.9</b>

#### *Individual surgeons' activity and results*

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. All surgeons submit their results for analysis and comparison with their peers. Patients should be encouraged to discuss risks and benefits of an operation with their surgeon and should not feel awkward asking their surgeon for his experience and results with any operation. Over the last three years cardiothoracic surgeons have each performed an average of 140 isolated coronary bypass operations per year. The table above indicates that this represents about 70% of a surgeon's operative activity. So most surgeons will be performing about 200 major cardiac operations a year. In addition, many also perform major lung surgery. Contrary to popular belief there is no relationship between the volume of operations performed and the outcome of surgery for individual consultants.



UKCSR: single open valve operations financial year ending 2001

	WITHOUT CABG						WITH CABG					
	Initial			Repeat			Initial			Repeat		
	No.	Died	%	No.	Died	%	No.	Died	%	No.	Died	%
<b>Aortic</b>												
Valvotomy/repair	17	0	0.0	0	0	0.0	8	2	25.0	2	0	0.0
Mechanical valve	1,474	30	2.0	166	4	2.4	703	25	3.6	36	6	16.7
Bioprosthesis	1,480	65	4.4	85	8	9.4	1,213	74	6.1	36	6	16.7
Homograft	48	0	0.0	25	1	4.0	9	1	11.1	3	1	33.3
Autograft	24	0	0.0	2	0	0.0	0	0	0.0	0	0	0.0
<b>Aortic total</b>	<b>3,043</b>	<b>95</b>	<b>3.1</b>	<b>278</b>	<b>13</b>	<b>4.7</b>	<b>1,933</b>	<b>102</b>	<b>5.3</b>	<b>77</b>	<b>13</b>	<b>16.9</b>
<b>Mitral</b>												
Valvotomy/repair	502	9	1.8	25	5	20.0	255	28	11.0	3	0	0.0
Mechanical valve	774	39	5.0	218	24	11.0	318	30	9.4	23	4	17.4
Bioprosthesis	145	14	9.7	41	9	22.0	108	14	13.0	6	2	33.3
Homograft	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0
Other	1	1	100.0	0	0	0.0	1	1	100.0	0	0	0.0
<b>Mitral total</b>	<b>1,422</b>	<b>63</b>	<b>4.4</b>	<b>284</b>	<b>38</b>	<b>13.4</b>	<b>682</b>	<b>73</b>	<b>10.7</b>	<b>32</b>	<b>6</b>	<b>18.8</b>
<b>Tricuspid</b>												
Valvotomy/repair	8	1	12.5	3	0	0.0	2	0	0.0	0	0	0.0
Mechanical valve	4	0	0.0	4	1	25.0	0	0	0.0	0	0	0.0
Bioprosthesis	7	1	14.3	3	1	33.3	1	0	0.0	0	0	0.0
Other	0	0	0.0	1	0	0.0	0	0	0.0	0	0	0.0
<b>Tricuspid total</b>	<b>19</b>	<b>2</b>	<b>10.5</b>	<b>11</b>	<b>2</b>	<b>18.2</b>	<b>3</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
<b>Total single valve</b>	<b>4,484</b>	<b>160</b>	<b>3.6</b>	<b>573</b>	<b>53</b>	<b>9.2</b>	<b>2,618</b>	<b>175</b>	<b>6.7</b>	<b>109</b>	<b>19</b>	<b>17.4</b>

UKCSR: multiple open valve operations financial year ending 2001

	WITHOUT CABG						WITH CABG					
	Initial			Repeat			Initial			Repeat		
	No.	Died	%	No.	Died	%	No.	Died	%	No.	Died	%
<b>Double valves</b>												
Mitral & Aortic	326	29	8.9	60	4	6.7	122	20	16.4	11	3	27.3
Mitral & Tricuspid	55	6	10.9	26	7	26.9	16	5	31.3	0	0	0.0
Aortic & Tricuspid	5	1	20.0	4	1	25.0	1	0	0.0	0	0	0.0
Other double valves	4	1	25.0	0	0		0	0	0.0	0	0	0.0
<b>Double total</b>	<b>390</b>	<b>37</b>	<b>9.5</b>	<b>90</b>	<b>12</b>	<b>13.3</b>	<b>139</b>	<b>25</b>	<b>18.0</b>	<b>11</b>	<b>3</b>	<b>27.3</b>
<b>Triple total</b>	<b>28</b>	<b>4</b>	<b>14.3</b>	<b>6</b>	<b>3</b>	<b>50.0</b>	<b>4</b>	<b>2</b>	<b>50.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
<b>Other multiple</b>	<b>1</b>	<b>1</b>	<b>100.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>						
<b>Total multiple</b>	<b>419</b>	<b>42</b>	<b>10.0</b>	<b>96</b>	<b>15</b>	<b>15.6</b>	<b>143</b>	<b>27</b>	<b>18.9</b>	<b>11</b>	<b>3</b>	<b>27.3</b>
<b>Total single</b>	<b>4,484</b>	<b>160</b>	<b>3.6</b>	<b>573</b>	<b>53</b>	<b>9.2</b>	<b>2,618</b>	<b>175</b>	<b>6.7</b>	<b>109</b>	<b>19</b>	<b>17.4</b>
<b>Total valve</b>	<b>4,903</b>	<b>202</b>	<b>4.1</b>	<b>669</b>	<b>68</b>	<b>10.2</b>	<b>2,761</b>	<b>202</b>	<b>7.3</b>	<b>120</b>	<b>22</b>	<b>18.3</b>



## UKCSR: isolated bypass grafts for ischaemic heart disease (IHD) financial year ending 2001

	Initial			Repeat			Total		
	No.	Died	%	No.	Died	%	No.	Died	%
<b>Single graft</b>									
<i>Venous</i>	170	10	5.9	67	10	14.9	237	20	8.4
<i>Arterial</i>	855	9	1.1	79	3	3.8	934	12	1.3
<b>Total single grafts</b>	<b>1,025</b>	<b>19</b>	<b>1.9</b>	<b>146</b>	<b>13</b>	<b>8.9</b>	<b>1,171</b>	<b>32</b>	<b>2.7</b>
<b>Double grafts</b>									
<i>Venous ×2</i>	838	41	4.9	107	8	7.5	945	49	5.2
<i>Venous + arterial</i>	2,965	41	1.4	107	5	4.7	3,072	46	1.5
<i>Arterial ×2</i>	1,057	13	1.2	49	2	4.1	1,106	15	1.4
<b>Total double grafts</b>	<b>4,860</b>	<b>95</b>	<b>2.0</b>	<b>263</b>	<b>15</b>	<b>5.7</b>	<b>5,123</b>	<b>110</b>	<b>2.1</b>
<b>Triple grafts</b>									
<i>Venous ×3</i>	1,200	69	5.8	82	9	11.0	1,282	78	6.1
<i>2 Venous + 1 arterial</i>	8,095	164	2.0	161	12	7.5	8,256	176	2.1
<i>1 Venous + 2 arterial</i>	1,325	22	1.7	42	4	9.5	1,367	26	1.9
<i>Arterial ×3</i>	1,016	13	1.3	23	3	13.0	1,039	16	1.5
<b>Total triple grafts</b>	<b>11,636</b>	<b>268</b>	<b>2.3</b>	<b>308</b>	<b>28</b>	<b>9.1</b>	<b>11,944</b>	<b>296</b>	<b>2.5</b>
<b>Quadruple grafts</b>									
<i>Venous ×4</i>	659	27	4.1	18	3	16.7	677	30	4.4
<i>3 Venous + 1 arterial</i>	3,996	63	1.6	45	2	4.4	4041	65	1.6
<i>2 Venous + 2 arterial</i>	647	8	1.2	16	0	0.0	663	8	1.2
<i>1 Venous + 3 arterial</i>	223	3	1.3	7	0	0.0	230	3	1.3
<i>Arterial ×4</i>	361	4	1.1	3	0	0.0	364	4	1.1
<b>Total quadruple grafts</b>	<b>5,886</b>	<b>105</b>	<b>1.8</b>	<b>89</b>	<b>5</b>	<b>5.6</b>	<b>5,975</b>	<b>110</b>	<b>1.8</b>
<b>Quintuple grafts</b>									
<i>Venous ×5</i>	34	4	11.8	2	0	0.0	36	4	11.1
<i>4 Venous + 1 arterial</i>	541	13	2.4	6	1	16.7	547	14	2.6
<i>3 Venous + 2 arterial</i>	121	3	2.5	4	0	0.0	125	3	2.4
<i>2 Venous + 3 arterial</i>	44	0	0.0	2	0	0.0	46	0	0.0
<i>1 Venous + 4 arterial</i>	36	1	2.8	1	1	100.0	37	2	5.4
<i>Arterial ×5</i>	29	0	0.0	0	0		29	0	0.0
<b>Total quintuple grafts</b>	<b>805</b>	<b>21</b>	<b>2.6</b>	<b>15</b>	<b>2</b>	<b>13.3</b>	<b>820</b>	<b>23</b>	<b>2.8</b>
<b>Total sextuple grafts</b>									
	<b>85</b>	<b>3</b>	<b>3.5</b>	<b>1</b>	<b>0</b>	<b>0.0</b>	<b>86</b>	<b>3</b>	<b>3.5</b>
<b>Other (7 or more)</b>									
	<b>8</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	<b>8</b>	<b>0</b>	<b>0.0</b>
<b>Total isolated CABG</b>									
	<b>24,305</b>	<b>511</b>	<b>2.1</b>	<b>822</b>	<b>63</b>	<b>7.7</b>	<b>25,127</b>	<b>574</b>	<b>2.3</b>

*UKCSR: miscellaneous operations for IHD financial year ending 2001*

	No.	Died	%
<b><i>Grafts and other procedures</i></b>			
<i>Excision infarct/aneurysm</i>	147	18	12.2
<i>Repair VSD</i>	71	26	36.6
<i>Other</i>	133	11	8.3
<b>Total</b>	<b>351</b>	<b>55</b>	<b>15.7</b>
<b><i>Procedures without grafts</i></b>			
<i>Excision infarct/aneurysm</i>	28	4	14.3
<i>Repair VSD</i>	68	32	47.1
<b>Total</b>	<b>96</b>	<b>36</b>	<b>37.5</b>

*UKCSR: Miscellaneous operations for acquired heart disease financial year ending 2001*

	No.	Died	%	
<b><i>Cardiopulmonary bypass operations</i></b>				
<i>Aortic surgery</i>	Replace ascending aorta without valve	191	38	19.9
	Replace ascending aorta and valve	94	12	12.8
	Replace ascending aorta, valve & coronary root	247	36	14.6
	Replace aortic arch	43	12	27.9
	Replace descending aorta	76	24	31.5
<i>Trauma surgery</i>	Heart	4	1	25.0
	Great vessels	1	0	0.0
	Ruptured thoracic aorta	9	1	11.1
	Lung	2	0	0.0
	Other	5	3	60.0
	Unclassified operations for trauma	19	3	15.8
<i>Transplant surgery</i> <sup>i</sup>	Heart transplant	181	21	11.7
	Heart & lung transplant	38	6	15.8
	One lung transplant	37	3	8.1
	Two lung transplant	45	4	7.8
<i>Tumour surgery</i>	Myxoma	81	3	3.7
	Other	11	0	0.0
<i>Valve surgery</i>	Repair paraprosthetic leak	16	2	12.5
<i>Dysrhythmias</i>	Ventricular	3	0	0.0
	Atrial +/- valve replacement	16	2	12.5
<i>Pulmonary embolectomy</i>		16	7	43.8
<i>HOCM / ASH without valve replacement</i>		13	0	0.0
<i>Pericardectomy</i> <sup>ii</sup>		53	2	3.7
<i>Other</i>		335	57	31.3

<sup>i</sup> These data were supplied by the United Kingdom National Audit of Intrathoracic Transplantation, based at the Clinical Effectiveness Unit in the Royal College of Surgeons of England. The data are validated and based on 30-day mortality.

<sup>ii</sup> This appears to be an unusually low mortality. Normally one third of patients die.



*UKCSR: cardiac surgical activity by centre financial year ending 2001*

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

<b>CITY</b>	<b>HOSPITAL</b>	<b>Operations for acquired heart disease</b>	<b>Operations for congenital conditions</b>	<b>Total heart operations</b>
<b>Aberdeen</b>	<i>Royal Infirmary</i>	554	0	554
<b>Belfast</b>	<i>Royal Victoria Hospital</i>	754	6	760
<b>Birmingham</b>	<i>Queen Elizabeth Hospital</i>	906	15	921
<b>Blackpool</b>	<i>Victoria Hospital</i>	861	5	866
<b>Brighton</b>	<i>Royal Sussex County Hospital</i>	559	1	560
<b>Bristol</b>	<i>Royal Infirmary</i>	1,140	21	1,161
<b>Cardiff</b>	<i>University Hospital of Wales</i>	680	0	680
<b>Coventry</b>	<i>Walsgrave Hospital</i>	1,121	4	1,125
<b>Edinburgh</b>	<i>Royal Infirmary</i>	1,030	24	1,054
<b>Glasgow</b>	<i>Royal Infirmary</i>	855	18	873
<b>Glasgow</b>	<i>Western Infirmary</i>	993	6	999
<b>Hull</b>	<i>Castle Hill Hospital</i>	855	4	859
<b>Leeds</b>	<i>General Infirmary</i>	1,213	32	1,245
<b>Leicester</b>	<i>Glenfield Hospital</i>	1,147	19	1,166
<b>Liverpool</b>	<i>Cardiothoracic Centre</i>	1,478	3	1,481
<b>London</b>	<i>Guy's Hospital &amp; St Thomas's Hospital</i>	1,421	18	1,439
<b>London</b>	<i>Hammersmith Hospital</i>	772	9	781
<b>London</b>	<i>Harefield Hospital</i>	929	12	941
<b>London</b>	<i>King's College Hospital</i>	725	3	728
<b>London</b>	<i>Middlesex Hospital</i>	622	54	676
<b>London</b>	<i>Royal Brompton Hospital</i>	1,142	76	1,218
<b>London</b>	<i>Royal Free Hospital</i>	82	0	82
<b>London</b>	<i>Bart's and the London Chest</i>	1,674	12	1,686
<b>London</b>	<i>St George's Hospital</i>	901	4	905
<b>London</b>	<i>St Mary's Hospital</i>	639	4	643
<b>Manchester</b>	<i>Royal Infirmary</i>	1,001	11	1,012
<b>Manchester</b>	<i>Wythenshawe Hospital</i>	1,210	8	1,218
<b>Middlesbrough</b>	<i>South Cleveland Hospital</i>	1,158	4	1,162
<b>Midhurst</b>	<i>King Edward VII Hospital</i>	203	0	203
<b>Newcastle</b>	<i>Freeman Hospital</i>	1,164	0	1,164
<b>Nottingham</b>	<i>City Hospital</i>	512	4	516
<b>Oxford</b>	<i>Oxford Heart Centre</i>	903	6	909
<b>Papworth</b>	<i>Papworth Hospital</i>	1,625	13	1,638
<b>Plymouth</b>	<i>Derriford Hospital</i>	1,006	10	1,016
<b>Sheffield</b>	<i>Northern General Hospital</i>	980	9	989
<b>Southampton</b>	<i>Southampton General Hospital</i>	1,132	37	1,169
<b>Stoke-on-Trent</b>	<i>North Staffordshire Royal Infirmary</i>	817	2	819
<b>Swansea</b>	<i>Morrison Hospital</i>	603	6	609
<b>Total:</b>		<b>35,367</b>	<b>460</b>	<b>35,827</b>



## UKCSR: activity and results by centre financial year ending 2001; isolated CABG

<b>CITY</b>	<b>HOSPITAL</b>	<b>Number</b>	<b>Mortality and 99% CI</b>	<b>Survival</b>
Aberdeen	Royal Infirmary	402	1.5% (0.5-4.2%)	98.5%
Belfast	Royal Victoria Hospital	497	1.6% (0.6-4.0%)	98.4%
Birmingham	Queen Elizabeth Hospital	573	3.5% (1.9-6.2%)	96.5%
Blackpool	Victoria Hospital	624	2.4% (1.2-4.7%)	97.6%
Brighton	Royal Sussex County Hospital	405	3.0% (1.4-6.2%)	97.0%
Bristol	Royal Infirmary	803	0.9% (0.3-2.3%)	99.1%
Cardiff	University Hospital of Wales	413	2.7% (1.2-5.7%)	97.3%
Coventry	Walsgrave Hospital	783	3.6% (2.2-5.8%)	96.4%
Edinburgh	Royal Infirmary	649	2.0% (0.9-4.1%)	98.0%
Glasgow	Royal Infirmary	611	2.5% (1.2-4.8%)	97.5%
Glasgow	Western Infirmary	734	1.5% (0.7-3.3%)	98.5%
Hull	Castle Hill Hospital	596	2.9% (1.5-5.3%)	97.1%
Leeds	General Infirmary	862	2.1% (1.1-3.8%)	97.9%
Leicester	Glenfield Hospital	722	1.7% (0.8-3.5%)	98.3%
Liverpool	Cardiothoracic Centre	1,023	1.7% (0.9-3.1%)	98.3%
London	Guy's Hospital & St Thomas's Hospital	913	2.3% (1.3-4.0%)	97.7%
London	Hammersmith Hospital	601	1.8% (0.8-4.0%)	98.2%
London	Harefield Hospital	588	2.0% (0.9-4.3%)	98.0%
London	King's College Hospital	557	2.2% (1.0-4.5%)	97.8%
London	Middlesex Hospital	408	4.7% (2.5-8.3%)	95.3%
London	Royal Brompton Hospital	756	1.5% (0.6-3.2%)	98.5%
London	Royal Free Hospital	70	1.4% (0.0-12.2%)	98.6%
London	Bart's and the London Chest	1,147	1.2% (0.6-2.4%)	98.8%
London	St George's Hospital	656	3.5% (2.0-6.0%)	96.5%
London	St Mary's Hospital	486	3.3% (1.7-6.2%)	96.7%
Manchester	Royal Infirmary	736	2.2% (1.1-4.1%)	97.8%
Manchester	Wythenshawe Hospital	833	2.2% (1.1-4.0%)	97.8%
Middlesbrough	South Cleveland Hospital	891	1.9% (1.0-3.6%)	98.1%
Midhurst	King Edward VII Hospital	157	1.9% (0.4-7.7%)	98.1%
Newcastle	Freeman Hospital	784	2.0% (1.0-3.9%)	98.0%
Nottingham	City Hospital	344	1.2% (0.3-4.0%)	98.8%
Oxford	Oxford Heart Centre	582	2.7% (1.4-5.2%)	97.3%
Papworth	Papworth Hospital	994	2.1% (1.2-3.7%)	97.9%
Plymouth	Derriford Hospital	694	1.3% (0.5-3.1%)	98.7%
Sheffield	Northern General Hospital	657	1.7% (0.7-3.6%)	98.3%
Southampton	Southampton General Hospital	700	1.3% (0.5-3.0%)	98.7%
Stoke-on-Trent	North Staffordshire Royal Infirmary	635	1.9% (0.9-4.0%)	98.1%
Swansea	Morrison Hospital	419	2.1% (0.9-5.0%)	97.9%
<b>Average:</b>		<b>640</b>	<b>2.1% (1.9-2.3%)</b>	<b>97.9%</b>

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<b>CITY</b>	<b>HOSPITAL</b>	<b>Number</b>	<b>Mortality and 99% CI</b>	<b>Survival</b>
Aberdeen	Royal Infirmary	1,263	3.3% (2.2-4.9%)	96.7%
Belfast	Royal Victoria Hospital	1,712	1.3% (0.8-2.3%)	98.7%
Birmingham	Queen Elizabeth Hospital	1,989	3.1% (2.2-4.3%)	96.9%
Blackpool	Victoria Hospital	1,680	2.0% (1.3-3.2%)	98.0%
Brighton <sup>i</sup>	Royal Sussex County Hospital	673	2.5% (1.3-4.7%)	97.5%
Bristol	Royal Infirmary	2,449	1.1% (0.7-1.8%)	98.9%
Cardiff	University Hospital of Wales	1,324	1.4% (0.8-2.6%)	98.6%
Coventry	Walsgrave Hospital	2,397	4.0% (3.1-5.2%)	96.0%
Edinburgh	Royal Infirmary	1,695	2.1% (1.4-3.3%)	97.9%
Glasgow	Royal Infirmary	1,839	2.3% (1.6-3.5%)	97.7%
Glasgow	Western Infirmary	2,290	1.6% (1.0-2.4%)	98.4%
Hull	Castle Hill Hospital	1,780	2.2% (1.4-3.3%)	97.8%
Leeds	General Infirmary	2,753	1.3% (0.8-2.0%)	98.7%
Leicester	Glenfield Hospital	2,270	2.0% (1.4-3.0%)	98.0%
Liverpool	Cardiothoracic Centre	2,707	1.8% (1.2-2.6%)	98.2%
London	Guy's Hospital & St Thomas's Hospital	2,975	2.4% (1.8-3.3%)	97.6%
London	Hammersmith Hospital	1,678	2.6% (1.7-3.8%)	97.4%
London	Harefield Hospital	1,767	2.5% (1.7-3.7%)	97.5%
London	King's College Hospital	1,763	2.1% (1.4-3.2%)	97.9%
London	Middlesex Hospital	1,356	3.9% (2.7-5.5%)	96.1%
London	Royal Brompton Hospital	1,977	2.2% (1.5-3.2%)	97.8%
London	Royal Free Hospital	183	2.2% (0.5-7.5%)	97.8%
London	Bart's and the London Chest	3,095	1.8% (1.3-2.6%)	98.2%
London	St George's Hospital	1,870	2.6% (1.8-3.8%)	97.4%
London	St Mary's Hospital	1,600	2.5% (1.6-3.8%)	97.5%
Manchester	Royal Infirmary	2,070	1.6% (1.0-2.6%)	98.4%
Manchester	Wythenshawe Hospital	2,297	2.7% (2.0-3.8%)	97.3%
Middlesbrough	South Cleveland Hospital	2,724	1.9% (1.3-2.7%)	98.1%
Midhurst <sup>i</sup>	King Edward VII Hospital	346	0.9% (0.2-2.7%)	98.1%
Newcastle	Freeman Hospital	2,363	1.9% (1.3-2.8%)	98.1%
Nottingham	City Hospital	972	0.9% (0.4-2.2%)	99.1%
Oxford	Oxford Heart Centre	2,016	2.4% (1.6-3.5%)	97.6%
Papworth	Papworth Hospital	3,243	2.1% (1.5-2.9%)	97.9%
Plymouth	Derriford Hospital	2,008	1.0% (0.6-1.8%)	99.0%
Sheffield	Northern General Hospital	1,892	1.4% (0.8-2.3%)	98.6%
Southampton	Southampton General Hospital	2,535	1.9% (1.3-2.8%)	98.1%
Stoke-on-Trent	North Staffordshire Royal Infirmary	1,601	1.9% (1.2-3.0%)	98.1%
Swansea	Morrison Hospital	1,235	1.2% (0.6-2.4%)	98.8%
<b>Average:</b>		<b>1,905</b>	<b>2.1% (2.0-2.2%)</b>	<b>97.9%</b>

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<sup>i</sup> Two year's data

*UKCSR: activity and results by centre financial year ending 2001; isolated AVR*

<b>CITY</b>	<b>HOSPITAL</b>	<b>Number</b>	<b>Mortality and 99% CI</b>	<b>Survival</b>
Aberdeen	Royal Infirmary	59	5.1% (1.0-19.1%)	94.9%
Belfast	Royal Victoria Hospital	97	5.2% (1.5-15.0%)	94.8%
Birmingham	Queen Elizabeth Hospital	80	3.8% (0.7-14.5%)	96.3%
Blackpool	Victoria Hospital	49	8.2% (2.0-25.1%)	91.8%
Brighton	Royal Sussex County Hospital	53	3.8% (0.5-18.4%)	96.2%
Bristol	Royal Infirmary	101	2.0% (0.2-10.2%)	98.0%
Cardiff	University Hospital of Wales	67	4.5% (0.8-17.1%)	95.5%
Coventry	Walsgrave Hospital	88	5.7% (1.6-16.4%)	94.3%
Edinburgh	Royal Infirmary	110	3.6% (0.9-12.1%)	96.4%
Glasgow	Royal Infirmary	76	5.3% (1.3-17.0%)	94.7%
Glasgow	Western Infirmary	89	1.1% (0.0-9.8%)	98.9%
Hull	Castle Hill Hospital	79	0.0% (0.0-3.7%)	100.0%
Leeds	General Infirmary	92	3.3% (0.6-12.8%)	96.7%
Leicester	Glenfield Hospital	122	2.5% (0.5-9.8%)	97.5%
Liverpool	Cardiothoracic Centre	123	0.8% (0.0-7.2%)	99.2%
London	Guy's Hospital & St Thomas's Hospital	145	1.4% (0.2-7.3%)	98.6%
London	Hammersmith Hospital	66	1.5% (0.0-12.9%)	98.5%
London	Harefield Hospital	82	3.7% (0.7-14.2%)	96.3%
London	King's College Hospital	60	5.0% (0.9-18.8%)	95.0%
London	Middlesex Hospital	58	6.9% (1.7-21.7%)	93.1%
London	Royal Brompton Hospital	106	2.8% (0.5-11.2%)	97.2%
London	Royal Free Hospital	7	14.3% (0.5-67.2%)	85.7%
London	Bart's and the London Chest	98	3.1% (0.6-12.0%)	96.9%
London	St George's Hospital	59	8.5% (2.4-23.6%)	91.5%
London	St Mary's Hospital	45	2.2% (0.1-18.1%)	97.8%
Manchester	Royal Infirmary	62	3.2% (0.4-16.0%)	96.8%
Manchester	Wythenshawe Hospital	118	1.7% (0.2-8.9%)	98.3%
Middlesbrough	South Cleveland Hospital	59	3.4% (0.4-16.8%)	96.6%
Midhurst	King Edward VII Hospital	22	0.0% (0.0-12.7%)	100.0%
Newcastle	Freeman Hospital	112	0.0% (0.0-2.6%)	100.0%
Nottingham	City Hospital	42	0.0% (0.0-6.9%)	100.0%
Oxford	Oxford Heart Centre	91	6.6% (2.1-17.4%)	93.4%
Papworth	Papworth Hospital	165	5.5% (2.2-12.4%)	94.5%
Plymouth	Derriford Hospital	102	0.0% (0.0-2.9%)	100.0%
Sheffield	Northern General Hospital	71	1.4% (0.0-12.1%)	98.6%
Southampton	Southampton General Hospital	98	1.0% (0.0-9.0%)	99.0%
Stoke-on-Trent	North Staffordshire Royal Infirmary	45	4.4% (0.5-21.3%)	95.6%
Swansea	Morrison Hospital	45	2.2% (0.1-18.1%)	97.8%
<b>Average:</b>		<b>80</b>	<b>3.1% (2.6-3.8%)</b>	<b>96.9%</b>

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*UKCSR: activity and results by centre financial years ending 1999-2001; isolated AVR*

<b>CITY</b>	<b>HOSPITAL</b>	<b>Number</b>	<b>Mortality and 99% CI</b>	<b>Survival</b>
Aberdeen	Royal Infirmary	135	5.2% (1.8-13.0%)	94.8%
Belfast	Royal Victoria Hospital	263	3.4% (1.4-7.9%)	96.6%
Birmingham	Queen Elizabeth Hospital	250	2.0% (0.6-6.1%)	98.0%
Blackpool	Victoria Hospital	139	4.3% (1.4-11.7%)	95.7%
Brighton <sup>i</sup>	Royal Sussex County Hospital	81	3.7% (0.7-14.4%)	96.3%
Bristol	Royal Infirmary	265	2.6% (0.9-6.8%)	97.4%
Cardiff	University Hospital of Wales	229	3.5% (1.3-8.4%)	96.5%
Coventry	Walsgrave Hospital	236	7.2% (3.8-13.1%)	92.8%
Edinburgh	Royal Infirmary	322	2.5% (0.9-6.1%)	97.5%
Glasgow	Royal Infirmary	203	3.4% (1.2-8.8%)	96.6%
Glasgow	Western Infirmary	270	3.7% (1.6-8.2%)	96.3%
Hull	Castle Hill Hospital	219	1.4% (0.3-5.6%)	98.6%
Leeds	General Infirmary	297	2.0% (0.7-5.6%)	98.0%
Leicester	Glenfield Hospital	413	2.7% (1.2-5.7%)	97.3%
Liverpool	Cardiothoracic Centre	366	1.9% (0.7-5.0%)	98.1%
London	Guy's Hospital & St Thomas's Hospital	446	2.5% (1.1-5.3%)	97.5%
London	Hammersmith Hospital	180	4.4% (1.7-10.6%)	95.6%
London	Harefield Hospital	207	4.3% (1.8-9.9%)	95.7%
London	King's College Hospital	208	3.4% (1.2-8.6%)	96.6%
London	Middlesex Hospital	188	6.9% (3.3-13.6%)	93.1%
London	Royal Brompton Hospital	294	2.4% (0.8-6.2%)	97.6%
London	Royal Free Hospital	20	5.0% (0.2-35.0%)	95.0%
London	Bart's and the London Chest	292	4.1% (1.9-8.5%)	95.9%
London	St George's Hospital	201	5.0% (2.1-10.9%)	95.0%
London	St Mary's Hospital	117	0.9% (0.0-7.6%)	99.1%
Manchester	Royal Infirmary	160	3.8% (1.2-10.2%)	96.3%
Manchester	Wythenshawe Hospital	314	1.9% (0.6-5.3%)	98.1%
Middlesbrough	South Cleveland Hospital	197	4.6% (1.8-10.4%)	95.4%
Midhurst <sup>i</sup>	King Edward VII Hospital	40	0.0% (0.0-7.2%)	100.0%
Newcastle	Freeman Hospital	276	2.9% (1.1-7.0%)	97.1%
Nottingham	City Hospital	126	3.2% (0.8-10.7%)	96.8%
Oxford	Oxford Heart Centre	307	3.9% (1.8-8.1%)	96.1%
Papworth	Papworth Hospital	478	3.8% (2.0-6.8%)	96.2%
Plymouth	Derriford Hospital	273	1.5% (0.4-5.1%)	98.5%
Sheffield	Northern General Hospital	199	2.0% (0.5-6.9%)	98.0%
Southampton	Southampton General Hospital	366	1.6% (0.5-4.6%)	98.4%
Stoke-on-Trent	North Staffordshire Royal Infirmary	141	2.8% (0.7-9.6%)	97.2%
Swansea	Morrison Hospital	130	1.5% (0.2-8.1%)	98.5%
<b>Average:</b>		<b>233</b>	<b>3.1% (2.8-3.5%)</b>	<b>96.9%</b>

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<sup>i</sup> Two year's data

*Comparison of two sources of data on isolated CABG procedures in the financial year ending 2001*

<b>CITY</b>	<b>HOSPITAL</b>	<b>Total Isolated CABG in UKCSR</b>	<b>Total Isolated CABG in Database</b>
<b>Aberdeen</b>	<i>Royal Infirmary</i>	402	393
<b>Belfast</b>	<i>Royal Victoria Hospital</i>	497	N/A
<b>Birmingham</b>	<i>Queen Elizabeth Hospital</i>	573	573
<b>Blackpool</b>	<i>Victoria Hospital</i>	624	643
<b>Brighton</b>	<i>Royal Sussex County Hospital</i>	405	415
<b>Bristol</b>	<i>Royal Infirmary</i>	803	827
<b>Cardiff</b>	<i>University Hospital of Wales</i>	413	429
<b>Coventry</b>	<i>Walsgrave Hospital</i>	783	807
<b>Edinburgh</b>	<i>Royal Infirmary</i>	649	648
<b>Glasgow</b>	<i>Royal Infirmary</i>	611	618
<b>Glasgow</b>	<i>Western Infirmary</i>	734	740
<b>Hull</b>	<i>Castle Hill Hospital</i>	596	616
<b>Leeds</b>	<i>General Infirmary</i>	862	867
<b>Leicester</b>	<i>Glenfield Hospital</i>	722	739
<b>Liverpool</b>	<i>Cardiothoracic Centre</i>	1,023	1,030
<b>London</b>	<i>Guy's &amp; St Thomas's Hospital</i>	913	734
<b>London</b>	<i>Hammersmith Hospital</i>	601	601
<b>London</b>	<i>Harefield Hospital</i>	588	621
<b>London</b>	<i>King's College Hospital</i>	557	572
<b>London</b>	<i>The Heart Hospital</i>	408	430
<b>London</b>	<i>Royal Brompton Hospital</i>	756	783
<b>London</b>	<i>Bart's &amp; The London Chest</i>	1,147	1,120
<b>London</b>	<i>St George's Hospital</i>	656	674
<b>London</b>	<i>St Mary's Hospital</i>	486	N/A <sup>i</sup>
<b>Manchester</b>	<i>Royal Infirmary</i>	736	782
<b>Manchester</b>	<i>Wythenshawe Hospital</i>	833	866
<b>Middlesbrough</b>	<i>South Cleveland Hospital</i>	891	1,161
<b>Newcastle</b>	<i>Freeman Hospital</i>	784	811
<b>Nottingham</b>	<i>City Hospital</i>	344	343
<b>Oxford</b>	<i>Oxford Heart Centre</i>	582	N/A
<b>Papworth</b>	<i>Papworth Hospital</i>	994	1,003
<b>Plymouth</b>	<i>Derriford Hospital</i>	694	N/A
<b>Sheffield</b>	<i>Northern General Hospital</i>	657	N/A
<b>Southampton</b>	<i>Southampton General Hospital</i>	700	703
<b>Stoke-on-Trent</b>	<i>North Staffs Royal Infirmary</i>	635	640
<b>Swansea</b>	<i>Morrison Hospital</i>	419	425

This table demonstrates the difficulty of simply counting the number of coronary bypass operations performed nationally. Undoubtedly the NHS administrative systems will have a different count. The truth will lie somewhere in between. Until we can reliably count the number of procedures comparative performance data will be suspect.

<sup>i</sup> Not imported.