

BACTS Cardiac Surgical Database Report

FINAL REPORT 2008



**Compiled by
BACTS DATABASE COMMITTEE**

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INTRODUCTION

This is the 6th BACTS Cardiac Surgery Database Report. It gives an overview of all cardiac surgery activity in Belgium. 27 centres have sent the minimal data.

As stated in the memory of understanding, anonymity and confidentiality are key issues for the database committee. We have summarized the data in an anonymous way. Only the aggregated report is public.

This report focuses on adult cardiac surgery. CPT codes are too complicated to analyze congenital cardiac surgery. So, there is only a very small overview of the congenital domain. We suggest to participate in the EACTS-congenital database project for the registration of congenital cardiac surgery.

We thank all contributors for their sustained effort to participate in the national database.

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28 ACTIVE CARDIAC CENTERS IN BELGIUM (2008)

1000 Brussel	CHU St.-Pierre
1000 Brussel	Clinique St. Jean
1020 Brussel	CHU Brugmann Huderf
1070 Brussel	Hôpital Erasme
1090 Brussel	UZ Brussel
1180 Brussel	Europa Ziekenhuizen St.-Elisabeth
1200 Brussel	Cliniques Universitaires Saint-Luc
2020 Antwerpen	ZNA Middelheim
2650 Edegem	UZ Antwerpen
2820 Bonheiden	Imelda Ziekenhuis
3000 Leuven	UZ Leuven
3500 Hasselt	Virga Jesse Ziekenhuis
3600 Genk	ZOL Campus Sint-Jan
4000 Liège	CHR de la Citadelle
4000 Liège	CHU de Liège Sart Tilman
5000 Namur	CHR de Namur
5004 Bouge	Clinique Saint-Luc Bouge
5530 Yvoir	Cliniques Universitaires de Mont-Godinne
6000 Charleroi	CHU de Charleroi – Hôpital Civil
6060 Gilly	Grand Hôpital de Charleroi
7100 Haine St. Paul	Hôpital de Jolimont
7100 La Louvière	CHU de Tivoli
8000 Brugge	AZ Sint-Jan
8800 Roeselare	Heilig Hartziekenhuis
9000 Gent	AZ Maria Middelaes
9000 Gent	UZ Gent
9300 Aalst	Algemeen Stedelijk Ziekenhuis
9300 Aalst	Onze Lieve Vrouwziekenhuis

An overview of cardiac surgery in Belgium

AN OVERVIEW OF CARDIAC SURGERY IN BELGIUM

DATA COLLECTION

1) Evolution of data collection

	2001	2002	2003	2004	2005	2006	2007	2008
active centers	29	29	29	29	29	29	28	28
participating centers core data set	27	28	29	29	29	28	28	27
participating summary only	2	1	-	-	-	-	-	-
participating full data set	n.a.	n.a.	12	16	14	13	16	18
no participating	-	-	-	-	-	1	-	1

2) General Cardiac Surgery

Any record with one of the 6 CPT codes in the following ranges is considered to be a **general cardiac surgery operation** (cpt-codes:33030-33031; 33120-33130; 33250-33261; 33300-33998)

It does not matter at all what values the other CPT codes have (everything is allowed, also non-cardiac codes).

A cpt code is a procedure, an operation can exist in one or more procedures (cpt codes)

Each operation is one record in the database.

All ages are included. Adult cardiac surgery is ≥ 16 years.

27 centres participated and 15879 records were submitted. This includes also non-cardiac operations performed by cardiac surgeons: eg pacemakers, revision for bleeding, sternal/wound procedures. The non-cardiac operations were not analysed.

In total **12356 general cardiac surgery operations** were performed in 27 centres. The mean is 457,6 and the median is 364 operations.

General cardiac surgery includes:

- The established cardiac operation with or without ECC (CABG, OPCAB, Valve, HTX, HLTX, Ascending Aorta and Arch, Congenital procedures
- Assist devices and ECMO/ECLS
- Surgery of the descending aorta
- Cardiac wounds
- Pericardiectomy
- Other congenital procedures such as: ductus botalli, coarctatio of the aorta, banding of pulmonary artery, Blalock/Taussing shunts....
- Introduction and removal of IABP

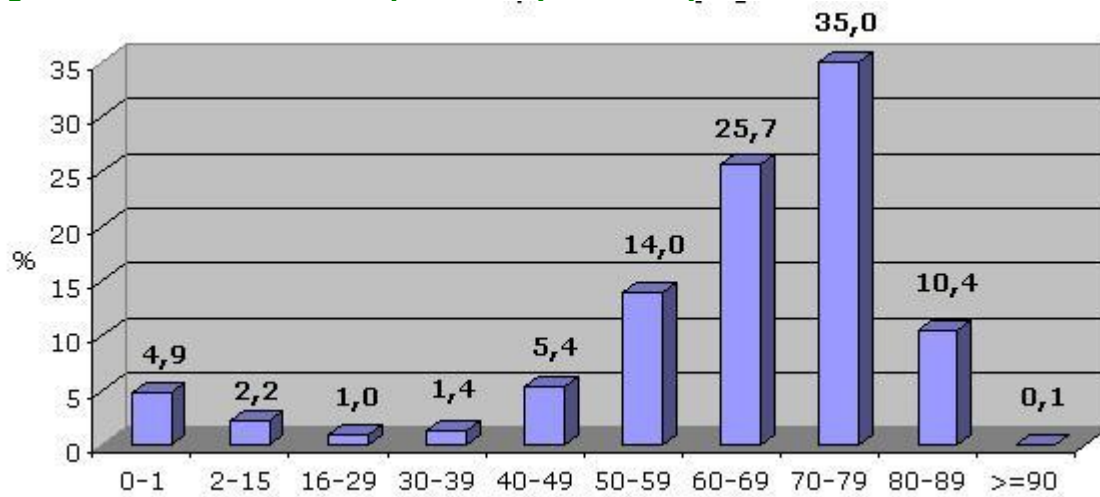
We are aware that some operations are not counted because they are performed by other specialists like cardiologists, thoracic or vascular surgeons, endovascular specialists.

Operations also not included in general cardiac surgery operations are:

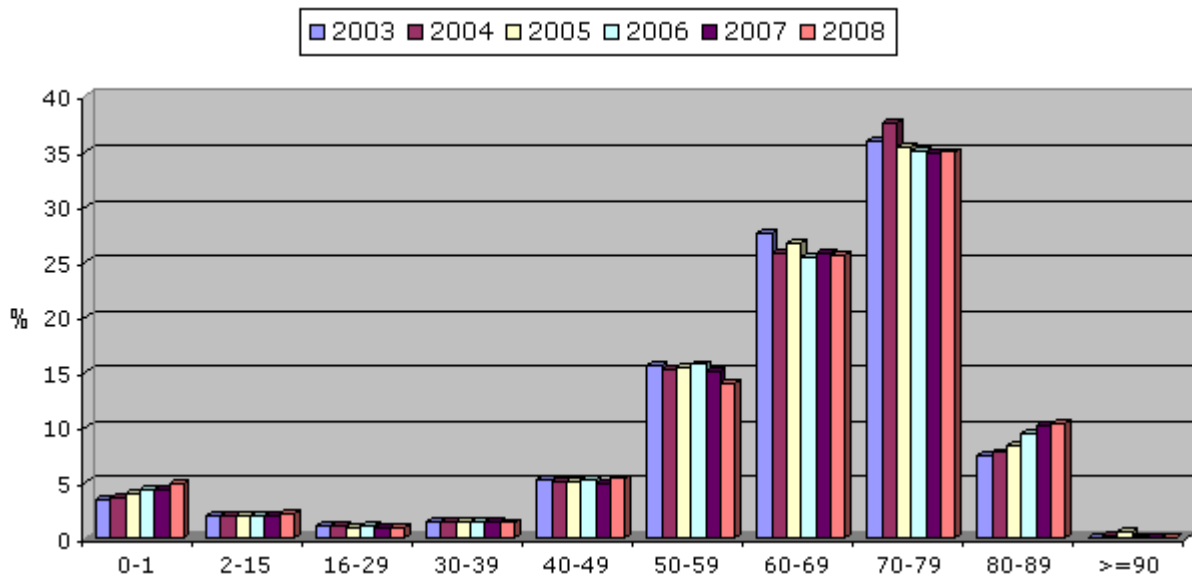
- Revisions for bleeding: this is considered to be a complication
- Surgical treatment for sternal and wound complications
- Pacemakers
- Non-cardiac operations as far as this procedures or not performed in combination with a cardiac operation.

	2001	2002	2003	2004	2005	2006	2007	2008
cardiac operations	11437	12773	13635	13694	12920	12876	12918	12356

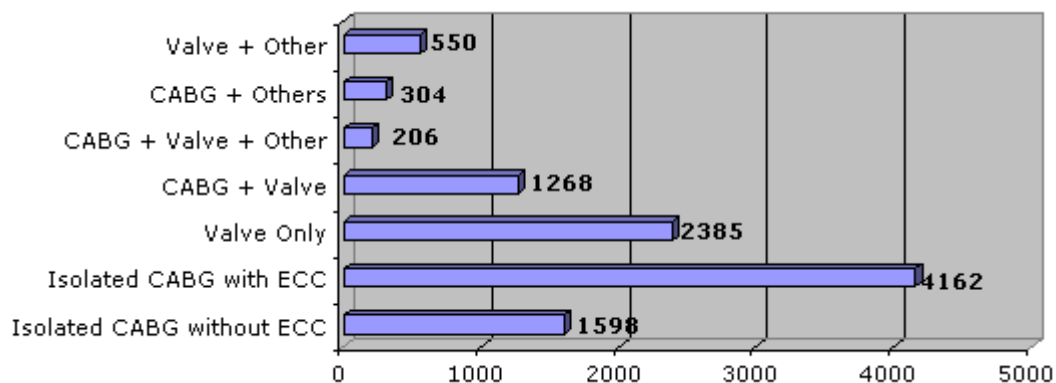
Age distribution of cardiac operations (n= 12356)



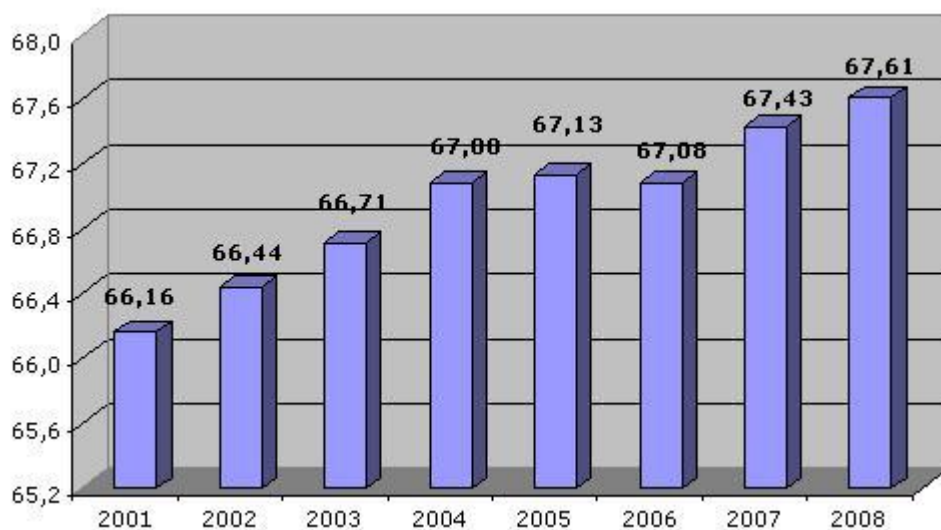
Evolution age distribution



Number of CABG and/or Valve operations – adults (≥16 years)

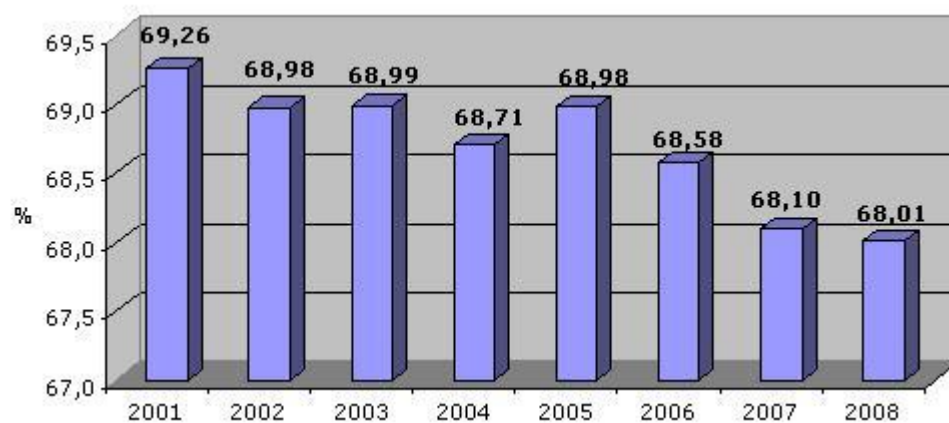


Evolution of mean age in cardiac operations - adults (≥ 16 years)

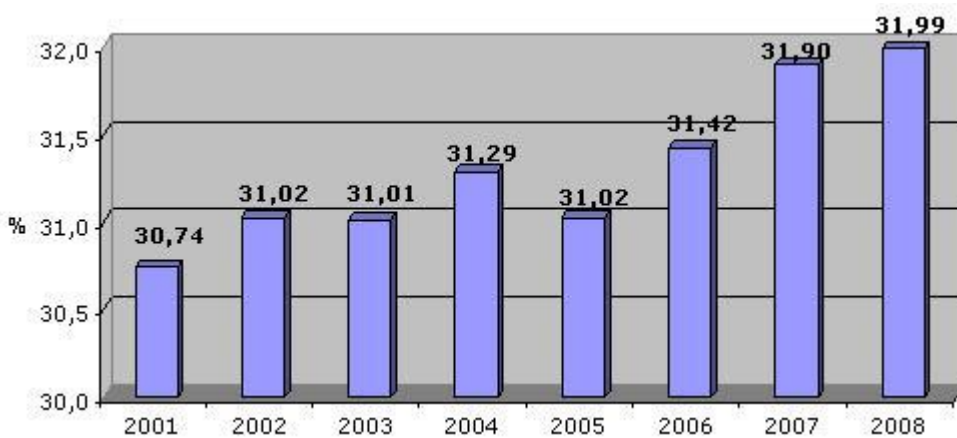


Cardiac operations - % by gender – evolution

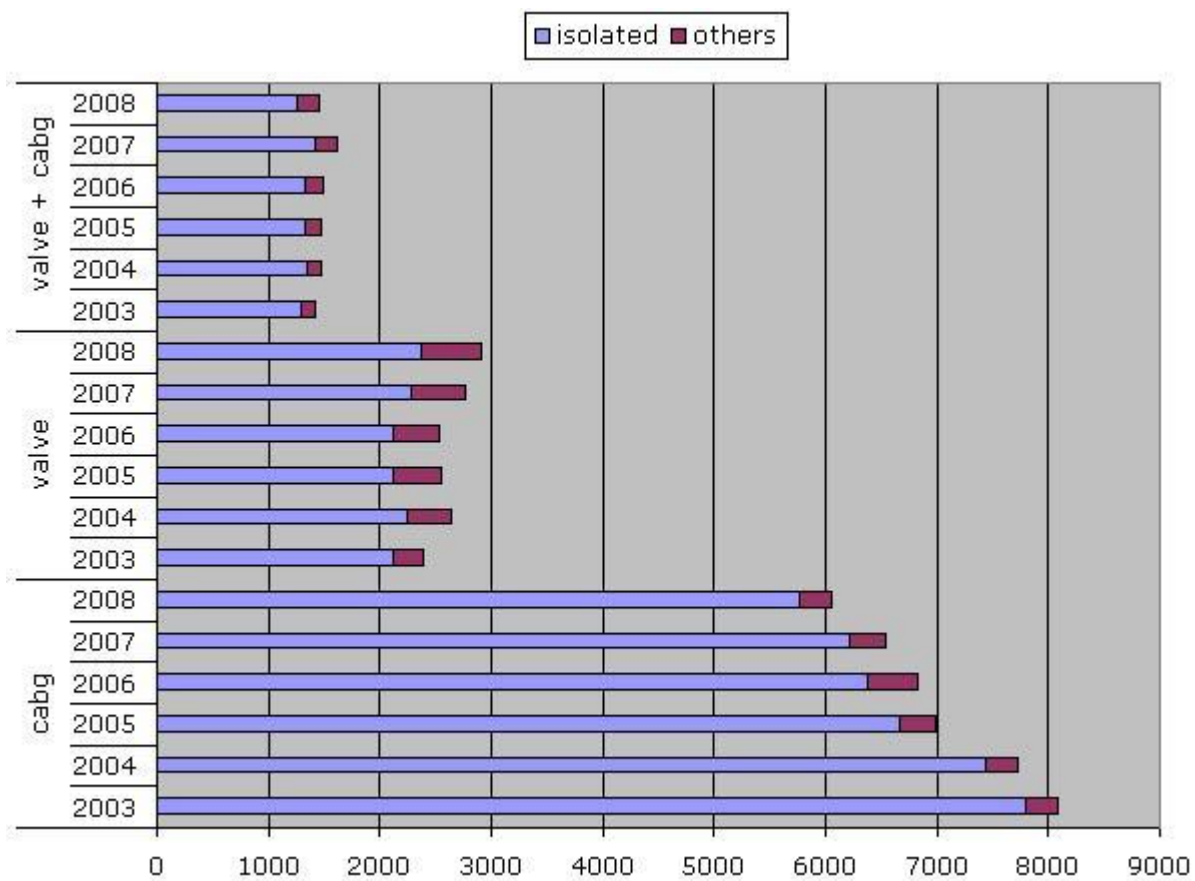
Male



Female



Evolution activities (years) – ‘operations’ performed (adults)



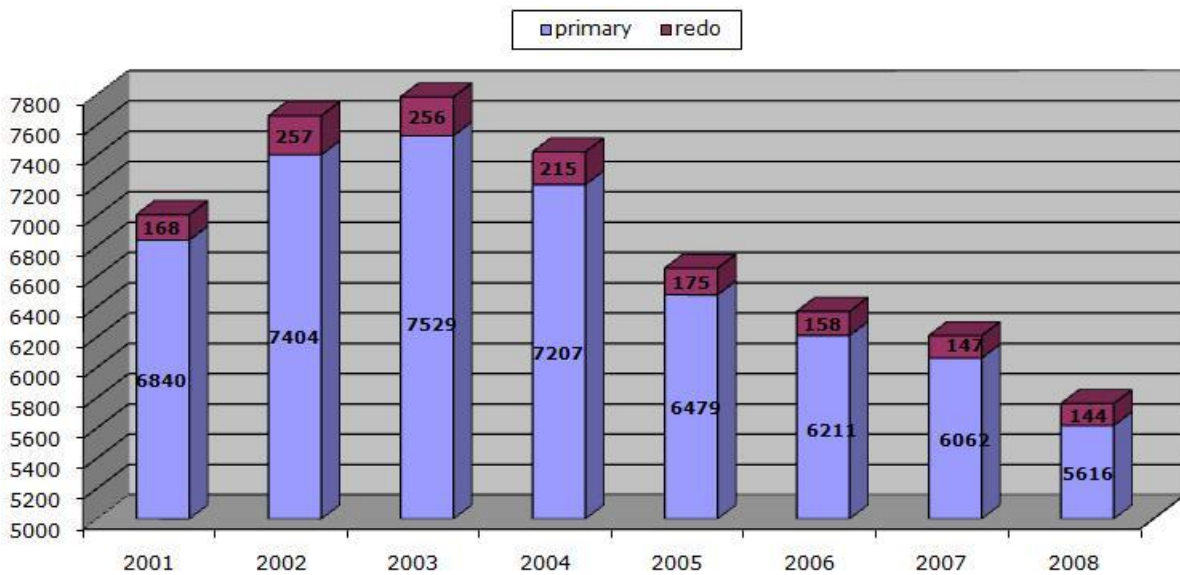
	2001	2002	2003	2004	2005	2006	2007	2008
isolated CABG	7012	7582	7795	7432	6665	6369	6209	5760
CABG + other	257	309	301	312	330	358	341	304
valve only	1673	1914	2120	2244	2127	2118	2273	2388
Valve + other	209	300	273	403	427	441	514	550
valve + CABG	859	1068	1299	1341	1322	1325	1417	1267
valve + CABG + other	66	120	137	153	174	177	217	206
thoracic aorta	304	368	439	468	445	593	542	544

Coronary bypass surgery

CORONARY BYPASS SURGERY

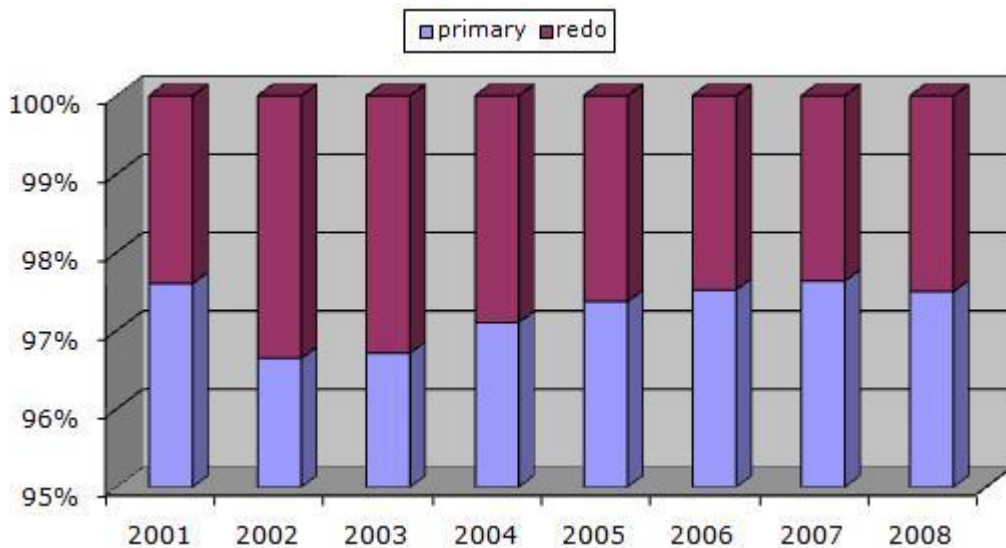
3) Isolated coronary artery bypass surgery

Evolution of number of isolated CABG ± redo



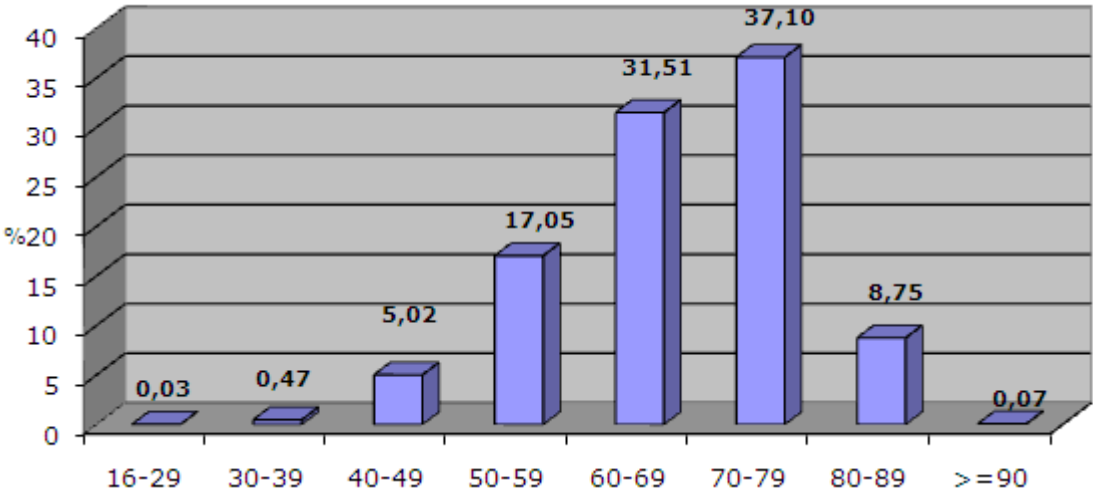
There are 2.5 % redo procedures in 2008. The redo code (33530) has no relation with the type of the previous procedure. Repeat coronary-redo and coronary-redo after a valve or another cardiac operation are included.

Evolution of % primary and redo CABG

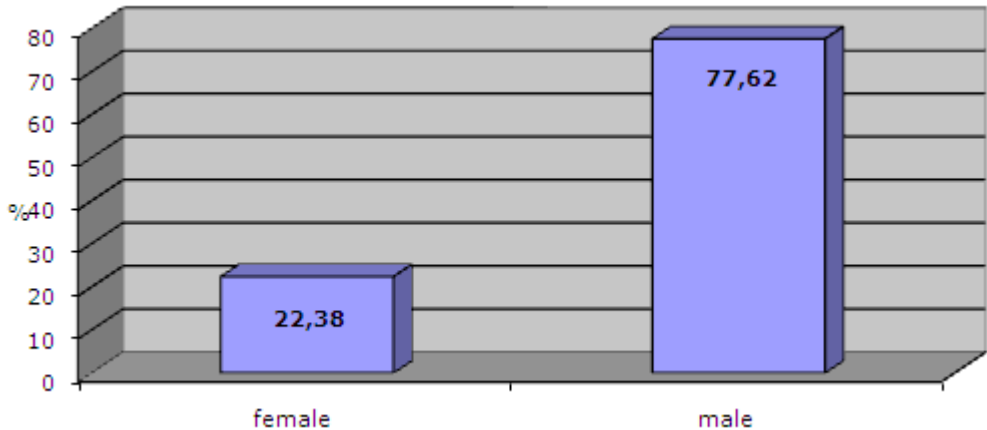


Evolution isolated CABG - mean age

Isolated CABG - age distribution (n= 5760)

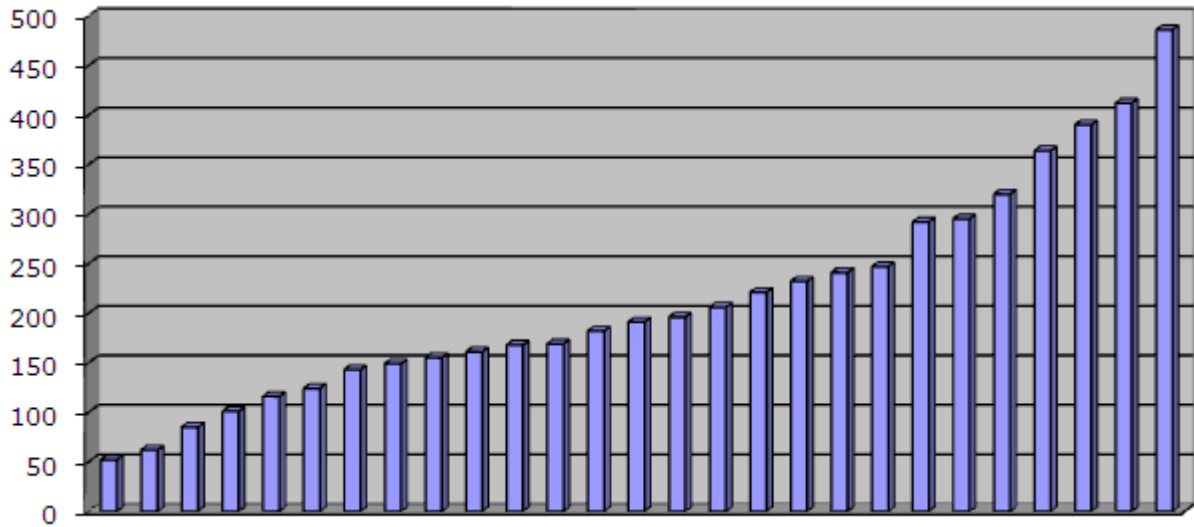


Isolated CABG - by gender (n= 5760)



Number of isolated CABG operations – by centre (n= 5760)

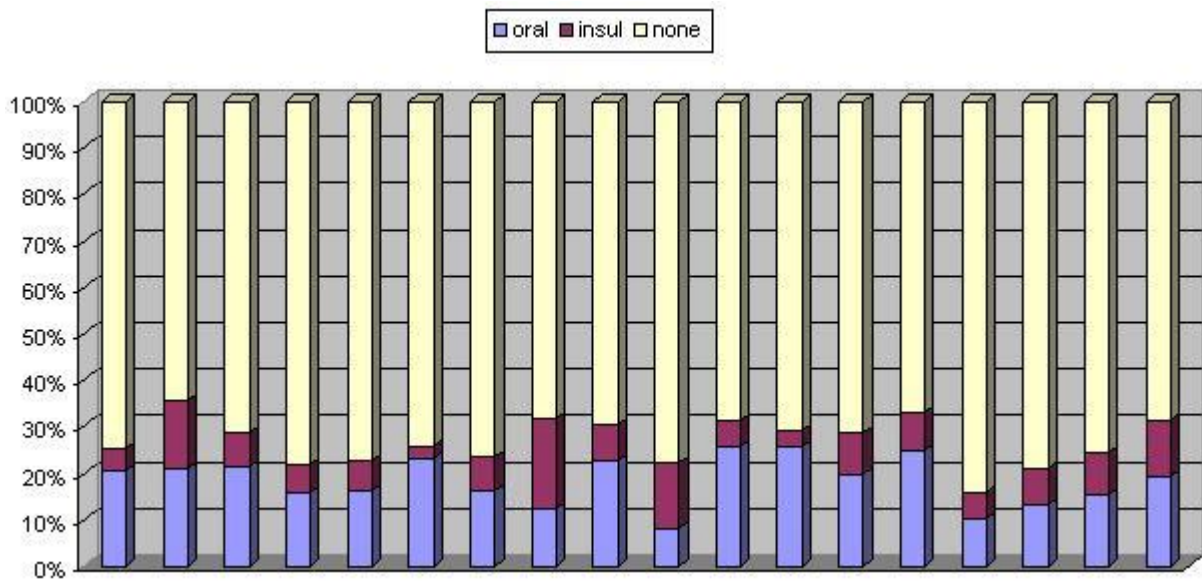
Median = 191
Mean = 213.33



Diabetic patients - % of isolated CABG (18 centres)

For patients with information about diabetes, n= 4054 operations.

median = 27.22 %
mean = 26.80 %



LVEF patients - % of isolated CABG – by centre (18 centres)

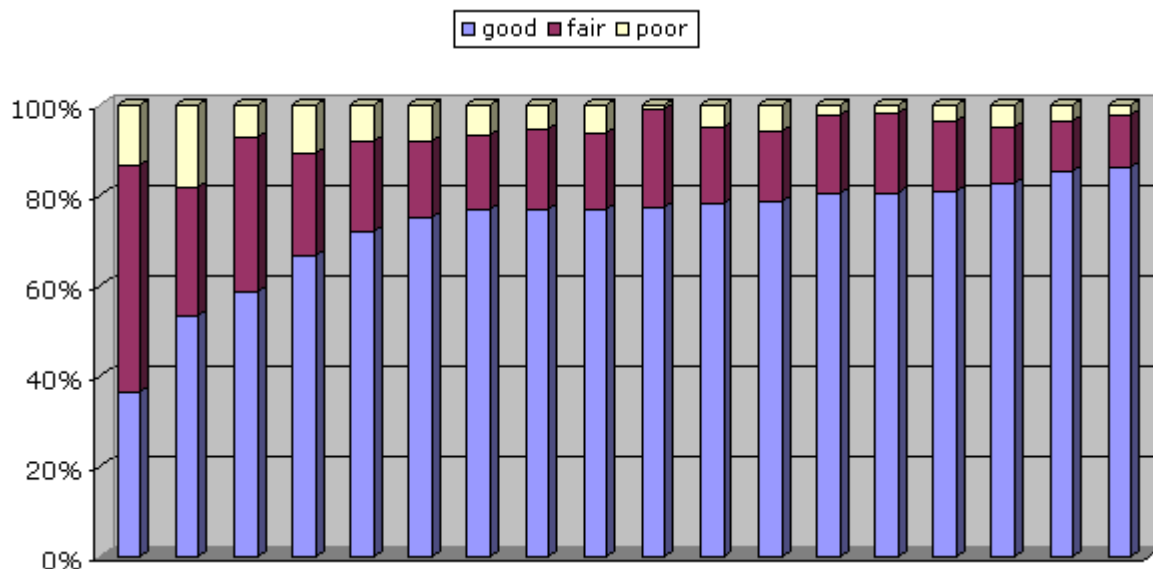
For patients with info about LVEF, n= 3696
 (poor < 30 %; fair ≥30 and < 50 %; good ≥ 50 %)

Overall percentages:

Good LVEF = 78.5 %

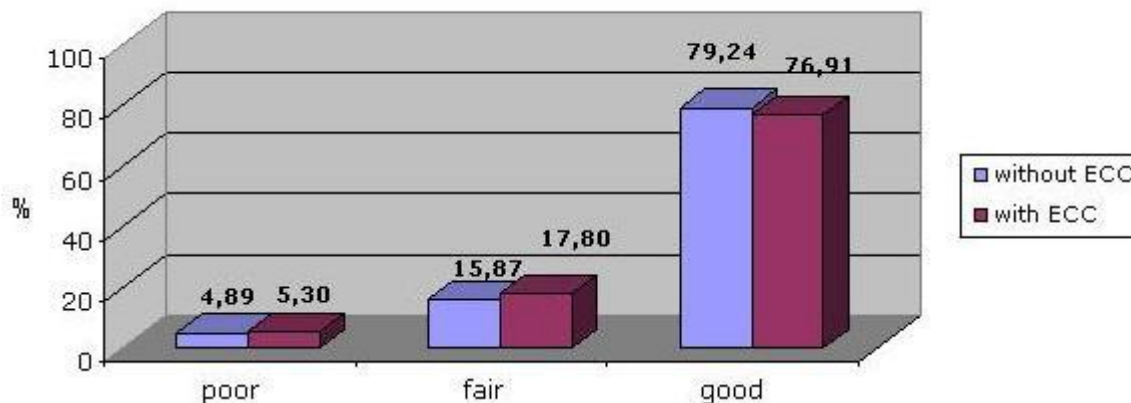
Fair LVEF = 17.3 %

Poor LVEF = 5.2 %



LVEF patients - % of isolated CABG - with or without ECC

with ECC n= 2776
 without ECC n= 920

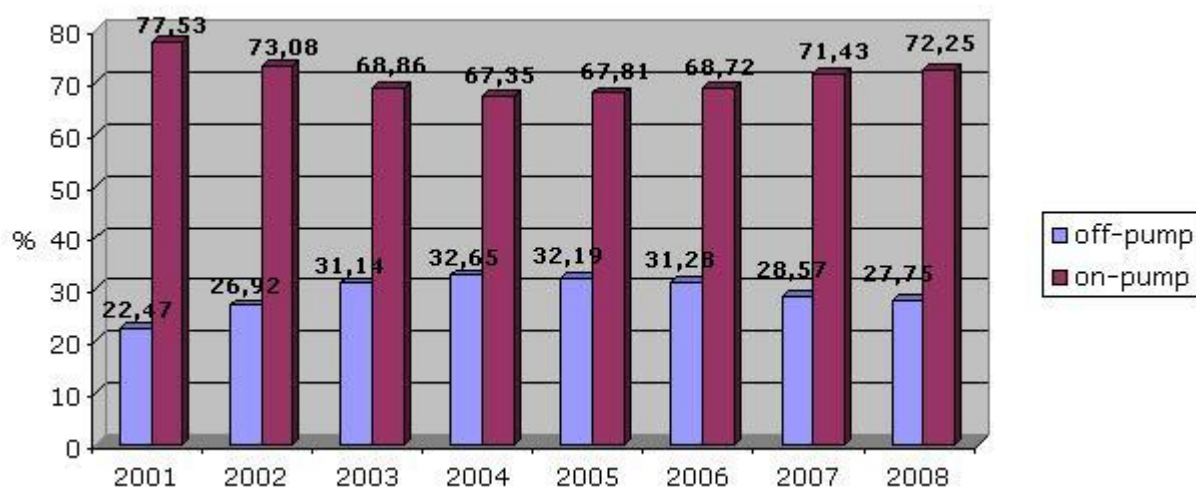


Euroscore – calculated on isolated CABG (n= 14 centres)

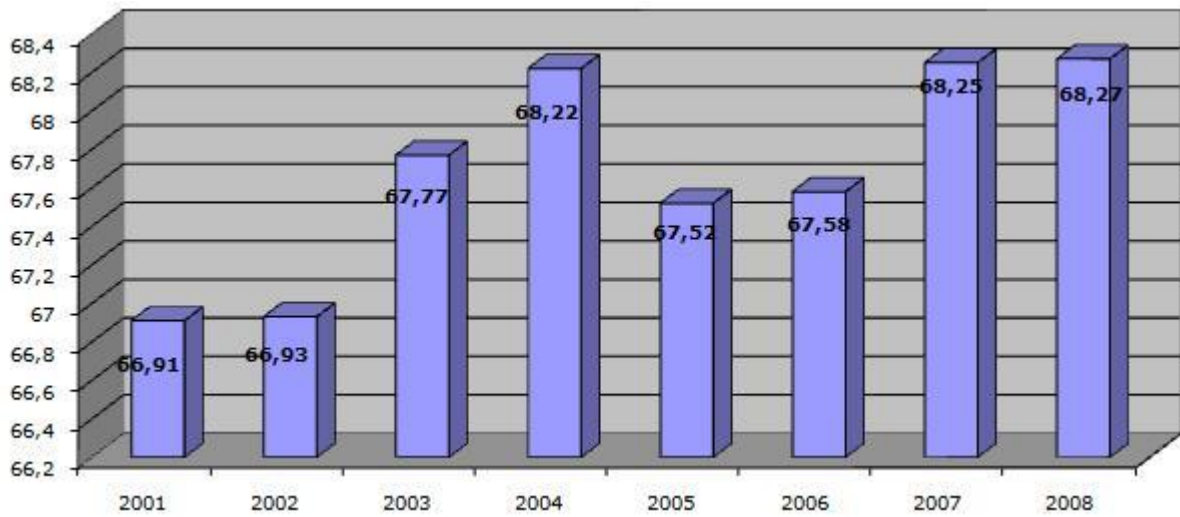
isolated cabg	euro score complete	additive score		logistic score		
		MEAN	STDDEV	MEAN	STDDEV	MEDIAN
295	2	3,50	0,71	2,44	0,33	2,44
169	7	7,00	2,77	9,36	7,17	6,28
247	11	6,27	2,45	7,71	5,3	6,14
62	58	5,53	3,76	8,5	13,38	4,5
85	83	4,71	3,13	5,8	6,98	3,59
124	110	4,88	3,37	6,45	7,37	3,5
116	115	6,13	4,6	11,97	17,09	4,39
143	127	4,86	3,75	7,37	12,52	3,11
149	145	3,96	3,52	5,53	11,6	2,52
155	154	5,65	3,11	7,62	7,96	4,96
232	196	4,91	3,68	7,06	10,58	3,31
390	377	4,39	2,47	4,67	4,95	3,44
412	392	5,44	3,11	7,21	8,71	4,23
486	470	4,38	2,84	4,93	6,15	3,12
3065	2245	72	43	97	10	56

More about Euroscore, see appendix 6

Isolated CABG- Evolution Off-pump/On-pump %

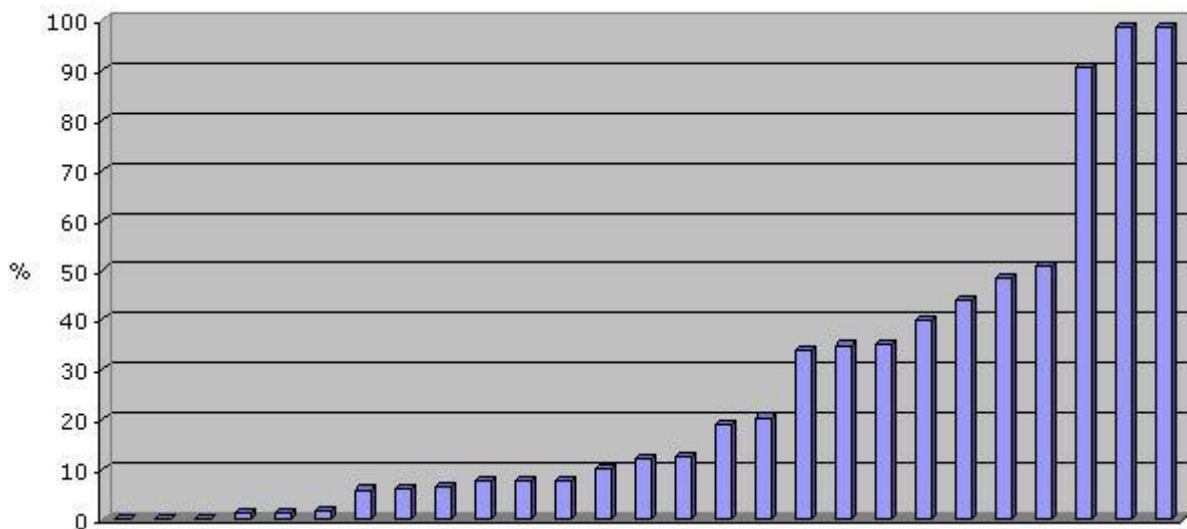


Evolution OPCAB for isolated CABG – mean age

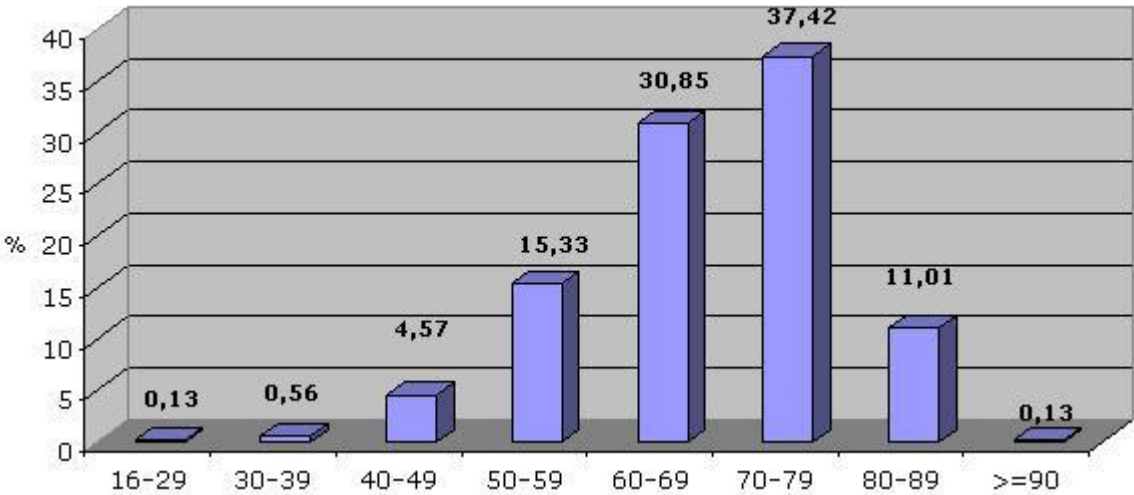


OPCAB - % of isolated CABG – by centre

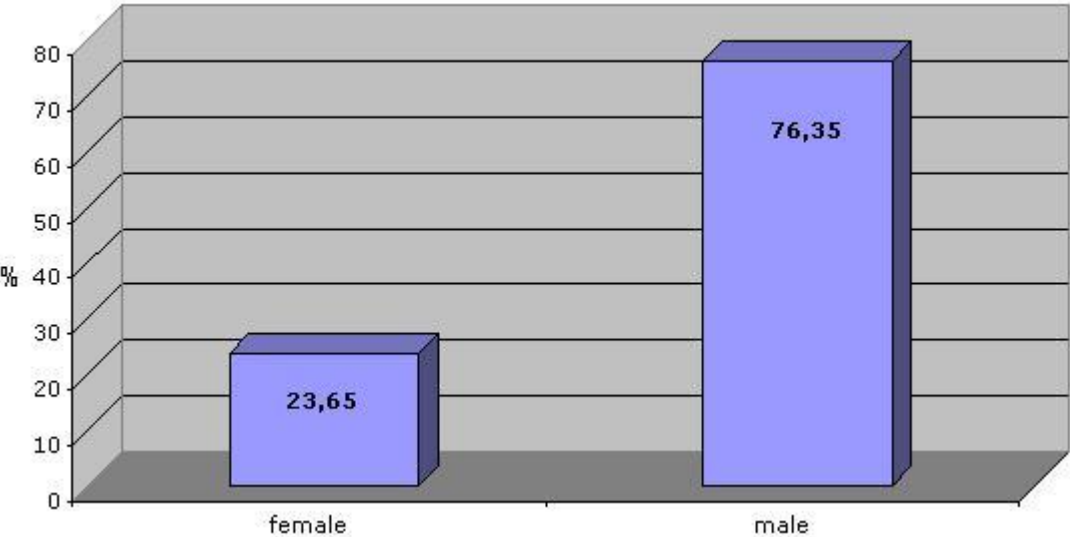
OPCAB n = 1598
3 centres = 0 %
Median = 12.10 %
Mean = 25.72 %



OPCAB for Isolated CABG - age distribution (n= 1598)



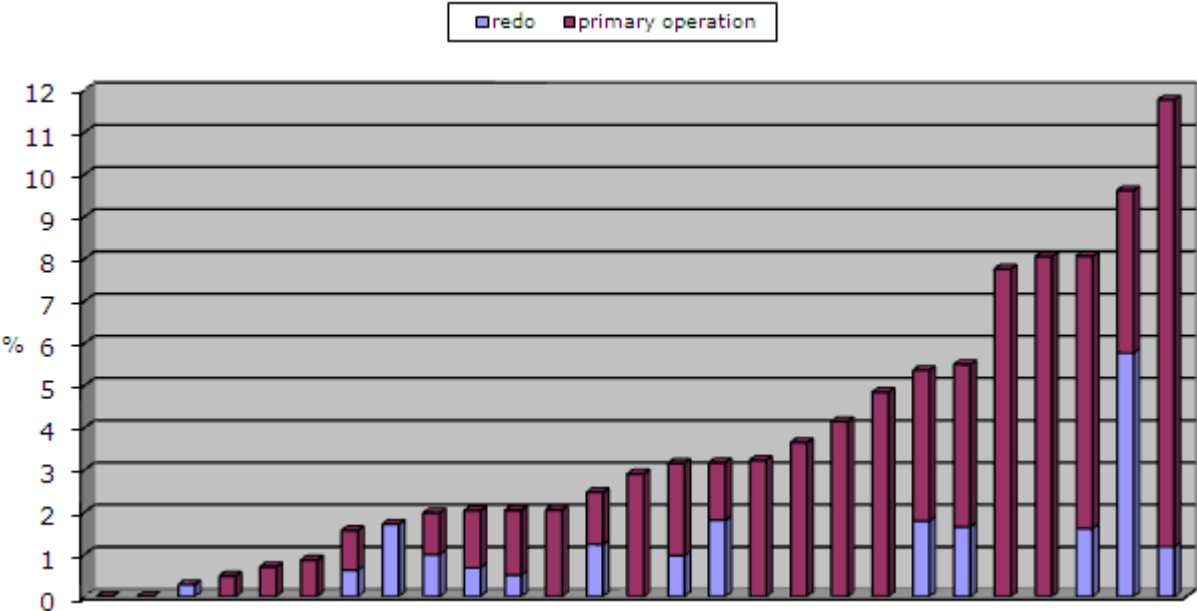
OPCAB for Isolated CABG - by gender (n= 1598)



Isolated CABG - % venous only grafting – by centre

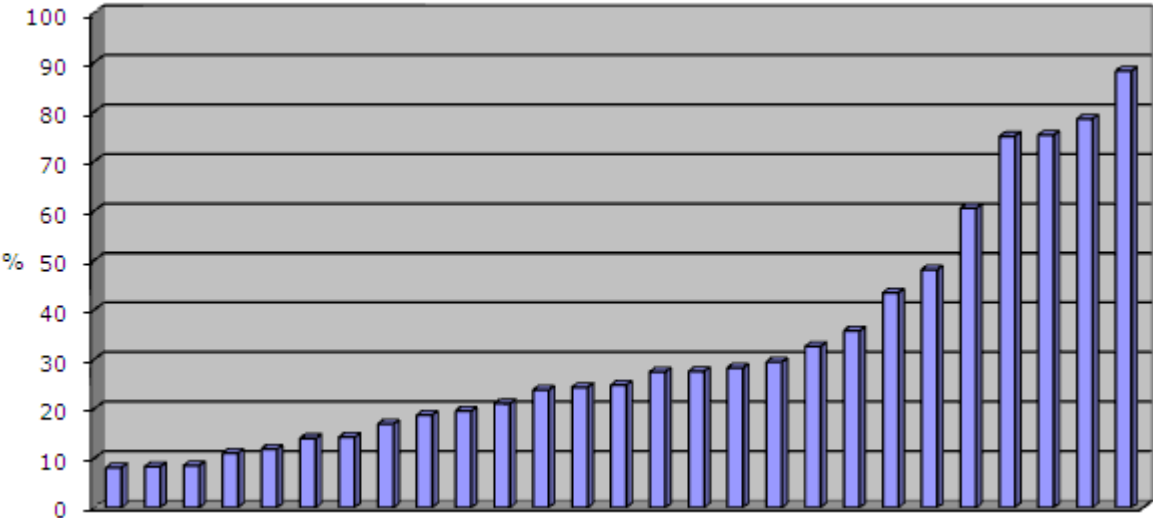
n= 174 patients out of 5760 isolated CABG (3.02 % of total)
 n = 0 (2 centres)
 median = 2,90 % by centre
 mean = 3.63 % by centre

n= 133 primary CABG
 n= 38 repeat CABG

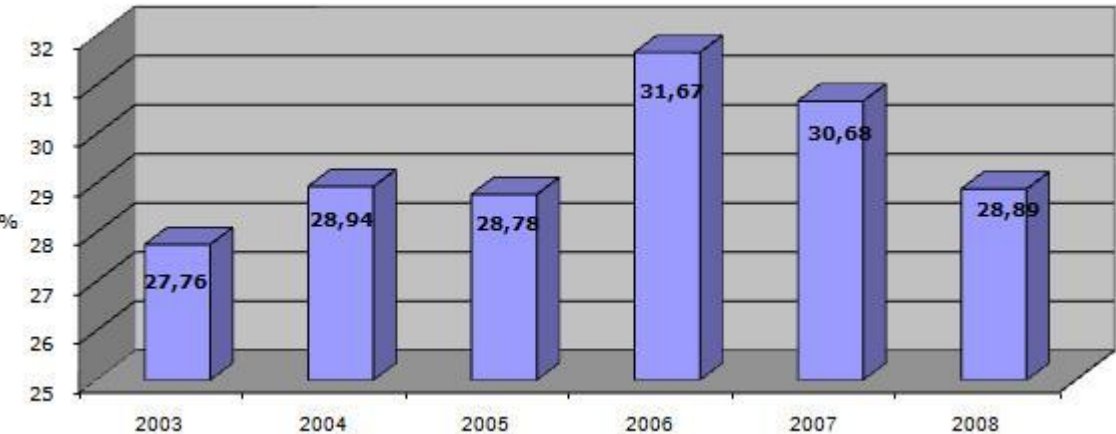


Isolated CABG - % total arterial grafting (no venous grafting) - by centre

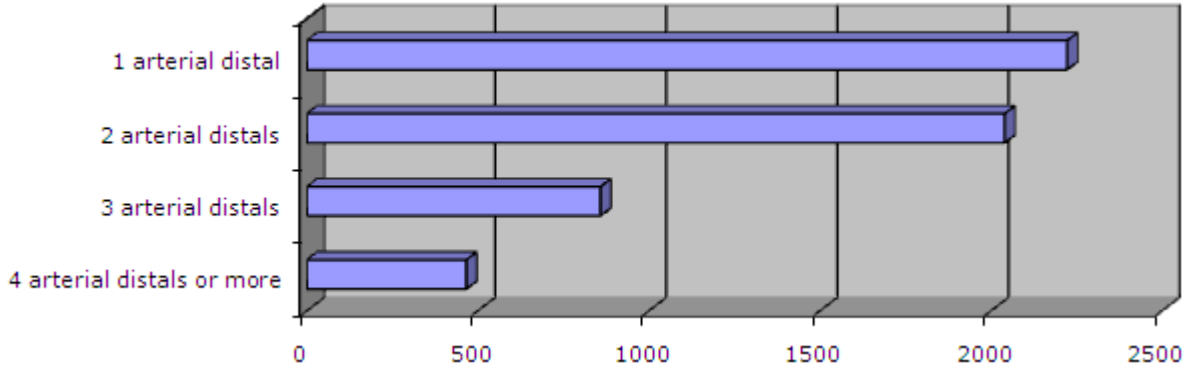
n= 1665 patients out of 5760 isolated CABG (28.90%)
 median = 24.75 % by centre
 mean = 24.52 % by centre



Evolution of total arterial grafting in isolated CABG



Number of arterial distal anastomoses in isolated CABG



At least 10739 arterial distal anastomosis are performed in 5760 isolated cabg. This is a mean of 1.86 arterial anostomosis per patient. It could be more because the cpt code cannot discriminate between 4 or more distal arterial grafts. The use of a radial artery (code 35600) was coded 129 times.

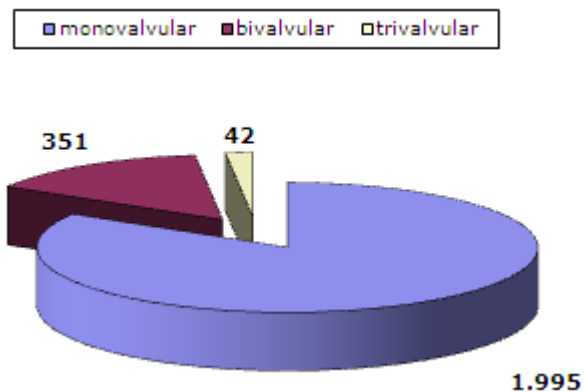
Heart valve surgery

HEART VALVE SURGERY

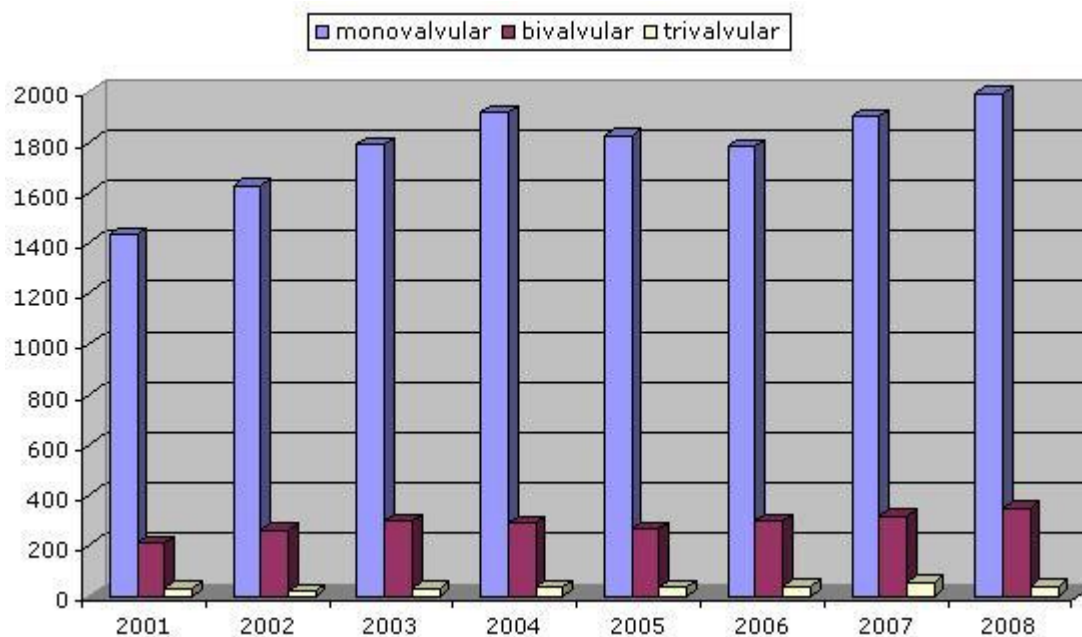
VALVE ONLY (1 or more valves)

4) Valve only – adult (≥ 16 years)

Type of operation - valve only (n= 2388)



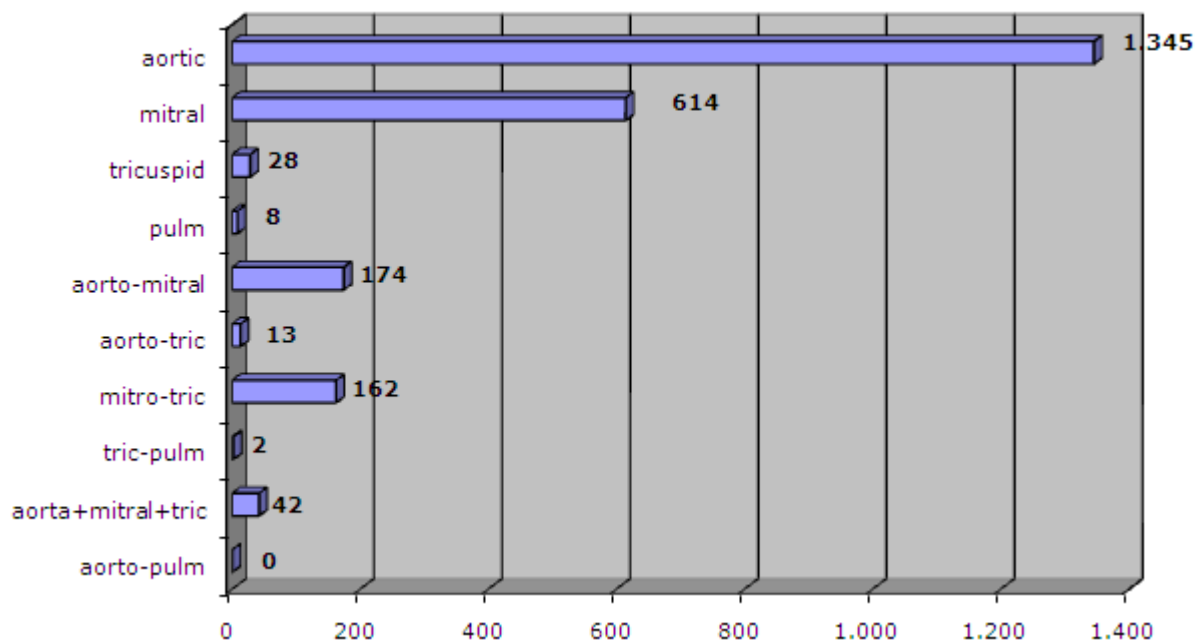
Evolution (years) – Type of operation (valve only)



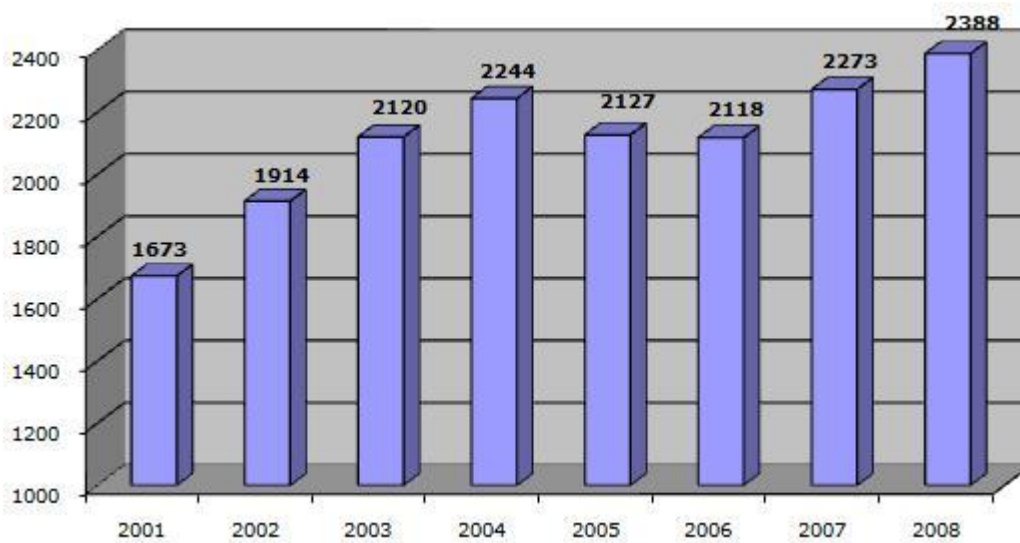
	2001	2002	2003	2004	2005	2006	2007	2008
Monovalvular	1431	1628	1789	1918	1825	1782	1900	1995
Bivalvular	212	264	299	291	266	298	318	351
Trivalvular	30	22	32	35	36	38	55	42

Valvular operations – valve only (n= 2388)

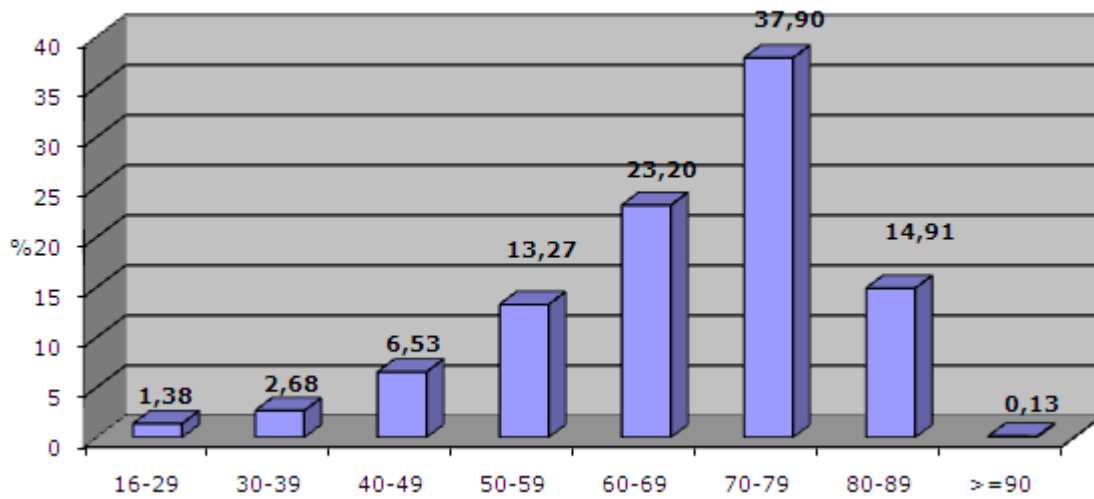
All valve procedures are included : replacement – reconstruction



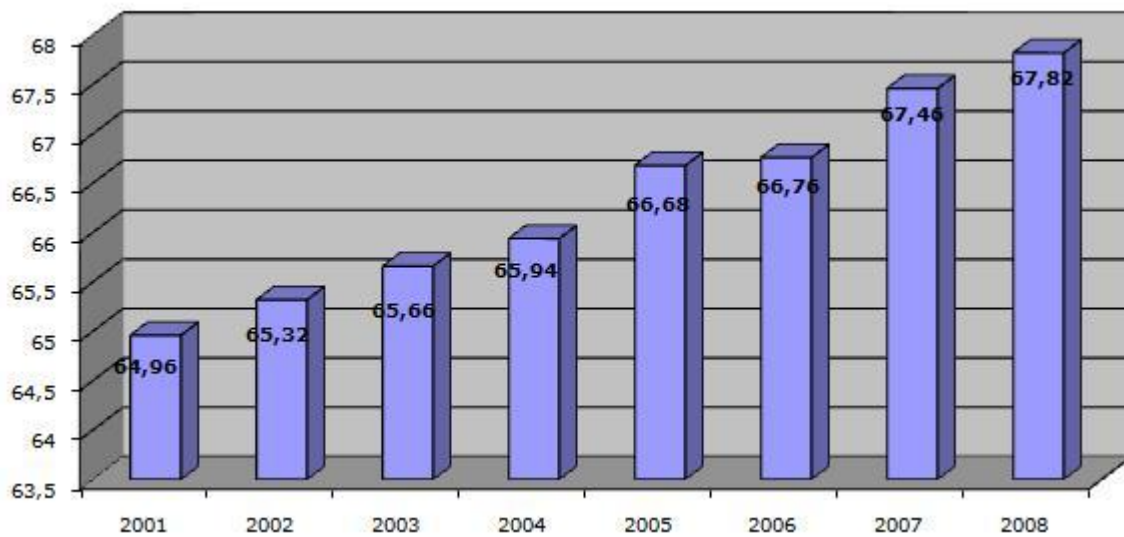
Evolution valve only – number of operations



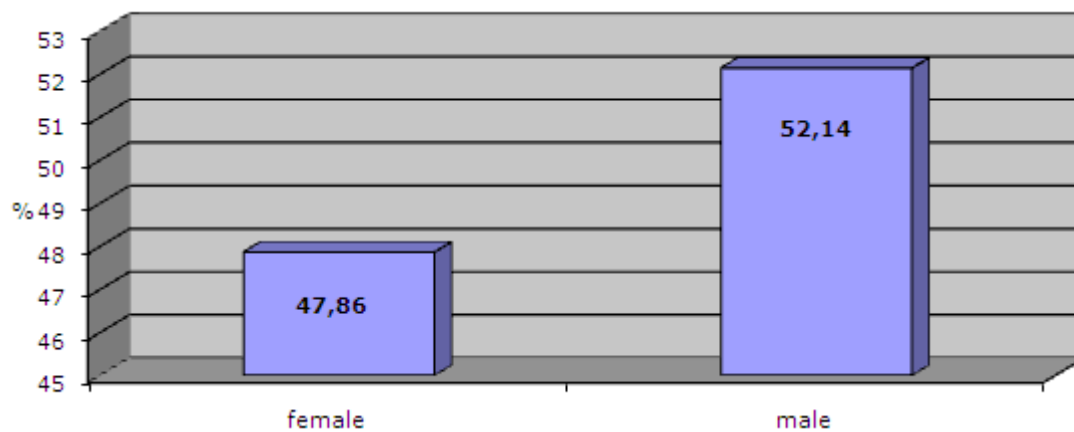
Valve only - age distribution (n= 2388)



Evolution valve only – mean age

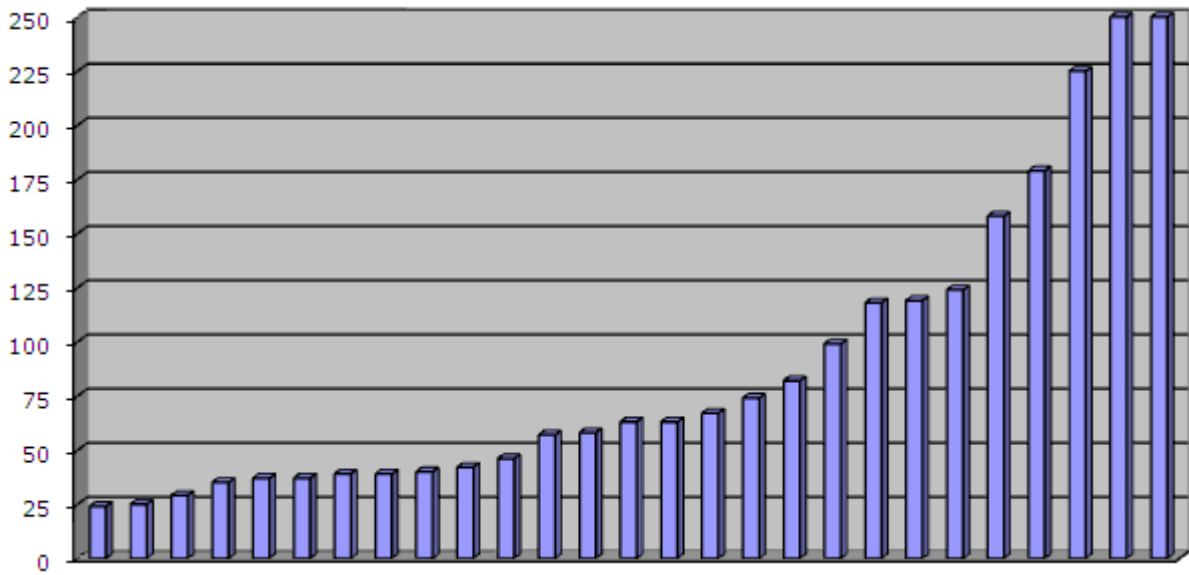


Valve only – by gender (n= 2388)



Number of Valve only operations – by centre (n= 2388)

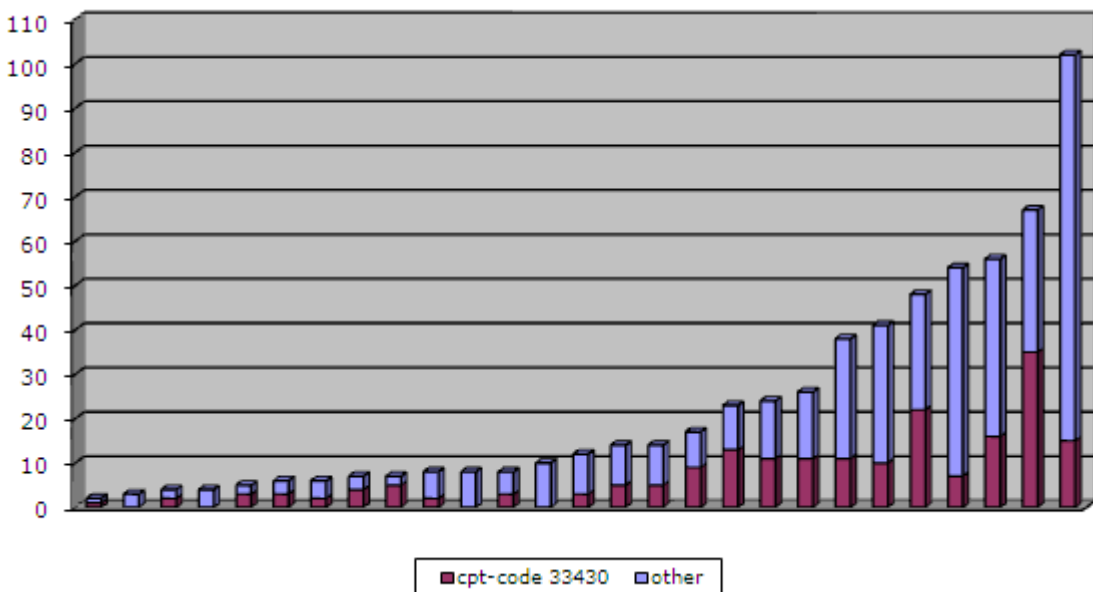
median= 63
 mean= 88.44



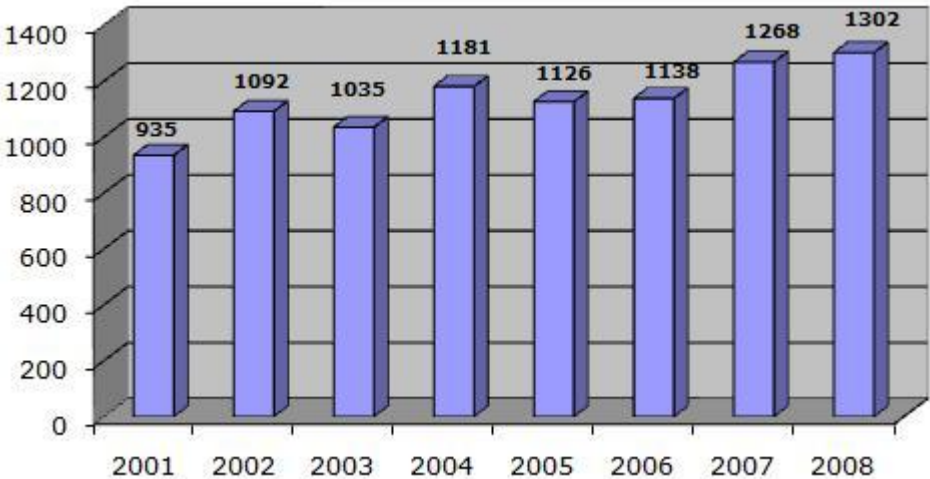
Number Isolated Mitral Valve operations - by centre (n= 614)

Cpt-codes :
 33425 = Valvuloplasty without ring MITR
 33426 = Valvuloplasty with prosthetic ring MITR
 33427 = Valvuloplasty-radical reconstruction MITR w/wo ring
 33430 = MVR
 Isolated valve = no other procedure

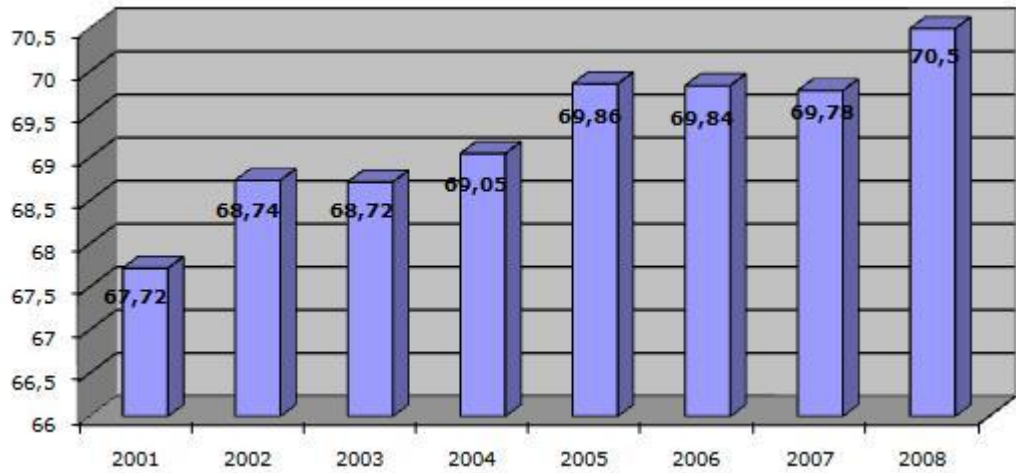
median= 12
 mean= 22.74



Evolution Isolated Aortic Valve Replacements – number of operations

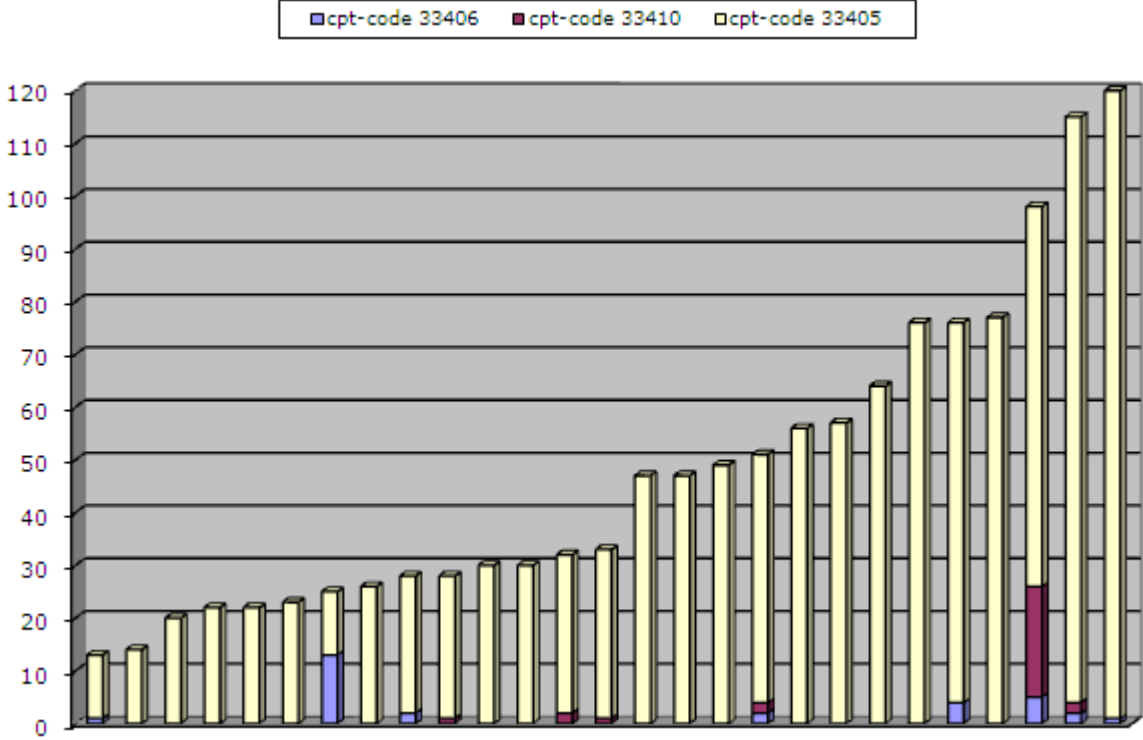


Evolution Isolated Aortic Valve replacements– mean age



Number Isolated Aortic Valve replacements - by centre (n= 1302)

Cpt-codes :
 33405 = AVR other than homograft or stentless valve
 33406 = AVR with Homograft
 33410 = AVR stentless valve
 isolated valve = no other procedure
 median= 33
 mean= 47.44



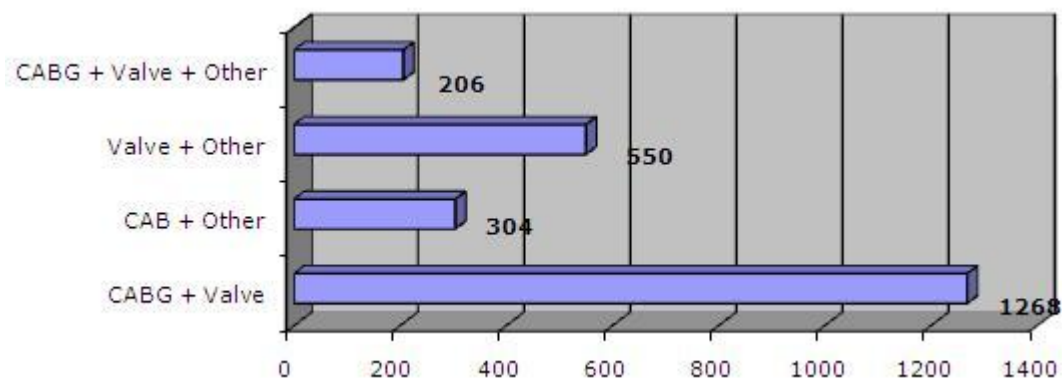
There are few stentless valves implanted. This could be due to a coding problem.

Combined Procedures

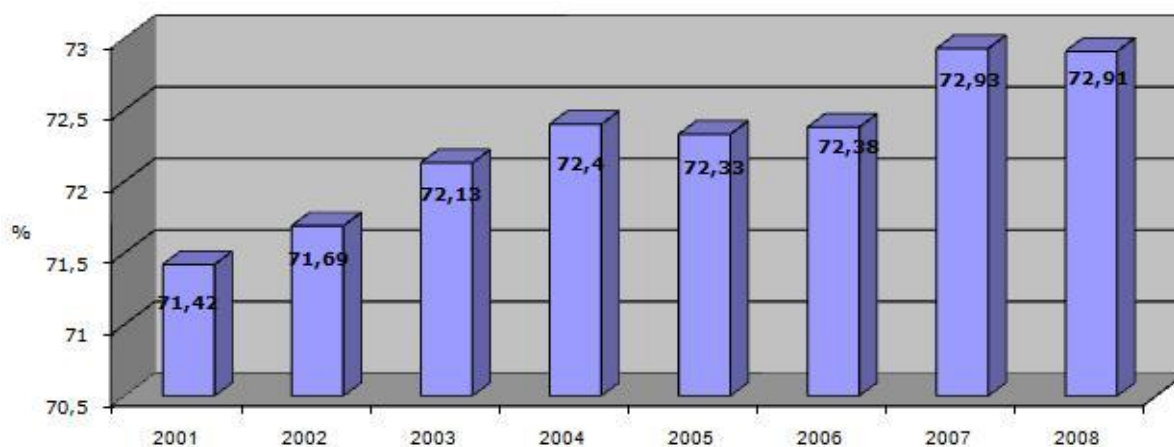
COMBINED PROCEDURES

5) Valve and/or CABG operations

Introduction combined procedures



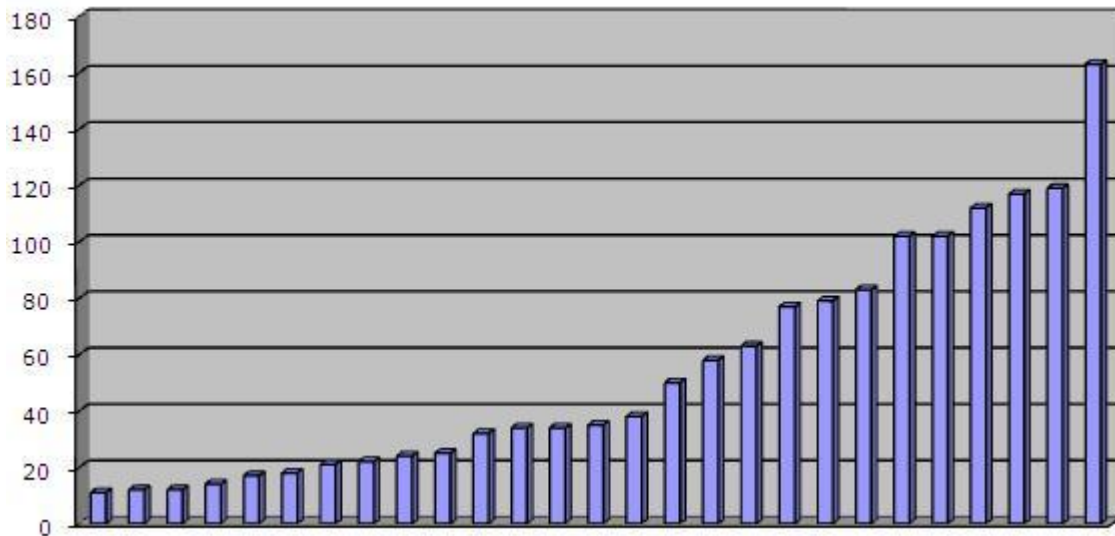
Evolution Valve + CABG ± other – mean age



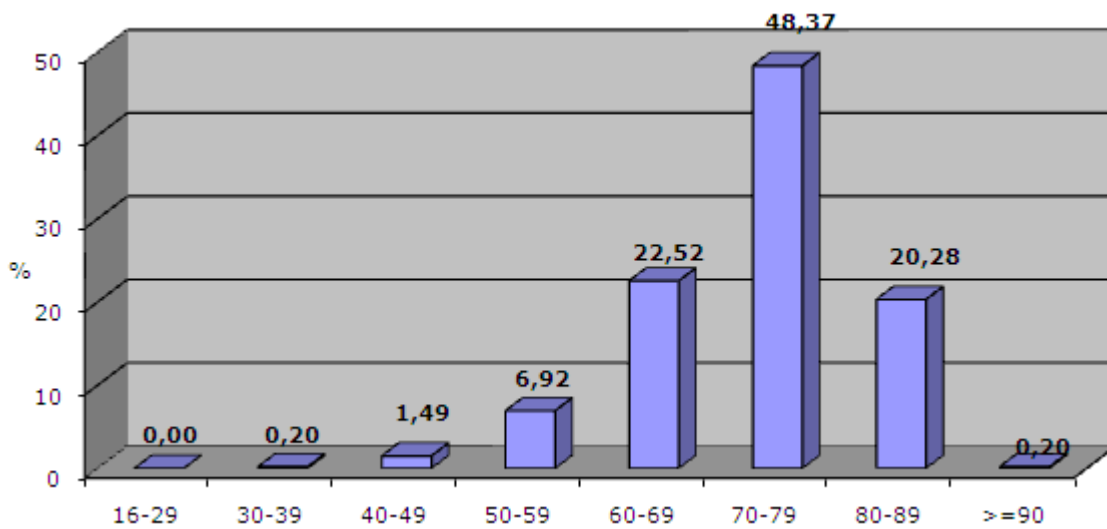
Others: ablation procedures, septal procedures, SVR – Dor procedures, ...
The group "others" is heterogeneous and very difficult to analyse.

Valve + CABG ± other – by centre (n= 1474)

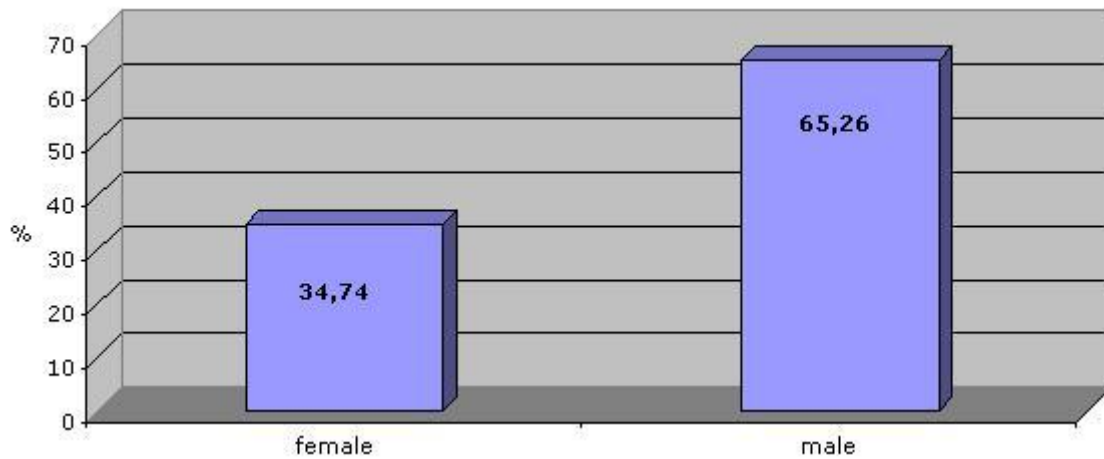
median= 35
mean= 54.59



Valve + CABG ± others - age distribution (n= 1474)



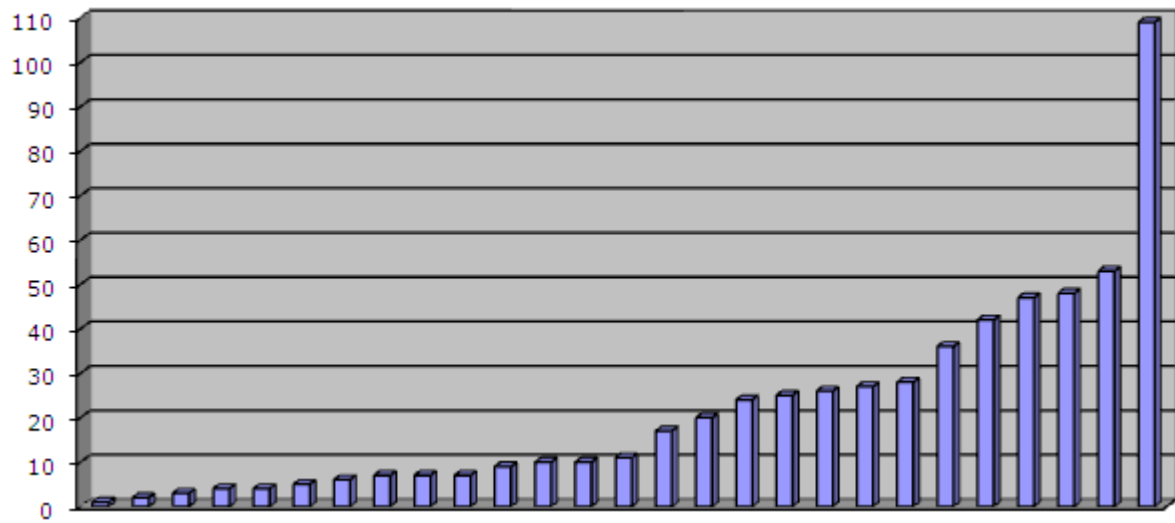
Valve + CABG ± other - by gender (n= 1474)



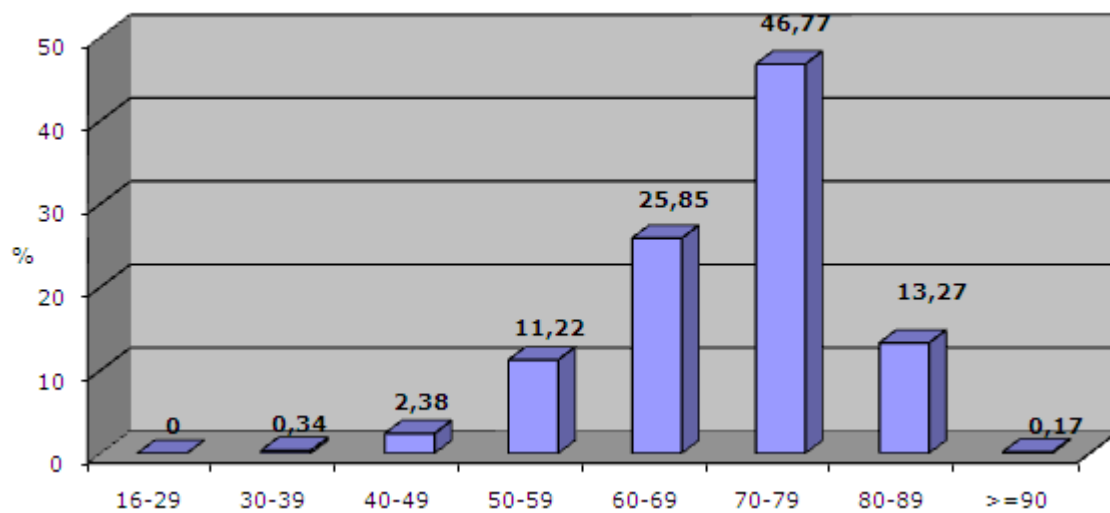
6) Mitral Valve + CABG ± other

Mitral valve + CABG ± other = by centre (n= 588)

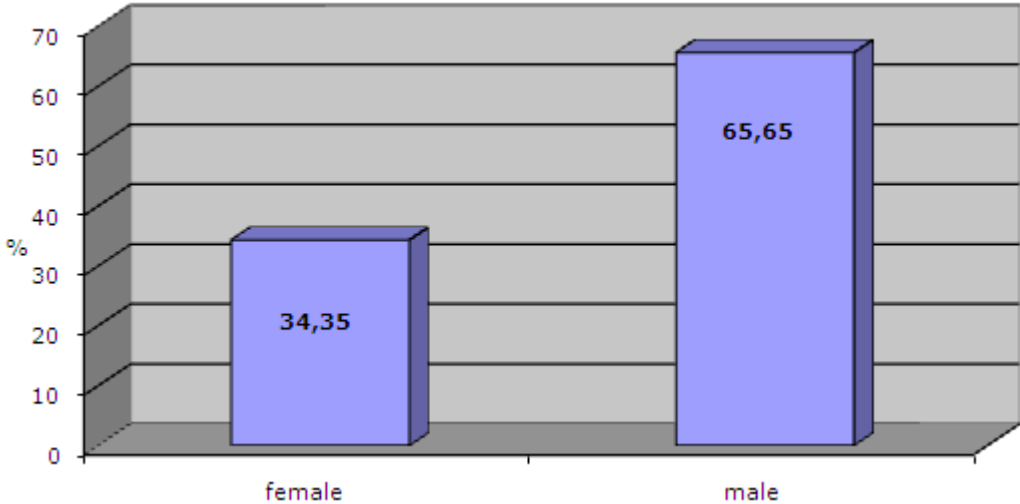
median= 11
mean= 21.78



Mitral valve + CABG ± other - age distribution (n= 588)



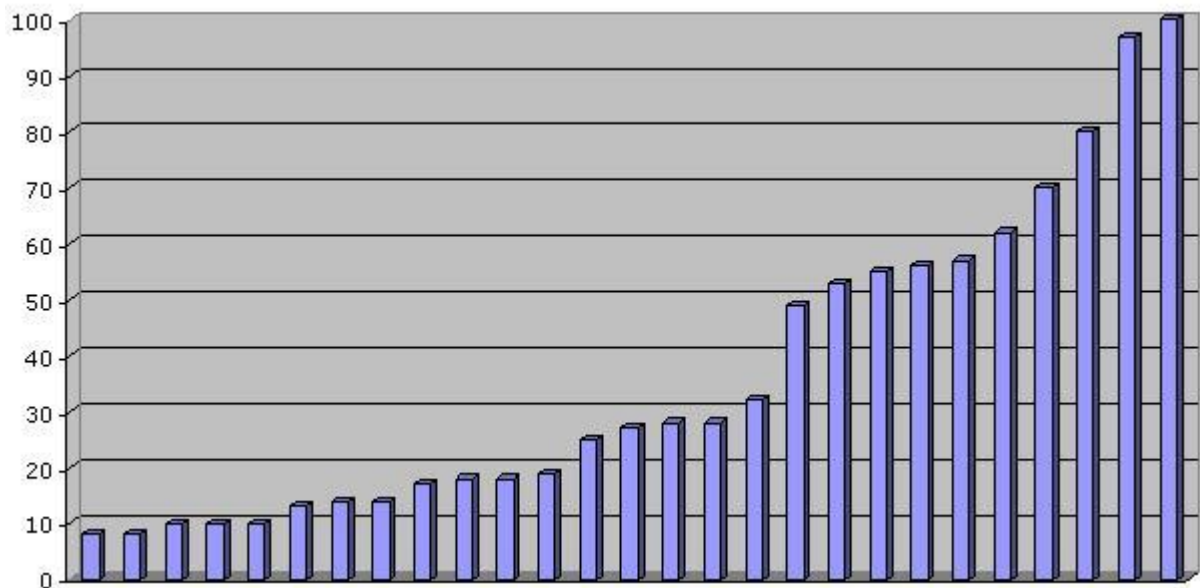
Mitral valve + CABG ± other - by gender (n= 588)



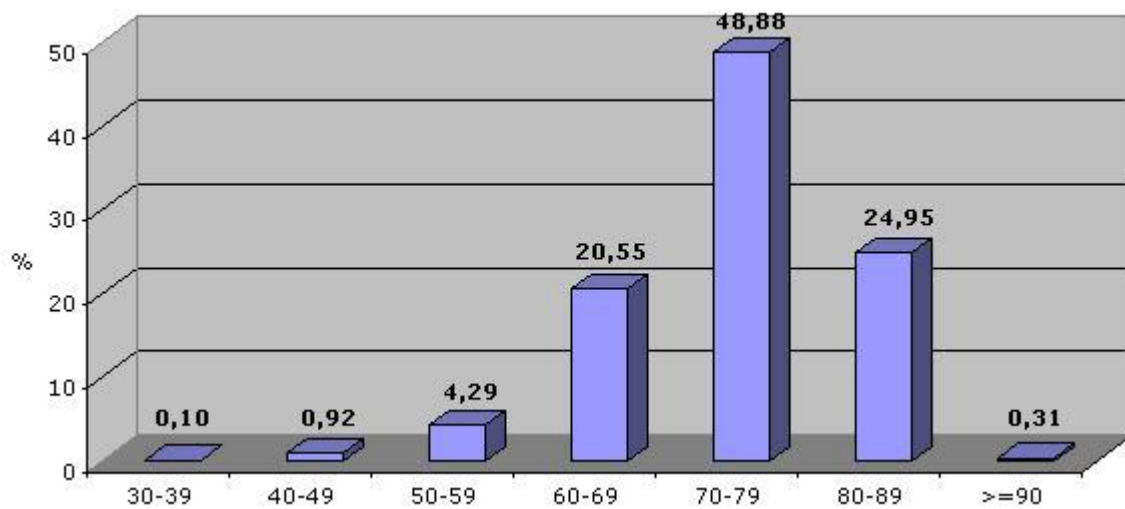
7) Aortic Valve + CABG ± other

Aortic valve + CABG ± other – by centre (n= 978)

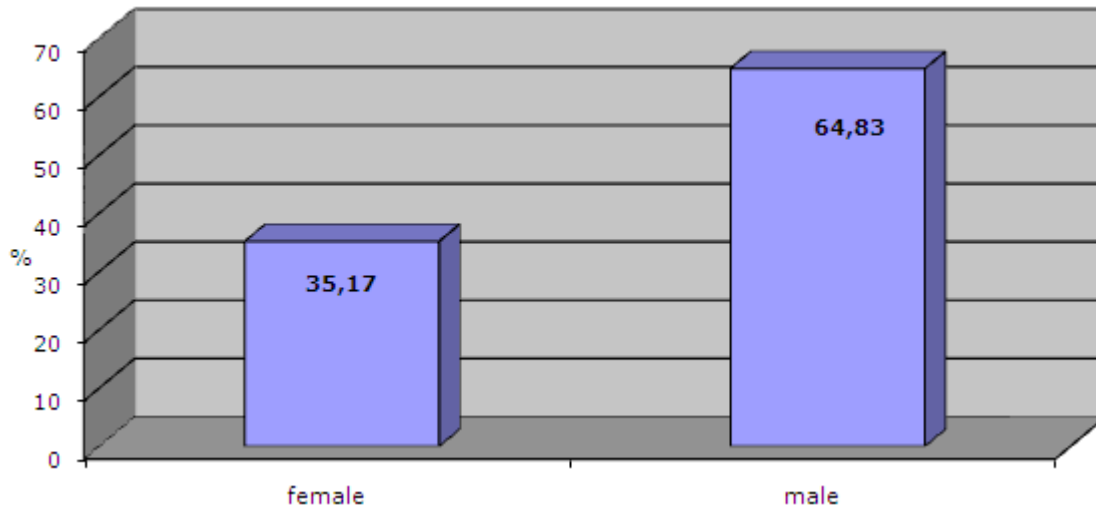
median= 27
mean= 36.22



Aortic valve + CABG ± other – age distribution (n= 978)

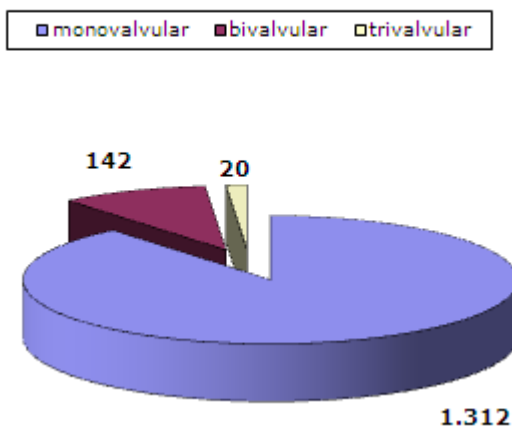


Aortic valve + CABG ± other – by gender (n= 978)

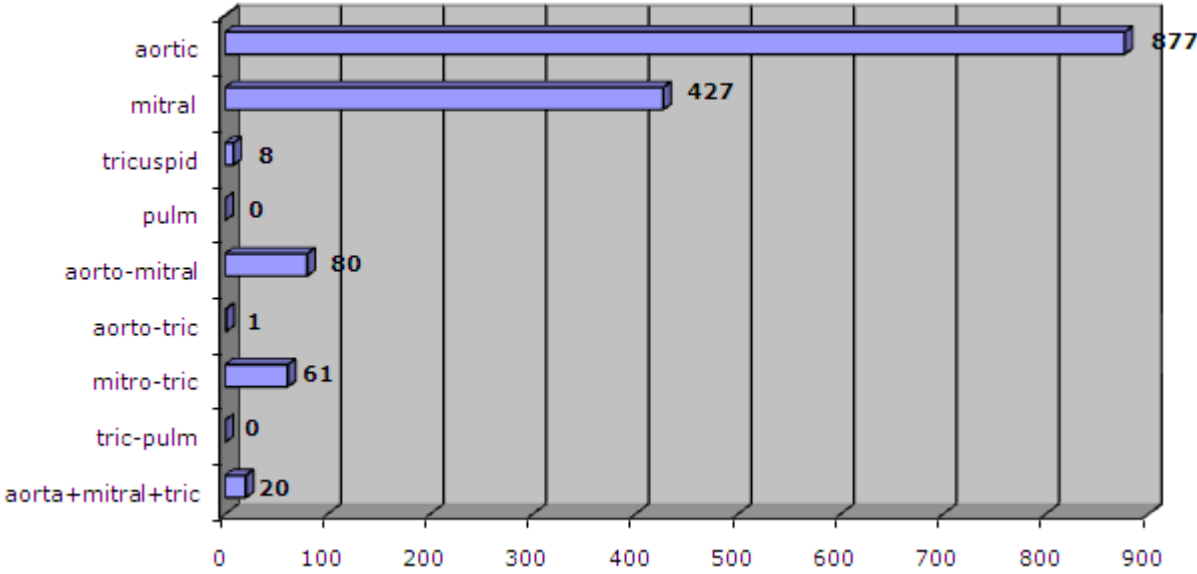


Type of valve operation – Valve + CABG ± other (n= 1474)

Type operations Valve + CABG + possible other



Valvular operations – valve + CABG ± other (n= 1474)



Congenital

CONGENITAL

8) Congenital procedures

Evolution activities (years) – ‘operations’ performed (congenital)

	2001	2002	2003	2004	2005	2006	2007	2008
0-1	433	503	464	505	520	558	573	601
2-15	238	279	270	283	253	254	264	276

Procedures

		< 16 year	>= 16 years
Septal Defects			
Atrial	33641; 33645	136	204
Ventricular	33647; 33681; 33684; 33688	111	14
Atrioventricular	33660; 33665; 33670	4	3
Right Heart Malformations			
Tricuspid valve	33463–33465; 33468	14	81
Pulmonary valve	33474–33478	3	12
Fallot+variants	33611; 33612; 33692; 33694; 33697	.	.
Pulmonary artery	33917–33920; 33922; 33924; 33690	.	.
Left Heart Malformations			
Mitral valve	33425–33427; 33430	22	1905
Aortic valve	33400; 33404–33406; 33411–33417	58	2879
Coronary artery	33500–33506	.	.
Aortic root anomalies	33702; 33710; 33720; 33722; 33860; 33861; 33863	2	2291
Vascular anomalies	33800; 33802; 33803; 33820; 33822; 33824; 33840; 33845; 33851–33853	100	3
Coarctation	33840; 33845	.	.
Ductus Arteriosus	33820; 33822; 33824	100	3
Truncal Malformations			
Truncus Arteriosus	33786; 33788	.	.
Aortopulmonary window	33813; 33814	.	.
Transposition Great Arteries	33771; 33774–33781	.	.
Single ventricle Malformations and palliative procedures	33600; 33602; 33606; 33608; 33610; 33615; 33617; 33619; 33735–33737; 33750; 33755; 33762; 33764; 33766; 33767	.	.
Total Anomalous Pulmonary venous Drainage	33730 - 33732	.	.

Only a selection of congenital *procedures* is listed. Some procedures are performed in combination with each other. We did not list the congenital *operations*.

The cpt code does not allow to analyse the congenial cardiac surgery. Therefore, we recommend participating in the EACTS Congenital Cardiac Surgery Database.

www.EACTScongenitaldb.org

Miscellaneous

MISCELLANEOUS

9) Thoracic Aorta procedures (all ages)

33860	Ascending aorta graft, with cardiopulmonary bypass, with or without valve suspension	269
33861	Ascending aorta graft, with cardiopulmonary bypass, with or without valve suspension; with coronary reconstruction	40
33863	Ascending aorta graft, with cardiopulmonary bypass, with or without valve suspension; with aortic root replacement using composite prosthesis and coronary reconstruction	198
33870	Transverse arch graft, with cardiopulmonary bypass	43
33875	Descending thoracic aorta graft, with or without bypass	19
33877	Repair of thoracoabdominal aortic aneurysm with graft, with or without cardiopulmonary bypass	18

10) Redo Surgery (all ages)

	Early redo	Late redo
CABG	14	201
Aortic Valve	9	216
Mitral Valve	17	183
Tricuspid Valve	2	78
Pulmonary Valve	.	27
Thoracic Aorta	4	54
Transplant	.	4
Arrhythmia	.	17
Isolated CABG	10	134
Valve Only	19	264
Assist	4	1

11) Other

Number of cardiac tumour (all ages)

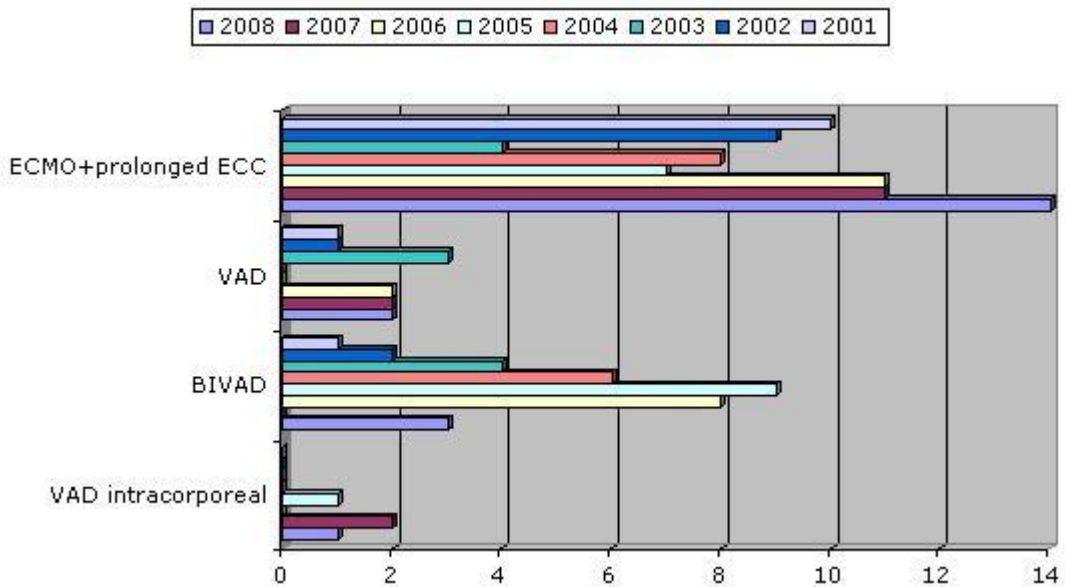
Intracardiac tumour with ECC	59
Extracardiac tumour	1

Number of cardiac wounds (all ages)

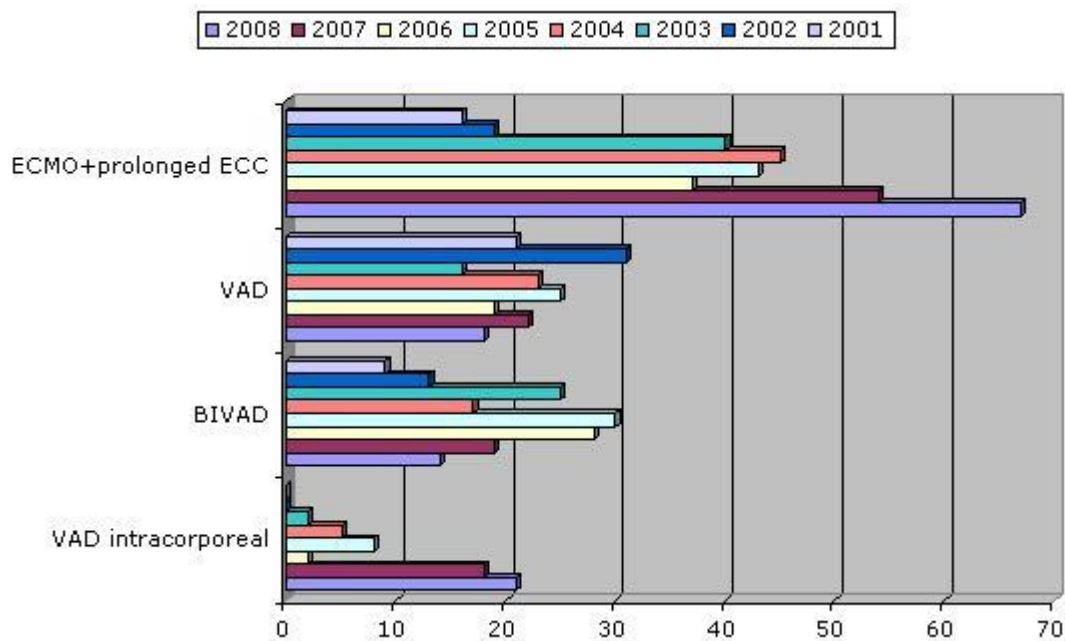
Repair cardiac wound without CPB	19
Repair cardiac wound with CPB	17

12) Ventricular assist device

Number of Ventricular Assist Device Implantation (< 16 years)



Number of Ventricular Assist Device Implantation (≥ 16 years)



The cpt code does not allow to make a difference between ECMO/ECLS and prolonged/repeat ECC

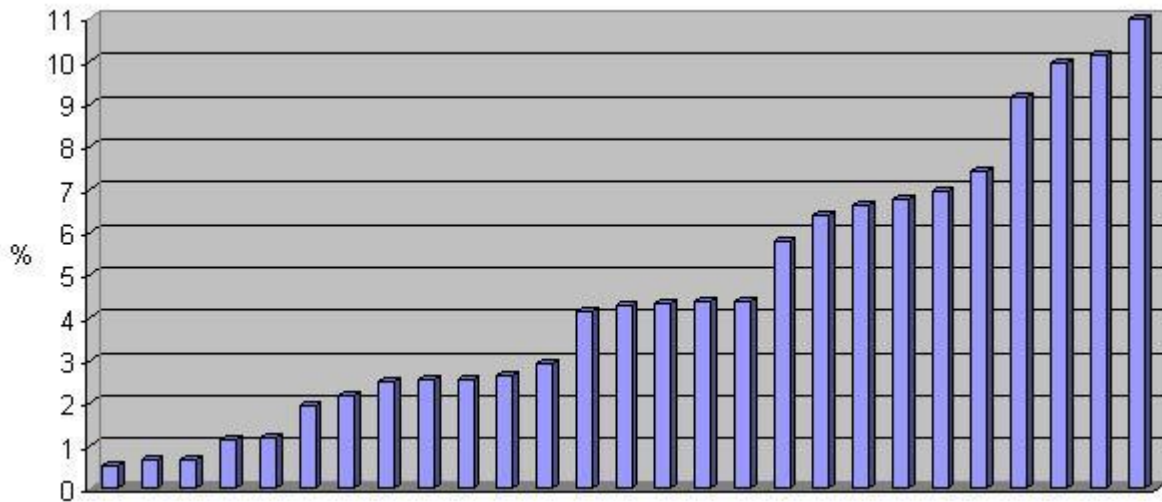
13) Revision for bleeding

Percent revision for bleeding/major cardiac operations – by centre

n= 649

median= 4.27

mean= 4.62



This graph shows an overview of all revisions for bleeding after cardiac surgery. All revisions are counted whatever the first operation was (CABG, valve, assist device....).

Crude Data

All operations – all ages

OPCAB		1.717
Discontinued procedure		27
Coronary Endarterectomy		52
Arterial Grafting for CABG		
	1 arterial distal graft	3.218
	2 arterial distal grafts	2.408
	3 arterial distal grafts	944
	4 arterial distal or more	515
	Radial artery (open or endoscopic)	129
Combined Arterial-VENOUS grafting		
	1 venous distal graft	1.955
	2 venous distal grafts	1.988
	3 venous distal grafts	801
	4 venous distal grafts	134
	5 venous distal grafts	15
	6 or more venous distal grafts	9
	ESVH	658
Venous grafts only		
	1 venous only distal graft	271
	2 venous only distal grafts	164
	3 venous only distal grafts	75
	4 venous only distal grafts	32
	5 venous only distal grafts	7
	6 or more venous only distal graft	1
	Vosoview ESVH	658
Mitral Valve		
	Valvuloplasty without ring MITR	86
	Valvuloplasty with prosthetic ring MITR	1.009
	Valvuloplasty-radical reconstruction MITR w/wo ring	284
	MVR	554
	Minimize	257
Aortic Valve		
	AVR other than homograft	2.558
	AVR with Homograft	52
	AVR stentless valve	57
	Aortic valvuloplasty	153
	Ross Procedure	33
	Resection or incision subvalvular tissue	22
	IHSS myectomy	62
Tricuspid Valve		
	Valvuloplasty Tric without ring / DeVega procedure	67
	Valvuloplasty Tric with prosthetic ring	364
	Valve replacement Tric	28
Pulmonary Valve		
	PVR	15
Reoperation		
	Revision for bleeding	658
	CABG or valve more than 1 month after original procedure	636
	Repair non structural valve dysfunction	1
	Early redo same surgeon(<30 days)(not revision)	29
	Early redo other surgeon(<30 days)(not revision)	24

Thoracic Aortic Aneurysm		
	Ascending Aorta graft w/wo valve suspension	269
	Ascending Aorta graft with coronary reconstruction	40
	Ascending Aorta graft with root replacement / Bentall procedure	198
	Transverse Arch graft	43
	Descending thoracic aorta graft	19
	Thoracoabdominal graft	18
Aortic Anomalies		
	Repair patent ductus by ligation	76
	Repair patent ductus by division under 18y	27
Pulmonary artery		
	Embolectomy with CPB	6
	Endarterectomy	19
Postinfarction complications		
	Postinfarction VSR	12
	Aneurysmectomy LV / DOR procedure	38
	Left ventricular free wall rupture	17
Septal Defects		
	ASD II closure	335
	PFO closure	335
	Partial AVcanal w/wo AVvalve repair	7
	Sinus venosus closure	15
	VSD closure	125
Transplantation Heart/Lung		
	Heart transplant	72
	Donor Pneumonectomy	.
	Lung transplant Single	4
	Lung transplant Single with ECC	1
	Lung transplant Double	15
	Lung transplant Double with ECC	7
Sternum/Wound		
	Secondary sternal debridement and closure	164
	Pectoralisplasty	16
	Omentoplasty extra-abdominal	13
	Omentoplasty intra-abdominal	5
	Sternal debridement	48
	Secondary closure	11
Pericardium		
	Pericardiotomy for removal of clot or foreign body	28
	Creation of pericardial window or partial resection	81
	Pericardial window thoracoscopic	6
	Pericardiotomy thoracoscopic (drainage, foreign body)	3
	Pericardiectomy without CPB	15
	Pericardiectomy with CPB	5
Wound of the heart		
	Repair cardiac wound without CPB	19
	Repair cardiac wound with CPB	17
	Exploratory cardiectomy (removal foreign body) without CPB	4
	Exploratory cardiectomy (removal foreign body) with CPB	5
	Suture repair of aorta or great vessels without CPB	3
	Suture repair of aorta or great vessels with shunt bypass	.
	Suture repair of aorta or great vessels with CPB	5

	Insertion of graft, aorta or great vessel without CPB	.
	Insertion of graft, aorta or great vessel with shunt bypass	.
	Insertion of graft, aorta or great vessel with CPB	15
Electrophysiologic procedures		
	Operative treatment of AF/flutter	257
	Ablation of ventricular arrhythmogenic focus	7
Cardiac Assist		
	ECMO / Prolonged ECC	81
	Insertion canulas prolonged ECC or ECMO	18
	IABP insertion percutaneous	160
	IABP removal percutaneous	46
	IABP insertion open femoral	41
	IABP removal open femoral	85
	IABP insertion ascending aorta	1
	IABP removal ascending aorta	.
	Implantation VAD	21
	Implantation BIVAD	17
	Removal VAD	12
	Removal BIVAD	28
	Implantation VAD intracorporeal	22
	Removal VAD intracorporeal	7
Isolated extracorporeal circulation		
	Isolated organ chemotherapy	1
Vascular procedures		
	Carotis TEA	147
	Trombectomy femoropopliteal	1
	Pseudoaneurysm femoralis direct/path repair	3
	Pseudoaneurysm femoralis graft repair	1
Thoracic procedures		
	Pulmonary resection (segmentectomy)	2
	Lobectomy	6
	Bilobectomy	.
	Pneumonectomy	1
Unlisted procedures		
	Unlisted cardiac	46
	Unlisted vascular	1
	Unlisted thoracic	1
Sinus Valsalva		
	Repair sinus valsalva fistula with CPB	1
	Repair sinus valsalva aneurism with CPB	6
Cardiac Tumour		
	Intracardiac tumour, with ECC	59
	extracardiac tumour	1

Participation to full dataset:

	Belgium N	%
STATUS OF THE PATIENT	8449	
elective	7026	83,16
urgent	959	11,35
emergent	341	4,04
salv	123	1,46
TYPE OF INCISION	8006	
full sternotomy	7327	91,52
mini sternotomy	539	6,73
thoracotomy	139	1,74
IS PATIENT DIABETES	7881	
no	6219	78,91
treated by insulin	492	6,24
treated by oral medication	1170	14,85
CHRONIC PULMONARY DISEASE	7014	
no	5938	84,66
yes	1076	15,34
EXTRA-CARDIAC ARTERIOPATHY	6828	
no	5406	79,17
yes	1422	20,83
LEF VENTRICULAR EJECTION FUNCTION BY ANGIO	7001	
<=30%	463	6,61
30-49%	1288	18,40
>=50%	5250	74,99
CREATININE (MG/DL)	6706	
NEUROLOGICAL DYSFUNCTION	7247	
no	7050	97,28
yes	197	2,72
ACTIVE ENDOCARDITIS	7723	
no	7573	98,06
yes	150	1,94
CRITICAL PREOPERATIVE STATE	7304	
no	6618	90,61
yes	686	9,39
UNSTABLE ANGINA	7351	
no	6238	84,86
yes	1113	15,14
RECENT INFARCT (<90 days)	5894	
no	4859	82,44
yes	1035	17,56
SYSTOLIC PULMONARY PRESSURE >= 60 mmHg	6895	
no	6439	93,39
yes	456	6,61

Appendix

APPENDIX 1 : List of selected CPT-Codes BACTS – 2007

DESCRIPTION list not-exhaustive [validated by DB Committee]	CODE
OPCAB	9952
Discontinued procedure	9953
Coronary Endarterectomy	33572
Arterial Grafting for CABG	
1 arterial distal graft	33533
2 arterial distal grafts	33534
3 arterial distal grafts	33535
4 arterial distal or more	33536
radial artery (open or endoscopic)	35600
Venous Grafts only	
1 venous only distal graft	33510
2 venous only distal grafts	33511
3 venous only distal grafts	33512
4 venous only distal grafts	33513
5 venous only distal grafts	33514
6 or more venous only distal grafts	33516
ESVH	33508
Combined Arterial-Venous grafting (2 CODES: Code for arterial grafting (vide supra) + Code for venous grafting)	
1 venous distal	33517
2 venous distal grafts	33518
3 venous distal grafts	33519
4 venous distal grafts	33521
5 venous distal grafts	33522
6 or more venous distal grafts	33523
ESVH	33508
Mitral Valve	
Valvuloplasty without ring MITR	33425
Valvuloplasty with prosthetic ring MITR	33426
Valvuloplasty-radical reconstruction MITR w/wo ring	33427
MVR	33430
Minimize	33253
Aortic Valve	
AVR other than homograft	33405
AVR with Homograft	33406
AVR stentless valve	33410
Aortic valvuloplasty	33400
Ross Procedure	33413
Resection or incision subvalvular tissue	33415
IHSS myectomy	33416
Tricuspid Valve	
Valvuloplasty Tric without ring /DeVega procedure	33463
Valvuloplasty Tric with prosthetic ring	33464
Valve replacement Tric	33465
Pulmonary Valve	
PVR	33478

Reoperation		
	Revision for bleeding	35820
	CABG or valve more than 1 month after original procedure	33530
	repair non structural valve dysfunction	33496
	Early redo same surgeon(<30 days)(not revision)	9976
	Early redo other surgeon(<30 days)(not revision)	9977
Thoracic Aortic Aneurysm		
	Ascending Aorta graft w/wo valve suspension	33860
	Ascending Aorta graft with coronary reconstruction	33861
	Ascending Aorta graft with root replacement / Bentall procedure	33863
	Transverse Arch graft	33870
	Descending thoracic aorta graft	33875
	Thoracoabdominal graft	33877
Aortic Anomalies		
	repair patent ductus by ligation	33820
	repair patent ductus by division under 18y	33822
Pulmonary artery		
	Embolectomy with CPB	33910
	Endarterectomy	33916
Postinfarction complications		
	Aneurysmectomy LV / DOR procedure	33542
	Postinfarction VSR	33545
	Surgical Ventricular Restoration (DOR)	33548
	Left ventricular free wall rupture	33305
Septal Defects		
	ASD II closure	33641
	PFO closure	33641
	partial AV-canal w/wo AV-valve repair	33660
	Sinus venosus closure	33645
	VSD closure	33681
Transplantation Heart/Lung		
	Heart transplant	33945
	Donor Pneumonectomy	32850
	Lung transplant Single	32851
	Lung transplant Single with ECC	32852
	Lung transplant Double	32853
	Lung transplant Double with ECC	32854
Sternum/Wound		
	Removal steelwire	20680
	Incision drainage, deep abscess or hematoma, soft tissues, neck or thorax	21501
	Incision, deep, with opening of bone cortex, thorax	21510
	Secondary sternal debridement and closure	21750
	Pectoralisplasty	15734
	Omentoplasty extra-abdominal	49904
	Sternal debridement	21627
	Secondary wound closure (SKIN)	13160
Pericardium		
	Pericardiotomy for removal of clot or foreign body	33020
	Creation of pericardial window or partial resection	33025
	Pericardial window thoracoscopic	32659
	Pericardiotomy thoracoscopic (drainage, foreign body)	32658
	Pericardiectomy without CPB	33030
	Pericardiectomy with CPB	33031
Wound of the heart		
	Repair cardiac wound without CPB	33300
	Repair cardiac wound with CPB	33305
	Exploratory cardiectomy (removal foreign body) without CPB	33310

	Exploratory cardiotomy (removal foreign body) with CPB	33315
	Suture repair of aorta or great vessels without CPB	33320
	Suture repair of aorta or great vessels with shunt bypass	33321
	Suture repair of aorta or great vessels with CPB	33322
	Insertion of graft, aorta or great vessel without CPB	33330
	Insertion of graft, aorta or great vessel with shunt bypass	33332
	Insertion of graft, aorta or great vessel with CPB	33335
Pacemaker and AICD		
	Permanent PM, epicardial by thoracotomy	33200
	Permanent PM, xiphoid approach	33201
	Removal permanent PM	33233
	Removal of pacemaker electrodes, single lead system	33234
	removal of pacemaker electrodes, dual lead system	33235
	removal of pacemaker electrodes by thoracotomy	33238
	insertion AICD (only generator)	33240
	removal AICD	33241
	removal AICD leads by thoracotomy	33243
	removal AICD leads by extraction	33244
	Insertion AICD (leads and generator)	33249
	LV electrode without PM/AICD	33224
	LV electrode with PM/AICD	33225
	left ventricular epicardial pacemaker lead for CRT	33245
	Repositioning of PM electrode	33215
	Revision of pacemaker pocket	33222
	Revision of AICD pocket	33223
Electrophysiologic procedures		
	Operative treatment of AF/flutter	33253
	Ablation of ventricular arrhythmogenic focus	33261
Cardiac Assist		
	Prolonged ECC/ECMO	33960
	Insertion canulas prolonged ECC or ECMO	36822
	IABP insertion percutaneous	33967
	IABP removal percutaneous	33968
	IABP insertion open femoral	33970
	IABP removal open femoral	33971
	IABP insertion ascending aorta	33973
	IABP removal ascending aorta	33974
	Implantation VAD	33975
	Implantation BIVAD	33976
	Removal VAD	33977
	Removal BIVAD	33978
	Implantation VAD intracorporeal	33979
	Removal VAD intracorporeal	33980
Isolated extracorporeal circulation		
	Isolated organ chemotherapy	36823
Vascular procedures		
	Carotis TEA	35301
	Trombectomy femoropopliteal	34201
	Pseudoaneurysm femoralis direct/path repair	35226
	Pseudoaneurysm femoralis graft repair	35141

Thoracic procedures		
	Pulmonary resection (segmentectomy)	32484
	Lobectomy	32480
	Bilobectomy	32482
	Pneumonectomy	32440
Unlisted procedures		
	Unlisted cardiac	33999
	Unlisted vascular	37799
	Unlisted thoracic	32999
Sinus Valsalva		
	Repair sinus valsalva fistula with CPB	33702
	Repair sinus valsalva aneurysm with CPB	33720
Cardiac Tumour		
	Intracardiac tumour, with ECC	33120
	Extracardiac tumour	33130

APPENDIX 2 : Core data set

To guarantee the confidentiality of the data,
the following three variables are recoded by the BACTS:
CENTER, SURG1, SURG2.
No surgeon specific analysis is made.
All centre specific analysis is anonymous.

CENTER	Definition : name of the hospital where the operation is performed. Explanation : FORMAT : text Length : 15 characters Example : Possible values : Excluded values : Note :
SURG1	Definition : "INAMI – RIZIV" number of the operating surgeon or supervisor if operation performed by a resident. Explanation : FORMAT : text Length : 14 characters Example : 1/49636/27/140 or 1-49636-27-140 Possible values : / / 140 or - - 140 Excluded values : / /014 (resident number) Note : <i>the code is unique for a surgeon and remains the same when the surgeon operates in two or more hospitals.</i>
SURG2	Definition : the assisting surgeon if he is not a resident. Explanation : FORMAT : text Length : 14 characters Example : 1/49636/27/140 or 1-49636-27-140 Possible values : / / 140 or - - 140 Excluded values : / /014 (resident number) Note : <i>the code is unique for a surgeon and remains the same when the surgeon operates in two or more hospitals.</i>
PATIENT	Definition : unique patient identification number. Explanation : this identification number must be unique for a patient in your hospital over different years. FORMAT : text Length : maximum 20 characters Example : b119730522. Possible values : Excluded values : 2000/01 (order of a patient in your yearly production) Note :
DATET	Definition : date of the operation Explanation : FORMAT : dd-mm-yyyy Length : 10 characters Example : 02-Mar-2003, 02/03/2003 Possible values : Excluded values : 02-Mar-03, 02/03/03 Note :
START	Definition : start operation time. Explanation : time when the patient <u>enters</u> the operating room. FORMAT : text Length : 4 characters Example : 0730, 1205, 0005 Possible values : 0000 to 2359 Excluded values : Note : no characters (e.g. h, :) should be placed between the hours and the minutes. For the minutes 00-60 two positions should be completed, for the hours two positions have to be filled out 00-23.

END **Definition :** end operation time.
Explanation : time when the patient leaves the operating room.
FORMAT : text
Length : 4 characters
Example : 0730, 1205, 0005
Possible values : 0000 to 2359
Excluded values :
Note : no characters (e.g. h, :) should be placed between the hours and the minutes. For the minutes 00-60 two positions should be completed, for the hours two positions have to be filled out 00-23.

BIRTH **Definition :** date of birth of the patient
Explanation :
FORMAT : dd-mm-yyyy
Length : 10 characters
Example : 06-Jul-1954
Possible values :
Excluded values : - - / - - / XX (need a four digits year)
Note :

SEX **Definition :** gender of the patient.
Explanation :
FORMAT : string
Length : 1 characters
Example :
Possible values : F , M (**capital letters**).
Excluded values :
Note :

CPT1 CPT codes.
CPT2 **FORMAT : Numeric (no decimal places)**
CPT3 Example : 33222
CPT4
CPT5
CPT6

APPENDIX 3 : Full data set

If you use Excel, find attached a blank file. The fields in this file have pre-specified formats.

-
- Part 1 : cfr. annex 2 : CPT codes registry.
 - Part 2 : new codes.
-

STATUS	Definition : status of the operation Explanation : ELEC = Elective : scheduled for more than 24 hours URGE = Urgent : within 24 hours after diagnosis but delayable EMER = Emergent : to be operated immediately, not delayable SALV = Salvage : reanimation during anaesthesia or on the way to operating room. FORMAT : string Length : 4 characters Example : Possible values : ELEC – URGE – EMER – SALV Excluded values : Note :
INCISION	Definition : type of incision performed. Explanation : STERN = Full sternotomy MINIS = Mini sternotomy or partial sternotomy THORA = Thoracotomy with use of a rib retractor MINIT = Mini thoracotomy without use of a rib retractor EPIGA = Epigastric THPL = Thoraco-phreno laparotomy ENDO = Endoscopic thoracotomy (no mini thoracotomy) FORMAT : string Length : 5 characters Example : Possible values : STERN – MINIS – THORA – MINIT – EPIGA – THPL Excluded values : Note :
DIABETES	Definition : is the patient diabetic ? And kind of treatment ? Explanation : FORMAT : string Length : 4 characters Example : Possible values : NO = No INSU = Treated by insulin ORAL = Treated by oral medication Excluded values : Note :

COPD **Definition :** presence of a chronic pulmonary disease (CPD).
Explanation : CPD defined by the long term use of bronchodilators or steroids for lung disease.
FORMAT : string
Length : 1 character
Example :
Possible values Y = Yes
 N = No

Excluded values :
Note :

ARTER **Definition :** presence of extra-cardiac arteriopathy.
Explanation : claudication, carotid occlusion or + > 50 % stenosis, previous or planned interventions on the abdominal aorta, limb aorta or carotids.
FORMAT : string
Length : 1 character
Example :
Possible values : Y = Yes
 N = No

Excluded values :
Note :

LVEF **Definition :** left ventricular ejection function estimated by angio or echo
Explanation : 1. Poor = < 30%
 2. Fair 31-49 %
 3. Good >= 50%
 4. Not available.

FORMAT : numeric 1 position
Length :
Example :
Possible values : 1 - 2 - 3 - 4
Excluded values :
Note :

CREA **Definition :** pre operative creatinine value in mg/dl
Explanation :
FORMAT : numeric position with 2 decimal places
Length :
Example : 1,23
Possible values :
Excluded values :
Note :

DYSF **Definition** : presence of pre operative neurological dysfunction
Explanation : severely affecting ambulation or day to day functioning
FORMAT: string
Length : 1 character
Example :
Possible values :Y = Yes
N = No
Excluded values :
Note :

ENDO **Definition** : presence of active endocarditis at the time of surgery
Explanation : Patient still under antibiotic treatment for endocarditis at the time of surgery
FORMAT : string
Length : 1 character
Example :
Possible values :Y = Yes
N = No
Excluded values :
Note :

PRE **Definition** : patient in critical pre-operative state.
Explanation : defined by presence of ..
Anyone or more of the following
- **Ventricular tachycardia or ventricular fibrillation**
- **Aborted sudden death**
- **Pre-operative cardiac massage**
- **Pre-operative ventilation before arrival in the anaesthetic room**
- **Pre-operative inotropic support**
- **Intra-aortic balloon counterpulsation**
- **Pre operative use.**
- Pre-operative acute renal failure (anuria or oliguria < 10 ml/hour)
FORMAT : string
Length : 1 character
Example :
Possible values :Y = Yes
N = No
Excluded values :
Note :

ANGINA**Definition** : unstable angina
Explanation : **Rest angina requiring IV nitrate until arrival in the anaesthetic room**
FORMAT : string
Length : 1 character
Example :
Possible values :Y = Yes
N = No
Excluded values :
Note :

INFARCT **Definition** : date of recent myocardial infarction.
Explanation : recent means less than 90 days before operation. Infarction defined by New Q Wave on EKG or CKMB > 6 % and CK total > 5 x upper normal value.
FORMAT : date dd-mm-yyyy
Length :
Example : 06-Jul-2003
Possible values :
Excluded values :
Note :

SYS **Definition** : presence of pulmonary hypertension .
Explanation : systolic pulmonary pressure > 60 mmHg on pre op cath or in operation room.
FORMAT : String
Length : 1 character
Example :
Possible values :Y = Yes
N = No
Excluded values :
Note :

ADDED 2005

- HEIGHT** **Definition :** height of the patient expressed in cm.
Explanation :
FORMAT : numeric without decimal position.
Length :
Example : 162
Possible values :
Excluded values :
Note :
- WEIGHT****Definition :** weight of the patient expressed in kg.
Explanation :
FORMAT : numeric without decimal position.
Length :
Example : 82
Possible values :
Excluded values :
Note :
- AORT. PRO.** **Definition :** code for valvular prosthesis used in aortic position.
Explanation :
FORMAT : 3 characters.
Length :
Example :
Possible values : cfr. EACTS coding.
Excluded values :
Note :
- MITRAL PRO.** **Definition :** code for valvular prosthesis or ring used in mitral position.
Explanation :
FORMAT : 3 characters.
Length :
Example :
Possible values : cfr. EACTS coding.
Excluded values :
Note :
- TRICUSP. PRO.** **Definition :** code for valvular prosthesis or ring used in tricuspid position.
Explanation :
FORMAT : 3 characters.
Length :
Example :
Possible values : cfr. EACTS coding.
Excluded values :
Note :
- PULM. PRO** **Definition :** code for prosthesis used in pulmonary position.
Explanation :
FORMAT : 3 characters.
Length :
Example :
Possible values : cfr. EACTS coding.
Excluded values :
Note :

APPENDIX 4 : Memory of Understanding (MOU)

1. The BACTS is the Belgian Association for Cardio-Thoracic Surgery, founded in November 1995.
2. The Database Committee, is a committee of the BACTS.
3. The Data-manager is a non-physician, responsible for data collection, data optimisation and data mapping in preparation of the data-analysis. The data-manager optimises the layout of the reports, as proposed by the Committee.
4. The Data-analyst is a non-physician expert in biomedical statistics, responsible for data analysis. The data-analyst interfaces with the data-manager concerning the data and with the Committee concerning the data-analysis.
5. The purpose of the Database Committee is mainly
 - a. To create, maintain and analyse a registry of the cardio-thoracic surgical activity in Belgium. (Could be extended to Luxemburg).
 - b. To create therapeutic or epidemiological studies involving the cardio-thoracic therapy, with the intention to improve the quality of care.
 - c. To participate directly (centre) or indirectly (database) in international projects.
 - d. The database will never serve to rank centres or surgeons, will never participate in malpractice investigation or conformity checking with legal requirements of centres and surgeons.
6. The Privacy Law (Dec 8th 1992) dictates that: (1) The database should be registered at the Commission for Protection of Privacy; (2) All centres have to be informed about the identity and the address of the holder of the database, the purpose of the database, the fact that one can get more information at the "Commission Protection of Privacy", the right to access and when necessary to correct their data; (3) The person responsible for analyzing the data, has to indicate the persons who have access to the data. The contents as well as the limits of this access have to be described in a registry. The registry of the Database Committee is registered at the Commission for Protection of Privacy, Ministry of Justice, Waterloolaan 115, 1000 Brussel. The holder's identification number is 00824597, the unique identification number is 000886559.
7. The access to the data has three levels. The first two levels concern the Database Committee members.
 - a. The first level is unrestricted. This access is given to the chairman of the database committee, the data-analyst and the data manager.
 - b. The second level is restricted to a "need to know level", defined by the committee and this access is given to all the members of the committee.
 - c. The third level is restricted to the centre's own data. This access is given to the Chairman of the center. This access is unrestricted in time but limited to the data of the center.

All members of the committee, including the data manager and the data analyst are under the medical secret. The database is protected by secret entry-codes. In addition the names of the centres and the RIZIV/INAMI numbers are recoded into secret codes. The password and codes are kept in a sealed envelope with the chairman of the database committee. No database committee chairman or member has access to the actual identification of the centre or the surgeon. The Law on the Medical Secret: data cannot and should not be transferred to any third party, e.g. council of BACTS, Health authorities, industry. There are two exceptions: (1) there is a database-specific law ordering the transfer of these data; (2) all parties or centres give their written permission for each specific output.

No centre- or surgeon-specific information can be given to any third part outside the database committee without the written permission of the chairman of the centre or the individual surgeon. No centre-, nor surgeon- identified information can be looked into by the members of the database committee.

The database committee guarantees that the data (conditional to the approval of each head of the department) that are transferred, after approval of the Board of Directors of the BACTS to a supra-national organisation (e.g. EACTS), will be transferred with secret coding of the identification of the department and additional secret coding of the surgeon.

8. There is a possible conflict of interest leading to the incompatibility of simultaneous membership of the Database Committee and membership of the Board of Directors of the BACTS or membership of the College. Any other position with possible conflict of interest needs to be presented to the database committee.

The acting members of the database committee will not be member of any other national audit or malpractice committee during their membership of the Committee.

9. The chairman of the database committee is chosen by the Board of Directors of the BACTS. The Board of directors of the BACTS nominates and dismisses the members of the Committee. The number of members can be changed on the suggestion of the Chairman of the Committee. A chairman and the Committee members remain custodians of the database till the nomination of their successors, in the event that their term has ended or that they are dismissed by the Board of Directors. Violation of the confidentiality (identified by the Committee) leads to automatic dismissal of the member or chairman by the Board of Directors of the BACTS.

The chairman of the database committee reports to the Board of Directors of the BACTS on a regular basis, as requested by the Board or the Committee. In addition an annual report is given at the business meeting of the annual convention. He will answers to the questions of the members concerning all matters of the Committee. The website will be updated on a regular basis.

10. The Committee will propose an annual budget to the Board of Directors.

11. The BACTS will take charge of the legal protection of the Committee members and the Database.

APPENDIX 5 : Additive Euroscore Calculation

Patient-related factors		Score
Age	(per 5 years or part thereof over 60 years)	1
Sex	female	1
Chronic pulmonary disease	longterm use of bronchodilators or steroids for lung disease	1
Extracardiac arteriopathy	any one or more of the following: claudication, carotid occlusion or >50% stenosis, previous or planned intervention on the abdominal aorta, limb arteries or carotids	2
Neurological dysfunction disease	severely affecting ambulation or day-to-day functioning	2
Previous cardiac surgery	requiring opening of the pericardium	3
Serum creatinine	>200m micromol/L preoperatively	2
Active endocarditis	patient still under antibiotic treatment for endocarditis at the time of surgery	3
Critical preoperative state	any one or more of the following: ventricular tachycardia or fibrillation or aborted sudden death, preoperative cardiac massage, preoperative ventilation before arrival in the anaesthetic room, preoperative inotropic support, intraaortic balloon counterpulsation or preoperative acute renal failure (anuria or oliguria <10 ml/hour)	3

Cardiac-related factors		Score
Unstable angina	rest angina requiring iv nitrates until arrival in the anaesthetic room	2
LV dysfunction	moderate or LVEF30-50%	1
	poor or LVEF <30	3
Recent myocardial infarct	(<90 days)	2
Pulmonary hypertension	Systolic PA pressure >60 mmHg	2

Operation-related factors		Score
Emergency	carried out on referral before the beginning of the next working day	2
Other than isolated CABG	major cardiac procedure other than or in addition to CABG	2
Surgery on thoracic aorta	for disorder of ascending, arch or descending aorta	3
Postinfarct septal rupture		4

Info : <http://www.euroscore.org>

**The European Association for Cardio-Thoracic Surgery
Adult Cardiac Surgery Database**

VALVE KEY

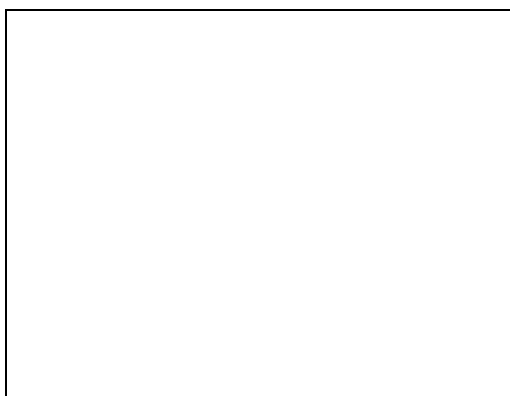
<p><u>Bioprosthetic</u></p> <p>B1 = Baxter Prima Plus Stentless Porcine B2 = Baxter Prima Stentless Porcine B3 = Biocor Porcine B4 = Biocor Stentless porcine B5 = CarboMedics PhotoFix Pericardial B6 = Carpentier-Edwards Pericardial B7 = Carpentier-Edwards Standard Porcine B8 = Carpentier-Edwards Supra-Annualr Porcine B9 = Cryolife O'Brien Stentless Porcine B10= Hancock Standard Porcine B11= Hancock II Porcine B12= Hancock Modified Orifice orcine B13= Ionescu-Shiley Pericardial B14= Labcor Stented Porcine B15= Labcor Stentless Porcine B16= Medtronic Freestyle Stentless Porcine B17= Medtronic intact Porcine B18= Medtronic Mosaic Porcine B19= Mitroflow Pericardial B20= Sorin Pericarbon Stentless Pericardial B21= St. Jude Medical - Toronto SPV Stentless Porcine B22= St. Jude Medical - Bioimplant Porcine B23= Shelhigh B24= Sorin Soprano B25= Shelhigh conduit B26= St. Jude Medical – Epic B27= Sorin freedom SOLO stentless pericardial B28= Carp. Edwards Perimount B29= Edwards Sapien Transcatheter B30=Medtr. Freestyle Aortic Root</p> <p><u>Ring</u></p> <p>R1 = Carpentier-Edwards Classic R2 = Carpentier-Edwards Physio R3 = Cosgrove-Edwards R4 = Medtronic Sculptor R5 = Medtronic Duran R6 = Sorin Puig Messana R7 = St. Jude Medical Sequin R8 = Edwards MC3 Annuloplasty Ring</p>	<p>R9 = Carbomedics Annuloflo R10= Carpentier McCarthy Adams R11= St. Jude Rigid Saddle R12= CG Future Compos. Annuloplasty Ring (Medtr) R13= Medtronic Simplicit-T annuloplasty R14= CG Future Annuloplasty Band Mitral Repair (Medtr) R15= Medtr. Profile 3D Annuloplasty Ring</p> <p><u>Mechanical</u></p> <p>M1 = ATS M2 = Bjork-Shiley Convex-concave M3 = Bjork-Shiley Monostrut M4 = CarboMedics M5 = Edwards Tekna M6 = Lillehei-Kaster M7 = Medtronic Hall M8 = OmniCarbon M9 = OmniScience M10= On-X M11= Sorin BiCarbon (Baxter Mira) M12= Sorin Monoleaflet Allcarbon M13= St. Jude Medical M14= Starr-Edwards Caged Ball M15= Advantage Medtronic M16= Carp. Edwards Perimount</p> <p><u>Homograft</u></p> <p>H1 = Aortic -Subcoronary H2 = Aortic Root / Cylinder H3 = Mitral H4 = Pulmonic root H5 = Cryolife H6 = Lillehei-Kaster H7 = Medtronic Hall</p> <p><u>Autograft</u></p> <p>A1 = Pulmonic root</p> <p>777= Other</p>
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<http://www.eacts.org>

APPENDIX 7 : Code Sheet – Example

BACTS – DATABASE 2008

Center :



- **Unique Patient Number :**
- **Birth date :** - - / - - / - - - -
- **Gender :** M - F
- **Height :** cm **Weight :** kg
- **Date Surgery :** - - / - - / 20 - -
- **Time in :** - - - -
- **Time out :** - - - -

- **Surgeon 1 :** - / - - - - - / - - / 140
- **Surgeon 2 :** - / - - - - - / - - / 140
- **Status :** ELEC - URGE - EMER - SALV
(scheduled >24h) (within 24h delayable) (not delayable) (rean. during anesth.preop)
- **Type of incision :** STERN - MINIS - THORA - MINIT - EPIGA - THPL - ENDO
(retractor) (no retractor)
- **Diabetes :** NO - INSUL - ORAL.
- **COPD :** Y - N (use bronch dilator or steroid preop)
- **Extracardiac arteriopathy :** Y - N (claudication, carotic stenosis, previous planned vasc. oper.)
- **LVEF :** 1. Poor (≤ 30 %) - 2. Fair (31 - 49 %) - 3. Good (≥ 50 %) - 4. Not available
- **Pre op creatinine :**,..... Mg/dl
- **Pre op neurological dysfunction :** Y - N
- **Active endocarditis :** Y - N
- **Critical pre op state :** Y - N (VT, VF, ventilated, sudden dead, massage, IABP, ...)
- **Unstable angina :** Y - N (IV nitrate)
- **Recent myocardial infarction (<90 days) :** → date of infarction : - - / - - / 20 - -
- **Pulmonary hypertension :** Y - N (pulm syst pressure > 60 mmHg)
- **CPT 1 :** **CPT 4 :**
- **CPT 2 :** **CPT 5 :**
- **CPT 3 :** **CPT 6 :**
- **Name Prosthesis :**
- **Position :** Aortic - Mitral - Tricuspid - Pulmonary

