KAROLINSKA HOSPITAL
DEPARTMENT OF CARDIOLOGY
SWEDEN

ANNUAL STATISTICAL REPORT 2017

SWEDISH ICD & PACEMAKER REGISTRY

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Foreword

We are proud to present the annual report for 2017 regarding Pacemaker and ICD treatment in Sweden. We have over the last years focused on longevity of devices, leads and complications triggered by the current events. We have also increased the data collected regarding lead extractions which is rapidly increasing in Sweden with an increased number of centers.
Complications are shown for each type of implantation for the country, for the region and hospital. There is also an ongoing discussion regarding concentration of therapy to fewer centers to improve outcomes by increasing the numbers of procedures per operator. To aid in this transformation we publish data on all individual implanters.
Lead extractions are reported per hospital using the definition by ACC, the removal of a lead with an implant duration of > one year regardless of the method and leads of < than one year if tools are used. All hospitals performing lead extractions are now sending complete data.
The report contains data from all implanting hospitals and > 95% of all procedures are reported when validated against the Patient care registry from The National Board of Wellfare, Socialstyrelsen, in an annual validation process.

Implant rates Pacemaker

There are 55539 pacemaker patients in Sweden at the end of 2017. As always there are regional differences with the highest implant rates in the large northern region of Västernorrland. Lowest are South Eastern region and Stockholm. Stockholm has a low implant rate due to a younger population than the national average.
The overall implant rate has increased somewhat from 2016 to 2017, 684 to 689 new implants per million. The Swedish population has also increased to 10,1 million and the total number of first implants increased in total.
The number of implanting hospitals is the same as in 2016, 43 centers.

Age and Gender distribution of pacemaker treatment

The average age for females receiving pacemaker treatment is 77 y and males 76 y and 8 patients over 100 years of age received primary implants. There is a male predominance with 60% of the new implants going to male patients but generator changes are more common in females due to the higher average survival of females in the country. There is no change in this distribution compared to previous years.

Pacemakers and leads

The manufacturers´ shares of the market show only slight redistribution and all regions are bound by tenders for 1-3 years. St Jude Medical is now Abbot and again largest with 45%, and Medtronic with the brand Vitatron is now down to second place with 24% market share. Boston Scientific has decreased its market shares to 14% in brady segment. Biotronik is still increasing and now up to 10% and Sorin is almost out with 1,4% of the market.
Right side pacemaker leads are now solely bipolar. Active fixation is used to 99% in the atrium and 90% in the ventricle whereas passive leads are used more commonly than in the US for example. We have now active fixation LV leads and 17% of the LV leads were active fixation, the same as in 2016. Quadripolar lead technology for CRT has rapidly increased and 70% of the LV leads are now quadripolar, an increase from 65% in 2016.
15663 leads were implanted all together.
Only a small number of epicardial systems are implanted in small children and patients without venous access and in some CRT patients. Venous access is almost equal between cephalic cut-down technique, 50%, and direct subclavian puncture 37% and 12% axillary punction which has increased as an access route.
The leadless pacemaker systems are new in clinical use and Medtronic Micras were implanted in 19 patients in 2017, a very small increase from 15 in 2016.

Pacemakers

All pacemakers implanted have RR capability and DDD-R is the most common subtype, 77%. CRT-Ps are used in small numbers, 6% but increased since 2016.
The rate of MRI safe systems increases rapidly, approximately 90% of the systems implanted are MRI safe. The trend from the manufacturers to label older leads together with new pulse generators as MRI safe has made it difficult to keep correct track of the actual percentage.
The most common aethiology for pacemaker treatment is still the “conductive tissue fibrosis” 80% and ischaemic disease is more common in males, 8 vs 3,6%. The usage of the term “conductive tissue fibrosis” is most probably too high and only represents a lack of proper diagnosis when entering registry data.
System upgrade is at a steady state, especially in brady-paced patients with heart failure and 2016 a total of 239 patients were upgraded from normal brady pacing to CRT compared to 221 in 2017.
The most common symptom is syncope followed closely by dizziness and dyspnea. ECG indications are 2017 as before mainly related to sinus node disease with AV conduction disorders second. Sinus node disease is slightly more common as an indication in women than in men.
Smaller hospitals tend to use VVI-R pacing more often than larger hospitals for AV-block and SSS.
Generators used to ERI criteria are fulfilled in 66% of the cases and 0,8% exhibit premature EOL. Lead failures are uncommon and survival rates are very good with a 10 year survival of 98%.

Implanting organisation

The number of procedures for each implanter vary to a large extent between hospitals. Recommendations as to minimum number of procedures from EHRA is not routinely followed especially regarding CRT implantation. A recommendation to implant volumes was made by the Swedish Cardilogy Society´s Arrhythmia Group in 2016 and has so far had no impact on the organization in hospital with low individual implant numbers.

Implant rates ICD

There are 11185 active ICD patients in Sweden 2017 and this is a >2% increase over 2016. The number centers implanting ICDs is 32 and represents roughly 2/3 of the PM implanting centers although 6 centers do <20 implants per year, well below recommendations by ESC and the Swedish national society. The national implant rate is lower in 2017 than 2016 139 vs 149 per million. The south east region is the only region that has increased its implant rate, all others show a small decrease. Otherwise implant rates show the same regional differences as in pacemakers with the highest rates in the north, 212 in Västerbotten and the lowest in the Stockholm region with 101 per million.
About 40 % of the ICD procedures are replacements, in 2016 increased by the SJM alert, but could be expected to go down with generators now showing increased longevity.
As with PM the regions are bound by ICD purchasing tenders and manufacturers share shows only slight variations over previous year. SJM is the largest with 45% market share, Medtronic second with 38%. Biotronic is smallest with 4,7% market share.
A small number of S-ICD devices were implanted but numbers are not increasing.

ICD Patients

The average age for ICD implant is stable at 65 years in males and 62 years in females for all types of implants, unchanged from previous years. 57 patients in the age group 80-89 received a first ICD implants of which 20 were primary prevention.
Clinical indication for all ICD implants was secondary prevention in 33% and primary in 67%. Aethiology was ischaemic heart disease in 56% of all patients but more common in males, 68% vs 32% in females.
Medication at the start of therapy is displayed in tables.

ICD Subtypes and leads

89% of the leads are now single coil and 98% were active fixation. An increase in single coil use from 65% in 2015. Venous access is comparable to PM implants with an equal distribution between cephalic cut-down and direct subclavian puncture. Subtypes are 38% DDDR devices and 37% CRT-D devices, an increase from 35% in 2015.
Only 60% of the ICD's are used until normal EOL/ERI, 8% are changed due to system upgrade, usually to a CRT system. Technical recalls stand for 1,2% of all box changes and premature EOL is 2,1%.
ICD leads display larger failure rates compared to pacemaker leads but overall longevity is still good. Specific statistics for Sprint Fidelis and Durata leads are displayed in the quality section.
The number of procedures display the same large variation in volumes as with pacemaker procedures at different hospitals and some are clearly below recommended volumes.

CRT implant rates

Implant rates of CRT system are only increasing slowly in Sweden, 63 per million CRT-Ds and 54 per million CRT-Ps new implants which is clearly up from 2016 for CRT-P systems.
The number of centers performing CRT implantations is less than the number doing ICDs, 22 vs 32. The number of CRT procedures per implanter range from 1-84 and only 1 implanter performed >50 implants and 15 implanters out of 72 perform > 20 implants per year which is the recommended minimum.
The distribution between CRT-D and CRT-P systems shows regional differences with some regions doing almost exclusively CRT-D systems. The failure rate at implant is according to the registry 5% but this is most likely an underestimation when compared to the literature.

CRT patients

The average age of CRT-P patients at first implant is 77 y and CRT-D patients 68 years with a large male predominance, the same as last year. Medication for patients receiving CRT for the first time is given in tables.

ILR

873 ILRs were implanted in Sweden 2017 which is up from 847 in 2016 with the main indication being dizzy spells and syncope. At the end of the ILR investigation period 50% of the patients were found to have a PM indication and 7,5% an ICD indication, the rest showed no pathological rhythm during the FU. In 5,4% a new ILR was implanted to extend the monitoring period.

Quality of device treatment, pacemakers, pacing modes

In high degree AV block only 5% of the patients receive VVI-R systems on average but to a higher degree, 10%, in small hospitals.
The use of pacing mode in sinus node disease shows 6% VVI-R systems on average and the same in small and large hospitals.

Lead extraction

The numbers of lead extractions are increasing and there are now 5 centers performing regular assisted lead extraction. Karolinska, 227 leads, Sahlgrenska 119 leads, Uppsala 94 leads, Lund 53 leads and Linköping 20 leads. The numbers are expected to increase further in 2018.
The most common reason is infection. Preventive extraction of leads with problems such as Medtronic Sprint Fidelis and SJM Riata is also performed in a lower number of cases in 2017 than before, due to decreasing numbers of leads still in use.
Methods and success rates are displayed for those hospitals that have complete reporting.

Complications Pacemaker

The total complication rate for pacemaker procedures is 4,3% vs 5.5% in 2016 with lead dislodgement being the most common. Passive atrial leads show the highest dislodgement rate with 4% vs 1.7 for active fix atrial leads. SC leads show the same tendency with 2,1% dislodgement for all passive types and 0,7% for the Medtronic screw-in type SC lead.
There is a variation among the operating hospitals with possible under-reporting in many cases. Hospitals that have registered <3% in total complication can be regarded as not having complete registration. This is based on literature regarding pacemaker procedure complications with a common rate of 5-15%.

Complications and gender

Infections are more common during generator changes than new implants and most common in CRT system changes. In PMR female sex is associated with less complications of all types but perforation and pneumothorax. This is different from the literature that usually has an overrepresentation of females in all types of complications.

Complications ICD

The overall complication rate to ICD treatment is 6.4% and is down slightly from 8,1% in 2016. The most common complication is lead dislodgement 2,8% followed by infection with 1%.
The rate between hospitals is also given in tables and as with pacemaker treatment <3% is considered incomplete registration.

Complications CRT

This is presented both as CRT-D and CRT-P complications. Both figures 6,4% and 3,8% are very low and do not compare well with literature findings of up to 15% complications. Most common is as with ICDs and PMs lead dislodgement 0,7% vs 3.1 for CRT-P and CRT-D. Most commonly it is the sc lead that dislodges.

Procedures

Duration of fluoroscopy and procedure times are given for all types and hospitals in tables. The procedures that have been performed in less than 10 at different sites are marked as not reliable for comparison.
A single chamber device as a mean takes 38-50 minutes to implant VVI-AAI, and a dual chamber device 49 min and a CRT system 86 min on average.

Device longevity ICD and PM

Generators generally have very good longevity with an average for Pacemakers of 99.4% after 5 years but there are large differences between models and manufacturers. Each model is given in the tables.
Pacemaker lead survival is very good with a survival rate of 98,3% after 10 years with very little difference between models.
ICD generator survival is more heterogenous than PM generator survival with larger differences between manufacturers and models and an average of 95,8% after 5 years.
SJM Fortify and Unify were identified as problem generators in 2014 in our registry, long before the SJM alert and survival curves were given for each model.
ICD lead survival is also shorter than pacemaker lead survival, 95% vs 99% after 10 years.
The Medtronic Sprint Fidelis models were implanted in 903 cases in Sweden and the survival rate is 67% after 10 years and has decreased rapidly as expected from previous year.
In the St Jude Riata models failures are increasing and 10 year survival is now down to 73%, down from 77% in 2016.

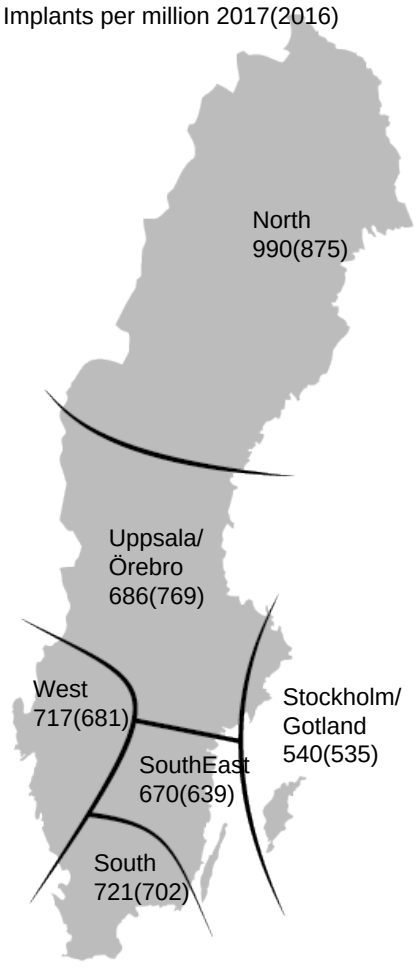
Patients

The ICD patient survival is 68.7% after 5 years for ICD patients vs 68.8% for pacemaker patients.
The heart failure patients treated with CRT have also the shortest expected survival rate among the PM and ICD patients. CRT-P patients have a 63% 5 year survival and CRT-D patients 33.3%.
One-year mortality is 9.1 % in PM patients, 4.4 % in ICD patients, 12.1 % in CRT-P patients and 5.4 % in CRT-D patients.

Fredrik Gadler
Manager Swedish National ICD and Pacemaker Registry

The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2366738	1279	540	11293
Uppsala/Örebro	2082515	1429	686	12447
South-East Sweden	1058269	709	670	5303
Southern Sweden	1837468	1324	721	10074
Western Sweden	1879718	1348	717	10532
Northern Sweden	895534	887	990	5890
Total	10120242	6976	689	55539



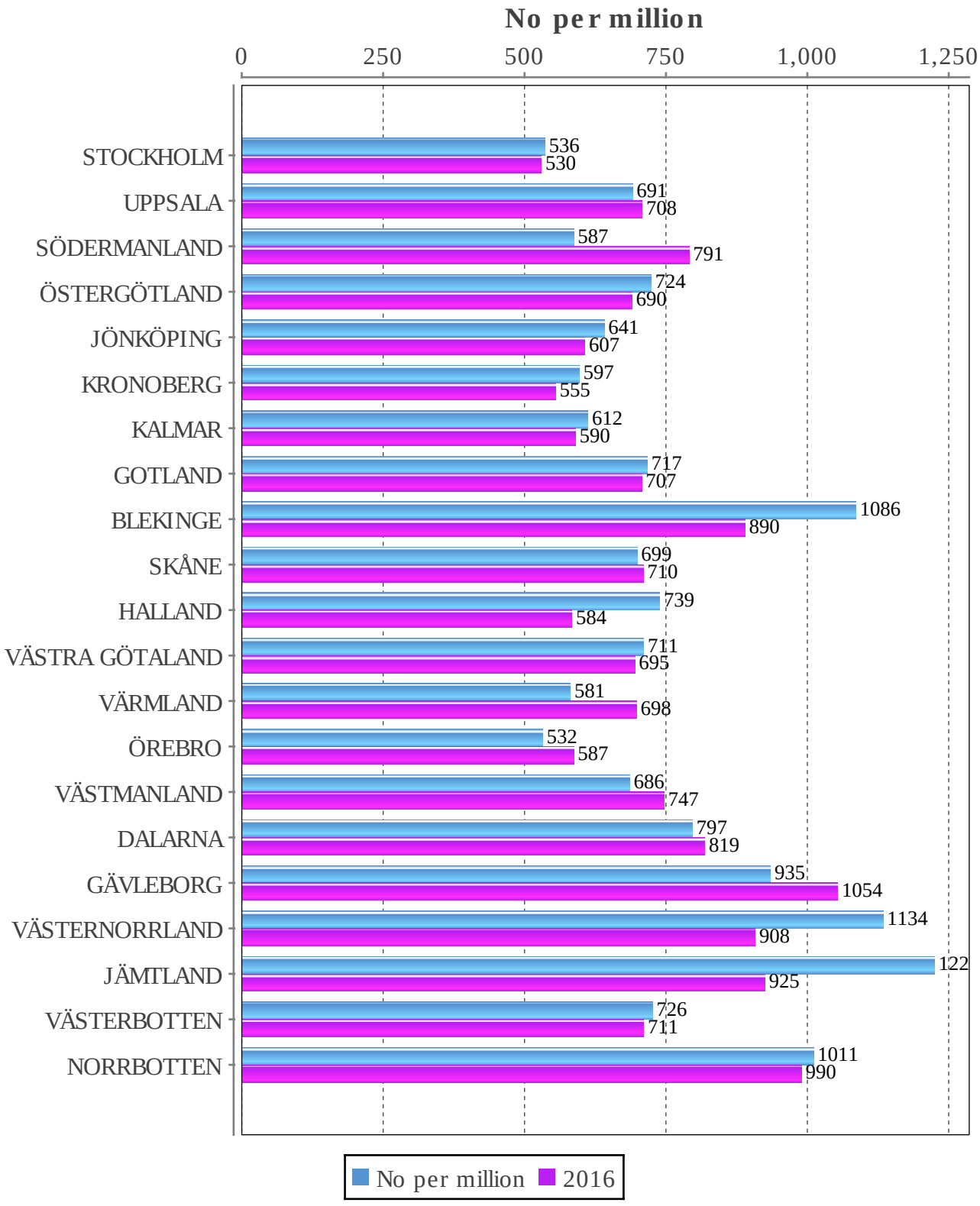
First implants per hospital

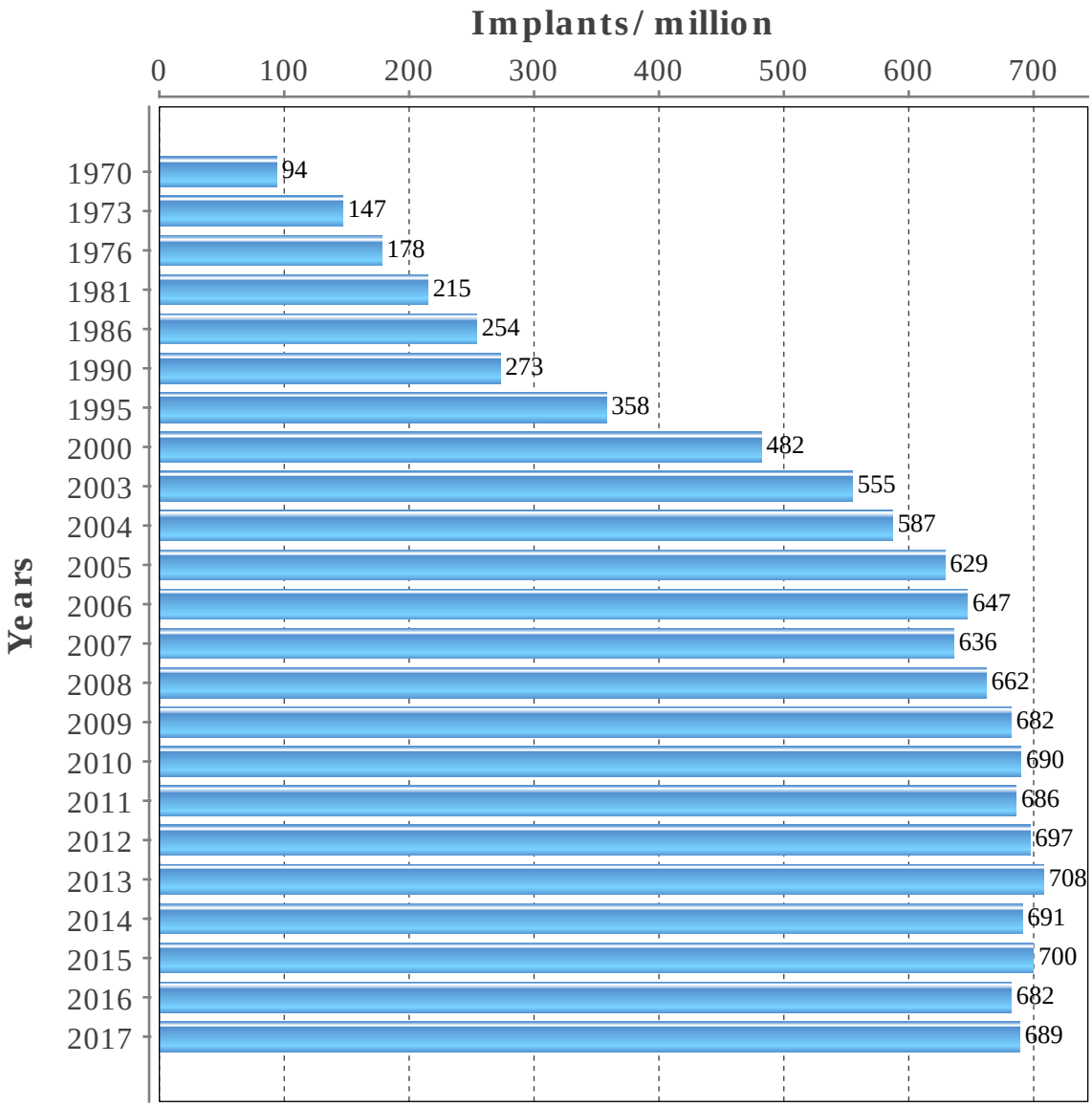
Region	Hospital	2017	2016
Northern Sweden	Norrlands Universitetssjukhus	162	151
	Skellefteå lasarett	54	63
	Sollefteå sjukhus	15	17
	Sunderby sjukhus	246	233
	Sundsvalls sjukhus	205	151
	Örnsköldsviks sjukhus	64	48
	Östersunds sjukhus	172	124
Southern Sweden	Blekingesjukhuset	180	141
	Centrallasarettet Växjö	117	105
	Centralsjukhuset Kristianstad	228	233
	Helsingborgs lasarett	38	0
	Länssjukhuset Halmstad	106	84
	Skånes universitetssjukhus, Lund	431	503
	Skånes universitetssjukhus, Malmö	268	236
	Varbergs sjukhus	117	90
South-East Sweden	Linköpings Universitetssjukhus	365	277
	Länssjukhuset Kalmar	85	73
	Länssjukhuset Ryhov	204	198
	Oskarshamns sjukhus	18	36
	Vrinnevisjukhuset	1	65
	Västerviks sjukhus	41	29
Stockholm/Gotland	Danderyds sjukhus	367	386
	Karolinska Universitetssjukhuset	363	324
	St Görans sjukhus	298	255
	Södersjukhuset	253	281
	Visby lasarett	25	27
Uppsala/Örebro	Akademiska sjukhuset	286	301
	Arvika sjukhus	4	8
	Centralsjukhuset Karlstad	125	170
	Centralsjukhuset Västerås	174	172
	Falu lasarett	224	227
	Hudiksvalls sjukhus	53	51
	Länssjukhuset Gävle	205	244
	Mälarsjukhuset	156	206
	Torsby sjukhus	28	25
	Universitetssjukhuset Örebro	169	180
Western Sweden	Alingsås lasarett	69	71
	Drottning Silvias Bus	11	10
	Kungälvs sjukhus	85	55
	Sahlgrenska Universitetssjukhuset	362	449
	Sahlgrenska Universitetssjukhuset /Östra	70	29
	Skaraborgs sjukhus Skövde	220	188
	Södra Älvsborgs sjukhus	162	148
	Trollhättan, NÄL	247	231

STATISTICS – PACEMAKER – IMPLANTS PER COUNTY

The regions are based on where the patients live, not where they are treated

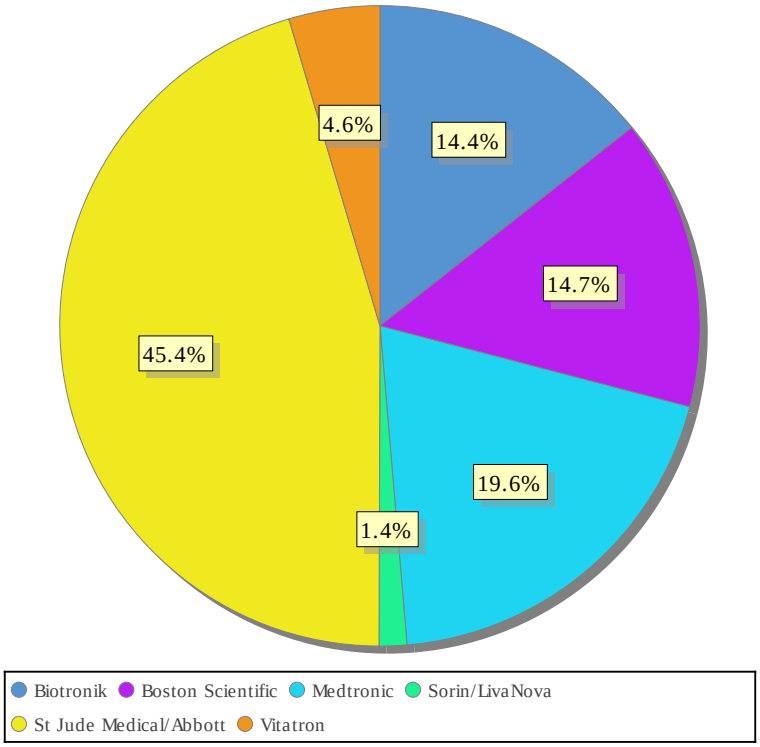
County	Population	No of first	No per million	Active patients
STOCKHOLM	2308143	1237	536	10855
UPPSALA	368971	255	691	2089
SÖDERMANLAND	291341	171	587	1660
ÖSTERGÖTLAND	457496	331	724	2404
JÖNKÖPING	357237	229	641	1784
KRONOBERG	197519	118	597	791
KALMAR	243536	149	612	1115
GOTLAND	58595	42	717	438
BLEKINGE	159371	173	1086	1011
SKÅNE	1344689	940	699	7592
HALLAND	324825	240	739	1654
VÄSTRA GÖTALAND	1690782	1202	711	9558
VÄRMLAND	280399	163	581	1604
ÖREBRO	298907	159	532	1512
VÄSTMANLAND	271095	186	686	1491
DALARNA	286165	228	797	1802
GÄVLEBORG	285637	267	935	2289
VÄSTERNORRLAND	245968	279	1134	1775
JÄMTLAND	129806	159	1225	624
VÄSTERBOTTEN	268465	195	726	1606
NORRBOTTEN	251295	254	1011	1885
Total	10120242	6977	689	55539


No per million
0
250
500
750
1,000
1,250
STOCKHOLM 536 530
UPPSALA 691 708
SÖDERMANLAND 587 791
ÖSTERGÖTLAND 724 690
JÖNKÖPING 641 607
KRONOBERG 597 555
KALMAR 612 590
GOTLAND 717 707
BLEKINGE 1086 890
SKÅNE 699 710
HALLAND 739 584
VÄSTRA GÖTALAND 711 695
VÄRMLAND 581 698
ÖREBRO 532 587
VÄSTMANLAND 686 747
DALARNA 797 819
GÄVLEBORG 935 1054
VÄSTERNORRLAND 1134 908
JÄMTLAND 122 925
VÄSTERBOTTEN 726 711
NORRBOTTEN 1011 990
No per million
2016


Implants/ million
0
100
200
300
400
500
600
700
Years
1970
1973
1976
1981
1986
1990
1995
2000
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
94
147
178
215
254
273
358
482
555
587
629
647
636
662
682
690
686
697
708
691
700
682
689

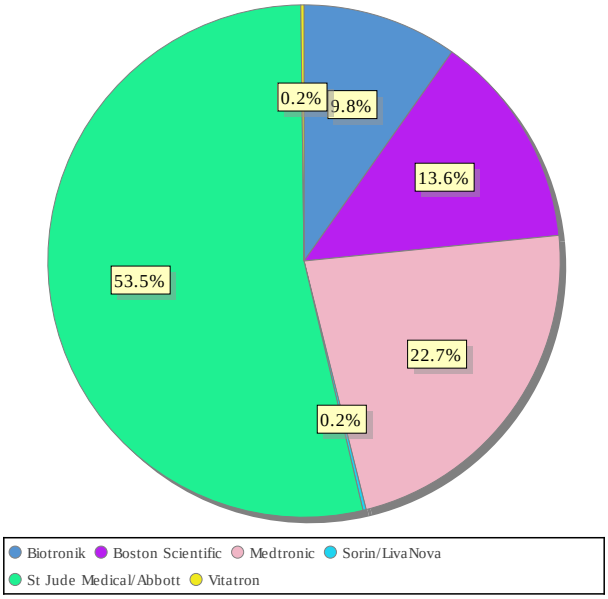
Market share per manufacturer in Sweden. Medtronic and Vitatron regarded as separat companies

Manufacturer	2014 %	2015 %	2016 %	2017 %
Biotronik	5.0	6.5	10.0	14.4
Boston Scientific	8.4	14.8	18.8	14.7
Medtronic	21.0	22.0	21.2	19.6
Sorin/LivaNova	5.0	5.7	2.0	1.4
St. Jude Medical	34.2	36.2	41.2	45.4
Vitatron	25.5	15.9	6.9	4.6
Nayamed International	0.1	0.1	-	-
Impulse Dynamics	-	-	-	-



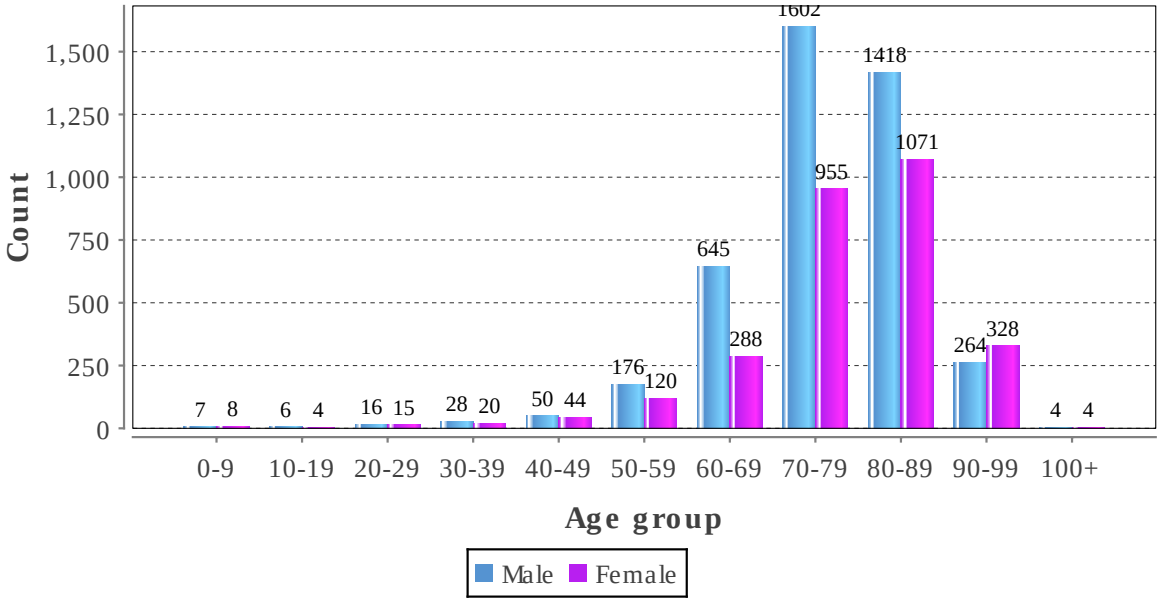
Market share per manufacturer in Sweden. Medtronic and Vitatron regarded as separat companies. From 2011 even including leads implanted in ICD systems.

Manufacturer	2014 %	2015 %	2016 %	2017 %
Biotronik	4.7	5.7	6.6	9.8
Boston Scientific	11.1	14.2	17.0	13.6
Medtronic	34.6	30.4	23.1	22.7
St. Jude Medical	48.7	49.5	52.9	53.5
Vitatron	0.8	0.1	0.2	0.2
Sorin/LivaNova	0.1	0.1	0.2	0.2



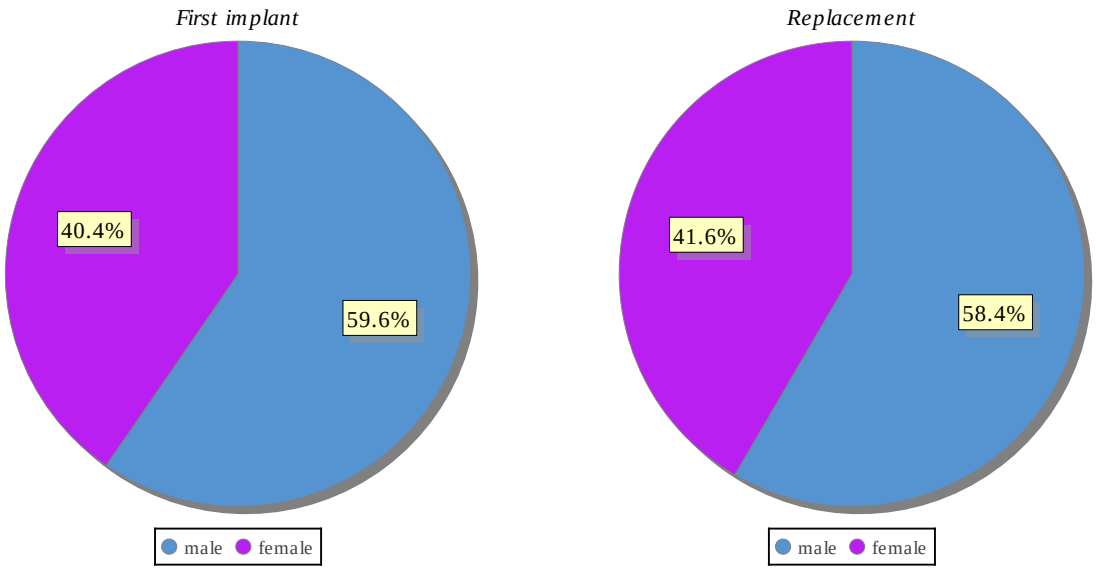
Age and gender distribution for new implants, total numbers

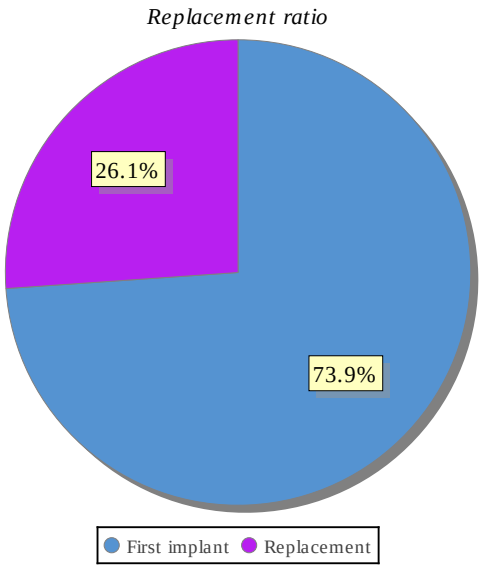
Age (years)	Total no	%	Male	Female
0-9	15	0.2	7	8
10-19	10	0.1	6	4
20-29	31	0.4	16	15
30-39	48	0.7	28	20
40-49	94	1.3	50	44
50-59	296	4.2	176	120
60-69	933	13.2	645	288
70-79	2557	36.2	1602	955
80-89	2489	35.2	1418	1071
90-99	592	8.4	264	328
100+	8	0.1	4	4
Average age	76	0.0	76	77
				Total number of implants: 7073

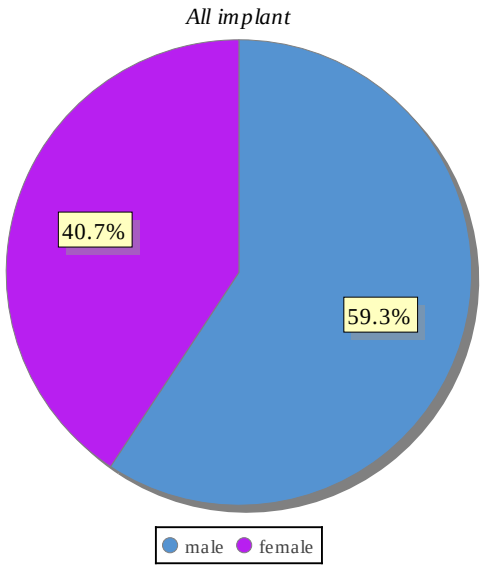


Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	7073	73.9	4216	59.6	2857	40.4
Replacement	2500	26.1	1460	58.4	1040	41.6
Total	9573	100.0	5676	59.3	3897	40.7



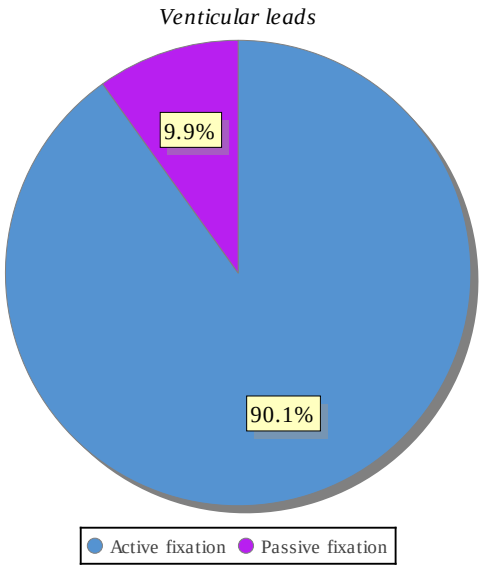


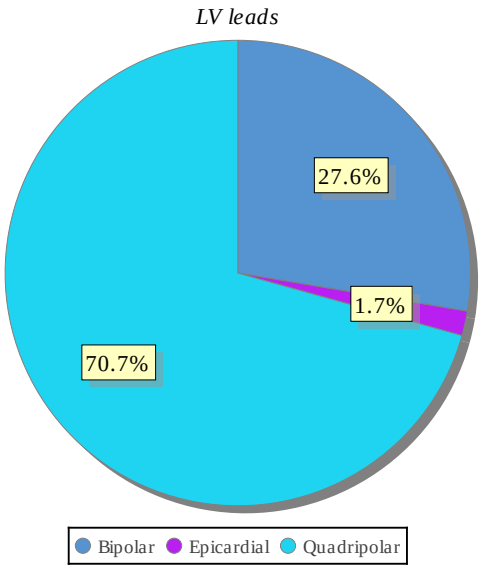


Lead type distribution for atrial and venticular use for first implants and replacements including all pace leads, pace and ICD systems

	Atrial		Venticular		LV-lead	
	no	%	no	%	no	%
Bipolar	6970	99.6	7367	99.6	350	27.6
Epicardial	25	0.4	31	0.4	22	1.7
Unipolar	-	-	1	-	-	-
Quadripolar	-	-	-	-	895	70.6

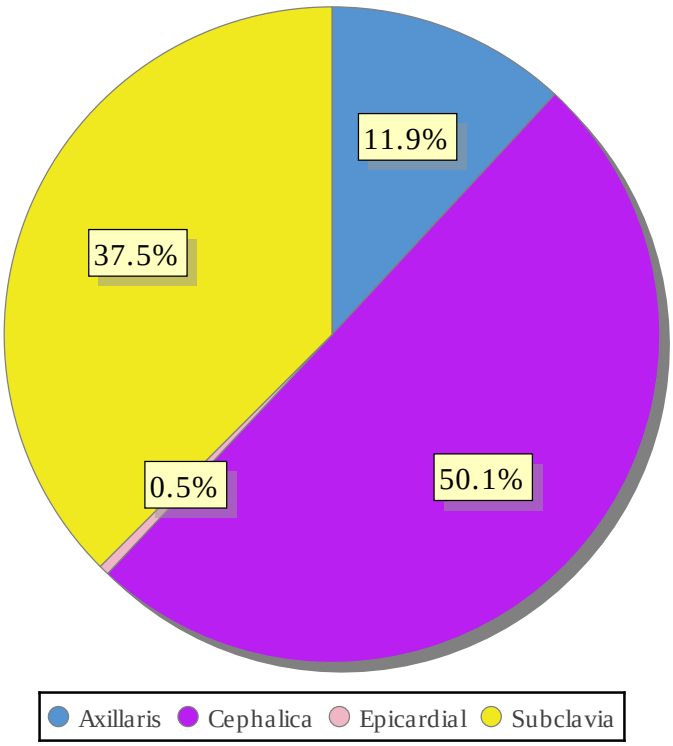
	Atrial		Venticular		LV-lead	
	no	%	no	%	no	%
Active fixation	6984	99.8	6670	90.1	212	16.7
Passive fixation	11	0.2	731	9.9	1055	83.3
					Total number of leads: 15663	





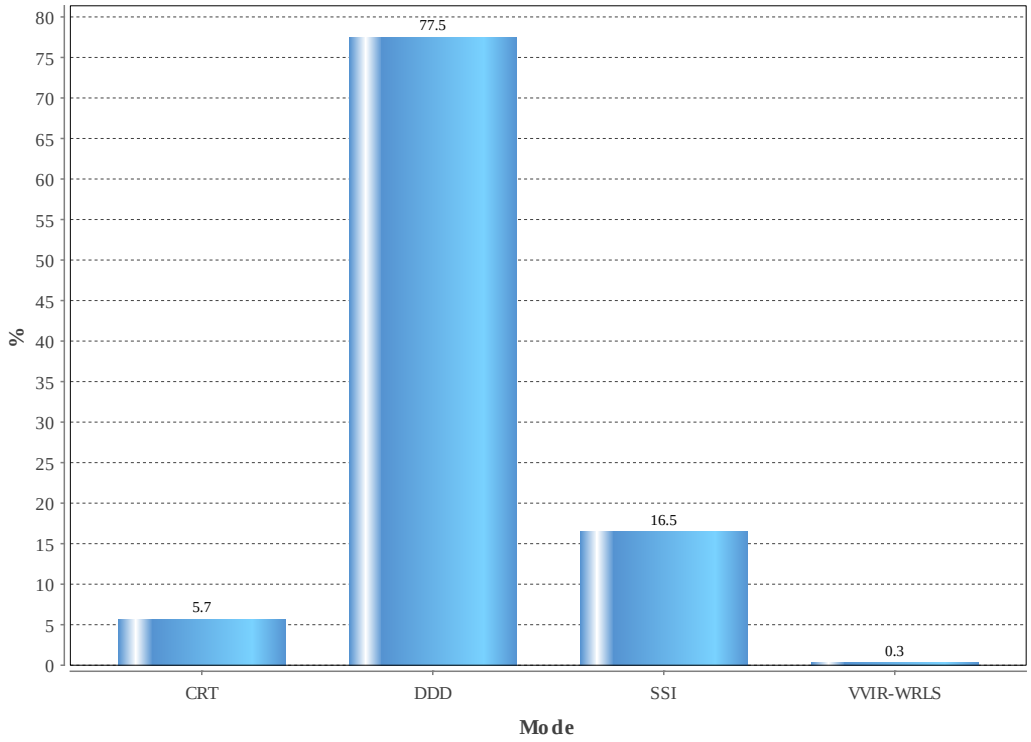
Venous access for first implants and replacements, all types of pace leads.

Lead access	No	%
Axillaris	1867	11.9
Cephalica	7842	50.1
Epicardial	77	0.5
Jugular	6	0.0
N/A	3	0.0
Subclavia	5868	37.5



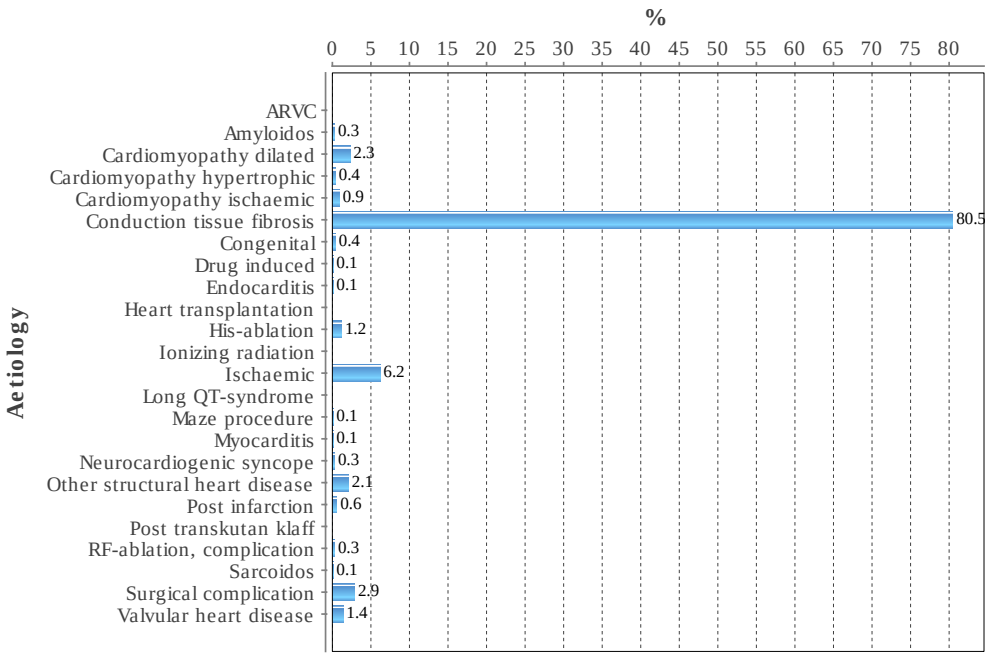
Implants by subtype (WRLS: wireless)

Mode	%	No
CRT	5.7	405
DDD	77.5	5483
SSI	16.5	1165
VVIR-WRLS	0.3	20
Total number of first implants 7073		



Main aetiology for implanting pacemakers

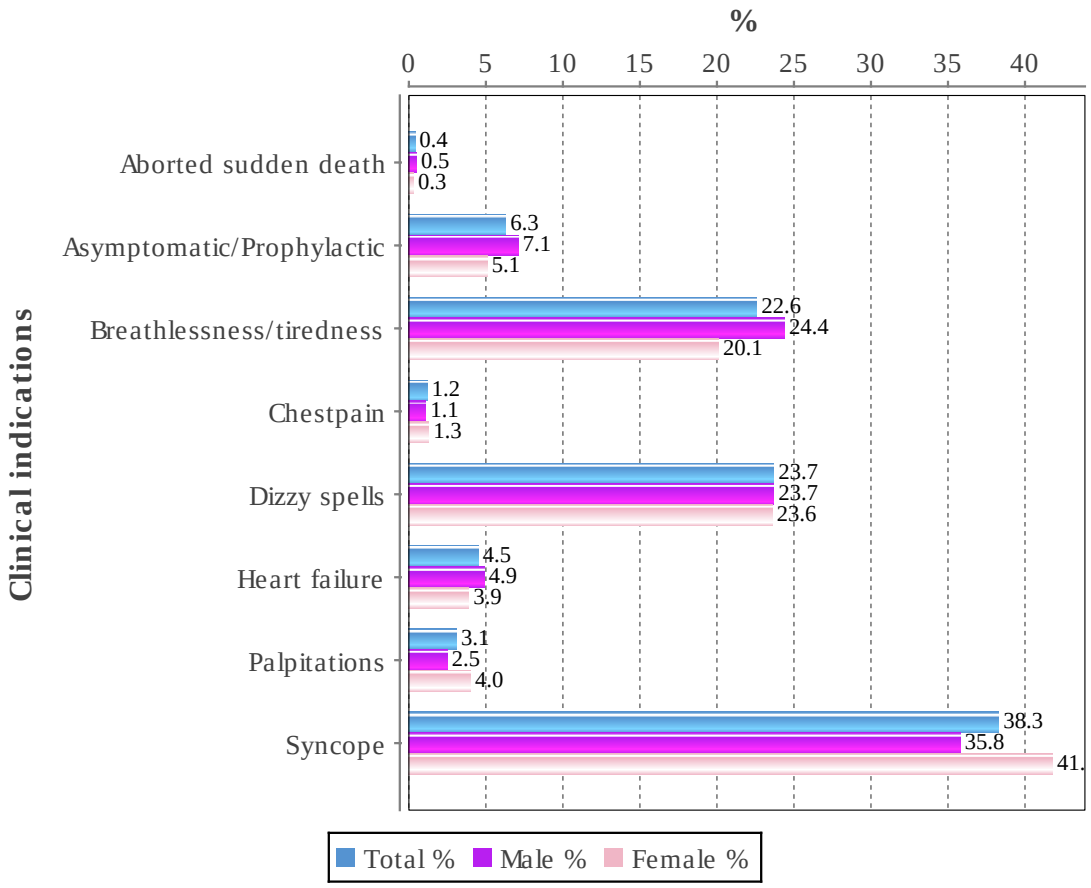
Aetiology	Total %	Male %	Female %
ARVC	0.0	0.0	0.0
Amyloidos	0.3	0.3	0.1
Cardiomyopathy dilated	2.3	2.5	2.0
Cardiomyopathy hypertrophic	0.4	0.3	0.5
Cardiomyopathy ischaemic	0.9	1.2	0.4
Conduction tissue fibrosis	80.5	78.5	83.5
Congenital	0.4	0.3	0.5
Drug induced	0.1	0.2	0.0
Endocarditis	0.1	0.1	0.0
Heart transplantation	0.0	0.0	0.0
His-ablation	1.2	0.7	1.9
Ionizing radiation	0.0	0.0	0.1
Ischaemic	6.2	8.0	3.6
Long QT-syndrome	0.0	0.0	0.0
Maze procedure	0.1	0.1	0.1
Myocarditis	0.1	0.1	0.0
Neurocardiogenic syncope	0.3	0.3	0.3
Other structural heart disease	2.1	2.1	2.0
Post infarction	0.6	0.6	0.7
Post transkutan klaff	0.0	0.0	0.0
RF-ablation, complication	0.3	0.2	0.3
Sarcoidos	0.1	0.1	0.1
Surgical complication	2.9	3.2	2.6
Valvular heart disease	1.4	1.5	1.2

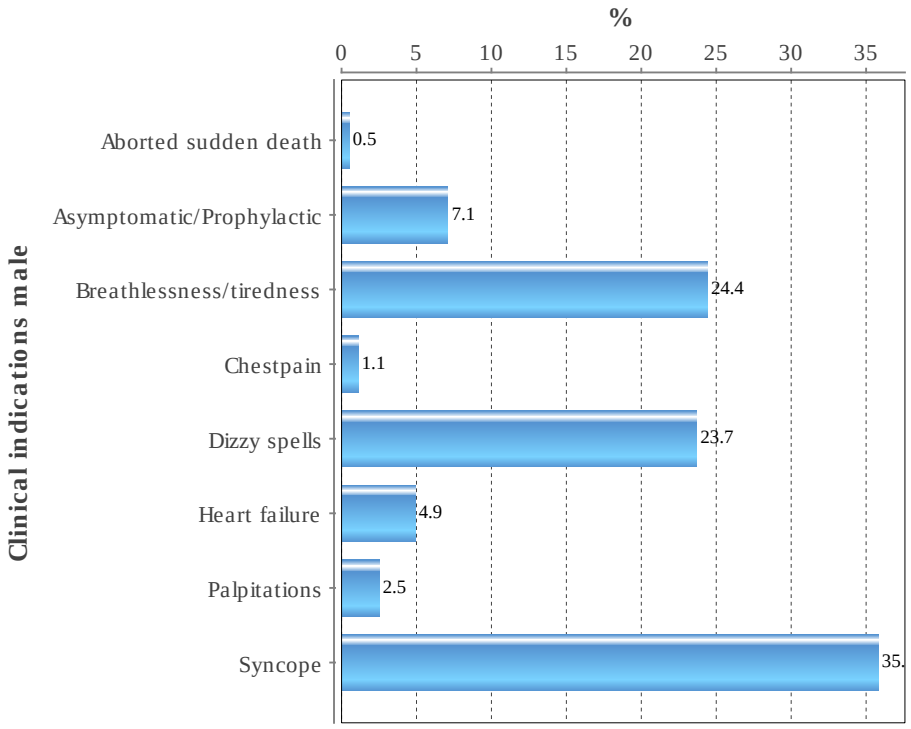


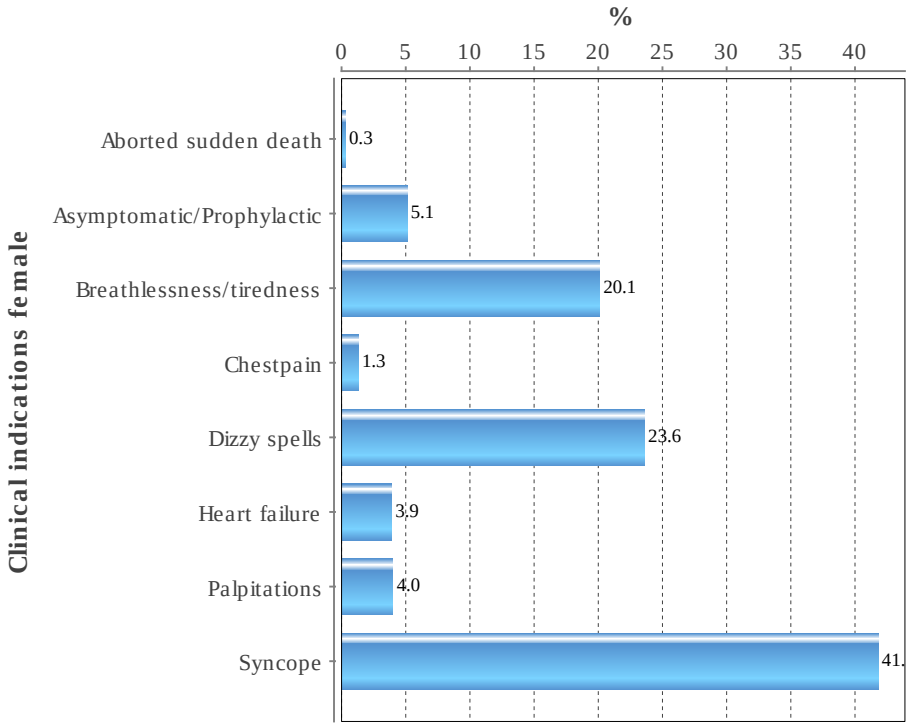
	2017	2016	2015	2014	2013	2012
VVI to VVIR	3	5	5	5	8	33
AAI/AAIR to DDD/DDDR	21	21	21	20	54	68
VVI/VVIR to DDD/DDDR	24	22	22	43	85	108
VVI/VVIR/DDD/DDDR to CRT	221	239	216	142	185	300

Main symptom for implanting pacemakers

Indication	Total %	Male %	Female %
Aborted sudden death	0.4	0.5	0.3
Asymptomatic/Prophylactic	6.3	7.1	5.1
Breathlessness/tiredness	22.6	24.4	20.1
Chestpain	1.2	1.1	1.3
Dizzy spells	23.7	23.7	23.6
Heart failure	4.5	4.9	3.9
Palpitations	3.1	2.5	4.0
Syncope	38.3	35.8	41.8

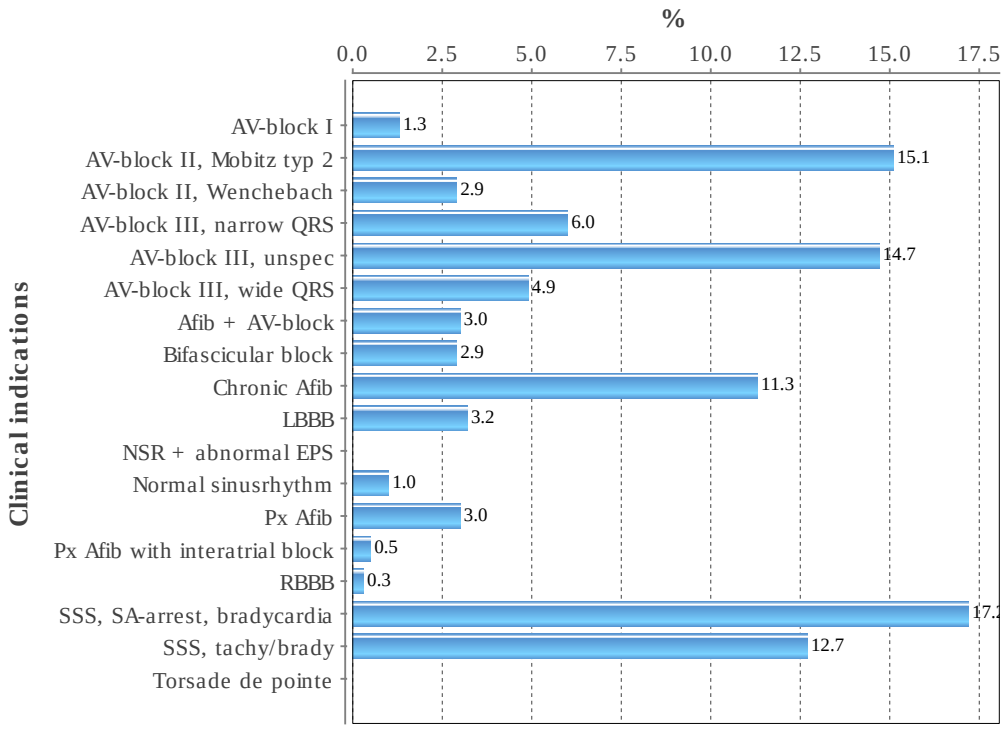



%
0
5
10
15
20
25
30
35
Clinical indications male
Aborted sudden death
0.5
Asymptomatic/Prophylactic
7.1
Breathlessness/tiredness
24.4
Chestpain
1.1
Dizzy spells
23.7
Heart failure
4.9
Palpitations
2.5
Syncope
35.


%
0
5
10
15
20
25
30
35
40
Clinical indications female
Aborted sudden death
0.3
Asymptomatic/Prophylactic
5.1
Breathlessness/tiredness
20.1
Chestpain
1.3
Dizzy spells
23.6
Heart failure
3.9
Palpitations
4.0
Syncope
41.

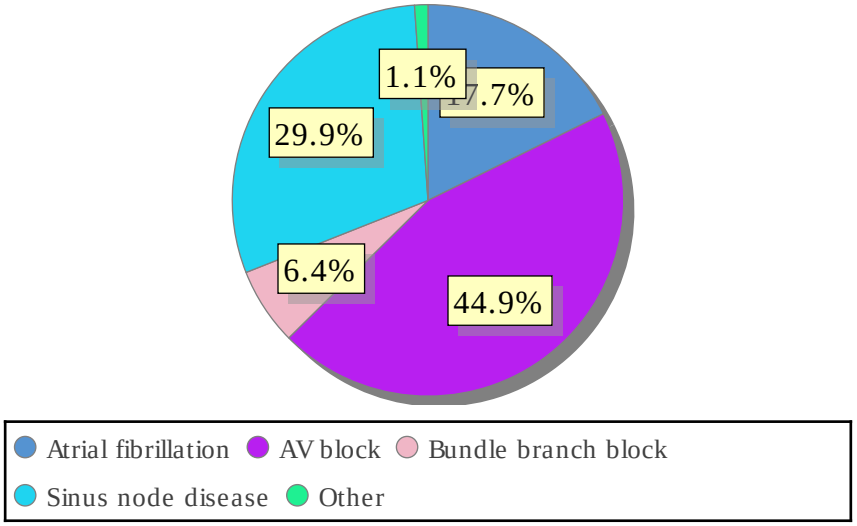
Main ECG indication, total

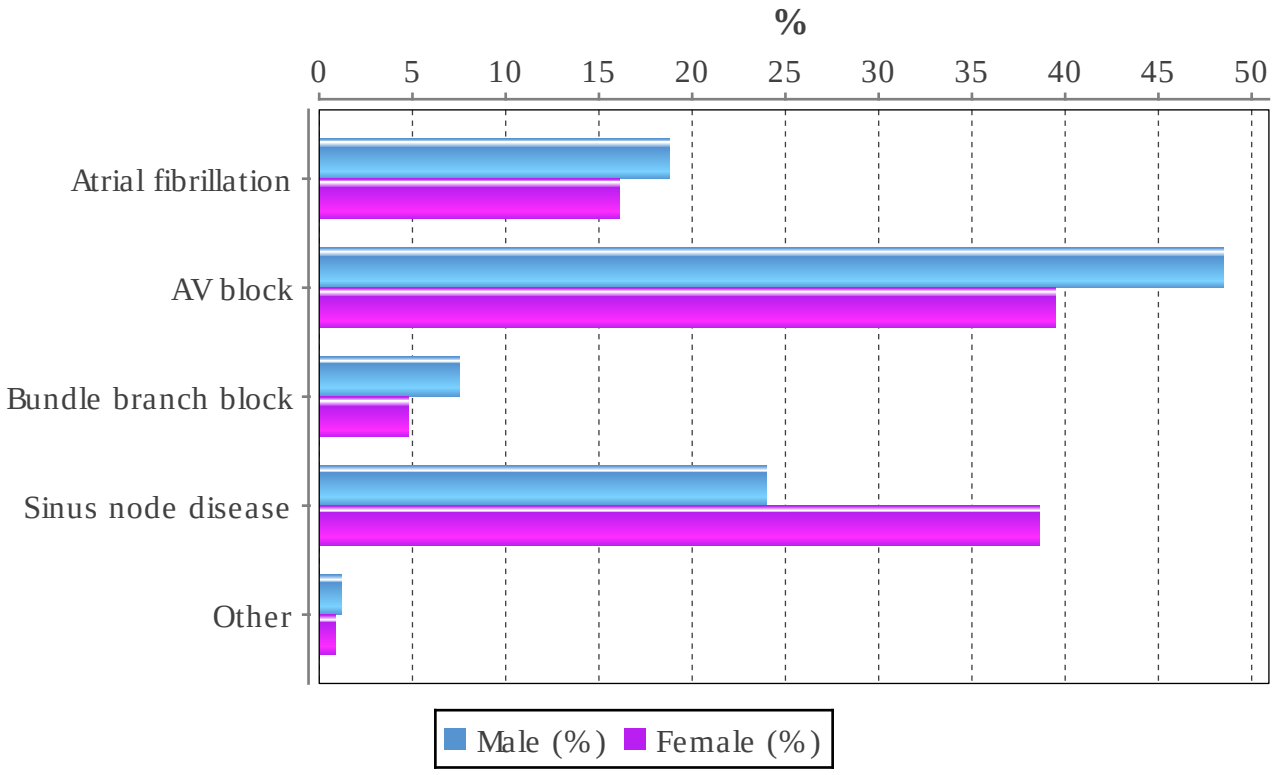
Indication	%
AV-block I	1.3
AV-block II, Mobitz typ 2	15.1
AV-block II, Wenchebach	2.9
AV-block III, narrow QRS	6.0
AV-block III, unspec	14.7
AV-block III, wide QRS	4.9
Afib + AV-block	3.0
Bifascicular block	2.9
Chronic Afib	11.3
LBBB	3.2
NSR + abnormal EPS	0.0
Normal sinusrhythm	1.0
Px Afib	3.0
Px Afib with interatrial block	0.5
RBBB	0.3
SSS, SA-arrest, bradycardia	17.2
SSS, tachy/brady	12.7
Torsade de pointe	0.0



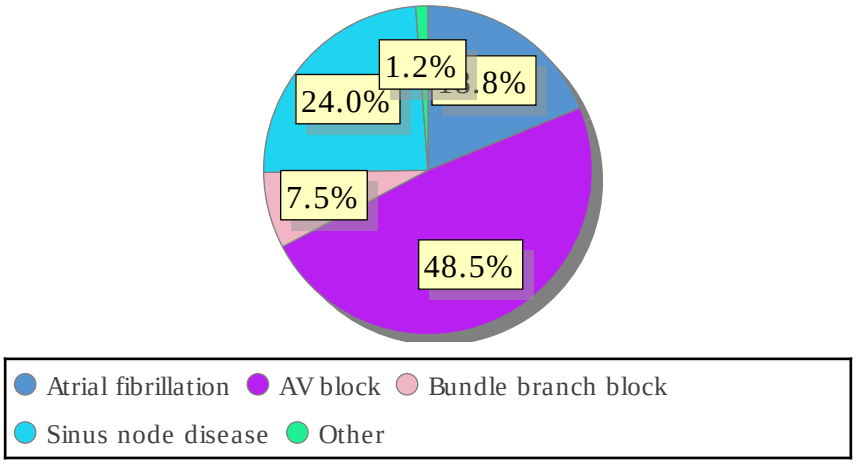
Main ECG indication by gender and for patients < 18 years of age

Indication	No	%	Male (%)	Female (%)	Younger than 18 (%)
Atrial fibrillation	1254	17.7	18.8	16.1	0.0
AV block	3174	44.9	48.5	39.5	76.5
Bundle branch block	454	6.4	7.5	4.8	0.0
Sinus node disease	2115	29.9	24.0	38.6	11.8
Other	76	1.1	1.2	0.9	11.8
					Total number of implants 7073

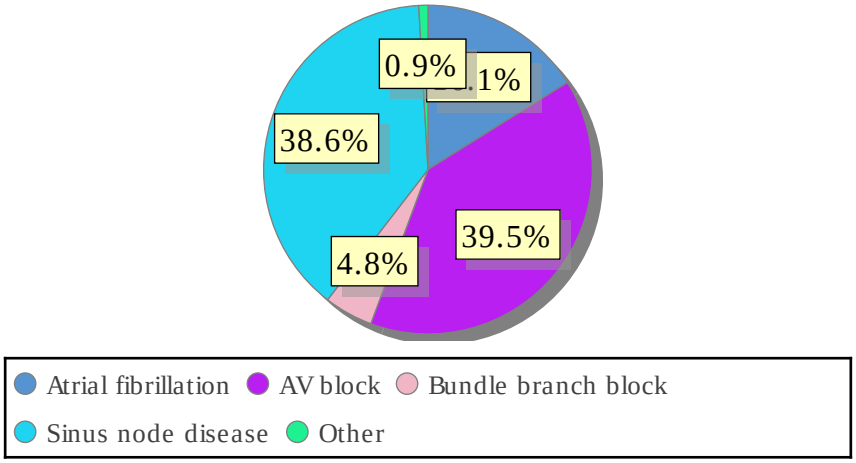




Male



Female



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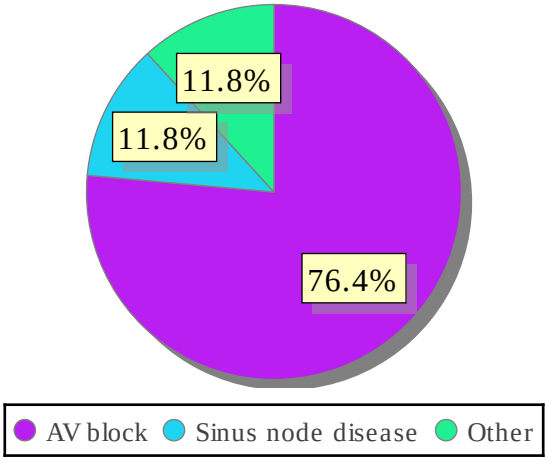
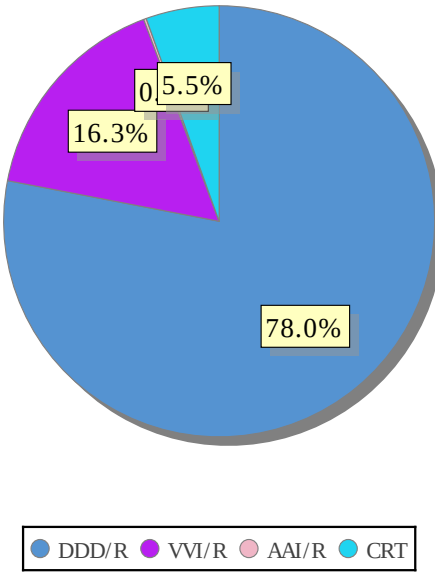


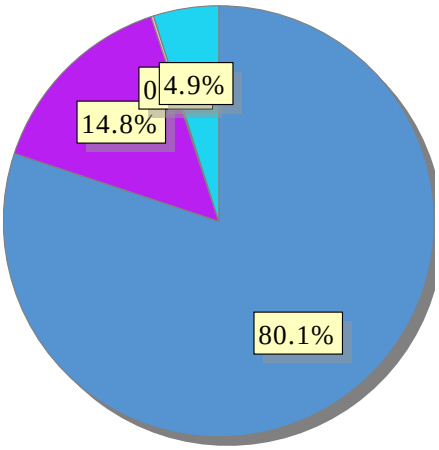
Use of pacemaker subtype for all indications per hospital size (number of new implants/year and hospital)

Size	Hospitals	DDD %	VVI %	AAI %	CRT %
Large	17	77.5	16.1	0.1	6.3
Medium	14	80.1	14.8	0.2	4.9
Small	14	76.1	22.5	0.9	0.5
Total	45	78.1	16.3	0.2	5.5

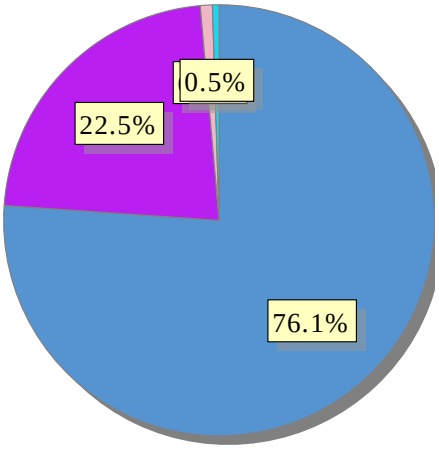
All hospitals



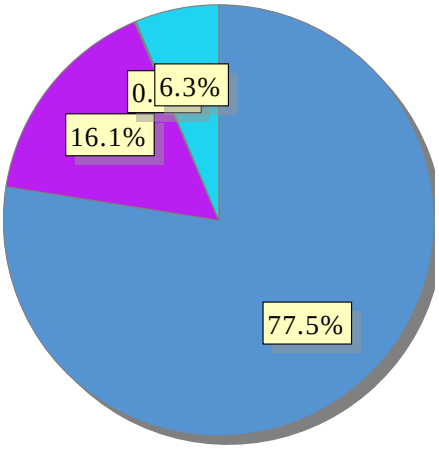
Medium hospitals



Small hospitals



Large hospitals



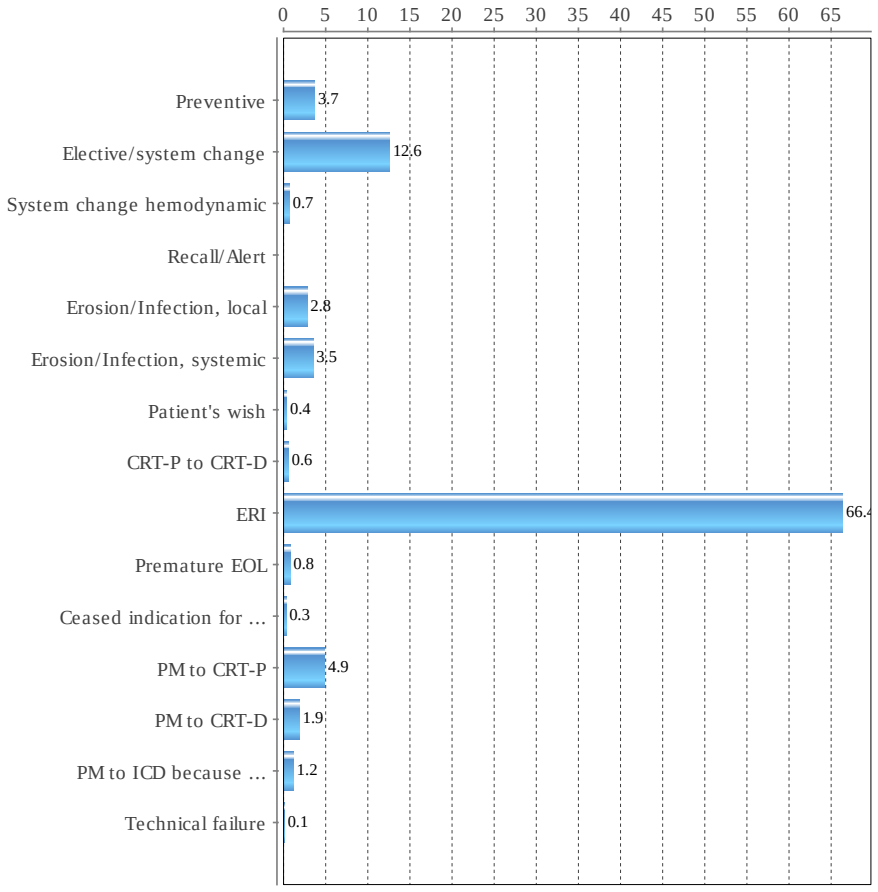
STATISTICS – PACEMAKER – USE OF PACING
MODES FIRST IMPLANT PER HOSPITAL

Use of pacemaker sub type for all indications per hospital (number of new implants / year and hospital))

Hospital	Number	DDD %	VVI %	AAI %	CRT %
Akademiska sjukhuset	282	77.0	18.8	0.0	4.3
Alingsås lasarett	69	73.9	20.3	5.8	0.0
Arvika sjukhus	4	50.0	50.0	0.0	0.0
Blekingesjukhuset	180	82.2	11.1	0.0	6.7
Centrallasarettet Växjö	117	82.1	12.8	0.0	5.1
Centralsjukhuset Karlstad	125	79.2	14.4	0.0	6.4
Centralsjukhuset Kristianstad	228	80.3	19.3	0.4	0.0
Centralsjukhuset Västerås	174	75.9	19.0	0.0	5.2
Danderyds sjukhus	367	80.9	12.8	0.0	6.3
Drottning Silvias Bus	10	60.0	30.0	10.0	0.0
Falu lasarett	224	73.2	20.5	0.4	5.8
Helsingborgs lasarett	38	78.9	21.1	0.0	0.0
Hudiksvalls sjukhus	53	75.5	24.5	0.0	0.0
Karolinska Universitetssjukhuset	359	77.2	8.6	0.0	14.2
Kungälvs sjukhus	85	81.2	16.5	2.4	0.0
Linköpings Universitetssjukhus	365	77.3	13.4	0.0	9.3
Länssjukhuset Gävle	205	75.6	20.0	0.0	4.4
Länssjukhuset Halmstad	106	76.4	23.6	0.0	0.0
Länssjukhuset Kalmar	75	62.7	33.3	0.0	4.0
Länssjukhuset Ryhov	204	82.8	17.2	0.0	0.0
Mälarsjukhuset	156	84.6	8.3	0.0	7.1
Norrlands Universitetssjukhus	162	76.5	11.1	0.6	11.7
Oskarshamns sjukhus	18	72.2	27.8	0.0	0.0
Sahlgrenska Universitetssjukhuset	362	77.6	14.9	0.6	6.9
Sahlgrenska Universitetssjukhuset /Östra	70	85.7	14.3	0.0	0.0
Skaraborgs sjukhus Skövde	220	68.6	15.9	0.0	15.5
Skellefteå lasarett	54	77.8	22.2	0.0	0.0
Skånes universitetssjukhus, Lund	428	78.0	15.7	0.2	6.1
Skånes universitetssjukhus, Malmö	268	79.1	20.9	0.0	0.0
Sollefteå sjukhus	15	53.3	46.7	0.0	0.0
St Görans sjukhus	298	82.2	13.8	0.0	4.0
Sunderby sjukhus	246	69.1	26.0	0.0	4.9
Sundsvalls sjukhus	205	86.3	12.7	0.0	1.0
Södersjukhuset	253	77.9	13.0	0.0	9.1
Södra Älvsborgs sjukhus	162	75.9	17.3	0.0	6.8
Torsby sjukhus	28	60.7	39.3	0.0	0.0
Trollhättan, NÄL	247	77.3	17.0	0.0	5.7
Universitetssjukhuset Örebro	169	82.2	15.4	0.0	2.4
Varbergs sjukhus	117	80.3	15.4	0.0	4.3
Visby lasarett	25	88.0	12.0	0.0	0.0
Vrinnevisjukhuset	1	100.0	0.0	0.0	0.0
Västerviks sjukhus	41	85.4	14.6	0.0	0.0
Örnsköldsviks sjukhus	64	87.5	12.5	0.0	0.0
Östersunds sjukhus	172	78.5	17.4	0.0	4.1

Reason for generator explant. Elective used for changes performed before reached ERI/EOL.

Reason	All hospitals %	(large) %	(medium) %	(small) %
Preventive	3.7	1.7	9.3	3.3
Elective/system change	12.6	16.5	4.0	6.5
System change hemodynamic	0.7	0.6	1.2	0.0
Recall/Alert	0.0	0.0	0.0	0.5
Erosion/Infection, local	2.8	3.5	1.7	0.0
Erosion/Infection, systemic	3.5	4.7	1.1	0.9
Patient's wish	0.4	0.2	0.9	0.5
CRT-P to CRT-D	0.6	0.7	0.6	0.0
ERI	66.4	61.9	72.1	85.6
Premature EOL	0.8	0.8	0.5	2.3
Ceased indication for PM therapy	0.3	0.2	0.6	0.0
PM to CRT-P	4.9	5.4	5.0	0.5
PM to CRT-D	1.9	2.1	1.8	0.0
PM to ICD because of arrhythmia	1.2	1.4	1.1	0.0
Technical failure	0.1	0.1	0.2	0.0

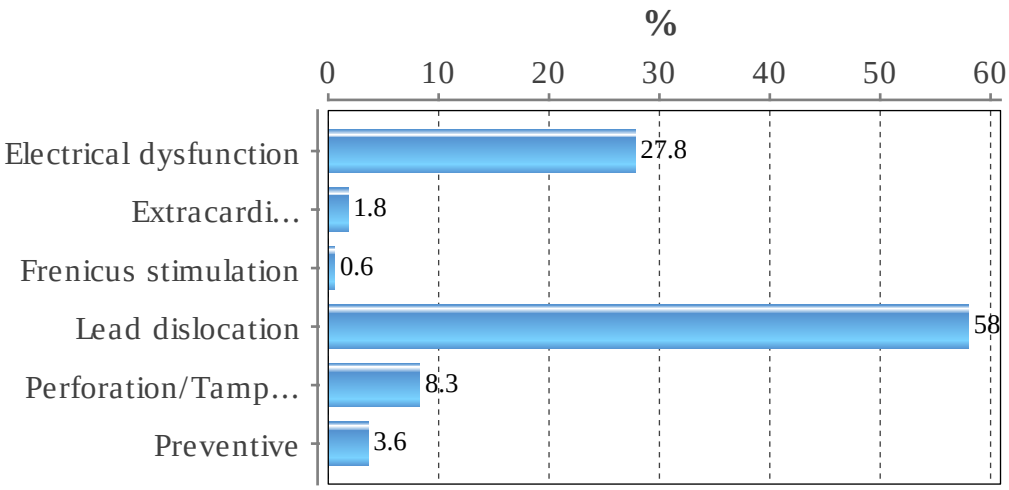


Historical explant indications

Reason	2013 %	2014 %	2015 %	2016 %	2017 %
Preventive	6.8	5.4	4.3	3.6	3.7
Elective/system change	2.6	3.8	10.3	11.7	12.6
System change hemodynamic	0.9	0.8	0.8	0.9	0.7
Erosion/Infection, local	3.4	3.3	3.1	2.9	2.8
Erosion/Infection, systemic	1.5	1.9	2.2	2.9	3.5
Patient's wish	0.3	0.3	0.4	0.2	0.4
ERI	74.8	73.1	68.4	64.8	66.4
Premature EOL	2.8	2.3	0.8	0.8	0.8
Ceased indication for PM therapy	0.8	0.3	0.3	0.5	0.3
PM to CRT-P	3.3	3.8	4.5	5.6	4.9
PM to CRT-D	1.4	2.4	3.0	2.4	1.9
PM to ICD because of arrhythmia	1.1	1.7	1.0	1.3	1.2
Technical failure	0.4	0.9	0.4	0.6	0.1
CRT-P to CRT-D	0.0	0.0	0.4	0.5	0.6
Heart transplant	0.0	0.0	0.1	0.1	0.0
Recall/Alert	0.0	0.0	0.0	1.2	0.0

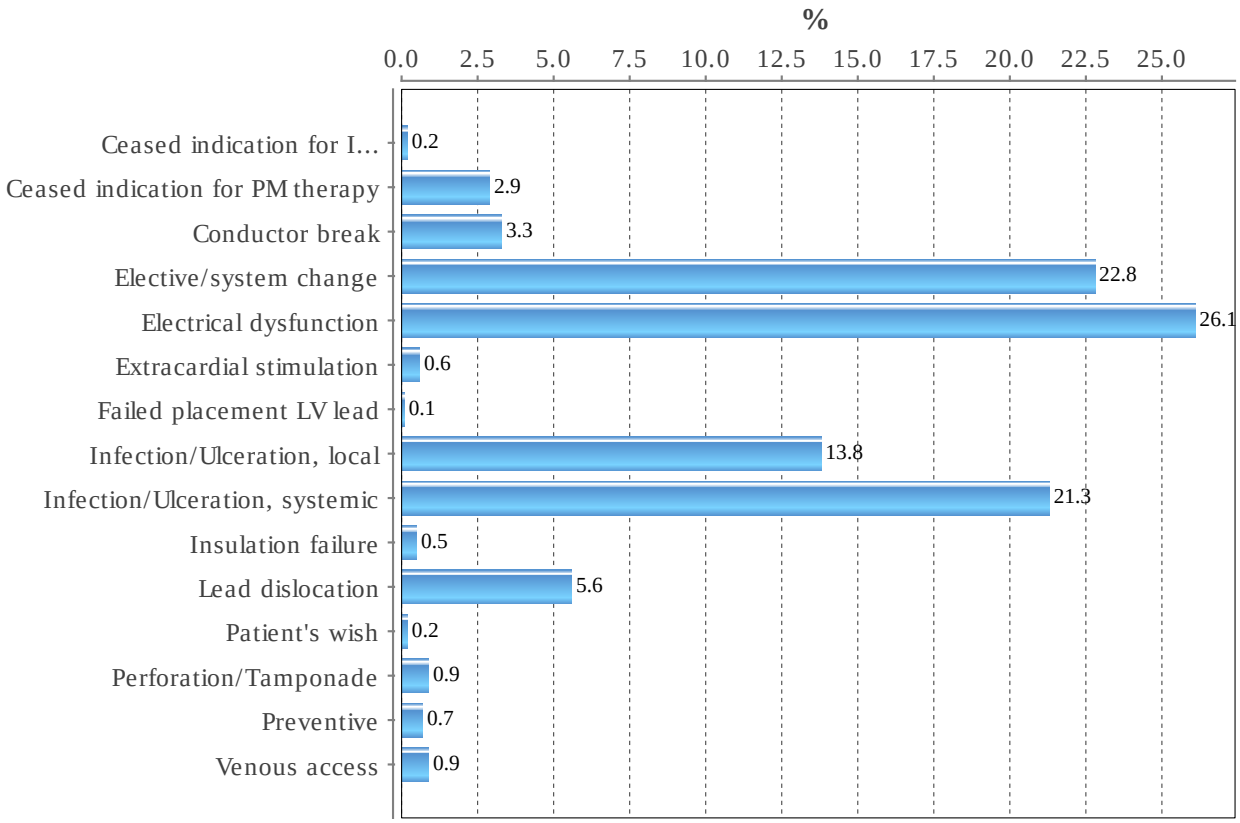
Reason for lead correction/reoperation by hospital size (number of new implants/ year and hospital) Electrical dysfunction including undersense and threshold increase.

Reason	All hospital (%)	Small (%)	Medium (%)	Large (%)
Electrical dysfunction	27.8	72.7	28.6	22.5
Extracardial stimulation	1.8	0.0	0.0	2.9
Frenicus stimulation	0.6	0.0	0.0	1.0
Lead dislocation	58.0	27.3	60.7	59.8
Perforation/Tamponade	8.3	0.0	5.4	10.8
Preventive	3.6	0.0	5.4	2.9
				Total no 169



Reason for lead explants by hospital size. (number of new implants/year and hospital)

Reason	All hospitals(%)	Small (%)	Medium (%)	Large (%)
Ceased indication for ICD therapy	0.2	-	-	0.3
Ceased indication for PM therapy	2.9	-	8.7	1.5
Conductor break	3.3	5.8	4.4	2.8
Elective/system change	22.8	30.8	31.6	19.8
Electrical dysfunction	26.1	51.9	25.2	24.6
Extracardial stimulation	0.6	-	1.5	0.4
Failed placement LV lead	0.1	-	-	0.1
Infection/Ulceration, local	13.8	-	8.3	16.3
Infection/Ulceration, systemic	21.3	5.8	9.2	25.8
Insulation failure	0.5	-	0.5	0.5
Lead dislocation	5.6	3.8	6.3	5.6
Patient's wish	0.2	-	1.0	-
Perforation/Tamponade	0.9	1.9	0.5	0.9
Preventive	0.7	-	1.9	0.4
Venous access	0.9	-	1.0	0.9
				Total no 995



Procedures per operator (exclusive CRT)

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	59
	Dimberg	6
	Haupt	15
	Janiec	3
	Jidéus	3
	Landelius	3
	Lindblom	2
	Melki	4
	Mörtsell	4
	Ostrowska	97
	Sciaraffia	77
	Teder	92
	Thorén	1
	Vali	2
	Vikholm	2
	Zemgulis	4
Alingsås lasarett	Kennergren	35
	Westerberg	52
Arvika sjukhus	Westbom	16
Ålands centralsjukhus	Ove Carlström	5
	Slotte	23
Blekingesjukhuset	Annan	1
	Borg	116
	Ericsson	24
	Ghaidan, Haider	9
	Kristjansson	1
	Ringborn, Michael	47
Centrallasarettet Växjö	Annan	2
	Johansson P	32
	Jonasson	33
	Rosén Helena	38
	Strandberg	34
	Strömberg	1
Centralsjukhuset Karlstad	Hallén	1
	Khalili	55
	Niklas Aldergård	35
	Saidi	58
Centralsjukhuset Kristianstad	Babiak	91
	Bakos	101
	Gadler	1
	Östenson	97
Centralsjukhuset Västerås	Azizi	8
	SkoglundAndersson	80
	Wiberg	105
Danderyds sjukhus	2	157
	3	108
	4	175
	6	49
Drottning Silvias Bus	Berggren	3
	Hallhagen	4
	Nilsson B	5
	Nilsson L	1
	Oskar Väärt	1
	Synnergren	4
Falu lasarett	Monheim	38
	Berglund	60
	Forsgren	86
	Guggi	92
Gävle sjukhus	Falck	2
	Jakobsson Stefan	46
	Johansson Staffan	24
	Kastberg	91
	Magnusson Peter	49
	Mati Jalakas	59
Helsingborgs lasarett	Jacobsson	15
	Rorsman	15
	Svensson	1
	Utter	14
Hudiksvalls sjukhus	Roussinne	78
Karolinska Universitetssjukhus	Annan	6
	Gadler	133
	Hörnsten	130
	Reistam	150
	Reistam/ Hörnsten	1
	Westholm	5
Kungälvs sjukhus	Norström	1
	Schultz	112
Länssjukhuset Halmstad	Martin Löfgren	63
	Rikard Berggren	77
	Rorsman-Söderström	8
Länssjukhuset Kalmar	Carlström	2
	David Olsson	36
	Hendrik Schreyer	34
	Jörg Carlsson	6
	Michael Lindstaedt	18
Länssjukhuset Ryhov	Annan	26
	Lagerberg	154
	Säfström	27
	Sonesson	8
	Stefanik	18
	Stumpf	23

Hospital	Operator	No
	Szamlewski	4
	Szymanowski	11
Linköpings universitetssjukhus	Pinna C	65
	Säfström K	123
	Sonesson L	54
	Svenson A	60
	Szymanowski A	92
Mälarsjukhuset	Andreas Pikwer	7
	Axel Nyberg	25
	Carl Westholm	45
	Gabriele Backers	10
	Georgios Matthaiou	30
	Hanan Alwan	7
	Jan Haapaniemi	30
	Joanna Mirowska	9
	Kave Keshavarz	13
	Krister Blomberg	1
	Linda Ärlehag	2
	Peter Spetz	14
	Ulla Lindblad	4
Norrlands Universitetssjukhus	Andersson	71
	Annan	2
	Forsgren	6
	Höglund	7
	Jensen	9
	Kesek	32
	Landström	21
	Rönn	25
Oskarshamns sjukhus	Verstraaten	20
Örnsköldsviks sjukhus	Ehlin	77
Östersunds sjukhus	Björklund	7
	Friberg	78
	Hansson	114
Sahlgrenska universitetssjukhuset	Ammar Taha	4
	Annan	30
	Jakob Gäbel	5
	Javid	2
	Kennergren	7
	Konstantinos Liakatsidas	66
	Piotr Szamlewski	159
	Shabbar Jamaly	148
	Stefan Jakobsson	28
Sahlgrenska universitetssjukhuset / Östra	Johansson B	110
	Piotr Szamlewski	3
Skaraborgs sjukhus Skövde	Anna Widunder	49
	Annan	1
	Daniel Hellner	12
	Falmer	28
	Lorentzen	54
	Paulsson	27
	Winterfeldt	61
Skånes universitetssjukhus, Lund	Annan	5
	David Mörtsell	7
	Erik Ljungström	5
	Jesper van der Pals	47
	Johan Brandt	247
	LingWei Wang	96
	Maiwand Farouq	71
	Martin Löfgren	48
	Pyotr Platonov	10
	Rasmus Borgquist	18
	Rorsman-Söderström	12
	Steen Jensen	15
	Tina Tahna	1
	Zoltan Bakos	2
Skånes universitetssjukhus, Malmö	Annan	25
	Johan Brandt	91
	Lingwei Wang	9
	Maiwand Farouq	36
	Rasmus Borgquist	17
	Torbjörn Persson	212
Skellefteå lasarett	Boström	9
	Bygdén	33
	Lindqvist	24
Sollefteå sjukhus	Åström	13
	Rudenstam	6
Södersjukhuset	Jonsson J-E	56
	Kjellman B	100
	Olson J	62
	Rydlund K	121
Södra Älvsborgs sjukhus	Hoff	3
	Litzén	1
	Lodin	59
	Riemer	56
	Widfeldt	103
St Görans sjukhus	1	116

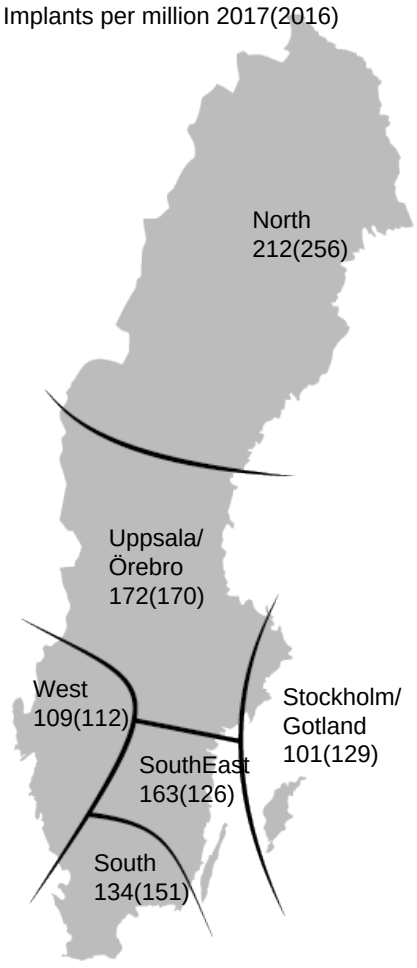
Hospital	Operator	No
	2	131
	3	114
Sunderby sjukhus	Agneta Johansson	100
	Annica Wennberg	22
	Lundblad	9
	Marcus Baas	51
	Peter Johansson	38
	Peter Rangson	73
Sundsvalls sjukhus	Annan	13
	Backman	1
	Ciubine	97
	Haupt	6
	Khadhim	76
	Sundelin	39
Torsby sjukhus	Bentjerodt	36
	Venizelos	3
Trollhättan, NÄL	Alice David	62
	Csaba Herczku	18
	Dinu Dusceac	65
	Jabbar	25
	Javid	107
	Orsolya Bene	5
	Söderbergh	11
	Usama	1
	Wetterling	27
Universitetssjukhuset Örebro	Anna Björkenheim	89
	Áron Sztanislav	6
	Barbara Kurt	8
	Friberg	1
	Lindell	76
	Tommy Andersson	71
Varbergs sjukhus	Emma Sandgren	35
	Pedersen	1
	Rorsman	117
Västerviks sjukhus	Emil Tomov	30
	Joachim Starck	17
Visby lasarett	Jacobsson L	35
	Litorell	13
Vrinnevisjukhuset	N/A	1

First implants per hospital (inclusive CRT)

Region	Hospital	2017	2016
Northern Sweden	Norrlands Universitetssjukhus	51	63
	Skellefteå lasarett	2	4
	Sunderby sjukhus	50	66
	Sundsvalls sjukhus	56	54
	Örnsköldsviks sjukhus	9	12
	Östersunds sjukhus	27	23
Southern Sweden	Blekingesjukhuset	34	35
	Centrallasarettet Växjö	23	27
	Länssjukhuset Halmstad	1	0
	Skånes universitetssjukhus, Lund	175	204
	Varbergs sjukhus	36	33
South-East Sweden	Linköpings Universitetssjukhus	116	78
	Länssjukhuset Kalmar	35	42
	Länssjukhuset Ryhov	29	19
Stockholm/Gotland	Danderyds sjukhus	49	64
	Karolinska Universitetssjukhuset	109	168
	St Görans sjukhus	48	47
	Södersjukhuset	44	63
	Visby lasarett	3	2
Uppsala/Örebro	Akademiska sjukhuset	65	71
	Centralsjukhuset Karlstad	36	39
	Centralsjukhuset Västerås	37	42
	Falu lasarett	58	59
	Hudiksvalls sjukhus	4	4
	Länssjukhuset Gävle	61	55
	Mälarsjukhuset	35	3
	Universitetssjukhuset Örebro	51	44
Western Sweden	Drottning Silvias Bus	1	1
	Sahlgrenska Universitetssjukhuset	80	67
	Skaraborgs sjukhus Skövde	27	25
	Södra Älvsborgs sjukhus	37	43
	Trollhättan, NÄL	47	49

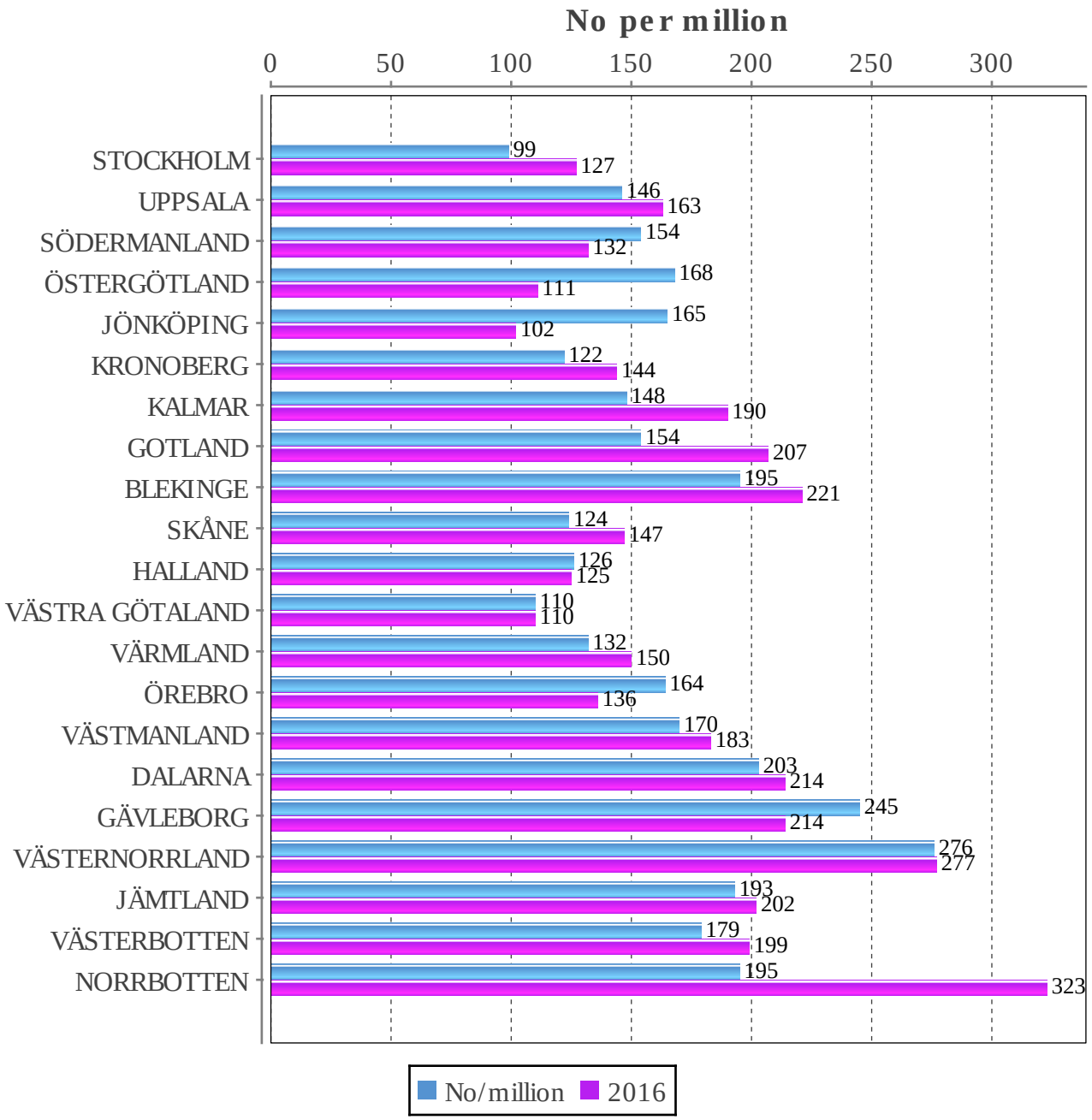
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2366738	238	101	2507
Uppsala/Örebro	2082515	359	172	2614
South-East Sweden	1058269	172	163	1153
Southern Sweden	1837468	246	134	2048
Western Sweden	1879718	204	109	1607
Northern Sweden	895534	190	212	1257
Total	10120242	1409	139	11186



The regions are based on where the patients live, not where they are treated

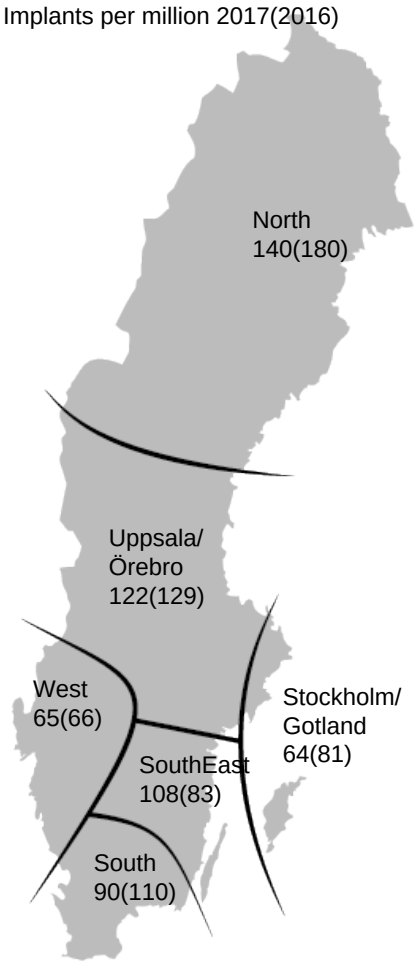
County	Population	No of first	No/million	Active patients
STOCKHOLM	2308143	229	99	2416
UPPSALA	368971	54	146	473
SÖDERMANLAND	291341	45	154	337
ÖSTERGÖTLAND	457496	77	168	439
JÖNKÖPING	357237	59	165	390
KRONOBERG	197519	24	122	212
KALMAR	243536	36	148	324
GOTLAND	58595	9	154	91
BLEKINGE	159371	31	195	199
SKÅNE	1344689	167	124	1469
HALLAND	324825	41	126	359
VÄSTRA GÖTALAND	1690782	186	110	1415
VÄRMLAND	280399	37	132	271
ÖREBRO	298907	49	164	351
VÄSTMANLAND	271095	46	170	321
DALARNA	286165	58	203	392
GÄVLEBORG	285637	70	245	469
VÄSTERNORRLAND	245968	68	276	354
JÄMTLAND	129806	25	193	122
VÄSTERBOTTEN	268465	48	179	356
NORRBOTTEN	251295	49	195	425
Total	10120242	1408	139	11185


No per million
0
50
100
150
200
250
300
STOCKHOLM
99
127
UPPSALA
146
163
SÖDERMANLAND
154
132
ÖSTERGÖTLAND
168
111
JÖNKÖPING
165
102
KRONOBERG
122
144
KALMAR
148
190
GOTLAND
154
207
BLEKINGE
195
221
SKÅNE
124
147
HALLAND
126
125
VÄSTRA GÖTALAND
110
110
VÄRMLAND
132
150
ÖREBRO
164
136
VÄSTMANLAND
170
183
DALARNA
203
214
GÄVLEBORG
245
214
VÄSTERNORRLAND
276
277
JÄMTLAND
193
202
VÄSTERBOTTEN
179
199
NORRBOTTEN
195
323
No/million
2016

STATISTICS – ICD – PRIMARY PREVENTION PER REGION

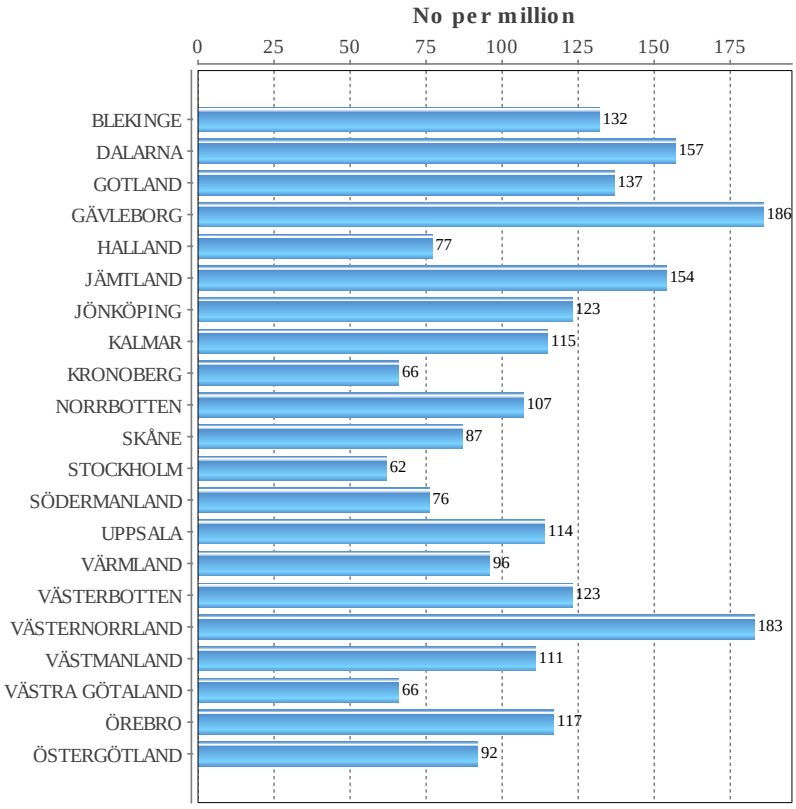
The regions are based on where the patients live, not where they are treated

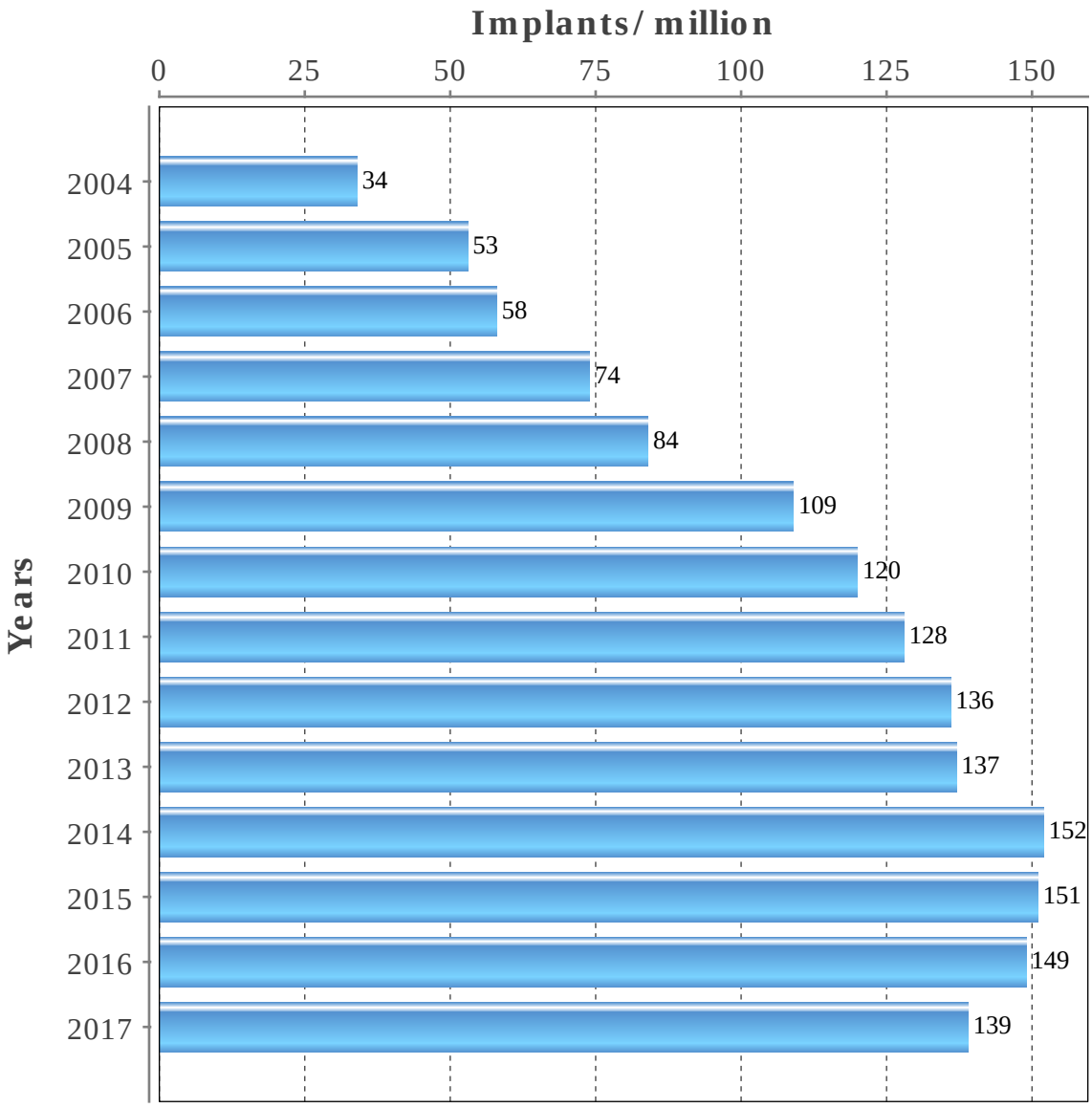
Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2366738	152	64	1485
Uppsala/Örebro	2082515	254	122	1452
South-East Sweden	1058269	114	108	694
Southern Sweden	1837468	166	90	1157
Western Sweden	1879718	123	65	759
Northern Sweden	895534	125	140	648
Total	10120242	934	92	6195



The regions are based on where the patients live, not where they are treated

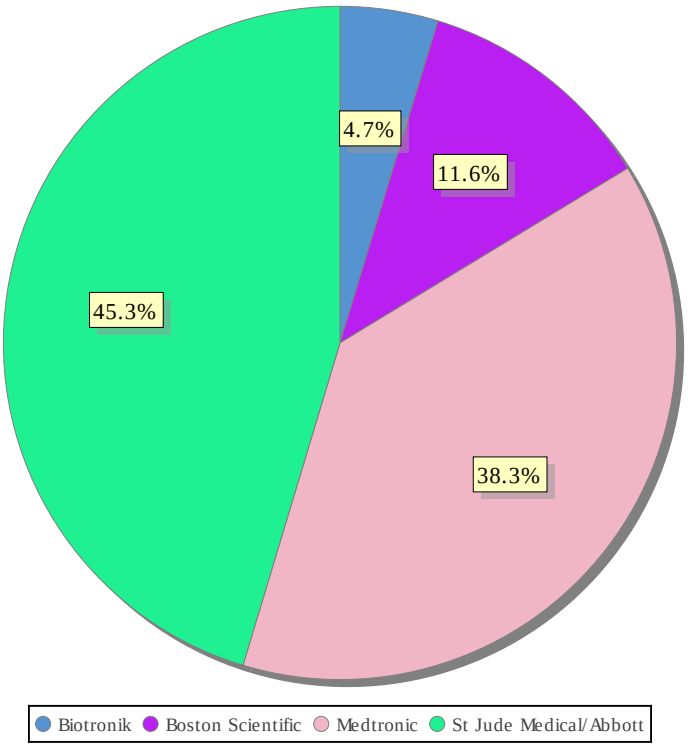
County	Population	No of first	No/million
BLEKINGE	159371	21	132
DALARNA	286165	45	157
GOTLAND	58595	8	137
GÄVLEBORG	285637	53	186
HALLAND	324825	25	77
JÄMTLAND	129806	20	154
JÖNKÖPING	357237	44	123
KALMAR	243536	28	115
KRONOBERG	197519	13	66
NORRBOTTEN	251295	27	107
SKÅNE	1344689	117	87
STOCKHOLM	2308143	144	62
SÖDERMANLAND	291341	22	76
UPPSALA	368971	42	114
VÄRMLAND	280399	27	96
VÄSTERBOTTEN	268465	33	123
VÄSTERNORRLAND	245968	45	183
VÄSTMANLAND	271095	30	111
VÄSTRA GÖTALAND	1690782	112	66
ÖREBRO	298907	35	117
ÖSTERGÖTLAND	457496	42	92
Total	10120242	933	92




Implants/ million
0
25
50
75
100
125
150
Years
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
34
53
58
74
84
109
120
128
136
137
152
151
149
139

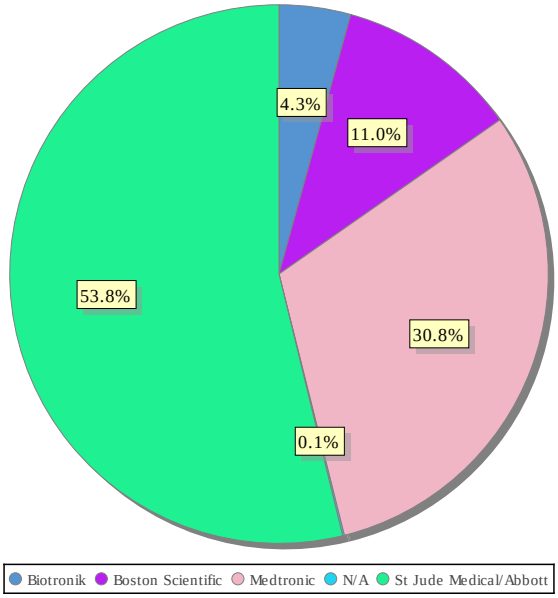
Market share per manufacturer in Sweden

Manufacturer	2014 %	2015 %	2016 %	2017 %
Biotronik	3.7	3.1	4.9	4.7
Boston Scientific	7.9	7.1	10.9	11.6
Medtronic	43.2	46.8	39.6	38.3
St. Jude Medical	44.6	41.8	44.2	45.3
Cameron Health	0.1	-	-	-
NayaMed International	0.5	1.3	0.4	-
Sorin/LivaNova	-	-	-	-
Boston Scientific includes Cameron Health from 2015				



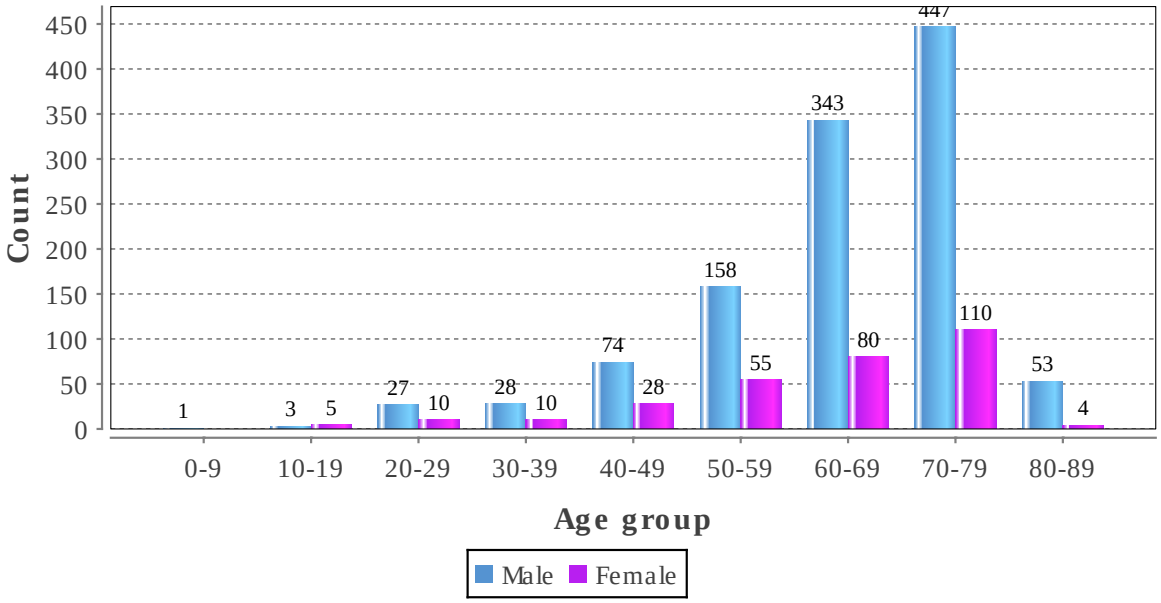
Market share per manufacturer in Sweden

Manufacturer	2014 %	2015 %	2016 %	2017 %
Biotronik	10.3	6.2	5.9	4.3
Boston Scientific	11.0	6.9	9.2	11.0
Medtronic	23.7	25.3	29.6	30.8
St. Jude Medical	54.3	60.7	55.2	53.8
NayaMed International	0.6	0.8	0.1	-
CameronHealth	0.1	-	-	-
N/A	-	-	-	0.1
Boston Scientific includes Cameron Health from 2015				



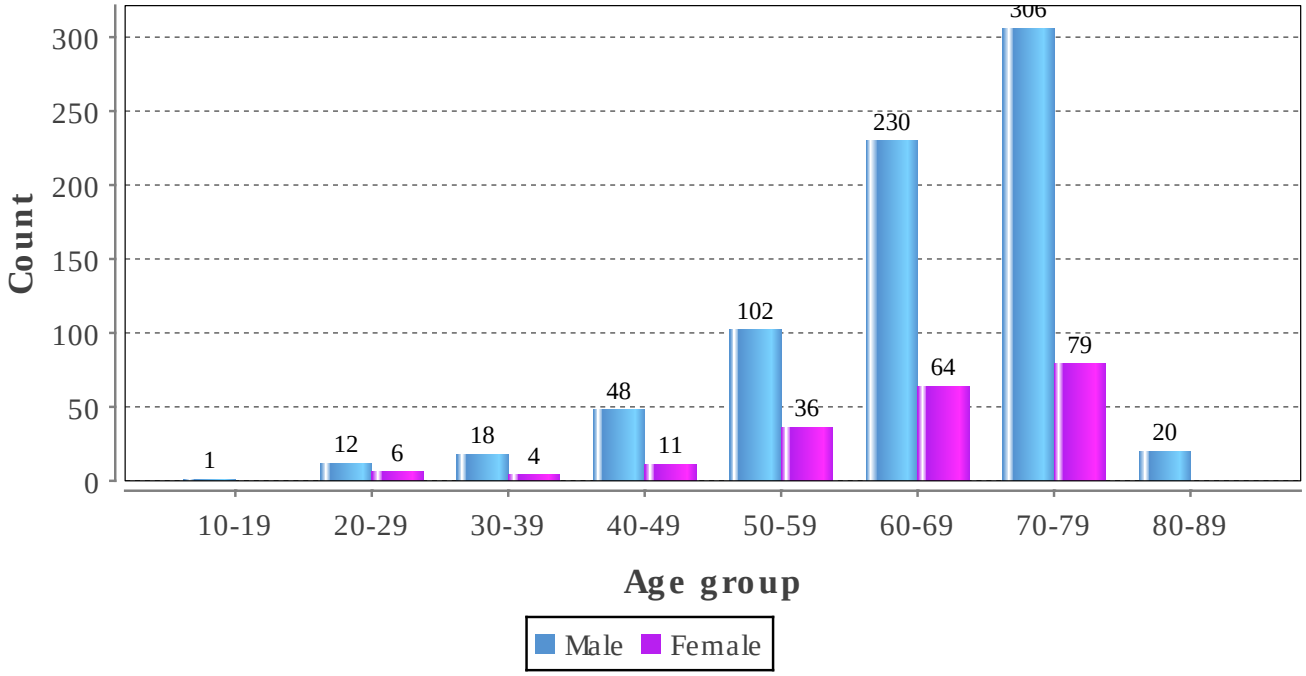
Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
0-9	1	0.1	1	0
10-19	8	0.6	3	5
20-29	37	2.6	27	10
30-39	38	2.6	28	10
40-49	102	7.1	74	28
50-59	213	14.8	158	55
60-69	423	29.5	343	80
70-79	557	38.8	447	110
80-89	57	4.0	53	4
Average age	64	-	65	62
			Total number of implants: 1436	



Primary prevention divided by gender and age.

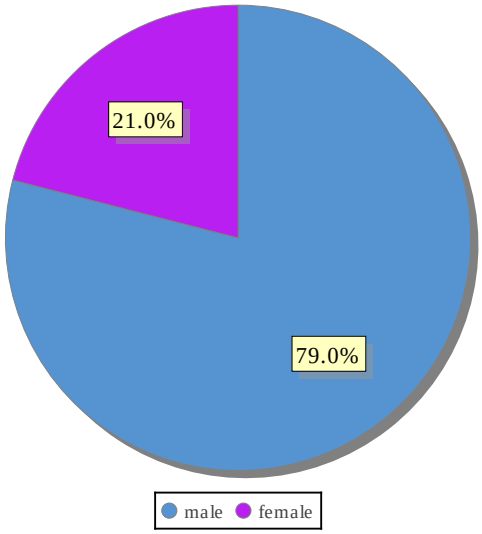
Age (years)	Total no	%	Male	Female
10-19	1	0.1	1	0
20-29	18	1.9	12	6
30-39	22	2.3	18	4
40-49	59	6.3	48	11
50-59	138	14.7	102	36
60-69	294	31.4	230	64
70-79	385	41.1	306	79
80-89	20	2.1	20	0
Average age	65	-	65	64
				Total number of implants: 937



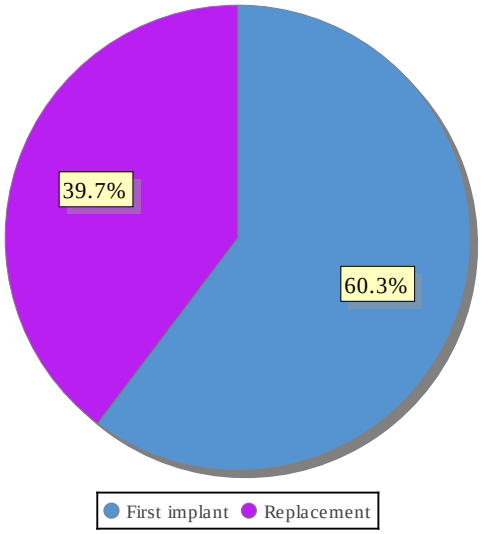
Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1436	60.3	1134	79.0	302	21.0
Replacement	945	39.7	744	78.7	201	21.3
Total	2381	100.0	1878	78.9	503	21.1

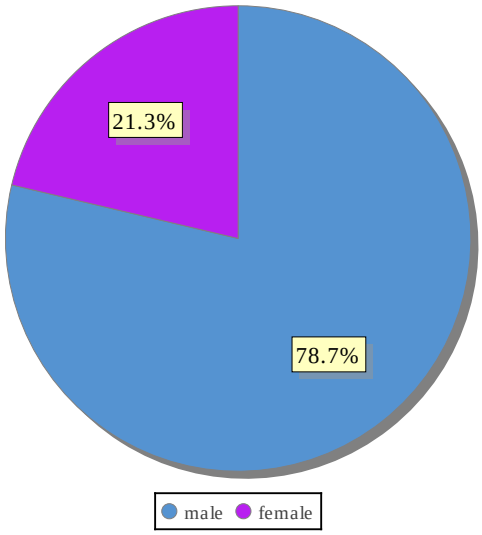
First implant



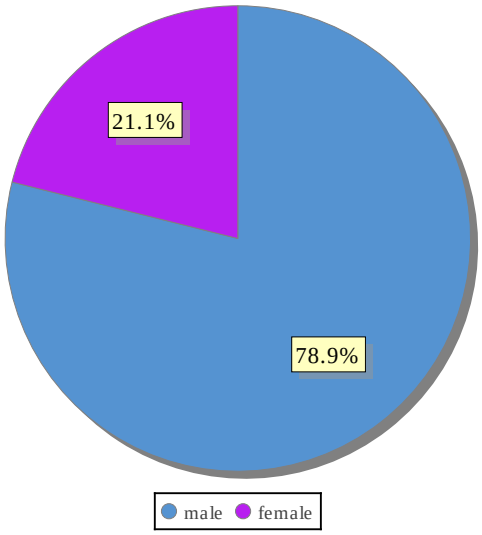
Replacement ratio



Replacement

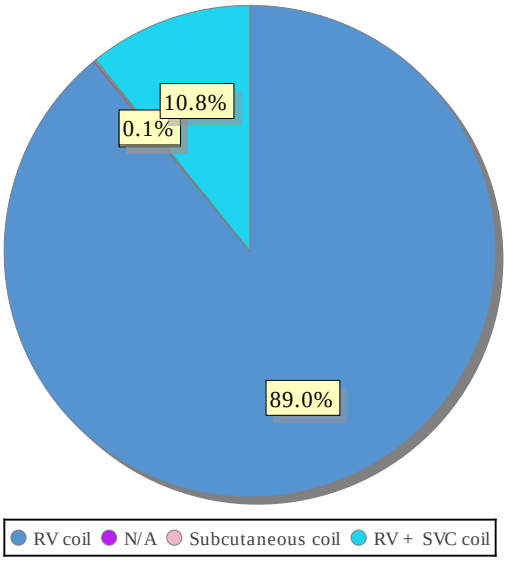


All implant



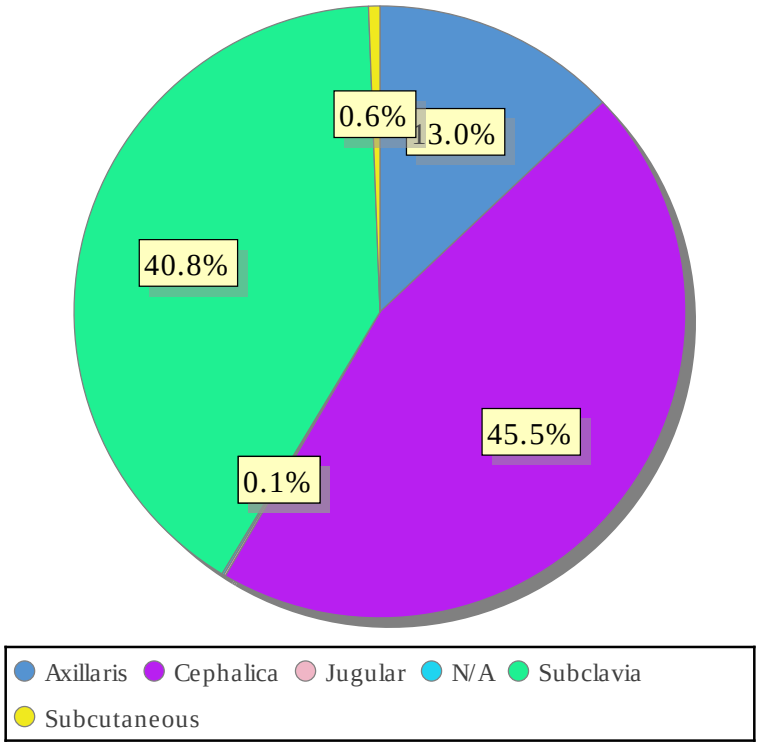
Lead type distribution for atrial and venticular use for new implants and replacements.

	2017		2016	
	no	%	no	%
RV coil	1413	89.1	1369	83.0
N/A	1	0.1	0	0.0
Subcutaneous coil	1	0.1	2	0.1
RV + SVC coil	171	10.8	279	16.9
Active fixation	1559	98.3	1619	98.1
N/A	1	0.1	0	0.0
Passive fixation	26	1.6	31	1.9
Total number of leads - 2017: 1586, 2016: 1650				



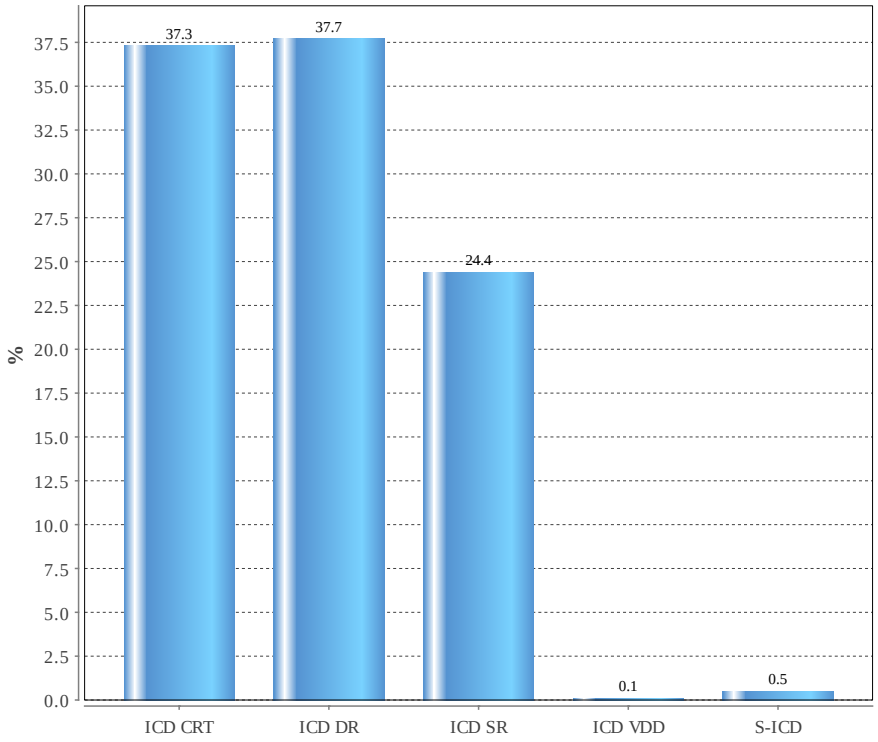
Venous access for new implants and replacements, all type of pacemakers

Lead access	No	%
Axillaris	207	13.0
Cephalica	726	45.5
Jugular	1	0.1
N/A	1	0.1
Subclavia	650	40.8
Subcutaneous	10	0.6



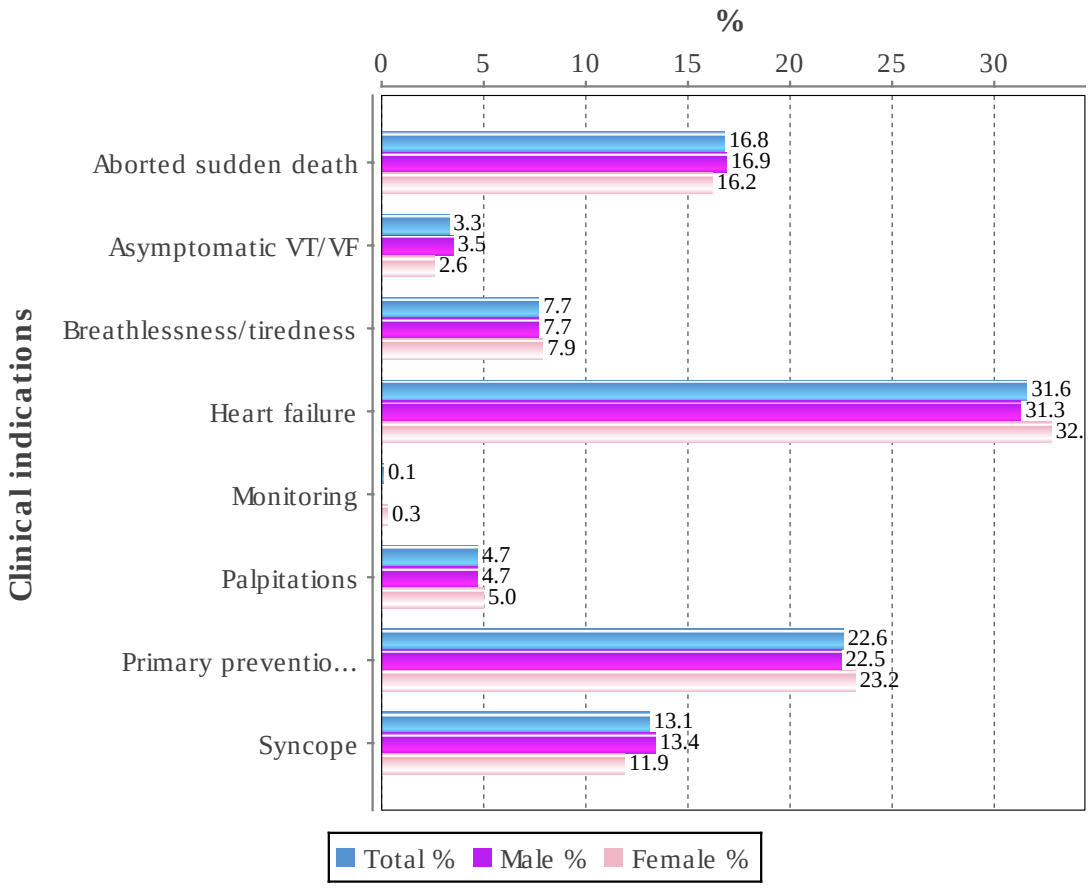
ICD subtype for new implants

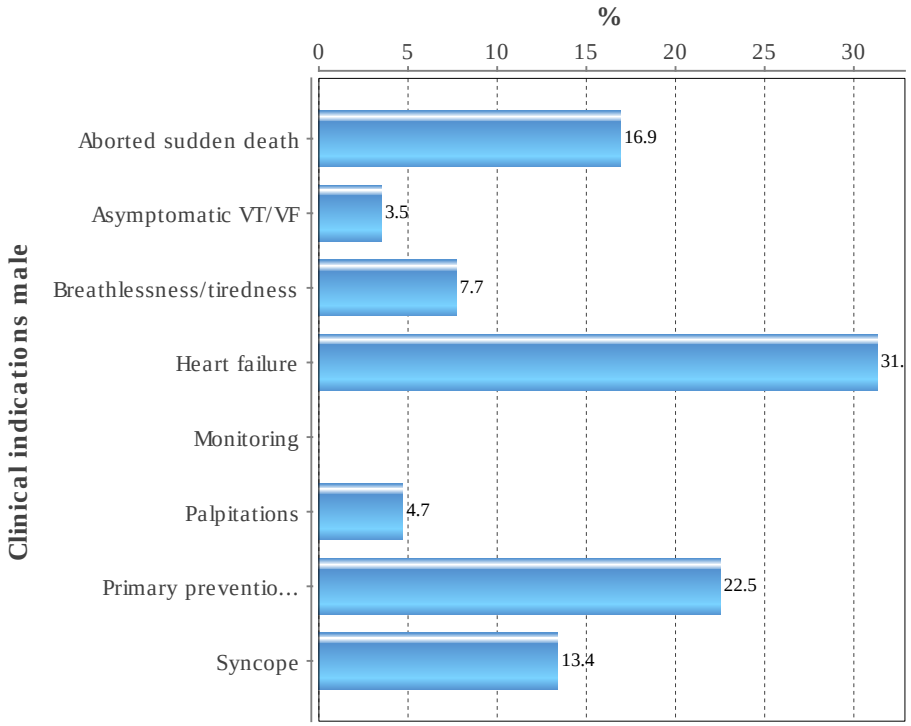
Mode	%	No
ICD CRT	37.3	536
ICD DR	37.7	541
ICD SR	24.4	351
ICD VDD	0.1	1
S-ICD	0.5	7

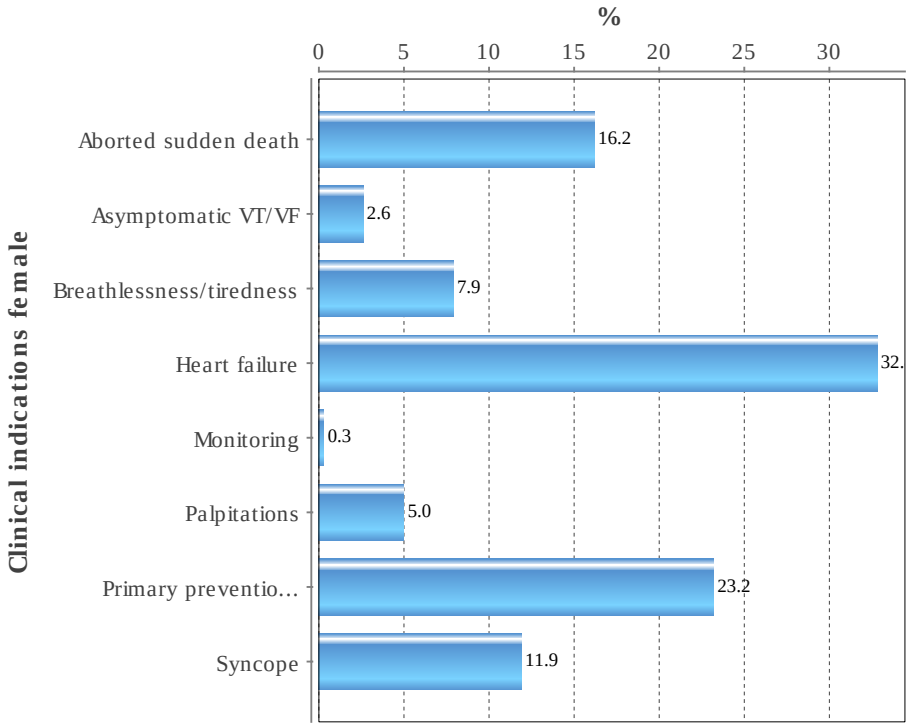


Main symptom for implanting ICDs

Indication	Total %	Male %	Female %
Aborted sudden death	16.8	16.9	16.2
Asymptomatic VT/VF	3.3	3.5	2.6
Breathlessness/tiredness	7.7	7.7	7.9
Heart failure	31.6	31.3	32.8
Monitoring	0.1	0.0	0.3
Palpitations	4.7	4.7	5.0
Primary prevention, asymptomatic	22.6	22.5	23.2
Syncope	13.1	13.4	11.9




%
0
5
10
15
20
25
30
Clinical indications male
Aborted sudden death
16.9
Asymptomatic VT/VF
3.5
Breathlessness/tiredness
7.7
Heart failure
31.
Monitoring
Palpitations
4.7
Primary preventio...
22.5
Syncope
13.4

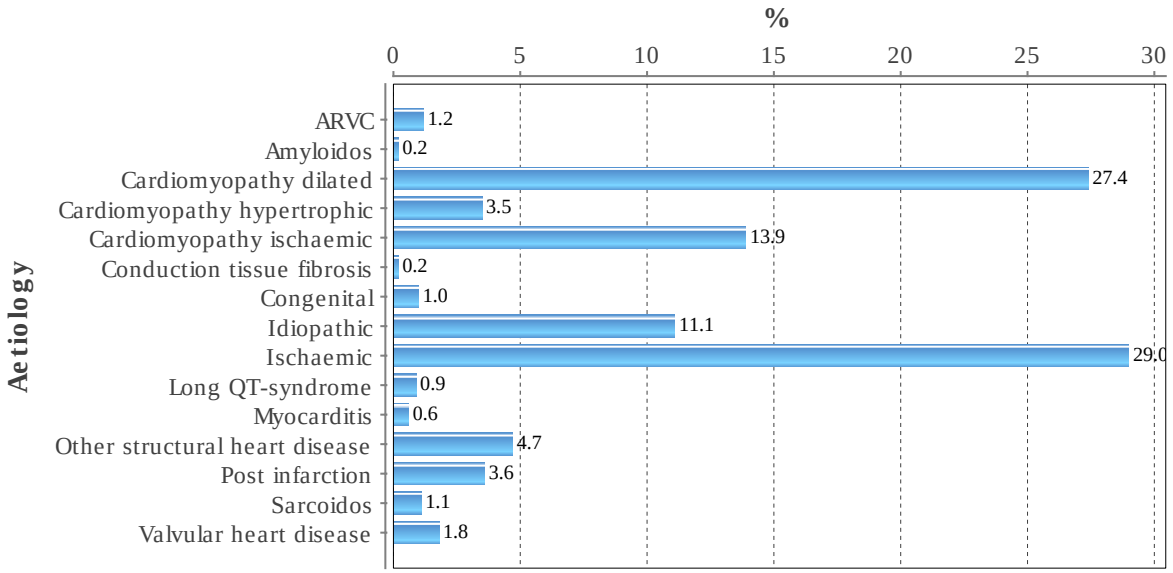

%
0
5
10
15
20
25
30
Clinical indications female
Aborted sudden death
16.2
Asymptomatic VT/VF
2.6
Breathlessness/tiredness
7.9
Heart failure
32.
Monitoring
0.3
Palpitations
5.0
Primary preventio...
23.2
Syncope
11.9

Main symptom for implanting ICDs, historical distribution

Indication	2016 %	2017 %
Aborted sudden death	16.8	16.8
Asymptomatic VT/VF	3.0	3.3
Primary prevention	69.7	66.8
Syncope	10.6	13.1

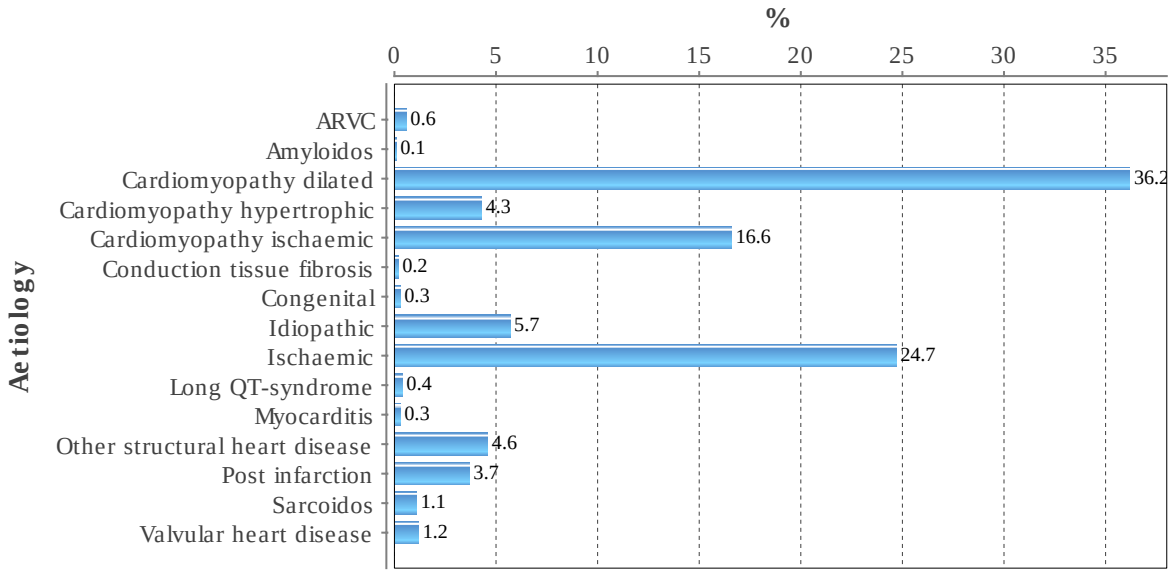
Main aetiology for implanting pacemakers

Aetiology	Total %	Male %	Female %
ARVC	1.2	1.1	1.3
Amyloidos	0.2	0.2	0.3
Cardiomyopathy dilated	27.4	25.7	33.8
Cardiomyopathy hypertrophic	3.5	2.4	7.6
Cardiomyopathy ischaemic	13.9	15.1	9.3
Conduction tissue fibrosis	0.2	0.1	0.7
Congenital	1.0	0.7	2.0
Idiopathic	11.1	10.8	12.6
Ischaemic	29.0	31.6	19.2
Long QT-syndrome	0.9	0.5	2.3
Myocarditis	0.6	0.4	1.3
Other structural heart disease	4.7	4.7	4.6
Post infarction	3.6	4.0	2.0
Sarcoidos	1.1	1.0	1.7
Valvular heart disease	1.8	1.9	1.3



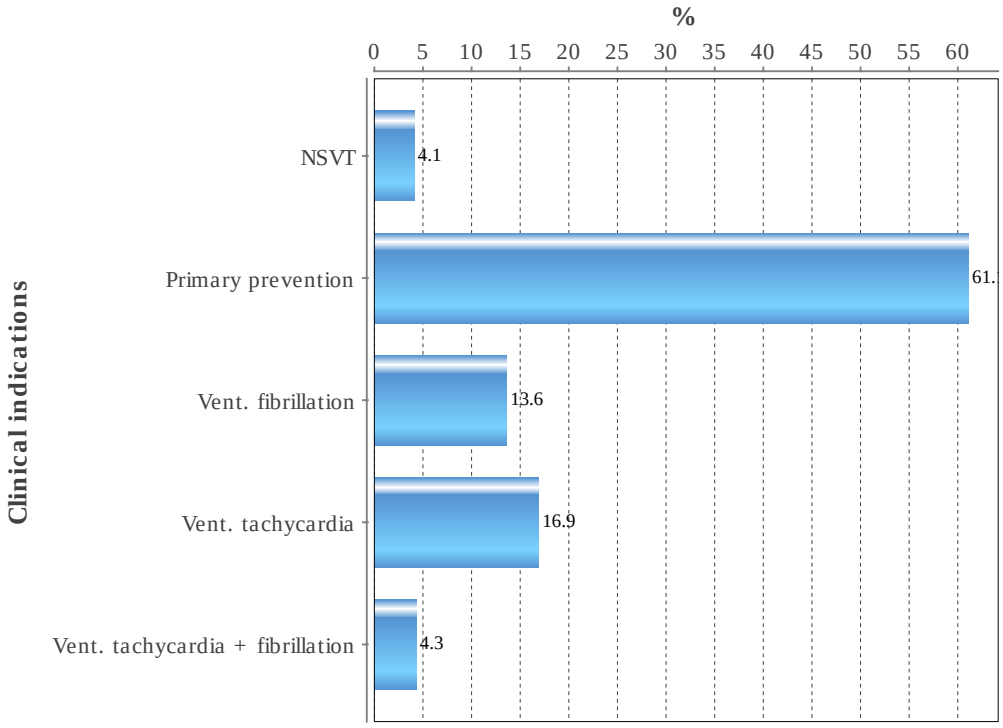
Main aetiology for implanting ICDs due to primary prevention

Aetiology	Total %	Male %	Female %
ARVC	0.6	0.7	0.5
Amyloidos	0.1	0.1	0.0
Cardiomyopathy dilated	36.2	33.6	45.5
Cardiomyopathy hypertrophic	4.3	3.4	7.5
Cardiomyopathy ischaemic	16.6	17.8	12.5
Conduction tissue fibrosis	0.2	0.1	0.5
Congenital	0.3	0.4	0.0
Idiopathic	5.7	5.7	5.5
Ischaemic	24.7	26.3	18.5
Long QT-syndrome	0.4	0.1	1.5
Myocarditis	0.3	0.0	1.5
Other structural heart disease	4.6	4.9	3.5
Post infarction	3.7	4.3	1.5
Sarcoidos	1.1	1.1	1.0
Valvular heart disease	1.2	1.4	0.5



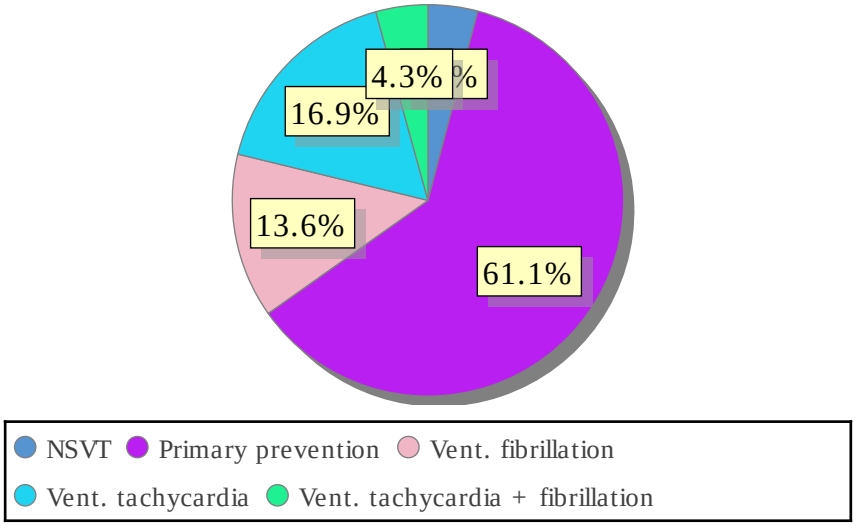
Documented ECG leading to ICD implant. (NSVT=non sustained VT)

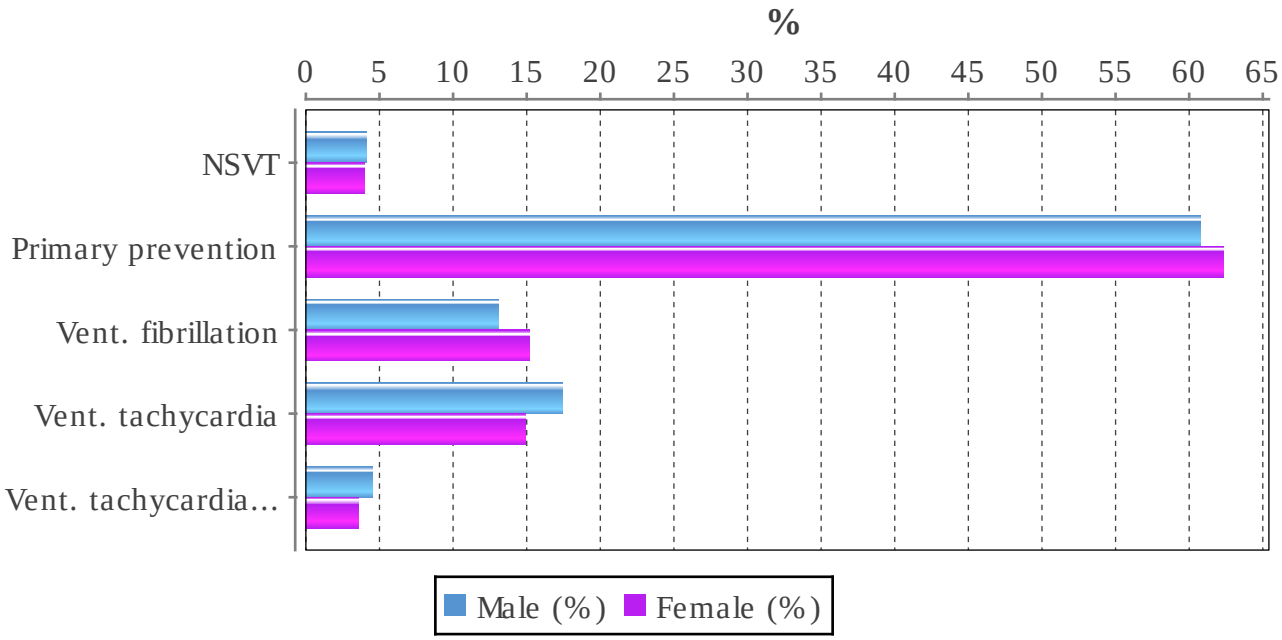
Indication	%
NSVT	4.1
Primary prevention	61.1
Vent. fibrillation	13.6
Vent. tachycardia	16.9
Vent. tachycardia + fibrillation	4.3



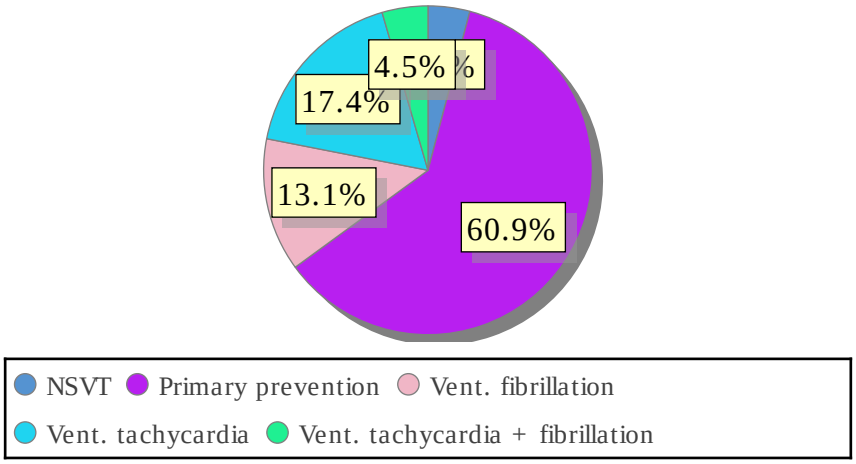
Documented ECG leading to ICD implant.(NSVT = non sustained VT) by gender and patients < 18 years

Indication	No	Total %	Male (%)	Female (%)	lt 18 (%)
NSVT	59	4.1	4.1	4.0	0.0
Primary prevention	878	61.1	60.8	62.3	20.0
Vent. fibrillation	195	13.6	13.1	15.2	60.0
Vent. tachycardia	242	16.9	17.4	14.9	20.0
Vent. tachycardia + fibrillation	62	4.3	4.5	3.6	0.0
					Total number of implants 1436

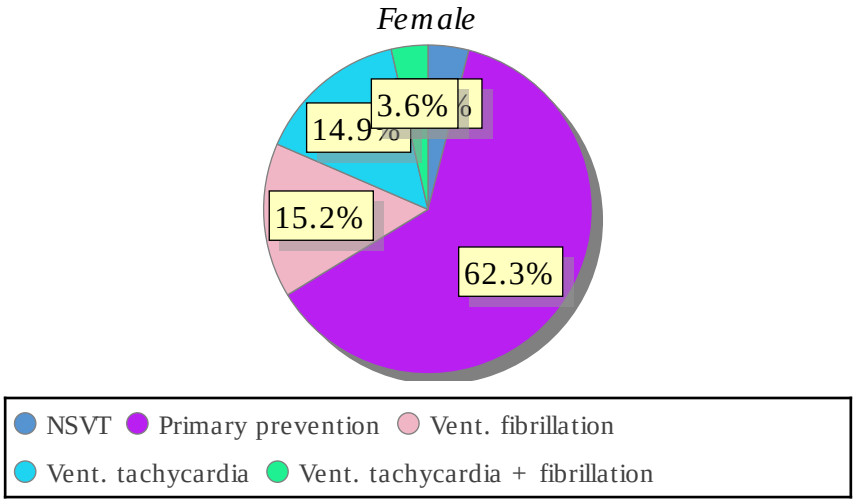




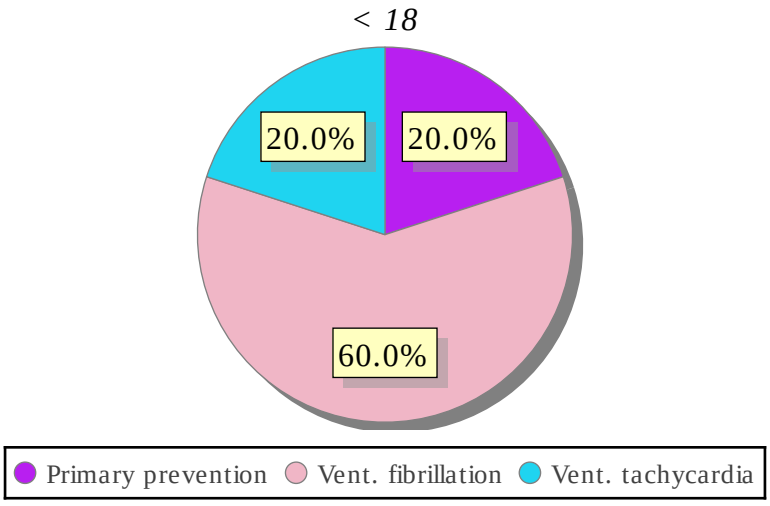
Male



Female



< 18

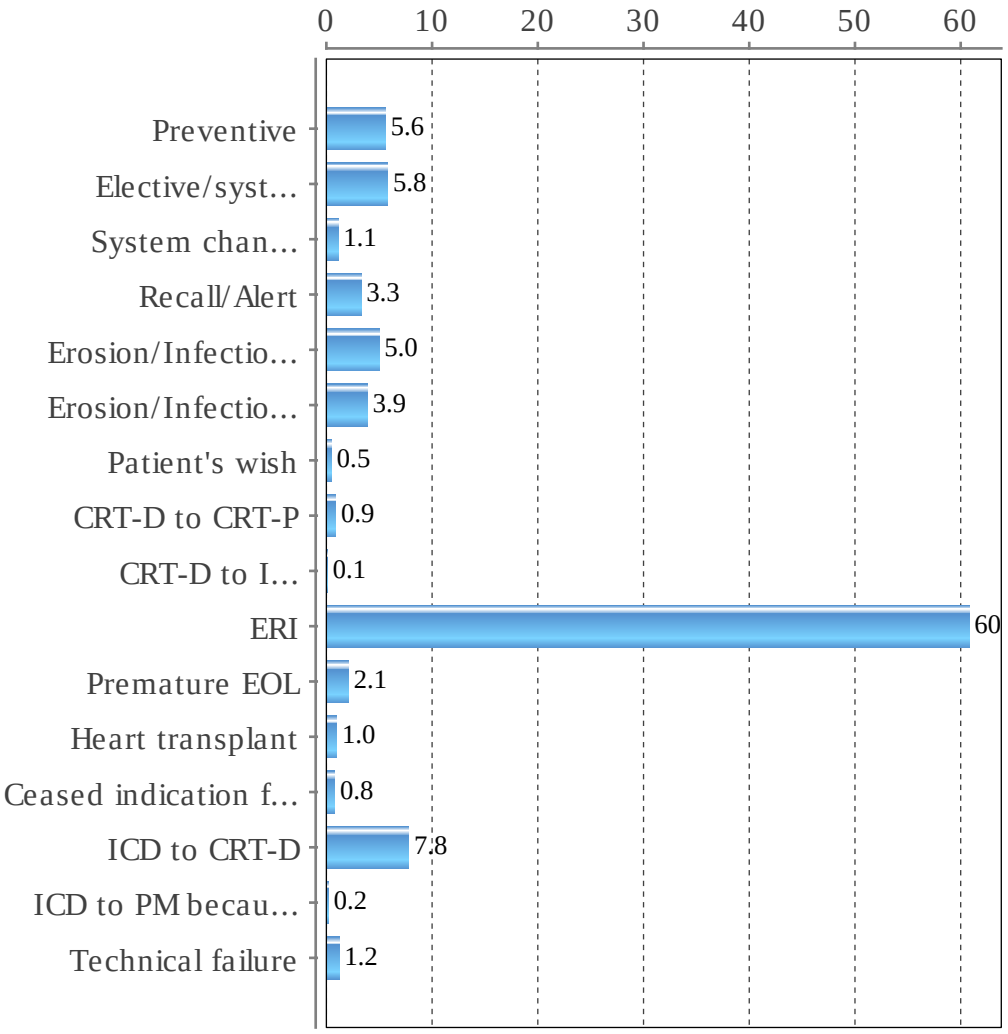


Use of ICD sub type for all indications per hospital (number of new implants / year and hospital))

Hospital	Number	ICD DR %	ICD SR %	ICD CRT %
Akademiska sjukhuset	65	18.5	47.7	33.8
Blekingesjukhuset	34	44.1	17.6	38.2
Centrallasarettet Växjö	23	78.3	4.3	17.4
Centralsjukhuset Karlstad	36	33.3	36.1	30.6
Centralsjukhuset Västerås	37	56.8	13.5	29.7
Danderyds sjukhus	49	42.9	16.3	40.8
Drottning Silvias Bus	1	100.0	0.0	0.0
Falu lasarett	58	19.0	46.6	34.5
Hudiksvalls sjukhus	4	75.0	25.0	0.0
Karolinska Universitetssjukhuset	109	54.1	13.8	32.1
Linköpings Universitetssjukhus	113	38.1	3.5	58.4
Länssjukhuset Gävle	61	47.5	18.0	34.4
Länssjukhuset Halmstad	1	100.0	0.0	0.0
Länssjukhuset Kalmar	33	27.3	33.3	39.4
Länssjukhuset Ryhov	29	72.4	27.6	0.0
Mälarsjukhuset	35	48.6	17.1	34.3
Norrlands Universitetssjukhus	51	29.4	25.5	45.1
Sahlgrenska Universitetssjukhuset	79	27.8	38.0	34.2
Skaraborgs sjukhus Skövde	27	29.6	11.1	59.3
Skellefteå lasarett	2	100.0	0.0	0.0
Skånes universitetssjukhus, Lund	175	35.4	36.0	28.6
St Görans sjukhus	48	31.3	16.7	52.1
Sunderby sjukhus	50	54.0	26.0	20.0
Sundsvalls sjukhus	56	39.3	26.8	33.9
Södersjukhuset	44	43.2	34.1	22.7
Södra Älvsborgs sjukhus	37	35.1	29.7	35.1
Trollhättan, NÄL	47	51.1	10.6	38.3
Universitetssjukhuset Örebro	51	39.2	23.5	37.3
Varbergs sjukhus	35	25.7	28.6	45.7
Visby lasarett	3	33.3	66.7	0.0
Örnsköldsviks sjukhus	9	88.9	11.1	0.0
Östersunds sjukhus	27	48.1	11.1	40.7

Reason for generator explant. Elective used for changes performed before reached ERI/EOL

Reason	All hospitals %	(large) %	(medium) %	(small) %
Preventive	5.6	2.9	12.6	8.8
Elective/system change	5.8	6.6	4.1	2.9
System change hemodynamic	1.1	0.7	1.9	2.9
Recall/Alert	3.3	4.4	0.7	0.0
Erosion/Infection, local	5.0	6.6	1.1	0.0
Erosion/Infection, systemic	3.9	5.0	1.5	0.0
Patient's wish	0.5	0.6	0.0	2.9
CRT-D to CRT-P	0.9	1.0	0.7	0.0
CRT-D to ICD because of ceased CRT-indication	0.1	0.0	0.4	0.0
ERI	60.8	58.8	65.9	61.8
Premature EOL	2.1	2.5	1.5	0.0
Heart transplant	1.0	1.4	0.0	0.0
Ceased indication for ICD therapy	0.8	0.7	1.1	0.0
ICD to CRT-D	7.8	7.3	7.4	20.6
ICD to PM because of ceased indication	0.2	0.3	0.0	0.0
Technical failure	1.2	1.2	1.1	0.0

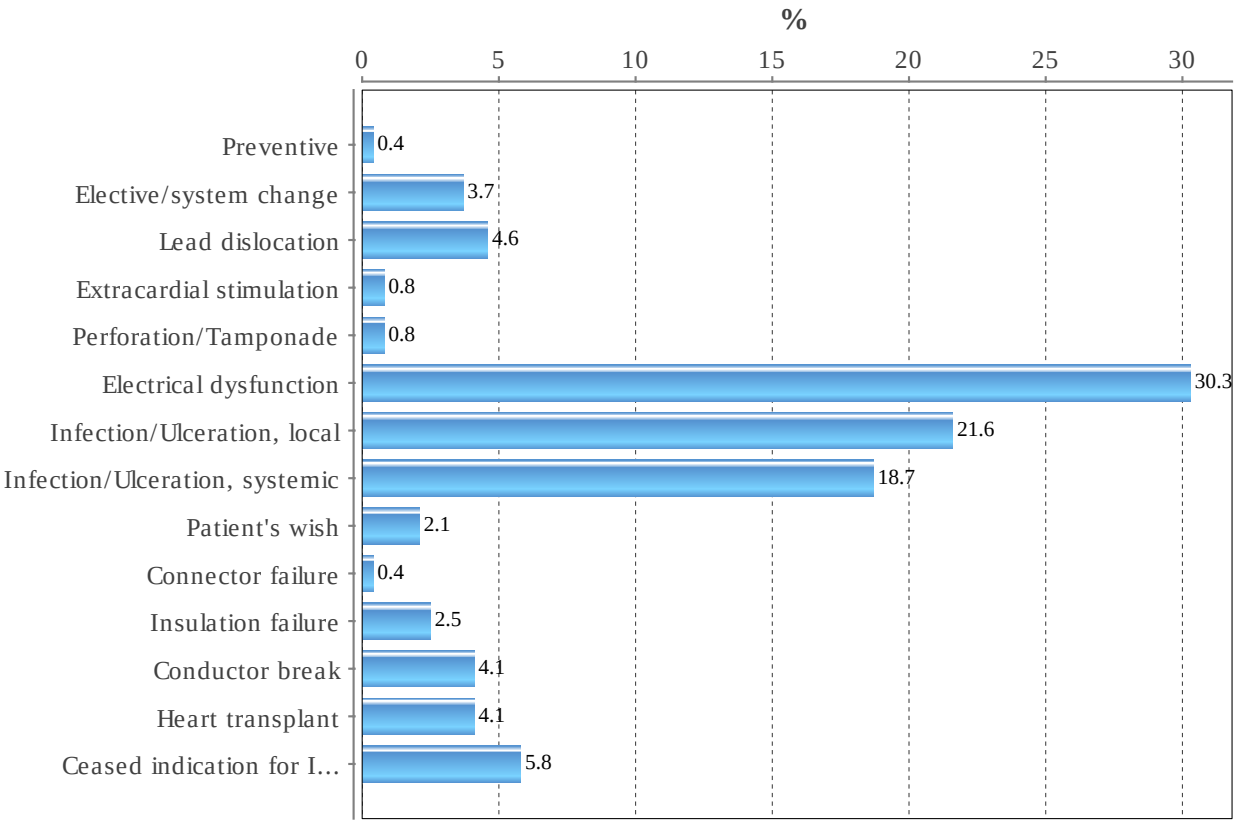

0
10
20
30
40
50
60
Preventive
5.6
Elective/syst…
5.8
System chan…
1.1
Recall/Alert
3.3
Erosion/Infectio…
5.0
Erosion/Infectio…
3.9
Patient's wish
0.5
CRT-D to CRT-P
0.9
CRT-D to I…
0.1
ERI
60
Premature EOL
2.1
Heart transplant
1.0
Ceased indication f…
0.8
ICD to CRT-D
7.8
ICD to PM becau…
0.2
Technical failure
1.2

Historical explants indications

Reason	2015 %	2016 %	2017 %
Preventive	3.6	4.5	5.6
Elective/system change	5.1	4.9	5.8
System change hemodynamic	0.9	0.4	1.1
Recall/Alert	0.4	8.6	3.3
Erosion/Infection, local	7.9	2.1	5.0
Erosion/Infection, systemic	3.6	5.0	3.9
Patient's wish	0.8	0.3	0.5
CRT-D to CRT-P	0.1	0.8	0.9
ERI	62.0	58.9	60.8
Premature EOL	3.0	2.4	2.1
Heart transplant	0.4	1.3	1.0
Ceased indication for ICD therapy	1.5	1.2	0.8
ICD to CRT-D	9.5	8.4	7.8
ICD to PM because of ceased indication	0.5	0.1	0.2
Technical failure	0.8	1.2	1.2
CRT-D to ICD because of ceased CRT-indication	0.0	0.0	0.1

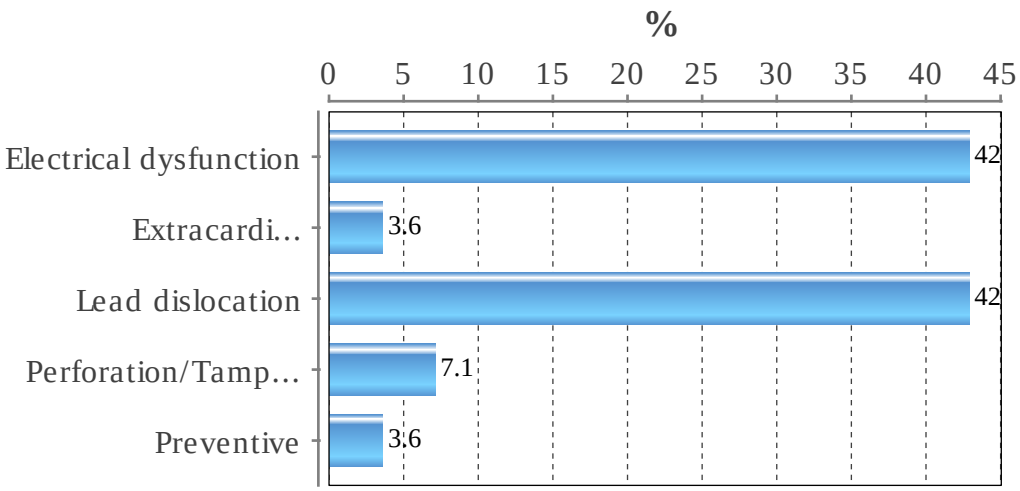
Historical lead explants indications

Reason	2015 %	2016 %	2017 %
Preventive	1.3	1.5	0.4
Elective/system change	8.1	8.0	3.7
Lead dislocation	5.5	7.0	4.6
Extracardial stimulation	0.9	0.0	0.8
Perforation/Tamponade	1.3	1.5	0.8
Electrical dysfunction	28.5	36.3	30.3
Recall/Alert	0.4	0.0	0.0
Infection/Ulceration, local	24.7	9.0	21.6
Infection/Ulceration, systemic	14.5	22.4	18.7
Patient's wish	1.3	1.0	2.1
Insulation failure	1.3	1.0	2.5
Conductor break	3.0	2.5	4.1
Heart transplant	1.3	6.5	4.1
Ceased indication for ICD therapy	7.7	3.5	5.8
Venous access	0.4	0.0	0.0
Connector failure	0.0	0.0	0.4


%
0
5
10
15
20
25
30
Preventive
0.4
Elective/system change
3.7
Lead dislocation
4.6
Extracardial stimulation
0.8
Perforation/Tamponade
0.8
Electrical dysfunction
30.3
Infection/Ulceration, local
21.6
Infection/Ulceration, systemic
18.7
Patient's wish
2.1
Connector failure
0.4
Insulation failure
2.5
Conductor break
4.1
Heart transplant
4.1
Ceased indication for I...
5.8

Lead correction indications

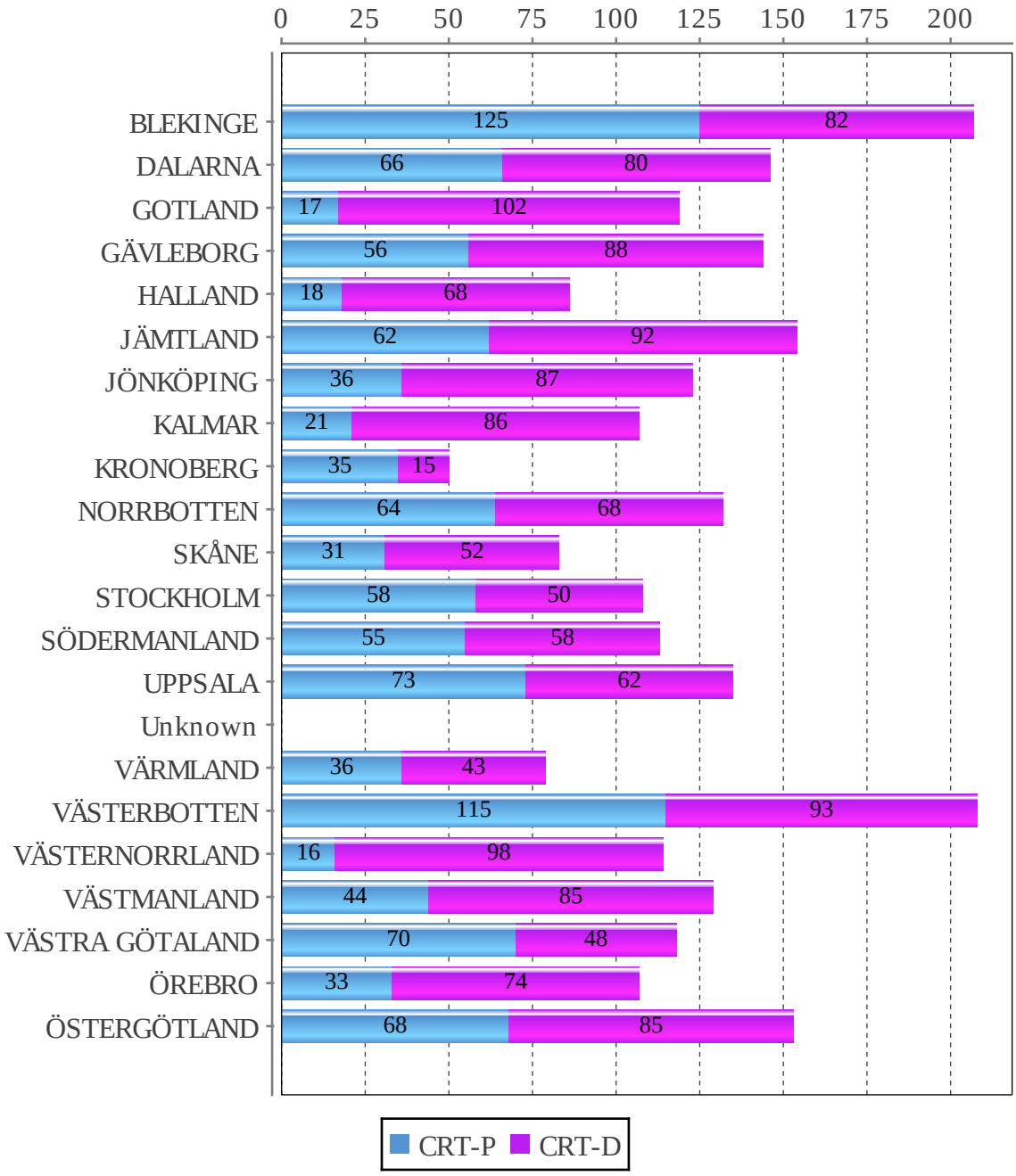
Reason	%
Electrical dysfunction	42.9
Extracardial stimulation	3.6
Lead dislocation	42.9
Perforation/Tamponade	7.1
Preventive	3.6
	Total no 28



Procedures per operator (exclusive CRT)

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	11
	Haupt	4
	Mörtsell	2
	Ostrowska	27
	Sciaraffia	5
	Teder	21
Ålands centralsjukhus	Slotte	3
Blekingesjukhuset	Borg	25
	Ericsson	4
	Ringborn, Michael	2
Centrallasarettet Växjö	Johansson P	8
	Jonasson	15
	Rosén Helena	8
	Strandberg	9
	Weber	1
Centralsjukhuset Karlstad	Khalili	13
	Niklas Aldergård	11
	Saidi	12
Centralsjukhuset Västerås	Azizi	2
	SkoglundAndersson	16
	Wiberg	17
Danderyds sjukhus	2	11
	3	11
	4	15
	6	7
Drottning Silvias Bus	Jamaly, Shabbar	1
Falu lasarett	Berglund	11
	Forsgren	31
	Guggi	9
Gävle sjukhus	Jakobsson Stefan	14
	Johansson Staffan	1
	Kastberg	12
	Magnusson Peter	34
	Mati Jalakas	4
Hudiksvalls sjukhus	Roussinne	6
Karolinska Universitetssjukhus	Gadler	48
	Hörnsten	36
	Reistam	41
Länssjukhuset Halmstad	Rorsman-Söderström	4
Länssjukhuset Kalmar	David Olsson	10
	Hendrik Schreyer	14
	Michael Lindstaedt	9
Länssjukhuset Ryhov	Annan	4
	Lagerberg	38
	Stefanik	1
	Stumpf	2
	Szymanowski	2
Linköpings universitetssjukhus	Pinna C	5
	Säfström K	16
	Sonesson L	17
	Svenson A	20
	Szymanowski A	16
Mälarsjukhuset	Carl Westholm	21
	Gabriele Backers	1
	Georgios Matthaiou	3
	Kave Keshavarz	8
Norrlands Universitetssjukhus	Andersson	8
	Höglund	3
	Jensen	2
	Kesek	6
	Landström	13
	Rönn	6
Örnsköldsviks sjukhus	Ehlin	12
Östersunds sjukhus	Friberg	11
	Hansson	14
Sahlgrenska universitetssjukhuset	Annan	5
	Jakob Gäbel	1
	Javid	1
	Kennergren	1
	Konstantinos Liakatsidas	17
	Piotr Szamlewski	36
	Shabbar Jamaly	31
	Stefan Jakobsson	2
Skaraborgs sjukhus Skövde	Anna Widunder	4
	Daniel Hellner	6
	Falmer	5
	Lorentzen	5
	Paulsson	3
Skånes universitetssjukhus, Lund	David Mörtsell	7
	Jesper van der Pals	6
	Johan Brandt	83
	LingWei Wang	43
	Maiwand Farouq	29
	Martin Löfgren	21

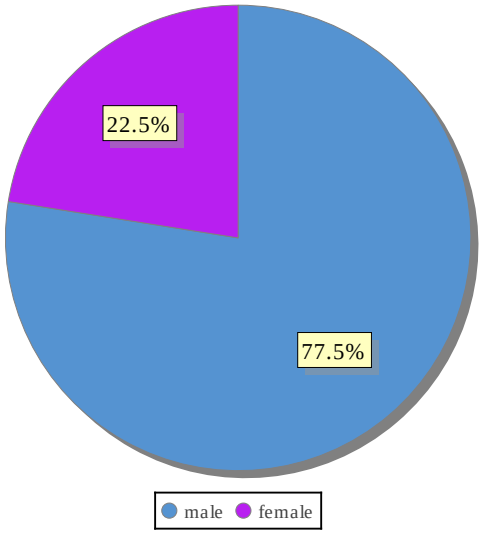
Hospital	Operator	No
	Pyotr Platonov	2
	Rasmus Borgquist	6
	Rorsman-Söderström	4
	Steen Jensen	8
Skellefteå lasarett	Bygdén	1
	Lindqvist	3
Södersjukhuset	Jonsson J-E	12
	Kjellman B	10
	Olson J	12
	Rydlund K	18
Södra Älvsborgs sjukhus	Lodin	13
	Riemer	28
St Görans sjukhus	1	12
	2	12
	3	9
Sunderby sjukhus	Agneta Johansson	19
	Annica Wennberg	4
	Lundblad	1
	Marcus Baas	9
	Peter Johansson	10
	Peter Rangson	12
Sundsvalls sjukhus	Ciubine	17
	Haupt	2
	Khadhim	14
	Sundelin	9
	Teder	2
Trollhättan, NÄL	Alice David	8
	Csaba Herczku	6
	Dinu Dusceac	8
	Jabbar	4
	Javid	15
	N/A	1
	Orsolya Bene	1
Universitetssjukhuset Örebro	Anna Björkenheim	12
	Áron Sztanislav	2
	Barbara Kurt	1
	Lindell	13
	Tommy Andersson	18
Varbergs sjukhus	Emma Sandgren	1
	Rorsman	36
Visby lasarett	Jacobsson L	5


0
25
50
75
100
125
150
175
200
BLEKINGE
125
82
DALARNA
66
80
GOTLAND
17
102
GÄVLEBORG
56
88
HALLAND
18
68
JÄMTLAND
62
92
JÖNKÖPING
36
87
KALMAR
21
86
KRONOBERG
35
15
NORRBOTTEN
64
68
SKÅNE
31
52
STOCKHOLM
58
50
SÖDERMANLAND
55
58
UPPSALA
73
62
Unknown
VÄRMLAND
36
43
VÄSTERBOTTEN
115
93
VÄSTERNORRLAND
16
98
VÄSTMANLAND
44
85
VÄSTRA GÖTALAND
70
48
ÖREBRO
33
74
ÖSTERGÖTLAND
68
85
CRT-P
CRT-D

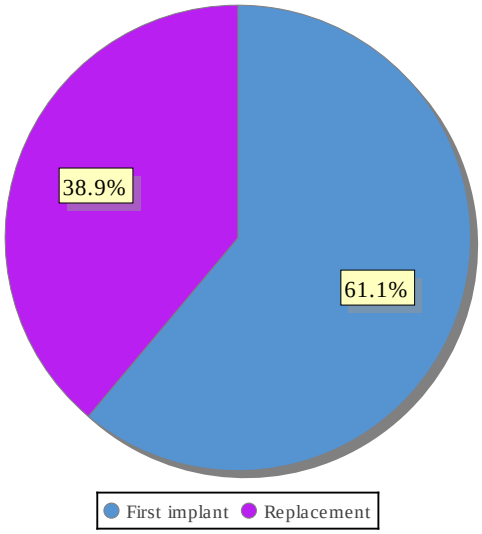
Based on both CRT-P and CRT-D

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1187	61.1	920	77.5	267	22.5
Replacement	755	38.9	596	78.9	159	21.1
Total	1942	100.0	1516	78.1	426	21.9

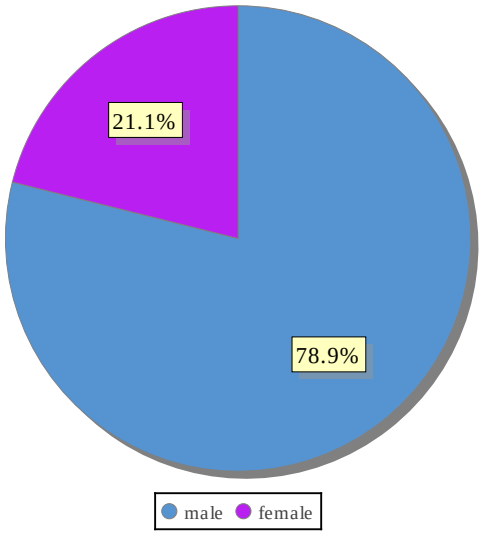
First implant



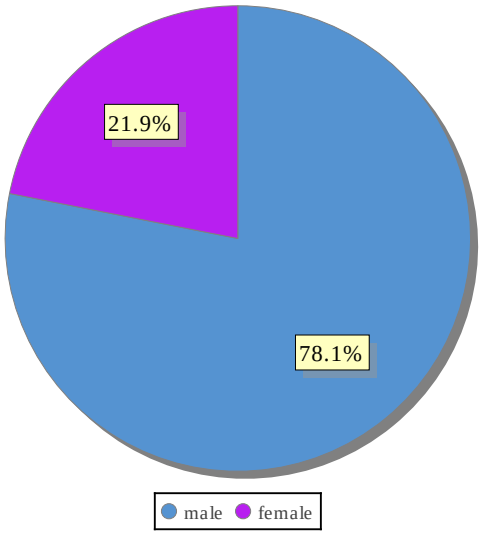
Replacement ratio



Replacement



All implant



CRT Historical implant rates per hundred thousand residents

			CRT-P		CRT-D	
Year	**Population**	**No First Impl**	**No**	**Rate**	**No**	**Rate**
2013	9644864	967	417	4.3	550	5.7
2014	9747355	987	395	4.1	592	6.1
2015	9851017	1059	448	4.5	611	6.2
2016	9995153	1138	479	4.8	659	6.6
2017	10120242	1191	549	5.4	642	6.3

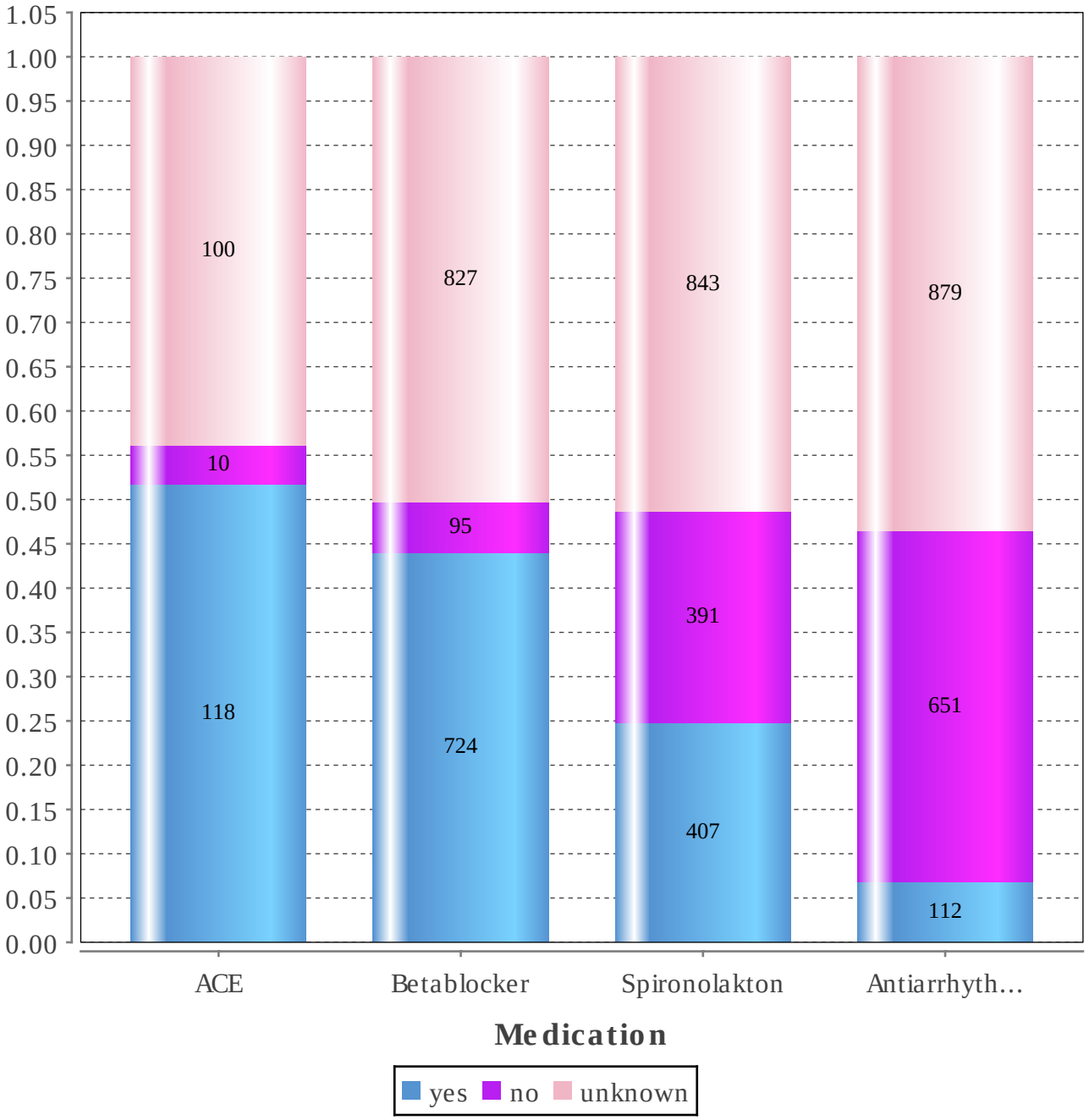
CRT-P (generator)

Status	First implant	Replacement
SC-lead plugged	6	1
SC-lead failed implant	13	3
SC-lead active system	554	302

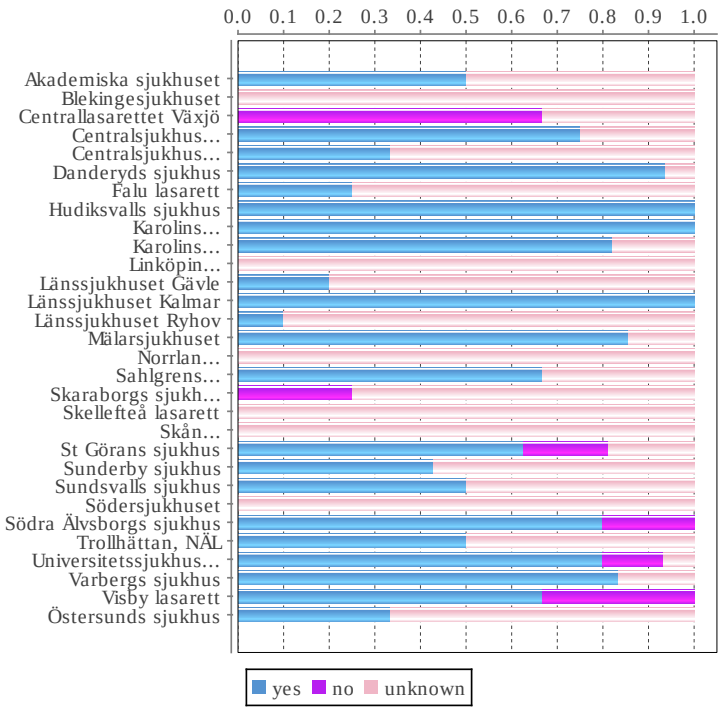
CRT-D (generator)

Status	First implant	Replacement
SC-lead plugged	14	6
SC-lead failed implant	16	1
SC-lead active system	641	460

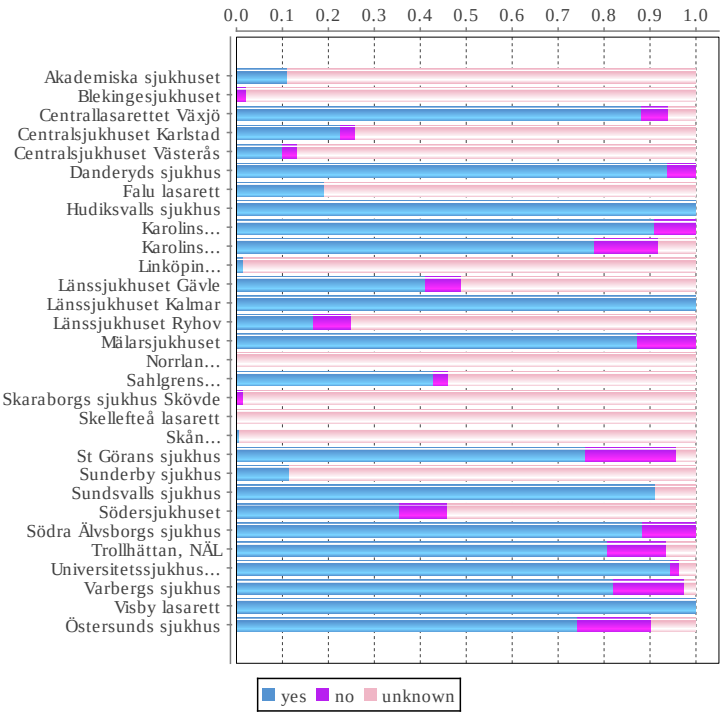
Previous medication for patients having CRT implant



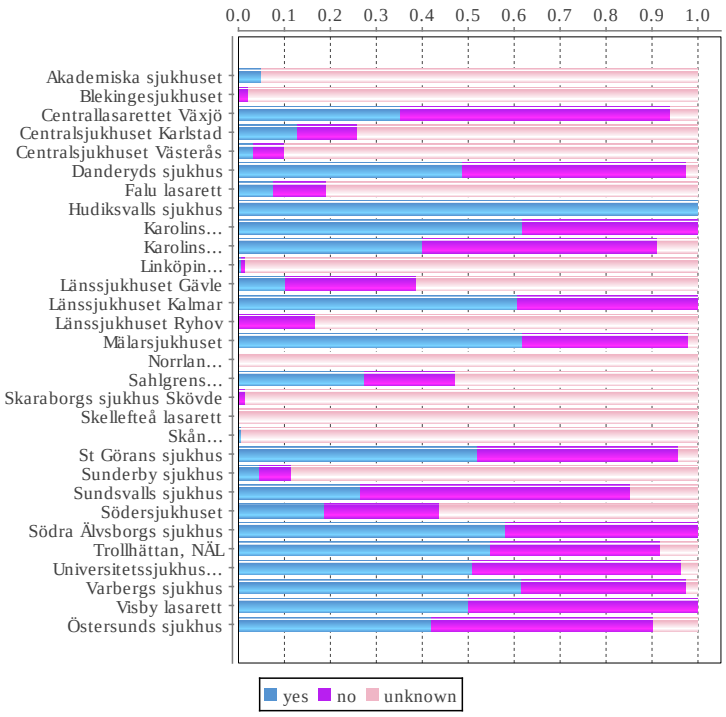
ACE



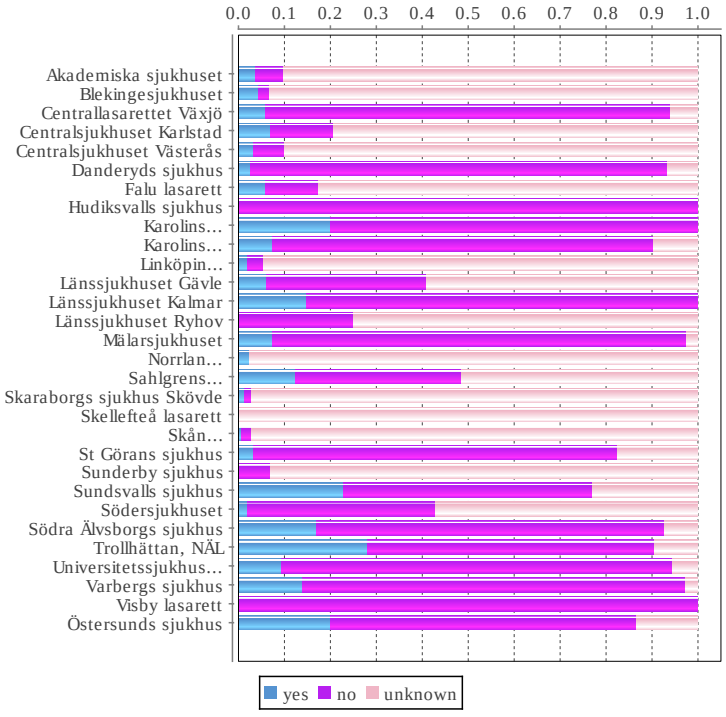
Betablocker



Spironolakton



Antiarrhythmica



Procedures per operator

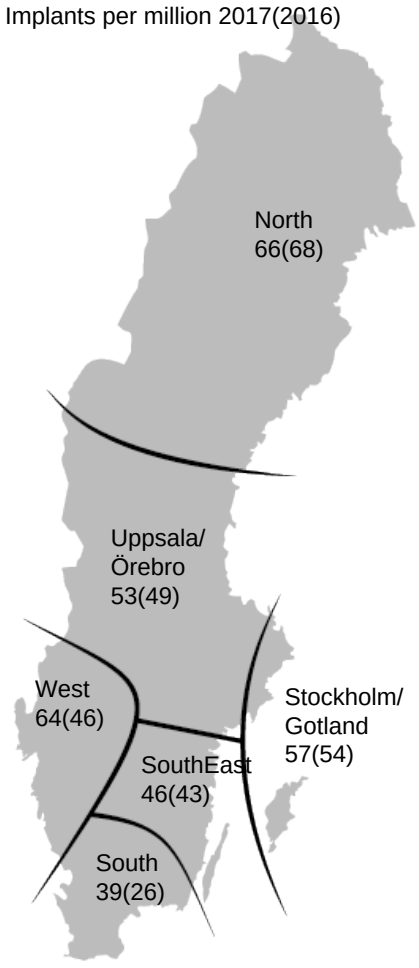
Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	7
	Mörtsell	1
	Teder	23
Ålands centralsjukhus	Slotte	5
Blekingesjukhuset	Annan	1
	Borg	22
Centrallasarettet Växjö	Jonasson	1
	Strandberg	2
	Strandberg-Jonasson	3
Centralsjukhuset Karlstad	Niklas Aldergård	10
Centralsjukhuset Västerås	SkoglundAndersson	3
	Wiberg	6
Danderyds sjukhus	2	1
	3	5
	4	20
	6	1
Falu lasarett	Forsgren	16
	Guggi	5
Gävle sjukhus	Falck	7
	Kastberg	8
Karolinska Universitetssjukhus	Gadler	37
	Hörnsten	19
	Reistam	7
	Reistam/Gadler	4
	Reistam/ Hörnsten	4
Länssjukhuset Kalmar	Michael Lindstaedt	4
Linköpings universitetssjukhus	Säfström K	21
	Sonesson L	11
	Szymanowski A	15
Mälarsjukhuset	Carl Westholm	15
Norrlands Universitetssjukhus	Andersson	1
	Forsgren	1
	Höglund	2
	Jensen	4
	Kesek	1
	Landström	21
	Rönn	3
Östersunds sjukhus	Friberg	1
	Friberg/Hansson	6
	Hansson	3
Sahlgrenska universitetssjukhuset	Annan	1
	Javid	1
	Kennergren	1
	Konstantinos Liakatsidas	1
	Piotr Szamlewski	22
	Shabbar Jamaly	10
Skaraborgs sjukhus Skövde	Daniel Hellner	1
	Falmer	7
	Lorentzen	25
	Paulsson	8
Skånes universitetssjukhus, Lund	Johan Brandt	20
	LingWei Wang	6
	Maiwand Farouq	13
	Rasmus Borgquist	3
	Rorsman-Söderström	3
Södersjukhuset	Jonsson J-E	8
	Kjellman B	7
	Olson J	12
Södra Älvsborgs sjukhus	Riemer	17
St Görans sjukhus	1	9
	2	6
Sunderby sjukhus	Marcus Baas	7
	Peter Johansson	9
Sundsvalls sjukhus	Annan	2
	Ciubine	1
	Haupt	1
Trollhättan, NÄL	Csaba Herczku	8
	Dinu Dusceac	4
	Javid	10
Universitetssjukhuset Örebro	Lindell	5
	Tommy Andersson	3
Varbergs sjukhus	Rorsman	5

Procedures per operator

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	7
	Haupt	3
	Mörtsell	8
	Teder	17
Ålands centralsjukhus	Slotte	5
Blekingesjukhuset	Annan	1
	Borg	16
Centrallasarettet Växjö	Jonasson	1
	Strandberg-Jonasson	3
Centralsjukhuset Karlstad	Niklas Aldergård	12
Centralsjukhuset Västerås	SkoglundAndersson	2
	Wiberg	14
Danderyds sjukhus	3	7
	4	17
	6	1
Falu lasarett	Forsgren	21
	Guggi	5
Gävle sjukhus	Falck	7
	Kastberg	17
Karolinska Universitetssjukhus	Gadler	44
	Hörnsten	20
	Reistam	2
	Reistam/Gadler	1
	Reistam/ Hörnsten	4
Länssjukhuset Kalmar	Hendrik Schreyer	2
	Michael Lindstaedt	18
Linköpings universitetssjukhus	Säfström K	41
	Sonesson L	12
	Szymanowski A	22
Mälarsjukhuset	Carl Westholm	17
Norrlands Universitetssjukhus	Forsgren	2
	Höglund	7
	Jensen	1
	Landström	15
	Rönn	3
Östersunds sjukhus	Friberg/Hansson	6
	Hansson	9
Sahlgrenska universitetssjukhuset	Annan	2
	Konstantinos Liakatsidas	1
	Piotr Szamlewski	19
	Shabbar Jamaly	12
Skaraborgs sjukhus Skövde	Daniel Hellner	1
	Falmer	3
	Lorentzen	7
	Paulsson	8
Skånes universitetssjukhus, Lund	David Mörtsell	6
	Johan Brandt	14
	LingWei Wang	23
	Maiwand Farouq	25
	Rasmus Borgquist	3
	Rorsman-Söderström	5
	Steen Jensen	2
Södersjukhuset	Jonsson J-E	4
	Kjellman B	5
	Olson J	5
Södra Älvsborgs sjukhus	Riemer	13
St Görans sjukhus	1	23
	1+2	5
	2	3
Sunderby sjukhus	Marcus Baas	8
	Peter Johansson	7
Sundsvalls sjukhus	Annan	16
	Ciubine	3
	Haupt	7
Trollhättan, NÄL	Csaba Herczku	12
	Dinu Dusceac	2
	Javid	9
Universitetssjukhuset Örebro	Anna Björkenheim	2
	Áron Sztanislav	1
	Lindell	15
	Tommy Andersson	7
Varbergs sjukhus	Rorsman	20

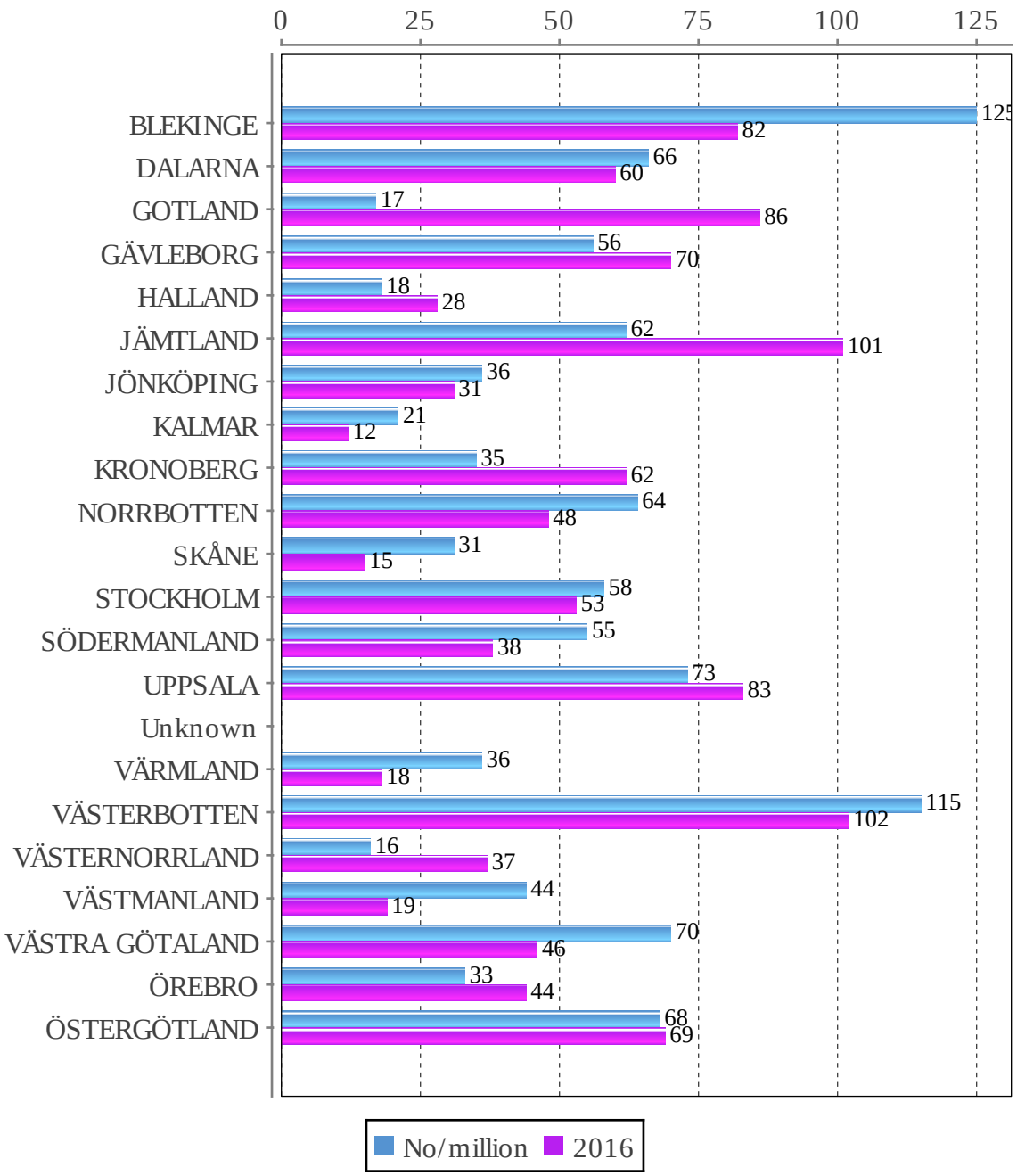
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million
Stockholm/Gotland	2366738	136	57
Uppsala/Örebro	2082515	110	53
South-East Sweden	1058269	49	46
Southern Sweden	1837468	72	39
Western Sweden	1879718	121	64
Northern Sweden	895534	59	66
Total	10120242	547	54



The regions are based on where the patients live, not where they are treated

	Population	No first impl	No/million
BLEKINGE	159371	20	125
DALARNA	286165	19	66
GOTLAND	58595	1	17
GÄVLEBORG	285637	16	56
HALLAND	324825	6	18
JÄMTLAND	129806	8	62
JÖNKÖPING	357237	13	36
KALMAR	243536	5	21
KRONOBERG	197519	7	35
NORRBOTTEN	251295	16	64
SKÅNE	1344689	42	31
STOCKHOLM	2308143	135	58
SÖDERMANLAND	291341	16	55
UPPSALA	368971	27	73
Unknown	0	7	0
VÄRMLAND	280399	10	36
VÄSTERBOTTEN	268465	31	115
VÄSTERNORRLAND	245968	4	16
VÄSTMANLAND	271095	12	44
VÄSTRA GÖTALAND	1690782	118	70
ÖREBRO	298907	10	33
ÖSTERGÖTLAND	457496	31	68
Total	10120242	554	55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BLEKINGE
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HALLAND
JÄMTLAND
JÖNKÖPING
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KRONOBERG
NORRBOTTEN
SKÅNE
STOCKHOLM
SÖDERMANLAND
UPPSALA
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VÄSTERBOTTEN
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44
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70
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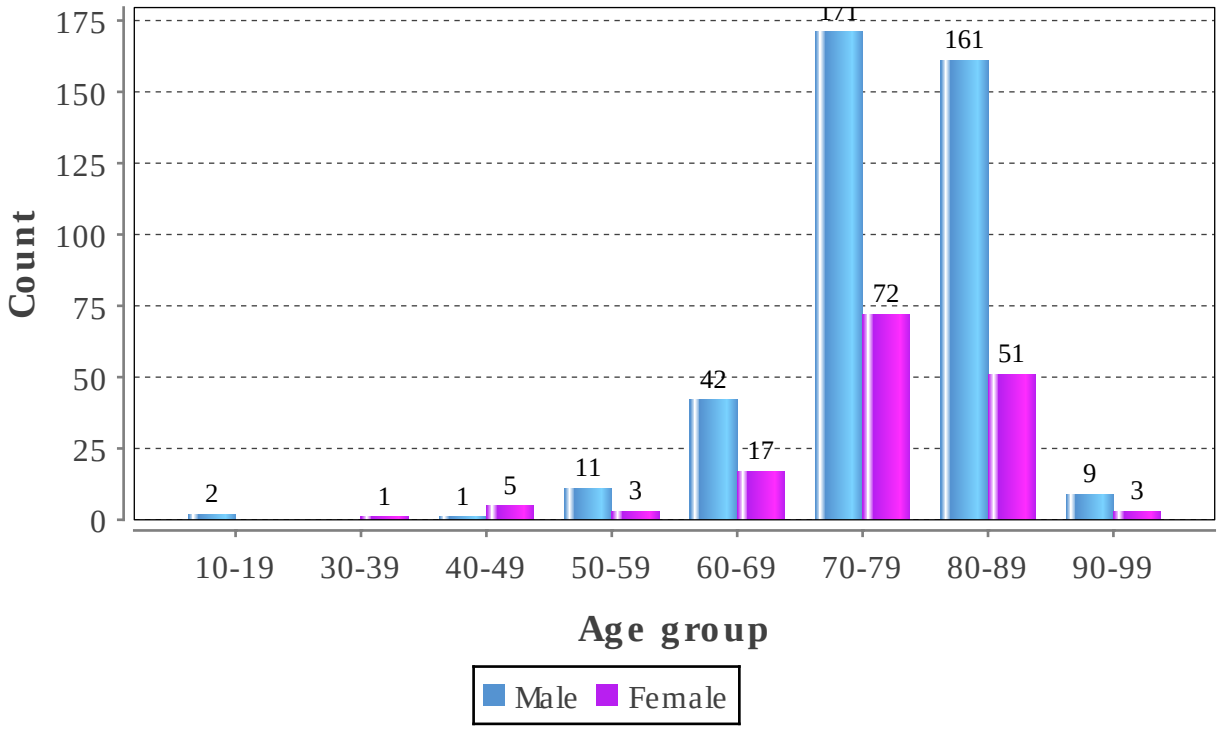
33
44
68
69
No/million
2016

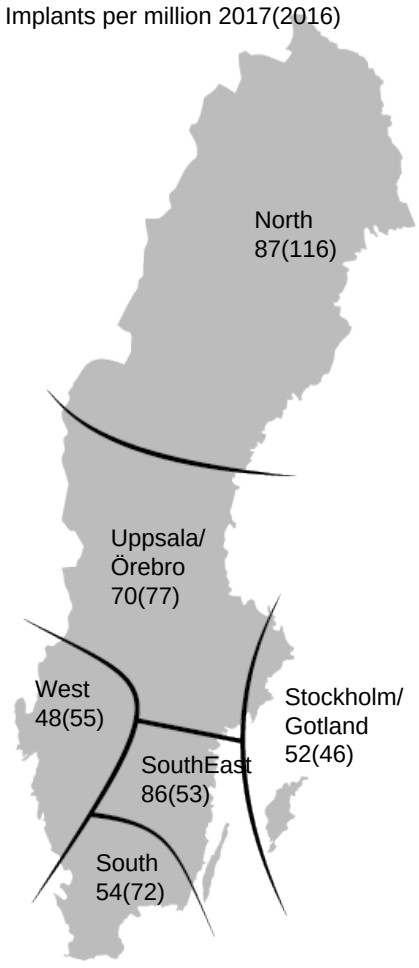
Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
10-19	2	0.4	2	0
30-39	1	0.2	0	1
40-49	6	1.1	1	5
50-59	14	2.6	11	3
60-69	59	10.7	42	17
70-79	243	44.3	171	72
80-89	212	38.6	161	51
90-99	12	2.2	9	3
Average age	77	0.0	77	75
				Total number of implants: 549



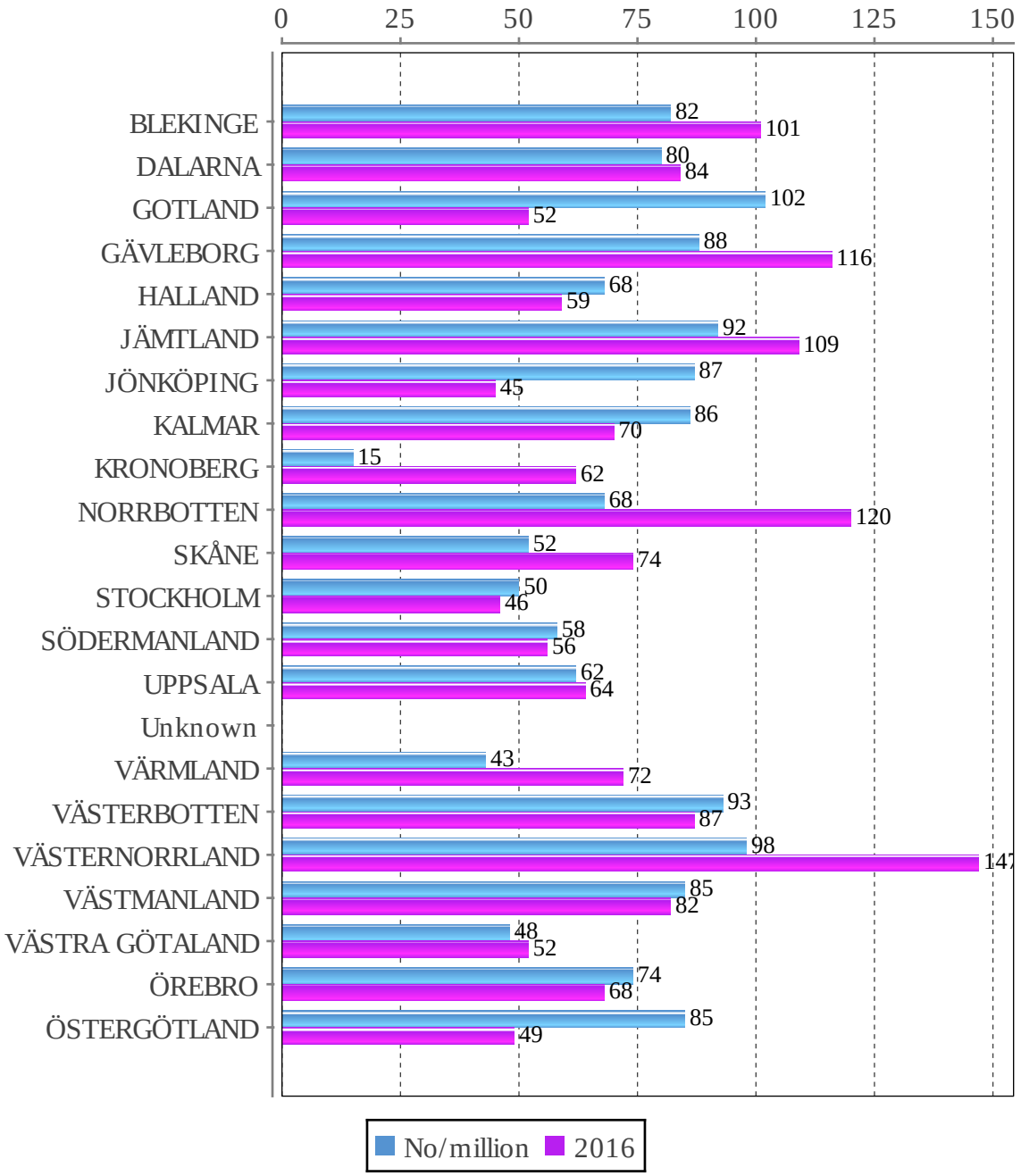
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million
Stockholm/Gotland	2366738	122	52
Uppsala/Örebro	2082515	145	70
South-East Sweden	1058269	91	86
Southern Sweden	1837468	100	54
Western Sweden	1879718	91	48
Northern Sweden	895534	78	87
Total	10120242	627	62



The regions are based on where the patients live, not where they are treated

	Population	No first impl	No/million
BLEKINGE	159371	13	82
DALARNA	286165	23	80
GOTLAND	58595	6	102
GÄVLEBORG	285637	25	88
HALLAND	324825	22	68
JÄMTLAND	129806	12	92
JÖNKÖPING	357237	31	87
KALMAR	243536	21	86
KRONOBERG	197519	3	15
NORRBOTTEN	251295	17	68
SKÅNE	1344689	70	52
STOCKHOLM	2308143	116	50
SÖDERMANLAND	291341	17	58
UPPSALA	368971	23	62
Unknown	0	15	0
VÄRMLAND	280399	12	43
VÄSTERBOTTEN	268465	25	93
VÄSTERNORRLAND	245968	24	98
VÄSTMANLAND	271095	23	85
VÄSTRA GÖTALAND	1690782	82	48
ÖREBRO	298907	22	74
ÖSTERGÖTLAND	457496	39	85
Total	10120242	641	63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BLEKINGE
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DALARNA
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GOTLAND
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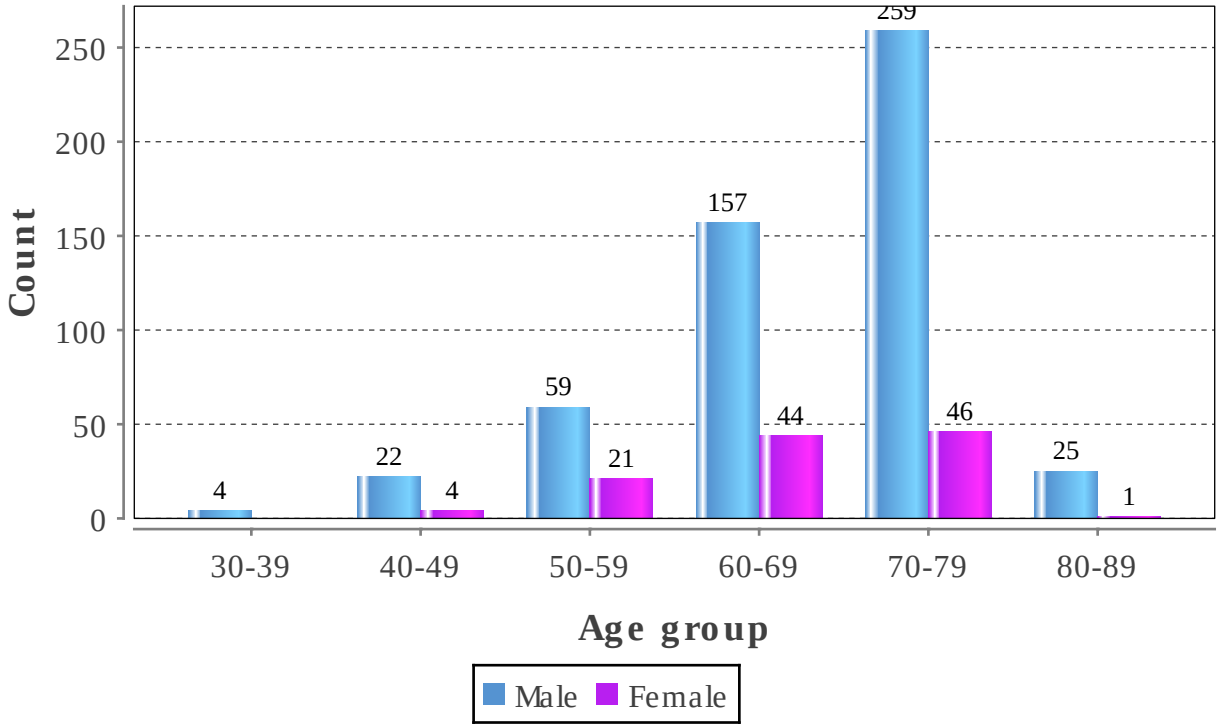
GÄVLEBORG
88
116
HALLAND
68
59
JÄMTLAND
92
109
JÖNKÖPING
87
45
KALMAR
86
70
KRONOBERG
15
62
NORRBOTTEN
68
120
SKÅNE
52
74
STOCKHOLM
50
46
SÖDERMANLAND
58
56
UPPSALA
62
64
Unknown
VÄRMLAND
43
72
VÄSTERBOTTEN
93
87
VÄSTERNORRLAND
98
147
VÄSTMANLAND
85
82
VÄSTRA GÖTALAND
48
52
ÖREBRO
74
68
ÖSTERGÖTLAND
85
49
No/million
2016

Age and gender distribution for new implants, total numbers

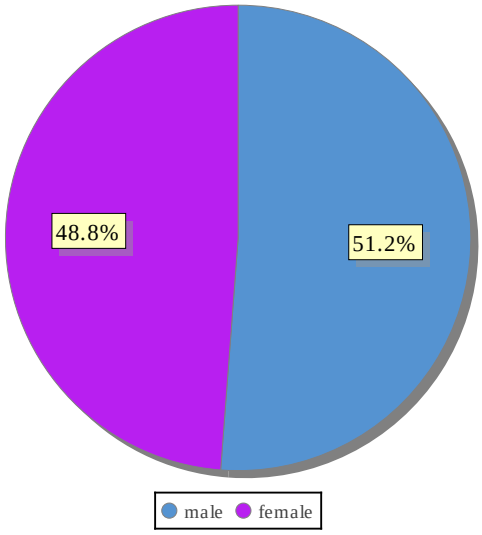
Age (years)	Total no	%	Male	Female
30-39	4	0.6	4	0
40-49	26	4.0	22	4
50-59	80	12.5	59	21
60-69	201	31.3	157	44
70-79	305	47.5	259	46
80-89	26	4.0	25	1
Average age	68	0.0	68	66
			Total number of implants: 642	



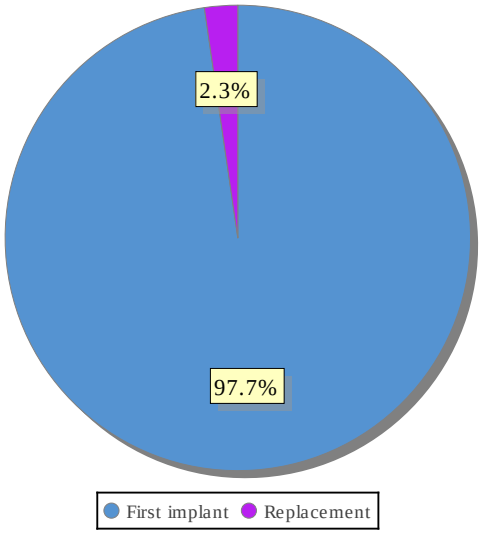
Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	853	97.7	437	51.2	416	48.8
Replacement	20	2.3	10	50.0	10	50.0
Total	873	100.0	447	51.2	426	48.8

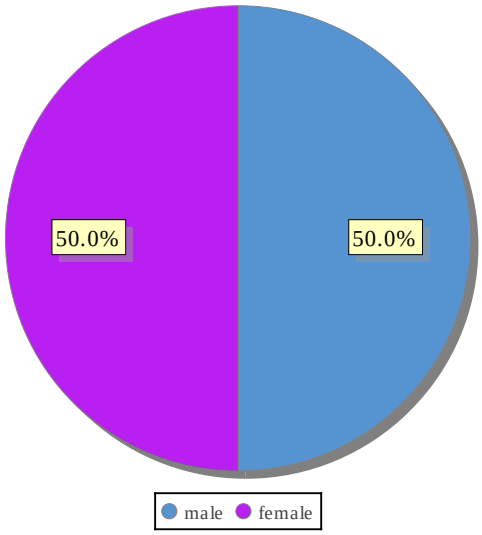
First implant



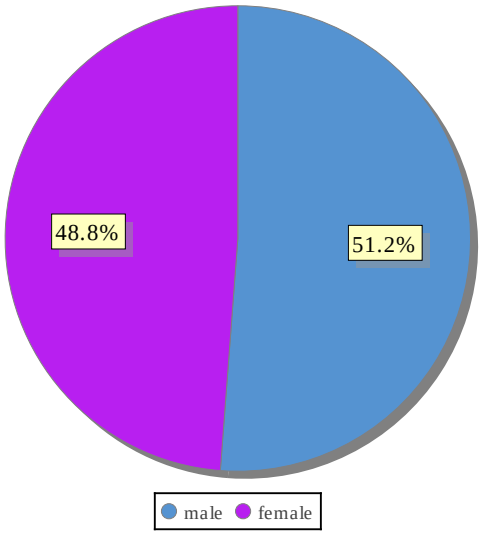
Replacement ratio



Replacement

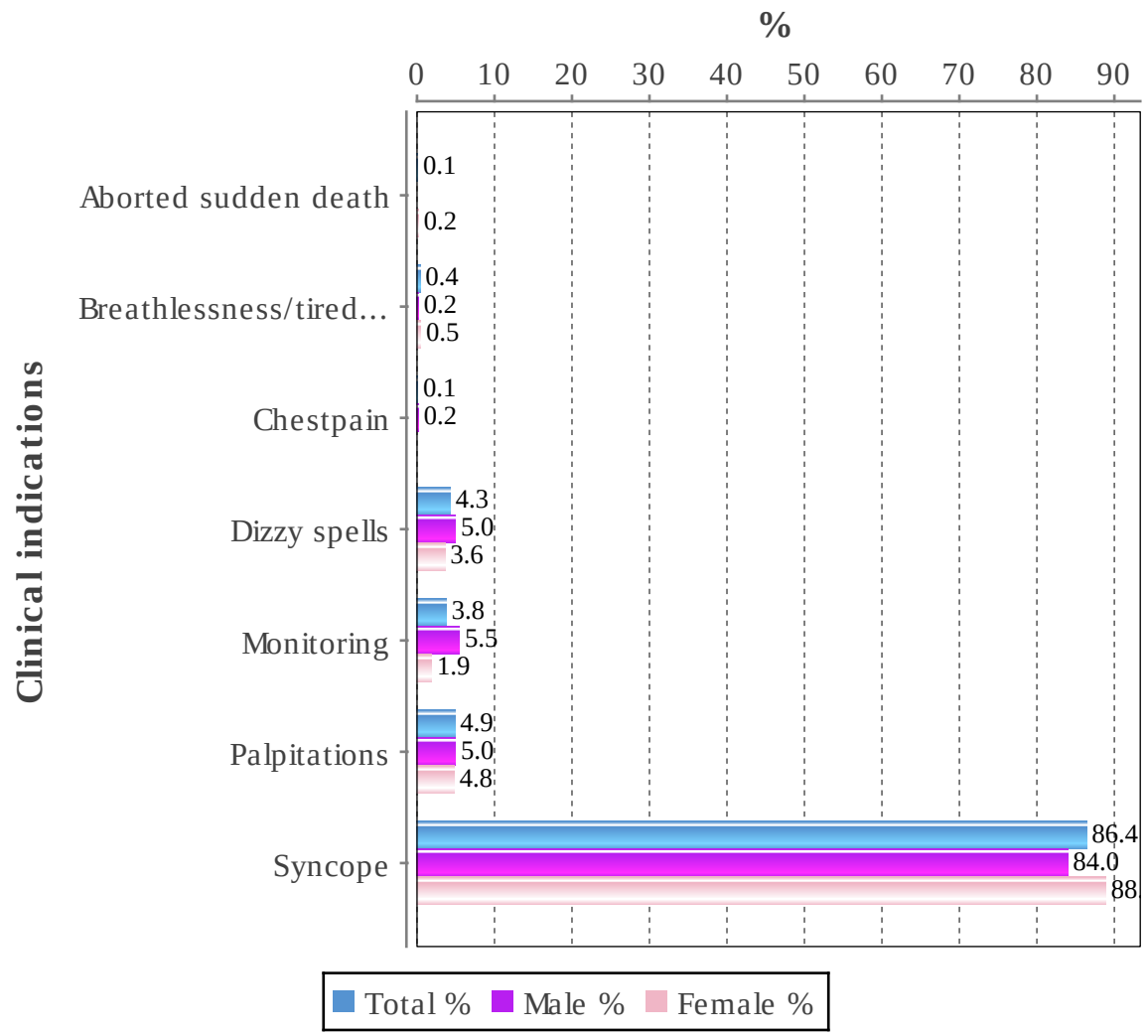


All implant



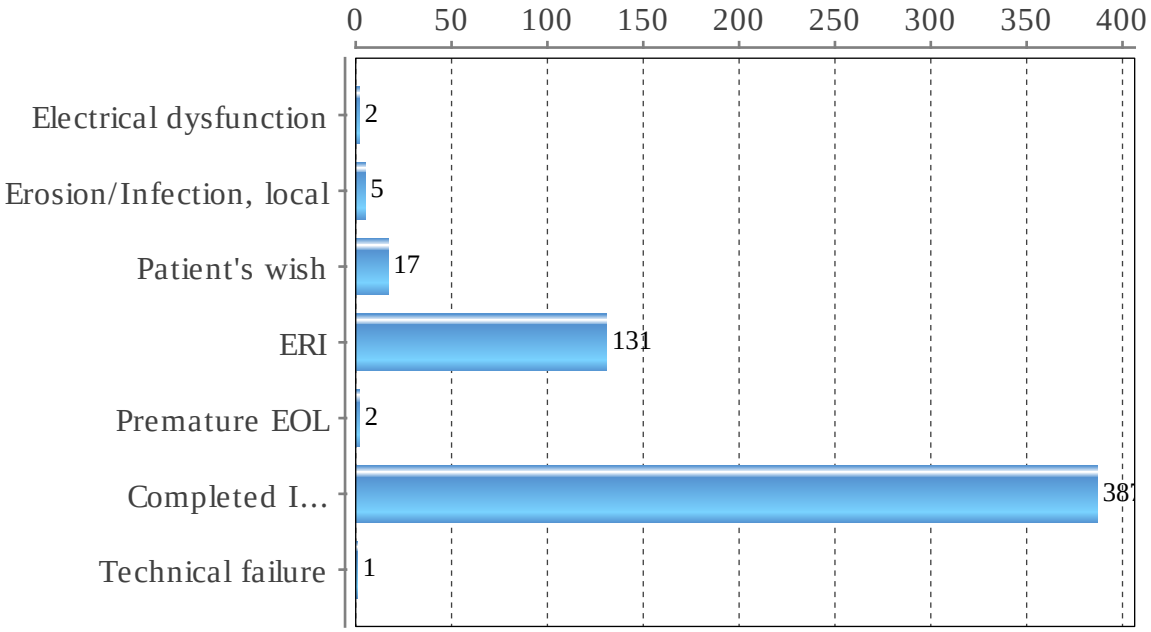
Main symptom for implanting ILR

Indication	Total %	Male %	Female %
Aborted sudden death	0.1	0.0	0.2
Breathlessness/tiredness	0.4	0.2	0.5
Chestpain	0.1	0.2	0.0
Dizzy spells	4.3	5.0	3.6
Monitoring	3.8	5.5	1.9
Palpitations	4.9	5.0	4.8
Syncope	86.4	84.0	88.9



Reason for generator removal

Reason	No	%
Electrical dysfunction	2	0.4
Erosion/Infection, local	5	0.9
Patient's wish	17	3.1
ERI	131	24.0
Premature EOL	2	0.4
Completed ILR investigation	387	71.0
Technical failure	1	0.2

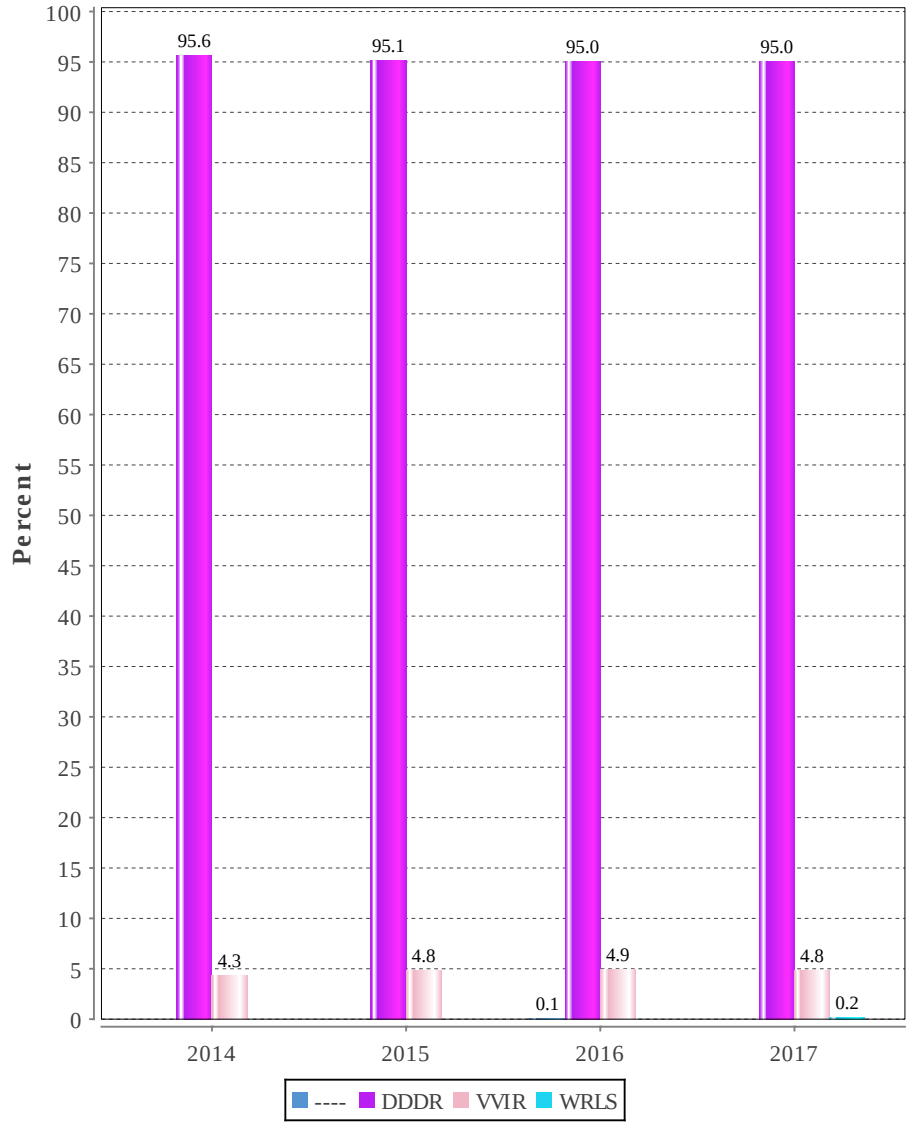


Investigation after first ILR implant in % of completed ILR investigation

Action	No	%
Pacemaker implant	194	50.1
ICD implant	29	7.5
New ILR implant	21	5.4

Use of pacing mode for total AV block indication, historical data

Mode %	2014	2015	2016	2017
----	0.0	0.0	0.1	0.0
DDDR	95.6	95.1	95.0	95.0
VVIR	4.3	4.8	4.9	4.8
WRLS	0.0	0.0	0.0	0.2



Use of pacing mode for total AV block indication per hospital (number of new implants / year)

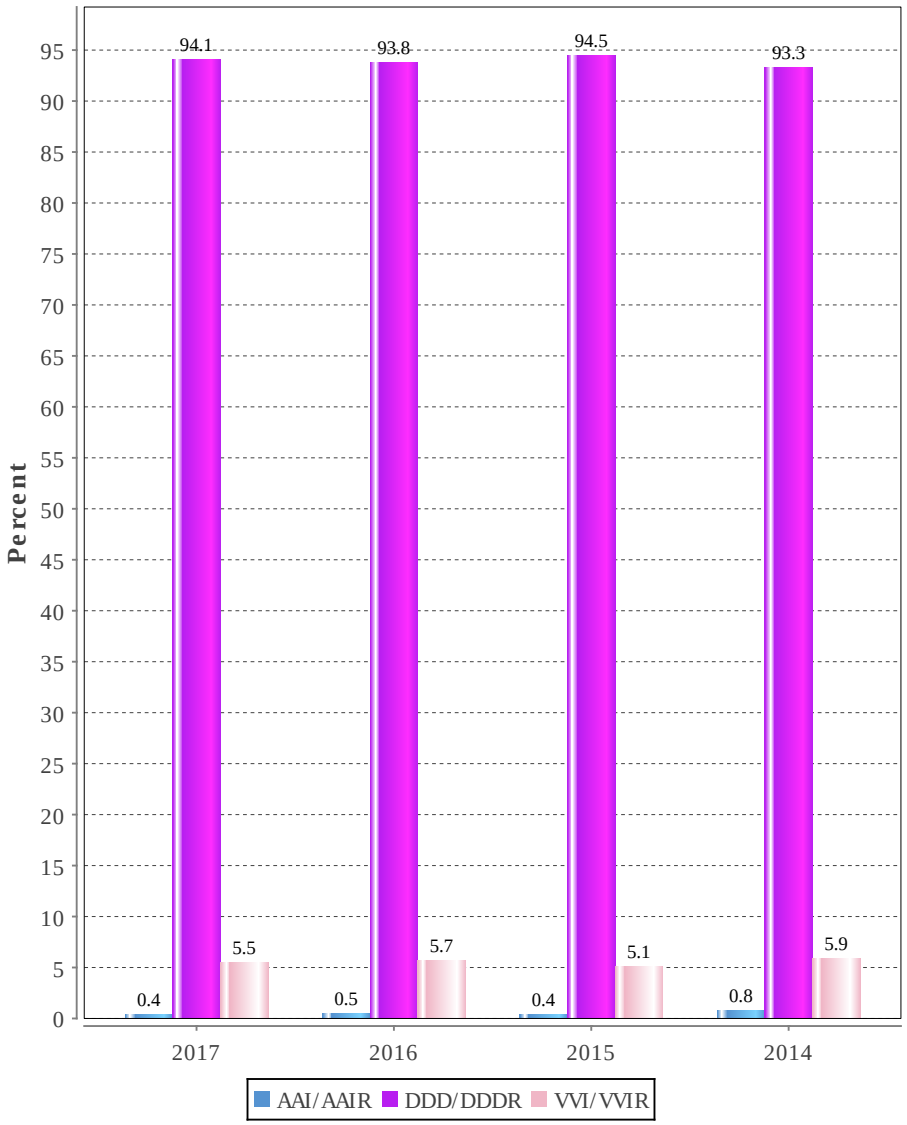
Hospital (%)	DDD	VVI
Akademiska sjukhuset	88.6	11.4
Alingsås lasarett	89.7	10.3
Arvika sjukhus	100.0	-
Blekingesjukhuset	100.0	-
Centrallasarettet Växjö	98.1	1.9
Centralsjukhuset Karlstad	98.1	1.9
Centralsjukhuset Kristianstad	94.7	5.3
Centralsjukhuset Västerås	96.1	3.9
Danderyds sjukhus	98.8	1.2
Drottning Silvias Bus	50.0	50.0
Falu lasarett	98.9	1.1
Helsingborgs lasarett	94.7	5.3
Hudiksvalls sjukhus	84.0	16.0
Karolinska Universitetssjukhuset	99.4	0.6
Kungälvs sjukhus	94.7	5.3
Linköpings Universitetssjukhus	93.6	6.4
Länssjukhuset Gävle	96.4	3.6
Länssjukhuset Halmstad	97.9	2.1
Länssjukhuset Kalmar	78.6	21.4
Länssjukhuset Ryhov	97.8	2.2
Mälarsjukhuset	98.8	1.2
Norrlands Universitetssjukhus	94.3	5.7
Oskarshamns sjukhus	85.7	14.3
Sahlgrenska Universitetssjukhuset	86.1	13.9
Sahlgrenska Universitetssjukhuset /Östra	100.0	-
Skaraborgs sjukhus Skövde	96.5	3.5
Skellefteå lasarett	85.0	15.0
Skånes universitetssjukhus, Lund	99.0	1.0
Skånes universitetssjukhus, Malmö	99.1	0.9
Sollefteå sjukhus	66.7	33.3
St Görans sjukhus	94.7	5.3
Sunderby sjukhus	93.8	6.3
Sundsvalls sjukhus	99.0	1.0
Södersjukhuset	97.1	2.9
Södra Älvsborgs sjukhus	98.5	1.5
Torsby sjukhus	91.7	8.3
Trollhättan, NÄL	85.3	14.7
Universitetssjukhuset Örebro	97.8	2.2
Varbergs sjukhus	94.8	5.2
Visby lasarett	100.0	-
Västerviks sjukhus	100.0	-
Örnsköldsviks sjukhus	100.0	-
Östersunds sjukhus	100.0	-

Use of pacing mode for total AV block indication per hospital size

Year	Mode	All hospitals (%)	Large (%)	Medium (%)	Small (%)
2017	DDD	95.2	95.0	97.5	89.7
	VVI	4.8	5.0	2.5	10.3
2016	DDD	95.1	95.9	95.4	88.8
	VVI	4.9	4.1	4.6	11.2
2015	DDD	95.2	95.9	96.0	85.7
	VVI	4.8	4.1	4.0	14.3
2014	DDDR	95.7	97.0	94.2	89.3
	DDDC	-	-	-	-
	VVIC	-	0.1	-	-
	VVIR	4.3	2.9	5.8	10.7
2013	DDDR	94.4	95.8	92.9	90.1
	DDDC	-	0.1	-	-
	VVIC	-	-	-	-

Use of pacing mode for Sinus Node Disease, historical data

Mode (%)	2017	2016	2015	2014
AAI/AAIR	0.4	0.5	0.4	0.8
DDD/DDDR	94.1	93.8	94.5	93.3
VVI/VVIR	5.5	5.7	5.1	5.9



QUALITY – PACEMAKER – FIRST IMPLANT
SINUS NODE DYSFUNCTION PER HOSPITAL

Use of pacing mode for Sinus Node Dysfunction indication per hospital size (number of new implants / year)

Year	Mode	All hospitals	Small %	Medium %	Large %
2017	AAI	0.4	2.8	0.2	0.2
	VVI	5.5	17.9	2.4	5.1
	DDD	94.1	79.3	97.4	94.7
2016	AAI	0.5	2.4	0.3	0.3
	VVI	5.7	17.1	6.5	3.8
	DDD	93.8	80.6	93.2	95.9
2015	AAI	0.4	1.9	0.3	0.3
	VVI	5.1	12.3	6.5	3.8
	DDD	94.5	85.8	93.2	95.9
2014	AAIR	0.8	1.1	0.9	0.8
	VVIR	5.9	16.1	7.7	4.1
	DDDR	93.3	82.8	91.4	95.1
2013	AAIR	1.1	0.9	1.0	1.2
	VVIR	6.6	12.8	8.7	4.7
	DDDR	92.2	86.3	90.0	94.2
	DDDC	-	-	0.1	-
	VVIC	-	-	0.1	-
2012	AAIC	-	-	-	-
	DDDC	-	-	-	-
	AAIR	1.2	0.6	1.3	1.2
	VVIC	-	0.6	-	-
	VVIR	7.8	13.4	8.6	6.1
	DDDR	91.0	85.4	90.2	92.6
2011	AAIC	-	-	-	-
	AAIR	1.4	0.4	1.0	2.3
	VVIC	0.1	0.4	0.1	-
	VVIR	7.5	19.6	8.3	2.8
	DDDR	91.0	79.6	90.6	95.0
2010	AAIR	3.4	2.5	2.9	4.2
	VVIC	0.1	1.2	-	-
	VVIR	9.2	20.1	10.3	6.1
	DDDR	87.3	76.2	86.8	89.7
2009	AAIR	5.1	6.3	4.8	5.2
	VVIC	0.2	-	0.1	-
	VVIR	9.3	17.6	11.9	5.6
	DDDR	85.4	73.9	83.2	89.2

QUALITY – PACEMAKER – FIRST IMPLANT
SINUS NODE DYSFUNCTION PER HOSPITAL

Use of pacing mode for Sinus Node Dysfunction indication per hospital (number of new implants / year)

Hospital (%)	DDD	VVI	AAI
Akademiska sjukhuset	89.5	10.5	-
Alingsås lasarett	81.5	3.7	14.8
Blekingesjukhuset	98.4	1.6	-
Centrallasarettet Växjö	97.2	2.8	-
Centralsjukhuset Karlstad	97.3	2.7	-
Centralsjukhuset Kristianstad	96.3	3.7	-
Centralsjukhuset Västerås	97.1	2.9	-
Danderyds sjukhus	100.0	-	-
Drottning Silvias Bus	50.0	-	50.0
Falu lasarett	100.0	-	-
Helsingborgs lasarett	75.0	25.0	-
Hudiksvalls sjukhus	77.3	22.7	-
Karolinska Universitetssjukhuset	99.0	1.0	-
Kungälvs sjukhus	93.3	3.3	3.3
Linköpings Universitetssjukhus	96.0	4.0	-
Länssjukhuset Gävle	88.5	11.5	-
Länssjukhuset Halmstad	93.1	6.9	-
Länssjukhuset Kalmar	55.0	45.0	-
Länssjukhuset Ryhov	89.9	10.1	-
Mälarsjukhuset	100.0	-	-
Norrlands Universitetssjukhus	98.0	2.0	-
Oskarshamns sjukhus	75.0	25.0	-
Sahlgrenska Universitetssjukhuset	94.8	3.1	2.1
Sahlgrenska Universitetssjukhuset /Östra	88.5	11.5	-
Skaraborgs sjukhus Skövde	100.0	-	-
Skellefteå lasarett	76.2	23.8	-
Skånes universitetssjukhus, Lund	96.8	2.4	0.8
Skånes universitetssjukhus, Malmö	88.2	11.8	-
Sollefteå sjukhus	50.0	50.0	-
St Görans sjukhus	97.2	2.8	-
Sunderby sjukhus	87.1	12.9	-
Sundsvalls sjukhus	84.7	15.3	-
Södersjukhuset	100.0	-	-
Södra Älvsborgs sjukhus	94.5	5.5	-
Torsby sjukhus	62.5	37.5	-
Trollhättan, NÄL	98.7	1.3	-
Universitetssjukhuset Örebro	100.0	-	-
Varbergs sjukhus	96.9	3.1	-
Visby lasarett	100.0	-	-
Vrinnevisjukhuset	100.0	-	-
Västerviks sjukhus	100.0	-	-
Örnsköldsviks sjukhus	95.5	4.5	-
Östersunds sjukhus	100.0	-	-

Dislocation rate for different lead types in atrial or ventricular placement. Based on all implants implanted 2006 and later and explanted/corrected 2017 or earlier

Type	Right atrium %	Right ventricle %	Left ventricle %	Total %
Fixed screw	1.7	1.1	0.7	1.4
Retractable screw	1.7	1.1	0.7	1.4
Passive	3.6	1.7	2.1	1.5
All	1.7	1.2	1.8	1.4

Extractions per hospital

Hospital	No of leads
Akademiska sjukhuset	94
Blekingesjukhuset	12
Drottning Silvias Bus	6
Karolinska Solna	227
Linköpings universitetssjukhus	20
Sahlgrenska universitetssjukhuset	119
Skånes universitetssjukhus, Lund	53
Sunderby sjukhus	6

Extractions per type

Type	Extractions
ICD lead	106
Pacemaker lead	466

Extractions per model (more then 5 extractions)

Manfacturer	Model	Extractions
Boston Scientific	4470 Fineline II Sterox EZ MRI	16
Medtronic	4074 Capsure Sense MRI	8
Medtronic	4076 CapSureFix Novus MRI	51
Medtronic	4968 CapSure Epi	6
Medtronic	5076 CapSureFix MRI	30
Medtronic	6947 Sprint Quattro Secure MRI	6
St Jude Medical/ Abbott	1258T QuickFlex	20
St Jude Medical/ Abbott	1458Q Quartet MRI	16
St Jude Medical/ Abbott	1480T	10
St Jude Medical/ Abbott	1488T Tendril SDX	8
St Jude Medical/ Abbott	1636T Isoflex	6
St Jude Medical/ Abbott	1646T Isoflex	10
St Jude Medical/ Abbott	1688T Tendril SDX	9
St Jude Medical/ Abbott	1948 Isoflex MRI	11
St Jude Medical/ Abbott	1999 Optisense	43
St Jude Medical/ Abbott	2088TC Tendril STS MRI	54
St Jude Medical/ Abbott	7120Q Durata	8
St Jude Medical/ Abbott	7122 Durata	8

Manfacturer	Model	Extractions
St Jude Medical/ Abbott	7122Q Durata	19
St Jude Medical/ Abbott	LPA1200M52cm TendrilMRI	9
St Jude Medical/ Abbott	LPA1200M58cm TendrilMRI	10
Vitatron	ICQ09B Crystalline	9

Extractions per reason

Reason	Extractions
Ceased indication for ICD therapy	9
Conductor break	12
Elective/system change	22
Electrical dysfunction	59
Heart transplant	11
Infection/Ulceration, local	174
Infection/Ulceration, systemic	234
Lead dislocation	12
Patient's wish	10
Preventive	6
Venous access	9

*Extraction positions**

Hospital	Femoral	Left superior	N/A	Right superior
Akademiska sjukhuset	6	81	0	7
Blekingesjukhuset	0	9	0	3
Drottning Silvias Bus	1	2	0	3
Karolinska Solna	1	217	0	9
Linköpings universitetssjukhus	0	17	0	3
Skånes universitetssjukhus, Lund	5	46	0	2
*Hospital Sahlgrenska and Sunderby excluded				

*Extraction problems**

Hospital	I	E	O	P	X	D
Akademiska sjukhuset	1	5	1	0	0	0
Blekingesjukhuset	0	0	0	0	0	0
Drottning Silvias Bus	0	0	0	0	0	0
Karolinska Solna	0	0	1	0	0	0
Linköpings universitetssjukhus	0	0	0	0	0	0
Skånes universitetssjukhus, Lund	0	1	0	0	0	0

(*Hospital Sahlgrenska and Sunderby excluded), I: Insulation break, E: Conductor break, O: Unintentional extraction of another lead, P: Perforation/Tamponade, X: Pneumothorax, D: Death

*Extraction results**

Hospital	Failed	Partially successfull	Successfull
Akademiska sjukhuset	0	5	89
Blekingesjukhuset	0	0	12
Drottning Silvias Bus	0	0	6
Karolinska Solna	0	5	222
Linköpings universitetssjukhus	0	0	20
Skånes universitetssjukhus, Lund	0	0	53

*Hospital Sahlgrenska and Sunderby excluded

*Extraction tools**

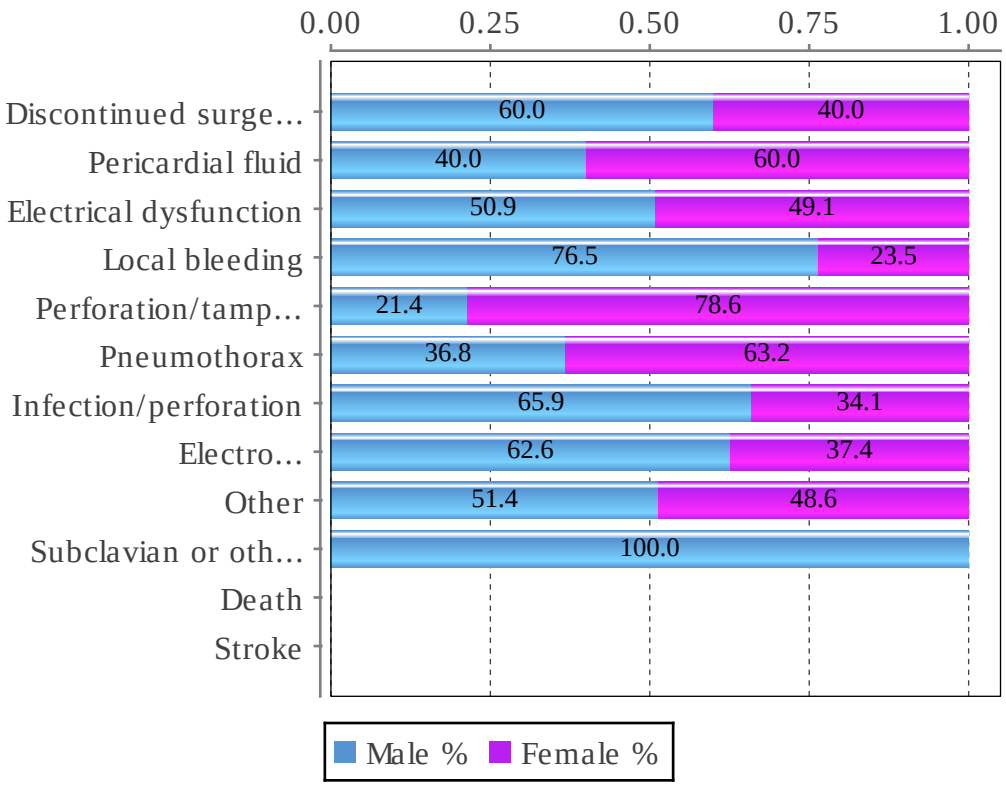
Hospital	SS	LS	PS	AM	L	S	PK	EK	AL
Akademiska sjukhuset	27	57	48	24	1	2	1	0	3
Blekingesjukhuset	0	5	0	2	0	0	0	0	0
Drottning Silvias Bus	0	0	0	0	0	0	0	0	0
Karolinska Solna	20	169	147	8	2	0	0	0	0
Linköpings universitetssjukhus	10	2	1	0	0	0	0	0	0
Skånes universitetssjukhus, Lund	5	15	0	15	0	0	0	0	0

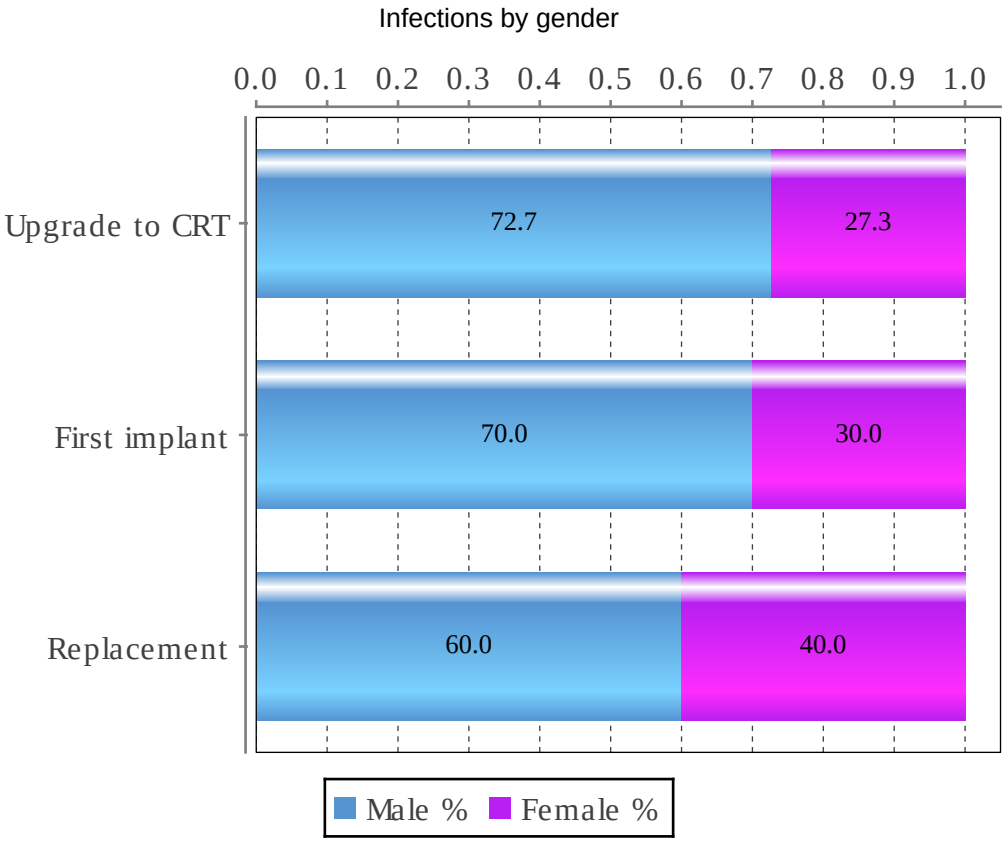
(*Hospital Sahlgrenska and Sunderby excluded), SS: Standard stylet, LS: Locking stylet, PS: Passive sheath, AM: Active mechanical sheath, L: Lasso, S: Snare, PK: Pigtail catheter, EP: EP catheter, AL: Active laser sheath

Registered complications for new implants and for bleeding, infection and other also including replacements

Complication	2016 %	2017 %	Based on
Discontinued surgery due to hemodynamic reasons	0.0	0.1	A
Pericardial fluid	0.1	0.1	A
Electrical dysfunction	0.9	0.7	B
Local bleeding	0.4	0.2	A
Perforation/tamponade	0.4	0.2	B
Pneumothorax	0.5	0.5	B
Infection/perforation	0.6	0.5	A
Electrode displacement	1.9	1.5	B
Other	0.6	0.4	A
Subclavian or other related thrombosis	0.1	0.1	B
Death	0.0	0.0	A
Stroke	0.0	0.0	A
Total	5.5	4.3	
Based on A=9573 (all implants) alternatively B=7612 (first implants + lead replacement) validated events			

Complications by gender

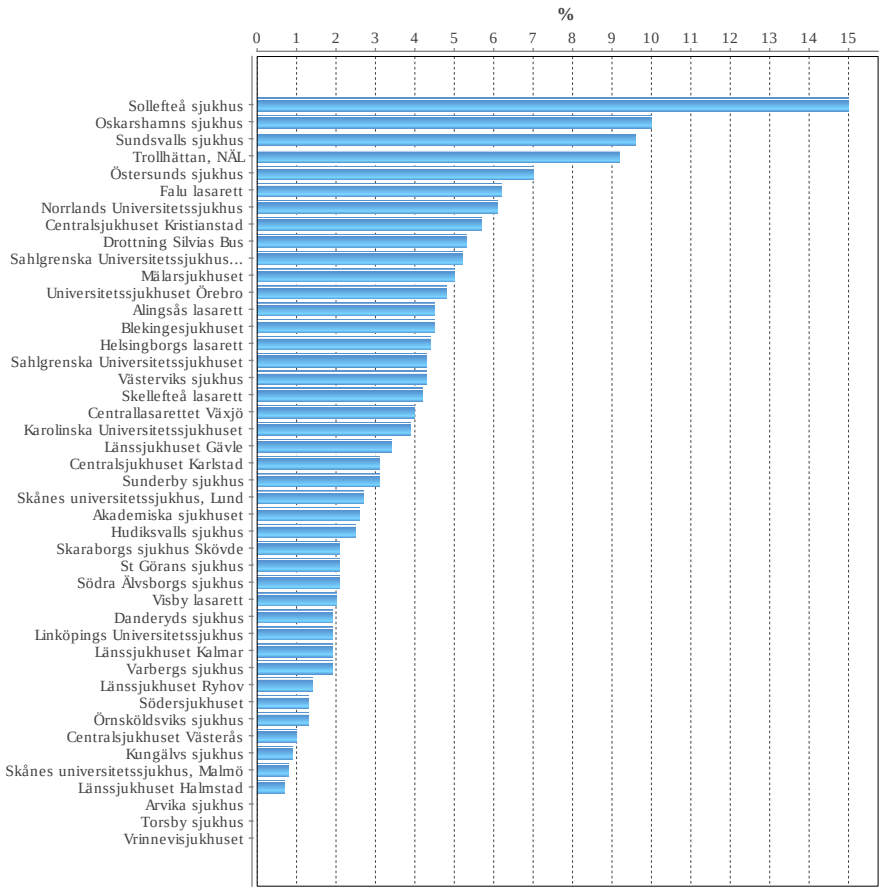




Infections related to all interventions by gender

Reason	Male %	Female %
First implant	*0.5*	*0.3*
Replacement	*1.2*	*1.2*
Upgrade to CRT	*1.4*	*1.5*

QUALITY – PACEMAKER – COMPLICATIONS PER HOSPITAL



De.: Death, **Dc.**: Discontinued surgery, **Df.**: Electrical dysfunction, **Dp.**: Lead dislocation, **In.**: Infection/Perforation, **Tr.**: Subclavian or other related thrombosis

Hospital	No	De. %	Dc. %	Df. %	Dp. %	In. %	Tr. %
Akademiska sjukhuset	423	-	-	0.2	1.2	-	-
Alingsås lasarett	88	-	1.1	-	-	1.1	-
Arvika sjukhus	16	-	-	-	-	-	-
Blekingesjukhuset	223	-	-	2.2	-	0.9	-
Centrallasarettet Växjö	149	-	-	1.3	2.0	-	-
Centralsjukhuset Karlstad	162	-	-	1.2	0.6	1.2	-
Centralsjukhuset Kristianstad	297	-	-	-	2.4	1.7	0.3
Centralsjukhuset Västerås	208	-	-	0.5	-	-	-
Danderyds sjukhus	537	-	-	0.2	1.5	0.2	-
Drottning Silvias Bus	19	-	-	5.3	-	-	-
Falu lasarett	306	-	0.3	0.3	2.9	0.7	-
Helsingborgs lasarett	45	-	-	-	-	-	-
Hudiksvalls sjukhus	81	-	-	-	1.2	-	-
Karolinska Universitetssjukhuset	517	-	-	0.8	1.5	0.6	-
Kungälvs sjukhus	113	-	-	-	0.9	-	-
Linköpings Universitetssjukhus	462	-	-	0.4	1.1	-	-
Länssjukhuset Gävle	295	-	-	0.7	1.0	0.3	-
Länssjukhuset Halmstad	148	-	-	-	-	-	-
Länssjukhuset Kalmar	103	-	-	1.0	-	1.0	-
Länssjukhuset Ryhov	277	-	-	-	0.7	0.4	-
Mälarsjukhuset	218	-	-	0.5	2.3	0.9	-
Norrlands Universitetssjukhus	214	-	-	0.5	3.7	-	-
Oskarshamns sjukhus	20	-	-	-	-	-	-
Sahlgrenska Universitetssjukhuset	516	-	-	0.4	1.4	1.0	-
Sahlgrenska Universitetssjukhuset /Östra	115	-	-	0.9	2.6	-	-
Skaraborgs sjukhus Skövde	285	-	-	-	0.4	-	0.4
Skellefteå lasarett	71	-	-	1.4	1.4	1.4	-
Skånes universitetssjukhus, Lund	637	-	-	-	1.3	0.9	-
Skånes universitetssjukhus, Malmö	397	-	-	-	-	-	-
Sollefteå sjukhus	20	-	-	5.0	-	-	-
St Görans sjukhus	384	-	-	0.3	0.5	0.3	0.3
Sunderby sjukhus	320	-	0.6	0.3	0.3	-	-
Sundsvalls sjukhus	240	-	-	1.3	3.3	0.8	-
Södersjukhuset	373	-	-	0.3	0.8	-	-
Södra Älvsborgs sjukhus	242	-	-	0.4	0.8	0.4	-
Torsby sjukhus	39	-	-	-	-	-	-
Trollhättan, NÄL	358	-	-	3.4	2.8	-	0.3
Universitetssjukhuset Örebro	272	-	0.4	1.5	1.1	0.7	-
Varbergs sjukhus	161	-	-	-	1.2	-	-
Visby lasarett	49	-	-	2.0	-	-	-
Vrinnevisjukhuset	1	-	-	-	-	-	-
Västerviks sjukhus	47	-	-	-	4.3	-	-
Örnsköldsviks sjukhus	79	-	-	-	-	1.3	-
Östersunds sjukhus	214	-	-	0.9	0.9	1.9	-

QUALITY – PACEMAKER – COMPLICATIONS PER HOSPITAL

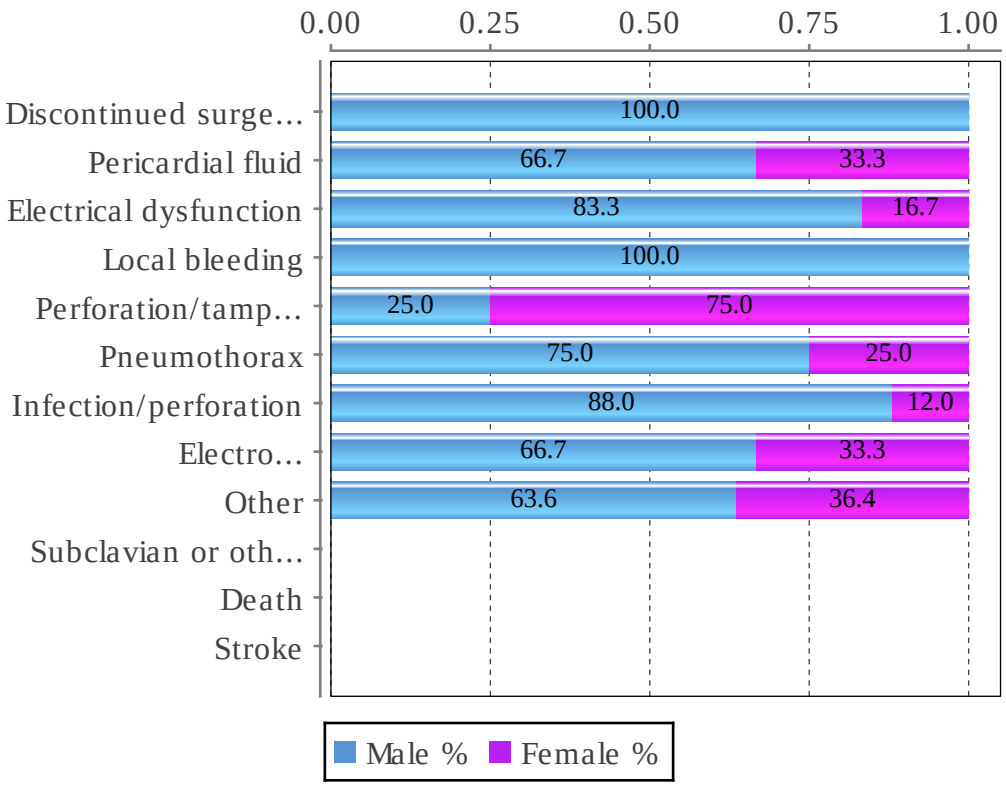
Bl.: Bleeding, **Ot.**: Other, **Tm.**: Perforation/Tamponade, **Pn.**: Pneumothorax, **Pf.**: Pericardial fluid, **St.**: Stroke

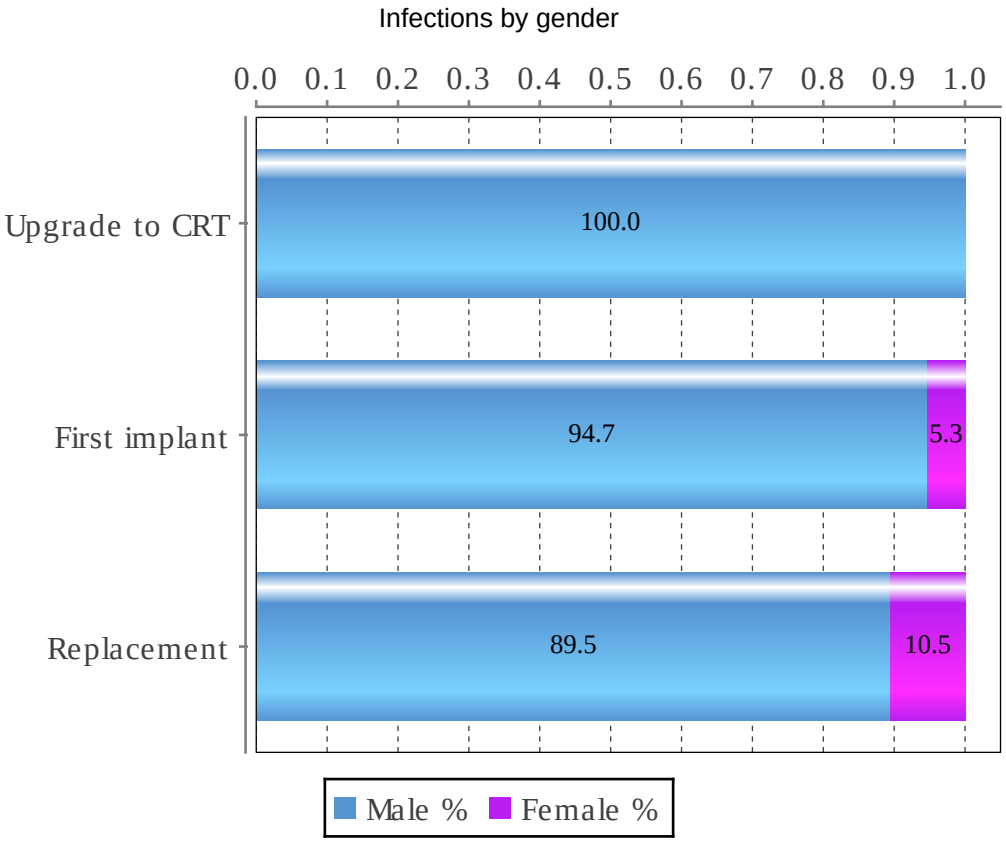
Hospital	No	Bl. %	Ot. %	Tm. %	Pn. %	Pf. %	St. %	All %
Akademiska sjukhuset	423	-	0.2	0.5	0.5	-	-	2.6
Alingsås lasarett	88	-	2.3	-	-	-	-	4.5
Arvika sjukhus	16	-	-	-	-	-	-	-
Blekingesjukhuset	223	0.4	-	-	0.9	-	-	4.5
Centrallasarettet Växjö	149	-	0.7	-	-	-	-	4.0
Centralsjukhuset Karlstad	162	-	-	-	-	-	-	3.1
Centralsjukhuset Kristianstad	297	0.3	0.7	-	0.3	-	-	5.7
Centralsjukhuset Västerås	208	-	-	-	0.5	-	-	1.0
Danderyds sjukhus	537	-	-	-	-	-	-	1.9
Drottning Silvias Bus	19	-	-	-	-	-	-	5.3
Falu lasarett	306	-	1.0	0.7	0.3	-	-	6.2
Helsingborgs lasarett	45	-	-	-	4.4	-	-	4.4
Hudiksvalls sjukhus	81	-	-	-	1.2	-	-	2.5
Karolinska Universitetssjukhuset	517	0.2	0.2	-	0.6	-	-	3.9
Kungälvs sjukhus	113	-	-	-	-	-	-	0.9
Linköpings Universitetssjukhus	462	-	0.4	-	-	-	-	1.9
Länssjukhuset Gävle	295	-	0.3	-	0.7	0.3	-	3.4
Länssjukhuset Halmstad	148	-	-	0.7	-	-	-	0.7
Länssjukhuset Kalmar	103	-	-	-	-	-	-	1.9
Länssjukhuset Ryhov	277	-	-	0.4	-	-	-	1.4
Mälarsjukhuset	218	-	-	0.5	0.9	-	-	5.0
Norrlands Universitetssjukhus	214	-	0.9	0.9	-	-	-	6.1
Oskarshamns sjukhus	20	5.0	-	-	5.0	-	-	10.0
Sahlgrenska Universitetssjukhuset	516	0.2	0.6	-	0.8	-	-	4.3
Sahlgrenska Universitetssjukhuset /Östra	115	1.7	-	-	-	-	-	5.2
Skaraborgs sjukhus Skövde	285	0.4	0.7	0.4	-	-	-	2.1
Skellefteå lasarett	71	-	-	-	-	-	-	4.2
Skånes universitetssjukhus, Lund	637	-	0.3	-	-	0.2	-	2.7
Skånes universitetssjukhus, Malmö	397	-	0.8	-	-	-	-	0.8
Sollefteå sjukhus	20	5.0	5.0	-	-	-	-	15.0
St Görans sjukhus	384	-	0.5	-	0.3	-	-	2.1
Sunderby sjukhus	320	0.3	-	0.3	1.3	-	-	3.1
Sundsvalls sjukhus	240	-	0.4	0.8	2.9	-	-	9.6
Södersjukhuset	373	-	-	0.3	-	-	-	1.3
Södra Älvsborgs sjukhus	242	-	0.4	-	-	-	-	2.1
Torsby sjukhus	39	-	-	-	-	-	-	-
Trollhättan, NÄL	358	0.6	0.3	-	1.4	0.6	-	9.2
Universitetssjukhuset Örebro	272	0.7	-	-	-	0.4	-	4.8
Varbergs sjukhus	161	-	0.6	-	-	-	-	1.9
Visby lasarett	49	-	-	-	-	-	-	2.0
Vrinnevisjukhuset	1	-	-	-	-	-	-	-
Västerviks sjukhus	47	-	-	-	-	-	-	4.3
Örnsköldsviks sjukhus	79	-	-	-	-	-	-	1.3
Östersunds sjukhus	214	1.4	1.4	-	0.5	-	-	7.0

Registered complications for new implants and for bleeding, infection and other also including replacements

Complication	2016 %	2017 %
Discontinued surgery due to hemodynamic reasons	0.1	0.0
Electrical dysfunction	1.8	1.5
Local bleeding	0.5	0.2
Perforation/tamponade	0.4	0.3
Pneumothorax	0.7	0.3
Infection/perforation	1.0	1.0
Electrode displacement	2.8	2.5
Other	0.6	0.5
Subclavian or other related thrombosis	0.2	0.0
Death	0.0	0.0
Pericardial fluid	0.0	0.1
Stroke	0.0	0.0
Total	8.1	6.4
Based on 2381 (all implants) alternatively 1583 (first implants + lead replacements) validated events		

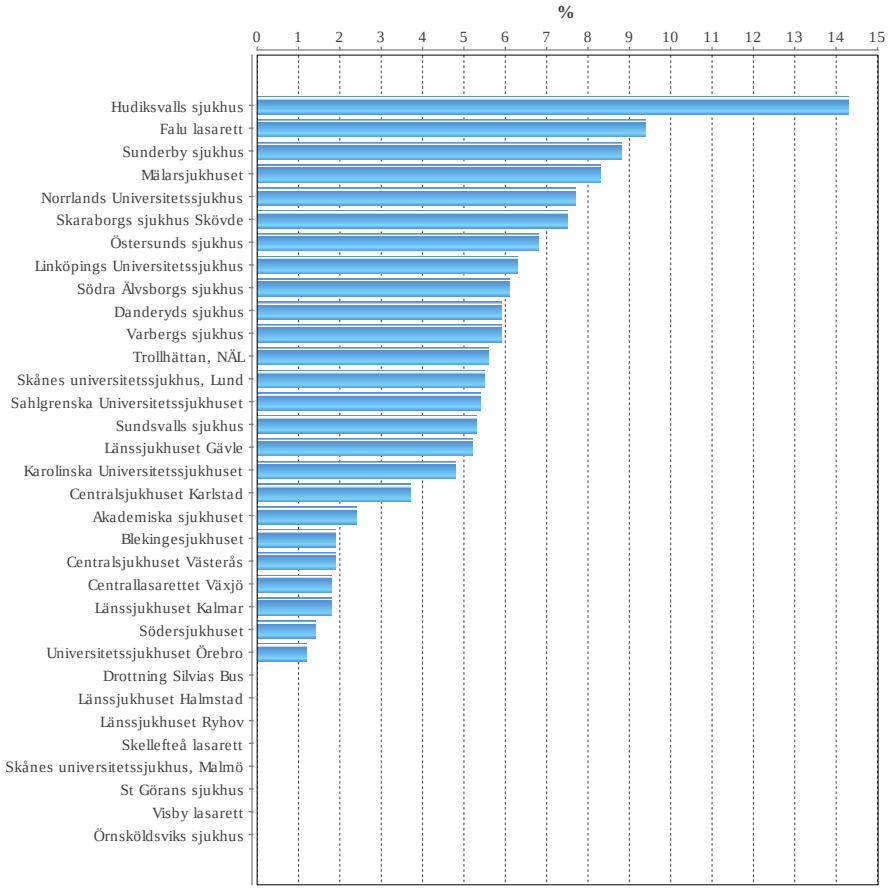
Complications by gender





Infections related to all interventions by gender

Reason	Male %	Female %
First implant	*1.6*	*0.3*
Replacement	*2.3*	*1.0*
Upgrade to CRT	*2.0*	*0.0*


%
0
1
2
3
4
5
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8
9
10
11
12
13
14
15
Hudiksvalls sjukhus
Falu lasarett
Sunderby sjukhus
Mälarsjukhuset
Norrlands Universitetssjukhus
Skaraborgs sjukhus Skövde
Östersunds sjukhus
Linköpings Universitetssjukhus
Södra Älvsborgs sjukhus
Danderyds sjukhus
Varbergs sjukhus
Trollhättan, NÄL
Skånes universitetssjukhus, Lund
Sahlgrenska Universitetssjukhuset
Sundsvalls sjukhus
Länssjukhuset Gävle
Karolinska Universitetssjukhuset
Centralsjukhuset Karlstad
Akademiska sjukhuset
Blekingesjukhuset
Centralsjukhuset Västerås
Centrallasarettet Växjö
Länssjukhuset Kalmar
Södersjukhuset
Universitetssjukhuset Örebro
Drottning Silvias Bus
Länssjukhuset Halmstad
Länssjukhuset Ryhov
Skellefteå lasarett
Skånes universitetssjukhus, Malmö
St Görans sjukhus
Visby lasarett
Örnsköldsviks sjukhus

QUALITY – ICD – COMPLICATIONS PER HOSPITAL

De.: Death, **Dc.**: Discontinued surgery, **Df.**: Electrical dysfunction, **Dp.**: Lead dislocation, **In.**: Infection/Perforation, **Tr.**: Subclavian and other related trombosis, **Bl.**: Bleeding

Hospital	No	De. %	Dc. %	Df. %	Dp. %	In. %	Tr. %	Bl. %
Akademiska sjukhuset	124	-	-	0.8	0.8	-	-	0.8
Blekingesjukhuset	54	-	-	-	1.9	-	-	-
Centrallasarettet Växjö	56	-	-	-	1.8	-	-	-
Centralsjukhuset Karlstad	54	-	-	3.7	-	-	-	-
Centralsjukhuset Västerås	53	-	-	1.9	-	-	-	-
Danderyds sjukhus	85	-	-	-	3.5	1.2	-	-
Drottning Silvias Bus	1	-	-	-	-	-	-	-
Falu lasarett	85	-	-	4.7	2.4	-	-	-
Hudiksvalls sjukhus	7	-	-	14.3	-	-	-	-
Karolinska Universitetssjukhuset	231	-	0.4	-	1.7	1.3	-	0.9
Linköpings Universitetssjukhus	174	-	-	1.1	4.6	0.6	-	-
Länssjukhuset Gävle	97	-	-	3.1	-	-	-	1.0
Länssjukhuset Halmstad	5	-	-	-	-	-	-	-
Länssjukhuset Kalmar	56	-	-	-	1.8	-	-	-
Länssjukhuset Ryhov	55	-	-	-	-	-	-	-
Mälarsjukhuset	60	-	-	-	1.7	5.0	-	-
Norrlands Universitetssjukhus	78	-	-	-	1.3	3.8	-	-
Sahlgrenska Universitetssjukhuset	147	-	-	0.7	2.7	1.4	-	-
Skaraborgs sjukhus Skövde	53	-	-	3.8	-	-	-	-
Skellefteå lasarett	5	-	-	-	-	-	-	-
Skånes universitetssjukhus, Lund	346	-	-	0.9	2.3	2.0	-	-
Skånes universitetssjukhus, Malmö	1	-	-	-	-	-	-	-
St Görans sjukhus	78	-	-	-	-	-	-	-
Sunderby sjukhus	80	-	-	-	1.3	2.5	-	1.3
Sundsvalls sjukhus	76	-	-	1.3	2.6	1.3	-	-
Södersjukhuset	72	-	-	-	1.4	-	-	-
Södra Älvsborgs sjukhus	66	-	-	4.5	-	-	-	-
Trollhättan, NÄL	71	-	-	1.4	-	1.4	-	-
Universitetssjukhuset Örebro	85	-	-	-	1.2	-	-	-
Varbergs sjukhus	68	-	-	-	1.5	1.5	-	-
Visby lasarett	9	-	-	-	-	-	-	-
Örnsköldsviks sjukhus	12	-	-	-	-	-	-	-
Östersunds sjukhus	44	-	-	2.3	-	-	-	-

QUALITY – ICD – COMPLICATIONS PER HOSPITAL

Ot.: Other, **Pa.**: Perioperative arrhythmia, **Tm.**: Perforation/Tamponade, **Pn.**: Pneumothorax, **Pf.**: Pericardial fluid, **St.**: Stroke

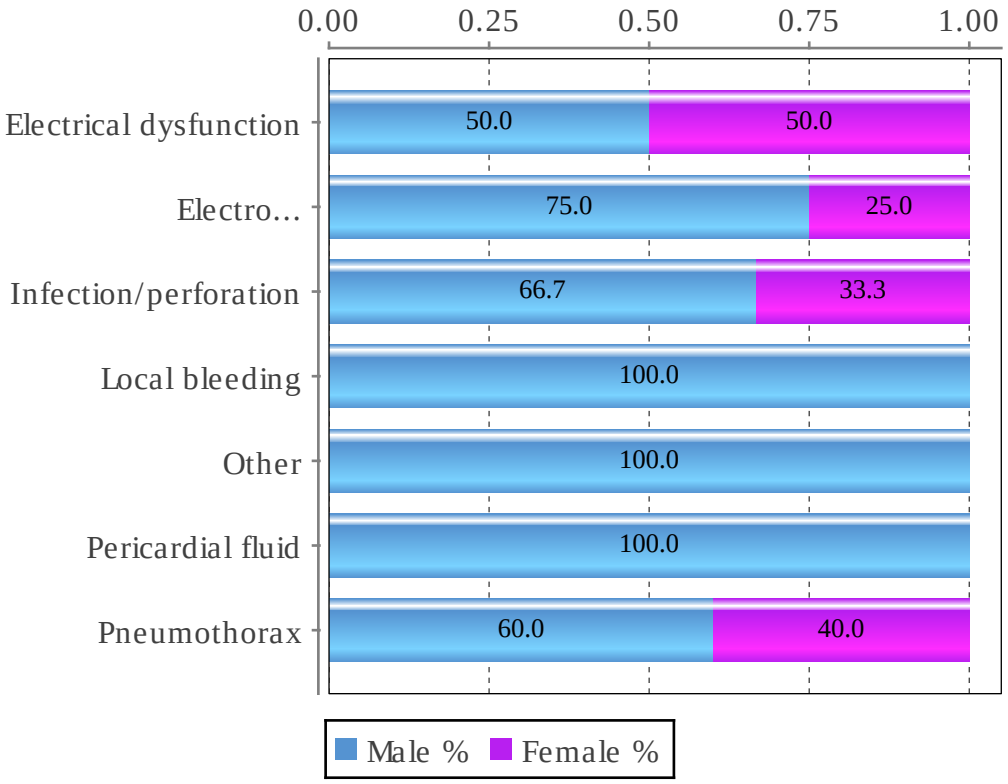
Hospital	No	Ot. %	Pa. %	Tm. %	Pn. %	Pf. %	St. %	All %
Akademiska sjukhuset	124	-	-	-	-	-	-	2.4
Blekingesjukhuset	54	-	-	-	-	-	-	1.9
Centrallasarettet Växjö	56	-	-	-	-	-	-	1.8
Centralsjukhuset Karlstad	54	-	-	-	-	-	-	3.7
Centralsjukhuset Västerås	53	-	-	-	-	-	-	1.9
Danderyds sjukhus	85	1.2	-	-	-	-	-	5.9
Drottning Silvias Bus	1	-	-	-	-	-	-	-
Falu lasarett	85	1.2	-	1.2	-	-	-	9.4
Hudiksvalls sjukhus	7	-	-	-	-	-	-	14.3
Karolinska Universitetssjukhuset	231	-	-	-	0.4	-	-	4.8
Linköpings Universitetssjukhus	174	-	-	-	-	-	-	6.3
Länssjukhuset Gävle	97	-	-	-	1.0	-	-	5.2
Länssjukhuset Halmstad	5	-	-	-	-	-	-	-
Länssjukhuset Kalmar	56	-	-	-	-	-	-	1.8
Länssjukhuset Ryhov	55	-	-	-	-	-	-	-
Mälarsjukhuset	60	-	-	1.7	-	-	-	8.3
Norrlands Universitetssjukhus	78	-	-	1.3	1.3	-	-	7.7
Sahlgrenska Universitetssjukhuset	147	0.7	-	-	-	-	-	5.4
Skaraborgs sjukhus Skövde	53	3.8	-	-	-	-	-	7.5
Skellefteå lasarett	5	-	-	-	-	-	-	-
Skånes universitetssjukhus, Lund	346	0.3	-	-	-	-	-	5.5
Skånes universitetssjukhus, Malmö	1	-	-	-	-	-	-	-
St Görans sjukhus	78	-	-	-	-	-	-	-
Sunderby sjukhus	80	-	-	1.3	1.3	1.3	-	8.8
Sundsvalls sjukhus	76	-	-	-	-	-	-	5.3
Södersjukhuset	72	-	-	-	-	-	-	1.4
Södra Älvsborgs sjukhus	66	1.5	-	-	-	-	-	6.1
Trollhättan, NÄL	71	-	-	-	1.4	1.4	-	5.6
Universitetssjukhuset Örebro	85	-	-	-	-	-	-	1.2
Varbergs sjukhus	68	2.9	-	-	-	-	-	5.9
Visby lasarett	9	-	-	-	-	-	-	-
Örnsköldsviks sjukhus	12	-	-	-	-	-	-	-
Östersunds sjukhus	44	4.5	-	-	-	-	-	6.8

Registered complications for new implants and for bleeding, infection and other also including replacements.

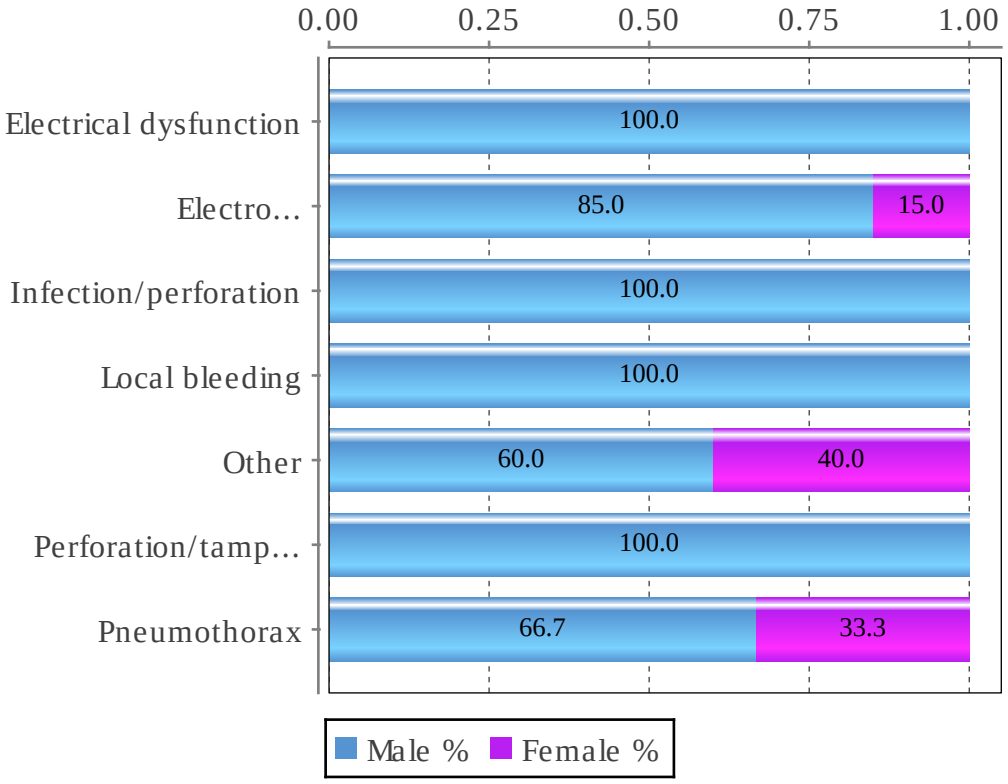
CRT-P Complication	%
Death	-
Discontinued surgery due to hemodynamic reasons	-
Electrical dysfunction	0.4
Electrode displacement	0.7
Infection/perforation	1.1
Local bleeding	0.2
Other	0.4
Perforation/tamponade	-
Pericardial fluid	0.2
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	0.9
Stroke	-
Subclavian or other related thrombosis	-
Total	3.8
Total no of implants	552

CRT-D Complication	%
Death	-
Discontinued surgery due to hemodynamic reasons	-
Electrical dysfunction	0.9
Electrode displacement	3.1
Infection/perforation	0.9
Local bleeding	0.2
Other	0.8
Perforation/tamponade	0.2
Pericardial fluid	-
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	0.5
Stroke	-
Subclavian or other related thrombosis	-
Total	6.4
Total no of implants	654

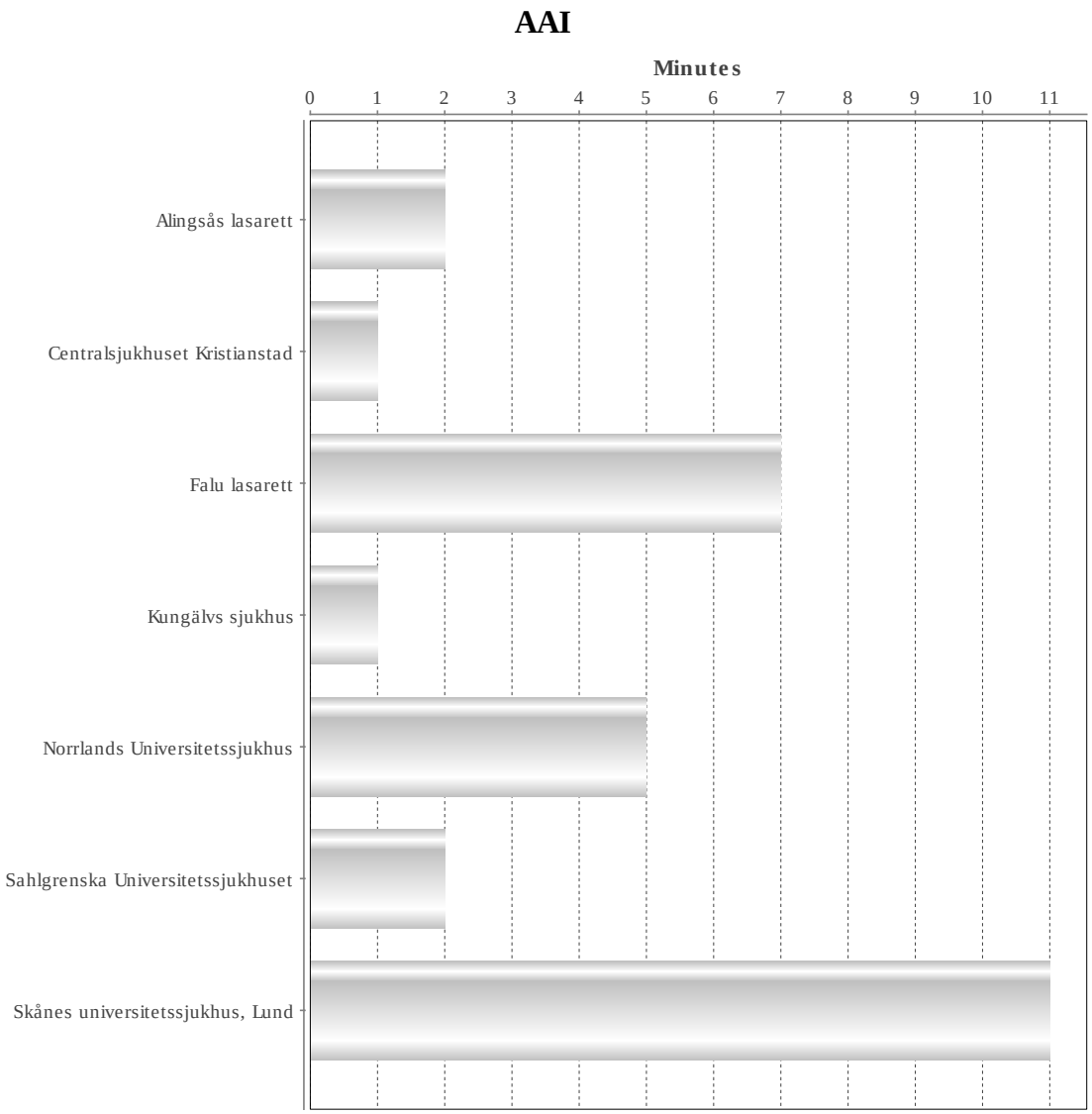
CRT-P complications by gender



CRT-D complications by gender

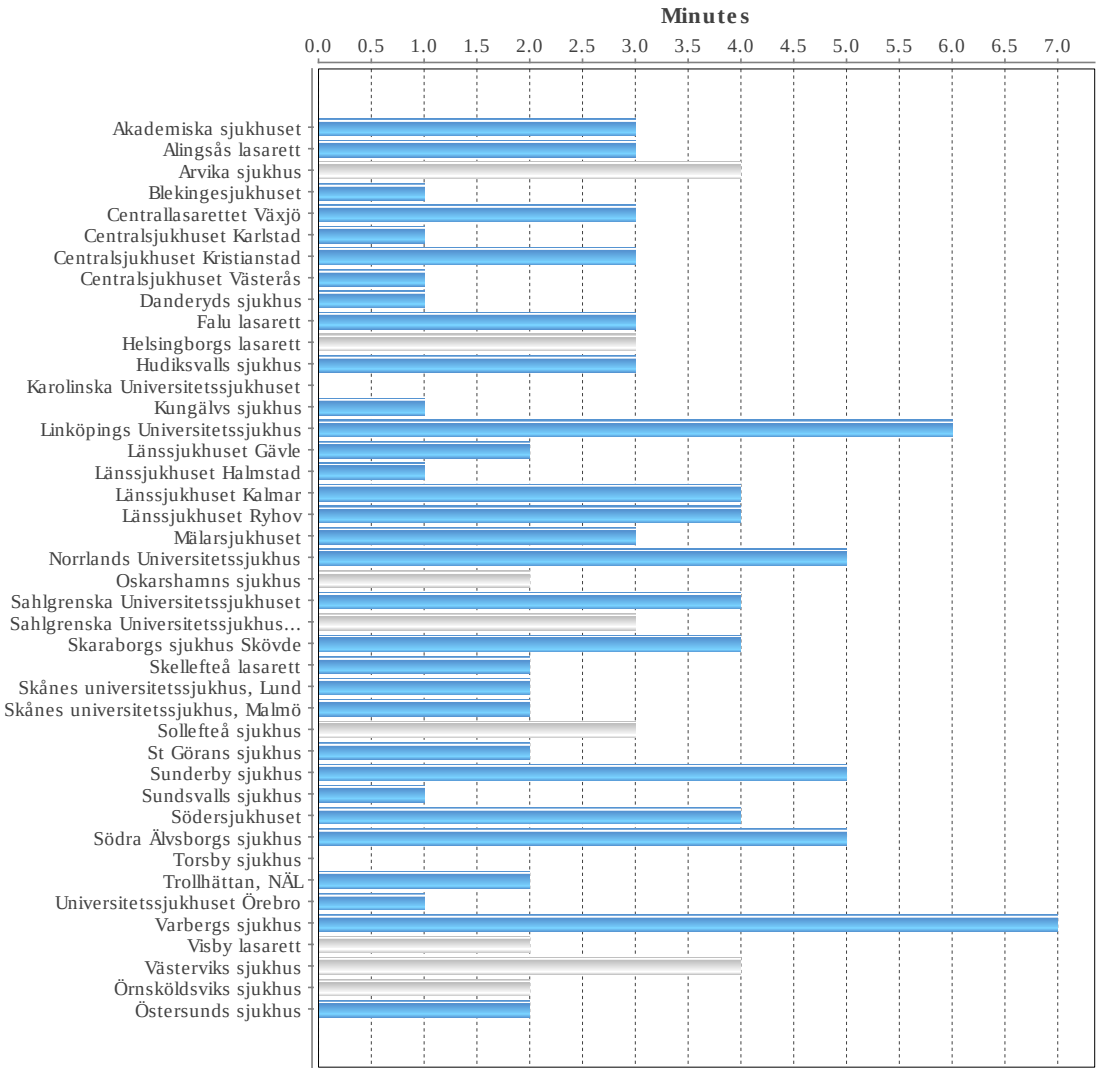


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

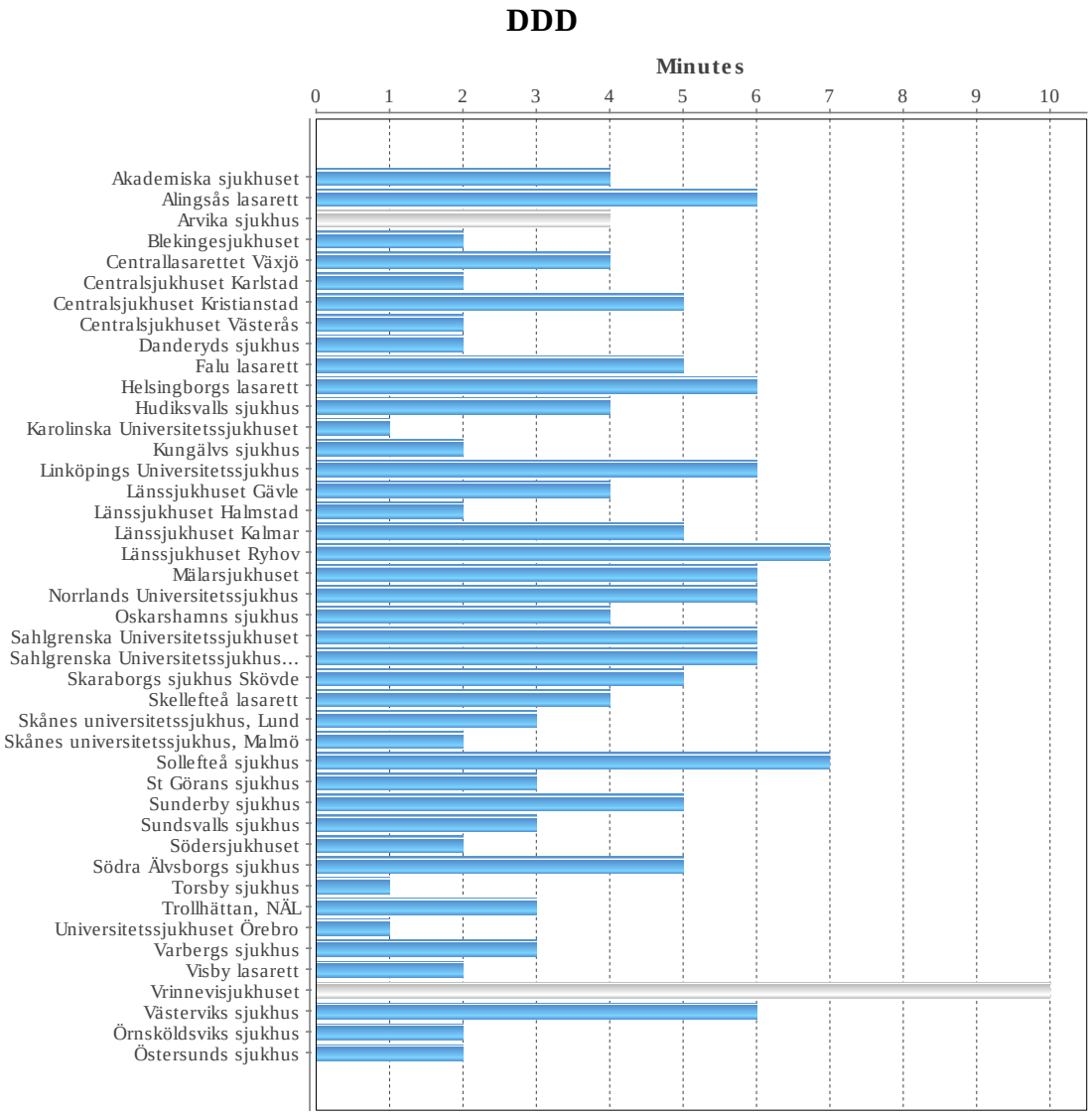


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI

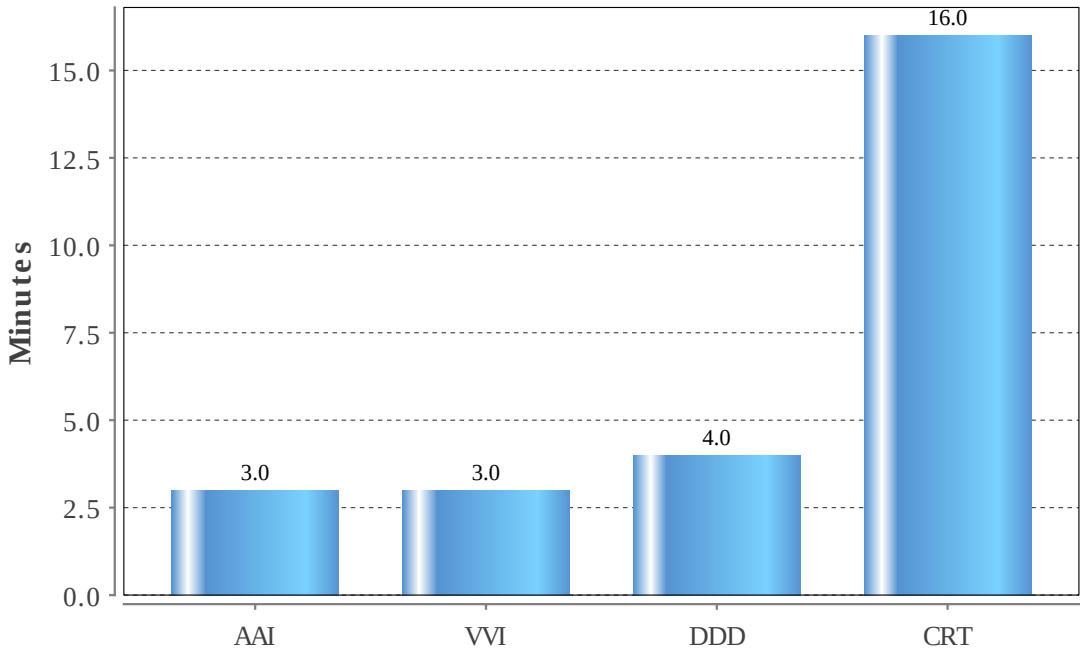


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.



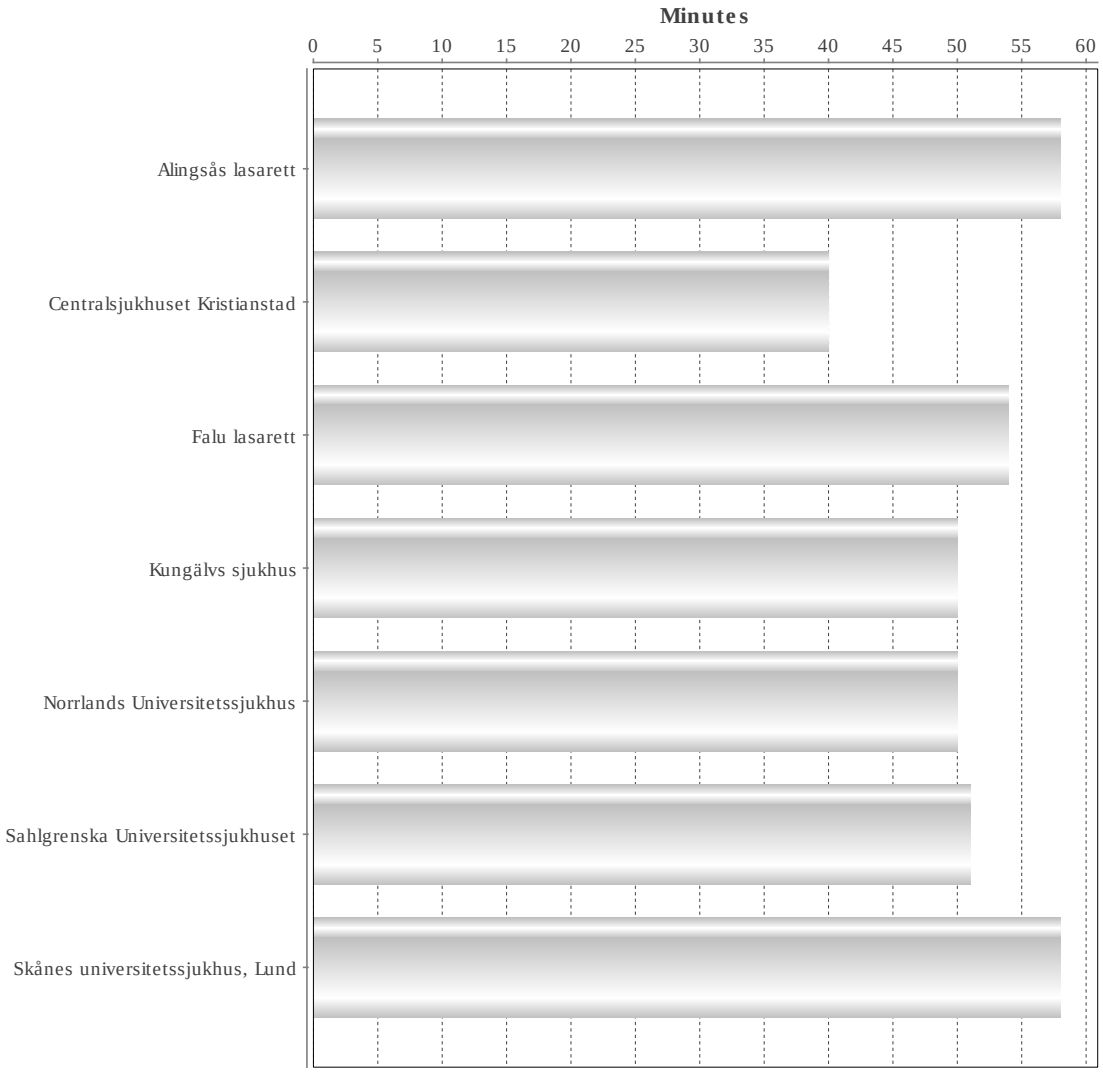
National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
AAI	3.0	3.0
VVI	3.0	5.5
DDD	4.0	4.0
CRT	16.0	13.1



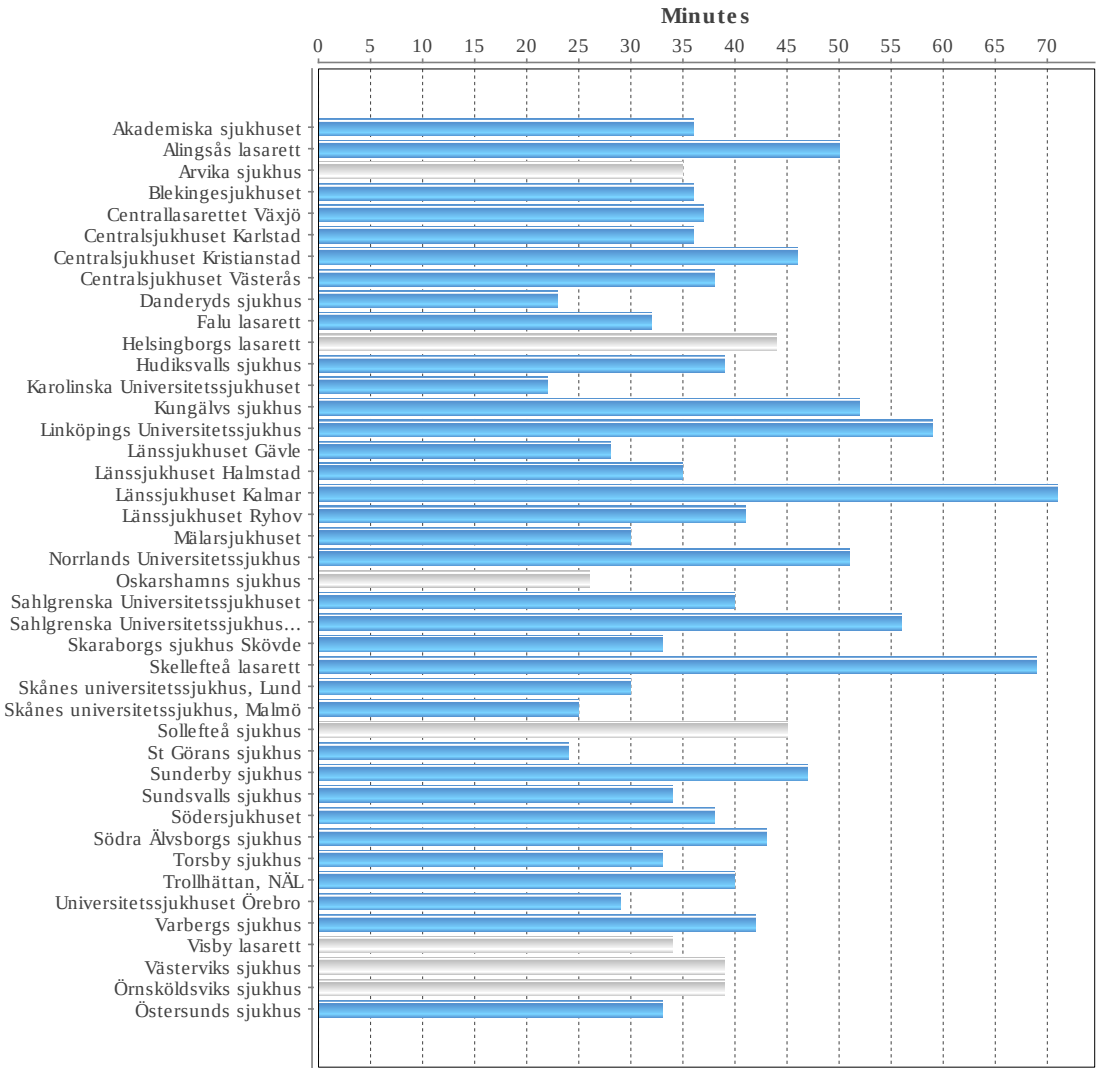
Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

AAI



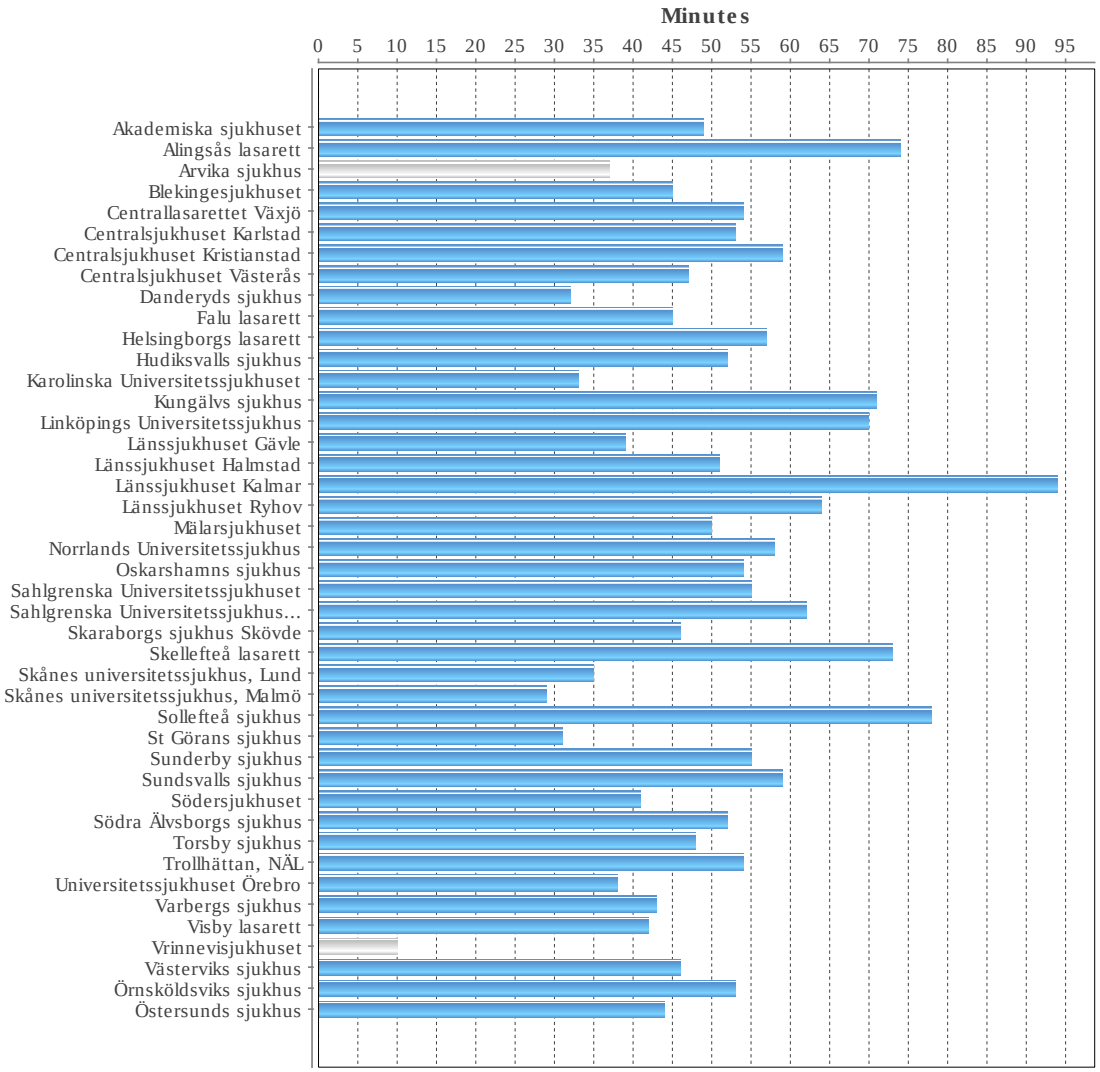
Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI



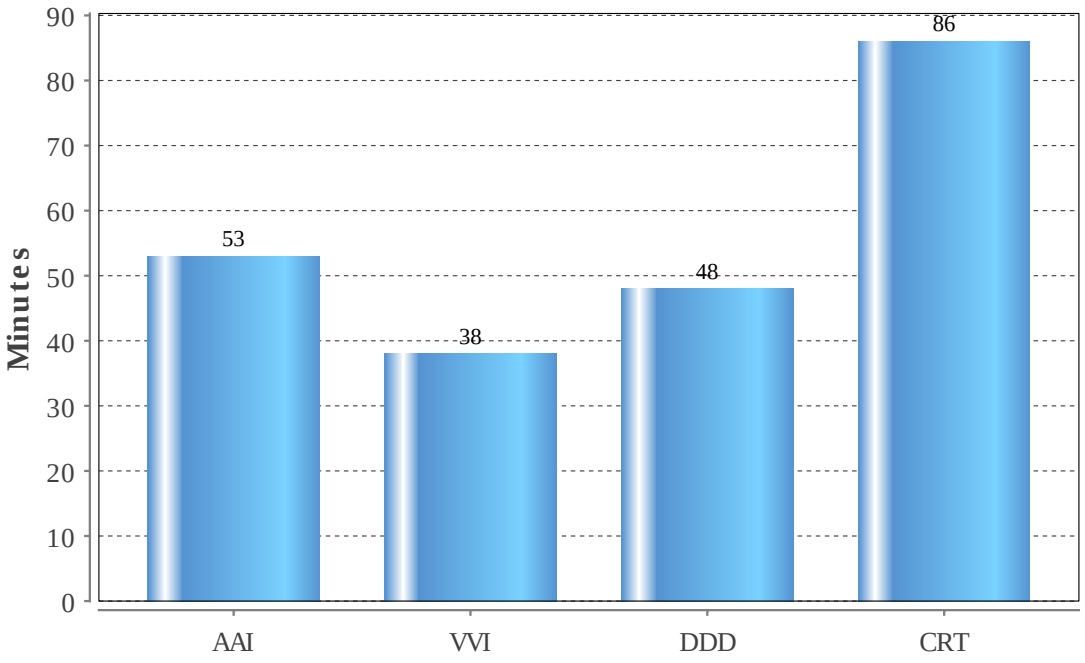
Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

DDD



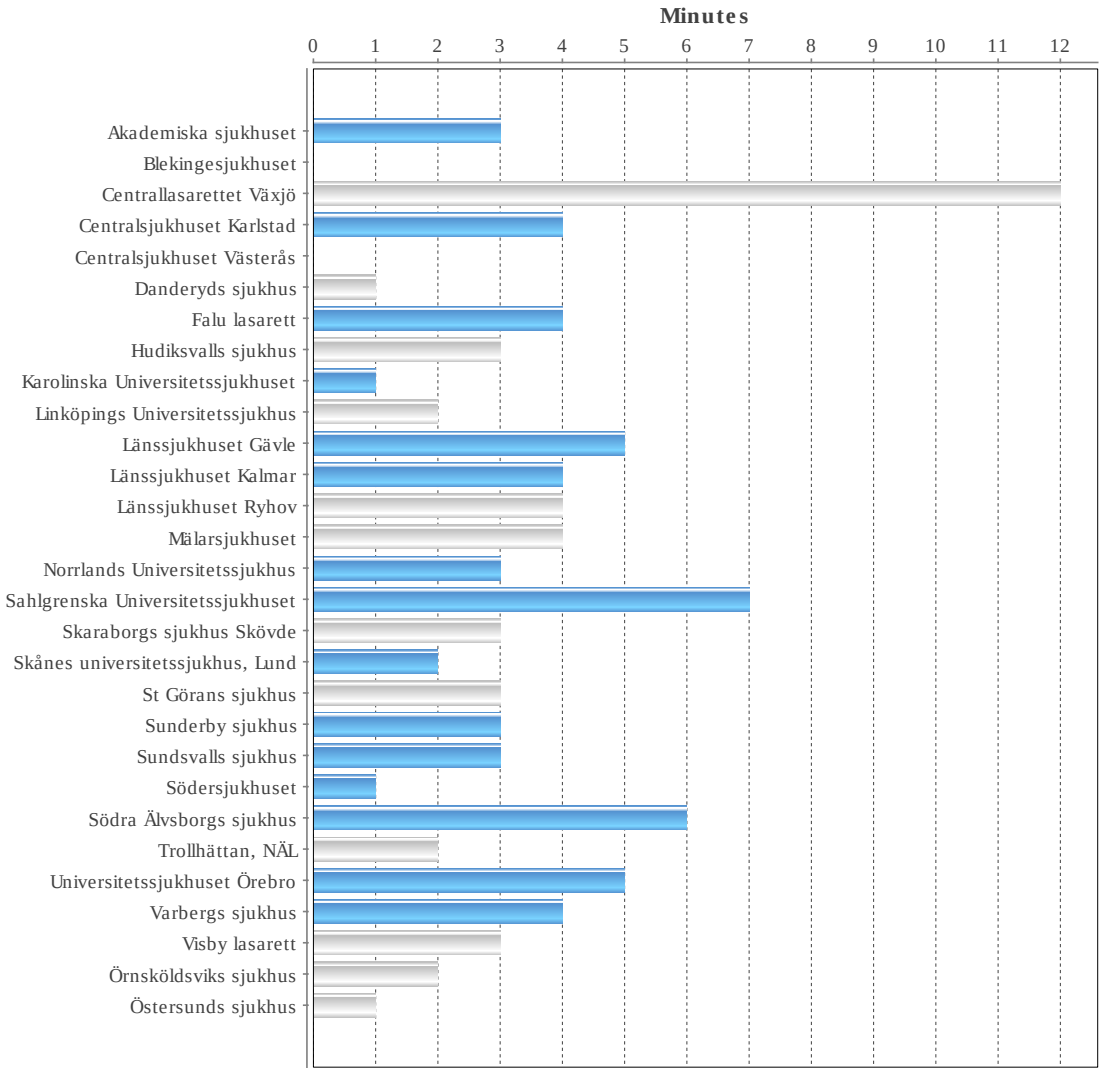
National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
AAI	53	13.9
VVI	38	21.8
DDD	48	21.5
CRT	86	37.4

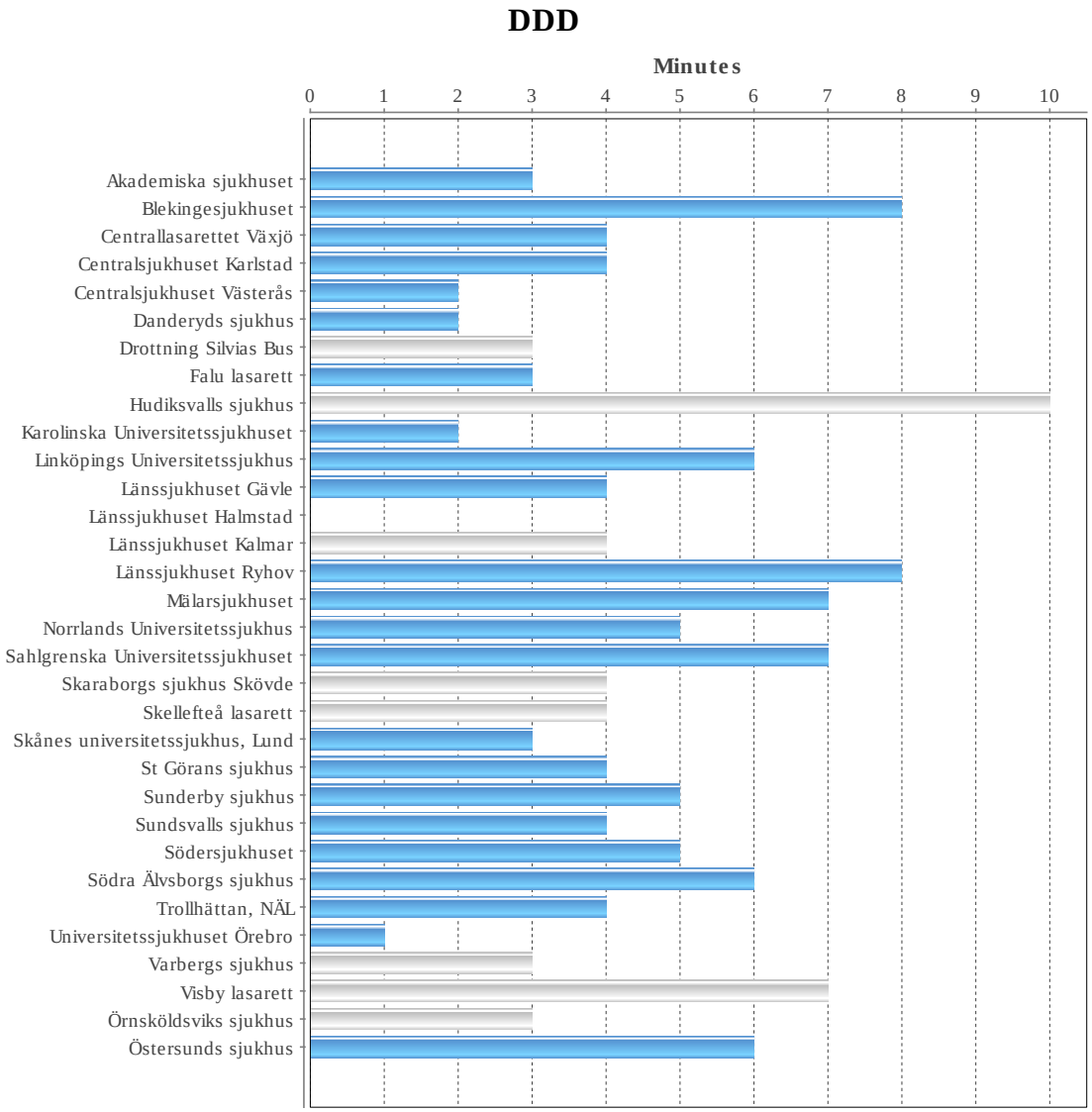


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI

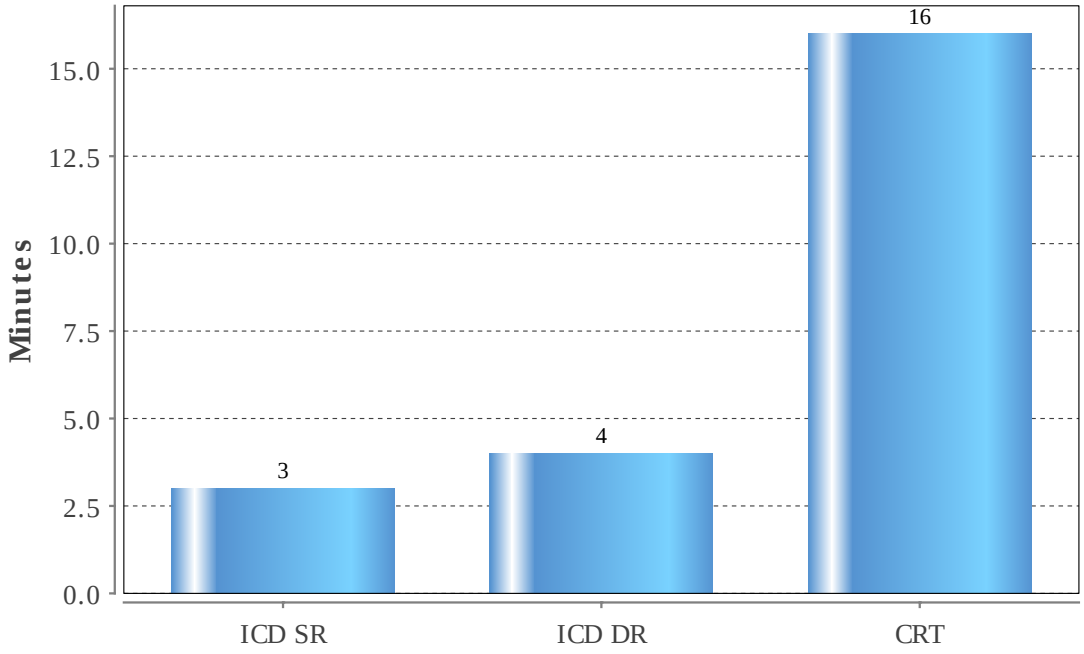


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.



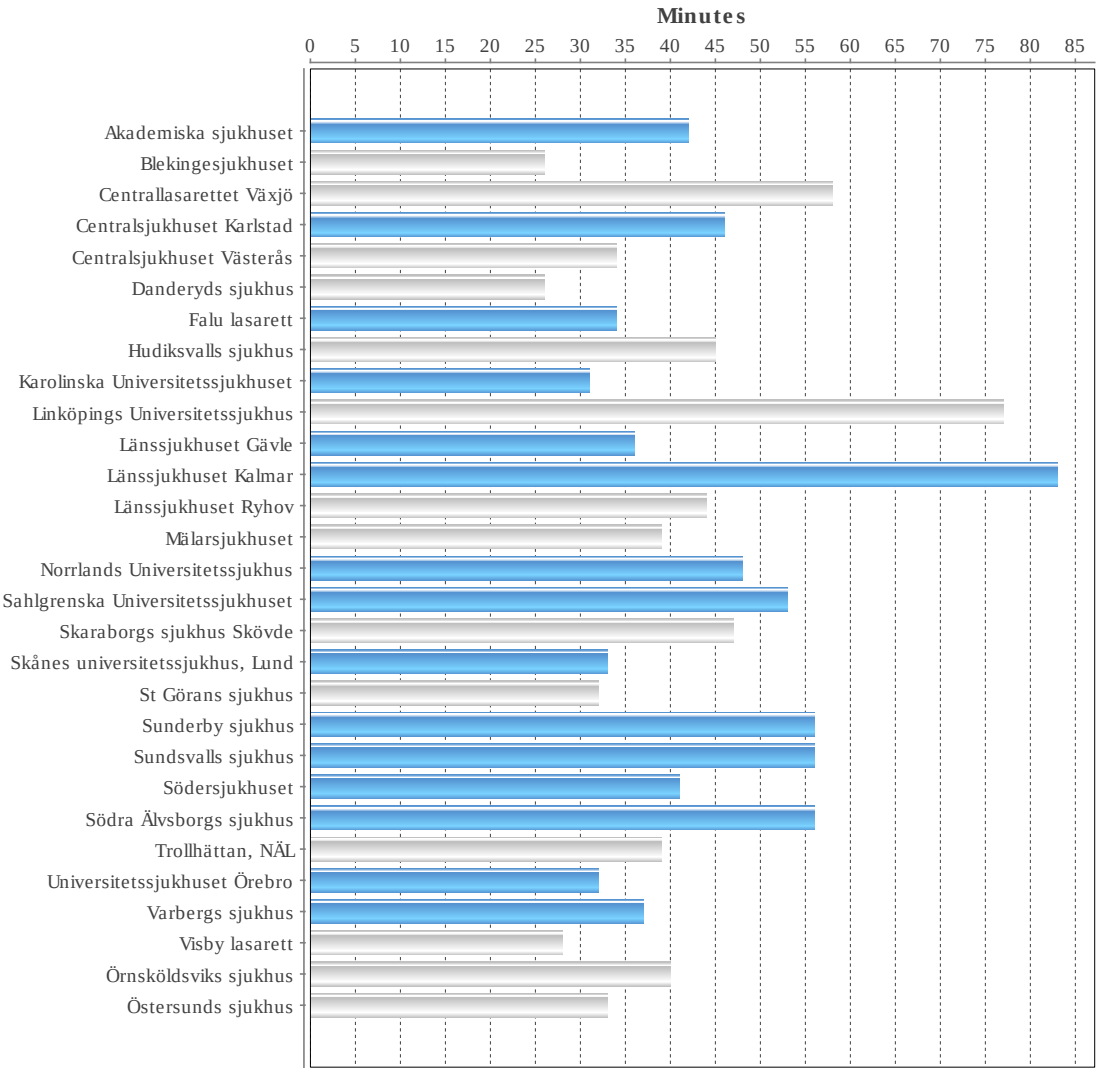
National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
ICD SR	3	5.5
ICD DR	4	4.8
CRT	16	13.5

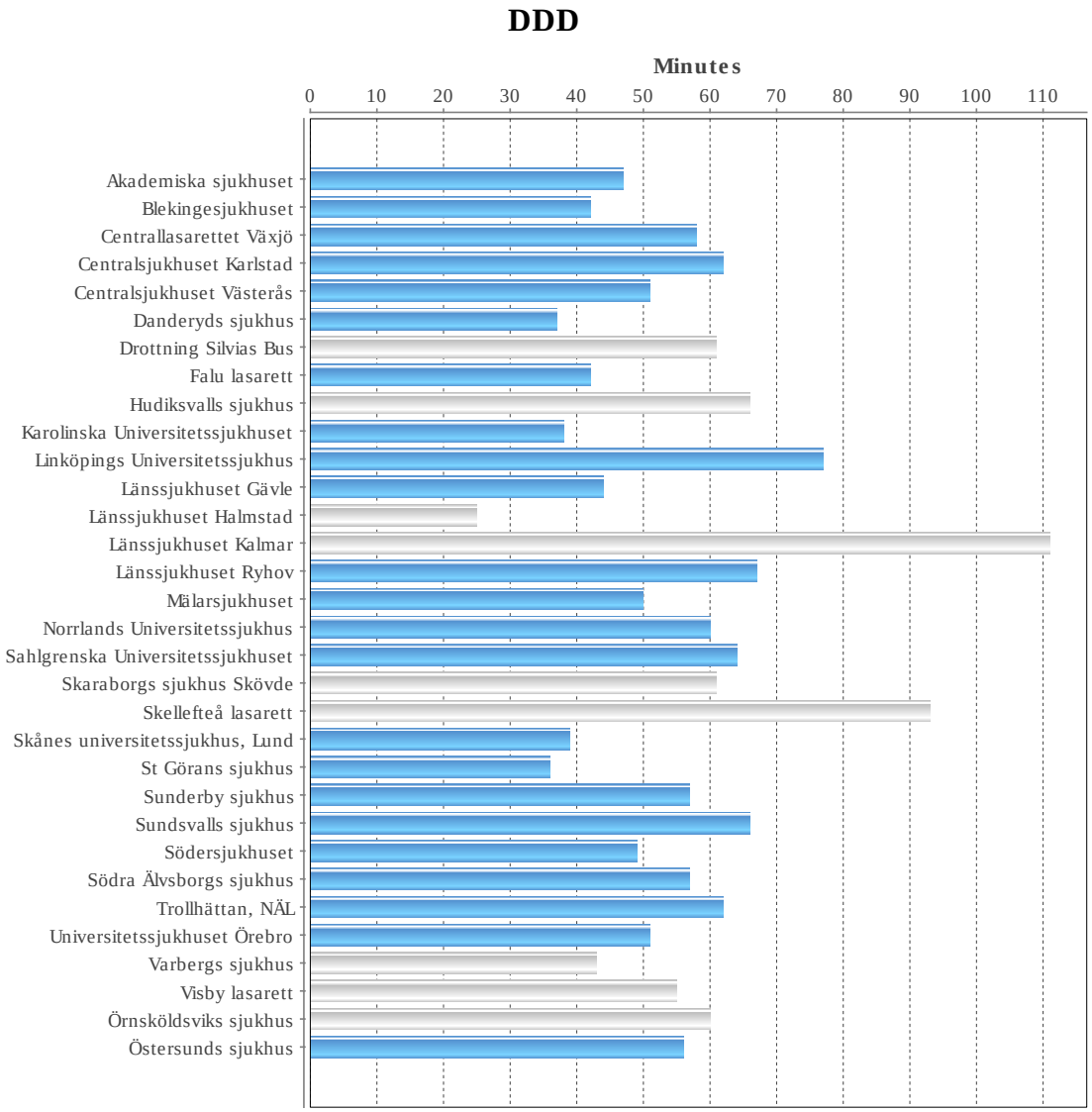


Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI

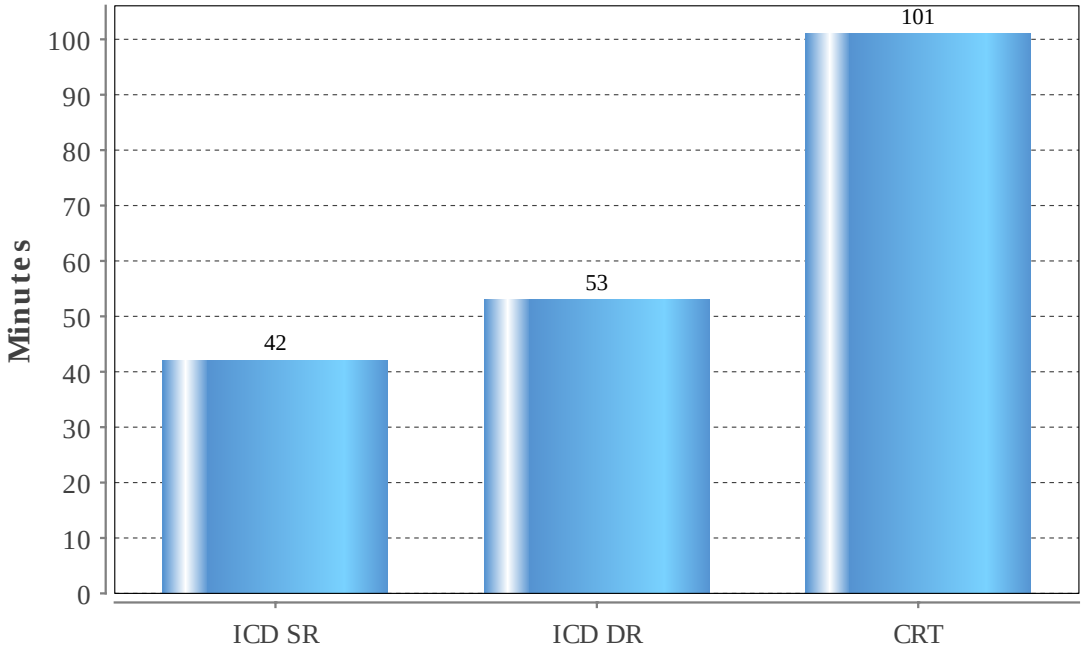


Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

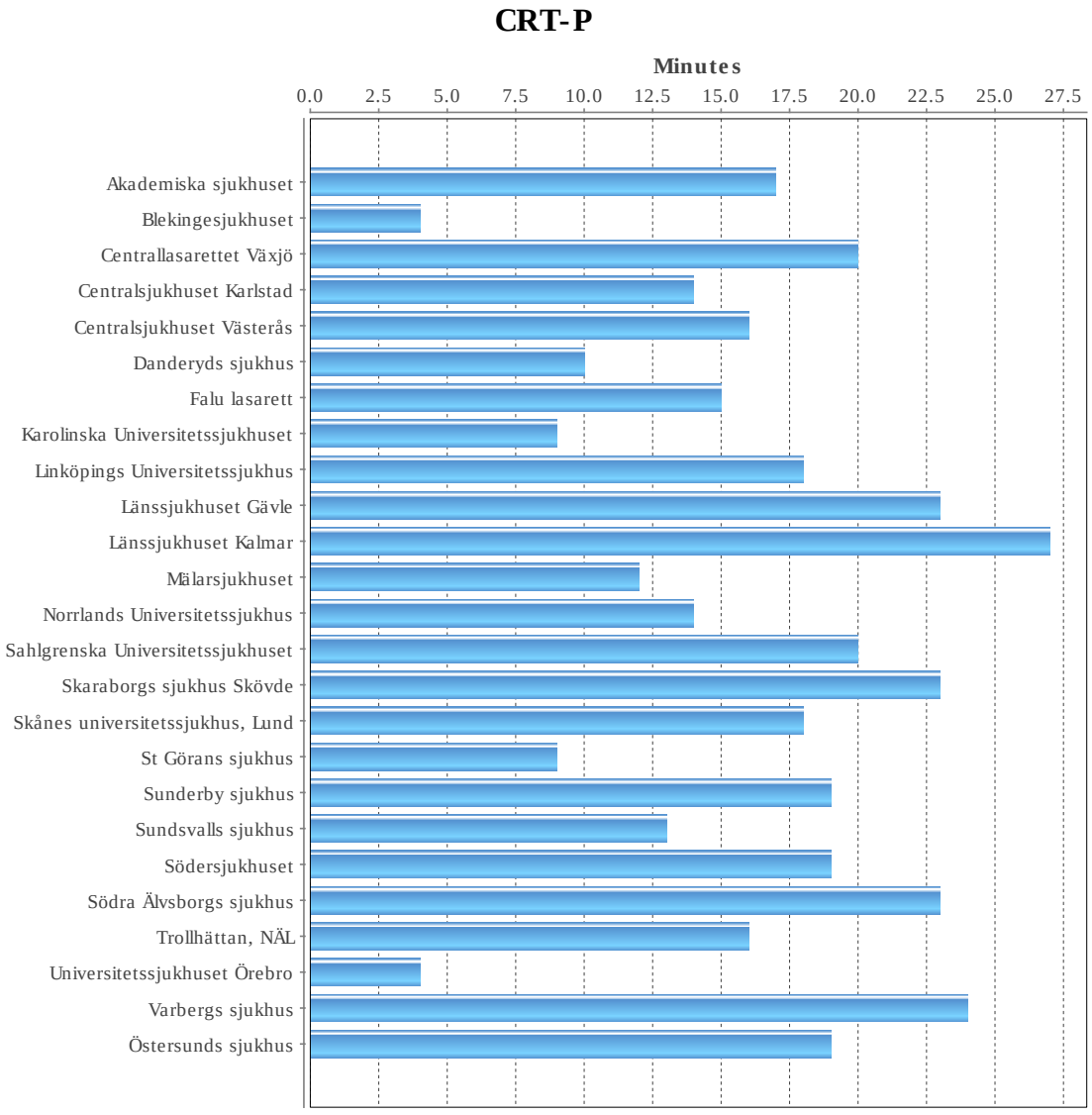


National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
ICD SR	42	21.9
ICD DR	53	23.1
CRT	101	43.6

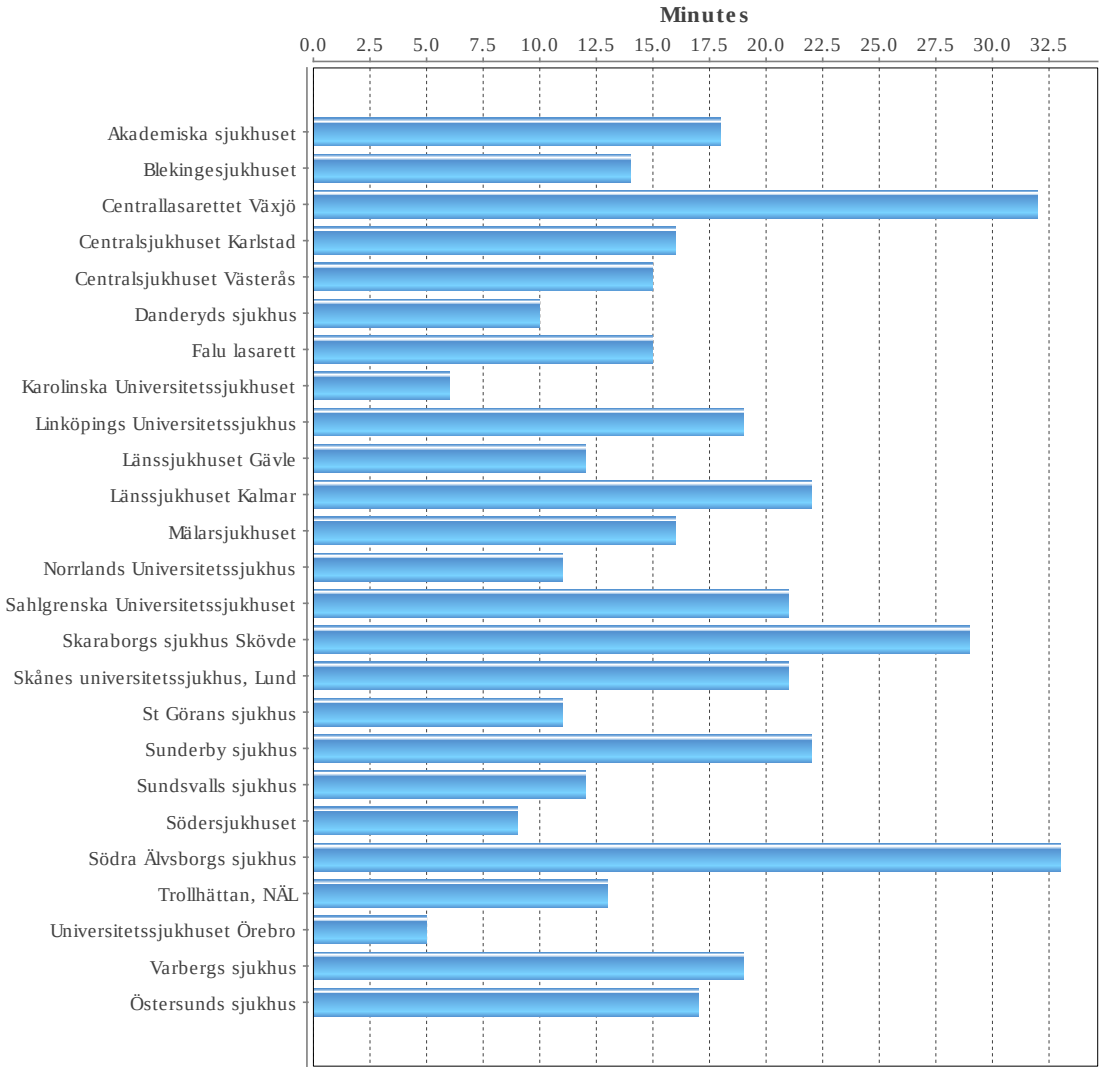


Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less then 10 observations

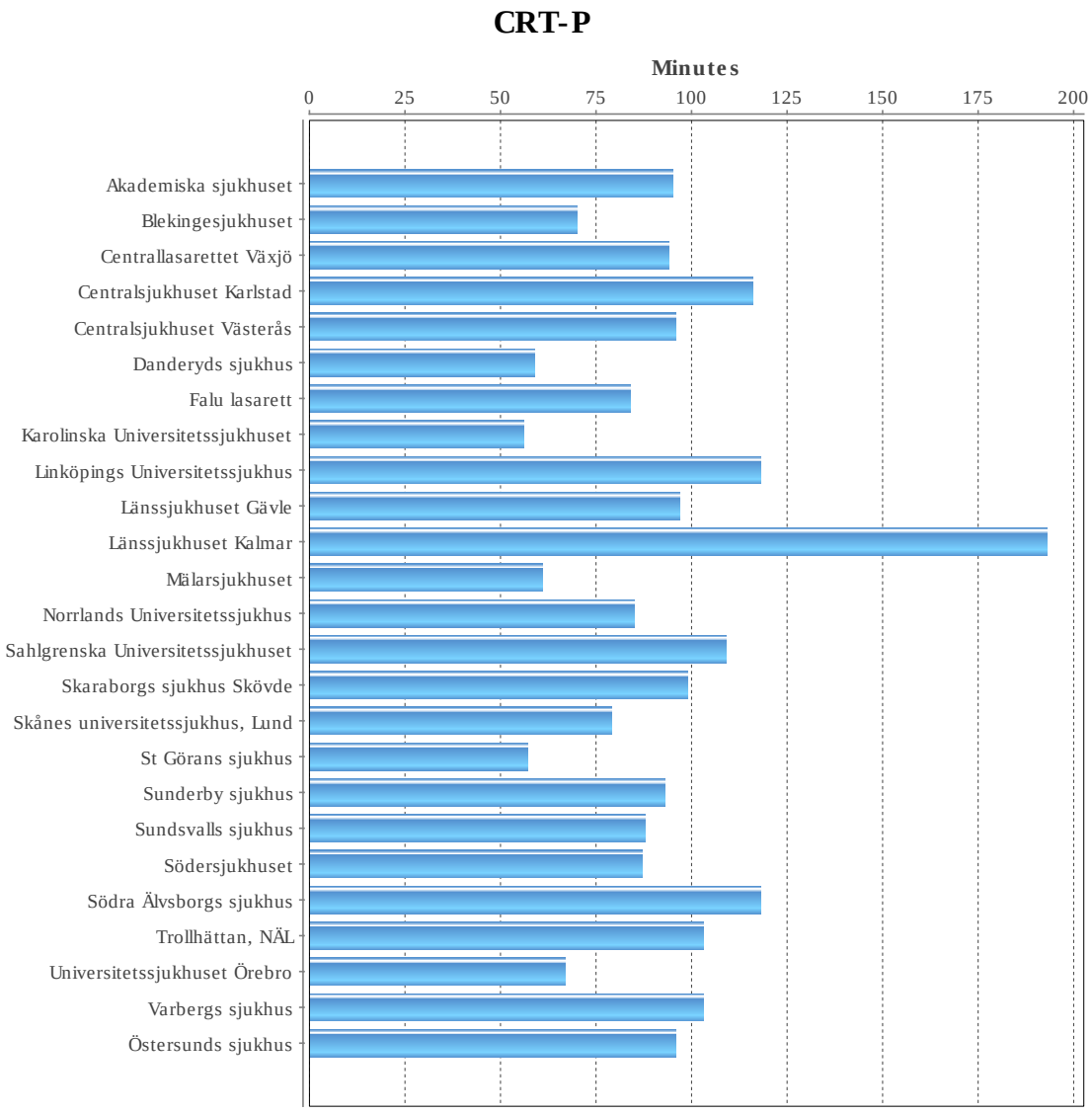


Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less then 10 observations

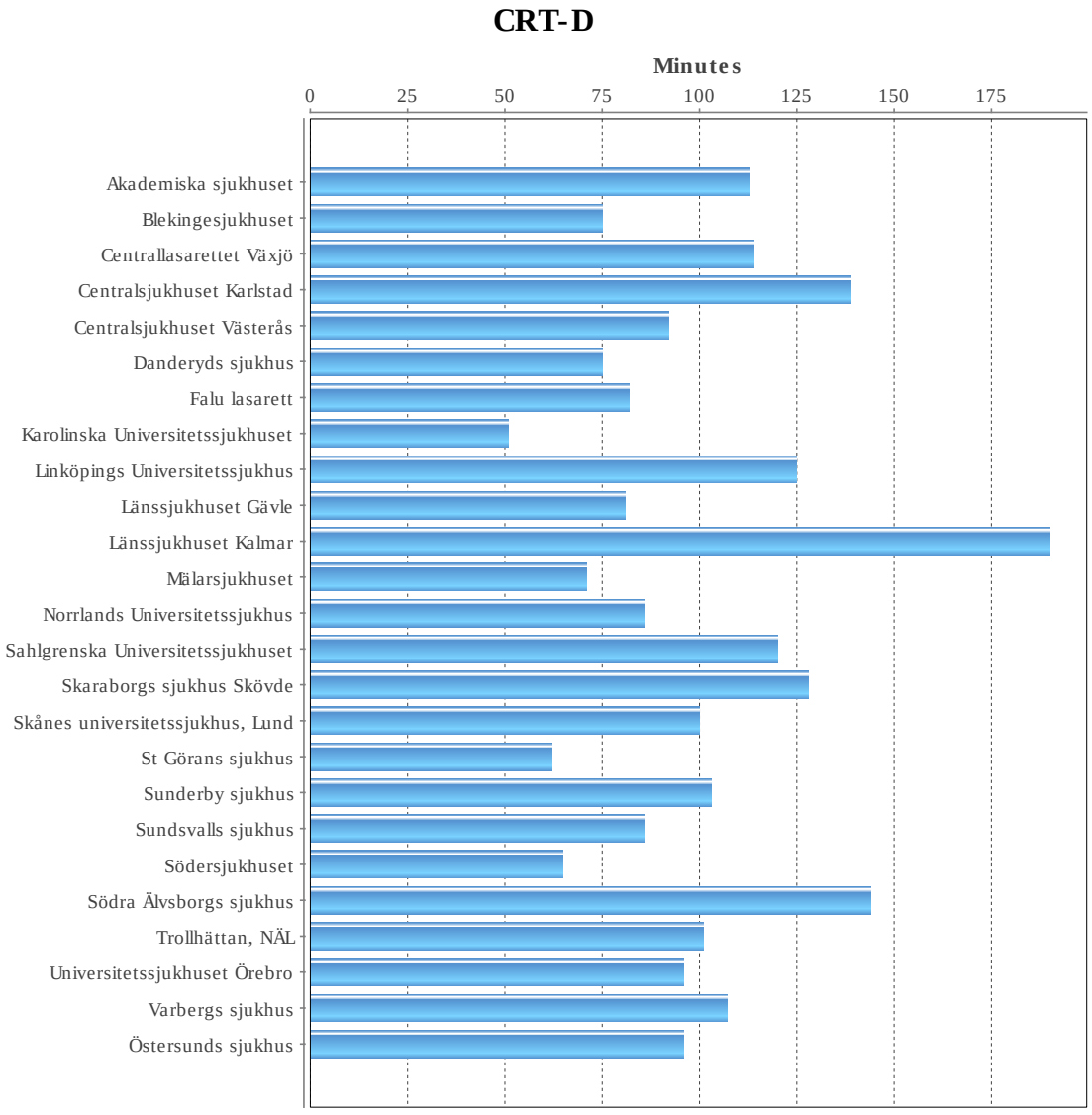
CRT-D



Mean skin to skin duration per subtype and hospital. Bars colored in grey are based on less then 10 observations



Mean skin to skin duration per subtype and hospital. Bars colored in grey are based on less then 10 observations

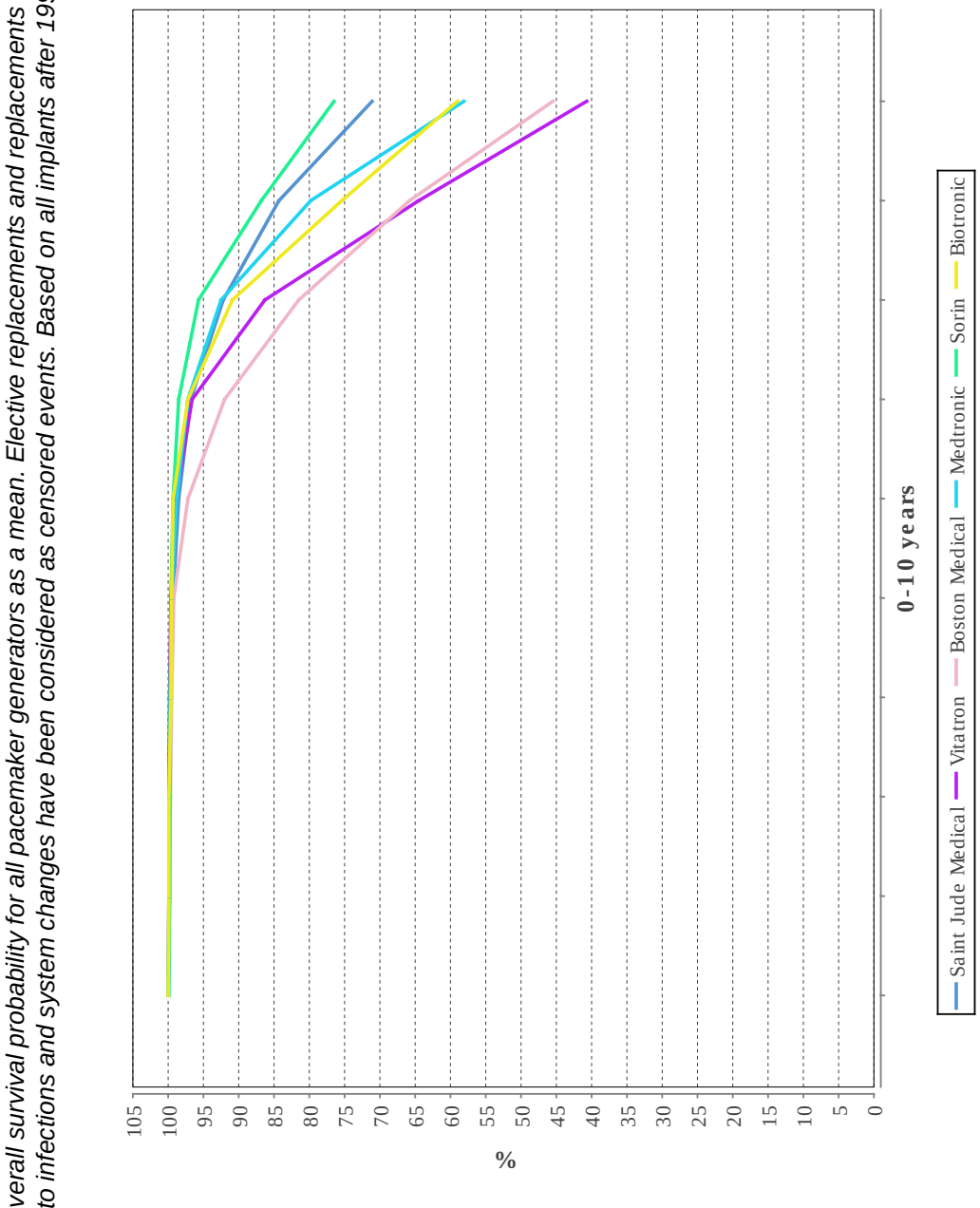


Year	At risk	Survival probability %
1	101550	100.0
2	86695	99.9
3	71084	99.8
4	57463	99.7
5	45462	99.4
6	34717	98.6
7	25245	96.4
8	16565	90.1
9	8923	76.3
10	3333	56.6

Overall survival probability for all PM generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006

Year	Total		Biotronic		Boston Scient		Medtronic		St Jude Medical		Vitatron		Sorin	
	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %
1	101519	100.0	6507	100.0	13124	100.0	28082	100.0	32435	100.0	16801	100.0	4570	99.9
2	86670	99.9	5052	99.9	11300	99.8	24497	99.9	27021	99.8	14665	99.9	4135	99.8
3	71060	99.8	3729	99.9	8942	99.7	20687	99.8	21363	99.8	12613	99.9	3726	99.7
4	57444	99.6	2705	99.6	6778	99.5	17198	99.7	16752	99.6	10747	99.8	3264	99.7
5	45454	99.5	2108	99.5	5377	99.2	14136	99.5	13046	99.3	8139	99.6	2648	99.6
6	34717	98.7	1592	99.3	4189	97.2	11376	98.8	9391	98.5	6045	98.9	2124	99.3
7	25245	96.4	985	97.2	3088	92.0	9005	97.2	6449	96.8	4043	96.6	1675	98.5
8	16565	89.9	518	90.9	2209	81.5	6129	92.5	3751	92.2	2753	86.3	1205	95.7
9	8923	76.1	196	75.4	1208	65.8	3124	79.8	2120	84.3	1661	64.5	614	86.8
10	3333	58.5	42	59.0	472	45.5	941	58.1	912	71.1	708	40.7	258	76.5

Overall survival probability for all pacemaker generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990



Models that have at least 100 implants and 50 explants

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Biotronik	Philos SR	100.0	100.0	100.0	100.0	100.0	100.0	96.3	96.3	96.3
Biotronik	Axios SR	100.0	100.0	100.0	100.0	100.0	94.7	77.3	71.3	61.1
Biotronik	Philos II DR-T	99.7	99.7	99.3	99.3	99.3	98.2	93.3	84.2	84.2
Biotronik	Philos II DR	100.0	100.0	99.6	99.2	98.8	97.2	87.0	63.9	43.5
Biotronik	Etrinsa 6 DR-T ProMRI	99.9	99.6	99.6	NaN	NaN	NaN	NaN	NaN	NaN
Biotronik	Talos SR	99.8	99.8	99.8	99.8	99.8	99.4	97.8	88.7	NaN
Biotronik	Effecta DR	100.0	100.0	99.8	99.8	99.8	99.8	NaN	NaN	NaN
Biotronik	Effecta SR	99.9	99.9	99.9	99.9	99.9	99.9	NaN	NaN	NaN
Boston Scientific	1294 Insignia I	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	58.8
Boston Scientific	1297 Insignia I	100.0	100.0	100.0	100.0	96.6	96.6	91.7	85.2	70.8
Boston Scientific	1192 Insignia	100.0	100.0	100.0	100.0	97.8	97.8	97.8	87.5	59.4
Boston Scientific	J172 Ingenio	98.6	98.6	98.6	98.6	98.6	NaN	NaN	NaN	NaN
Boston Scientific	J174 Ingenio EL	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN
Boston Scientific	W173 Invive CRT	100.0	100.0	99.4	99.4	98.4	98.4	NaN	NaN	NaN
Boston Scientific	S601 Altrua 60	100.0	99.5	99.0	99.0	99.0	96.7	91.1	73.9	65.1
Boston Scientific	S603 Altrua 60	100.0	100.0	99.5	98.5	96.7	88.6	62.1	36.6	12.5
Boston Scientific	S402 Altrua 40	99.7	99.7	99.7	99.7	99.1	99.1	97.1	93.3	86.8
Boston Scientific	J064 Adventio EL	99.8	99.8	99.8	99.8	99.8	99.8	NaN	NaN	NaN
Boston Scientific	S606 Altrua 60	99.8	99.8	99.8	99.5	98.8	97.7	96.4	95.7	NaN
Boston Scientific	L210 Proponent MRI SR	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN	NaN
Boston Scientific	H140 Contak Renewal TR2	100.0	100.0	99.4	98.6	95.1	84.4	57.2	24.7	6.2
Boston Scientific	S602 Altrua 60	100.0	99.6	99.6	99.3	98.8	97.4	95.0	90.5	82.8
Boston Scientific	1291 Insignia I	99.4	99.4	99.4	99.4	98.4	96.2	93.6	83.9	63.5
Boston Scientific	S501 Altrua 50	100.0	100.0	99.2	99.2	98.9	97.6	94.5	85.3	72.0
Boston Scientific	J277 Vitalio MRI	99.5	99.2	99.2	99.2	NaN	NaN	NaN	NaN	NaN
Boston Scientific	S404 EL Altrua 40	100.0	99.9	99.7	99.5	99.1	98.7	97.7	94.3	93.4
Boston Scientific	1190 Insignia	99.9	99.1	98.5	98.3	96.7	93.0	84.7	65.2	43.0
Boston Scientific	1290 Insignia I	99.9	99.8	99.6	98.6	92.9	79.2	57.5	31.9	8.4
Boston Scientific	L231 Proponent MRI EL DR	99.9	99.8	99.8	NaN	NaN	NaN	NaN	NaN	NaN

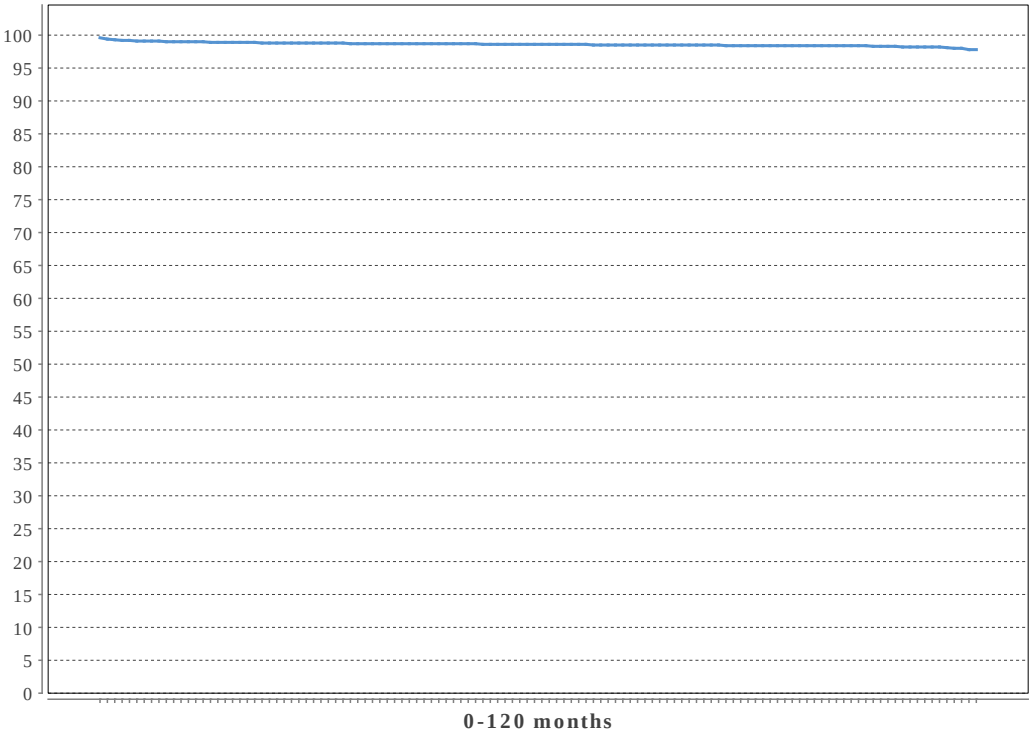
Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Medtronic	KDR931 Kappa DR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.1	58.7
Medtronic	SS303 Sigma S	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN
Medtronic	ADSR01 Adapta	100.0	99.1	99.1	99.1	99.1	99.1	76.8	42.6	11.1
Medtronic	P1501DR EnRhythm	100.0	100.0	100.0	100.0	97.2	78.6	45.1	25.5	16.4
Medtronic	KSR703 Kappa SR	100.0	100.0	100.0	97.1	93.8	79.4	49.4	29.3	10.1
Medtronic	E2DR31 EnPulse	100.0	100.0	100.0	98.8	98.8	98.8	97.2	92.0	75.9
Medtronic	E2SR01 EnPulse	100.0	100.0	100.0	99.3	96.6	91.5	53.4	13.1	4.4
Medtronic	EN1SR01 Ensura SR MRI	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN	NaN
Medtronic	KSR901 Kappa SR	98.6	98.6	98.6	98.6	98.6	89.5	45.0	15.6	6.8
Medtronic	SEDR01 Sensia	100.0	100.0	100.0	100.0	99.7	99.2	97.0	83.4	63.4
Medtronic	C2TR01 Syncra CRT	99.8	99.7	99.4	98.6	95.0	90.5	81.1	NaN	NaN
Medtronic	ADDR01 Adapta	100.0	99.8	99.6	99.3	98.5	98.2	95.3	81.4	48.1
Medtronic	VEDR01 Versa	100.0	99.7	99.5	99.3	99.0	97.1	93.7	74.8	45.4
Medtronic	A3DR01 Advisa DR MRI	100.0	100.0	100.0	100.0	100.0	98.4	96.2	87.4	NaN
Medtronic	8042 InSync III	100.0	99.8	99.0	97.9	95.7	87.3	67.9	36.3	11.3
Medtronic	SESR01 Sensia	99.8	99.8	99.6	99.4	98.6	96.9	94.7	76.1	38.2
Medtronic	EN1DR01 Ensura DR MRI	99.9	99.8	99.7	99.6	98.8	97.7	96.7	NaN	NaN
Medtronic	E2DR01 EnPulse	100.0	99.8	99.7	99.2	98.4	96.5	88.9	60.0	21.1
Medtronic	RESR01 Relia SR	99.7	99.7	99.7	99.3	98.5	97.1	91.4	75.1	50.8
Medtronic	ADDRL1 Adapta	99.9	99.8	99.8	99.8	99.7	99.2	99.0	97.7	91.4
Medtronic	SEDRL1 Sensia	100.0	99.9	99.8	99.8	99.6	99.5	99.0	97.5	92.8
Medtronic	REDR01 Relia DR	99.9	99.8	99.7	99.6	99.4	98.7	97.2	91.0	82.5
Sorin/LivaNova	2530 Rhapsody	100.0	100.0	100.0	100.0	100.0	98.9	97.8	95.1	93.6
Sorin/LivaNova	Reply SR	100.0	100.0	100.0	100.0	98.8	98.8	98.8	98.8	86.7
Sorin/LivaNova	Esprit DR	100.0	100.0	100.0	99.7	99.7	99.1	94.8	86.5	81.4

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Sorin/LivaNova	2550 Symphony DR	100.0	100.0	100.0	100.0	99.7	99.4	98.4	96.8	91.7
Sorin/LivaNova	Reply 200 DR	99.9	99.6	99.4	99.4	NaN	NaN	NaN	NaN	NaN
Sorin/LivaNova	Reply DR	99.7	99.6	99.6	99.6	99.1	98.1	94.5	78.5	53.6
St Jude Medical/ Abbott	5157 M/S Verity ADx XL SR	100.0	100.0	100.0	100.0	100.0	95.2	95.2	95.2	95.2
St Jude Medical/ Abbott	5610 Victory	100.0	100.0	100.0	100.0	97.1	83.5	45.0	13.8	NaN
St Jude Medical/ Abbott	3112 Anthem	100.0	100.0	98.9	97.7	94.9	94.9	87.0	NaN	NaN
St Jude Medical/ Abbott	2525T Microny II	98.7	98.7	98.7	94.2	82.4	79.2	65.8	55.7	39.6
St Jude Medical/ Abbott	5180 Identity ADx SR	100.0	100.0	97.9	97.9	88.2	77.7	51.1	13.9	4.6
St Jude Medical/ Abbott	5810 Victory DR	100.0	100.0	94.4	87.3	68.0	44.6	27.4	20.3	20.3
St Jude Medical/ Abbott	1136 Sustain XL	100.0	100.0	100.0	99.1	99.1	99.1	NaN	NaN	NaN
St Jude Medical/ Abbott	5356 Verity ADx XL DR	100.0	100.0	100.0	99.0	96.7	96.7	96.7	94.1	82.3
St Jude Medical/ Abbott	2136 Sustain XL DR	99.5	99.5	99.5	99.1	98.8	98.4	NaN	NaN	NaN
St Jude Medical/ Abbott	3242 Allure RF	99.8	99.8	99.8	99.8	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	1162 Endurity SR	99.8	99.8	99.8	99.8	99.8	99.8	99.8	NaN	NaN
St Jude Medical/ Abbott	5596 Frontier II	100.0	100.0	99.4	97.4	90.0	79.5	60.4	39.9	24.6
St Jude Medical/ Abbott	2212 Accent DR	99.8	99.6	99.6	99.0	98.6	98.3	95.5	91.7	NaN
St Jude Medical/ Abbott	2224 Accent DR MRI	99.8	99.8	99.8	99.4	99.4	99.4	NaN	NaN	NaN
St Jude Medical/ Abbott	2160 Endurity	99.5	99.5	99.5	99.5	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	1160 Endurity SR	99.9	99.7	99.7	99.7	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	3212 Anthem	99.6	99.1	98.3	97.2	92.7	81.0	69.6	56.7	NaN
St Jude Medical/ Abbott	3222 Allure RF	99.8	99.8	99.8	98.7	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	5386 Identity ADx XL DR	98.9	98.5	98.0	98.0	95.2	94.5	91.2	75.9	55.9
St Jude Medical/ Abbott	1272 Assurity MRI SR	99.9	99.9	99.9	NaN	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	5626 Zephyr XL	99.9	99.6	99.6	99.4	99.3	99.3	98.8	97.9	96.4
St Jude Medical/ Abbott	2112 Accent DR	99.9	99.9	99.9	99.8	99.7	98.9	98.9	NaN	NaN
St Jude Medical/ Abbott	2260 Assurity + DR	99.7	99.7	99.6	99.6	NaN	NaN	NaN	NaN	NaN

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
St Jude Medical/ Abbott	5156 Verity ADx XL SR	100.0	100.0	100.0	99.7	99.6	99.2	99.0	98.5	96.9
St Jude Medical/ Abbott	5826 Zephyr XL DR	99.8	99.7	99.6	99.5	99.1	98.5	95.7	87.3	77.0
St Jude Medical/ Abbott	5816 Victory XL	99.8	99.7	99.6	99.5	99.1	97.8	92.4	83.6	63.5
St Jude Medical/ Abbott	2272 Assurity MRI DR	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	NaN
Vitatron	T20SR	99.8	99.8	99.8	99.2	98.0	95.6	93.0	90.3	85.6
Vitatron	C10S	99.9	99.9	99.7	99.4	99.1	98.6	96.8	94.8	93.5
Vitatron	C70DR	100.0	100.0	100.0	100.0	99.8	97.7	87.4	64.2	31.0
Vitatron	E60A1	100.0	100.0	100.0	100.0	100.0	98.6	98.6	NaN	NaN
Vitatron	T70DR	99.5	99.3	99.3	99.0	96.9	91.8	71.8	43.6	21.0
Vitatron	C20SR	100.0	99.9	99.9	99.9	99.3	98.1	96.3	94.9	87.3
Vitatron	T60DR	100.0	100.0	99.6	99.2	98.2	95.5	82.8	56.8	34.7
Vitatron	G20A1	99.9	99.9	99.9	99.7	99.1	96.3	96.3	NaN	NaN
Vitatron	C60DR	99.9	99.8	99.6	99.4	98.3	95.6	84.1	58.5	31.1
Vitatron	G70A1	99.9	99.8	99.8	99.7	99.7	99.5	98.8	NaN	NaN

Based on all implants after 1990

Year	At risk	Survival probabilty %
1	149973	99.6
2	128567	99.0
3	105440	98.8
4	85043	98.7
5	66766	98.7
6	50555	98.6
7	36480	98.5
8	24654	98.5
9	14746	98.4
10	6538	98.3



Models that have at least 50 implants and 10 explants

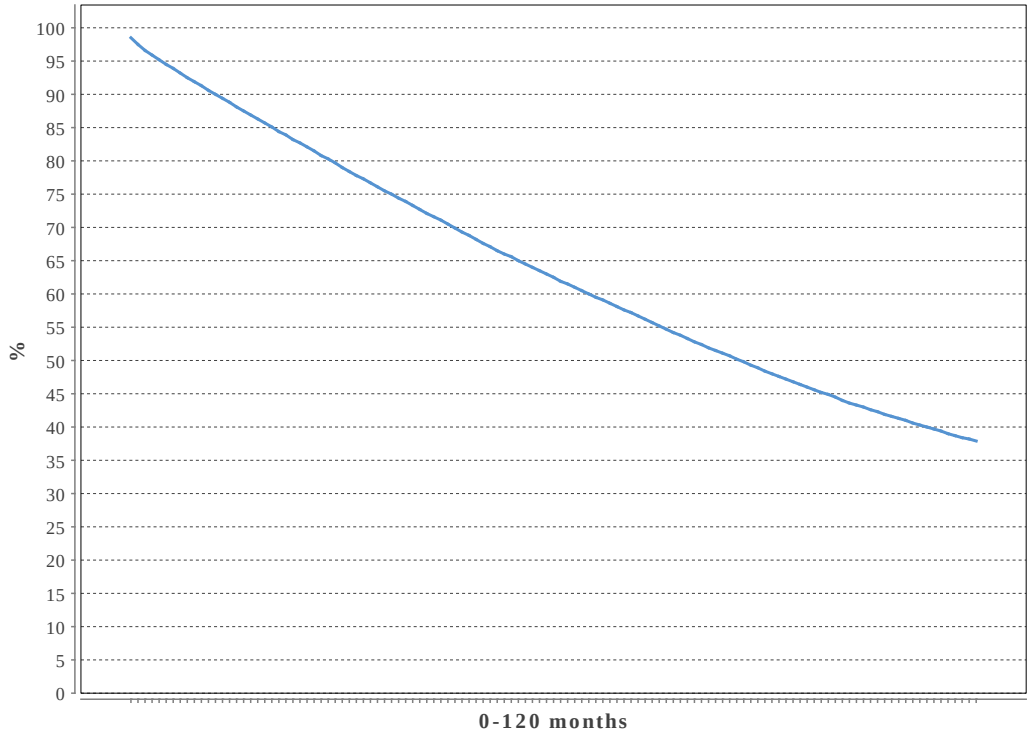
Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Y53-BP	100.0	100.0	100.0	100.0	100.0	95.0	95.0	95.0	95.0
Biotronik	Selox SR 60	97.8	97.8	96.3	96.3	96.3	96.3	96.3	96.3	96.3
Biotronik	PX60-UP	99.9	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Biotronik	Selox ST 60	100.0	100.0	100.0	99.1	99.1	99.1	99.1	99.1	99.1
Biotronik	Safio ProMRI S53	99.0	98.5	98.5	98.5	98.5	98.5	98.5	NaN	NaN
Biotronik	Y60-BP	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Biotronik	PX60-BP	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8
Biotronik	Safio ProMRI S60	99.1	99.1	99.1	99.1	99.1	99.1	99.1	NaN	NaN
Biotronik	Siello S60	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	NaN
Biotronik	Siello S53	98.6	98.5	98.3	98.3	98.3	98.3	98.3	98.3	NaN
Biotronik	Solia S60 MRI	98.9	98.9	98.9	98.9	98.9	98.9	NaN	NaN	NaN
Biotronik	Solia S53 MRI	98.9	98.9	98.9	98.9	98.9	98.9	NaN	NaN	NaN
Boston Scientific	4480 Fineline II Sterox EZ MRI	95.9	95.9	95.2	94.6	94.6	94.6	94.6	94.6	94.6
Boston Scientific	4542 Easytrak	95.9	94.7	93.4	91.8	91.8	89.2	89.2	89.2	89.2
Boston Scientific	4474 Fineline II Sterox EZ MRI	99.5	99.0	98.6	98.3	98.0	97.9	97.8	97.4	97.4
Boston Scientific	4471 Fineline II Sterox EZ MRI	97.4	97.2	97.2	97.2	97.2	96.6	96.6	96.6	94.9
Boston Scientific	4457 Fineline II Sterox EZ MRI	99.5	99.4	99.2	99.1	99.1	99.1	99.1	99.1	99.1
Boston Scientific	4473 Fineline II Sterox EZ MRI	99.2	99.0	98.9	98.9	98.9	98.9	98.9	98.7	98.7
Boston Scientific	7741 Ingevity MRI	98.4	98.4	98.2	98.2	NaN	NaN	NaN	NaN	NaN
Boston Scientific	7742 Ingevity MRI	98.7	98.5	98.5	98.5	NaN	NaN	NaN	NaN	NaN
Boston Scientific	4470 Fineline II Sterox EZ MRI	99.4	99.3	99.3	99.2	99.2	99.1	99.1	99.0	98.7
Medtronic	4396 Attain Ability MRI	98.7	98.7	98.7	98.7	98.7	98.7	98.7	98.7	NaN
Medtronic	4965 CapSure Epi	98.7	98.7	98.7	97.7	96.6	93.9	93.9	93.9	93.9
Medtronic	4194 Attain OTW	94.8	94.3	94.3	93.0	93.0	93.0	91.3	91.3	91.3
Medtronic	4598 Attain Performa MRI	99.0	99.0	99.0	99.0	99.0	NaN	NaN	NaN	NaN
Medtronic	4196 Attain Ability MRI	97.7	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
Medtronic	4193 Attain OTW	94.6	93.8	93.3	92.9	92.1	91.5	90.9	89.8	89.8

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Medtronic	5092 Capsure SP Novus	98.7	98.5	98.5	98.3	98.1	98.1	97.8	97.4	97.4
Medtronic	5086 CapSureFix MRI	99.0	99.0	99.0	99.0	99.0	98.7	98.7	98.7	98.7
Medtronic	4796 Attain Stability MRI	99.1	98.8	98.3	98.3	98.3	98.3	NaN	NaN	NaN
Medtronic	4296 Attain Ability MRI	97.0	96.4	96.4	96.4	96.4	96.4	96.4	96.4	NaN
Medtronic	4968 CapSure Epi	99.7	99.2	98.6	98.6	97.6	97.6	97.1	96.5	92.7
Medtronic	5054 CapSure Z Novus MRI	99.1	98.9	98.7	98.7	98.6	98.5	98.5	98.1	98.1
Medtronic	4074 Capsure Sense MRI	99.1	99.1	99.1	99.0	99.0	98.9	98.9	98.8	98.8
Medtronic	5076 CapSureFix MRI	99.0	98.9	98.8	98.6	98.6	98.5	98.4	98.2	97.8
Medtronic	4076 CapSureFix Novus MRI	99.4	99.4	99.3	99.3	99.2	99.2	99.1	99.1	99.1
N/A	N/A	99.5	99.4	99.4	99.1	98.9	98.9	98.0	97.5	97.5
Osypka	KY-5	93.3	88.5	86.3	82.6	80.9	80.9	78.1	78.1	78.1
St Jude Medical/ Abbott	1699T OptiSense	98.2	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3
St Jude Medical/ Abbott	1056K QuickSite	96.9	96.3	95.5	94.6	94.6	94.6	90.7	90.7	90.7
St Jude Medical/ Abbott	1084T Myodex	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1
St Jude Medical/ Abbott	1480T	98.8	98.2	98.1	98.1	97.9	97.7	97.5	97.5	97.5
St Jude Medical/ Abbott	1488T Tendril SDX	98.5	98.2	97.9	97.7	97.5	97.1	97.0	96.0	95.1
St Jude Medical/ Abbott	1156T Quickflex	97.3	96.8	96.3	96.3	95.8	95.8	95.8	95.8	95.8
St Jude Medical/ Abbott	1056T QuickSite	96.1	95.4	94.6	93.8	93.6	93.2	93.2	93.2	89.3
St Jude Medical/ Abbott	1699TC OptiSense	98.9	98.6	98.5	98.4	98.4	98.3	98.1	98.1	98.1
St Jude Medical/ Abbott	1636T Isoflex	97.8	97.6	97.3	97.3	97.1	96.8	96.8	96.4	95.9
St Jude Medical/ Abbott	LPA1200M52cm TendrilMRI	98.1	98.0	97.8	97.8	97.4	97.4	NaN	NaN	NaN
St Jude Medical/ Abbott	1788TC Tendril ST	97.6	97.5	97.5	97.4	97.3	97.3	97.3	97.3	97.1
St Jude Medical/ Abbott	LPA1200M58cm TendrilMRI	99.2	98.9	98.8	98.4	97.6	97.6	NaN	NaN	NaN
St Jude Medical/ Abbott	1888TC Tendril ST	98.6	98.6	98.5	98.5	98.5	98.4	98.3	98.3	98.3
St Jude Medical/ Abbott	1788T Tendril ST	97.3	96.7	96.1	95.7	95.7	95.7	95.7	95.7	95.7

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
St Jude Medical/ Abbott	1258T QuickFlex	98.1	97.8	97.7	97.6	97.3	96.8	96.8	96.8	96.8
St Jude Medical/ Abbott	1458Q Quartet MRI	98.3	97.8	97.6	97.4	97.4	97.4	97.4	97.4	NaN
St Jude Medical/ Abbott	1688T Tendril SDX	97.1	96.6	96.2	95.9	95.5	95.0	95.0	94.4	94.1
St Jude Medical/ Abbott	1646T Isoflex	98.4	98.2	98.0	97.9	97.8	97.8	97.8	97.6	97.4
St Jude Medical/ Abbott	1948 Isoflex MRI	98.9	98.8	98.8	98.7	98.6	98.6	98.4	98.4	98.4
St Jude Medical/ Abbott	1999 Optisense	99.2	99.0	98.9	98.8	98.8	98.7	98.6	98.6	98.6
St Jude Medical/ Abbott	2088TC Tendril STS MRI	99.4	99.3	99.2	99.1	99.0	99.0	99.0	99.0	NaN
Vitatron	ICL08 Crystalline	97.3	96.8	96.8	96.8	96.8	95.9	94.6	94.6	94.6
Vitatron	ICF09 Crystalline	97.4	97.2	97.2	97.0	96.9	96.6	96.3	96.3	95.7
Vitatron	IHP09B	98.2	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0
Vitatron	ICF09B Crystalline	98.5	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
Vitatron	ICM09B Crystalline	98.8	98.7	98.7	98.7	98.6	98.4	98.4	98.4	98.2
Vitatron	ICQ09B Crystalline	99.1	98.9	98.8	98.8	98.7	98.7	98.7	98.7	98.7

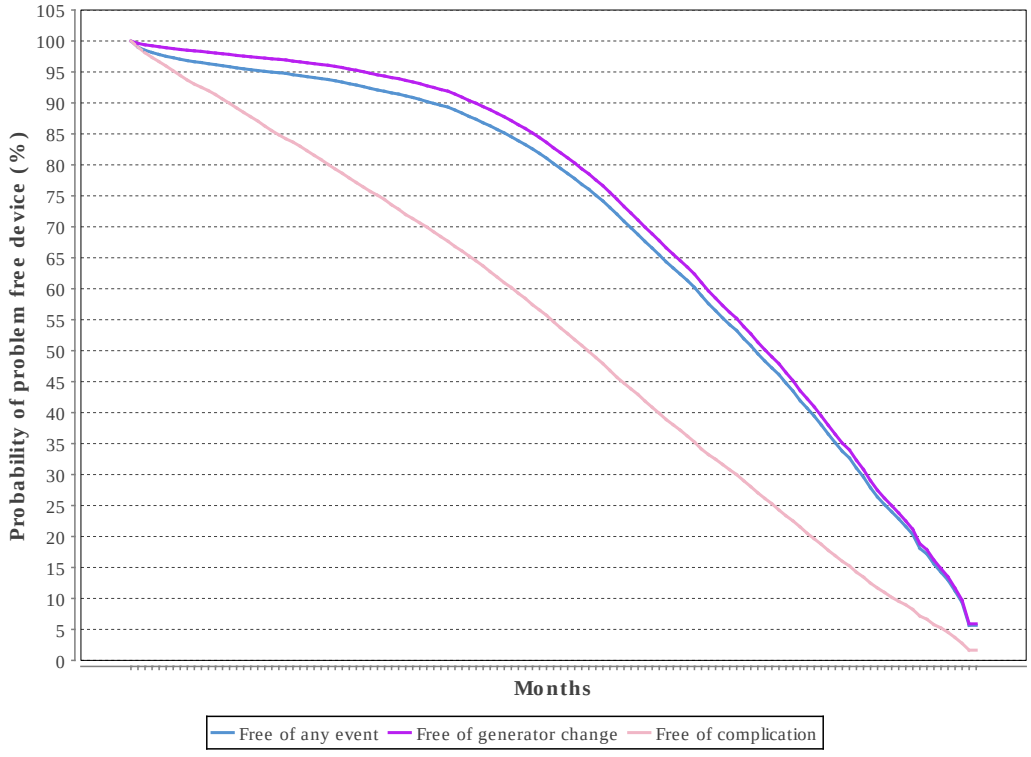
Based on all implants after 1990

Year	At risk	Survival probability %
1	104313	98.5
2	88576	90.0
3	73001	82.7
4	59400	75.5
5	47486	68.8
6	36697	62.5
7	27229	56.7
8	18594	51.1
9	11030	46.0
10	5565	41.6



Probablility of event free ICD-device

Year	At risk	Free of any event %	Free of generator change %	Free of complication %
1	26391	96.2	98.1	91.4
2	22520	94.4	96.6	83.0
3	18828	91.9	94.3	74.4
4	15186	87.8	90.4	65.3
5	11180	80.2	82.7	54.7
6	7167	68.7	71.1	42.9
7	4045	55.3	57.3	31.6
8	1862	40.7	42.3	20.5
9	532	24.0	25.0	10.2
10	28	5.7	5.9	1.7

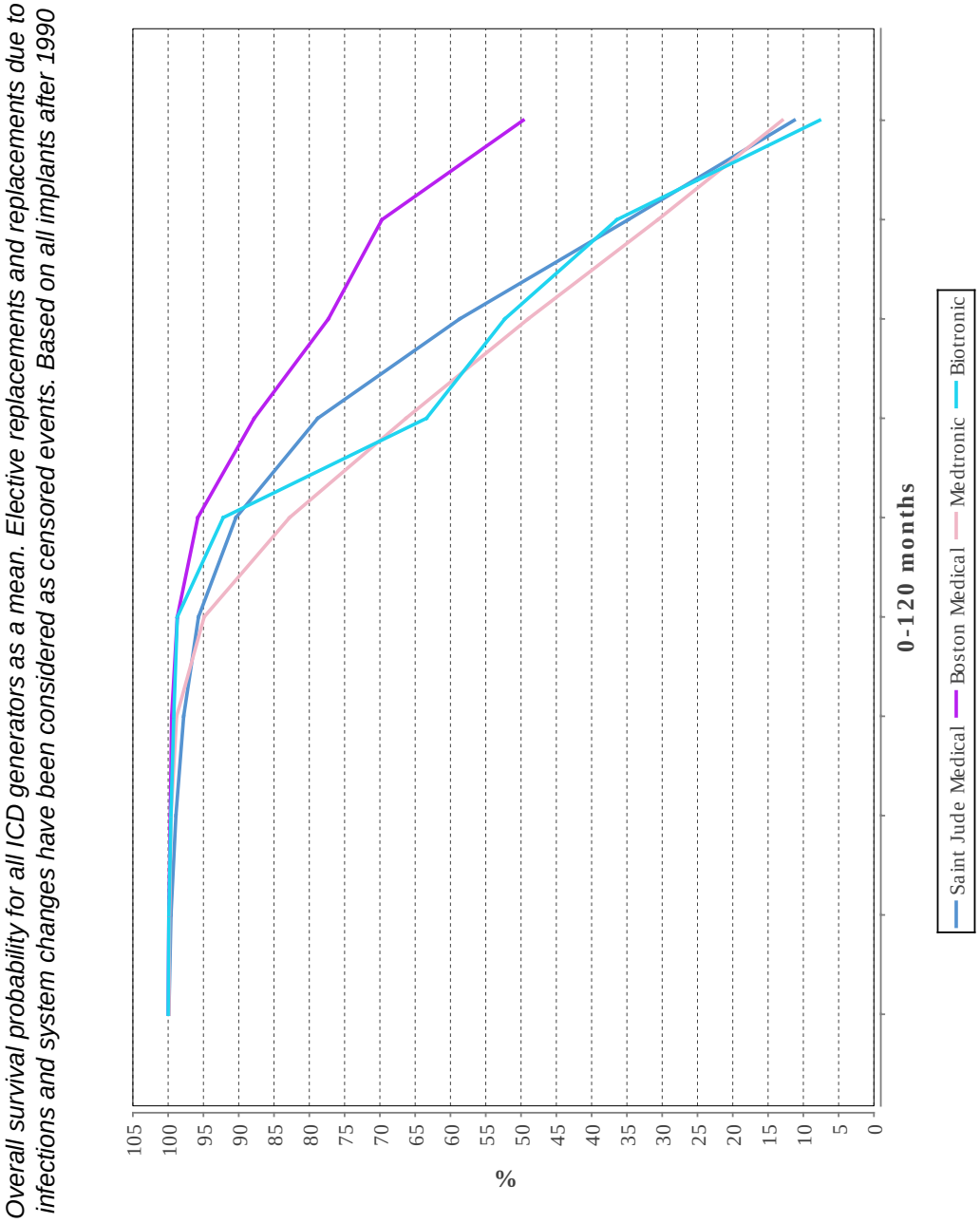


Year	At risk	Survival probability %
1	18921	99.9
2	16427	99.7
3	13241	99.3
4	10436	98.5
5	7869	95.8
6	5419	88.0
7	3271	74.1
8	1755	56.9
9	707	38.7
10	167	18.4

Overall survival probability for all ICD generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006

Year	Total		Biotronic		Boston Scientific		Medtronic		St Jude Medical	
	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %
1	18853	133.3	808	100.0	2065	100.0	7896	99.9	8084	99.9
2	16365	133.1	716	99.9	1795	99.9	6925	99.8	6929	99.6
3	13188	132.6	577	99.6	1456	99.7	5601	99.6	5554	98.9
4	10407	131.8	452	99.2	1185	99.5	4434	98.8	4336	97.8
5	7850	129.3	356	98.7	999	98.7	3206	94.9	3289	95.7
6	5406	120.4	249	92.2	754	95.8	2129	82.8	2274	90.4
7	3263	98.8	126	63.4	518	87.8	1244	66.3	1375	78.8
8	1753	79.1	59	52.3	381	77.3	635	49.0	678	58.7
9	707	57.2	23	36.4	224	69.7	249	30.6	211	34.8
10	167	27.2	4	7.7	66	49.7	54	13.0	43	11.3

Overall survival probability for all ICD generators as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990



Models that have at least 50 implants and 10 explants

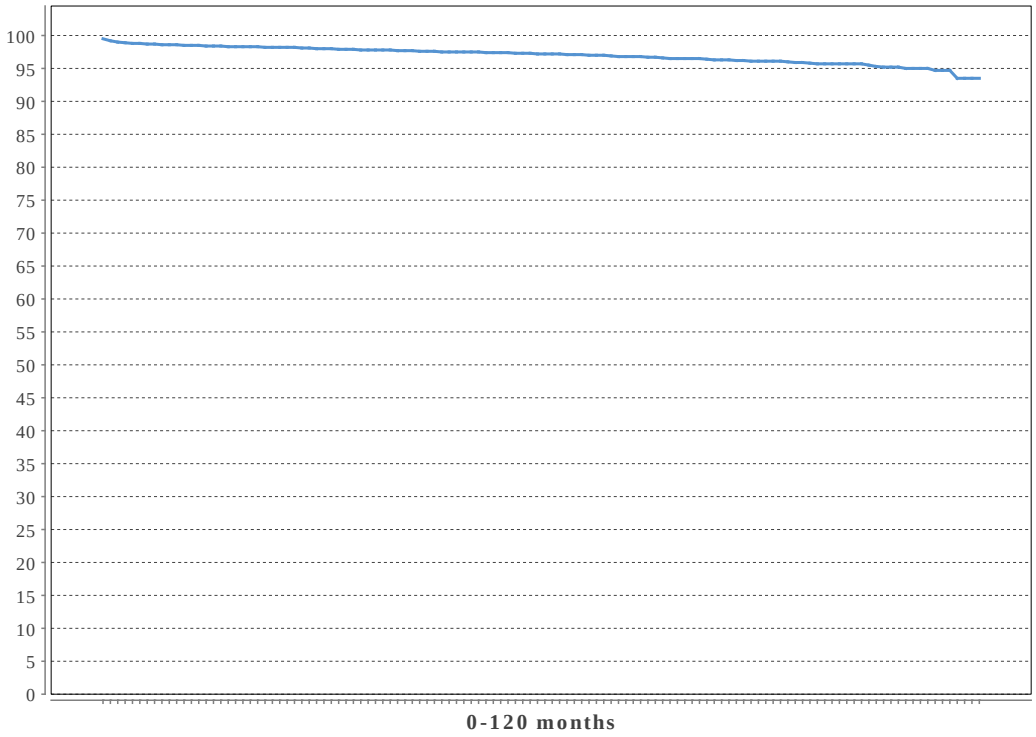
Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Biotronik	Lumax 540 VR-T	100.0	100.0	100.0	100.0	97.6	97.6	97.6	97.6	0.0
Biotronik	Lumax 340 DR-T	100.0	100.0	98.3	96.5	78.9	10.4	5.6	5.6	5.6
Biotronik	Lumax 540 DR-T	100.0	98.8	98.8	97.6	97.6	95.9	92.0	43.4	0.0
Boston Scientific	F102 Teligen	100.0	100.0	100.0	100.0	100.0	98.2	92.2	90.0	90.0
Boston Scientific	P108 Cognis CRT	100.0	100.0	100.0	96.0	94.6	94.6	89.8	89.8	NaN
Boston Scientific	F111 Teligen	100.0	100.0	100.0	100.0	97.5	94.1	91.9	91.9	NaN
Boston Scientific	H247 Livian	100.0	100.0	100.0	100.0	93.4	69.6	29.0	22.1	NaN
Boston Scientific	P107 Cognis CRT	99.0	99.0	99.0	99.0	96.0	94.2	83.5	83.5	78.6
Boston Scientific	T167 Vitality 2	100.0	100.0	98.8	97.5	94.9	81.4	76.8	61.7	11.5
Boston Scientific	D174 Autogen EL	99.4	99.4	99.4	NaN	NaN	NaN	NaN	NaN	NaN
Boston Scientific	F110 Teligen	100.0	99.5	99.5	99.0	97.9	94.7	90.6	89.6	89.6
Medtronic	D364DRM Protecta	100.0	100.0	100.0	100.0	100.0	88.9	NaN	NaN	NaN
Medtronic	D264VRM Maximo II	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN
Medtronic	D264TRM Maximo II	100.0	100.0	100.0	90.9	40.9	0.0	NaN	NaN	NaN
Medtronic	D154ATG EnTrust	100.0	100.0	100.0	98.2	86.1	56.1	18.3	1.1	NaN
Medtronic	D164VWC Virtuoso	100.0	100.0	98.0	96.0	91.5	89.0	80.2	52.3	32.4
Medtronic	D354TRM Protecta	100.0	100.0	98.7	96.6	55.5	25.6	NaN	NaN	NaN
Medtronic	DTBC2D4 Brava	99.1	99.1	99.1	99.1	99.1	NaN	NaN	NaN	NaN
Medtronic	7278 Maximo	100.0	100.0	100.0	94.6	85.5	67.4	15.7	0.0	NaN
Medtronic	D354DRG Protecta	100.0	100.0	100.0	98.5	94.5	87.2	51.7	NaN	NaN
Medtronic	7304 Maximo	100.0	98.9	97.5	75.0	35.8	8.4	5.6	NaN	NaN
Medtronic	D264DRM Maximo II	100.0	100.0	100.0	100.0	96.8	83.3	83.3	NaN	NaN
Medtronic	D354DRM Protecta	100.0	100.0	100.0	100.0	100.0	84.2	84.2	NaN	NaN
Medtronic	D354TRG Protecta	100.0	99.3	95.6	84.3	58.8	29.9	15.0	NaN	NaN
Medtronic	D364VRG Protecta	99.6	99.6	99.6	98.9	97.5	97.5	96.2	NaN	NaN
Medtronic	DTBC2D1 Brava	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN
Medtronic	7288 Intrinsic	100.0	98.8	97.6	97.6	88.6	60.5	16.8	NaN	NaN
Medtronic	7298 Sentry	100.0	99.1	93.9	68.8	31.7	4.9	0.8	NaN	NaN
Medtronic	C174AWK Concerto	99.5	98.9	97.7	91.0	64.5	38.9	20.1	9.7	0.0

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Medtronic	DDBC3D1 Evera S DR DF1	100.0	98.8	98.8	98.8	98.8	NaN	NaN	NaN	NaN
Medtronic	DDBC3D4 Evera S DR DF4	99.4	99.4	99.4	99.4	99.4	NaN	NaN	NaN	NaN
Medtronic	D364TRG Protecta	100.0	99.5	96.8	85.5	60.3	30.1	7.6	NaN	NaN
Medtronic	D164AWG Virtuoso	100.0	98.7	98.7	96.6	88.4	76.2	61.8	29.6	2.8
Medtronic	7232Cx Maximo VR	100.0	100.0	98.9	98.4	97.1	95.8	87.8	55.9	15.1
Medtronic	D284VRC Maximo II	99.7	99.7	99.4	99.4	98.1	96.0	91.3	79.9	57.4
Medtronic	D364DRG Protecta	99.5	99.5	99.0	98.0	94.1	75.6	54.8	53.1	NaN
Medtronic	DDMC3D4 Evera S MRI DR DF4	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	NaN
Medtronic	D284TRK Maximo II	99.8	99.8	98.8	86.8	51.8	15.7	10.3	7.0	7.0
Medtronic	D284DRG Maximo II	99.8	99.8	99.4	98.7	93.6	78.8	43.0	17.9	10.0
St Jude Medical/ Abbott	1211-36 Current VR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN
St Jude Medical/ Abbott	3251-40 Unify Quadra	98.6	98.6	96.9	92.7	83.5	78.0	NaN	NaN	NaN
St Jude Medical/ Abbott	2233-40 Fortify DR	100.0	100.0	100.0	97.4	94.3	87.2	84.2	84.2	NaN
St Jude Medical/ Abbott	1359-40C Fortify Assura	100.0	100.0	95.8	95.8	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	V-341 Atlas + DR	98.5	98.5	98.5	88.1	65.0	39.8	35.8	10.6	0.0
St Jude Medical/ Abbott	V-193 Atlas + VR	98.0	98.0	98.0	95.6	95.6	95.6	89.6	75.7	17.8
St Jude Medical/ Abbott	3239-40Q Promote	99.3	99.3	99.3	99.3	99.3	95.9	95.9	95.9	NaN
St Jude Medical/ Abbott	3235-40Q Unify	100.0	100.0	100.0	98.7	93.2	78.5	62.0	55.8	NaN
St Jude Medical/ Abbott	1233-40Q Fortify	100.0	100.0	99.1	99.1	96.8	95.5	89.2	89.2	NaN
St Jude Medical/ Abbott	1211-36Q Current VR	99.2	99.2	99.2	99.2	99.2	97.2	97.2	NaN	NaN
St Jude Medical/ Abbott	V-168 Atlas 2 VR	100.0	100.0	100.0	97.4	94.7	88.3	76.6	28.6	NaN
St Jude Medical/ Abbott	2211-36 Current + DR	99.3	99.3	98.4	98.4	98.4	89.2	84.2	NaN	NaN
St Jude Medical/ Abbott	1359-40QC Fortify Assura	100.0	99.1	99.1	99.1	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	3211-36 Promote	99.3	99.3	97.2	95.9	86.9	35.3	NaN	NaN	NaN

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
St Jude Medical/ Abbott	3215-36 Promote HF	99.2	98.4	98.4	94.2	90.8	67.1	14.4	7.0	NaN
St Jude Medical/ Abbott	3211-36Q Promote	99.3	99.3	99.3	96.3	90.0	64.8	29.8	NaN	NaN
St Jude Medical/ Abbott	1207-36 Current VR	100.0	100.0	99.2	96.6	94.7	93.7	92.5	85.4	61.7
St Jude Medical/ Abbott	2359-40C Fortify Assura	97.9	93.9	89.9	85.8	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	V-243 Atlas + DR	100.0	100.0	100.0	98.7	97.2	92.6	73.6	42.1	0.0
St Jude Medical/ Abbott	3235-40 Unify	100.0	100.0	98.6	94.1	84.6	70.6	59.8	NaN	NaN
St Jude Medical/ Abbott	3361-40QC Unify Assura	98.9	96.4	93.6	93.6	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	3367-40QC Quadra Assura	100.0	98.1	95.3	95.3	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	2233-40Q Fortify DR	99.6	99.1	98.6	95.6	93.3	89.5	89.5	87.2	NaN
St Jude Medical/ Abbott	V-367 Atlas II	99.5	98.2	94.8	83.3	54.3	30.6	15.0	1.3	1.3
St Jude Medical/ Abbott	3251-40Q Unify Quadra	99.7	97.5	96.3	95.1	90.8	89.5	NaN	NaN	NaN
St Jude Medical/ Abbott	3361-40C Unify Assura	99.2	94.6	89.3	73.3	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	V-268 Atlas II	100.0	100.0	99.1	98.1	87.3	65.3	17.2	1.2	1.2
St Jude Medical/ Abbott	2359-40QC Fortify Assura	99.7	99.3	97.5	96.5	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	1377-36QC Ellipse VR	100.0	100.0	98.9	98.9	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	2211-36Q Current + DR	100.0	100.0	99.7	99.7	98.8	96.7	93.7	NaN	NaN
St Jude Medical/ Abbott	2207-36 Current DR	99.6	99.6	99.6	96.5	94.7	90.1	78.3	36.0	2.8
St Jude Medical/ Abbott	3213-36 Promote HF	99.6	99.3	98.0	96.6	86.2	57.4	20.0	8.8	3.8
St Jude Medical/ Abbott	2377-36QC Ellipse DR	99.4	99.1	99.1	99.1	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	3371-40QC Quadra Assura MP	99.7	98.8	97.3	97.3	NaN	NaN	NaN	NaN	NaN

Overall survival probability for all ICD leads as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990

Year	At risk	Survival probabilty %
1	14169	99.5
2	12384	98.5
3	10309	98.2
4	8295	97.8
5	6424	97.5
6	4834	97.2
7	3476	96.8
8	2326	96.3
9	1341	95.8
10	579	95.2

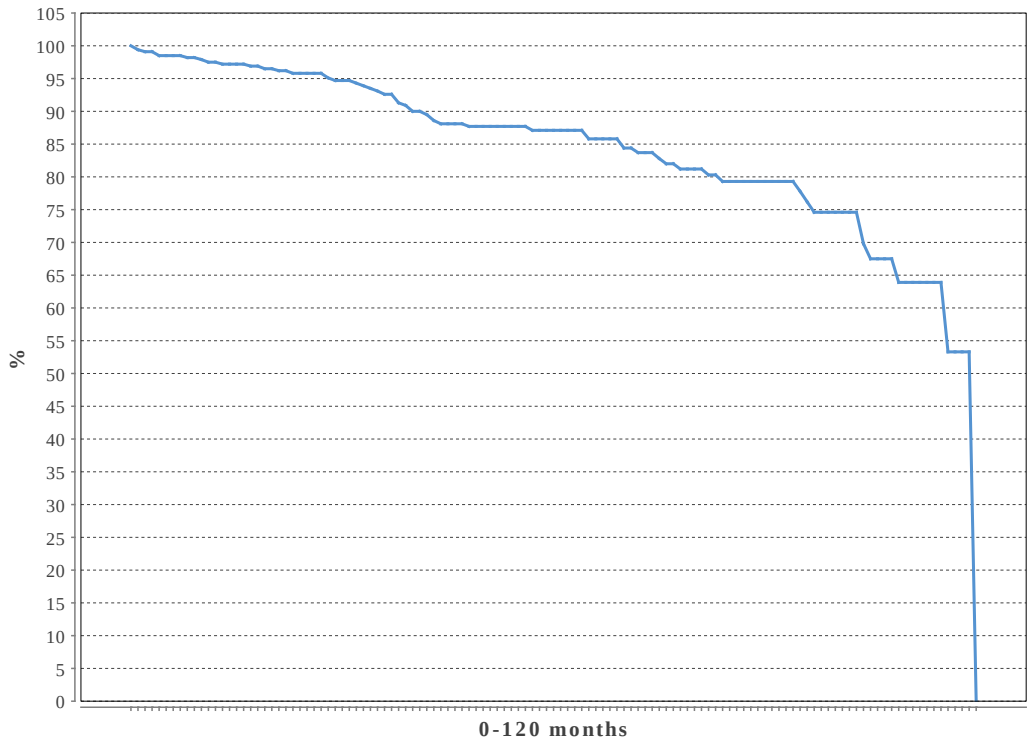


Models that have at least 50 implants and 20 explants

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Linox Smart SD 65/18	97.6	97.1	95.4	95.4	94.2	94.2	93.2	93.2	93.2
Biotronik	Linox Smart S75	98.5	98.2	98.2	98.2	98.2	98.2	98.2	98.2	NaN
Boston Scientific	0174 Reliance	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1
Boston Scientific	0692 Reliance	97.9	97.4	97.4	96.8	96.8	NaN	NaN	NaN	NaN
Medtronic	6948 Sprint Fidelis	98.1	98.1	94.5	90.4	90.4	88.3	82.8	74.1	66.7
Medtronic	6944 Sprint	98.5	98.1	97.6	97.6	96.1	95.0	94.4	94.4	94.4
Medtronic	6949 Sprint Fidelis	97.0	94.7	92.0	85.8	84.8	81.1	76.6	76.6	68.1
Medtronic	6935 Sprint Quattro Secure S MRI	99.4	99.4	99.4	99.2	98.9	98.5	98.0	98.0	98.0
Medtronic	6947M Sprint Quattro Secure MRI	99.2	99.2	99.2	99.2	98.5	98.5	98.5	NaN	NaN
Medtronic	6947 Sprint Quattro Secure MRI	99.2	99.2	99.0	98.9	98.7	98.7	98.4	98.4	98.4
Medtronic	6935M Sprint Quattro Secure S MRI	99.5	99.5	99.5	99.5	99.5	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	1571 Riata	96.7	96.7	96.7	91.8	91.8	91.8	91.8	91.8	91.8
St Jude Medical/ Abbott	7041 Riata ST	97.6	97.6	97.6	97.6	86.1	86.1	86.1	68.9	68.9
St Jude Medical/ Abbott	1581 Riata	95.9	95.9	95.9	93.1	90.1	86.5	86.5	73.6	55.2
St Jude Medical/ Abbott	7172Q Durata	99.3	97.7	95.9	95.9	95.9	93.5	93.5	NaN	NaN
St Jude Medical/ Abbott	7001 Riata ST	94.6	94.6	94.6	94.6	94.6	91.2	86.4	86.4	86.4
St Jude Medical/ Abbott	7170 Durata	98.2	97.4	97.0	96.1	96.1	96.1	96.1	96.1	96.1
St Jude Medical/ Abbott	7122 Durata	99.4	99.2	98.6	98.6	98.6	98.3	97.9	97.9	97.9
St Jude Medical/ Abbott	7120Q Durata	98.3	97.8	97.6	97.4	97.2	96.7	96.7	96.7	NaN
St Jude Medical/ Abbott	7120 Durata	97.9	97.5	97.4	97.2	97.2	97.0	96.8	96.6	96.6
St Jude Medical/ Abbott	LDA210Q Optisure DF4	98.4	98.4	98.4	98.4	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	7122Q Durata	98.3	98.0	97.7	97.5	97.5	97.3	96.9	96.9	NaN

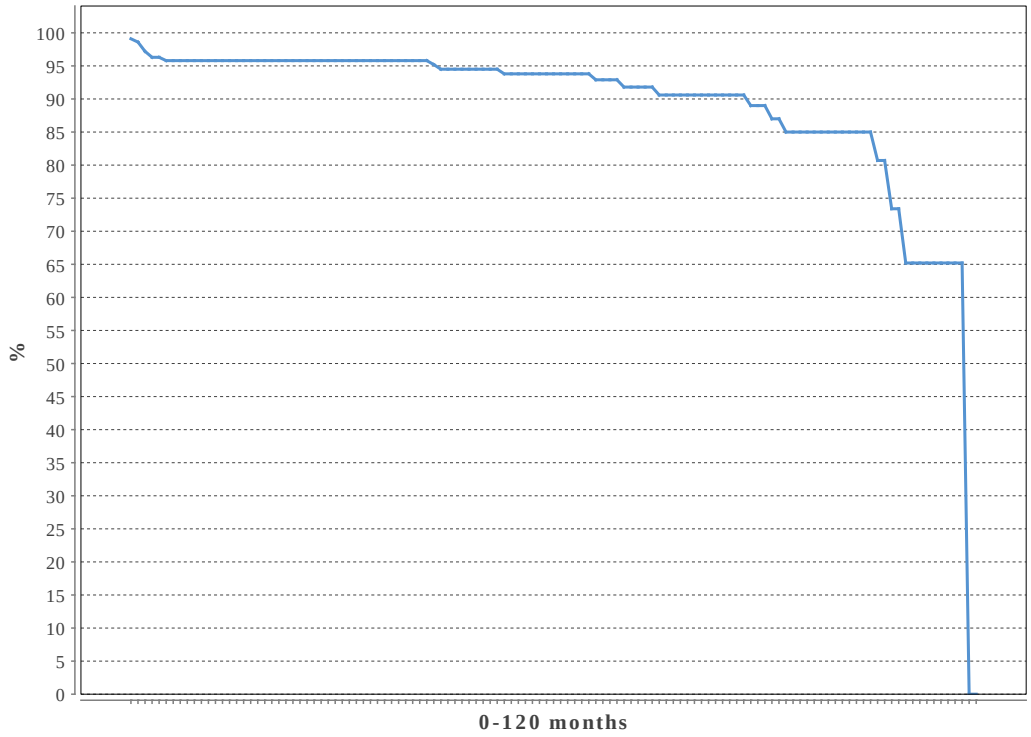
Survival probability for ICD lead Medtronic Sprint Fidelis. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	343	100.0
2	299	97.5
3	267	95.8
4	219	92.6
5	179	87.7
6	150	87.1
7	114	83.7
8	80	79.3
9	49	76.2
10	23	67.5



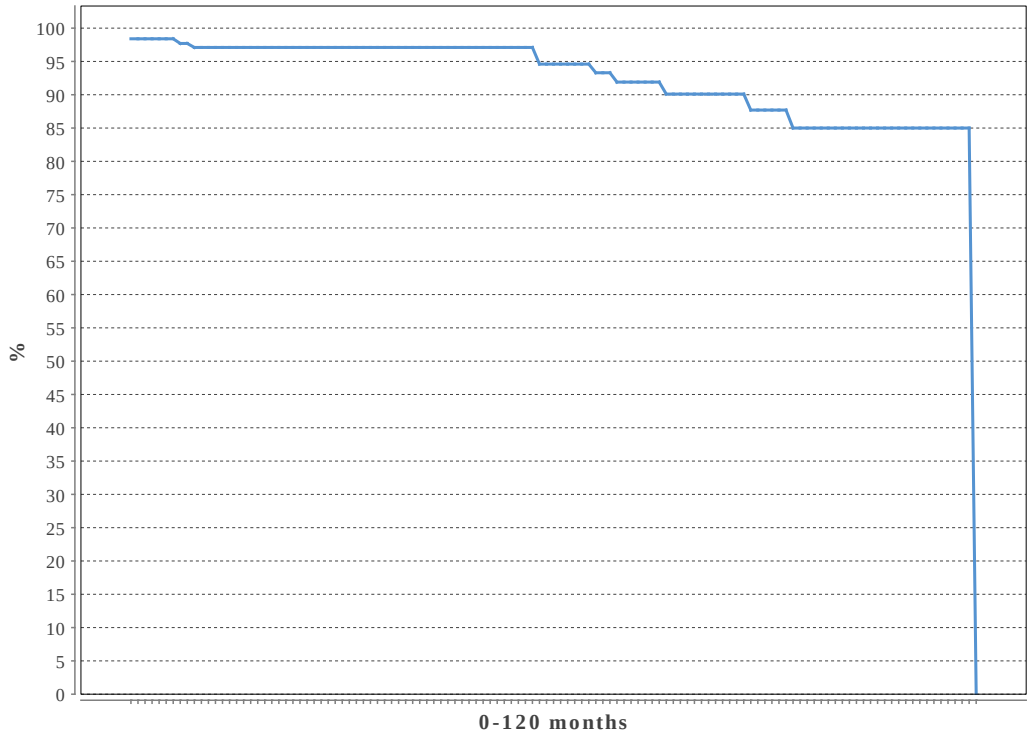
Survival probability for SJM lead type 1561,1570,1571,1572,1580,1581,1582,1591. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	219	99.1
2	193	95.8
3	176	95.8
4	158	95.8
5	138	94.5
6	114	93.8
7	80	91.8
8	60	90.6
9	39	85.0
10	11	73.4



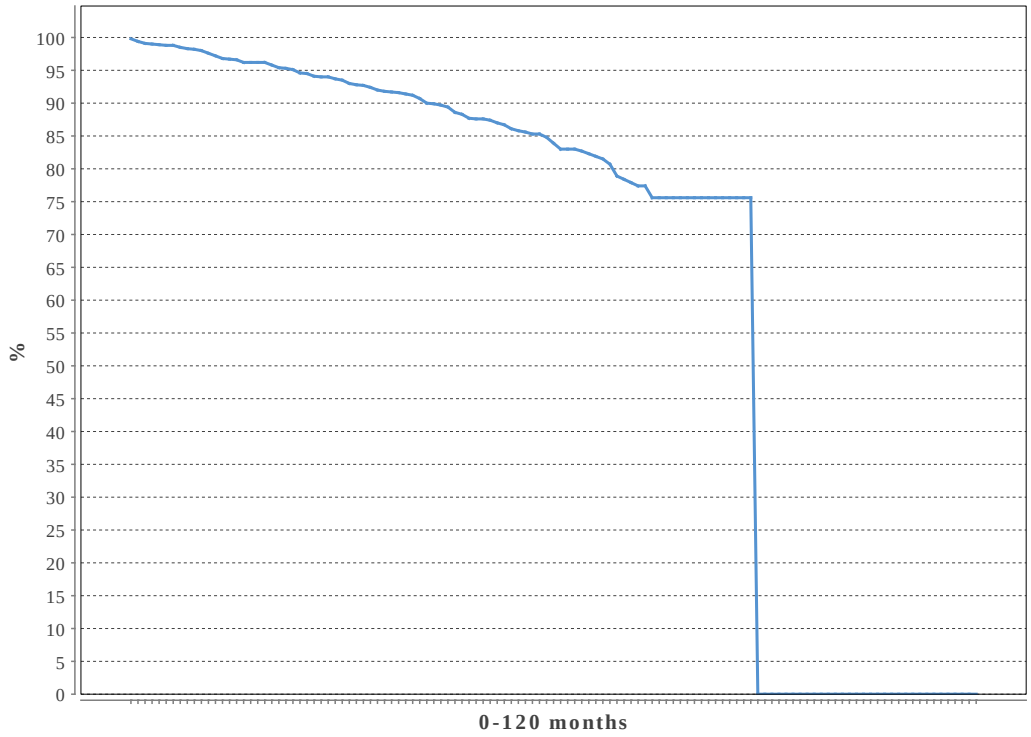
Survival probability for SJM lead type 7000,7001,7002,7040,7041,7042. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	183	98.4
2	147	97.1
3	135	97.1
4	120	97.1
5	98	97.1
6	76	94.6
7	60	91.9
8	45	90.1
9	29	85.0
10	19	85.0



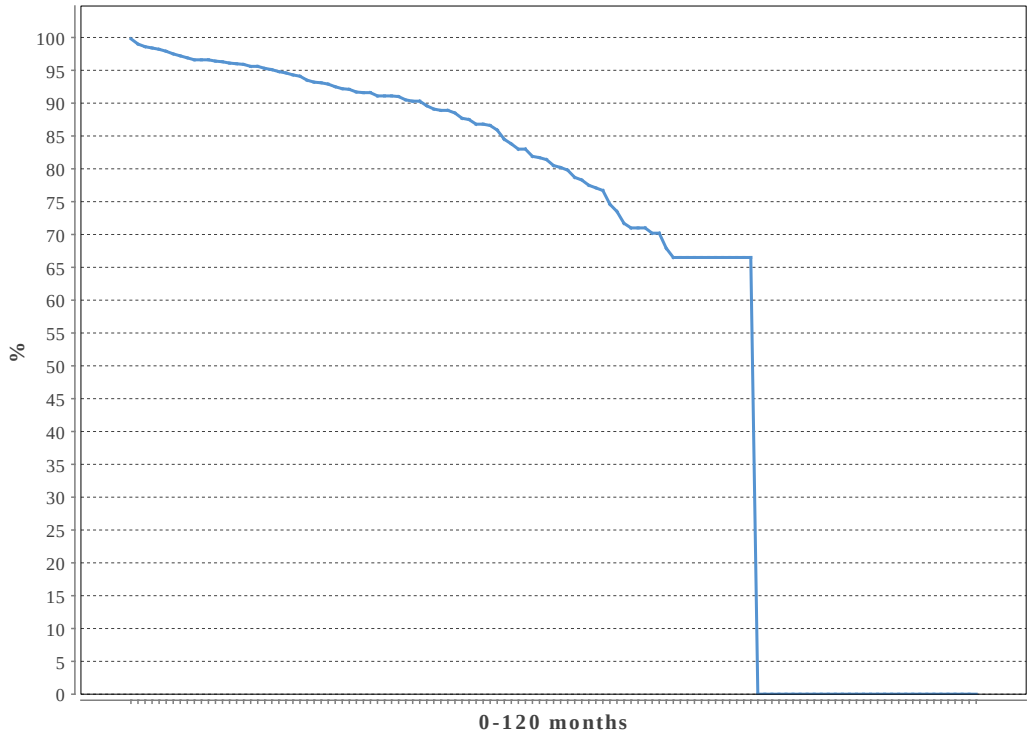
Survival probability for SJM ICD Fortify. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	1588	99.8
2	1366	97.2
3	1071	94.6
4	775	91.8
5	506	87.7
6	296	83.9
7	152	77.4
8	46	75.6
9	0	0.0
10	0	0.0



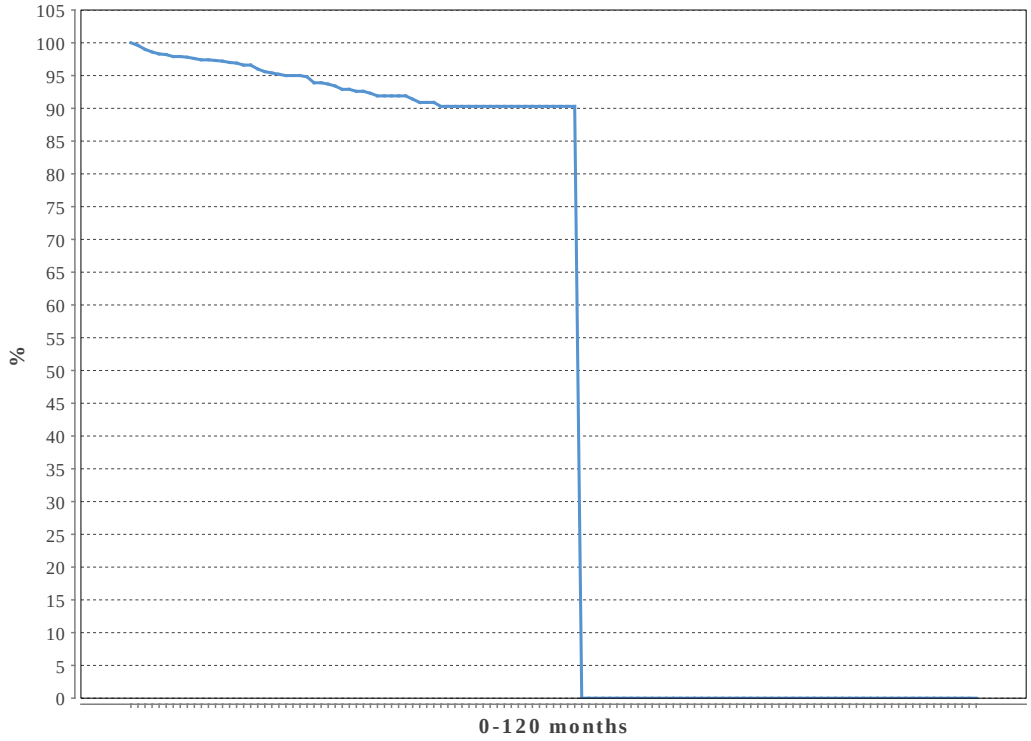
Survival probability for SJM ICD Unify. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	1346	99.8
2	1127	96.4
3	861	94.1
4	610	91.1
5	429	87.5
6	271	80.5
7	111	71.0
8	19	66.5
9	0	0.0
10	0	0.0



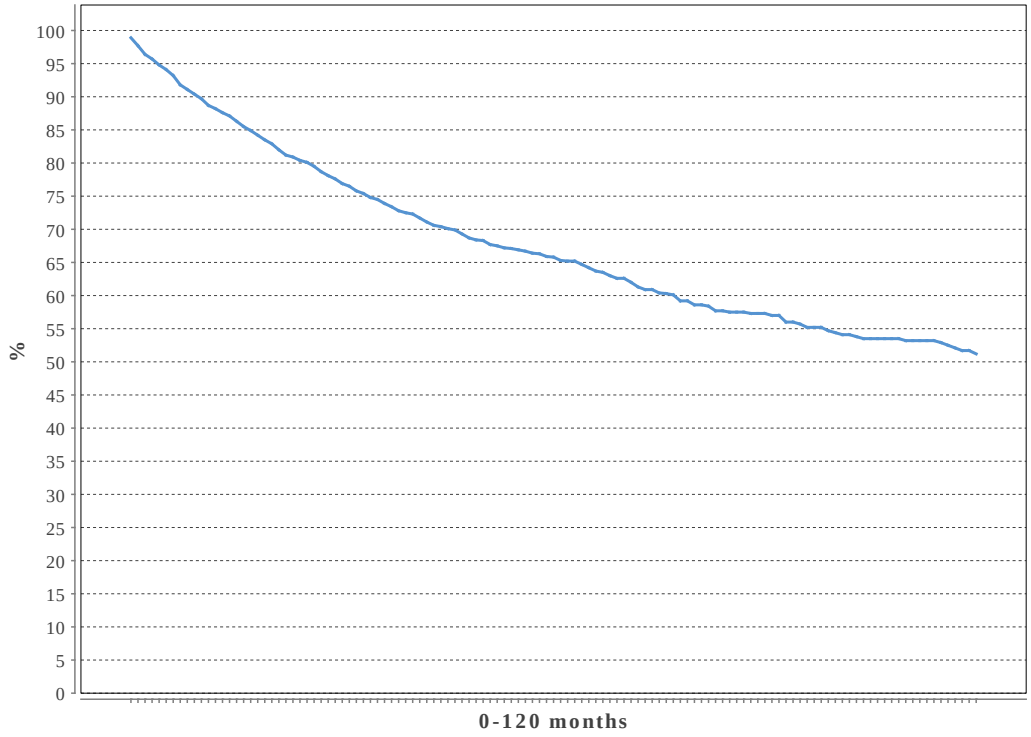
Survival probability for SJM ICD Quadra. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	1067	100.0
2	813	97.3
3	484	95.0
4	266	91.9
5	102	90.3
6	17	90.3
7	0	0.0
8	0	0.0
9	0	0.0
10	0	0.0



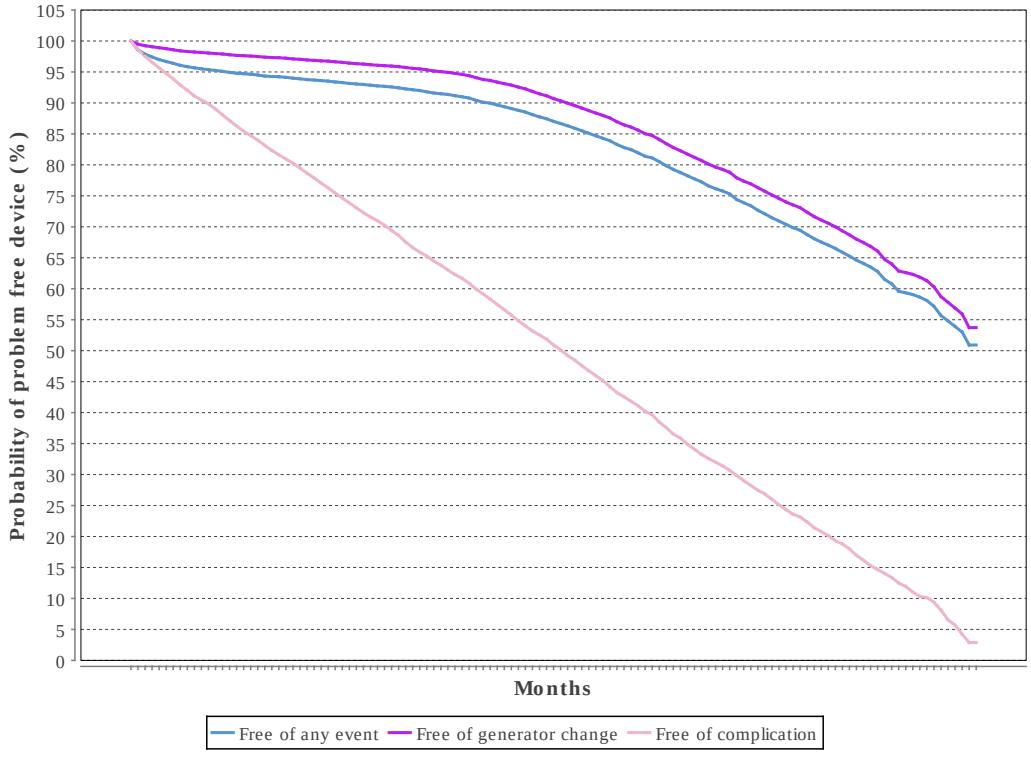
Based on all implants after 1990

Year	At risk	Survival probability %
1	2016	98.9
2	1713	88.2
3	1496	80.4
4	1211	73.9
5	897	68.7
6	608	65.8
7	401	61.3
8	268	57.7
9	210	55.2
10	181	53.5



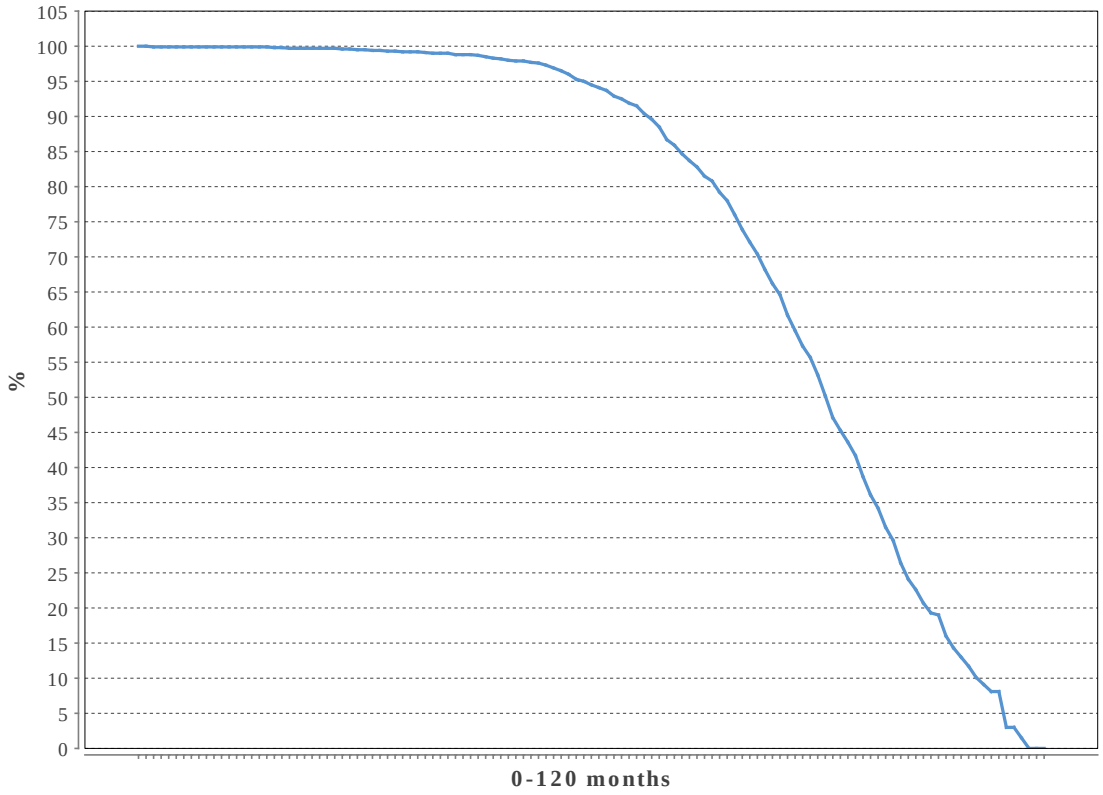
Probablility of event free CRT-device

Year	At risk	Free of any event %	Free of generator change %	Free of complication %
1	36814	95.2	98.0	89.0
2	29602	93.9	97.0	79.5
3	23476	92.7	96.0	70.3
4	18022	90.8	94.4	60.9
5	12956	87.0	90.7	50.9
6	8529	81.9	85.6	41.1
7	5044	75.8	79.3	31.4
8	2654	68.7	72.4	22.4
9	1041	60.8	64.0	13.4
10	76	50.9	53.7	2.9



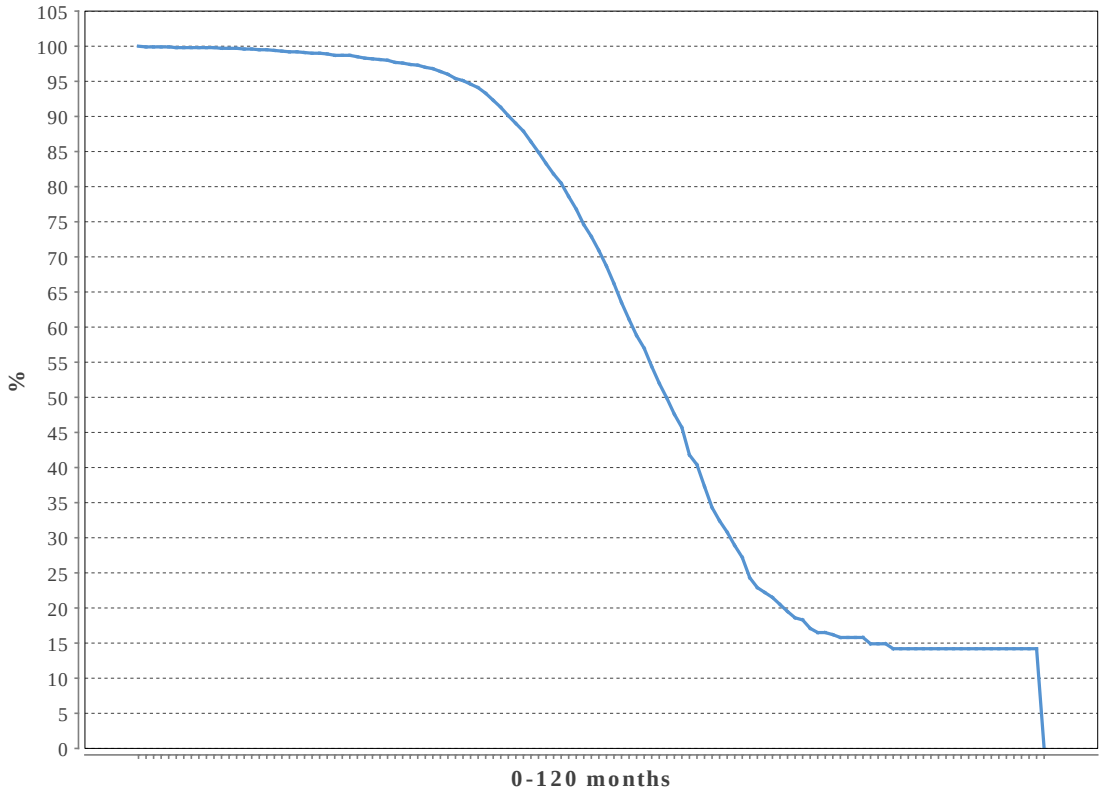
Overall CRT-P generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006

Year	At risk	Survival probability %
1	5648	100.0
2	4613	99.9
3	3588	99.7
4	2703	99.2
5	2041	98.2
6	1436	94.5
7	903	84.7
8	480	66.2
9	184	38.7
10	38	14.3



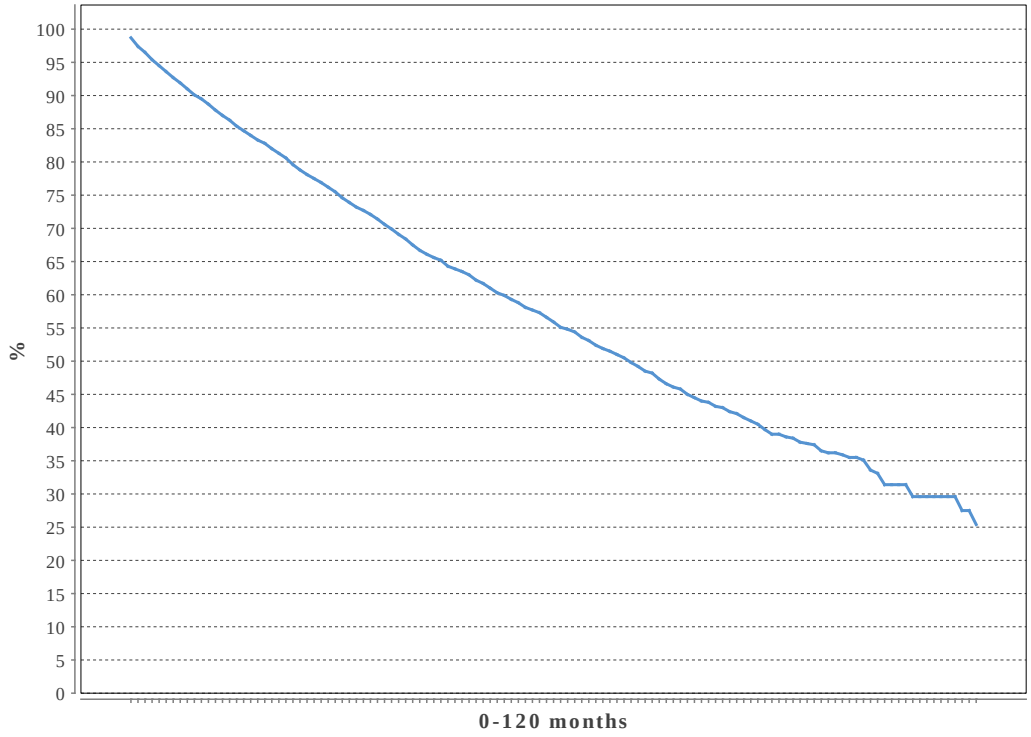
Overall CRT-D generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006

Year	At risk	Survival probability %
1	6367	100.0
2	5382	99.7
3	4123	99.0
4	3075	97.4
5	2115	91.3
6	1162	72.9
7	457	45.7
8	121	21.5
9	39	15.8
10	11	14.2



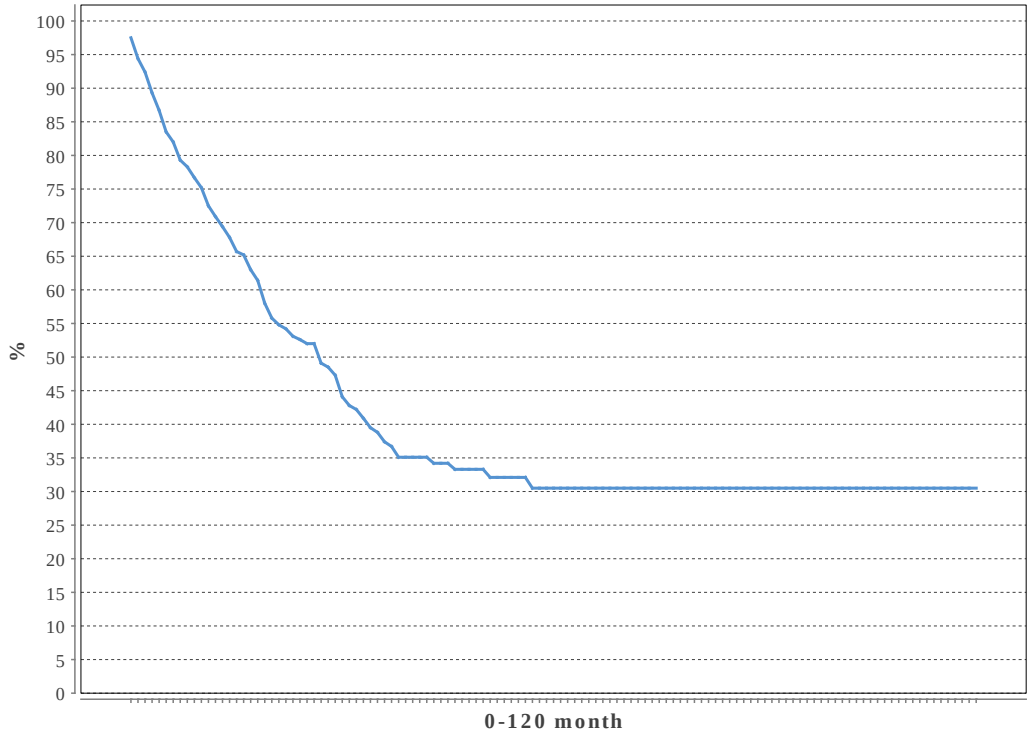
Overall patient survival probability for patients receiving CRT-P therapy. Based on all implants after 2006

Year	At risk	Survival probability %
1	5706	98.7
2	4599	87.8
3	3576	78.8
4	2703	70.6
5	2036	63.0
6	1433	55.9
7	906	49.2
8	484	43.0
9	190	37.6
10	49	31.4



Overall patient survival probability for patients receiving CRT-D therapy. Based on all implants after 1990

Year	At risk	Survival probability %
1	201	97.5
2	139	70.9
3	98	52.6
4	55	37.4
5	33	33.3
6	19	30.5
7	16	30.5
8	15	30.5
9	14	30.5
10	14	30.5



QUALITY – DEAD WITHIN ONE YEAR FROM IMPLANT

Ratio of patients being dead one year after implantation

Type	Implants in 2017	Death within year	%
PM	9377	857	9.1
ICD	2382	105	4.4
CRT-P	511	62	12.1
CRT-D	646	35	5.4

Intervention ratio (primary/correction)

Region	Hospital	Type	Count
Norra Sverige	Norrlands Universitetssjukhus	PFE	209
	Norrlands Universitetssjukhus	PFG	75
	Örnsköldsviks sjukhus	PFE	78
	Örnsköldsviks sjukhus	PFG	12
	Östersunds sjukhus	PFE	213
	Östersunds sjukhus	PFG	43
	Skellefteå lasarett	PFE	68
	Skellefteå lasarett	PFG	5
	Sollefteå sjukhus	PFE	19
	Sunderby sjukhus	PFE	316
	Sunderby sjukhus	PFG	75
	Sundsvalls sjukhus	PFE	237
	Sundsvalls sjukhus	PFG	73
Södra Sverige	Blekingesjukhuset	PFE	222
	Blekingesjukhuset	PFG	53
	Centrallasarettet Växjö	PFE	147
	Centrallasarettet Växjö	PFG	53
	Centralsjukhuset Kristianstad	PFE	290
	Helsingborgs lasarett	PFE	45
	Länssjukhuset Halmstad	PFE	148
	Länssjukhuset Halmstad	PFG	5
	Skånes universitetssjukhus, Lund	PFE	632
	Skånes universitetssjukhus, Lund	PFG	338
	Skånes universitetssjukhus, Malmö	PFE	395
	Varbergs sjukhus	PFE	161
	Varbergs sjukhus	PFG	65
Stockholm/Gotland	Danderyds sjukhus	PFE	529
	Danderyds sjukhus	PFG	82
	Karolinska Huddinge	PFE	201
	Karolinska Huddinge	PFG	70
	Karolinska Solna	PFE	307
	Karolinska Solna	PFG	145
	Södersjukhuset	PFE	367
	Södersjukhuset	PFG	71
	St Görans sjukhus	PFE	383
	St Görans sjukhus	PFG	77
	Visby lasarett	PFE	49
	Visby lasarett	PFG	9
Sydöstra Sverige	Länssjukhuset Kalmar	PFE	101
	Länssjukhuset Kalmar	PFG	55
	Länssjukhuset Ryhov	PFE	274
	Länssjukhuset Ryhov	PFG	55
	Linköpings universitetssjukhus	PFE	448
	Linköpings universitetssjukhus	PFG	166
	Oskarshamns sjukhus	PFE	20
	Västerviks sjukhus	PFE	47
	Vrinnevisjukhuset	PFE	1
Uppsala/Örebro	Akademiska sjukhuset	PFE	408
	Akademiska sjukhuset	PFG	114
	Arvika sjukhus	PFE	16

Region	Hospital	Type	Count
	Centralsjukhuset Karlstad	PFE	161
	Centralsjukhuset Karlstad	PFG	53
	Centralsjukhuset Västerås	PFE	206
	Centralsjukhuset Västerås	PFG	51
	Falu lasarett	PFE	298
	Falu lasarett	PFG	78
	Gävle sjukhus	PFE	292
	Gävle sjukhus	PFG	93
	Hudiksvalls sjukhus	PFE	79
	Hudiksvalls sjukhus	PFG	7
	Mälarsjukhuset	PFE	214
	Mälarsjukhuset	PFG	60
	Torsby sjukhus	PFE	39
	Universitetssjukhuset Örebro	PFE	267
	Universitetssjukhuset Örebro	PFG	78
Utland	Ålands centralsjukhus	PFE	34
	Ålands centralsjukhus	PFG	7
	Utland	PFE	17
	Utland	PFG	6
Västra Sverige	Alingsås lasarett	PFE	87
	Drottning Silvias Bus	PFE	18
	Drottning Silvias Bus	PFG	1
	Kungälvs sjukhus	PFE	113
	Sahlgrenska universitetssjukhuset	PFE	494
	Sahlgrenska universitetssjukhuset	PFG	139
	Sahlgrenska universitetssjukhuset /Östra	PFE	113
	Skaraborgs sjukhus Skövde	PFE	278
	Skaraborgs sjukhus Skövde	PFG	50
	Södra Älvsborgs sjukhus	PFE	240
	Södra Älvsborgs sjukhus	PFG	64
	Trollhättan, NÄL	PFE	347
	Trollhättan, NÄL	PFG	67