KAROLINSKA HOSPITAL
DEPARTMENT OF CARDIOLOGY
SWEDEN

ANNUAL STATISTICAL REPORT 2014

SWEDISH ICD & PACEMAKER REGISTRY

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Foreword

We are proud to present the annual report for 2014 with expanded data regarding quality and device longevity together with implant rates and usage of device therapy in Sweden. The quality section has expanded data regarding longevity of devices, leads and complications. 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. The report contains data from all implanting hospitals and > 95% of all procedures are reported when validated against the Patient care registry from Socialstyrelsen.

Implant rates Pacemaker

There are 55321 active pacemaker patients in Sweden at the end of 2014, an increase by almost 10000 patients. There are regional differences with the highest implant rates in the small regions of Gotland and Blekinge but also the larger northern region of Västernorrland. The overall implant rate has decreased somewhat from 2013 691 vs 697 implants per million but population has increased and thereby the total number of first implants to an all time high of 6777 new implants. No new centers have started and the number of implanting hospitals is 43. (p 8-12) The manufacturers shares of the market show slight redistribution and all regions are bound by tenders for 1-3 years. Medtronic with the brand Vitatron is largest with 46% with St Jude second with 34%. The smaller brands of Sorin and Biotronik are slowly increasing and Boston has lost market shares in brady segment.

Age and Gender distribution of pacemaker treatment

The average age for females receiving pacemaker treatment is 77 years and males 75 years and six patients over 100 years of age received primary implants. There is a male predominance with 58% 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

Pacemaker leads are now solely bipolar with one unipolar transvenous lead implanted. Active fixation is used to 98% in the atrium but only to 80% in the ventricle where passive leads are used more commonly than in the US for example. We now have active fixation LV leads and 9% of the LV leads were active fixation. Quadripolar lead technology for CRT has rapidly increased and 50% of the LV leads are now quadripolar. 14912 leads were implanted all together. Only a small number of epicardial systems are implanted in small children patients without venous access and in some CRT patients. Venous access is almost equal between cephalic cut-down technique, 52%, and direct subclavian puncture 42% and 5% axillary punction which has increased as access route.

Pacemakers

All pacemakers implanted have RR capability and DDD-R is the most common subtype, 77%. CRT-P are used in small numbers, 4.5% of all PM implants which is slightly less than previous year. The most common aethiology for pacemaker treatment is still the “conductive tissue fibrosis” 80% and ischaemic disease is more common in males, 10 vs 5%. 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 decreasing, especially in brady-paced patients with heart failure and 2014 a total of 142 patients were upgraded from normal brady pacing to CRT compared to 185 2013 The most common symptom is syncope followed closely by dizziness and dyspne.. ECG indications are 2014 as before mainly related to sinus node disease with AV conduction disorders second. Sinus node disease is slightly more common as an indication I women than in men. Smaller hospitals tend to use VVI-R pacing more often than larger hospitals for AV-block. Generators are used to ERI criteria are fulfilled in 74% of the cases and 3% exhibit premature EOL. Lead failures are uncommon and survival rates are very good.

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.

Implant rates ICD

There are 9081 active ICD patients in Sweden 2014 and this is a > 15% increase over 7752 2013. The number centers implanting ICD's is 32. The national implant rate is up slightly from 2013 152 vs 137. Implant rates show the same regional differences as in pacemakers with the highest rates in the north and the lowest in the western region, 207 vs 95 per million. It has even decreased in the western region compared to 2013! The highest differences are in primary prevention between the same regions, 114 vs 58 per million in northern and western region. Clear explanations for this are not at hand. The national average is 98 per million and is an increase from 89 2013. About 25% of the procedures are replacements. As with PM the regions are bound by tenders and manufacturers share show only slight variations over previous year. A small number of subcutaneous devices were implanted but is rapidly increasing.

ICD Patients

The average age for ICD implant is 65 years in males and 61 years in females for all types of implants. 61 patients in the age group 80-89 (p 45-46). Clinical indication for ICD implant was secondary prevention in 32% and secondary 68%. Primary prevention is increasing. Aethiology was ischaemic heart disease in 34% of all patients but more common in males, 37% vs 22% males vs females. Medication at the start of therapy is displayed in tables.

ICD Subtypes and leads

66% of the leads are single coil (increase from 61% 2013) and 98% were active fixation. Venous access is comparable to PM implants with an equal distribution between cephalic cut-down and direct subclavian puncture. Subtypes are 41% DDR devices, 36% CRT-D and 21% VVI-R devices. Only 64% of the ICD's are used until normal EOL/ERI, 8% are changed due to system upgrade, CRT. Technical recalls stand for 0.3% of all box changes. ICD leads display larger failure rates but overall longevity is still good. The number of procedures display the same large variation I volumes as with pacemaker procedures at different hospitals and some are clearly below recommended volumes (p 65-66).

CRT implant rates

Implant rates of CRT system are only increasing slowly in Sweden, 61 per million CRT-D's and 41 per million CRT-P's new implants. The number of centers performing CRT implantations are less than the number doing ICD's. The distribution between CRT-D and CRT-P systems show 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 76 y and CRT-D patients 67 years with a large male predominance. Medication for patients receiving CRT for the first time is given in tables.

ILR

752 ILR's were implanted in Sweden 2014 which is up by 20% since 2013 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 3% an ICD indication, the rest 47% showed no pathological rhythm during the FU. In 2% a new ILR was implanted to extend the monitoring period. The most common finding during regular FU was however normal sinus rhythm in 81% of the registered FU events.

Quality of device treatment, pacemakers, pacing modes

In high degree AV block only 4% 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 show the same tendency with 7% VVI-R systems on average but 16% in small hospitals. This unfortunate trend is constant since 2012 and may depend upon a lack of skilled implanters at small hospitals.

Lead extraction

For the first time we have included lead extractions in the registry. The definition used is base on ACC and EHRA documents. A lead extraction is a removal of a lead older than 1 years or any lead removal requiring the use of a specific tool. Leads less than one year old that are removed without a tool is a lead removal and

not a lead extraction. The numbers from each hospital is presented in a table at p 99. 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 number of cases (p100-101). A more fully developed statistics will be available in 2015 report!

Complications Pacemaker

The total complication rate for pacemaker procedures is 5.4% with lead displacement being the most common. There is a variation among the operating hospitals and lead types. 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 ICD

The overall complication rate to ICD treatment is 9.3% and is up slightly from 8.1% in 2013. The most common complication is lead dislodgement 2.9% followed by infection with 1.7%. The rate between hospitals are also given in tables and as with pacemaker treatment <3% is considered incomplete registration.

Complications CRT

This is presented as a both CRT-D and CRT-P complications. Both figures 4% and 8.8% are very low and does not compare well with literature findings of up to 15% complications. Reasons for this are unknown.

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 generally takes 34 minutes to implant, a dual chamber device 48 min and a CRT system 85 min.

Device longevity ICD and PM

Generators generally have very good longevity with an average for Pacemakers of 99.1% after 5 years but there are differences between models and manufacturers. Pacemaker lead survival is very good with a survival rate of 97,4% after 10 years (p 135) with very little difference between models an manufacturers. ICD generator survival is more heterogenous than PM generator survival with larger difference between manufacturers and models and an average of 92.6% after 5 years. SJM Fortify and Unify are one poorly performing devices of recent manufacture. ICD lead survival is also shorter than pacemaker lead survival, 91% vs 99% after 10 years (p 146) The Medtronic Sprint Fidelis models were implanted in 903 cases in Sweden and the survival rate is 85.8% after 10 years which is down from 88% in 2013. In the St Jude Riata models only a few failures have occurred so far and 10 year survival is 92.7%

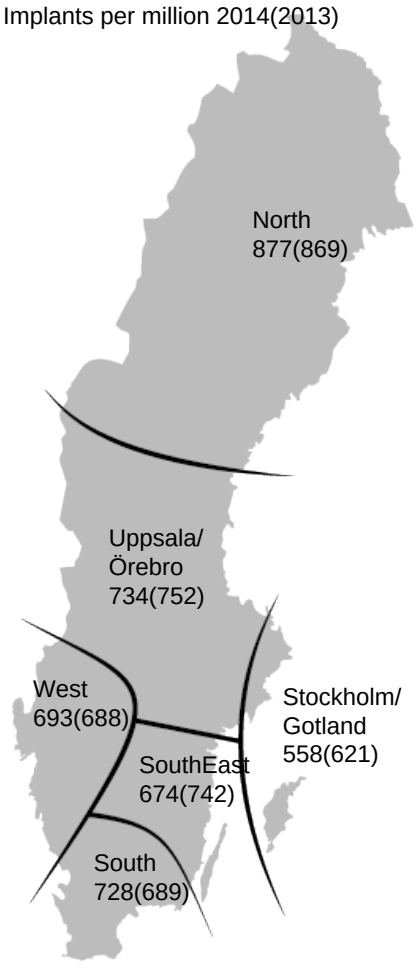
Patients

The ICD patient survival is markedly longer than for pacemaker patients, 82% after 5 years for ICD patients vs 64% for pacemaker patients. This being an effect partly of course due to the average implant age 65 vs 75 for patients at the first implant. The heart failure patients also have the shortest expected survival rate among the PM and ICD patients. The difference between CRT-P and CRT-D patients are however surprisingly small in an unadjusted comparison (p 151-157).

Fredrik Gadler 2015 12 10

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	2255299	1259	558	11480
Uppsala/Örebro	2013046	1477	734	12173
South-East Sweden	1021965	689	674	5465
Southern Sweden	1761784	1282	728	10249
Western Sweden	1813086	1256	693	10223
Northern Sweden	882175	774	877	5731
Total	9747355	6737	691	55321



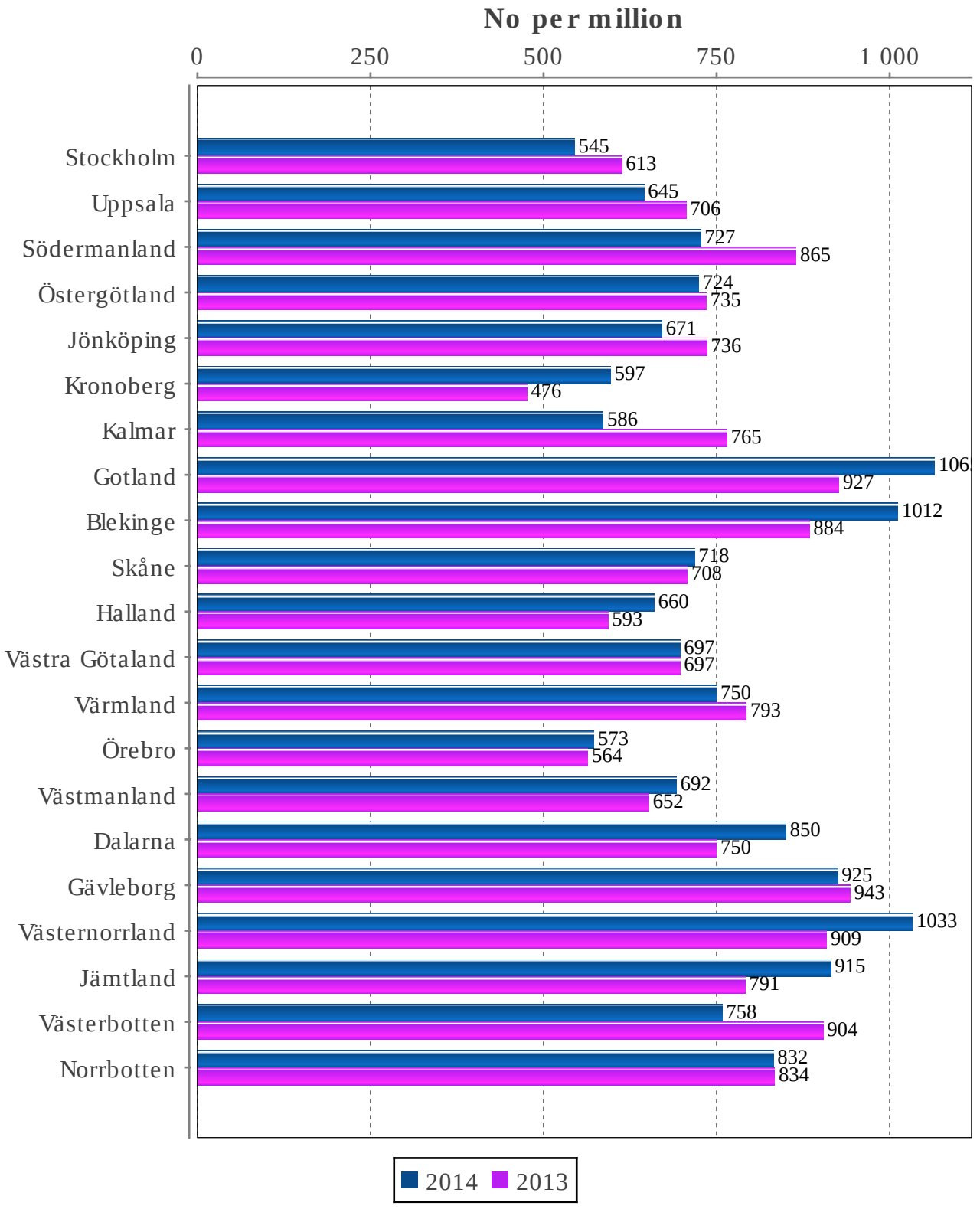
First implants per hospital

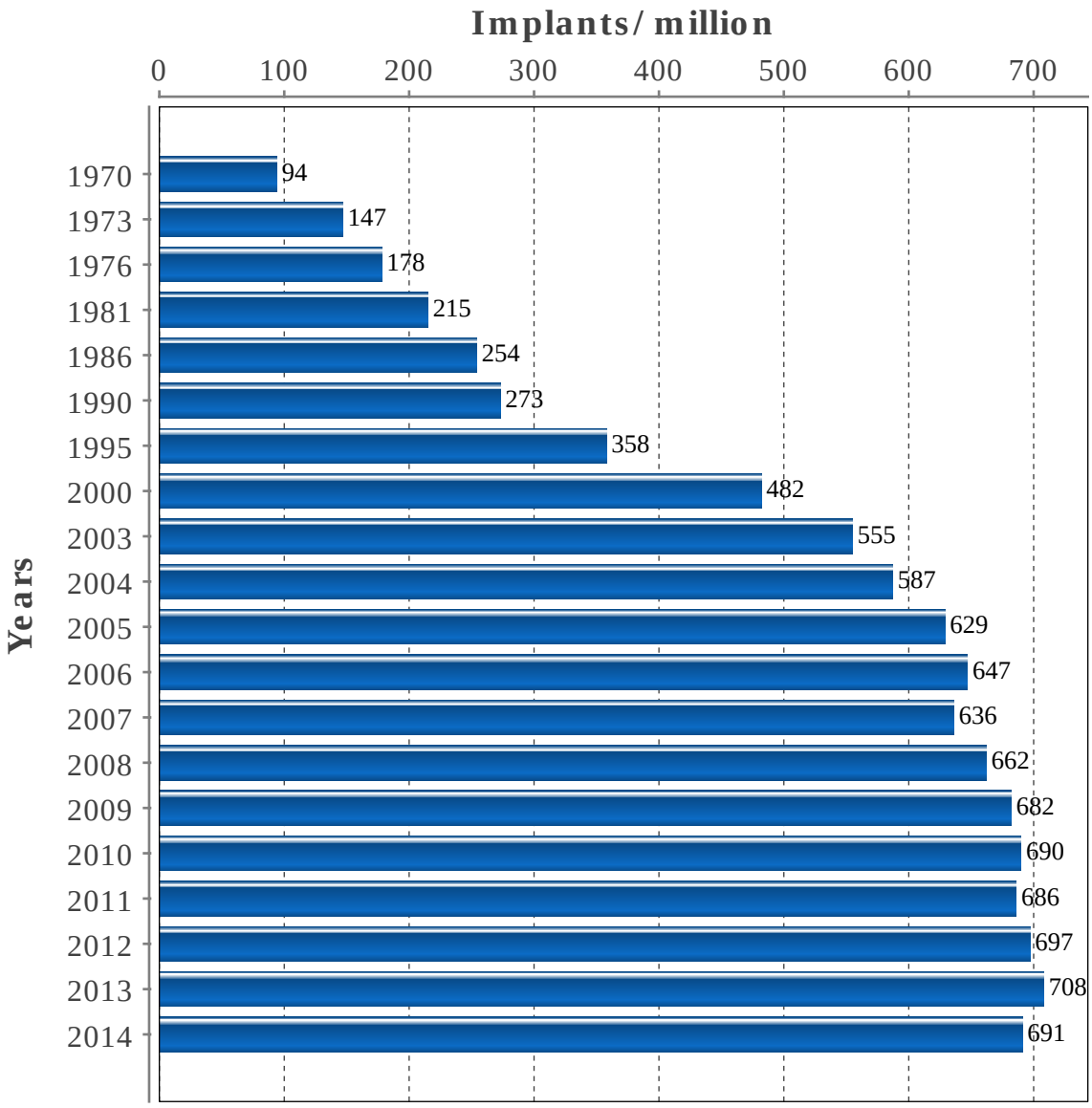
Region	Hospital	2014	2013
Northern Sweden	Norrlands Universitetssjukhus	168	207
	Skellefteå lasarett	53	56
	Sollefteå sjukhus	25	28
	Sunderby sjukhus	200	196
	Sundsvalls sjukhus	154	153
	Örnsköldsviks sjukhus	59	37
	Östersunds sjukhus	120	91
Southern Sweden	Blekingesjukhuset	202	152
	Centrallasarettet Växjö	108	74
	Centralsjukhuset Kristianstad	1	0
	Länssjukhuset Halmstad	98	79
	Skånes universitetssjukhus, Lund	642	618
	Skånes universitetssjukhus, Malmö	245	282
South-East Sweden	Linköpings Universitetssjukhus	238	251
	Länssjukhuset Kalmar	71	99
	Länssjukhuset Ryhov	220	233
	Oskarshamns sjukhus	27	39
	Vrinnevisjukhuset	105	99
	Västerviks sjukhus	33	37
Stockholm/Gotland	Danderyds sjukhus	345	398
	Karolinska Universitetssjukhuset	410	471
	St Görans sjukhus	202	207
	Södersjukhuset	280	276
	Visby lasarett	43	39
Uppsala/Örebro	Akademiska sjukhuset	268	280
	Arvika sjukhus	13	22
	Centralsjukhuset Karlstad	145	154
	Centralsjukhuset Västerås	166	156
	Falu lasarett	227	192
	Hudiksvalls sjukhus	49	71
	Länssjukhuset Gävle	201	181
	Mälarsjukhuset	189	225
	Torsby sjukhus	37	28
	Universitetssjukhuset Örebro	169	175
Western Sweden	Alingsås lasarett	79	59
	Drottning Silvias Bus	7	9
	Kungälvs sjukhus	72	98
	Sahlgrenska Universitetssjukhuset	325	306
	Sahlgrenska Universitetssjukhuset /Östra	80	108
	Skaraborgs sjukhus Skövde	212	206
	Södra Älvsborgs sjukhus	156	171
	Trollhättan, NÄL	235	201
	Varbergs sjukhus	98	90

STATISTICS – PACEMAKER – IMPLANTS PER COUNTY

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

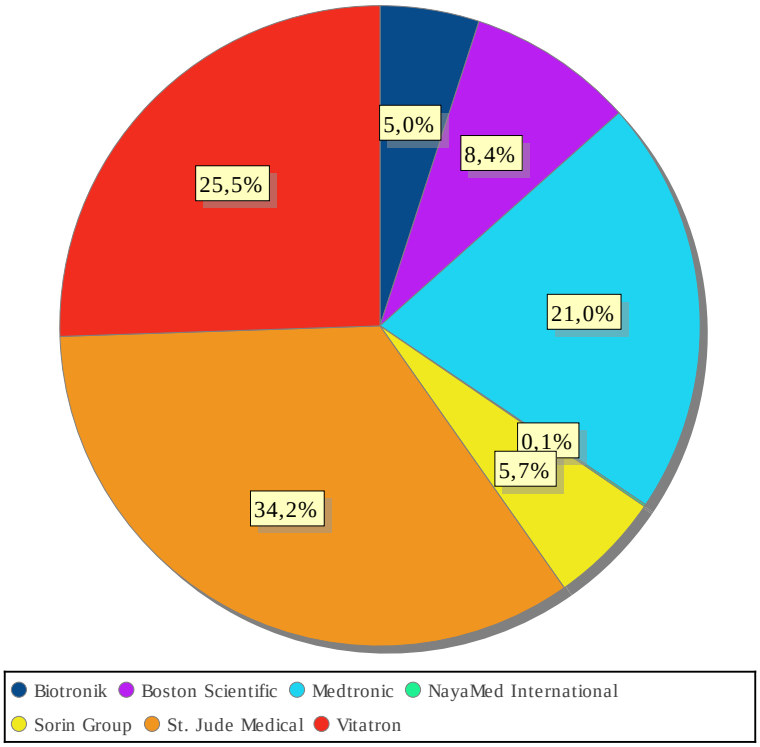
County	Population	No of first	2014	Active patients
Stockholm	2198044	1198	545	11057
Uppsala	348942	225	645	1996
Södermanland	280666	204	727	1625
Östergötland	442105	320	724	2431
Jönköping	344262	231	671	1912
Kronoberg	189128	113	597	947
Kalmar	235598	138	586	1122
Gotland	57255	61	1065	423
Blekinge	154157	156	1012	1127
Skåne	1288908	926	718	7553
Halland	310665	205	660	1575
Västra Götaland	1632012	1138	697	9269
Värmland	274691	206	750	1619
Örebro	288150	165	573	1449
Västmanland	261703	181	692	1527
Dalarna	278903	237	850	1754
Gävleborg	279991	259	925	2203
Västernorrland	243061	251	1033	1620
Jämtland	126765	116	915	684
Västerbotten	262362	199	758	1586
Norrbotten	249987	208	832	1841
Total	9747355	6737	691	55320


No per million
0
250
500
750
1 000
Stockholm
545
613
Uppsala
645
706
Södermanland
727
865
Östergötland
724
735
Jönköping
671
736
Kronoberg
597
476
Kalmar
586
765
Gotland
106
927
Blekinge
1012
884
Skåne
718
708
Halland
660
593
Västra Götaland
697
697
Värmland
750
793
Örebro
573
564
Västmanland
692
652
Dalarna
850
750
Gävleborg
925
943
Västernorrland
1033
909
Jämtland
915
791
Västerbotten
758
904
Norrbotten
832
834
2014
2013


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
94
147
178
215
254
273
358
482
555
587
629
647
636
662
682
690
686
697
708
691

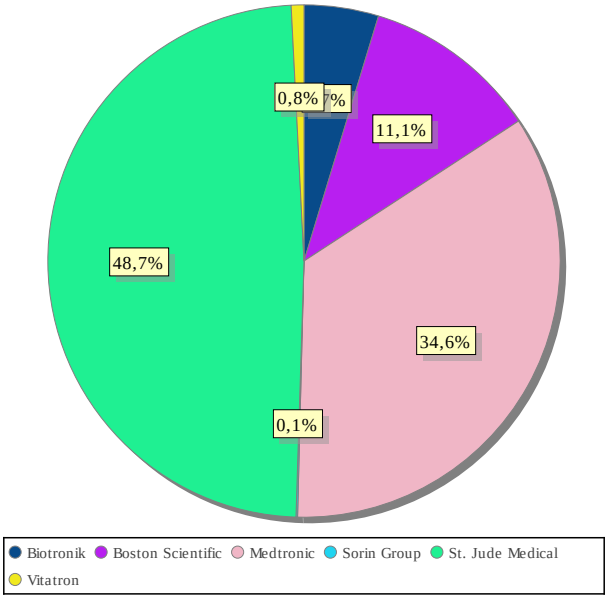
Market share per manufacturer in Sweden. Medtronic and Vitatron regarded as separat companies

Manufacturer	2011 %	2012 %	2013 %	2014 %
Biotronik	6.0	7.6	6.0	5.0
Boston Scientific	7.0	6.7	7.7	8.4
Medtronic	42.0	26.1	20.2	21.0
Sorin Group	7.0	5.3	5.0	5.7
St. Jude Medical	30.0	36.2	37.0	34.2
Vitatron	5.0	18.2	23.9	25.5
Nayamed International	-	-	0.1	0.1
Impulse Dynamics	-	-	-	-



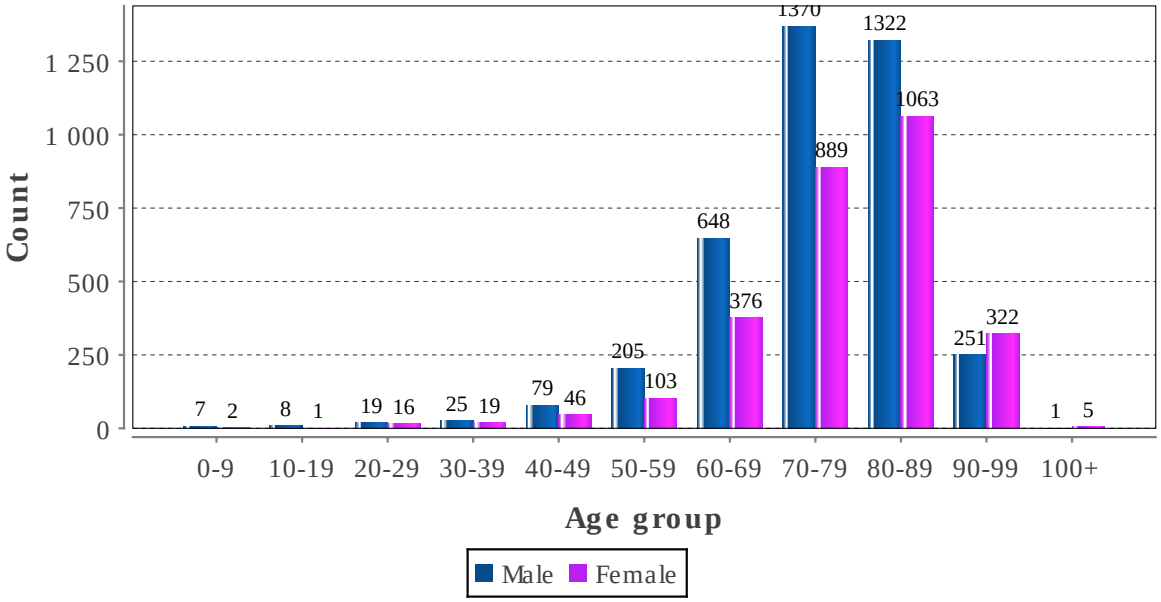
Market share per manufacturer in Sweden. Medtronic and Vitatron regarded as separat companies. From 2011 even including leads implanted in ICD systems.

Manufacturer	2011 %	2012 %	2013 %	2014 %
Biotronik	1.0	2.1	4.6	4.7
Boston Scientific	10.0	10.0	9.3	11.1
Medtronic	39.0	31.0	33.0	34.6
St. Jude Medical	47.0	53.2	51.2	48.7
Vitatron	3.0	3.7	1.9	0.8
Sorin Group	-	-	-	0.1



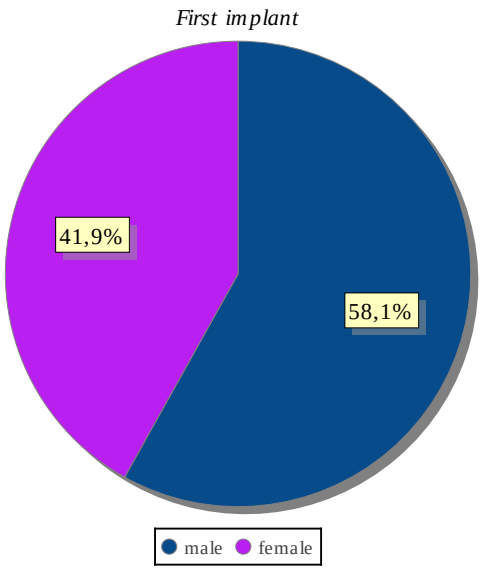
Age and gender distribution for new implants, total numbers

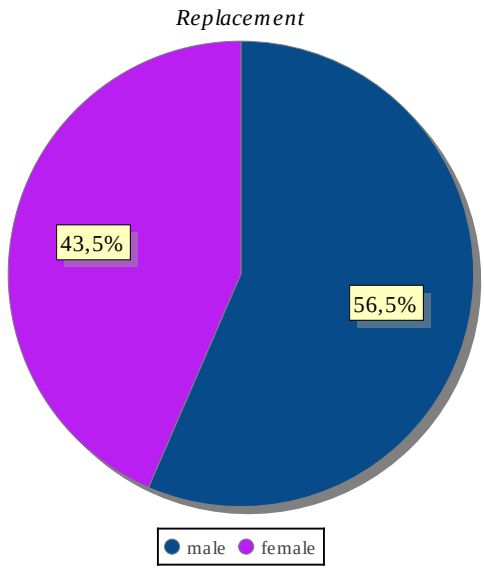
Age (years)	Total no	%	Male	Female
0-9	9	0.1	7	2
10-19	9	0.1	8	1
20-29	35	0.5	19	16
30-39	44	0.6	25	19
40-49	125	1.8	79	46
50-59	308	4.5	205	103
60-69	1024	15.1	648	376
70-79	2259	33.3	1370	889
80-89	2385	35.2	1322	1063
90-99	573	8.5	251	322
100+	6	0.1	1	5
Average age	76	0.0	75	77
				Total number of implants: 6777

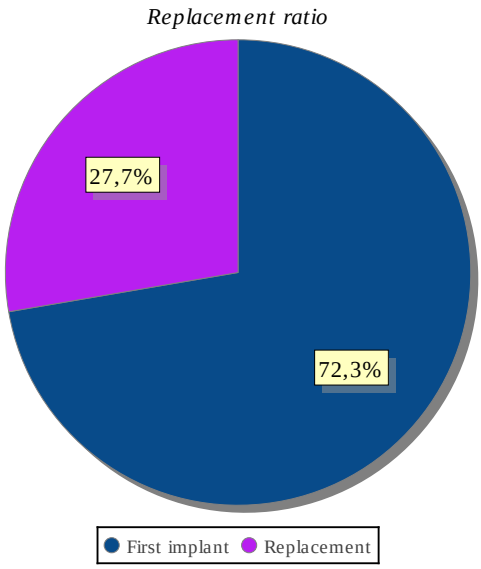


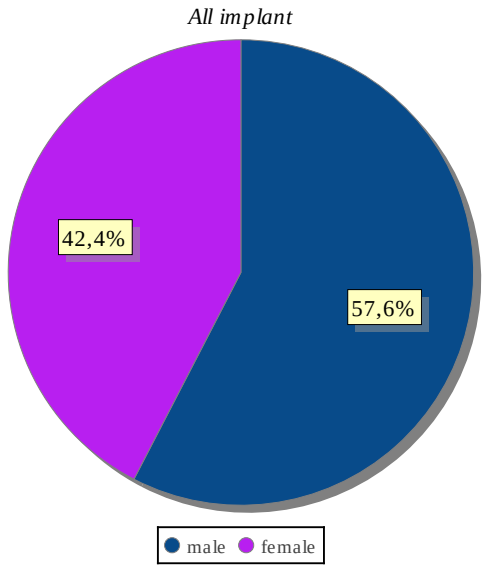
Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	6777	72.3	3935	58.1	2842	41.9
Replacement	2598	27.7	1468	56.5	1130	43.5
Total	9375	100.0	5403	57.6	3972	42.4



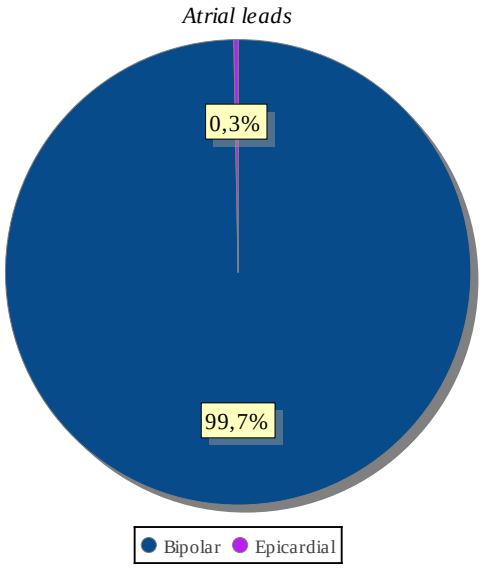


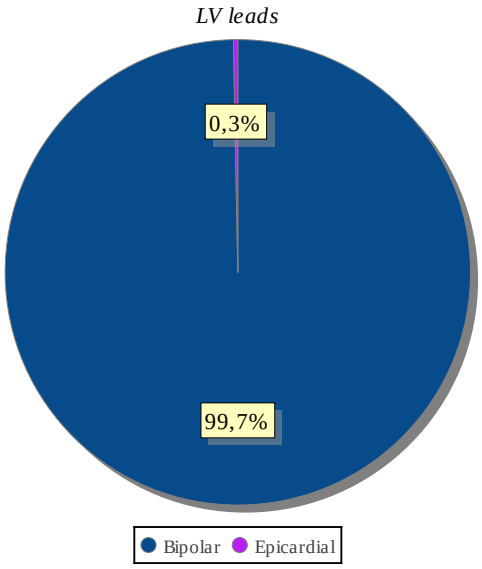


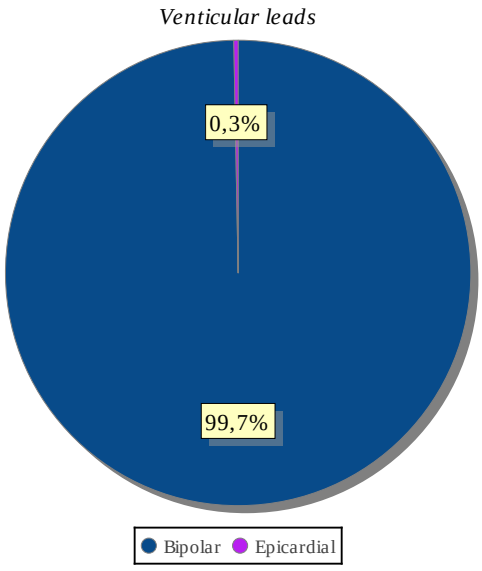


Lead type distribution for atrial and venticular use for first implants and replacements including all pace leads, pace and ICD systems

	Atrial		Venticular		LV-lead	
	no	%	no	%	no	%
Bipolar	6681	99.7	7105	99.6	499	46.2
Epicardial	18	0.3	24	0.3	34	3.2
Unipolar	0	0.0	1	0.0	1	0.1
Quadripolar	0	0.0	0	0.0	545	50.5
	0	0.0	0	0.0	0	0.0
Active fixation	6582	98.2	5677	79.6	102	9.4
Passive fixation	118	1.8	1455	20.4	978	90.6
					Total number of leads: 14912	

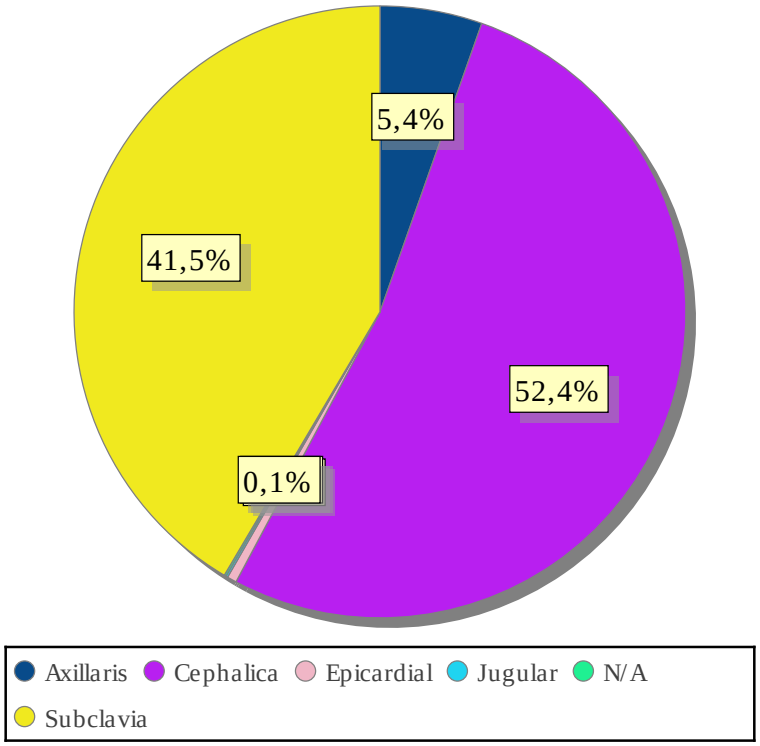






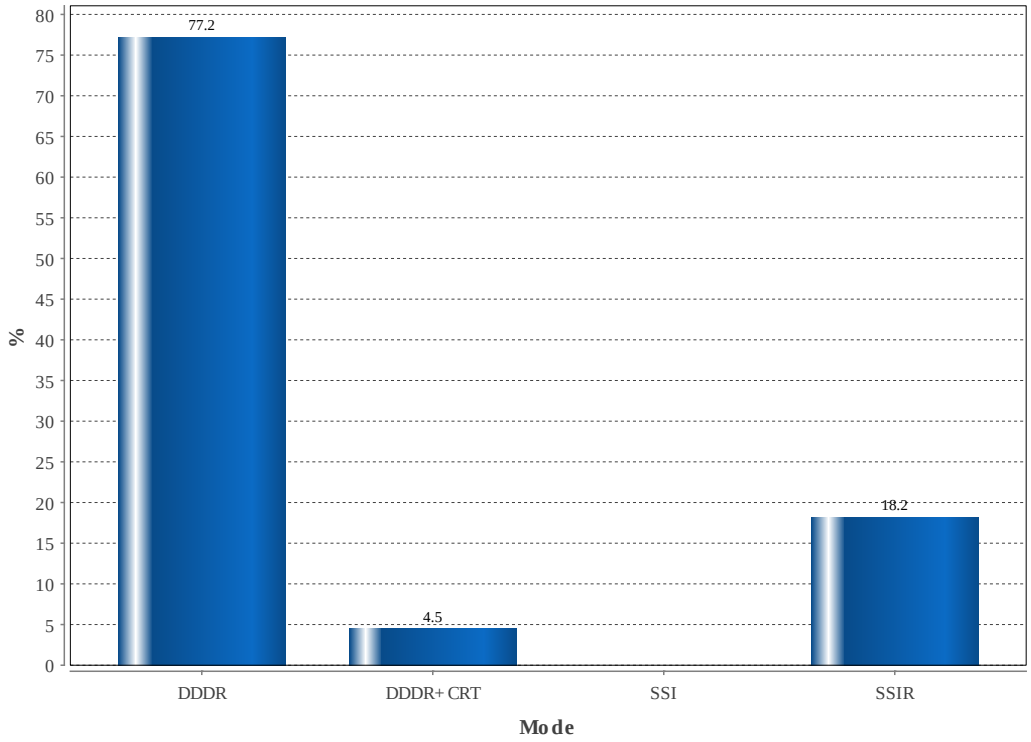
Venous access for first implants and replacements, all types of pace leads.

Lead access	No	%
Axillaris	805	5.4
Cephalica	7820	52.4
Epicardial	76	0.5
Jugular	11	0.1
N/A	8	0.1
Subclavia	6192	41.5



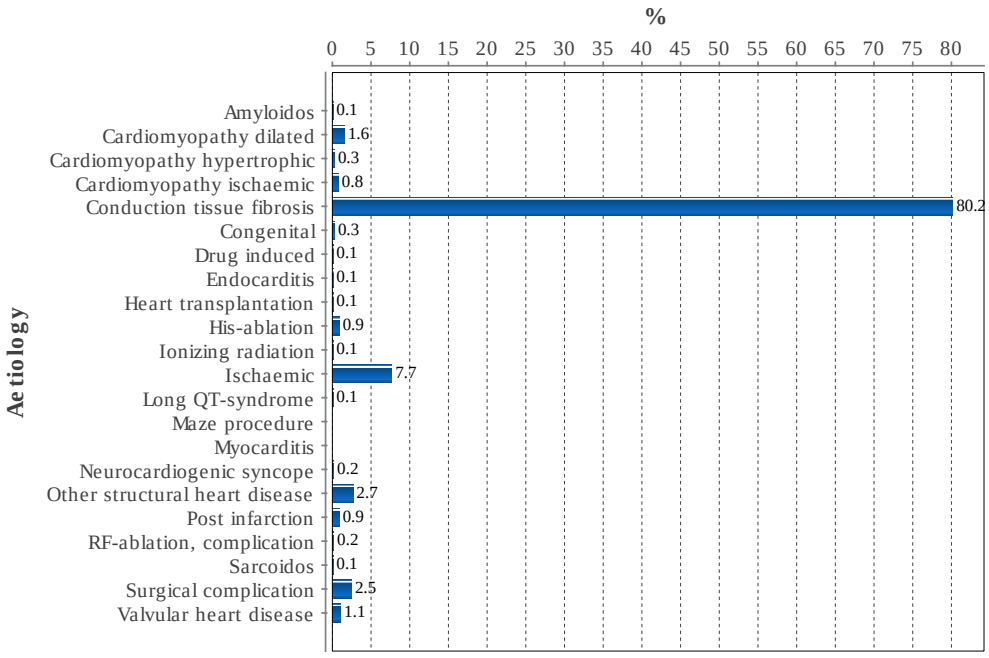
Implants by subtype

Mode	%	No
DDDR	77.2	5232
DDDR+CRT	4.5	308
SSI	0.0	2
SSIR	18.2	1235
Total number of first implants 6777		



Main aetiology for implanting pacemakers

Aetiology	Total %	Male %	Female %
Amyloidos	0.1	0.1	0.0
Cardiomyopathy dilated	1.6	2.0	1.1
Cardiomyopathy hypertrophic	0.3	0.2	0.3
Cardiomyopathy ischaemic	0.8	1.0	0.6
Conduction tissue fibrosis	80.2	77.8	83.6
Congenital	0.3	0.4	0.3
Drug induced	0.1	0.1	0.2
Endocarditis	0.1	0.1	0.0
Heart transplantation	0.1	0.1	0.1
His-ablation	0.9	0.7	1.2
Ionizing radiation	0.1	0.0	0.1
Ischaemic	7.7	9.7	4.9
Long QT-syndrome	0.1	0.1	0.1
Maze procedure	0.0	0.1	0.0
Myocarditis	0.0	0.0	0.1
Neurocardiogenic syncope	0.2	0.2	0.1
Other structural heart disease	2.7	2.6	2.8
Post infarction	0.9	1.0	0.8
RF-ablation, complication	0.2	0.2	0.3
Sarcoidos	0.1	0.1	0.0
Surgical complication	2.5	2.5	2.4
Valvular heart disease	1.1	1.0	1.1



VVI to VVIR

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	50	37	39	38	24	13	33	8	5
(Elective/ERI)	10	0	1	3	22	2	2	1	1
(Hemodynamic)	0	0	0	0	0	0	0	0	0

VVI/VVIR to DDD/DDDR

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	39	45	59	70	39	53	108	85	43
(elective/ERI)	7	2	5	1	18	14	13	4	4
(Hemodynamic)	10	13	15	26	11	3	10	2	2

AAI/AAIR to DDD/DDDR

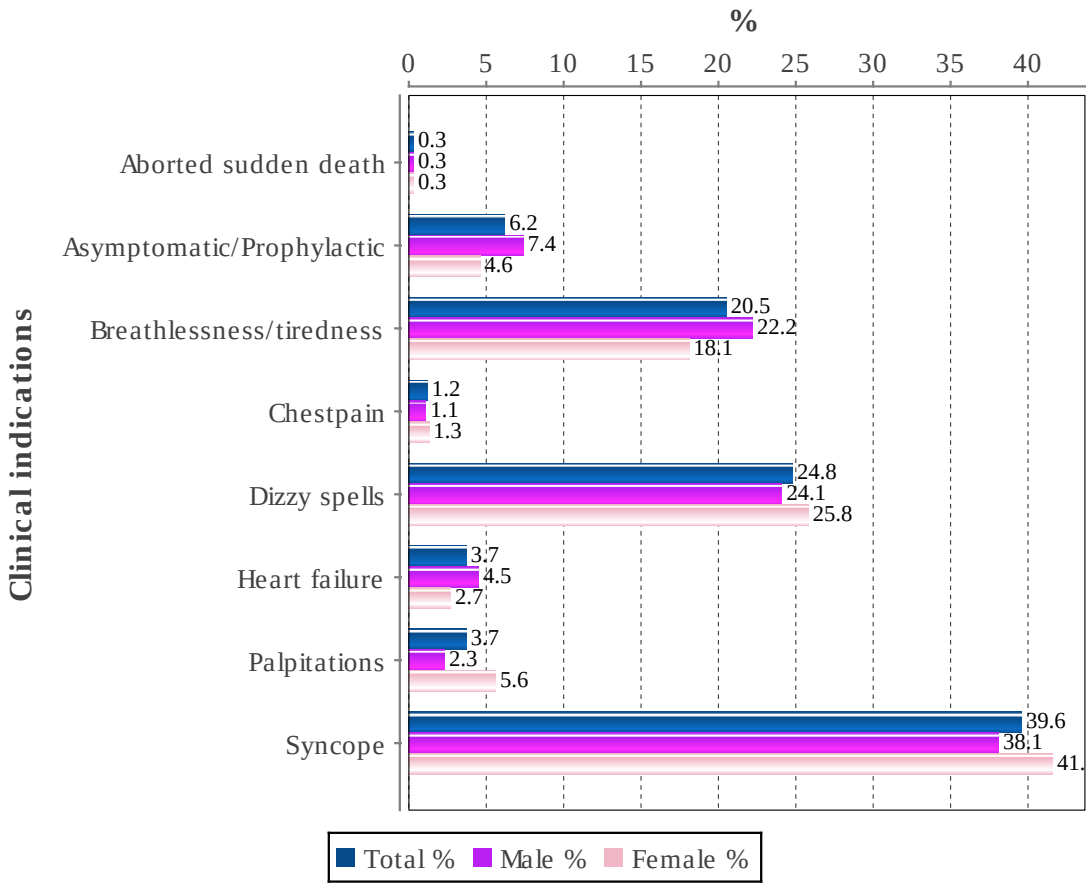
	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	58	50	54	44	26	39	68	54	20
(elective/ERI)	9	2	5	3	15	13	8	2	2
(Hemodynamic)	15	17	20	6	5	2	6	1	1

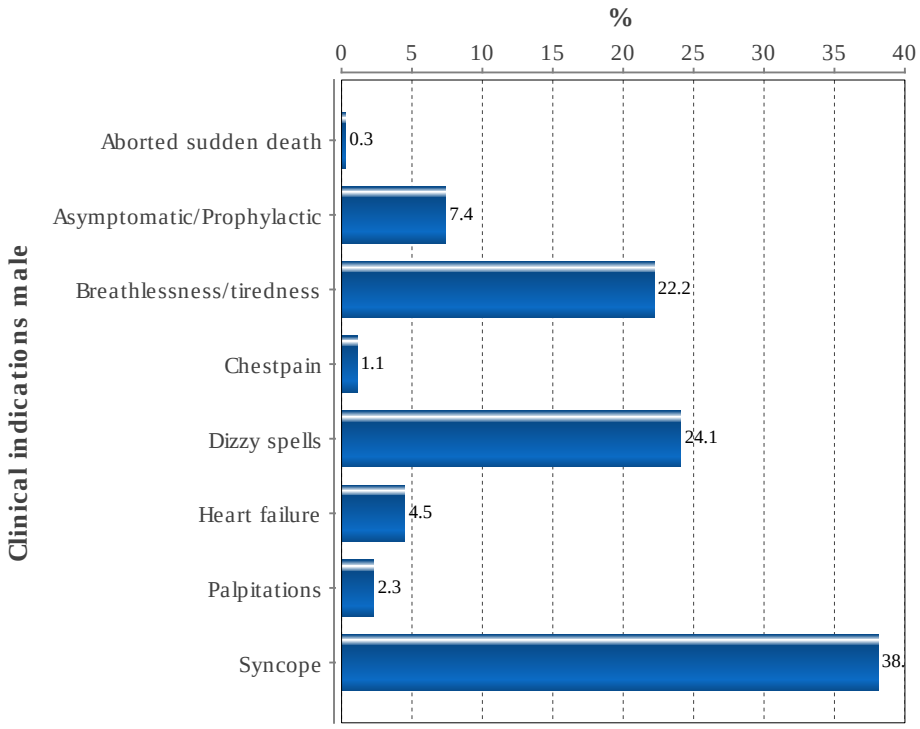
VVI/VVIR/DDD/DDDR to CRT

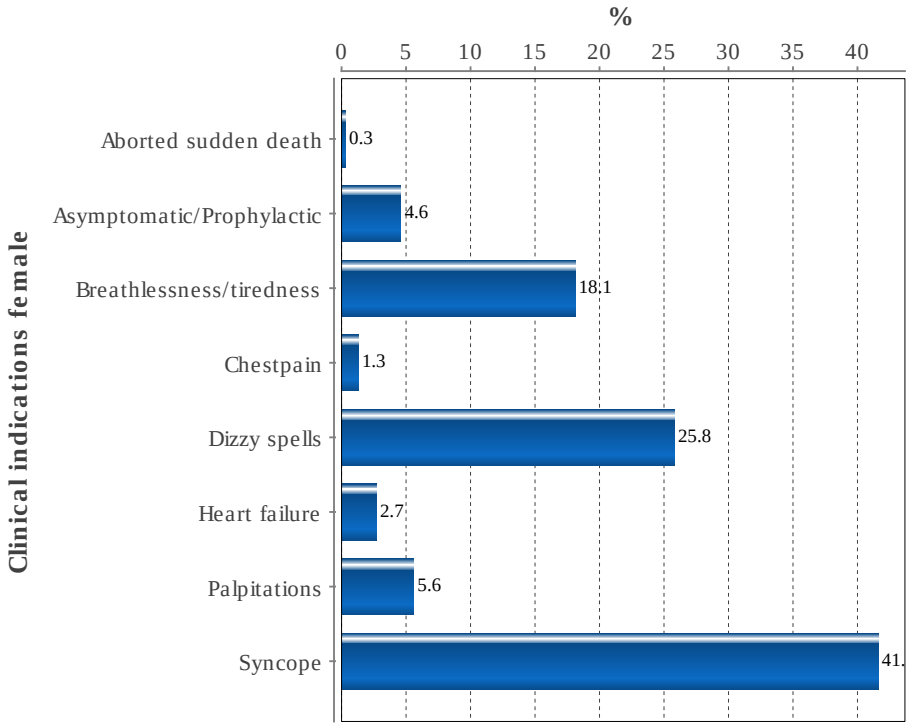
	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	93	99	93	102	79	127	300	185	142
(elective/ERI)	14	8	3	2	11	21	22	6	5
(Hemodynamic)	61	65	74	84	62	16	22	3	4

Main symptom for implanting pacemakers

Indication	Total %	Male %	Female %
Aborted sudden death	0.3	0.3	0.3
Asymptomatic/Prophylactic	6.2	7.4	4.6
Breathlessness/tiredness	20.5	22.2	18.1
Chestpain	1.2	1.1	1.3
Dizzy spells	24.8	24.1	25.8
Heart failure	3.7	4.5	2.7
Palpitations	3.7	2.3	5.6
Syncope	39.6	38.1	41.6

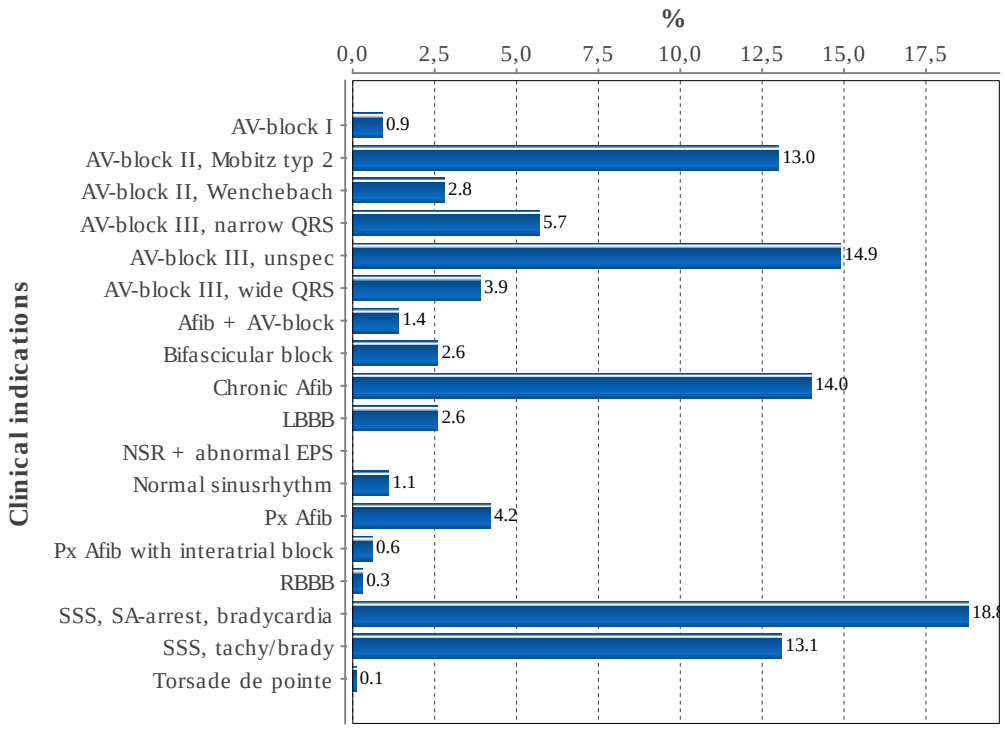



%
0
5
10
15
20
25
30
35
40
Clinical indications male
Aborted sudden death
Asymptomatic/Prophylactic
Breathlessness/tiredness
Chestpain
Dizzy spells
Heart failure
Palpitations
Syncope
0.3
7.4
22.2
1.1
24.1
4.5
2.3
38.


%
0
5
10
15
20
25
30
35
40
Clinical indications female
Aborted sudden death
Asymptomatic/Prophylactic
Breathlessness/tiredness
Chestpain
Dizzy spells
Heart failure
Palpitations
Syncope
0.3
4.6
18.1
1.3
25.8
2.7
5.6
41.

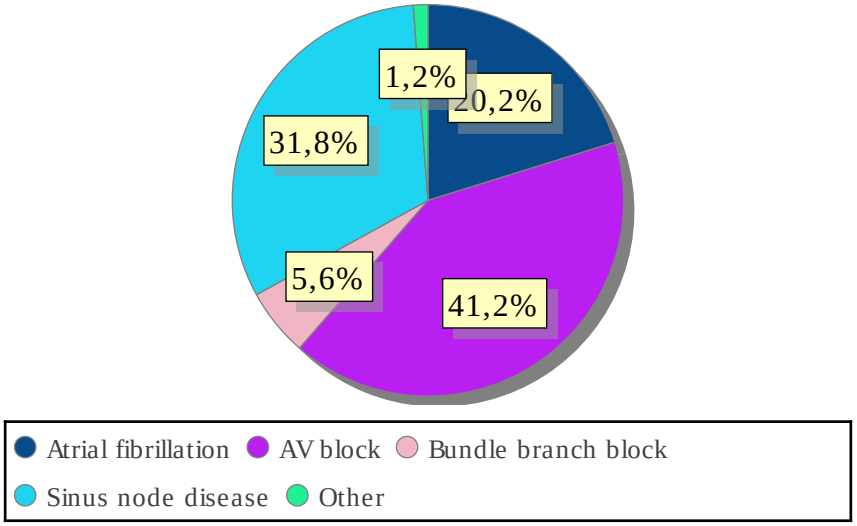
Main ECG indication, total

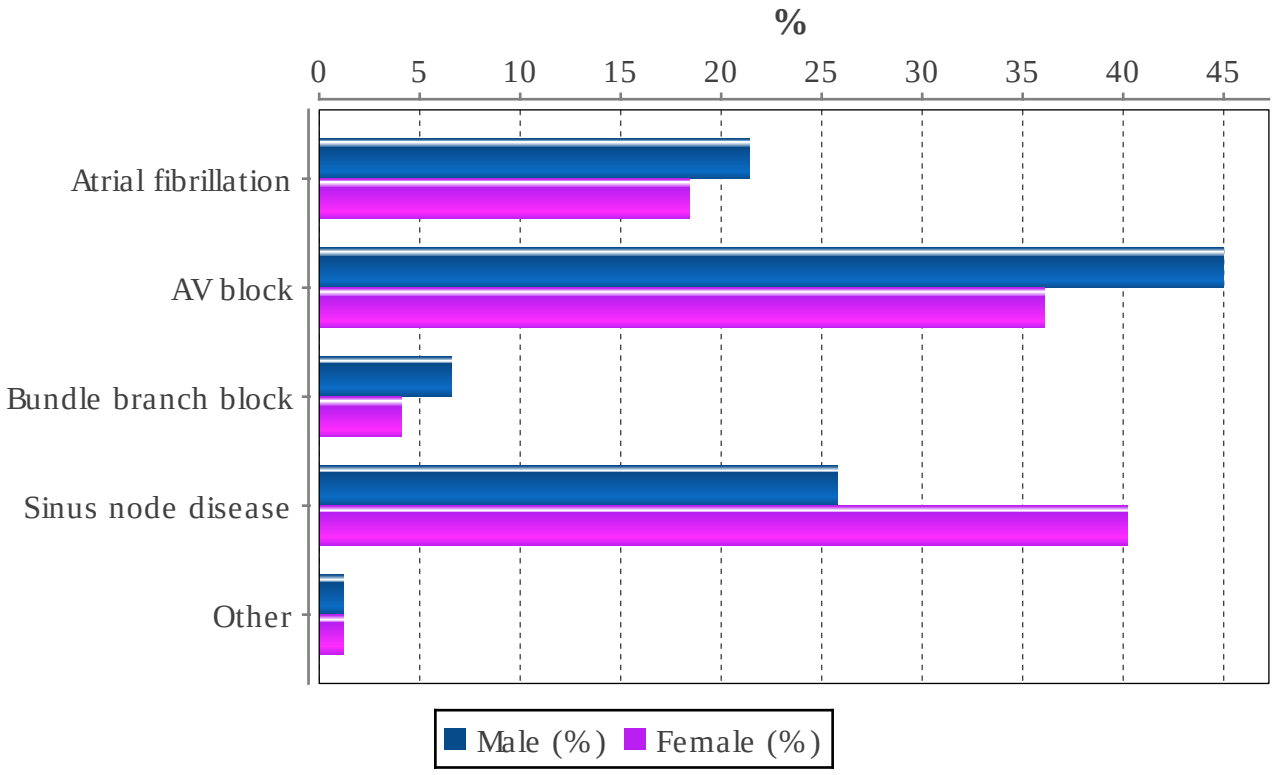
Indication	%
AV-block I	0.9
AV-block II, Mobitz typ 2	13.0
AV-block II, Wenchebach	2.8
AV-block III, narrow QRS	5.7
AV-block III, unspec	14.9
AV-block III, wide QRS	3.9
Afib + AV-block	1.4
Bifascicular block	2.6
Chronic Afib	14.0
LBBB	2.6
NSR + abnormal EPS	0.0
Normal sinusrhythm	1.1
Px Afib	4.2
Px Afib with interatrial block	0.6
RBBB	0.3
SSS, SA-arrest, bradycardia	18.8
SSS, tachy/brady	13.1
Torsade de pointe	0.1



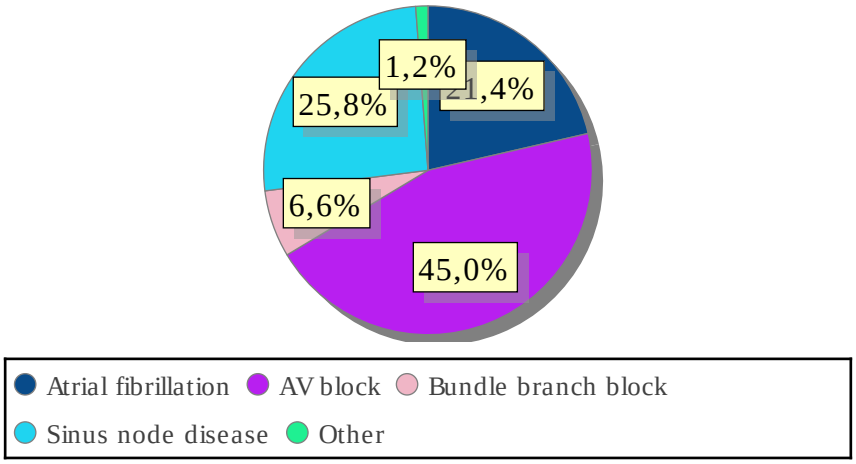
Main ECG indication by gender and for patients < 18 years of age

Indication	No	%	Male (%)	Female (%)	Younger than 18 (%)
Atrial fibrillation	1366	20.2	21.4	18.4	0.0
AV block	2794	41.2	45.0	36.1	66.7
Bundle branch block	377	5.6	6.6	4.1	0.0
Sinus node disease	2158	31.8	25.8	40.2	26.7
Other	82	1.2	1.2	1.2	6.7
					Total number of implants 6777

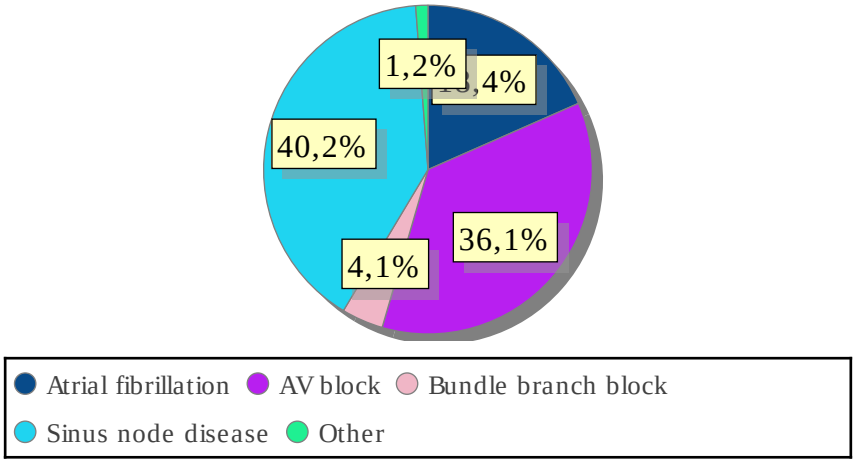




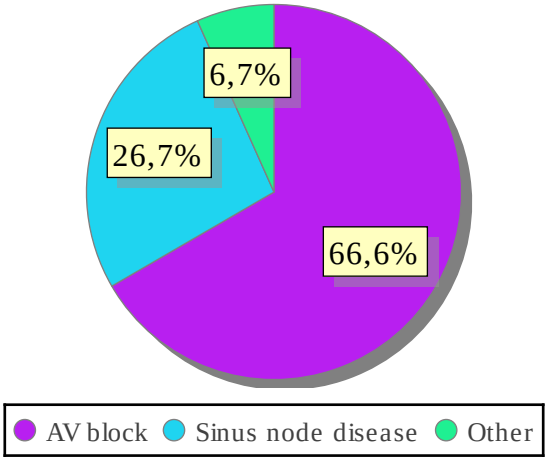
Male



Female



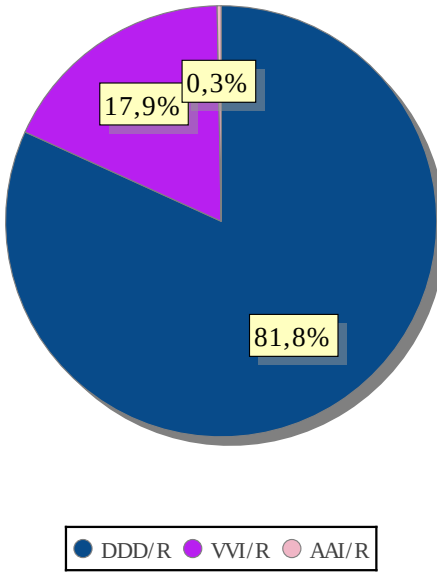
< 18



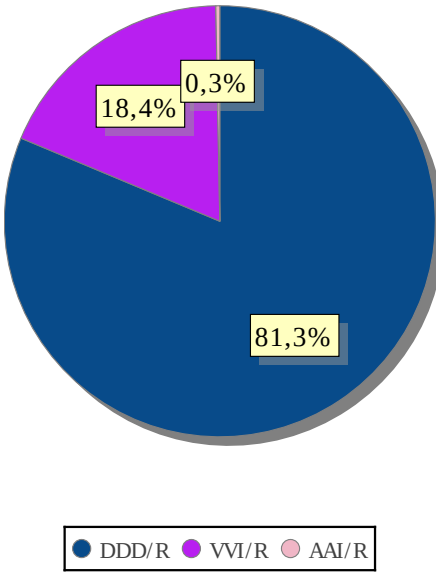
Use of pacemaker subtype for all indications per hospital size (number of new implants/year and hospital)

Size	Hospitals	DDD/R %	VVI/R %	AAI/R %
Large	15	82.7	17.0	0.3
Medium	19	81.3	18.4	0.3
Small	9	73.1	26.6	0.3
Total	43	81.8	17.9	0.3

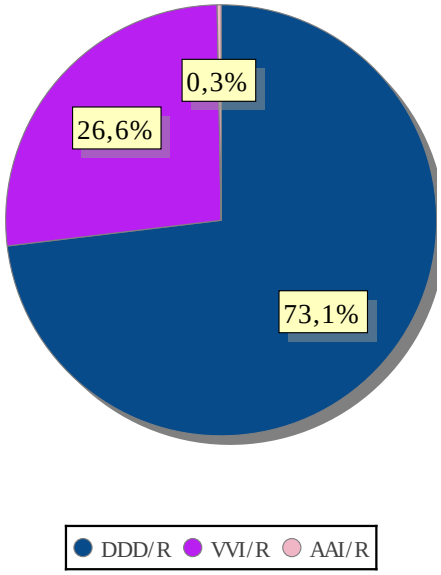
All hospitals



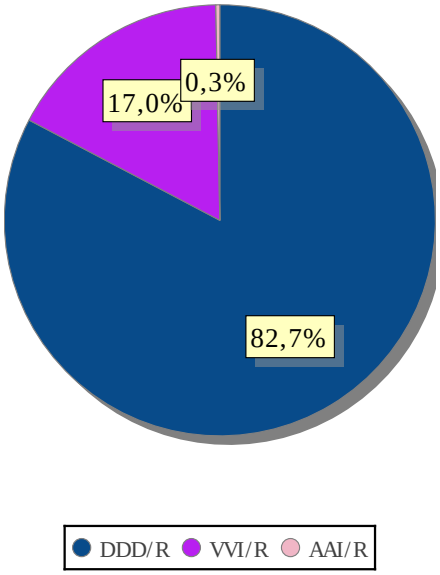
Medium hospitals



Small hospitals



Large hospitals



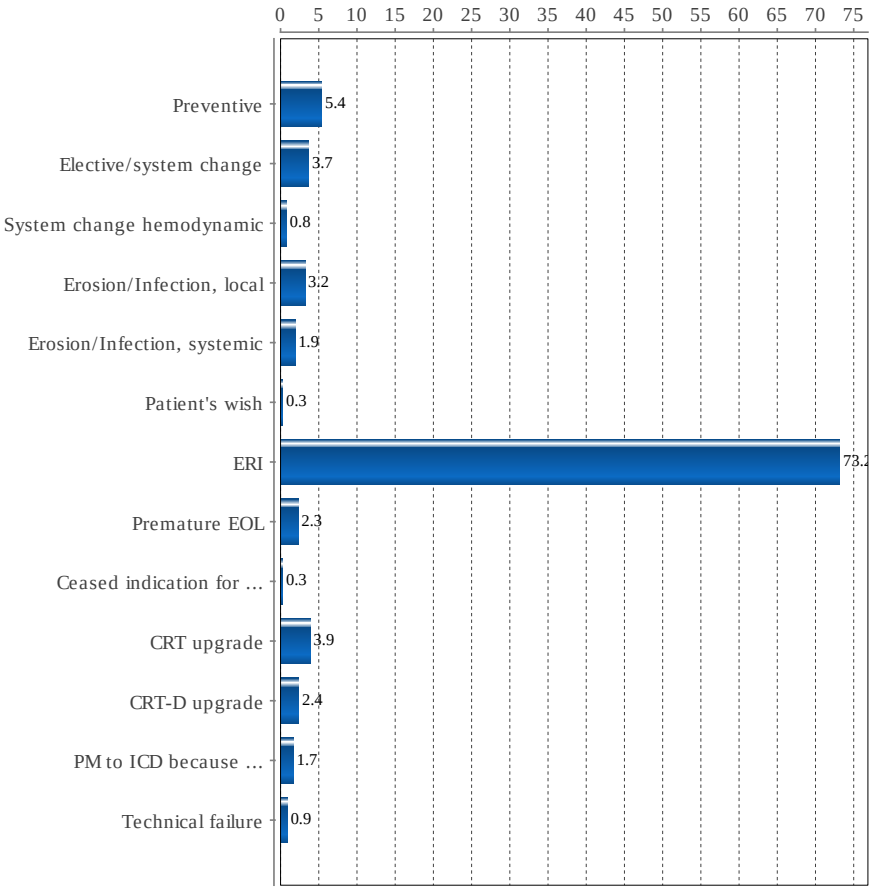
STATISTICS – PACEMAKER – USE OF PACING
MODES FIRST IMPLANT PER HOSPITAL

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

Hospital	DDD/R	VVI/R	AAI/R
Akademiska sjukhuset	81.0	18.7	0.4
Alingsås lasarett	79.7	20.3	0.0
Arvika sjukhus	76.9	23.1	0.0
Blekingesjukhuset	86.6	13.4	0.0
Centrallasarettet Växjö	82.4	17.6	0.0
Centralsjukhuset Karlstad	80.0	19.3	0.7
Centralsjukhuset Kristianstad	0.0	100.0	0.0
Centralsjukhuset Västerås	80.1	19.9	0.0
Danderyds sjukhus	82.6	17.4	0.0
Drottning Silvias Bus	66.7	16.7	16.7
Falu lasarett	78.0	22.0	0.0
Hudiksvalls sjukhus	75.5	24.5	0.0
Karolinska Universitetssjukhuset	89.5	10.2	0.2
Kungälvs sjukhus	80.6	18.1	1.4
Linköpings Universitetssjukhus	91.6	8.4	0.0
Länssjukhuset Gävle	82.1	17.4	0.5
Länssjukhuset Halmstad	84.7	15.3	0.0
Länssjukhuset Kalmar	63.9	33.3	2.8
Länssjukhuset Ryhov	77.7	22.3	0.0
Mälarsjukhuset	81.5	18.5	0.0
Norrlands Universitetssjukhus	73.8	25.6	0.6
Oskarshamns sjukhus	63.0	37.0	0.0
Sahlgrenska Universitetssjukhuset	85.8	13.8	0.3
Sahlgrenska Universitetssjukhuset /Östra	82.5	16.3	1.3
Skaraborgs sjukhus Skövde	88.7	11.3	0.0
Skellefteå lasarett	71.7	28.3	0.0
Skånes universitetssjukhus, Lund	83.2	15.7	1.1
Skånes universitetssjukhus, Malmö	81.6	18.4	0.0
Sollefteå sjukhus	60.0	40.0	0.0
St Görans sjukhus	86.1	13.9	0.0
Sunderby sjukhus	73.0	27.0	0.0
Sundsvalls sjukhus	73.7	26.3	0.0
Södersjukhuset	80.7	18.6	0.7
Södra Älvsborgs sjukhus	88.5	11.5	0.0
Torsby sjukhus	48.6	51.4	0.0
Trollhättan, NÄL	82.6	17.4	0.0
Universitetssjukhuset Örebro	77.5	22.5	0.0
Varbergs sjukhus	80.6	18.4	1.0
Visby lasarett	83.7	16.3	0.0
Vrinnevisjukhuset	85.7	14.3	0.0
Västerviks sjukhus	72.7	27.3	0.0
Örnsköldsviks sjukhus	93.2	6.8	0.0
Östersunds sjukhus	73.3	26.7	0.0

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

Reason	All hospitals %	(large) %	(medium) %	(small) %
Preventive	5.4	5.0	6.6	2.0
Elective/system change	3.7	2.6	5.6	4.9
System change hemodynamic	0.8	1.0	0.4	0.0
Erosion/Infection, local	3.2	4.4	1.2	2.9
Erosion/Infection, systemic	1.9	2.6	0.7	1.0
Patient's wish	0.3	0.3	0.2	0.0
ERI	73.2	71.7	74.8	83.3
Premature EOL	2.3	3.3	0.4	2.9
Ceased indication for PM therapy	0.3	0.5	0.0	0.0
CRT upgrade	3.9	3.7	4.7	0.0
CRT-D upgrade	2.4	2.8	1.8	1.0
PM to ICD because of arrhythmia	1.7	1.9	1.6	1.0
Technical failure	0.9	0.3	2.0	1.0

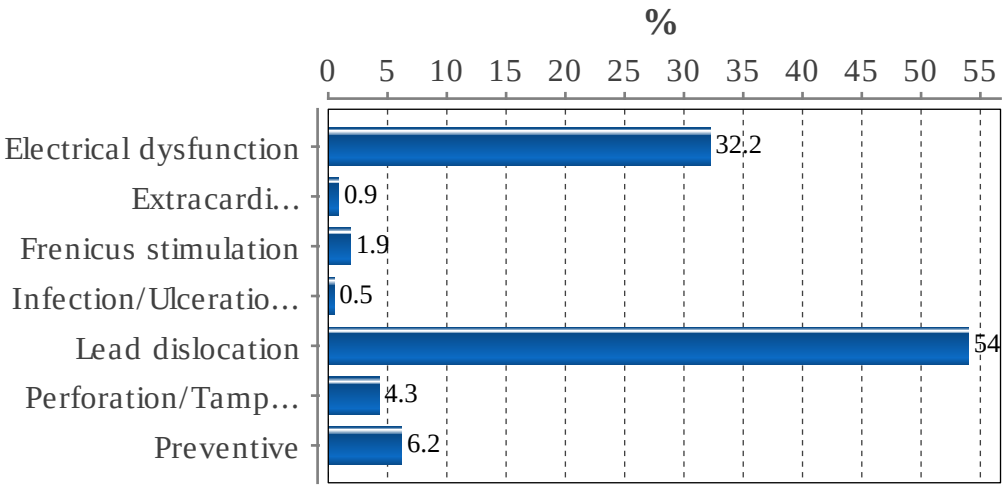


Historical explant indications

Reason	2010 %	2011 %	2012 %	2013 %	2014 %
Preventive	4.5	3.7	6.2	6.8	5.4
Erosion/Infection, local	4.7	4.9	5.1	3.4	3.3
Heart transplant	0.0	0.0	0.1	0.0	0.0
ERI	79.3	77.7	75.7	74.8	73.1
Premature EOL	3.3	4.3	2.8	2.8	2.3
Patient's wish	0.1	0.1	0.1	0.3	0.3
Recall/Alert	0.0	0.0	0.1	0.0	0.0
System change arrhythmia	3.7	3.3	0.0	0.0	0.0
System change hemodynamic	3.4	4.5	2.4	0.9	0.8
Technical failure	0.5	0.6	0.3	0.4	0.9
Ceased indication for PM therapy	0.5	0.4	0.4	0.8	0.3
CRT upgrade	0.0	0.2	4.1	3.3	3.8
PM to ICD because of arrhythmia	0.0	0.2	2.5	1.1	1.7
Elective/system change	0.0	0.0	0.0	2.6	3.8
Erosion/Infection, systemic	0.0	0.0	0.0	1.5	1.9
CRT-D upgrade	0.0	0.0	0.0	1.4	2.4

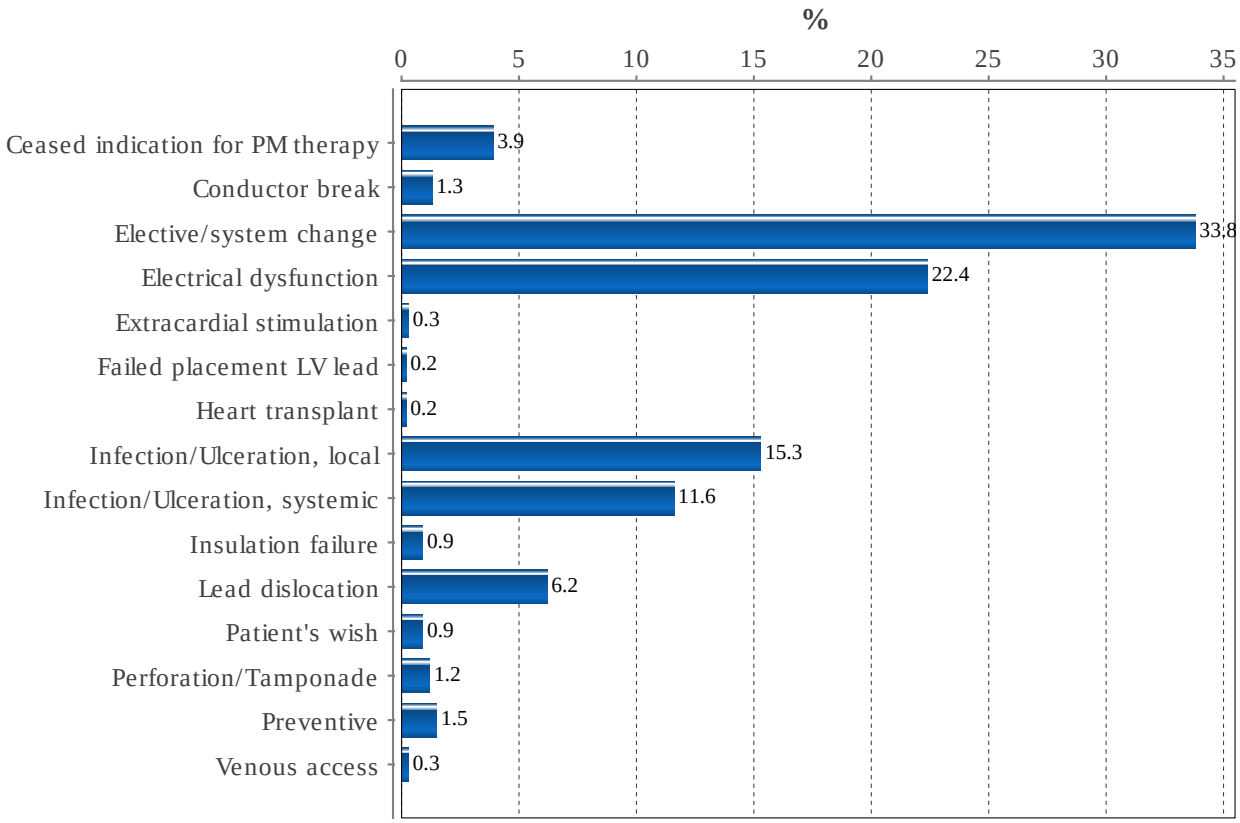
Reason for lead correction/reoperation by hospital size (number of new implants/ year and hospital) Electrical dysfunction including undersense and threshold increase.

Reason	All hospital (%)	Small (%)	Medium (%)	Large (%)
Electrical dysfunction	32.2	10.0	24.1	39.8
Extracardial stimulation	0.9	0.0	0.0	1.7
Frenicus stimulation	1.9	0.0	1.2	2.5
Infection/Ulceration, local	0.5	0.0	0.0	0.8
Lead dislocation	54.0	70.0	59.0	49.2
Perforation/Tamponade	4.3	0.0	6.0	3.4
Preventive	6.2	20.0	9.6	2.5
				Total no 211



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

Reason	All hospitals(%)	Small (%)	Medium (%)	Large (%)
Ceased indication for PM therapy	3.9	-	1.9	4.9
Conductor break	1.3	5.7	1.6	1.0
Elective/system change	33.8	40.0	41.7	30.0
Electrical dysfunction	22.4	37.1	31.2	18.0
Extracardial stimulation	0.3	-	0.3	0.3
Failed placement LV lead	0.2	2.9	-	0.1
Heart transplant	0.2	-	0.6	-
Infection/Ulceration, local	15.3	5.7	3.8	20.7
Infection/Ulceration, systemic	11.6	5.7	3.8	15.2
Insulation failure	0.9	2.9	0.6	1.0
Lead dislocation	6.2	-	12.4	3.8
Patient's wish	0.9	-	1.0	1.0
Perforation/Tamponade	1.2	-	0.3	1.6
Preventive	1.5	-	0.6	1.9
Venous access	0.3	-	-	0.4
				Total no 1078



Procedures per operator

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	81
	Dimberg	34
	Hellgren	9
	Janiec	9
	Jidéus	20
	Landelius	6
	Lindblom	3
	Melki	11
	Mörtsell	61
	Myrdahl	2
	N/A	2
	Nilsson L	10
	Ramström	1
	Schiller	6
	Sciaraffia	29
	Teder	78
	Zemgulis	8
Alingsås lasarett	Kennergren	50
	Sivik	45
	Westerberg	11
Arvika sjukhus	Brunmark	7
	Westbom	24
Ålands centralsjukhus	Ove Carlström	1
	Slotte	17
Blekingesjukhuset	Borg	79
	Ericsson	82
	Ghaidan, Haider	34
	Kristjansson	1
	Ringborn, Michael	48
	Rorsman-Söderström	4
Centrallasarettet Växjö	Annan	1
	Björkman	4
	Jacobsson K	1
	Johansson P	42
	Jonasson	27
	Rosén Helena	27
	Strandberg	43
	Weber	4
Centralsjukhuset Karlstad	Annan	13
	Gerdes	2
	Hallén	4
	Khalili	26
	Niklas Aldergård	49
	Saidi	83
	Sigvant	1
	Venizelos Georgius	3
Centralsjukhuset Kristianstad	Gadler	1
Centralsjukhuset Västerås	Dilan	76
	SkoglundAndersson	53
	Täckström	17
	Wiberg	65
Danderyds sjukhus	2	102
	3	91
	4	130
	6	134
Drottning Silvias Bus	Hallhagen	5
	Nilsson B	1
	Oskar Väärt	4
	Synnergren	2
Falu lasarett	Ågren	22
	Berglund	94
	Forsgren	138
	Guggi	60
Hudiksvalls sjukhus	Roussinne	59
	Thomas Andrews	7
Karolinska Universitetssjukhus	Annan	1
	Gadler	150
	Hörnsten	159
	Reistam	26
	Reistam, Ulrika	94
	Reistam/Gadler	4
	Reistam/ Westholm	2
	Westholm	195
Kungälvs sjukhus	Fogelqvist	48
	Hellström	34
	Norström	15
	Skånberg	25
Länssjukhuset Gävle	Falck	33
	Johansson Staffan	42
	Kastberg	89
	Larsson Anders	3
	Magnusson Peter	67
	Mati Jalakas	55
Länssjukhuset Halmstad	Berggren	69
	Engdahl	56
Länssjukhuset Kalmar	Anja Fagerström	2
	Carlström	20
	David Olsson	28
	Michael Lindstaedt	40
Länssjukhuset Ryhov	Annan	1
	Asking	37

Hospital	Operator	No
	Christina Holmgren	2
	Jakobsson S	115
	Lagerberg	135
Linköpings universitetssjukhus	Jönsson A	7
	Säfström K	98
	Sonesson L	137
	Svenson A	5
	Szamlewski P	1
	Szymanowski A	94
Mälarsjukhuset	Andreas Pikwer	35
	Axel Nyberg	33
	Bozena Ostrowska	56
	Hanan Alwan	48
	Krister Blomberg	3
	Marcus Castegren	9
	Peter Spetz	33
	Ulla Lindblad	28
Norrlands Universitetssjukhus	Annan	1
	Höglund	33
	Höglund/Rönn	1
	Jensen	19
	Kesek	49
	Kesek/Rönn	1
	Landström	74
	Rönn	49
Oskarshamns sjukhus	Van Der Wal	28
Örnsköldsviks sjukhus	Ehlin	80
Östersunds sjukhus	Björklund	29
	Friberg	32
	Hansson	83
	Sandström	1
Sahlgrenska universitetssjukhuset	Annan	4
	Gäbel	10
	Jamaly	84
	Javid	30
	Kennergren	20
	Petersson M	1
	Piotr Szamlewski	143
	Schultz	101
	Westbom	83
Sahlgrenska universitetssjukhuset / Östra	Javid	66
	Johansson B	51
	Salim Barywani	14
	Schultz	3

Hospital	Operator	No
Skaraborgs sjukhus Skövde	Falmer	54
	Frick	2
	Lorentzen	140
	Loumann	1
	Paulsson	52
	Winterfeldt	55
Skånes universitetssjukhus, Lund	Annan	6
	Fredrik Slotte	69
	Ingrid Litterfeldt	8
	Johan Brandt	324
	Maiwand Farouq	135
	Pyotr Platonov	87
	Rasmus Borgquist	18
	Steen Jensen	15
	Wang Lingwei	215
Skånes universitetssjukhus, Malmö	Annan	39
	Borgquist	8
	Brandt	10
	Pehrsson	255
	WANG	39
Skellefteå lasarett	Boström	20
	Lindqvist	46
Sollefteå sjukhus	Åström	9
	Kramarz	31
	Rudenstam	2
Södersjukhuset	Jonsson J-E	90
	Kjellman B	116
	Lerner	76
	Olson J	94
	Rydlund K	13
Södra Älvsborgs sjukhus	Almqvist	26
	Friedemann	36
	Harlid	2
	Lodin	52
	Sandgren	53
	Widfeldt	49
St Görans sjukhus	1	129
	1+2	2
	2	108
	3	55
Sunderby sjukhus	Baas	29
	Haupt	99
	Johansson A	1
	Johansson P	67
	Lundblad	17

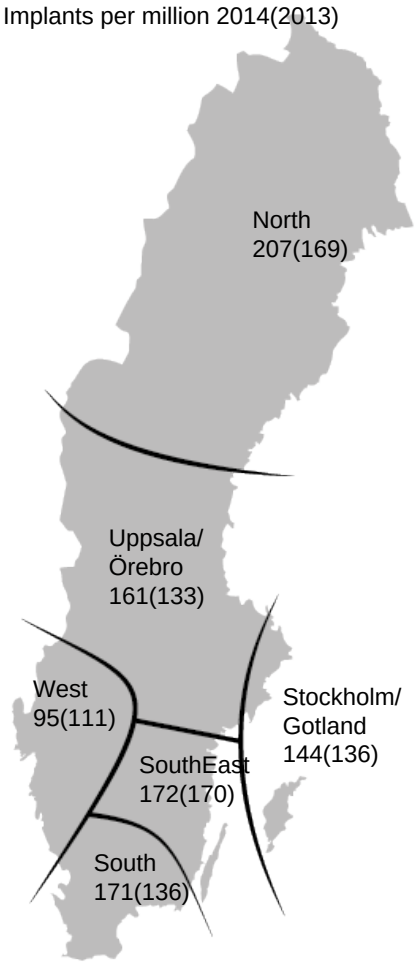
Hospital	Operator	No
	Wennberg	61
Sundsvalls sjukhus	Jonas Rudenholm	1
	Khadhim	99
	Sundelin	107
Torsby sjukhus	Bentjerodt	20
	Brunmark	3
	Venizelos	16
Trollhättan, NÄL	Csaba Herczku	29
	Dinu Dusceac	24
	Jabbar	12
	Lennander	52
	Petersen P	42
	Söderbergh	56
	Wetterling	82
	Wiberg Dennis	38
Universitetssjukhuset Örebro	Anna Björkenheim	6
	Jenny Eriksson	3
	Lindell	120
	Tommy Andersson	110
Varbergs sjukhus	El Bahrawy	3
	Emma Sandgren	8
	Myredal	18
	Rorsman	112
Västerviks sjukhus	Arvidsson	34
	Joachim Starck	9
	Ove Carlström	2
Visby lasarett	Jacobsson L	30
	Litorell	19
Vrinnevisjukhuset	Engström	16
	Lindberget	45
	Schiöler	25
	Svensson	49

First implants per hospital

Region	Hospital	2014	2013
Northern Sweden	Norrlands Universitetssjukhus	61	40
	Skellefteå lasarett	6	5
	Sunderby sjukhus	41	52
	Sundsvalls sjukhus	31	24
	Örnsköldsviks sjukhus	11	8
	Östersunds sjukhus	34	18
Southern Sweden	Blekingesjukhuset	35	22
	Centrallasarettet Växjö	33	31
	Skånes universitetssjukhus, Lund	200	161
South-East Sweden	Linköpings Universitetssjukhus	98	93
	Länssjukhuset Kalmar	52	44
	Länssjukhuset Ryhov	39	35
Stockholm/Gotland	Danderyds sjukhus	80	83
	Karolinska Universitetssjukhuset	157	141
	St Görans sjukhus	33	34
	Södersjukhuset	68	54
	Visby lasarett	3	8
Uppsala/Örebro	Akademiska sjukhuset	70	44
	Centralsjukhuset Karlstad	32	0
	Centralsjukhuset Västerås	37	34
	Falu lasarett	50	46
	Hudiksvalls sjukhus	4	6
	Länssjukhuset Gävle	50	39
	Mälarsjukhuset	27	36
	Universitetssjukhuset Örebro	44	46
Western Sweden	Drottning Silvias Bus	2	0
	Sahlgrenska Universitetssjukhuset	69	78
	Sahlgrenska Universitetssjukhuset /Östra	2	4
	Skaraborgs sjukhus Skövde	40	32
	Södra Älvsborgs sjukhus	15	37
	Trollhättan, NÄL	27	24
	Varbergs sjukhus	50	44

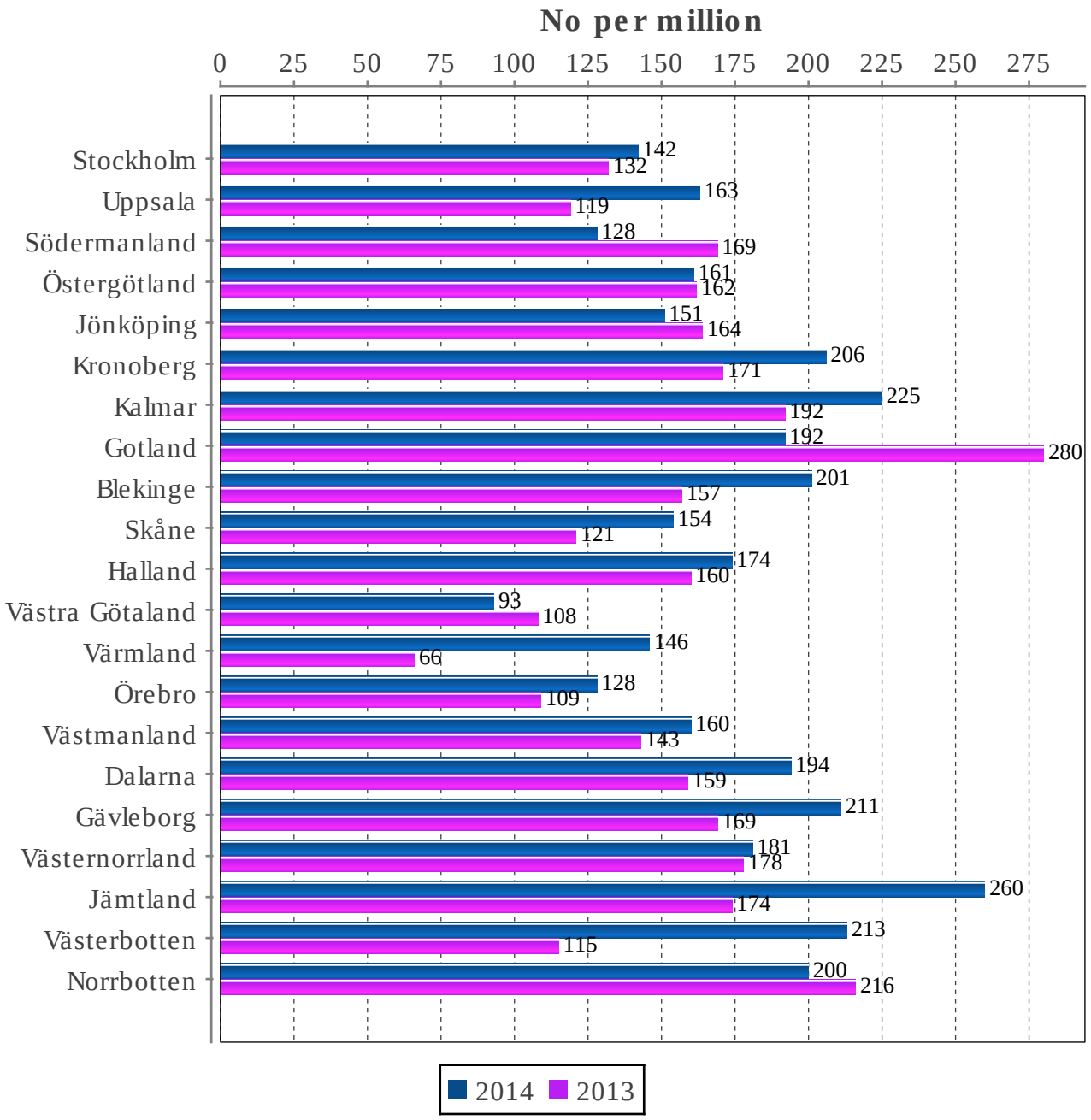
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2255299	324	144	2177
Uppsala/Örebro	2013046	325	161	1921
South-East Sweden	1021965	176	172	973
Southern Sweden	1761784	301	171	1782
Western Sweden	1813086	173	95	1278
Northern Sweden	882175	183	207	950
Total	9747355	1482	152	9081



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

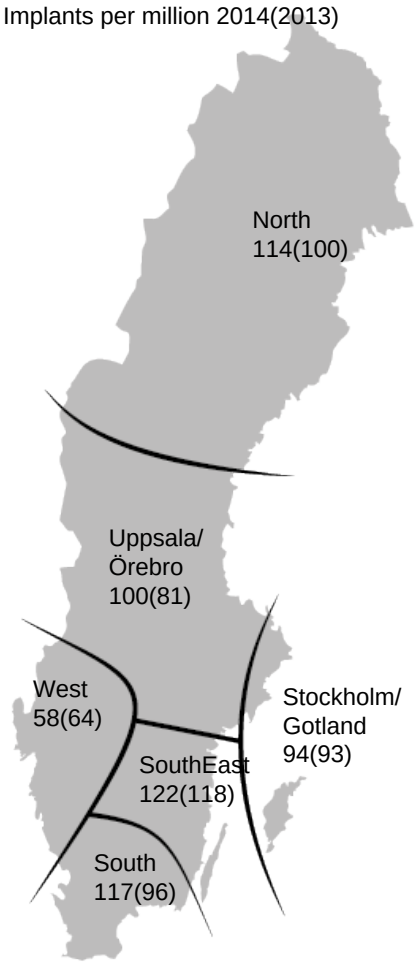
County	Population	No of first	2014	Active patients
Stockholm	2198044	313	142	2098
Uppsala	348942	57	163	366
Södermanland	280666	36	128	254
Östergötland	442105	71	161	388
Jönköping	344262	52	151	311
Kronoberg	189128	39	206	220
Kalmar	235598	53	225	274
Gotland	57255	11	192	79
Blekinge	154157	31	201	172
Skåne	1288908	198	154	1234
Halland	310665	54	174	313
Västra Götaland	1632012	152	93	1122
Värmland	274691	40	146	208
Örebro	288150	37	128	239
Västmanland	261703	42	160	231
Dalarna	278903	54	194	269
Gävleborg	279991	59	211	354
Västernorrland	243061	44	181	227
Jämtland	126765	33	260	131
Västerbotten	262362	56	213	276
Norrbotten	249987	50	200	316
Total	9747355	1482	152	9082


No per million
0
25
50
75
100
125
150
175
200
225
250
275
Stockholm 142 132
Uppsala 163 119
Södermanland 128 169
Östergötland 161 162
Jönköping 151 164
Kronoberg 206 171
Kalmar 225 192
Gotland 192 280
Blekinge 201 157
Skåne 154 121
Halland 174 160
Västra Götaland 93 108
Värmland 146 66
Örebro 128 109
Västmanland 160 143
Dalarna 194 159
Gävleborg 211 169
Västernorrland 181 178
Jämtland 260 174
Västerbotten 213 115
Norrbotten 200 216
2014
2013

STATISTICS – ICD – PRIMARY PREVENTION PER REGION

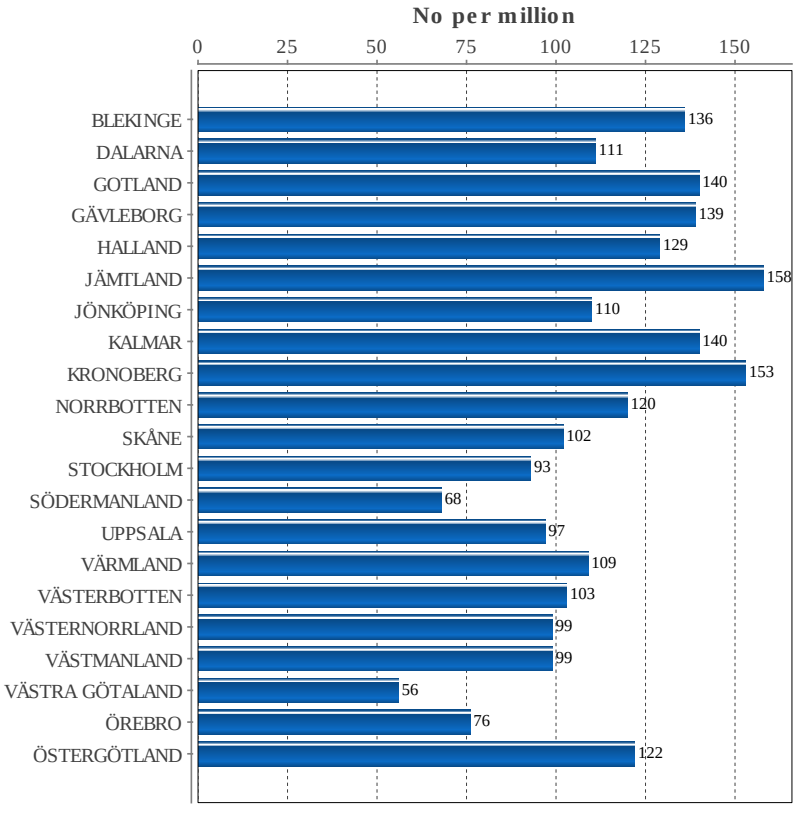
The regions are based on where the patients live, not where they are treated

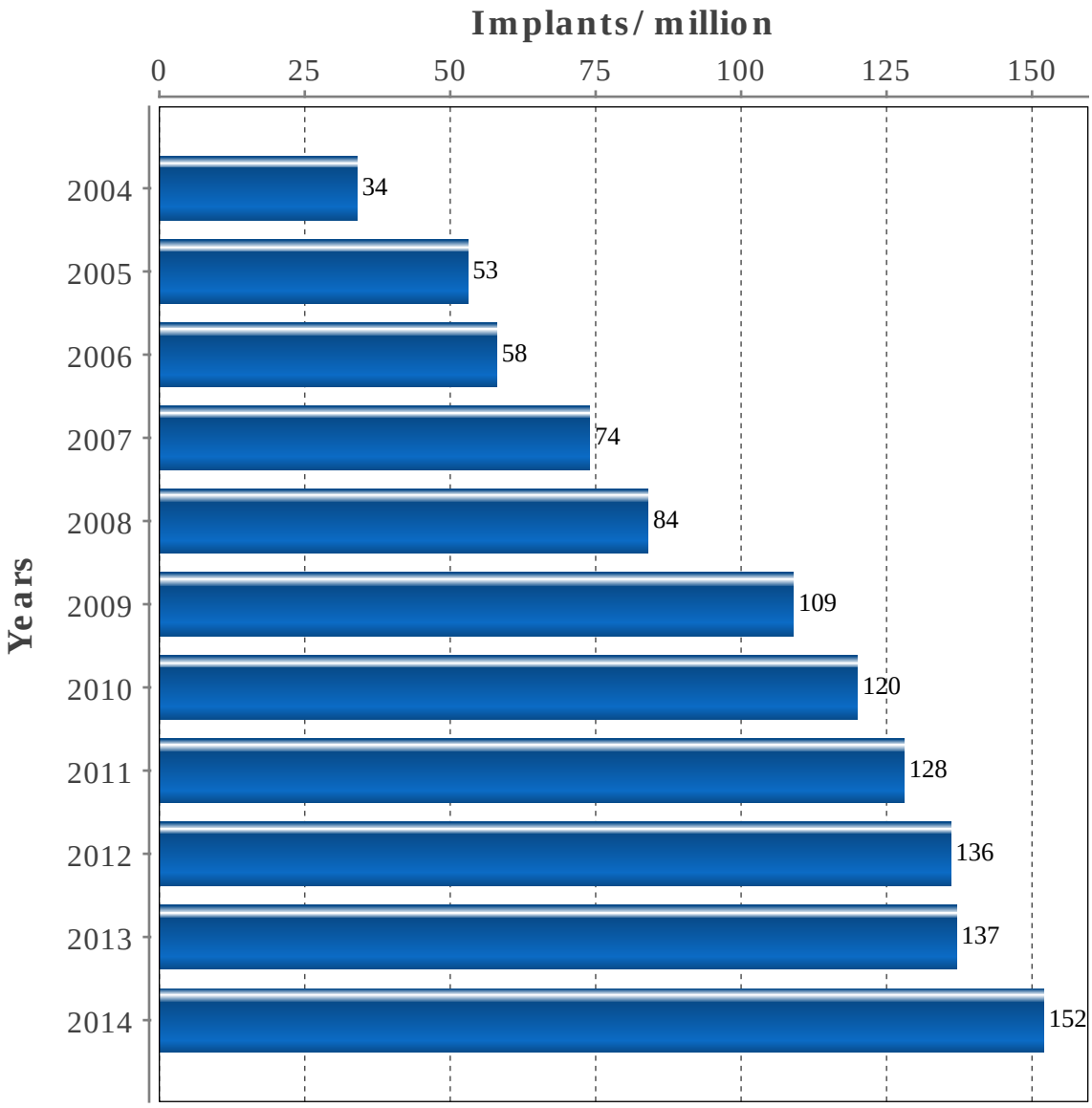
Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2255299	213	94	1311
Uppsala/Örebro	2013046	201	100	906
South-East Sweden	1021965	125	122	542
Southern Sweden	1761784	206	117	950
Western Sweden	1813086	106	58	542
Northern Sweden	882175	101	114	425
Total	9747355	952	98	4676



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

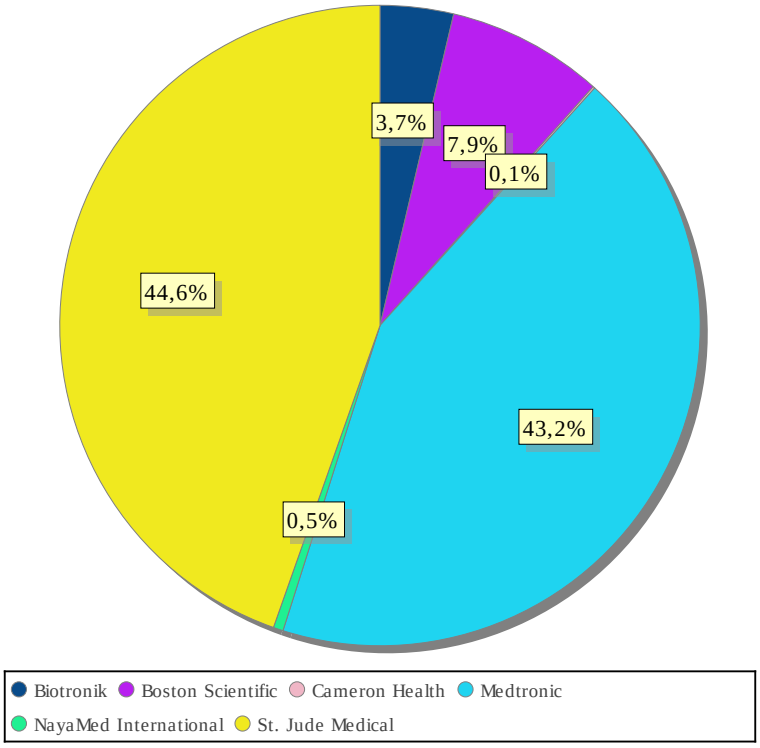
County	Population	No of first	No/million
BLEKINGE	154157	21	136
DALARNA	278903	31	111
GOTLAND	57255	8	140
GÄVLEBORG	279991	39	139
HALLAND	310665	40	129
JÄMTLAND	126765	20	158
JÖNKÖPING	344262	38	110
KALMAR	235598	33	140
KRONOBERG	189128	29	153
NORRBOTTEN	249987	30	120
SKÅNE	1288908	131	102
STOCKHOLM	2198044	205	93
SÖDERMANLAND	280666	19	68
UPPSALA	348942	34	97
VÄRMLAND	274691	30	109
VÄSTERBOTTEN	262362	27	103
VÄSTERNORRLAND	243061	24	99
VÄSTMANLAND	261703	26	99
VÄSTRA GÖTALAND	1632012	91	56
ÖREBRO	288150	22	76
ÖSTERGÖTLAND	442105	54	122
Total	9747355	952	98




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

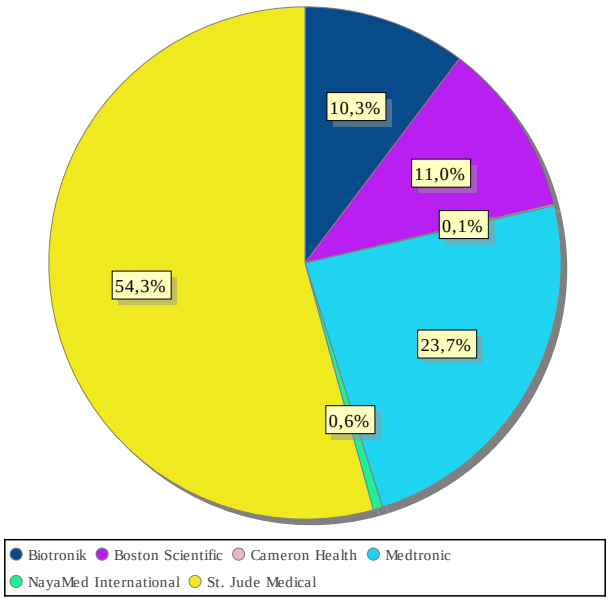
Market share per manufacturer in Sweden

Manufacturer	2011 %	2012 %	2013 %	2014 %
Biotronik	5.6	6.2	4.8	3.7
Boston Scientific	5.8	7.0	10.4	7.9
Medtronic	43.9	42.8	36.8	43.2
St. Jude Medical	44.6	43.7	47.8	44.6
Cameron Health	-	0.1	0.1	0.1
NayaMed International	-	-	-	0.5



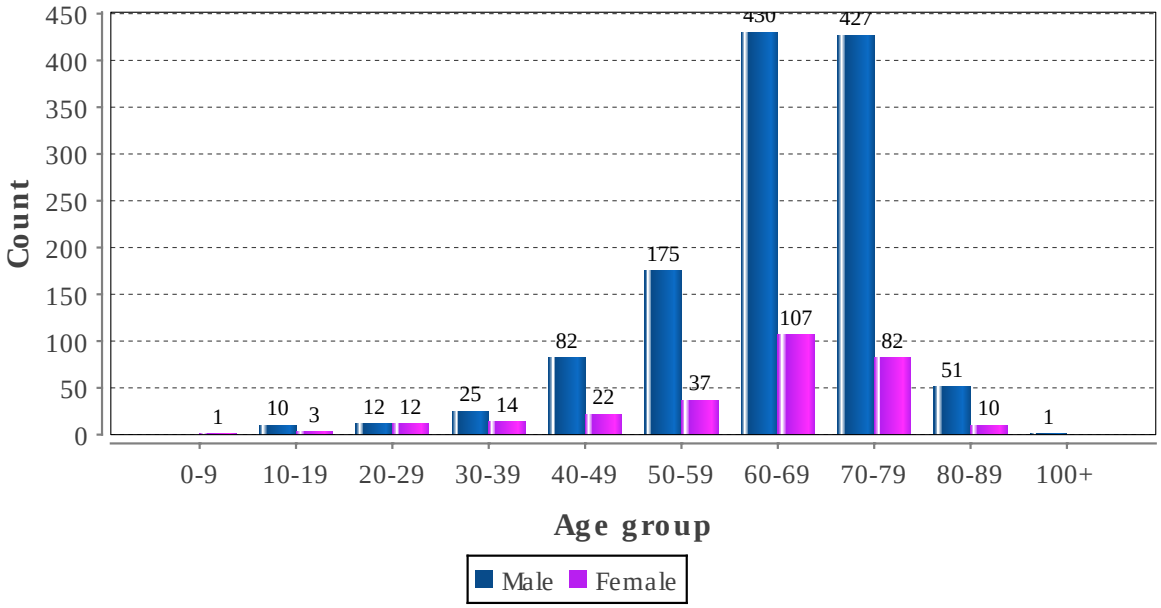
Market share per manufacturer in Sweden

Manufacturer	2011 %	2012 %	2013 %	2014 %
Biotronik	18.1	16.1	11.5	10.3
Boston Scientific	7.4	13.4	7.7	11.0
Medtronic	23.6	23.5	24.9	23.7
St. Jude Medical	50.9	46.8	55.7	54.3
Cameron Health	-	-	0.1	0.1
NayaMed International	-	-	-	0.6



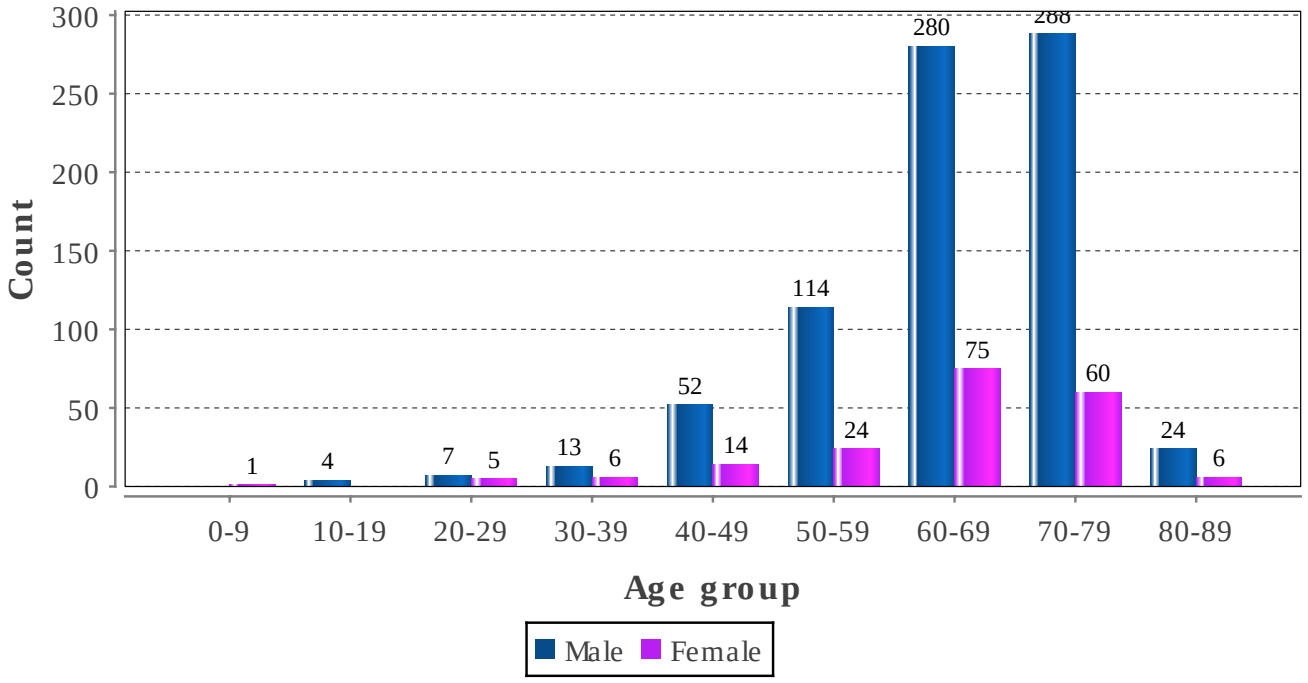
Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
0-9	1	0.1	0	1
10-19	13	0.9	10	3
20-29	24	1.6	12	12
30-39	39	2.6	25	14
40-49	104	6.9	82	22
50-59	212	14.1	175	37
60-69	537	35.8	430	107
70-79	509	33.9	427	82
80-89	61	4.1	51	10
100+	1	0.1	1	0
Average age	64	-	65	61
			Total number of implants: 1501	



Primary prevention divided by gender and age.

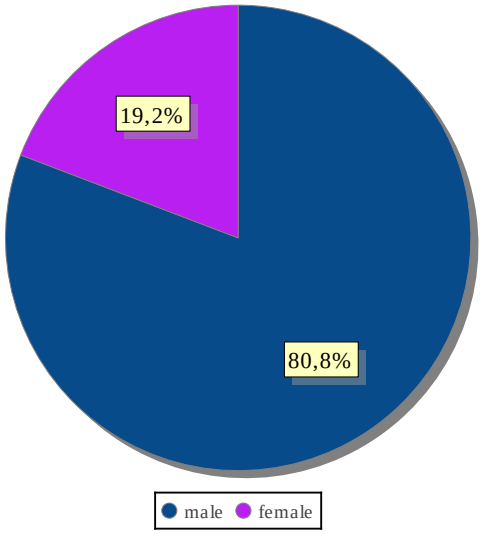
Age (years)	Total no	%	Male	Female
0-9	1	0.1	0	1
10-19	4	0.4	4	0
20-29	12	1.2	7	5
30-39	19	2.0	13	6
40-49	66	6.8	52	14
50-59	138	14.2	114	24
60-69	355	36.5	280	75
70-79	348	35.8	288	60
80-89	30	3.1	24	6
Average age	65	-	65	63
				Total number of implants: 973



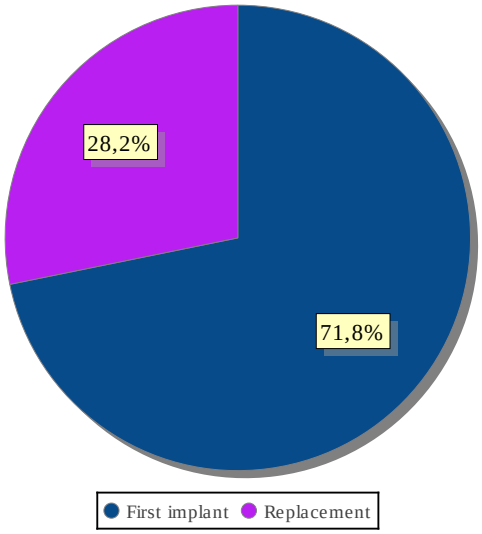
Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1501	71.8	1213	80.8	288	19.2
Replacement	590	28.2	469	79.5	121	20.5
Total	2091	100.0	1682	80.4	409	19.6

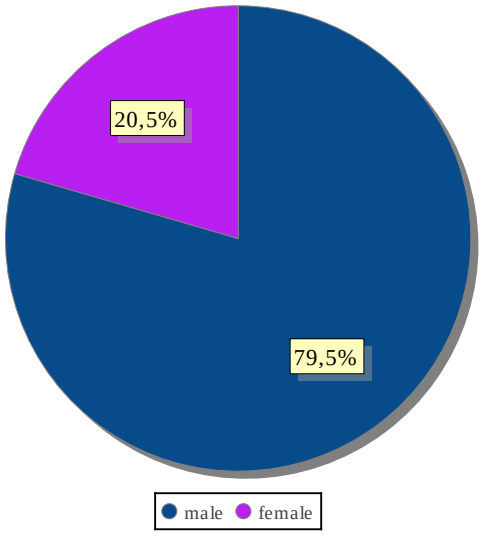
First implant



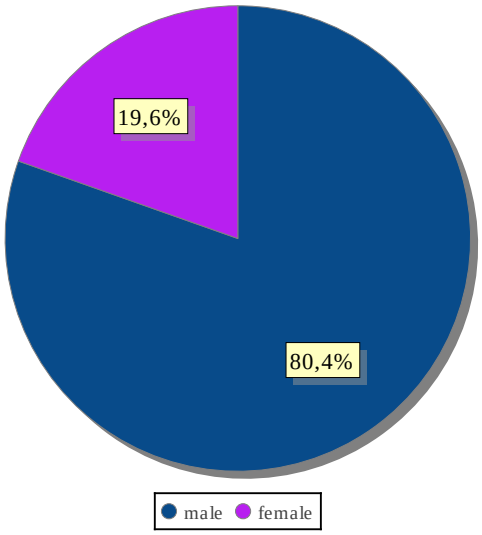
Replacement ratio



Replacement

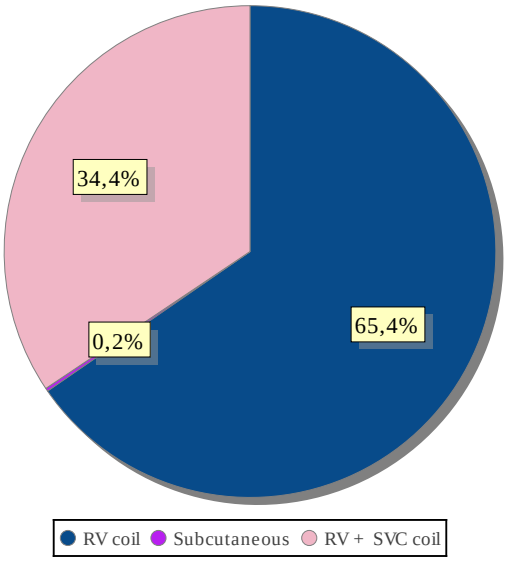


All implant



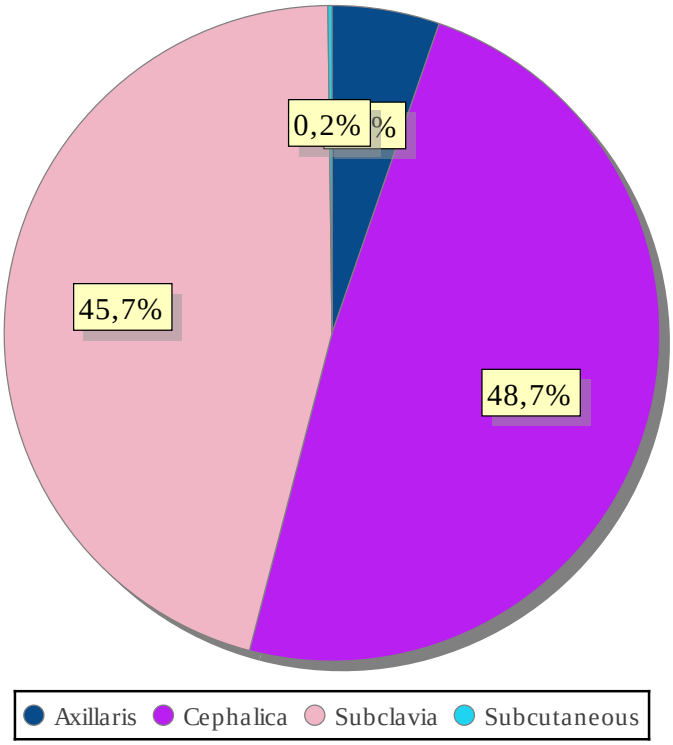
Lead type distribution for atrial and venticular use for new implants and replacements.

	2014		2013	
	no	%	no	%
RV coil	1077	65.4	900	60.8
Subcutaneous	4	0.2	3	0.2
RV + SVC coil	566	34.4	577	39.0
Active fixation	1602	97.3	1446	97.7
Passive fixation	34	2.1	34	2.3
Passive fixation	11	0.7	0	0.0
Total number of leads - 2014: 1647, 2013: 1480				



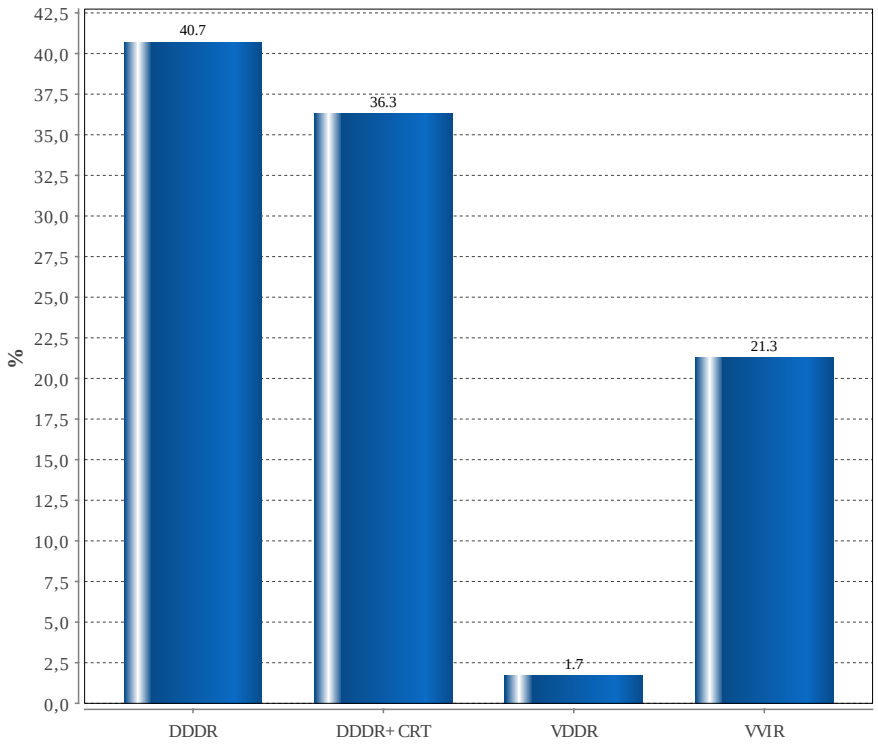
Venous access for new implants and replacements, all type of pacemakers

Lead access	No	%
Axillaris	88	5.3
Cephalica	802	48.7
Subclavia	753	45.7
Subcutaneous	4	0.2



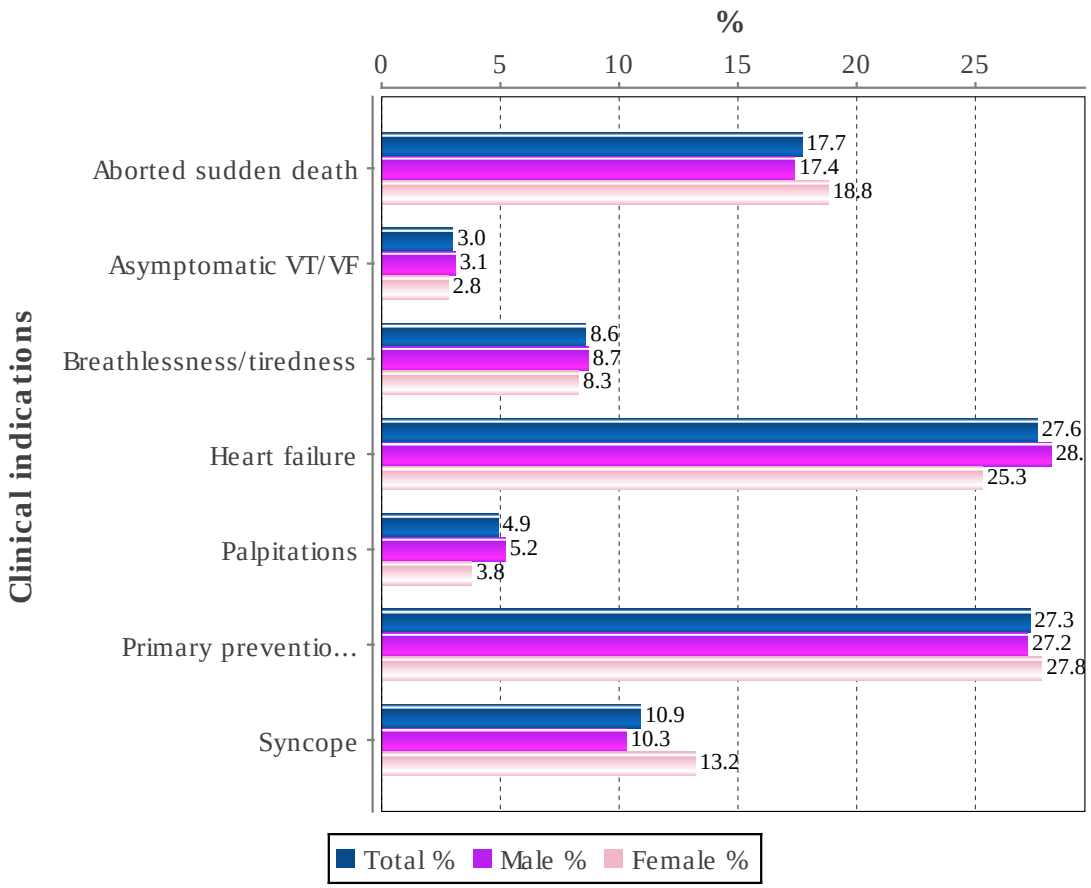
ICD subtype for new implants

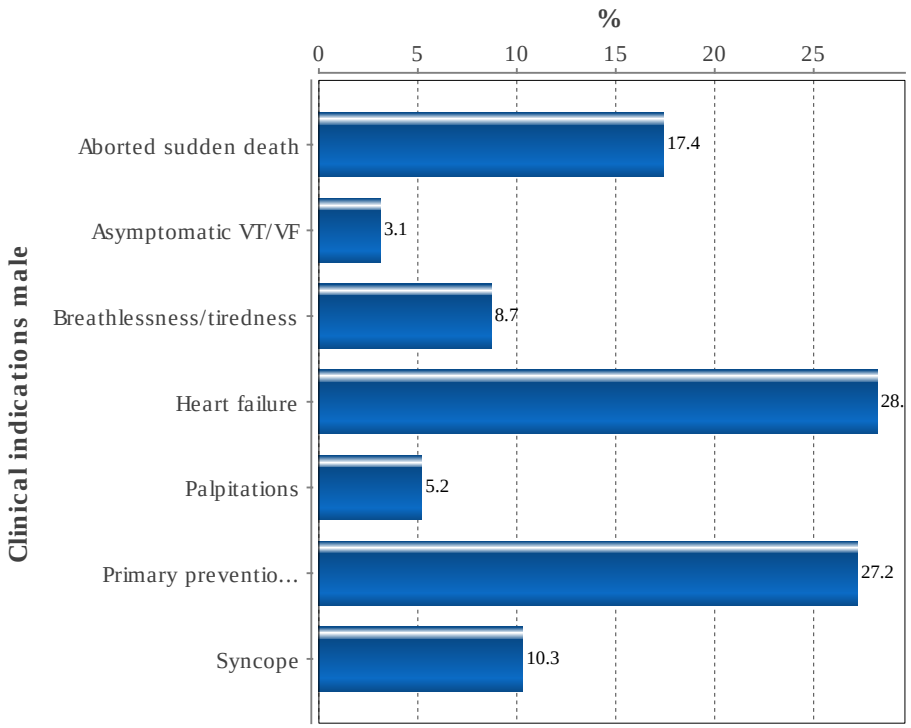
Mode	%	No
DDDR	40.7	611
DDDR+CRT	36.3	545
VDDR	1.7	26
VVIR	21.3	319

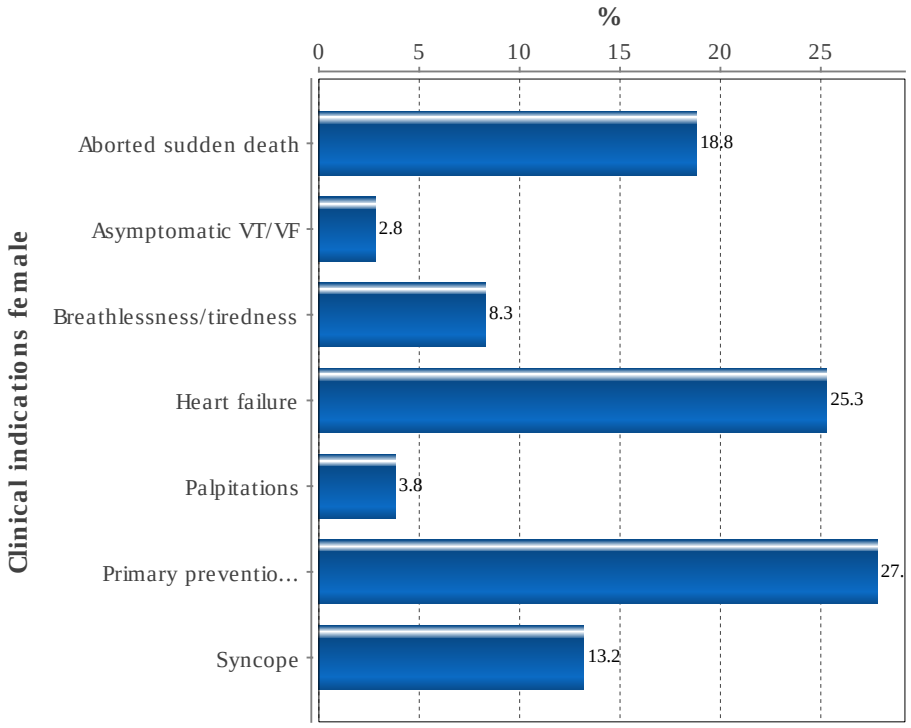


Main symptom for implanting ICDs

Indication	Total %	Male %	Female %
Aborted sudden death	17.7	17.4	18.8
Asymptomatic VT/VF	3.0	3.1	2.8
Breathlessness/tiredness	8.6	8.7	8.3
Heart failure	27.6	28.2	25.3
Palpitations	4.9	5.2	3.8
Primary prevention, asymptomatic	27.3	27.2	27.8
Syncope	10.9	10.3	13.2




%
0
5
10
15
20
25
Clinical indications male
Aborted sudden death
17.4
Asymptomatic VT/VF
3.1
Breathlessness/tiredness
8.7
Heart failure
28.
Palpitations
5.2
Primary preventio...
27.2
Syncope
10.3

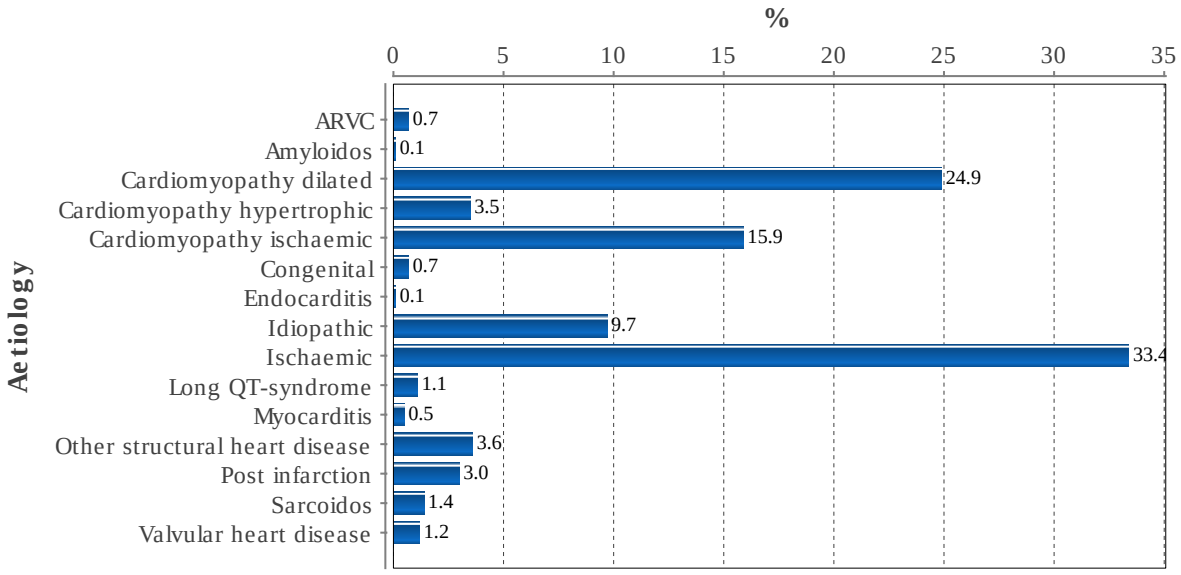

%
0
5
10
15
20
25
Clinical indications female
Aborted sudden death
18.8
Asymptomatic VT/VF
2.8
Breathlessness/tiredness
8.3
Heart failure
25.3
Palpitations
3.8
Primary preventio...
27.
Syncope
13.2

Main symptom for implanting ICDs, historical distribution

Indication	2012 %	2013 %	2014 %
Aborted sudden death	15.6	13.8	17.7
Asymptomatic VT/VF	3.6	3.6	3.0
Primary prevention	66.9	66.2	68.5
Syncope	13.9	16.3	10.9

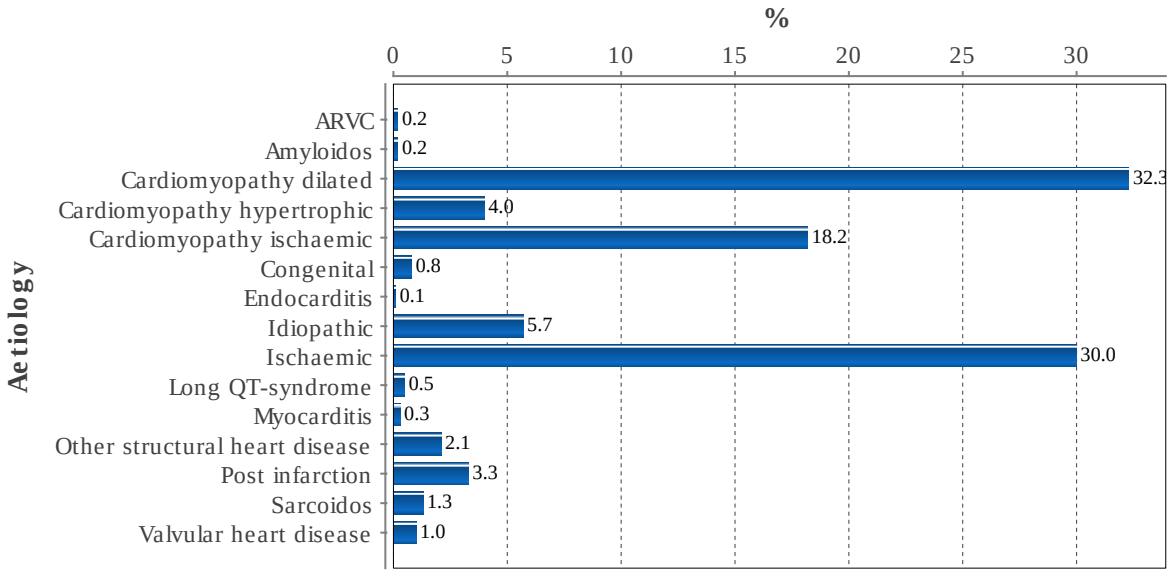
Main aetiology for implanting pacemakers

Aetiology	Total %	Male %	Female %
ARVC	0.7	0.7	0.7
Amyloidos	0.1	0.2	0.0
Cardiomyopathy dilated	24.9	22.8	33.3
Cardiomyopathy hypertrophic	3.5	2.9	6.3
Cardiomyopathy ischaemic	15.9	17.0	11.5
Congenital	0.7	0.7	1.0
Endocarditis	0.1	0.2	0.0
Idiopathic	9.7	8.9	13.2
Ischaemic	33.4	36.4	21.2
Long QT-syndrome	1.1	0.7	2.8
Myocarditis	0.5	0.5	0.7
Other structural heart disease	3.6	3.7	3.1
Post infarction	3.0	3.0	3.1
Sarcoidos	1.4	1.0	3.1
Valvular heart disease	1.2	1.5	0.0



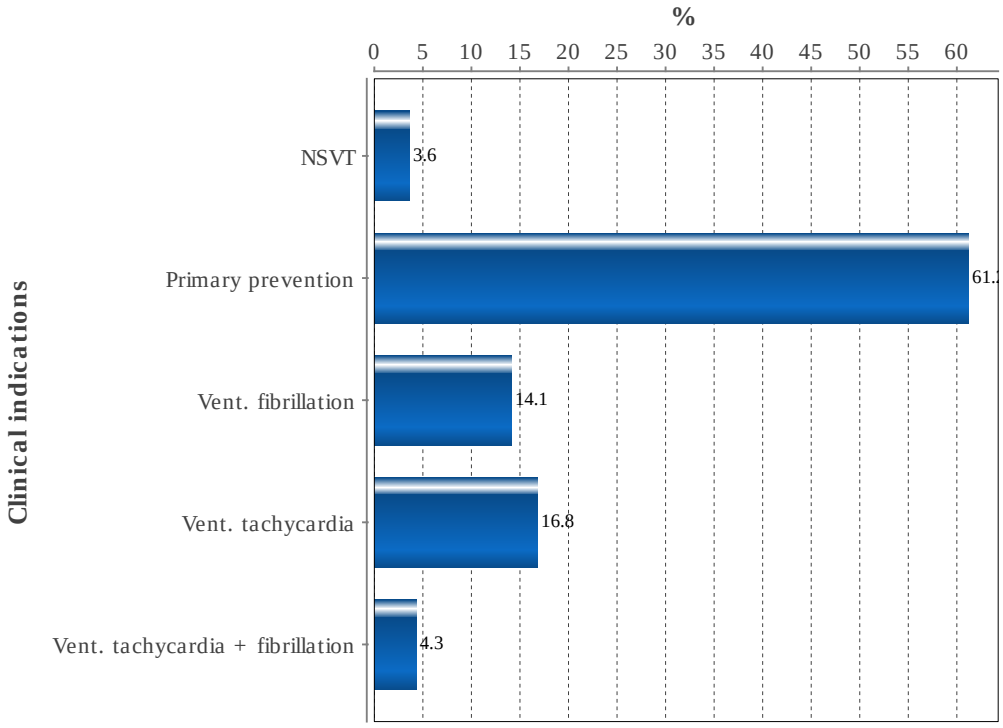
Main aetiology for implanting ICDs due to primary prevention

Aetiology	Total %	Male %	Female %
ARVC	0.2	0.3	0.0
Amyloidos	0.2	0.3	0.0
Cardiomyopathy dilated	32.3	29.9	41.9
Cardiomyopathy hypertrophic	4.0	3.3	6.8
Cardiomyopathy ischaemic	18.2	19.7	12.0
Congenital	0.8	0.8	1.0
Endocarditis	0.1	0.1	0.0
Idiopathic	5.7	5.1	7.9
Ischaemic	30.0	32.5	19.9
Long QT-syndrome	0.5	0.4	1.0
Myocarditis	0.3	0.3	0.5
Other structural heart disease	2.1	2.2	1.6
Post infarction	3.3	3.2	3.7
Sarcoidos	1.3	0.8	3.7
Valvular heart disease	1.0	1.3	0.0



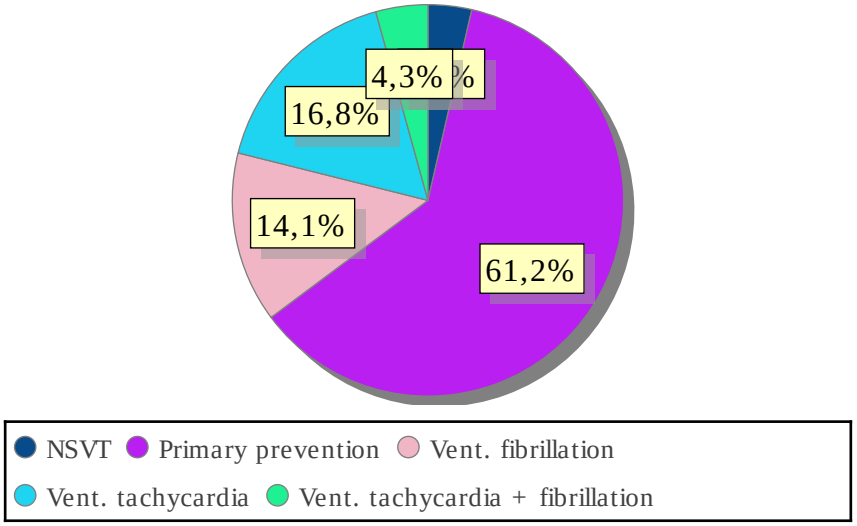
Documented ECG leading to ICD implant. (NSVT=non sustained VT)

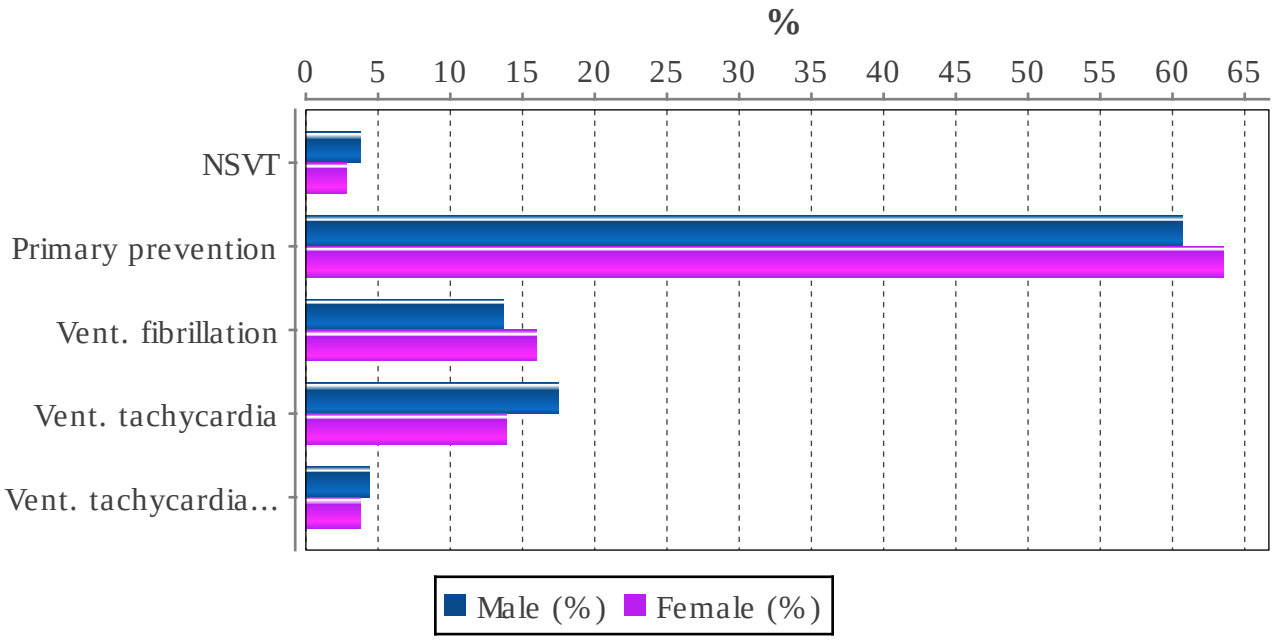
Indication	%
NSVT	3.6
Primary prevention	61.2
Vent. fibrillation	14.1
Vent. tachycardia	16.8
Vent. tachycardia + fibrillation	4.3



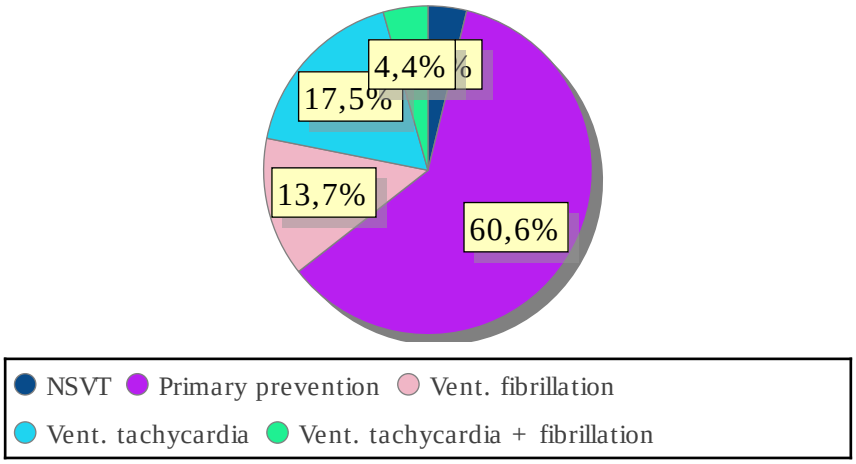
Documented ECG leading to ICD implant.(NSVT = non sustained VT) by gender and patients < 18 years

Indication	No	%	Male (%)	Female (%)	lt 18 (%)
NSVT	54	3.6	3.8	2.8	0.0
Primary prevention	919	61.2	60.7	63.5	40.0
Vent. fibrillation	212	14.1	13.7	16.0	40.0
Vent. tachycardia	252	16.8	17.5	13.9	10.0
Vent. tachycardia + fibrillation	64	4.3	4.4	3.8	10.0
					Total number of implants 1501

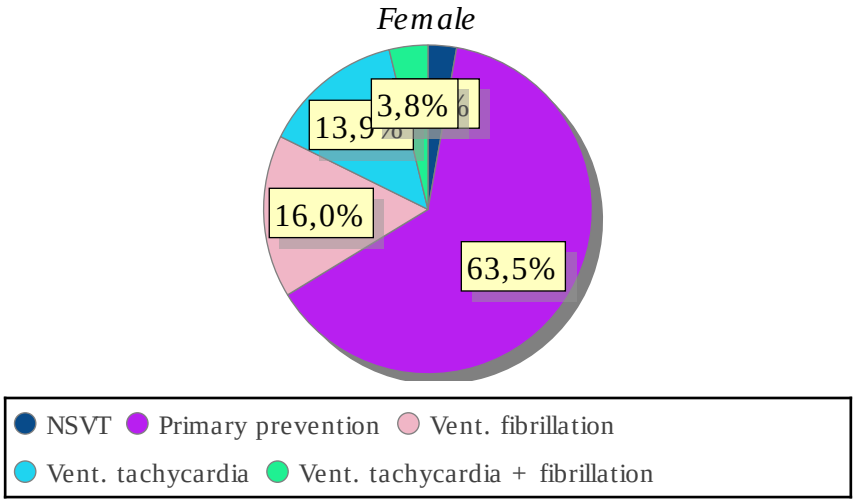




Male



Female



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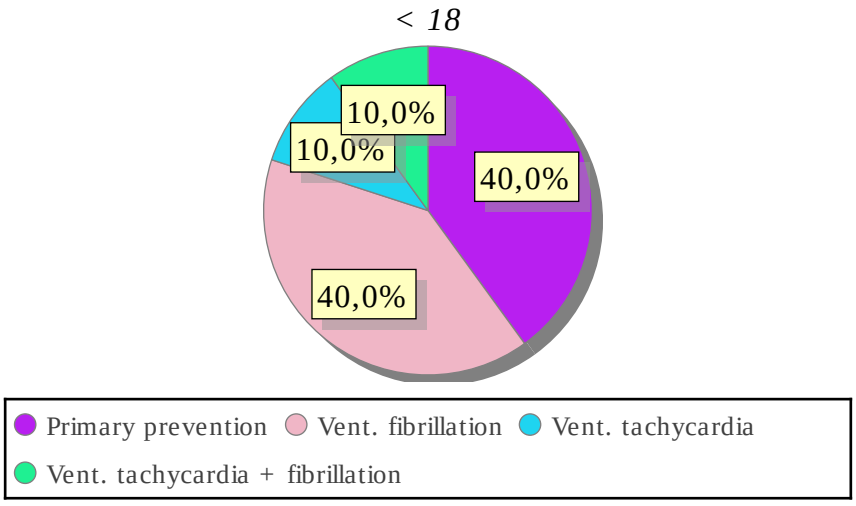
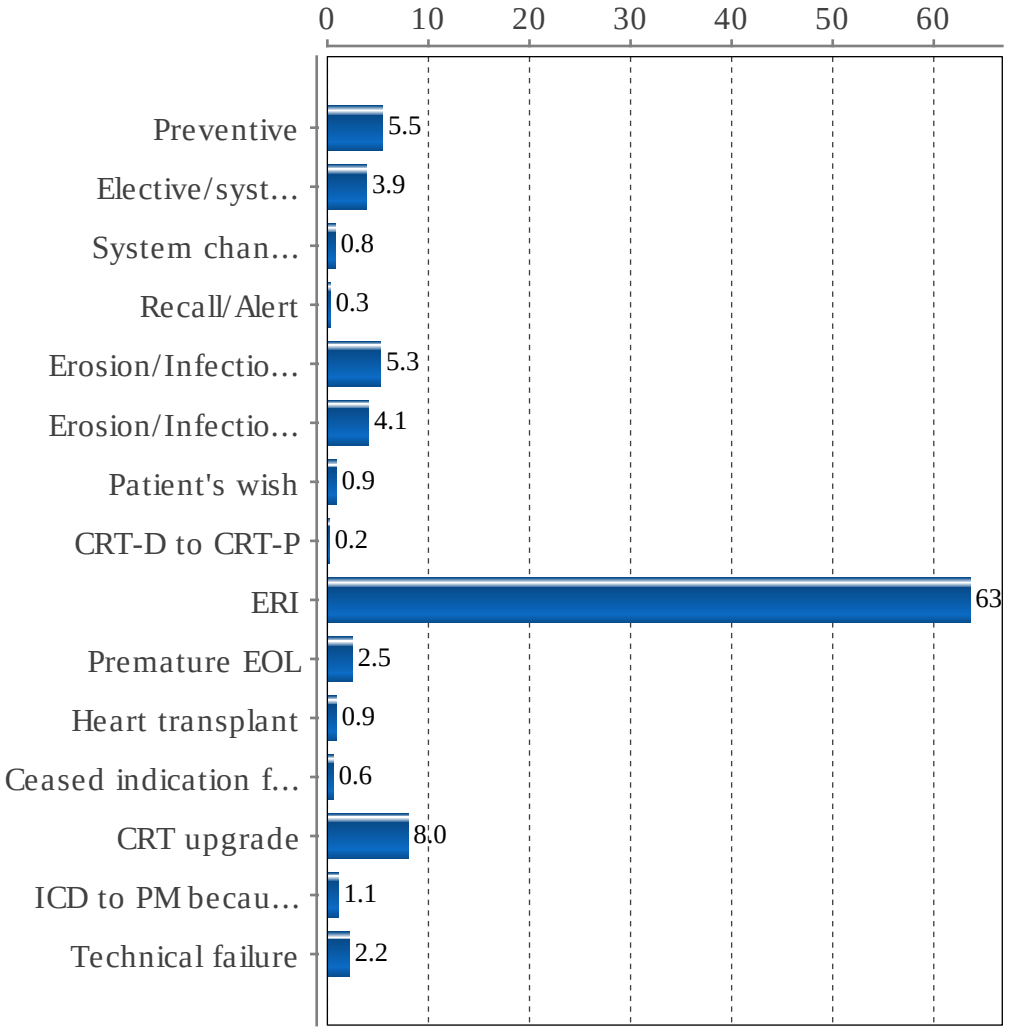


Reason for generator explant. Elective used for changes performed before reached ERI/EOL

Reason	All hospitals %	(large) %	(medium) %	(small) %
Preventive	5.5	3.7	8.7	10.0
Elective/system change	3.9	3.2	5.5	0.0
System change hemodynamic	0.8	1.0	0.5	0.0
Recall/Alert	0.3	0.2	0.5	0.0
Erosion/Infection, local	5.3	7.3	1.8	0.0
Erosion/Infection, systemic	4.1	5.1	2.3	0.0
Patient's wish	0.9	1.2	0.5	0.0
CRT-D to CRT-P	0.2	0.0	0.5	0.0
ERI	63.6	61.6	67.1	70.0
Premature EOL	2.5	2.7	1.8	10.0
Heart transplant	0.9	1.5	0.0	0.0
Ceased indication for ICD therapy	0.6	1.0	0.0	0.0
CRT upgrade	8.0	8.6	6.8	10.0
ICD to PM because of ceased indication	1.1	1.0	1.4	0.0
Technical failure	2.2	2.0	2.7	0.0

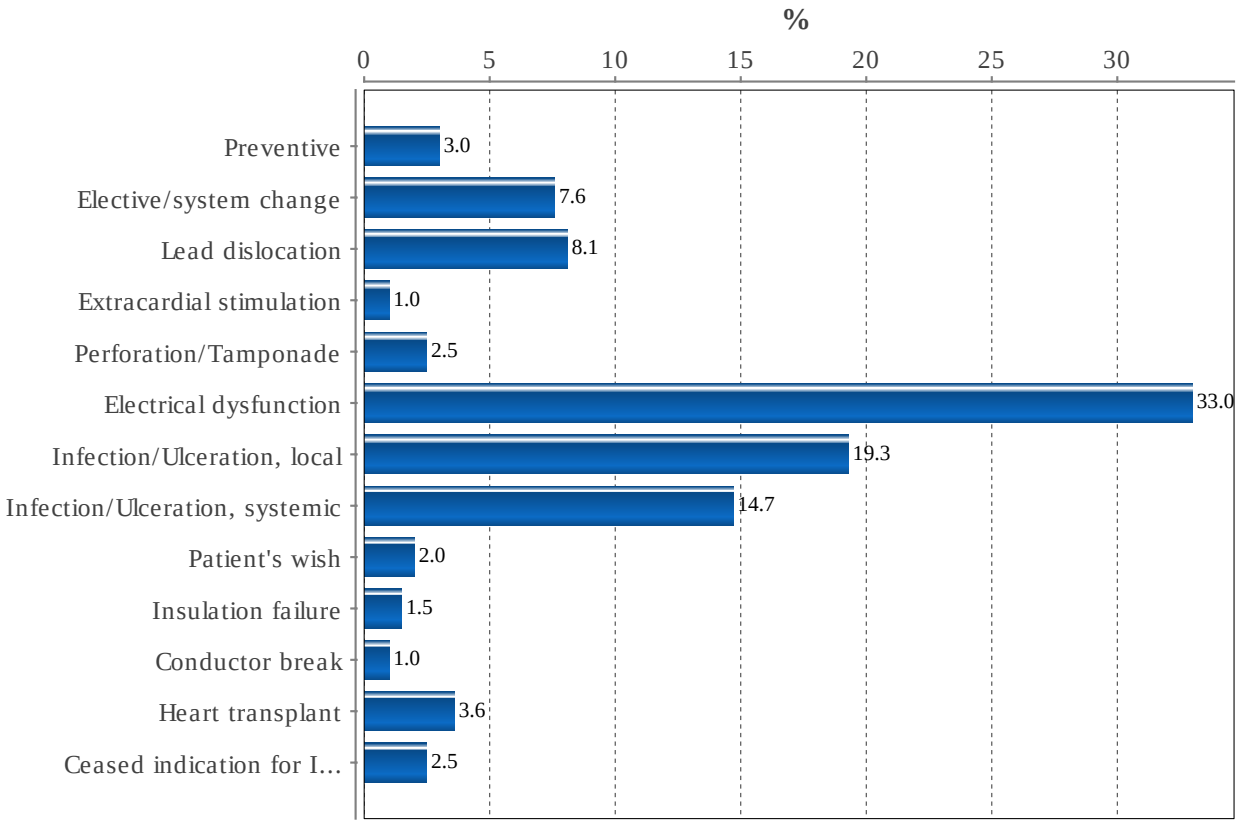


Historical explants indications

Reason	2012 %	2013 %	2014 %
Preventive	8.3	4.8	5.5
System change hemodynamic	2.8	1.1	0.8
Erosion/Infection, local	15.2	10.3	5.3
Patient's wish	0.8	0.6	0.9
ERI	57.3	64.1	63.6
Premature EOL	2.8	2.2	2.5
Heart transplant	1.0	0.6	0.9
Ceased indication for ICD therapy	1.0	1.6	0.6
CRT upgrade	8.7	8.9	8.0
ICD to PM because of ceased indication	1.2	1.0	1.1
Technical failure	0.6	0.8	2.2
Elective/system change	0.0	2.2	3.9
Recall/Alert	0.0	0.2	0.3
Erosion/Infection, systemic	0.0	1.6	4.1
CRT-D to CRT-P	0.0	0.0	0.2

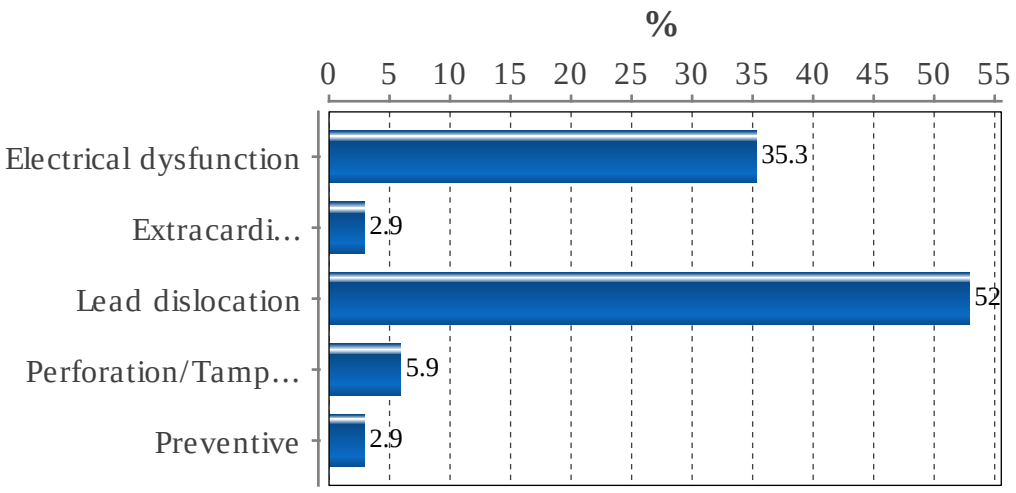
Historical lead explants indications

Reason	2012 %	2013 %	2014 %
Preventive	6.0	5.1	3.0
Elective/system change	8.2	6.1	7.6
Lead dislocation	1.1	3.0	8.1
Perforation/Tamponade	1.1	0.5	2.5
Electrical dysfunction	38.8	34.5	33.0
Recall/Alert	0.5	0.5	0.0
Infection/Ulceration, local	26.2	31.0	19.3
Infection/Ulceration, systemic	12.6	8.1	14.7
Patient's wish	0.5	1.5	2.0
Insulation failure	0.5	0.0	1.5
Conductor break	1.1	1.0	1.0
Heart transplant	2.2	2.5	3.6
Ceased indication for ICD therapy	1.1	5.6	2.5
Venous access	0.0	0.5	0.0
Extracardial stimulation	0.0	0.0	1.0


%
0
5
10
15
20
25
30
Preventive
3.0
Elective/system change
7.6
Lead dislocation
8.1
Extracardial stimulation
1.0
Perforation/Tamponade
2.5
Electrical dysfunction
33.0
Infection/Ulceration, local
19.3
Infection/Ulceration, systemic
14.7
Patient's wish
2.0
Insulation failure
1.5
Conductor break
1.0
Heart transplant
3.6
Ceased indication for I...
2.5

Historical lead correction indications

Reason	%
Electrical dysfunction	35.3
Extracardial stimulation	2.9
Lead dislocation	52.9
Perforation/Tamponade	5.9
Preventive	2.9
	Total no 34



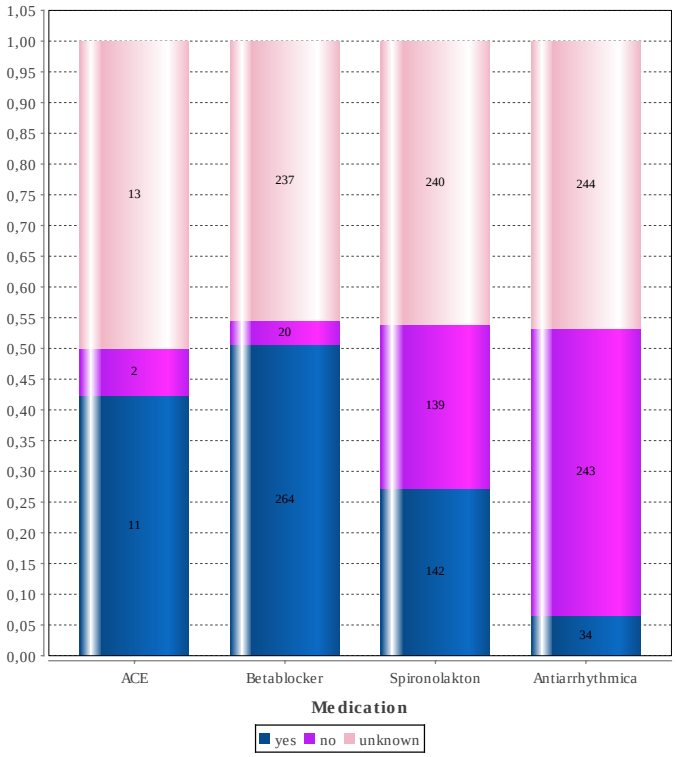
Procedures per operator

Hospital	Operator	No
Akademiska sjukhuset	Arvanitis	8
	Jidéus	1
	Mörtsell	41
	N/A	2
	Sciaraffia	1
	Teder	43
Ålands centralsjukhus	Slotte	1
Blekingesjukhuset	Borg	28
	Ericsson	10
	Rorsman-Söderström	9
Centrallasarettet Växjö	Johansson P	13
	Jonasson	12
	Näsström Jesper	1
	Rosén Helena	7
	Strandberg	16
	Weber	1
Centralsjukhuset Karlstad	Khalili	6
	Niklas Aldergård	34
	Saidi	7
Centralsjukhuset Västerås	Dilan	26
	SkoglundAndersson	2
	Täckström	3
	Wiberg	17
Danderyds sjukhus	2	11
	3	24
	4	41
	6	23
Drottning Silvias Bus	Charles Kennergren	2
	Oskar Väärt	1
Falu lasarett	Berglund	6
	Forsgren	46
	Guggi	10
Hudiksvalls sjukhus	Roussinne	7
	Thomas Andrews	2
Karolinska Universitetssjukhus	Gadler	80
	Hörnsten	61
	Reistam	5
	Reistam, Ulrika	27
	Reistam/ Hörnsten	2
	Westholm	65
Länssjukhuset Gävle	Falck	18
	Johansson Staffan	12
	Kastberg	16
	Magnusson Bo	1
	Magnusson Peter	21
	Mati Jalakas	5
Länssjukhuset Kalmar	Carlström	26
	David Olsson	13
	Michael Lindstaedt	28
Länssjukhuset Ryhov	Asking	1
	Jakobsson S	33
	Lagerberg	17
Linköpings universitetssjukhus	Jönsson A	1
	Säfström K	37
	Sonesson L	46
	Svenson A	1
	Szamlewski P	1
	Szymanowski A	40
Mälarsjukhuset	Bozena Ostrowska	42
Norrlands Universitetssjukhus	Höglund	14
	Höglund/Rönn	1
	Jensen	8
	Kesek	9
	Landström	22
	Rönn	23
Örnsköldsviks sjukhus	Ehlin	14
Östersunds sjukhus	Björklund	5
	Friberg	14
	Hansson	23
Sahlgrenska universitetssjukhuset	Jamaly	18
	Javid	5
	Kennergren	5
	Piotr Szamlewski	44
	Schultz	7
	Westbom	25
Sahlgrenska universitetssjukhuset / Östra	Javid	6
Skaraborgs sjukhus Skövde	Falmer	6
	Lorentzen	24
	Paulsson	17
	Winterfeldt	7
Skånes universitetssjukhus, Lund	Fredrik Slotte	28
	Ingrid Litterfeldt	4
	Johan Brandt	108
	Maiwand Farouq	21
	Pyotr Platonov	20

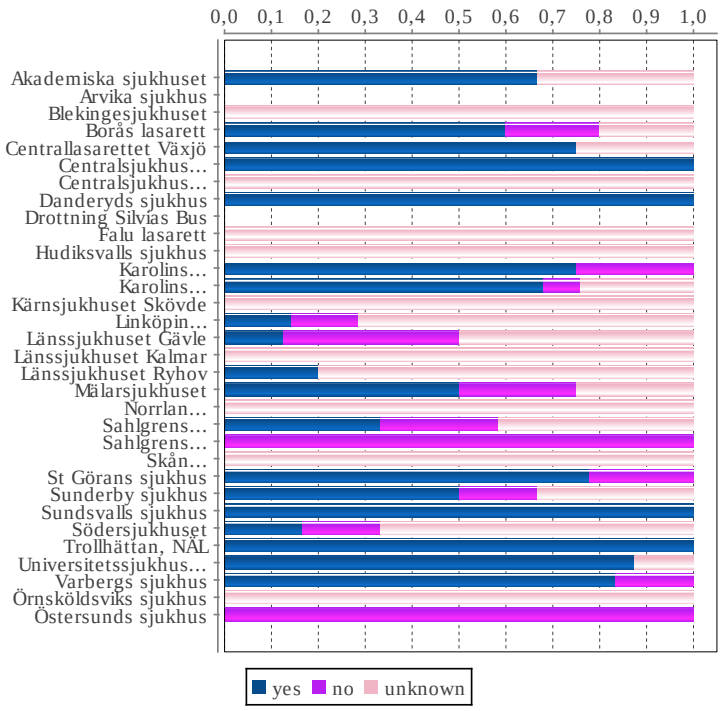
Hospital	Operator	No
	Rasmus Borgquist	2
	Steen Jensen	5
	Wang Lingwei	88
Skellefteå lasarett	Lindqvist	11
Södersjukhuset	Jonsson J-E	19
	Kjellman B	24
	Lerner	18
	Olson J	17
Södra Älvsborgs sjukhus	Friedemann	13
	Sandgren	21
St Görans sjukhus	1	22
	1+2	5
	2	15
	3	6
Sunderby sjukhus	Baas	6
	Haupt	33
	Johansson P	12
	Lundblad	4
	Wennberg	4
Sundsvalls sjukhus	Annan	1
	Khadhim	17
	Sundelin	23
Trollhättan, NÄL	Csaba Herczku	24
	Dinu Dusceac	12
	Jabbar	4
	Söderbergh	1
Universitetssjukhuset Örebro	Anna Björkenheim	2
	Lindell	39
	Tommy Andersson	30
Varbergs sjukhus	Myredal	4
	Rorsman	65
Visby lasarett	Jacobsson L	6

Previous medication for patients having ICD implant

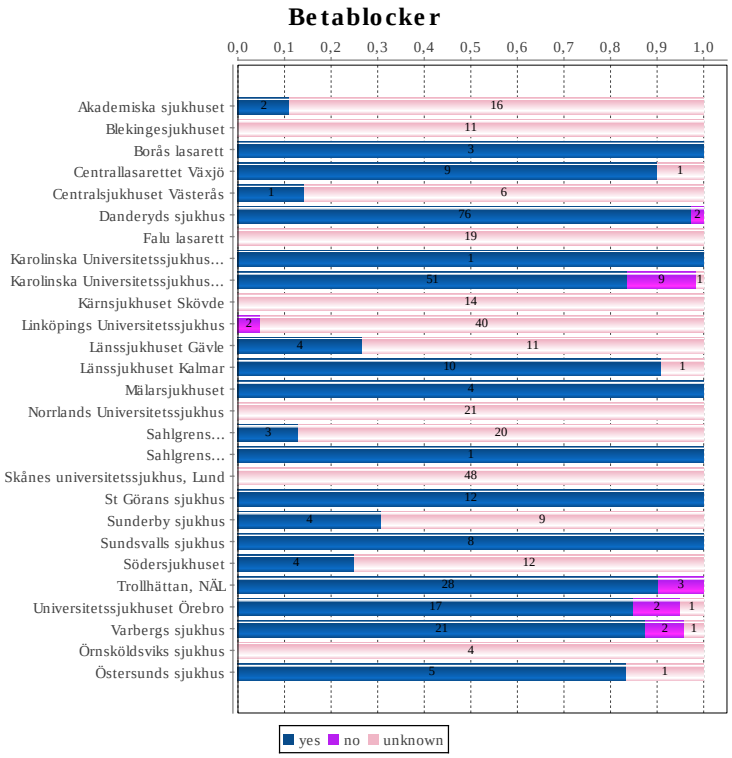
Medication	yes	no	unknown	yes(%)	no(%)	unknown(%)
ACE	11	2	13	42	8	50
Betablocker	264	20	237	51	4	45
Spironolakton	142	139	240	27	27	46
Antiarrhythmica	34	243	244	7	47	47



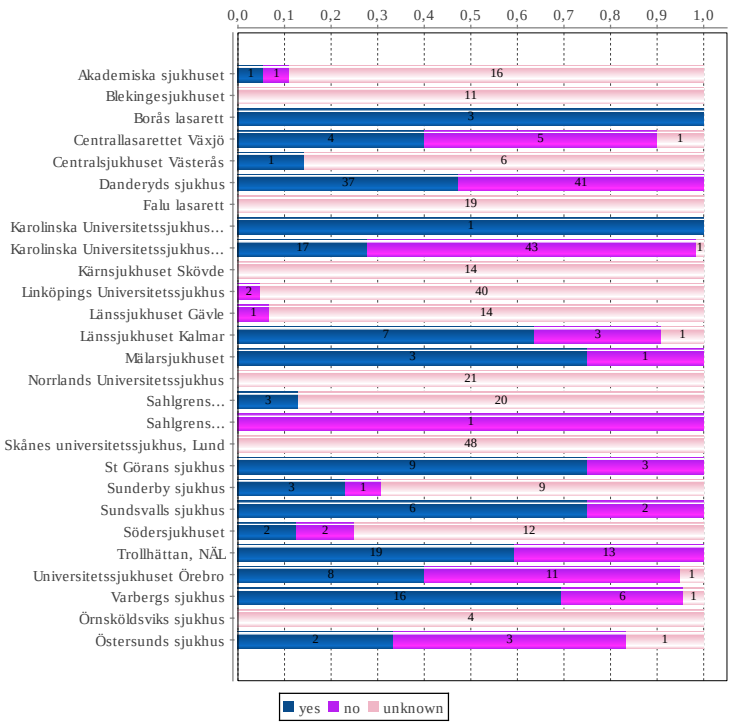
ACE



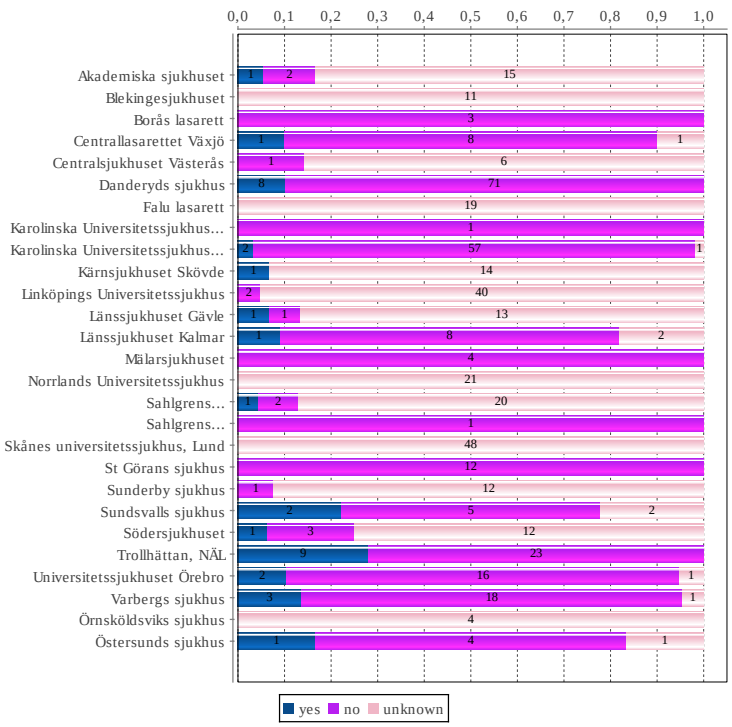
Betablocker



Spironolakton



Antiarrhythmica

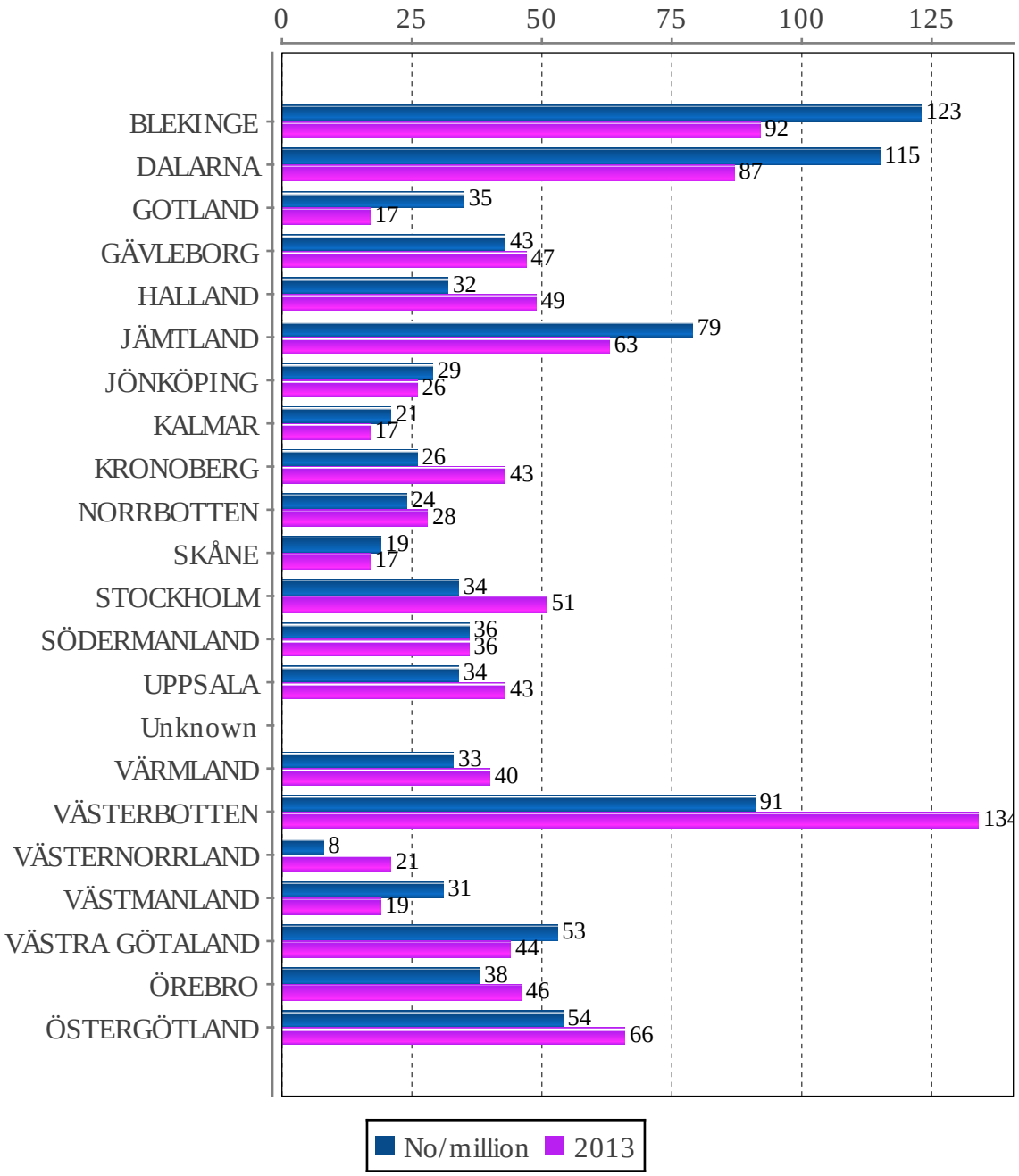


CRT Historical implant rates per million residents

		CRT-P		CRT-D	
Year	**Population**	**No**	**Rate**	**No**	**Rate**
2010	9415570	307	3.3	314	3.3
2011	9482855	354	3.7	441	4.7
2012	9555893	350	3.7	441	4.6
2013	9644864	417	4.3	550	5.7
2014	9747355	395	4.1	592	6.1

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

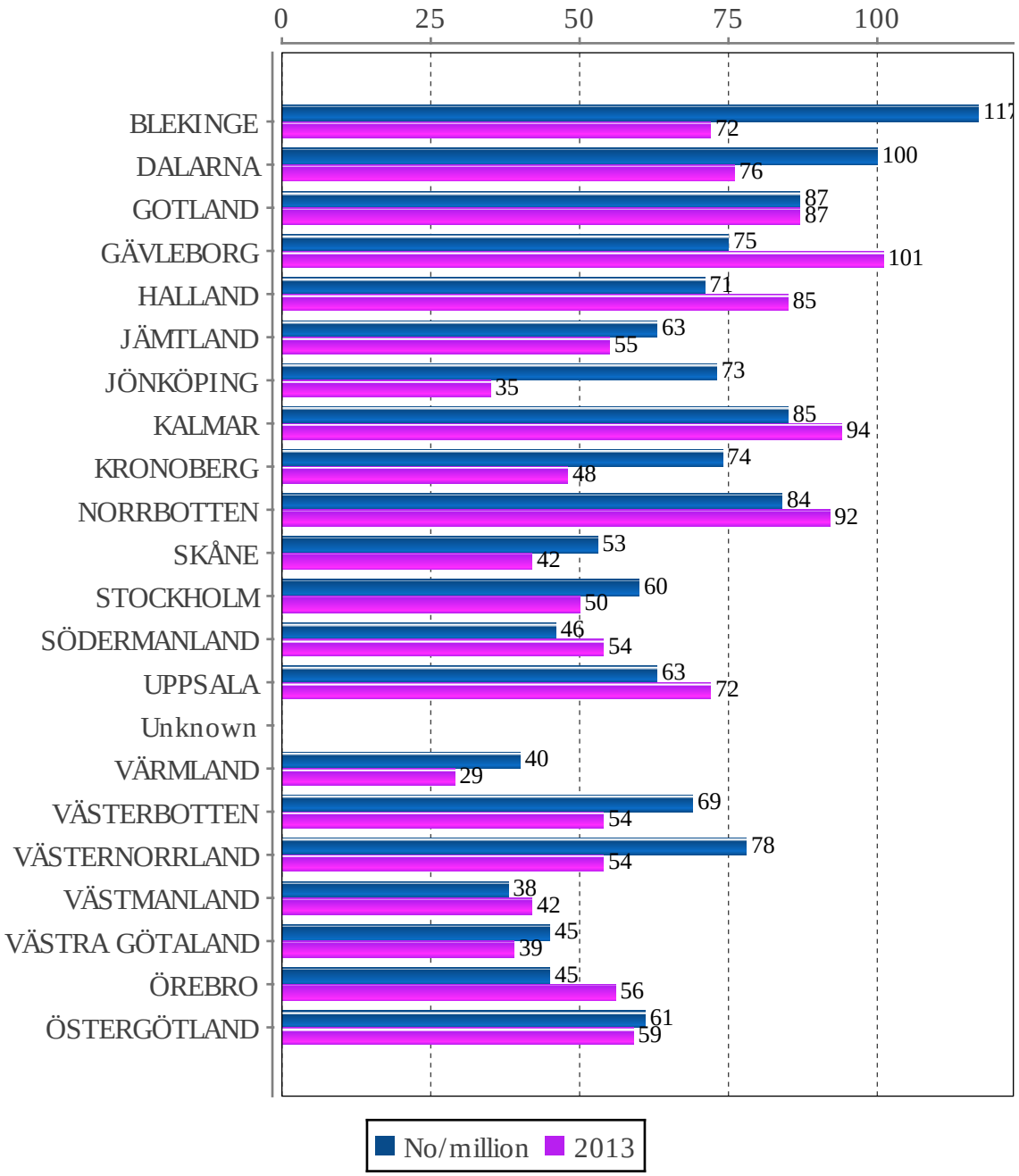
	Population	No first impl	No/million
BLEKINGE	154157	19	123
DALARNA	278903	32	115
GOTLAND	57255	2	35
GÄVLEBORG	279991	12	43
HALLAND	310665	10	32
JÄMTLAND	126765	10	79
JÖNKÖPING	344262	10	29
KALMAR	235598	5	21
KRONOBERG	189128	5	26
NORRBOTTEN	249987	6	24
SKÅNE	1288908	25	19
STOCKHOLM	2198044	74	34
SÖDERMANLAND	280666	10	36
UPPSALA	348942	12	34
Unknown	0	2	0
VÄRMLAND	274691	9	33
VÄSTERBOTTEN	262362	24	91
VÄSTERNORRLAND	243061	2	8
VÄSTMANLAND	261703	8	31
VÄSTRA GÖTALAND	1632012	86	53
ÖREBRO	288150	11	38
ÖSTERGÖTLAND	442105	24	54
Total	9747355	398	41

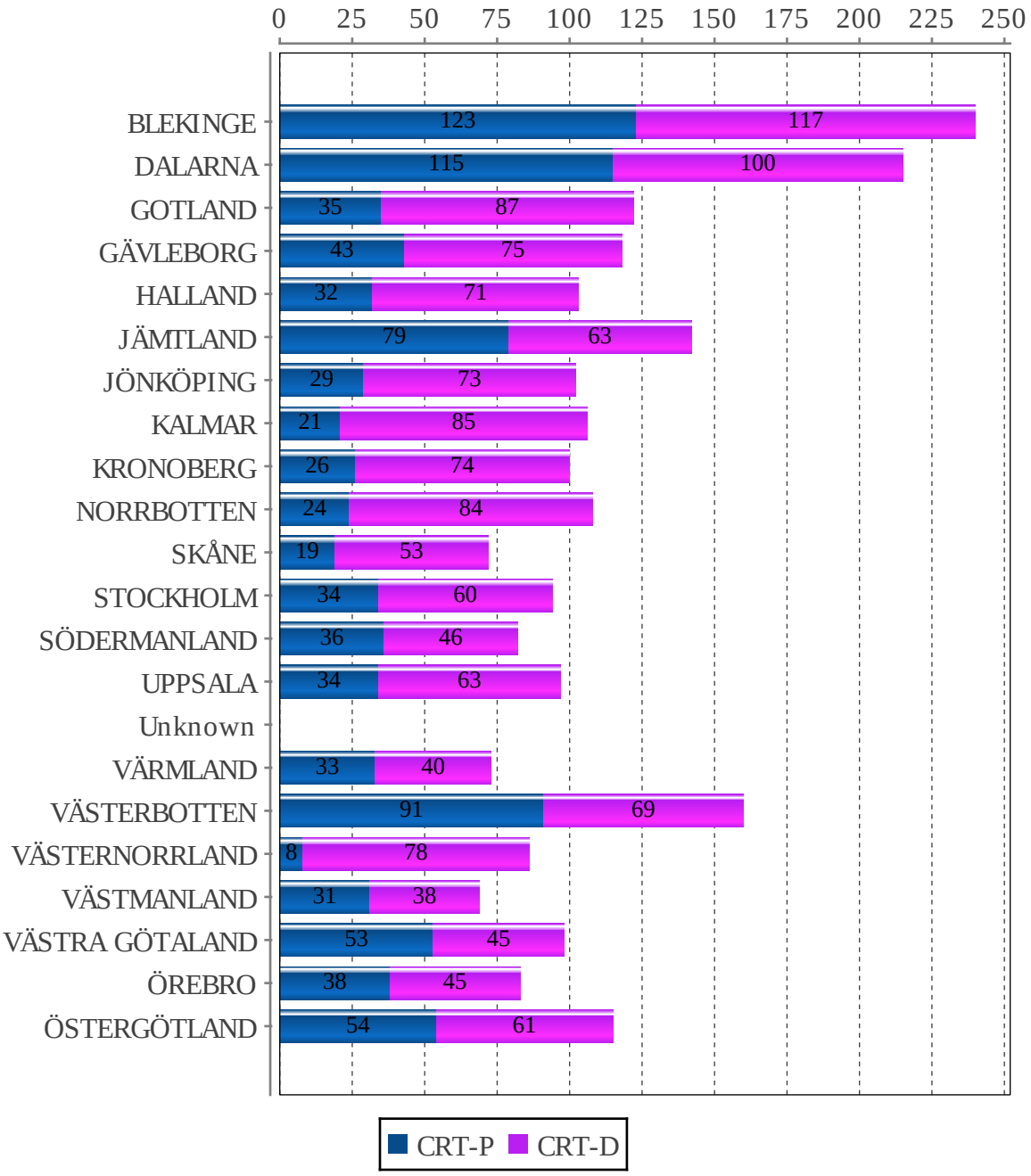

0
25
50
75
100
125
BLEKINGE
DALARNA
GOTLAND
GÄVLEBORG
HALLAND
JÄMTLAND
JÖNKÖPING
KALMAR
KRONOBERG
NORRBOTTEN
SKÅNE
STOCKHOLM
SÖDERMANLAND
UPPSALA
Unknown
VÄRMLAND
VÄSTERBOTTEN
VÄSTERNORRLAND
VÄSTMANLAND
VÄSTRA GÖTALAND
ÖREBRO
ÖSTERGÖTLAND
123
92
115
87
35
17
43
47
32
49
79
63
29
26
21
17
26
43
24
28
19
17
34
51
36
36
34
43
33
40
91
134
8
21
31
19
53
44
38
46
54
66
No/million
2013

STATISTICS – CRT-D – IMPLANTS PER COUNTY

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

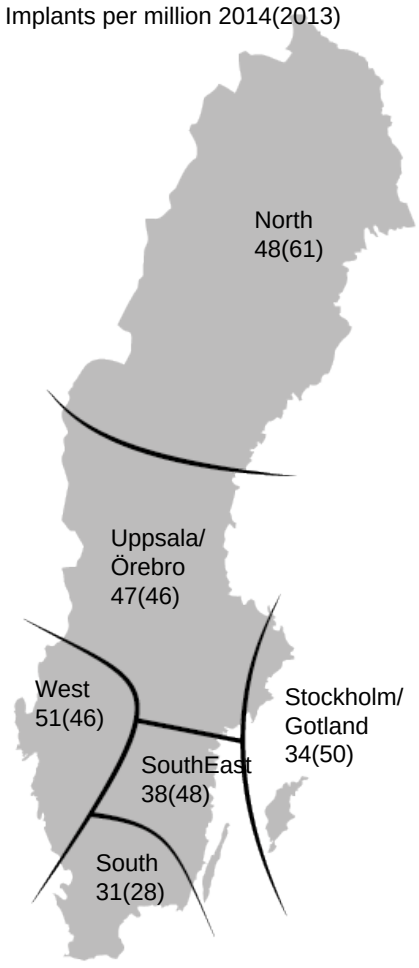
	Population	No first impl	No/million
BLEKINGE	154157	18	117
DALARNA	278903	28	100
GOTLAND	57255	5	87
GÄVLEBORG	279991	21	75
HALLAND	310665	22	71
JÄMTLAND	126765	8	63
JÖNKÖPING	344262	25	73
KALMAR	235598	20	85
KRONOBERG	189128	14	74
NORRBOTTEN	249987	21	84
SKÅNE	1288908	68	53
STOCKHOLM	2198044	132	60
SÖDERMANLAND	280666	13	46
UPPSALA	348942	22	63
Unknown	0	6	0
VÄRMLAND	274691	11	40
VÄSTERBOTTEN	262362	18	69
VÄSTERNORRLAND	243061	19	78
VÄSTMANLAND	261703	10	38
VÄSTRA GÖTALAND	1632012	73	45
ÖREBRO	288150	13	45
ÖSTERGÖTLAND	442105	27	61
Total	9747355	594	61


0
25
50
75
100
BLEKINGE
DALARNA
GOTLAND
GÄVLEBORG
HALLAND
JÄMTLAND
JÖNKÖPING
KALMAR
KRONOBERG
NORRBOTTEN
SKÅNE
STOCKHOLM
SÖDERMANLAND
UPPSALA
Unknown
VÄRMLAND
VÄSTERBOTTEN
VÄSTERNORRLAND
VÄSTMANLAND
VÄSTRA GÖTALAND
ÖREBRO
ÖSTERGÖTLAND
117
72
100
76
87
87
75
101
71
85
63
55
73
35
85
94
74
48
84
92
53
42
60
50
46
54
63
72
40
29
69
54
78
54
38
42
45
39
45
56
61
59
No/million
2013


0
25
50
75
100
125
150
175
200
225
250
BLEKINGE
123
117
DALARNA
115
100
GOTLAND
35
87
GÄVLEBORG
43
75
HALLAND
32
71
JÄMTLAND
79
63
JÖNKÖPING
29
73
KALMAR
21
85
KRONOBERG
26
74
NORRBOTTEN
24
84
SKÅNE
19
53
STOCKHOLM
34
60
SÖDERMANLAND
36
46
UPPSALA
34
63
Unknown
VÄRMLAND
33
40
VÄSTERBOTTEN
91
69
VÄSTERNORRLAND
8
78
VÄSTMANLAND
31
38
VÄSTRA GÖTALAND
53
45
ÖREBRO
38
45
ÖSTERGÖTLAND
54
61
CRT-P
CRT-D

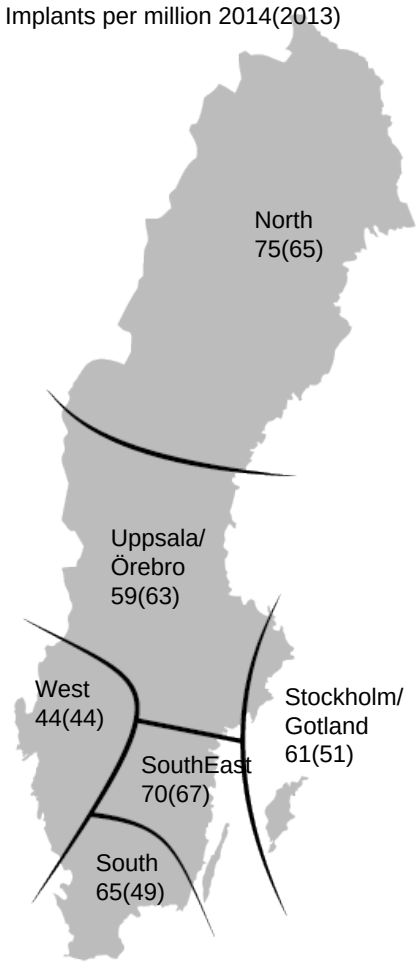
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million
Stockholm/Gotland	2255299	76	34
Uppsala/Örebro	2013046	94	47
South-East Sweden	1021965	39	38
Southern Sweden	1761784	54	31
Western Sweden	1813086	92	51
Northern Sweden	882175	42	48
Total	9747355	397	41



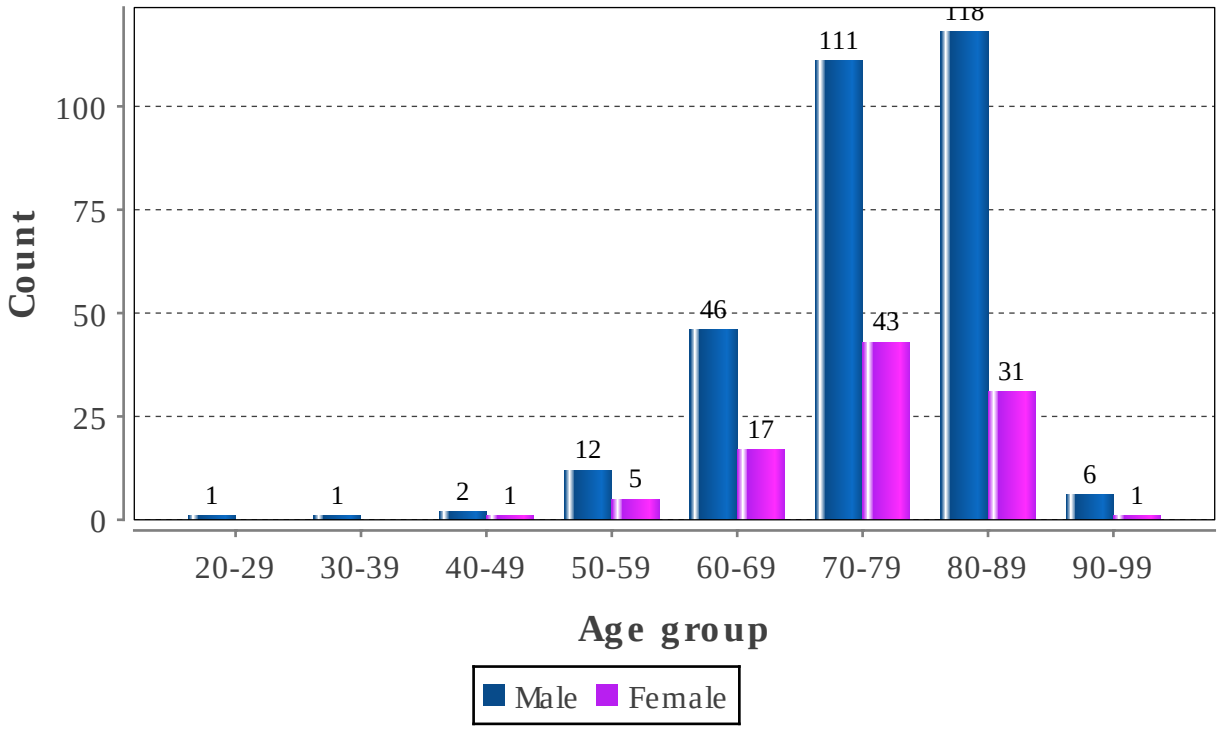
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million
Stockholm/Gotland	2255299	137	61
Uppsala/Örebro	2013046	118	59
South-East Sweden	1021965	72	70
Southern Sweden	1761784	115	65
Western Sweden	1813086	80	44
Northern Sweden	882175	66	75
Total	9747355	588	60



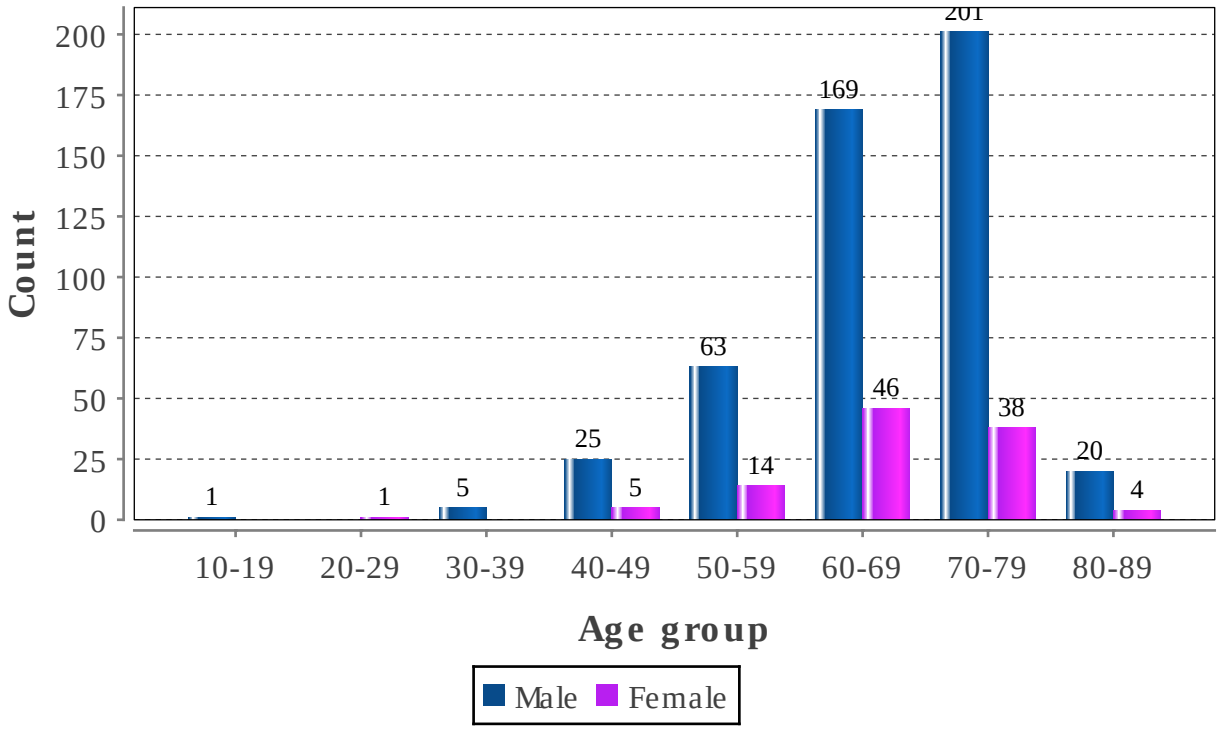
Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
20-29	1	0.3	1	0
30-39	1	0.3	1	0
40-49	3	0.8	2	1
50-59	17	4.3	12	5
60-69	63	15.9	46	17
70-79	154	39.0	111	43
80-89	149	37.7	118	31
90-99	7	1.8	6	1
Average age	76	0.0	76	75
				Total number of implants: 395



Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
10-19	1	0.2	1	0
20-29	1	0.2	0	1
30-39	5	0.8	5	0
40-49	30	5.1	25	5
50-59	77	13.0	63	14
60-69	215	36.3	169	46
70-79	239	40.4	201	38
80-89	24	4.1	20	4
Average age	67	0.0	67	66
				Total number of implants: 592



CRT-P (generator)

Status	First implant	Replacement
SC-lead failed implant	2	0
SC-lead active system	389	20

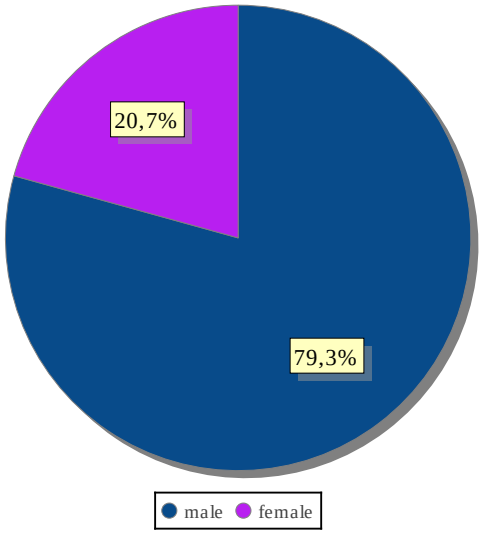
CRT-D (generator)

Status	First implant	Replacement
SC-lead plugged	6	2
SC-lead failed implant	7	3
SC-lead active system	569	46

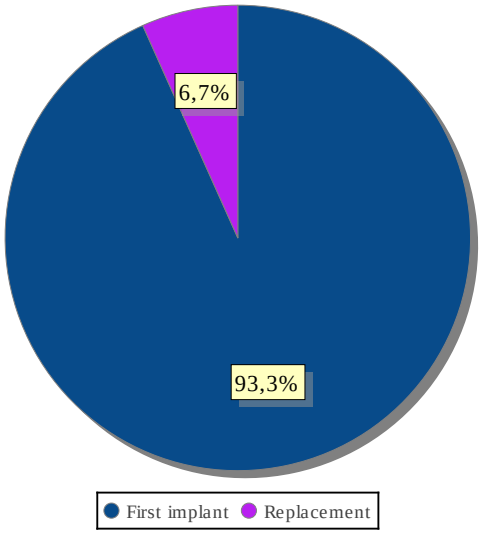
Based on both CRT-P and CRT-D

	Total		Male		Female	
	no	%	no	%	no	%
First implant	995	93.3	789	79.3	206	20.7
Replacement	72	6.7	54	75.0	18	25.0
Total	1067	100.0	843	79.0	224	21.0

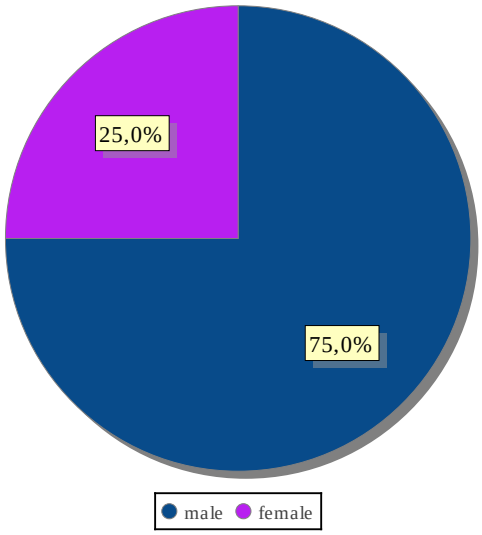
First implant



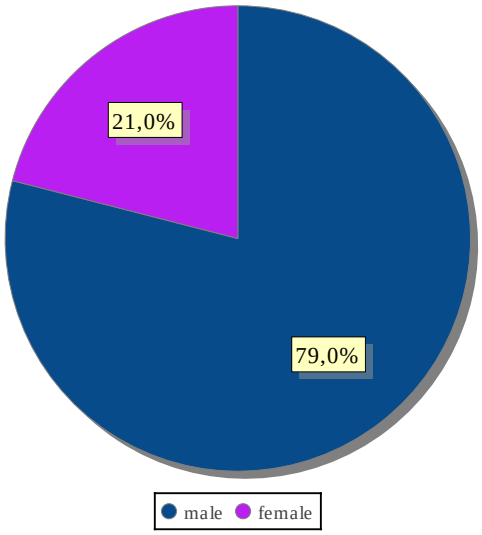
Replacement ratio



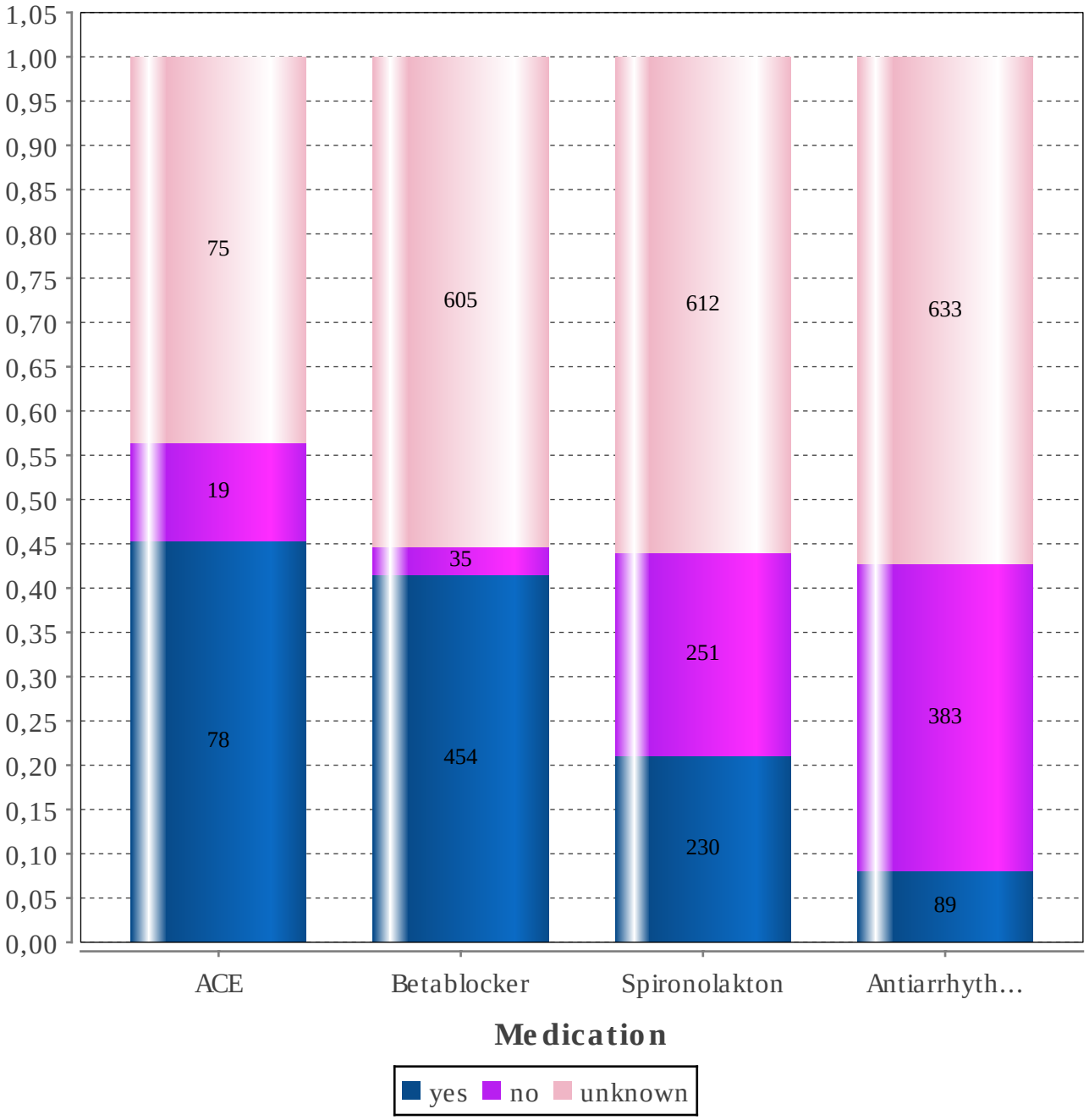
Replacement



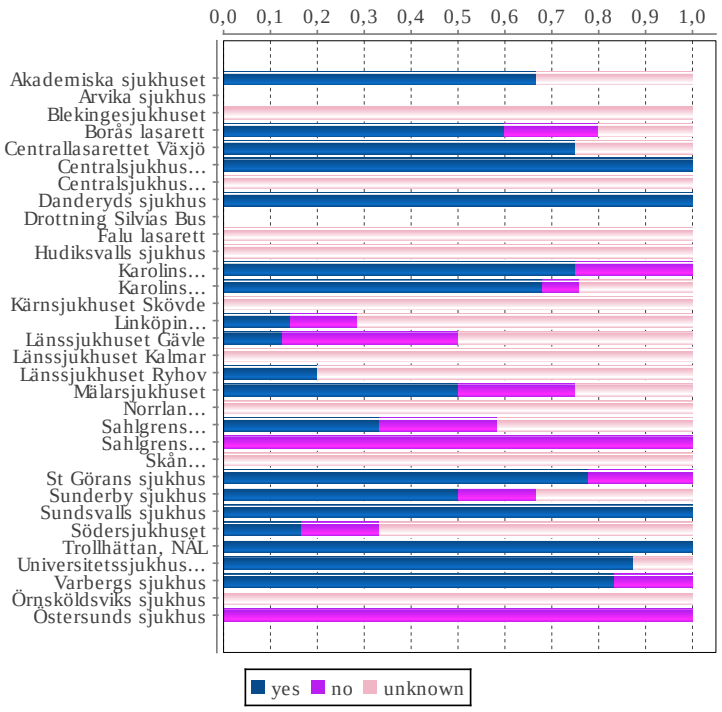
All implant



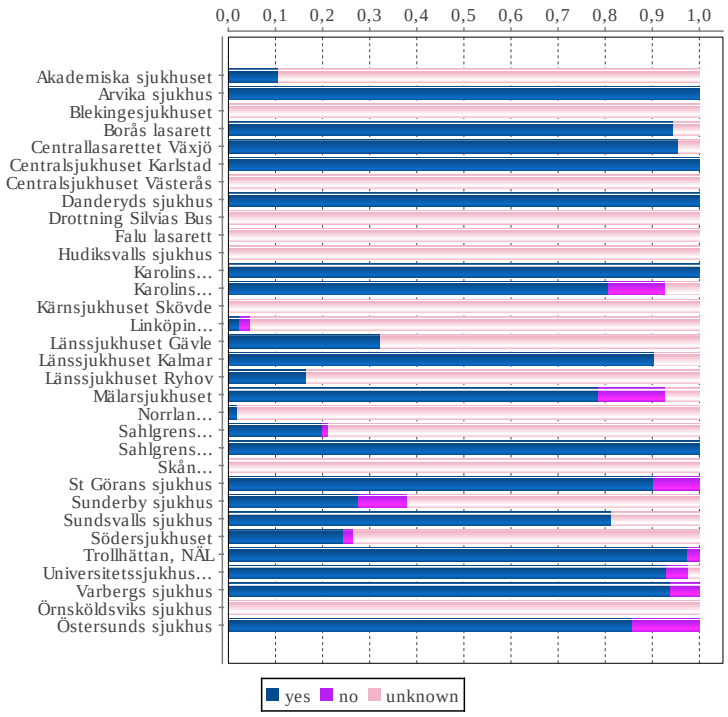
Previous medication for patients having CRT implant



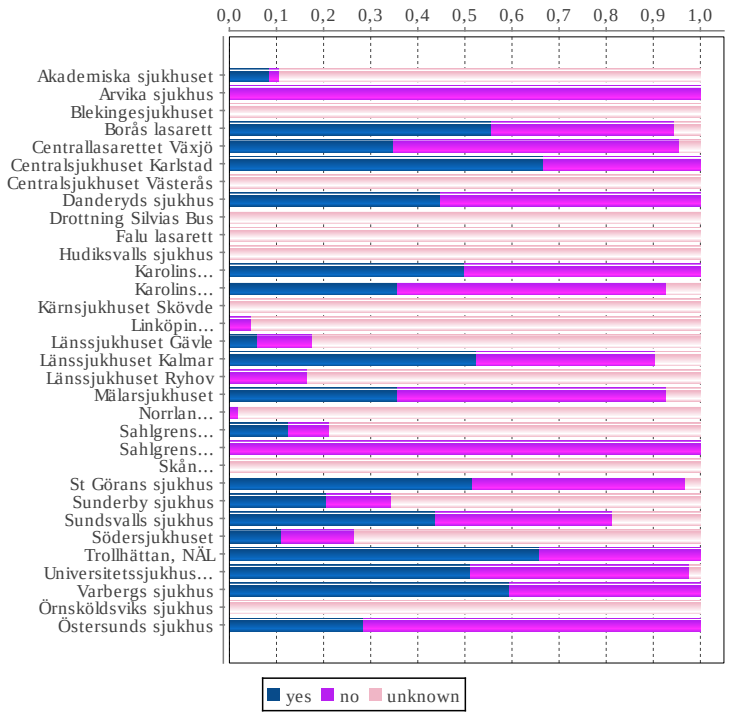
ACE



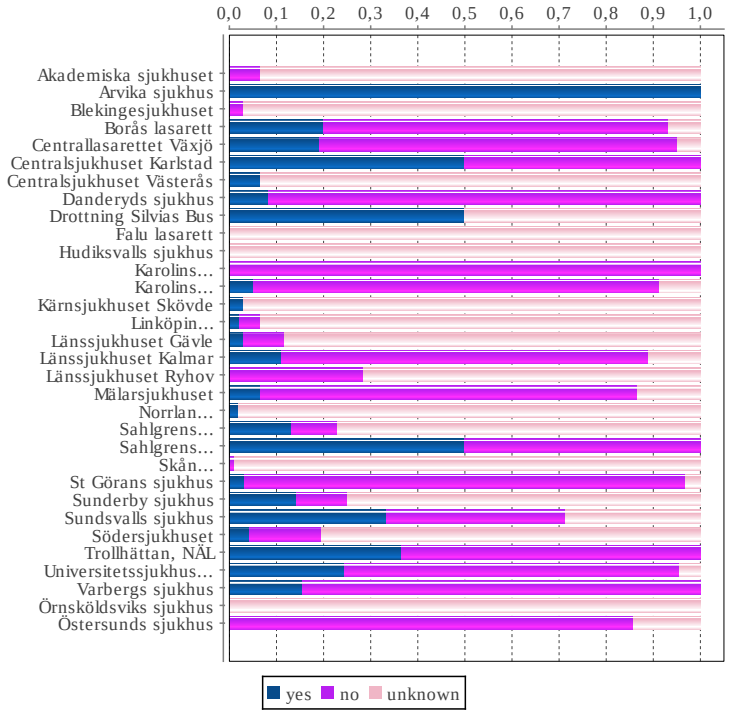
Betablocker



Spironolakton



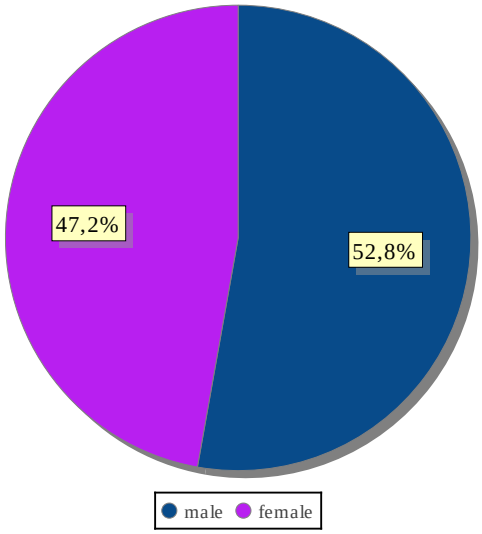
Antiarrhythmica



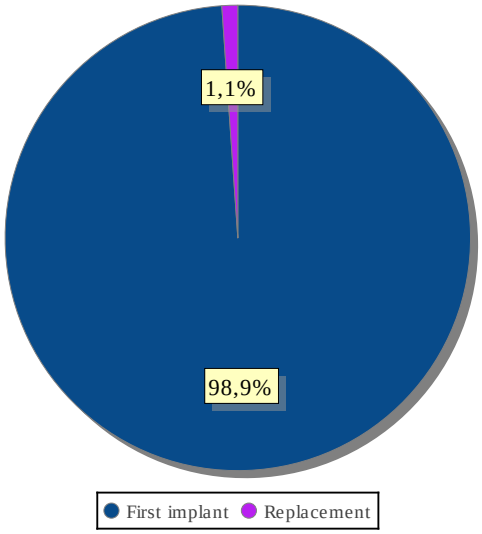
Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	744	98.9	393	52.8	351	47.2
Replacement	8	1.1	1	12.5	7	87.5
Total	752	100.0	394	52.4	358	47.6

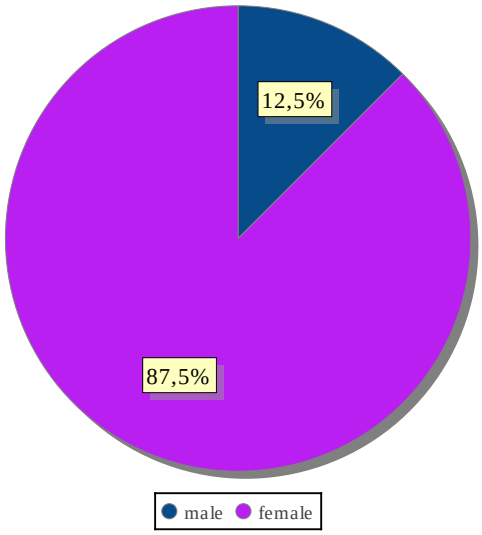
First implant



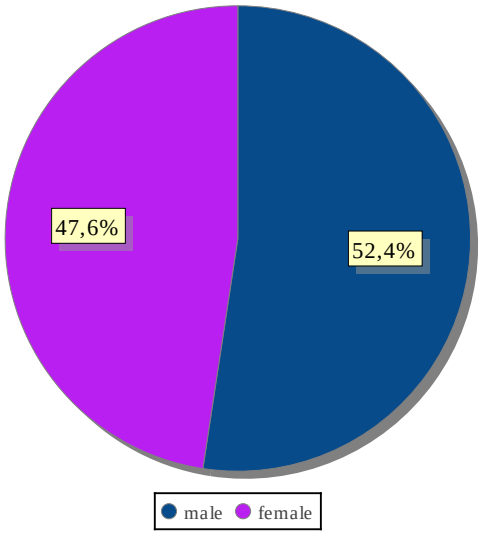
Replacement ratio



Replacement

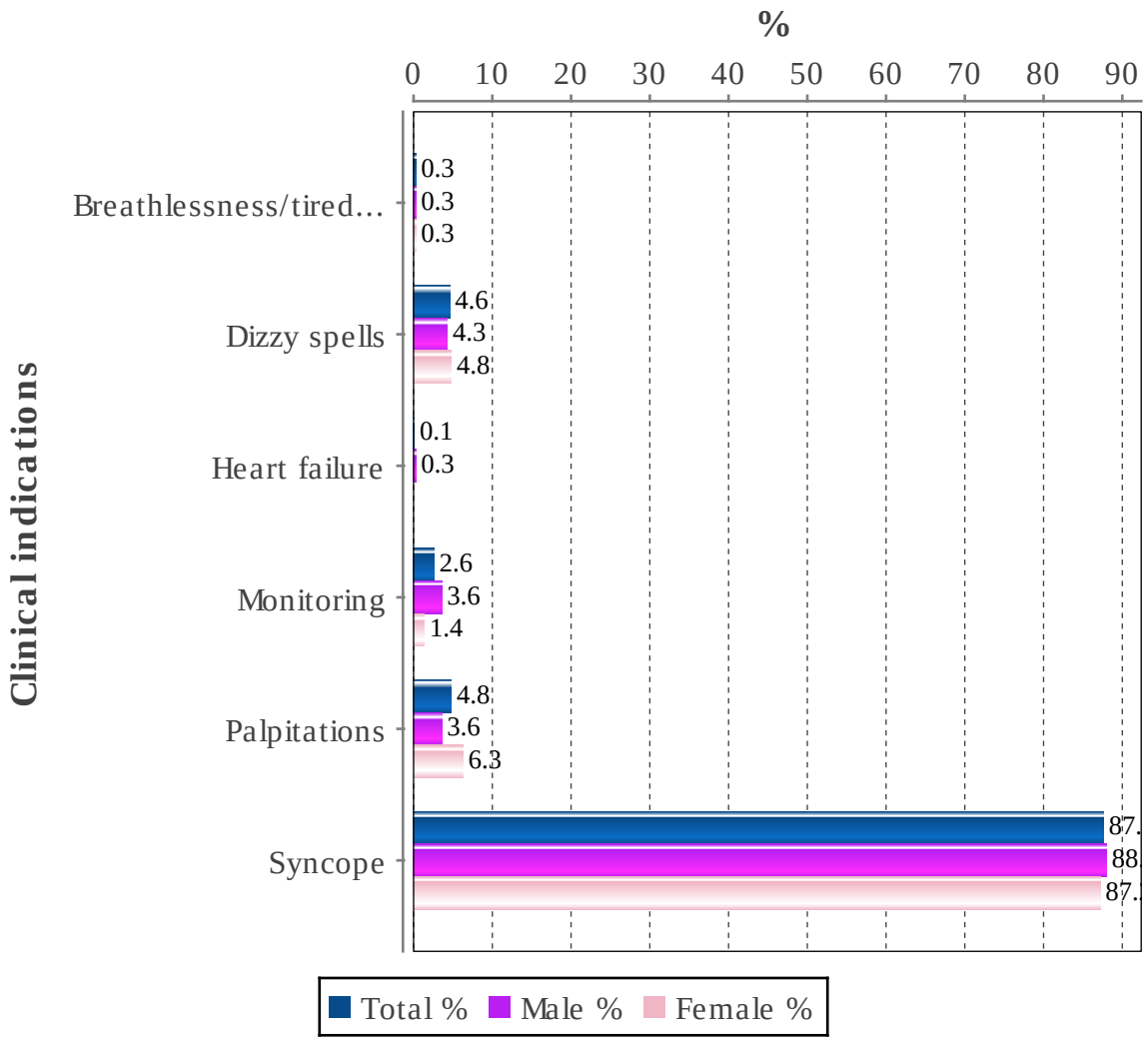


All implant



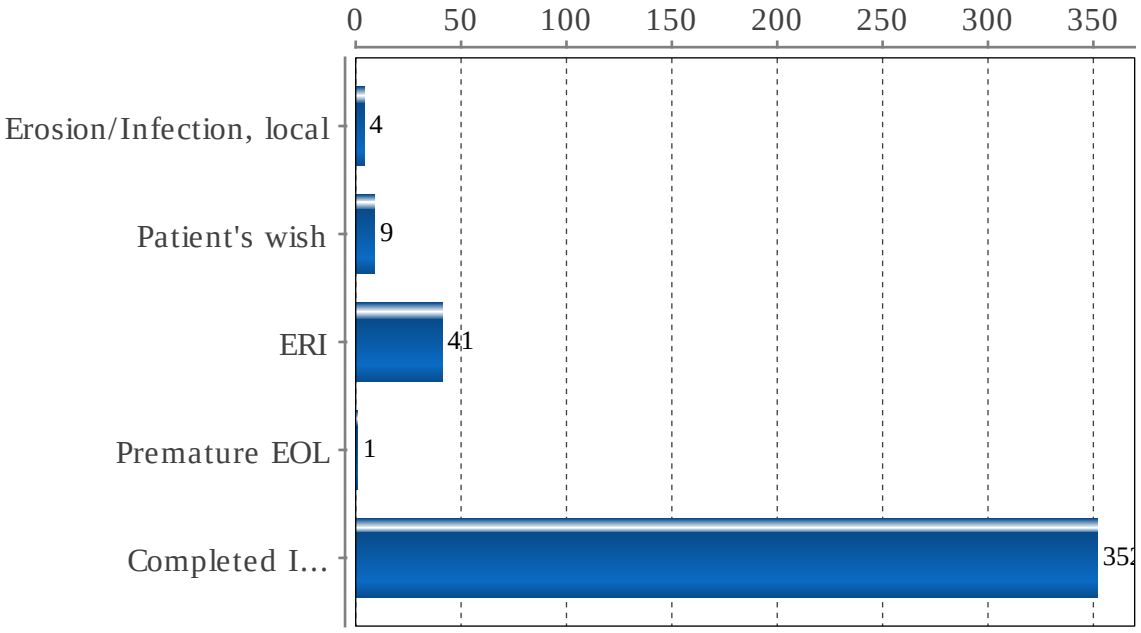
Main symptom for implanting ILR

Indication	Total %	Male %	Female %
Breathlessness/tiredness	0.3	0.3	0.3
Dizzy spells	4.6	4.3	4.8
Heart failure	0.1	0.3	0.0
Monitoring	2.6	3.6	1.4
Palpitations	4.8	3.6	6.3
Syncope	87.6	88.0	87.2



Reason for generator removal

Reason	No	%
Erosion/Infection, local	4	1.0
Patient's wish	9	2.2
ERI	41	10.1
Premature EOL	1	0.2
Completed ILR investigation	352	86.5

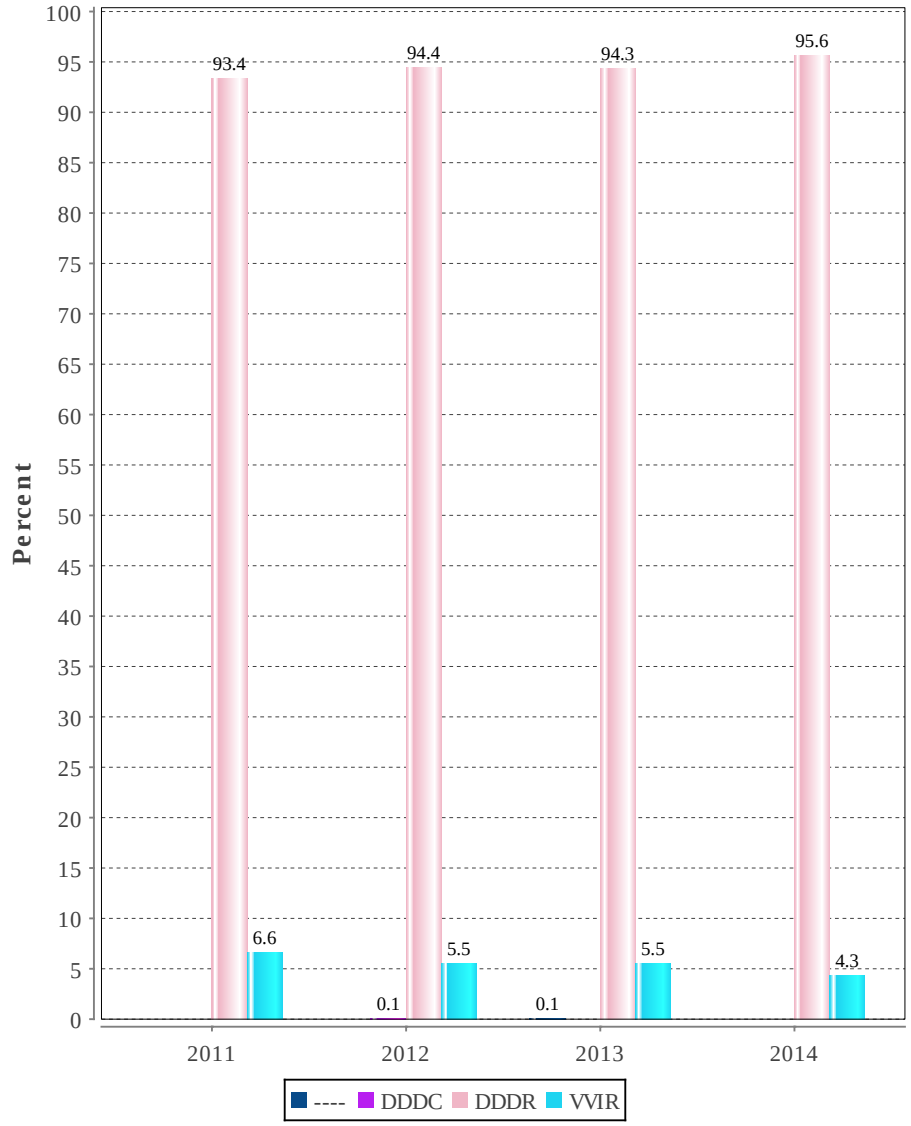


Investigation after first ILR implant in % of completed ILR investigation

Action	No	%
Pacemaker implant	175	49.7
ICD implant	10	2.8
New ILR implant	8	2.3

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

Mode %	2011	2012	2013	2014
----	0.0	0.0	0.1	0.0
DDDC	0.0	0.1	0.0	0.0
DDDR	93.4	94.4	94.3	95.6
VVIR	6.6	5.5	5.5	4.3



QUALITY – PACEMAKER – AV BLOCK MODES USED PER HOSPITAL

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

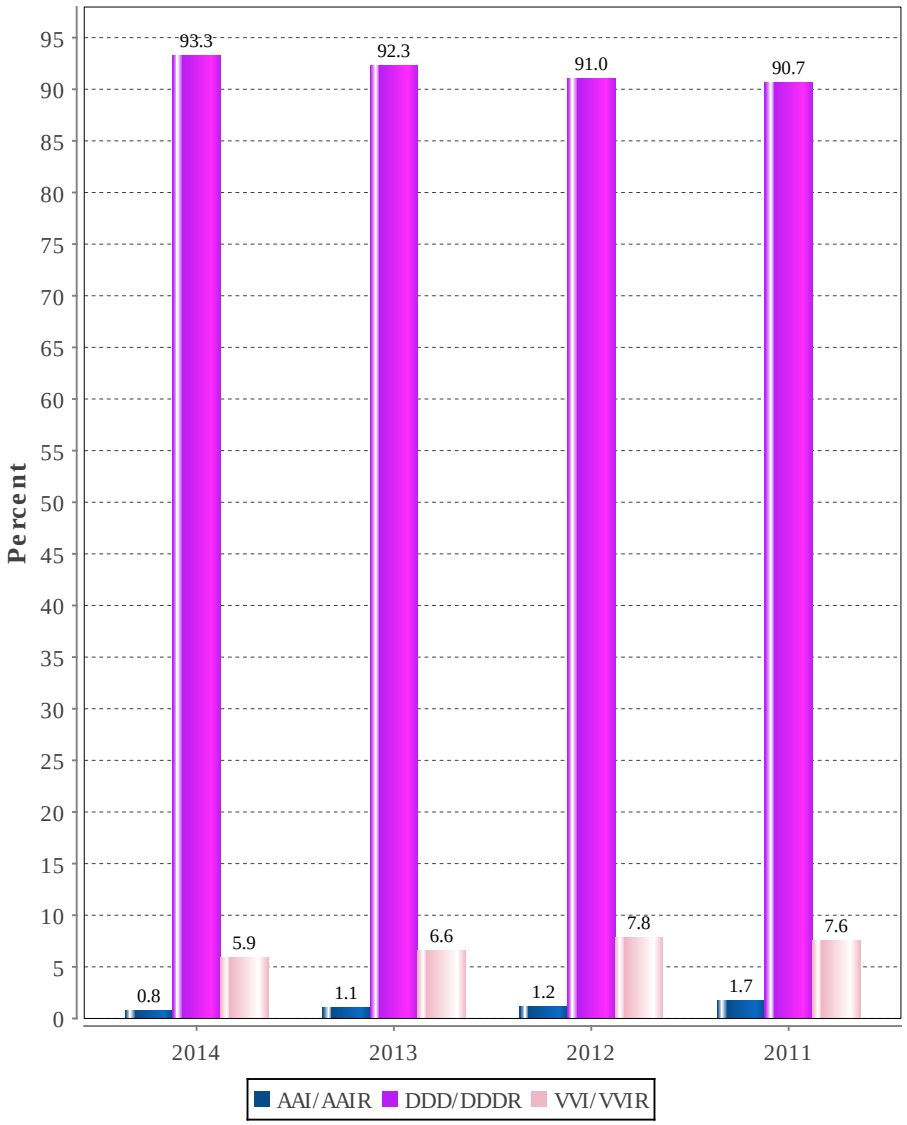
Hospital (%)	DDDR	DDDC	VVIC	VVIR
Akademiska sjukhuset	90.3	-	-	9.7
Alingsås lasarett	96.7	-	-	3.3
Arvika sjukhus	100.0	-	-	-
Blekingesjukhuset	97.3	-	-	2.7
Centrallasarettet Växjö	90.0	-	-	10.0
Centralsjukhuset Karlstad	89.7	-	-	10.3
Centralsjukhuset Västerås	93.8	-	-	6.3
Danderyds sjukhus	100.0	-	-	-
Drottning Silvias Bus	75.0	-	-	25.0
Falu lasarett	100.0	-	-	-
Hudiksvalls sjukhus	87.5	-	-	12.5
Karolinska Universitetssjukhuset	100.0	-	-	-
Kungälvs sjukhus	100.0	-	-	-
Linköpings Universitetssjukhus	93.7	-	-	6.3
Länssjukhuset Gävle	96.3	-	-	3.8
Länssjukhuset Halmstad	97.7	-	-	2.3
Länssjukhuset Kalmar	76.2	-	-	23.8
Länssjukhuset Ryhov	95.3	-	-	4.7
Mälarsjukhuset	100.0	-	-	-
Norrlands Universitetssjukhus	95.2	-	-	4.8
Oskarshamns sjukhus	88.9	-	-	11.1
Sahlgrenska Universitetssjukhuset	96.6	-	-	3.4
Sahlgrenska Universitetssjukhuset /Östra	93.5	-	-	6.5
Skaraborgs sjukhus Skövde	98.8	-	-	1.2
Skellefteå lasarett	88.2	-	-	11.8
Skånes universitetssjukhus, Lund	97.8	-	0.4	1.9
Skånes universitetssjukhus, Malmö	96.9	-	-	3.1
Sollefteå sjukhus	85.7	-	-	14.3
St Görans sjukhus	97.3	-	-	2.7
Sunderby sjukhus	93.2	-	-	6.8
Sundsvalls sjukhus	86.4	-	-	13.6
Södersjukhuset	96.7	-	-	3.3
Södra Älvsborgs sjukhus	98.5	-	-	1.5
Torsby sjukhus	75.0	-	-	25.0
Trollhättan, NÄL	95.7	-	-	4.3
Universitetssjukhuset Örebro	97.3	-	-	2.7
Varbergs sjukhus	95.1	-	-	4.9
Visby lasarett	73.7	-	-	26.3
Vrinnevisjukhuset	92.2	-	-	7.8
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 (%)
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	-	-	-	-
	VVIR	5.6	4.2	7.1	9.9
2012	DDDR	94.4	95.4	94.2	89.2
	DDDC	0.1	-	0.2	-
	VVIC	-	-	-	-

Use of pacing mode for Sinus Node Disease, historical data

Mode (%)	2014	2013	2012	2011
AAI/AAIR	0.8	1.1	1.2	1.7
DDD/DDDR	93.3	92.3	91.0	90.7
VVI/VVIR	5.9	6.6	7.8	7.6



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 %
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 (%)	DDDR	DDDC	VVIC	VVIR	AAIC	AAIR
Akademiska sjukhuset	95.1	-	-	4.9	-	-
Alingsås lasarett	93.3	-	-	6.7	-	-
Arvika sjukhus	85.7	-	-	14.3	-	-
Blekingesjukhuset	97.3	-	-	2.7	-	-
Centrallasarettet Växjö	100.0	-	-	-	-	-
Centralsjukhuset Karlstad	83.0	-	-	15.1	-	1.9
Centralsjukhuset Västerås	97.4	-	-	2.6	-	-
Danderyds sjukhus	99.1	-	-	0.9	-	-
Drottning Silvias Bus	50.0	-	-	-	-	50.0
Falu lasarett	93.2	-	-	6.8	-	-
Hudiksvalls sjukhus	72.7	-	-	27.3	-	-
Karolinska Universitetssjukhuset	98.3	-	-	1.7	-	-
Kungälvs sjukhus	84.6	-	-	11.5	-	3.8
Linköpings Universitetssjukhus	98.8	-	-	1.2	-	-
Länssjukhuset Gävle	86.4	-	-	12.1	-	1.5
Länssjukhuset Halmstad	87.2	-	-	12.8	-	-
Länssjukhuset Kalmar	44.4	-	-	44.4	-	11.1
Länssjukhuset Ryhov	85.3	-	-	14.7	-	-
Mälarsjukhuset	98.6	-	-	1.4	-	-
Norrlands Universitetssjukhus	90.2	-	-	7.3	-	2.4
Oskarshamns sjukhus	70.0	-	-	30.0	-	-
Sahlgrenska Universitetssjukhuset	93.8	-	-	4.9	-	1.2
Sahlgrenska Universitetssjukhuset /Östra	89.7	-	-	6.9	-	3.4
Skaraborgs sjukhus Skövde	98.4	-	-	1.6	-	-
Skellefteå lasarett	75.0	-	-	25.0	-	-
Skånes universitetssjukhus, Lund	95.3	-	-	2.2	-	2.6
Skånes universitetssjukhus, Malmö	99.0	-	-	1.0	-	-
Sollefteå sjukhus	66.7	-	-	33.3	-	-
St Görans sjukhus	94.4	-	-	5.6	-	-
Sunderby sjukhus	97.4	-	-	2.6	-	-
Sundsvalls sjukhus	94.1	-	-	5.9	-	-
Södersjukhuset	95.3	-	-	2.4	-	2.4
Södra Älvsborgs sjukhus	96.6	-	-	3.4	-	-
Torsby sjukhus	77.8	-	-	22.2	-	-
Trollhättan, NÄL	96.8	-	-	3.2	-	-
Universitetssjukhuset Örebro	100.0	-	-	-	-	-
Varbergs sjukhus	83.8	-	-	13.5	-	2.7
Visby lasarett	100.0	-	-	-	-	-
Vrinnevisjukhuset	90.6	-	-	9.4	-	-
Västerviks sjukhus	83.3	-	-	16.7	-	-
Örnsköldsviks sjukhus	100.0	-	-	-	-	-
Östersunds sjukhus	79.3	-	-	20.7	-	-

Dislocation rate for different lead types in atrial or ventricular placement. Based on all implants implanted 2005 and later and explanted/corrected 2014 or earlier

Type	Right atrium %	Right ventricle %	Left ventricle %	Total %
Fixed screw	1.6	1.2	167.2	2.4
Retractable screw	1.6	1.2	167.2	2.4
Passive	3.5	1.7	0.7	2.2
All	1.7	1.3	18.8	2.3

Extractions per hospital

Hospital	No of leads
Akademiska sjukhuset	92
Blekingesjukhuset	4
Centralsjukhuset Karlstad	3
Danderyds sjukhus	2
Karolinska Solna	212
Kungälvs sjukhus	1
Länssjukhuset Gävle	2
Länssjukhuset Kalmar	3
Länssjukhuset Ryhov	1
Linköpings universitetssjukhus	7
Mälarsjukhuset	1
Norrlands Universitetssjukhus	2
Sahlgrenska universitetssjukhuset	98
Skaraborgs sjukhus Skövde	2
Skånes universitetssjukhus, Lund	15
Skånes universitetssjukhus, Malmö	3
Skellefteå lasarett	2
Södersjukhuset	5
Sunderby sjukhus	8
Universitetssjukhuset Örebro	3

Extractions per type

Type	Extractions
ICD lead	95
Pacemaker lead	371

Extractions per model (more then 5 extractions)

Manfacturer	Model	Extractions
Boston Scientific	4470	10
Boston Scientific	4474	9
Medtronic	4074 Capsure	8
Medtronic	4076 CapSure	52
Medtronic	4193 Attain OTW	6
Medtronic	5076 CapSureFix MRI	15
Medtronic	6944 Sprint	7
Medtronic	6947 Sprint Quattro	6
Medtronic	6948 Sprint F	7
Medtronic	6949 Sprint F	7
Medtronic	N/A	7
St. Jude Medical	1056T QuickSite	9
St. Jude Medical	1258T QuickFlex	7
St. Jude Medical	1388T Tendril DX	9
St. Jude Medical	1458Q Quartet	6
St. Jude Medical	1488T TendrilSDX	6
St. Jude Medical	1646T Isoflex	10
St. Jude Medical	1688T TendrilSDX	21
St. Jude Medical	1948 Isoflex	7
St. Jude Medical	1999 Optisense	24
St. Jude Medical	2088TC Tendril	42
St. Jude Medical	7120 Durata	7
St. Jude Medical	7122 Durata	6
St. Jude Medical	7122Q Durata	14

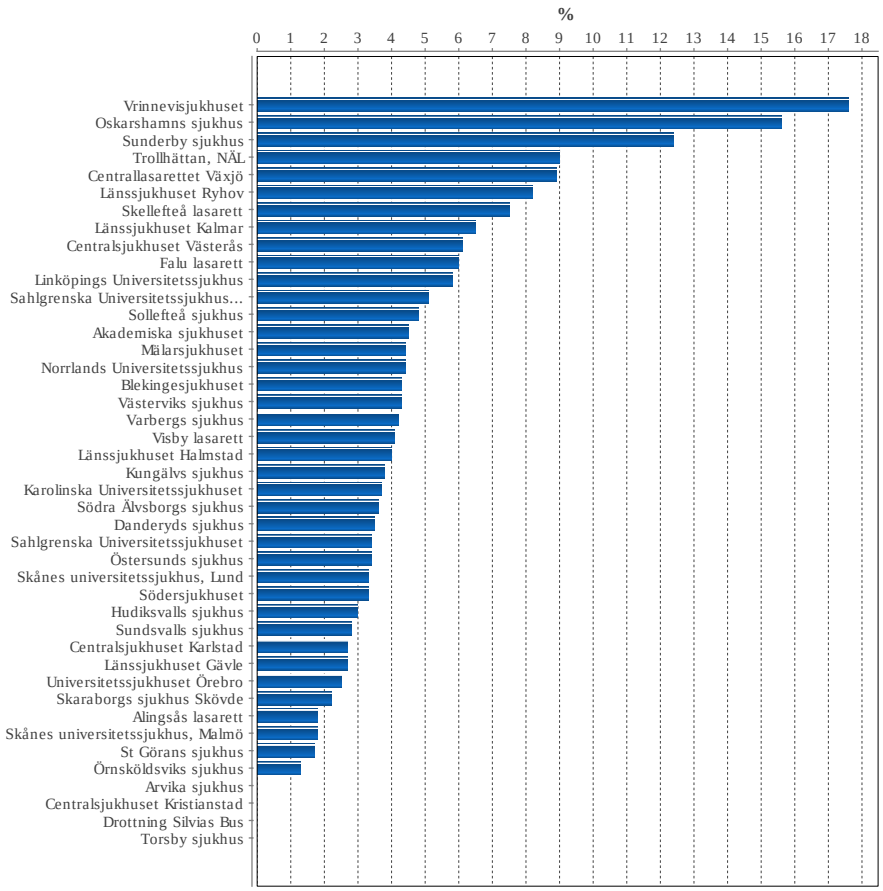
Extractions per reason

Reason	Extractions
Ceased indication for ICD therapy	6
Ceased indication for PM therapy	16
Conductor break	3
Connector failure	1
Elective/system change	19
Electrical dysfunction	70
Extracardial stimulation	1
Heart transplant	11
Infection/Ulceration, local	153
Infection/Ulceration, systemic	133

Reason	Extractions
Insulation failure	2
Lead dislocation	17
Patient's wish	12
Perforation/Tamponade	4
Preventive	15
Venous access	3

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

Complication	2013 %	2014 %	Based on
Discontinued surgery due to hemodynamic reasons	0.0	0.0	A
Pericardial fluid	0.0	0.1	A
Electrical dysfunction	0.9	1.0	B
Local bleeding	0.2	0.3	A
Perforation/tamponade	0.4	0.3	B
Pneumothorax	0.4	0.6	B
Infection/perforation	0.5	0.5	A
Electrode displacement	2.3	1.9	B
Other	0.6	0.6	A
Subclavian or other related thrombosis	0.1	0.1	B
Death	0.0	0.0	A
Stroke	0.0	0.0	A
Total	5.4	5.4	
Based on A=9375 (all implants) alternatively B=7293 (first implants + lead replacement) validated events			


%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Vrinnevisjukhuset
Oskarshamns sjukhus
Sunderby sjukhus
Trollhättan, NÄL
Centrallasarettet Växjö
Länssjukhuset Ryhov
Skellefteå lasarett
Länssjukhuset Kalmar
Centralsjukhuset Västerås
Falu lasarett
Linköpings Universitetssjukhus
Sahlgrenska Universitetssjukhus...
Sollefteå sjukhus
Akademiska sjukhuset
Mälarsjukhuset
Norrlands Universitetssjukhus
Blekingesjukhuset
Västerviks sjukhus
Varbergs sjukhus
Visby lasarett
Länssjukhuset Halmstad
Kungälvs sjukhus
Karolinska Universitetssjukhuset
Södra Älvsborgs sjukhus
Danderyds sjukhus
Sahlgrenska Universitetssjukhuset
Östersunds sjukhus
Skånes universitetssjukhus, Lund
Södersjukhuset
Hudiksvalls sjukhus
Sundsvalls sjukhus
Centralsjukhuset Karlstad
Länssjukhuset Gävle
Universitetssjukhuset Örebro
Skaraborgs sjukhus Skövde
Alingsås lasarett
Skånes universitetssjukhus, Malmö
St Görans sjukhus
Örnsköldsviks sjukhus
Arvika sjukhus
Centralsjukhuset Kristianstad
Drottning Silvias Bus
Torsby sjukhus

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	381	-	-	0.5	1.3	1.0	0.3
Alingsås lasarett	109	-	-	0.9	0.9	-	-
Arvika sjukhus	31	-	-	-	-	-	-
Blekingesjukhuset	254	-	-	1.2	2.4	-	-
Centrallasarettet Växjö	158	-	-	1.9	4.4	-	-
Centralsjukhuset Karlstad	186	-	-	1.1	1.6	-	-
Centralsjukhuset Kristianstad	1	-	-	-	-	-	-
Centralsjukhuset Västerås	212	-	-	-	2.4	-	-
Danderyds sjukhus	462	-	-	0.9	1.3	0.2	-
Drottning Silvias Bus	12	-	-	-	-	-	-
Falu lasarett	316	-	-	1.3	2.8	0.9	-
Hudiksvalls sjukhus	67	-	-	1.5	1.5	-	-
Karolinska Universitetssjukhuset	643	-	-	0.2	0.9	0.9	-
Kungälvs sjukhus	130	-	-	1.5	0.8	-	-
Linköpings Universitetssjukhus	362	-	-	1.7	1.4	0.6	0.6
Länssjukhuset Gävle	292	-	-	0.7	0.7	0.7	-
Länssjukhuset Halmstad	125	-	-	-	2.4	0.8	-
Länssjukhuset Kalmar	92	-	-	1.1	3.3	-	-
Länssjukhuset Ryhov	294	-	-	0.3	3.1	1.0	-
Mälarsjukhuset	248	-	-	1.2	2.0	-	-
Norrlands Universitetssjukhus	229	-	-	0.4	2.6	-	-
Oskarshamns sjukhus	32	-	-	3.1	-	3.1	-
Sahlgrenska Universitetssjukhuset	496	-	-	0.6	1.2	-	-
Sahlgrenska Universitetssjukhuset /Östra	137	-	-	-	-	0.7	-
Skaraborgs sjukhus Skövde	315	-	0.3	0.3	-	-	-
Skellefteå lasarett	67	-	-	1.5	3.0	-	-
Skånes universitetssjukhus, Lund	880	-	-	0.1	2.2	0.7	-
Skånes universitetssjukhus, Malmö	385	-	-	-	1.3	-	-
Sollefteå sjukhus	42	-	-	-	-	4.8	-
St Görans sjukhus	294	-	-	-	-	0.3	0.3
Sunderby sjukhus	275	-	-	-	1.1	0.7	-
Sundsvalls sjukhus	211	-	-	-	1.4	0.5	-
Södersjukhuset	396	-	-	1.5	0.3	0.5	-
Södra Älvsborgs sjukhus	220	-	-	0.9	1.4	0.9	-
Torsby sjukhus	39	-	-	-	-	-	-
Trollhättan, NÄL	346	0.3	-	4.0	1.4	0.9	0.6
Universitetssjukhuset Örebro	244	-	-	0.4	-	0.4	-
Varbergs sjukhus	144	-	-	0.7	1.4	-	-
Visby lasarett	49	-	-	-	-	-	-
Vrinnevisjukhuset	142	-	-	5.6	4.9	3.5	-
Västerviks sjukhus	47	-	-	-	2.1	-	-
Örnsköldsviks sjukhus	80	-	-	-	-	-	-
Östersunds sjukhus	146	-	-	-	1.4	-	-

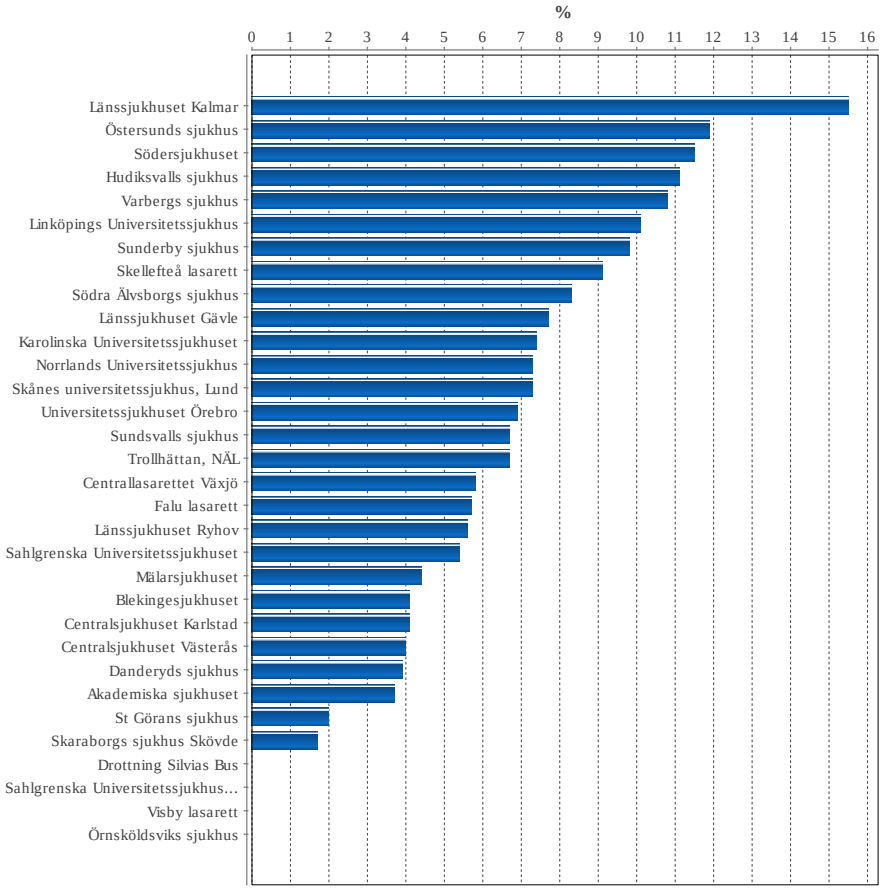
QUALITY – PACEMAKER – COMPLICATIONS PER HOSPITAL

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	381	-	-	0.8	0.5	-	-	4.5
Alingsås lasarett	109	-	-	-	-	-	-	1.8
Arvika sjukhus	31	-	-	-	-	-	-	-
Blekingesjukhuset	254	0.4	-	-	0.4	-	-	4.3
Centrallasarettet Växjö	158	0.6	1.3	-	0.6	-	-	8.9
Centralsjukhuset Karlstad	186	-	-	-	-	-	-	2.7
Centralsjukhuset Kristianstad	1	-	-	-	-	-	-	-
Centralsjukhuset Västerås	212	0.5	-	-	1.9	0.9	0.5	6.1
Danderyds sjukhus	462	-	0.6	0.4	-	-	-	3.5
Drottning Silvias Bus	12	-	-	-	-	-	-	-
Falu lasarett	316	-	-	0.3	0.6	-	-	6.0
Hudiksvalls sjukhus	67	-	-	-	-	-	-	3.0
Karolinska Universitetssjukhuset	643	0.6	0.3	0.2	0.6	-	-	3.7
Kungälvs sjukhus	130	-	1.5	-	-	-	-	3.8
Linköpings Universitetssjukhus	362	0.6	-	0.3	0.6	0.3	-	5.8
Länssjukhuset Gävle	292	0.3	-	-	-	0.3	-	2.7
Länssjukhuset Halmstad	125	-	-	-	0.8	-	-	4.0
Länssjukhuset Kalmar	92	1.1	-	-	1.1	-	-	6.5
Länssjukhuset Ryhov	294	0.3	1.4	-	2.0	-	-	8.2
Mälarsjukhuset	248	0.4	0.4	-	0.4	-	-	4.4
Norrlands Universitetssjukhus	229	0.4	-	-	0.9	-	-	4.4
Oskarshamns sjukhus	32	-	3.1	-	3.1	3.1	-	15.6
Sahlgrenska Universitetssjukhuset	496	0.2	0.6	0.6	0.2	-	-	3.4
Sahlgrenska Universitetssjukhuset /Östra	137	-	3.6	-	0.7	-	-	5.1
Skaraborgs sjukhus Skövde	315	1.0	0.6	-	-	-	-	2.2
Skellefteå lasarett	67	-	1.5	-	1.5	-	-	7.5
Skånes universitetssjukhus, Lund	880	0.1	0.2	-	-	-	-	3.3
Skånes universitetssjukhus, Malmö	385	-	0.3	-	0.3	-	-	1.8
Sollefteå sjukhus	42	-	-	-	-	-	-	4.8
St Görans sjukhus	294	0.7	-	-	0.3	-	-	1.7
Sunderby sjukhus	275	0.4	9.1	-	1.1	-	-	12.4
Sundsvalls sjukhus	211	-	0.5	-	0.5	-	-	2.8
Södersjukhuset	396	-	-	0.8	0.3	-	-	3.3
Södra Älvsborgs sjukhus	220	-	-	-	0.5	-	-	3.6
Torsby sjukhus	39	-	-	-	-	-	-	-
Trollhättan, NÄL	346	0.3	0.3	0.3	0.9	-	-	9.0
Universitetssjukhuset Örebro	244	-	-	0.8	0.8	-	-	2.5
Varbergs sjukhus	144	1.4	-	0.7	-	-	-	4.2
Visby lasarett	49	-	2.0	2.0	-	-	-	4.1
Vrinnevisjukhuset	142	1.4	-	0.7	0.7	0.7	-	17.6
Västerviks sjukhus	47	-	2.1	-	-	-	-	4.3
Örnsköldsviks sjukhus	80	1.3	-	-	-	-	-	1.3
Östersunds sjukhus	146	0.7	-	-	1.4	-	-	3.4

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

Complication	2013 %	2014 %
Discontinued surgery due to hemodynamic reasons	0.2	0.3
Electrical dysfunction	1.2	1.0
Local bleeding	0.7	0.9
Perforation/tamponade	0.3	0.7
Pneumothorax	0.3	0.5
Infection/perforation	2.0	1.7
Electrode displacement	1.7	2.9
Other	1.5	1.1
Subclavian or other related thrombosis	0.2	0.1
Death	0.0	0.0
Pericardial fluid	0.0	0.1
Stroke	0.0	0.0
Total	8.1	9.3
Based on 1501 (all implants) alternatively 1642 (first implants + lead replacements) validated events		


%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Länssjukhuset Kalmar
Östersunds sjukhus
Södersjukhuset
Hudiksvalls sjukhus
Varbergs sjukhus
Linköpings Universitetssjukhus
Sunderby sjukhus
Skellefteå lasarett
Södra Älvsborgs sjukhus
Länssjukhuset Gävle
Karolinska Universitetssjukhuset
Norrlands Universitetssjukhus
Skånes universitetssjukhus, Lund
Universitetssjukhuset Örebro
Sundsvalls sjukhus
Trollhättan, NÄL
Centrallasarettet Växjö
Falu lasarett
Länssjukhuset Ryhov
Sahlgrenska Universitetssjukhuset
Mälarsjukhuset
Blekingesjukhuset
Centralsjukhuset Karlstad
Centralsjukhuset Västerås
Danderyds sjukhus
Akademiska sjukhuset
St Görans sjukhus
Skaraborgs sjukhus Skövde
Drottning Silvias Bus
Sahlgrenska Universitetssjukhus...
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	109	-	-	-	0.9	1.8	-	-
Blekingesjukhuset	49	-	-	4.1	-	-	-	-
Centrallasarettet Växjö	52	-	-	-	1.9	-	-	1.9
Centralsjukhuset Karlstad	49	-	-	-	2.0	2.0	-	-
Centralsjukhuset Västerås	50	-	-	-	4.0	-	-	-
Danderyds sjukhus	102	-	-	-	1.0	1.0	-	1.0
Drottning Silvias Bus	3	-	-	-	-	-	-	-
Falu lasarett	70	-	-	1.4	1.4	-	-	-
Hudiksvalls sjukhus	9	-	-	-	-	11.1	-	-
Karolinska Universitetssjukhuset	258	-	-	0.8	1.6	2.3	0.4	1.2
Linköpings Universitetssjukhus	139	-	-	2.2	3.6	-	-	0.7
Länssjukhuset Gävle	78	-	-	2.6	1.3	-	1.3	1.3
Länssjukhuset Kalmar	71	-	-	-	-	4.2	-	2.8
Länssjukhuset Ryhov	54	-	-	-	1.9	-	-	1.9
Mälarsjukhuset	45	-	-	-	2.2	-	-	-
Norrlands Universitetssjukhus	82	-	-	2.4	1.2	2.4	-	-
Sahlgrenska Universitetssjukhuset	111	-	-	-	2.7	0.9	-	-
Sahlgrenska Universitetssjukhuset /Östra	6	-	-	-	-	-	-	-
Skaraborgs sjukhus Skövde	58	-	-	-	-	-	-	-
Skellefteå lasarett	11	-	-	-	-	9.1	-	-
Skånes universitetssjukhus, Lund	286	-	-	1.0	3.8	1.7	-	0.3
St Görans sjukhus	49	-	-	-	2.0	-	-	-
Sunderby sjukhus	61	-	-	-	1.6	-	-	-
Sundsvalls sjukhus	45	-	2.2	-	2.2	-	-	-
Södersjukhuset	87	-	-	2.3	6.9	-	-	-
Södra Älvsborgs sjukhus	36	-	2.8	-	5.6	-	-	-
Trollhättan, NÄL	45	-	-	4.4	2.2	-	-	-
Universitetssjukhuset Örebro	72	-	-	-	4.2	2.8	-	-
Varbergs sjukhus	74	-	2.7	-	4.1	-	-	1.4
Visby lasarett	6	-	-	-	-	-	-	-
Örnsköldsviks sjukhus	17	-	-	-	-	-	-	-
Östersunds sjukhus	42	-	-	-	-	7.1	-	2.4

QUALITY – ICD – COMPLICATIONS PER HOSPITAL

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

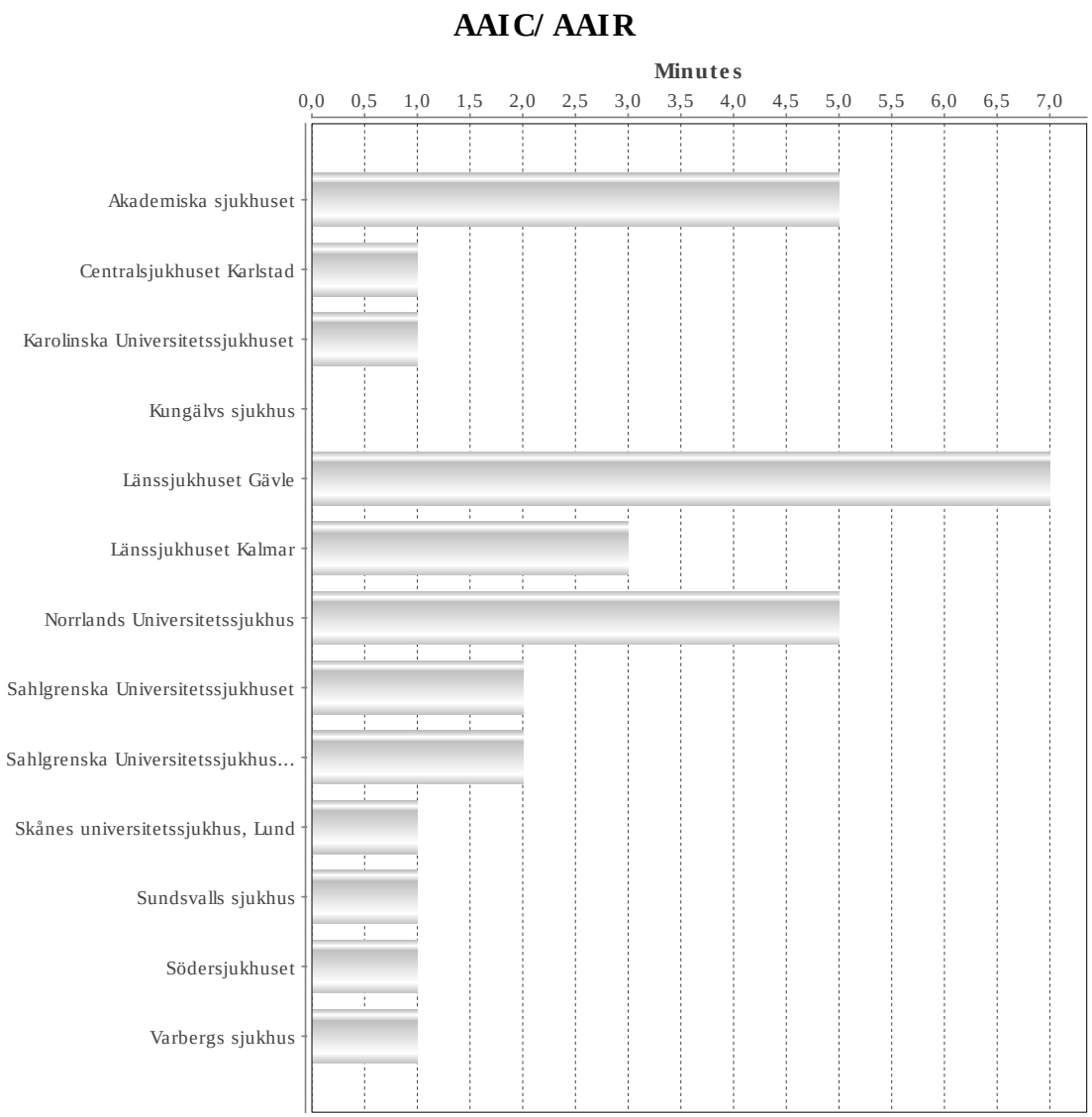
Hospital	No	Ot. %	Pa. %	Tm. %	Pn. %	Pf. %	St. %	All %
Akademiska sjukhuset	109	-	-	-	0.9	-	-	3.7
Blekingesjukhuset	49	-	-	-	-	-	-	4.1
Centrallasarettet Växjö	52	-	-	1.9	-	-	-	5.8
Centralsjukhuset Karlstad	49	-	-	-	-	-	-	4.1
Centralsjukhuset Västerås	50	-	-	-	-	-	-	4.0
Danderyds sjukhus	102	1.0	-	-	-	-	-	3.9
Drottning Silvias Bus	3	-	-	-	-	-	-	-
Falu lasarett	70	-	-	2.9	-	-	-	5.7
Hudiksvalls sjukhus	9	-	-	-	-	-	-	11.1
Karolinska Universitetssjukhuset	258	0.4	-	0.4	0.4	-	-	7.4
Linköpings Universitetssjukhus	139	0.7	-	1.4	0.7	0.7	-	10.1
Länssjukhuset Gävle	78	1.3	-	-	-	-	-	7.7
Länssjukhuset Kalmar	71	1.4	-	4.2	2.8	-	-	15.5
Länssjukhuset Ryhov	54	-	-	-	1.9	-	-	5.6
Mälarsjukhuset	45	-	-	-	-	2.2	-	4.4
Norrlands Universitetssjukhus	82	-	-	-	1.2	-	-	7.3
Sahlgrenska Universitetssjukhuset	111	0.9	-	0.9	-	-	-	5.4
Sahlgrenska Universitetssjukhuset /Östra	6	-	-	-	-	-	-	-
Skaraborgs sjukhus Skövde	58	1.7	-	-	-	-	-	1.7
Skellefteå lasarett	11	-	-	-	-	-	-	9.1
Skånes universitetssjukhus, Lund	286	0.3	-	-	-	-	-	7.3
St Görans sjukhus	49	-	-	-	-	-	-	2.0
Sunderby sjukhus	61	8.2	-	-	-	-	-	9.8
Sundsvalls sjukhus	45	2.2	-	-	-	-	-	6.7
Södersjukhuset	87	-	-	1.1	1.1	-	-	11.5
Södra Älvsborgs sjukhus	36	-	-	-	-	-	-	8.3
Trollhättan, NÄL	45	-	-	-	-	-	-	6.7
Universitetssjukhuset Örebro	72	-	-	-	-	-	-	6.9
Varbergs sjukhus	74	1.4	-	1.4	-	-	-	10.8
Visby lasarett	6	-	-	-	-	-	-	-
Örnsköldsviks sjukhus	17	-	-	-	-	-	-	-
Östersunds sjukhus	42	2.4	-	-	-	-	-	11.9

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	0.3
Electrode displacement	1.5
Infection/perforation	0.3
Local bleeding	0.5
Other	0.5
Perforation/tamponade	-
Pericardial fluid	-
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	1.0
Stroke	-
Subclavian or other related thrombosis	-
Total	4.0
Total no of implants	400

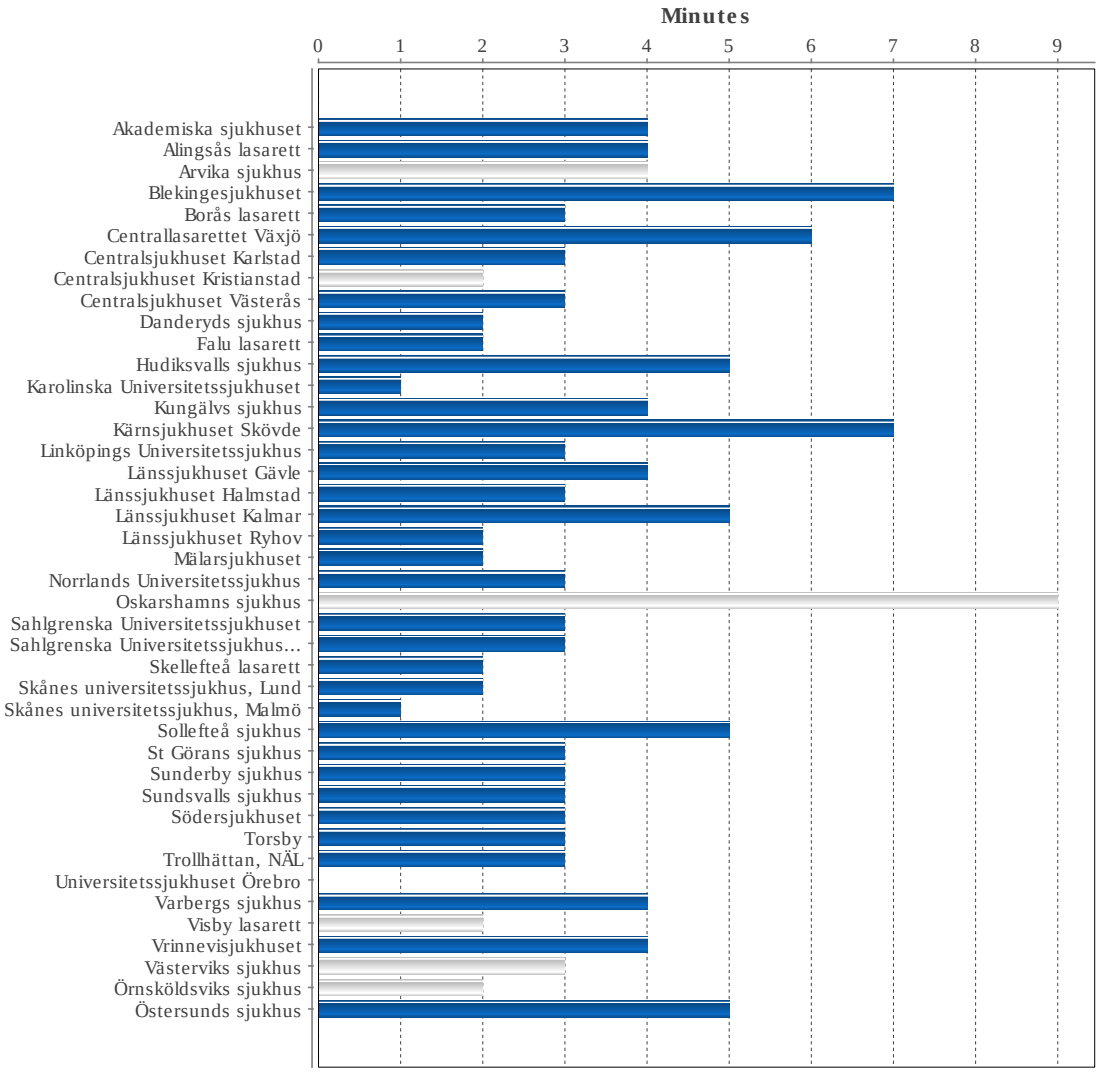
CRT-D Complication	%
Death	-
Discontinued surgery due to hemodynamic reasons	-
Electrical dysfunction	1.1
Electrode displacement	3.1
Infection/perforation	2.0
Local bleeding	0.8
Other	0.3
Perforation/tamponade	0.5
Pericardial fluid	0.2
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	0.7
Stroke	-
Subclavian or other related thrombosis	0.2
Total	8.8
Total no of implants	613

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.



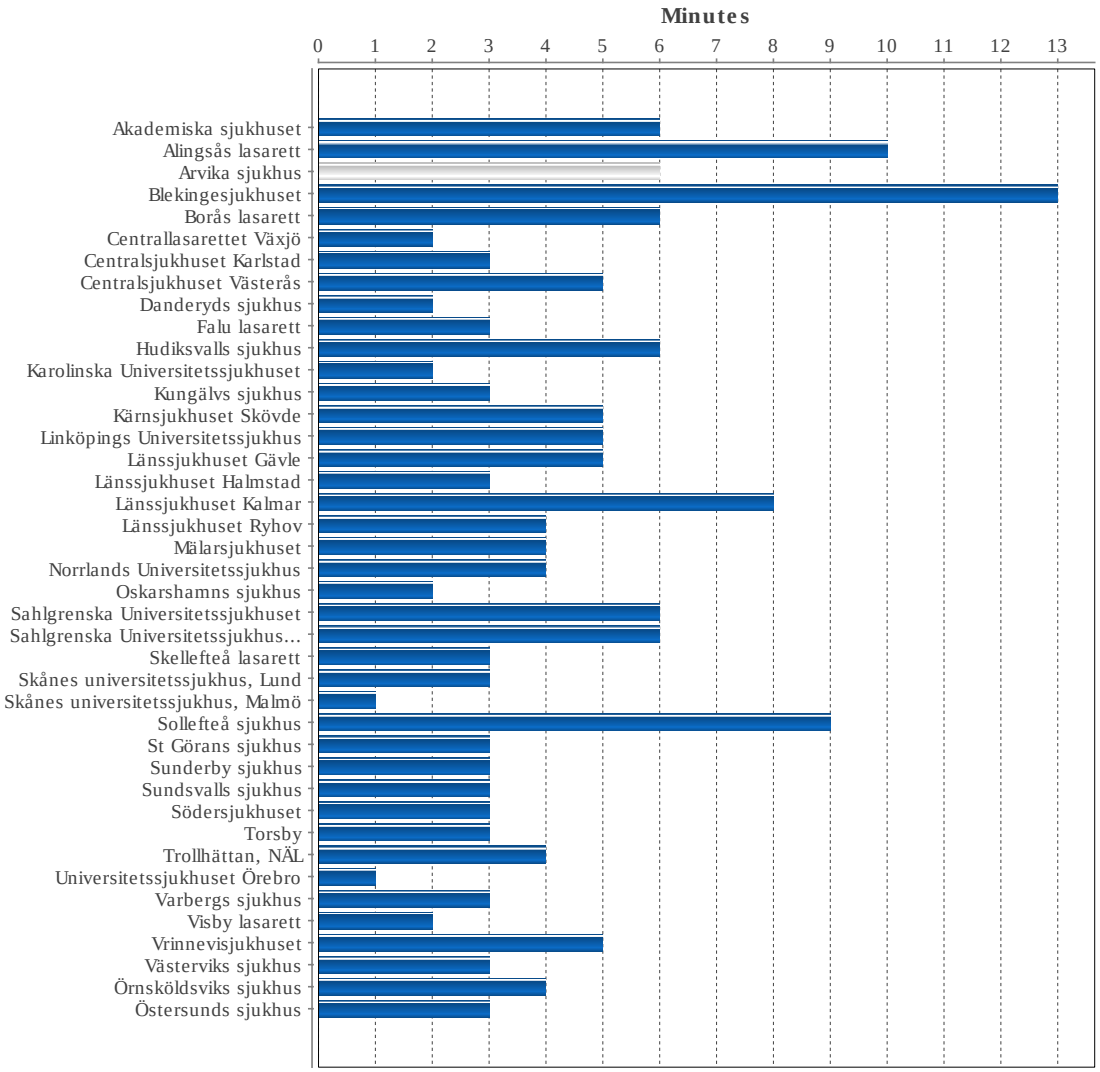
Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVIC/ VVIR



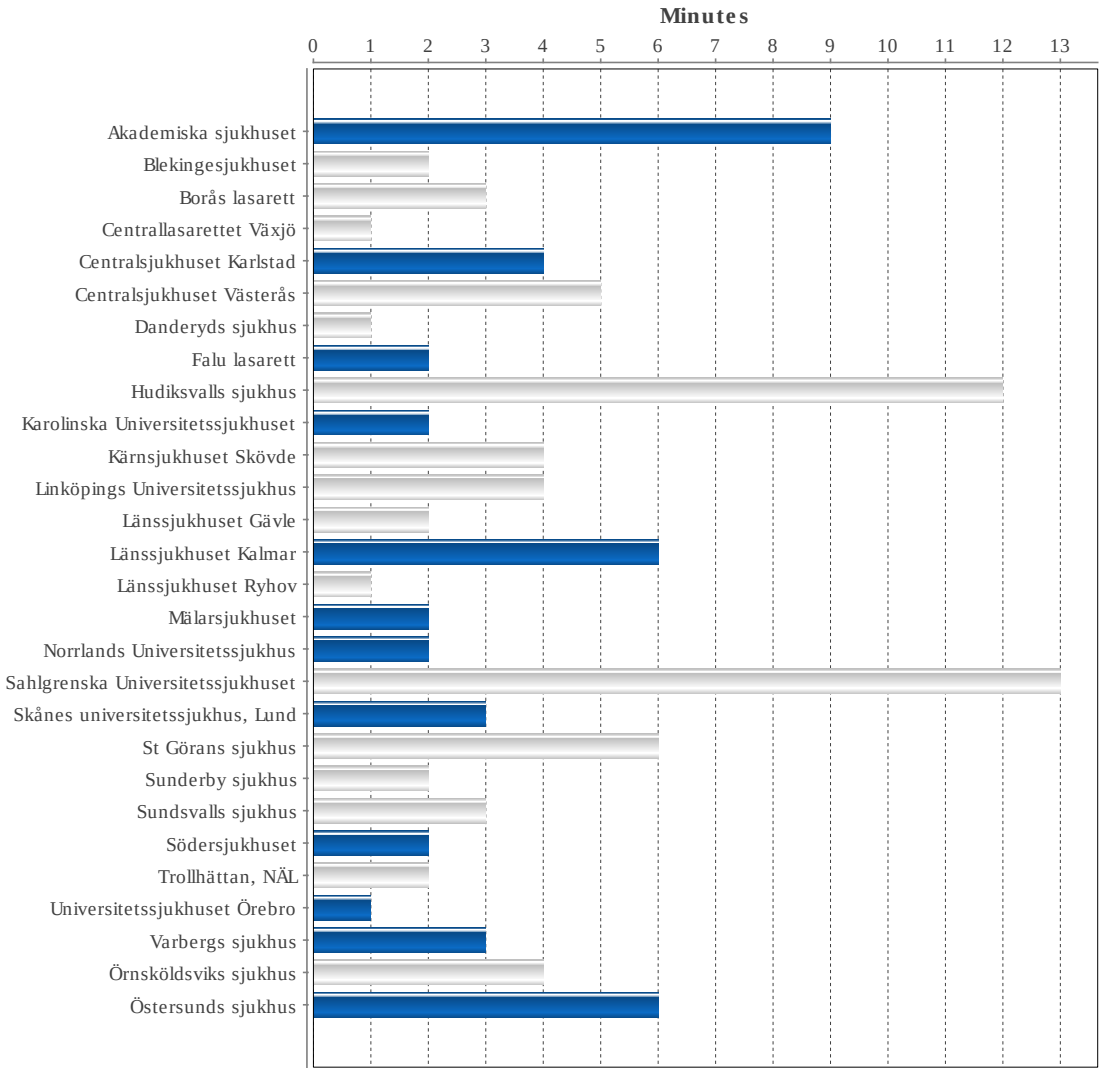
Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

DDDC/ DDDR



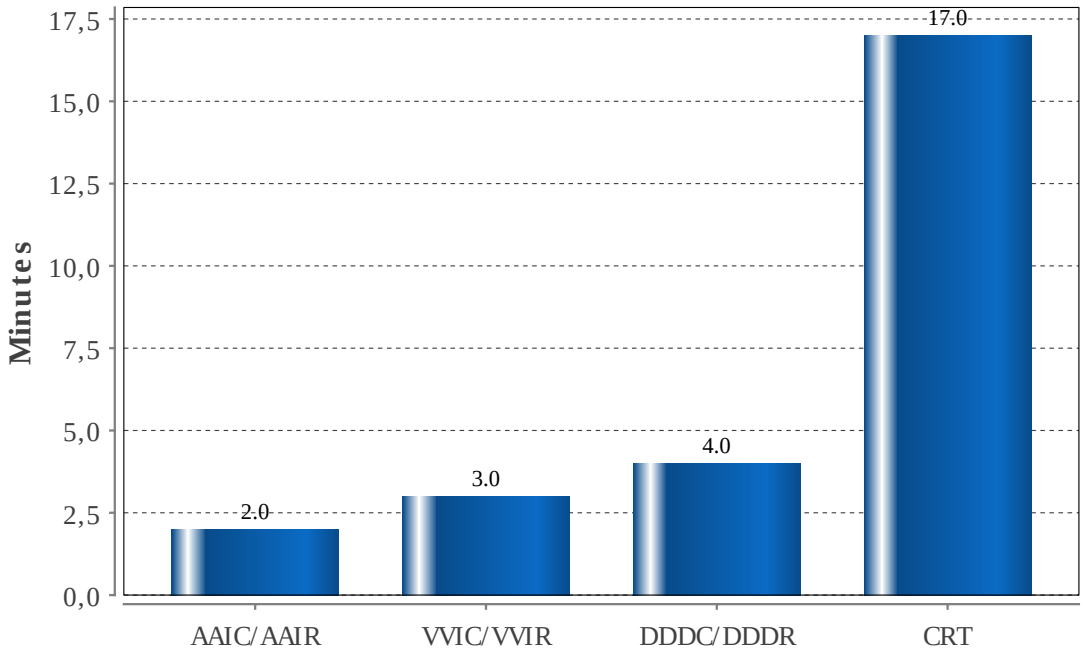
Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

CRT



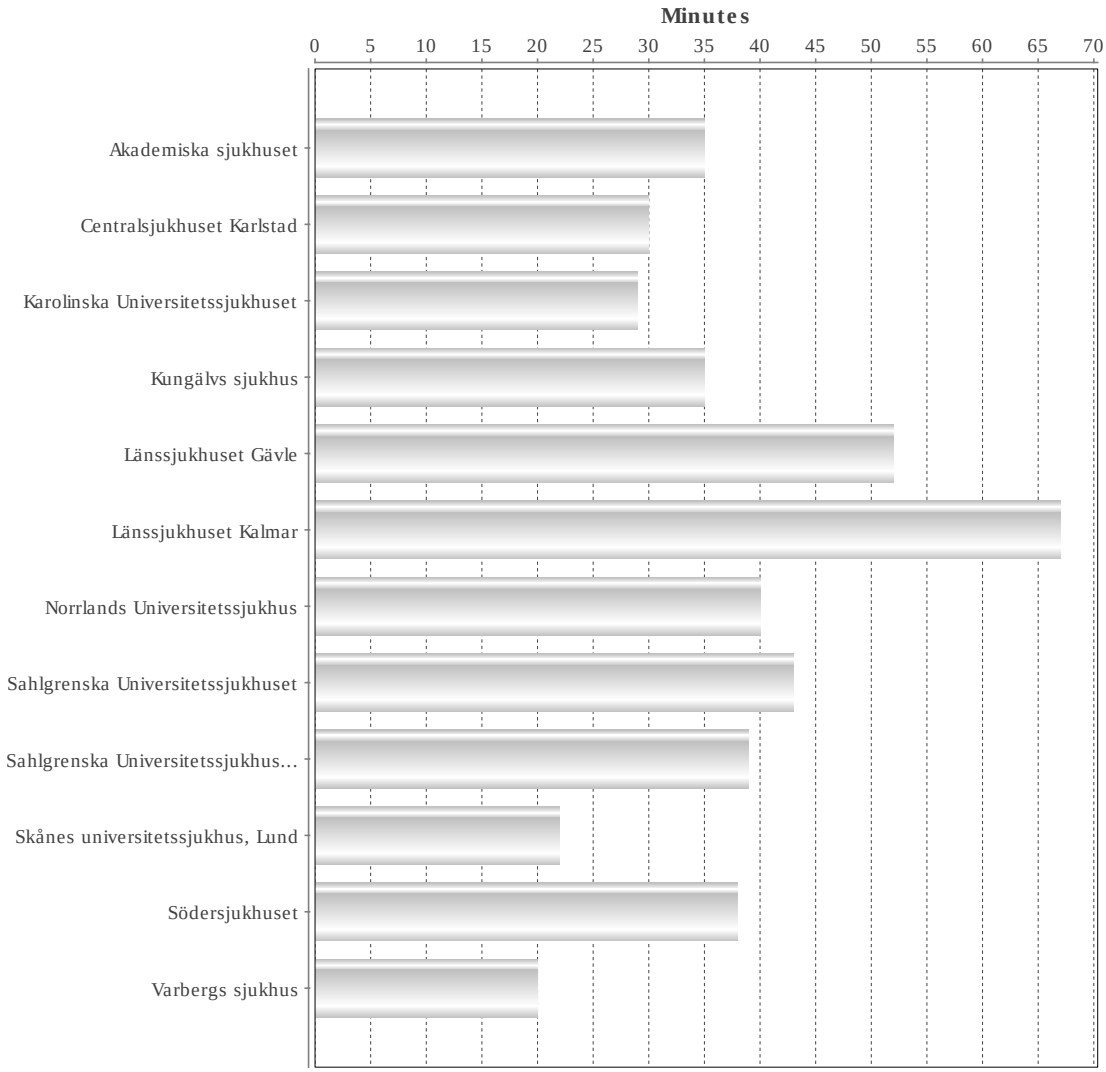
National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
AAIC/AAIR	2.0	1.8
VVIC/VVIR	3.0	5.8
DDDC/DDDR	4.0	10.3
CRT	17.0	14.7



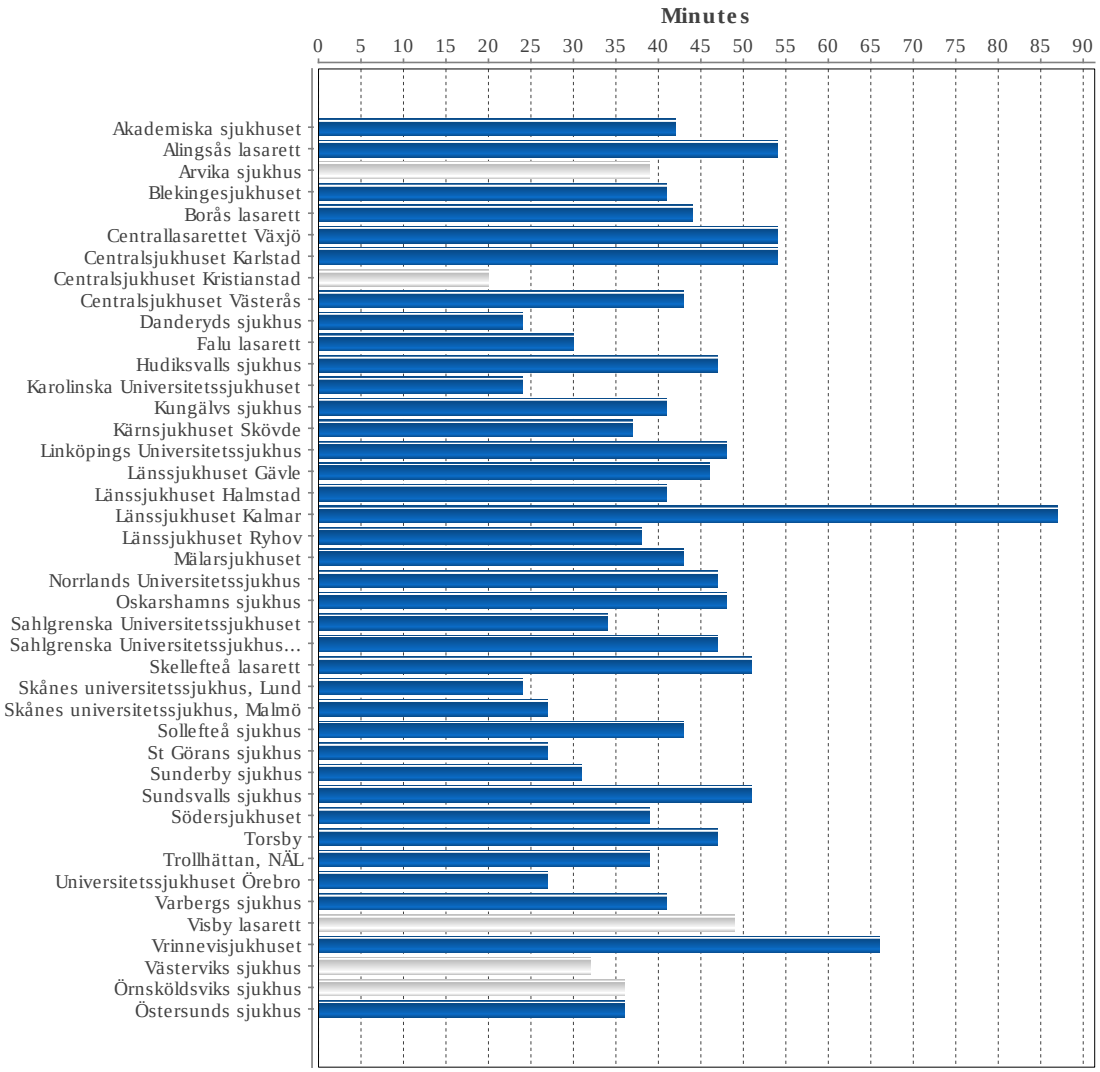
Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

AAI/ AAIR



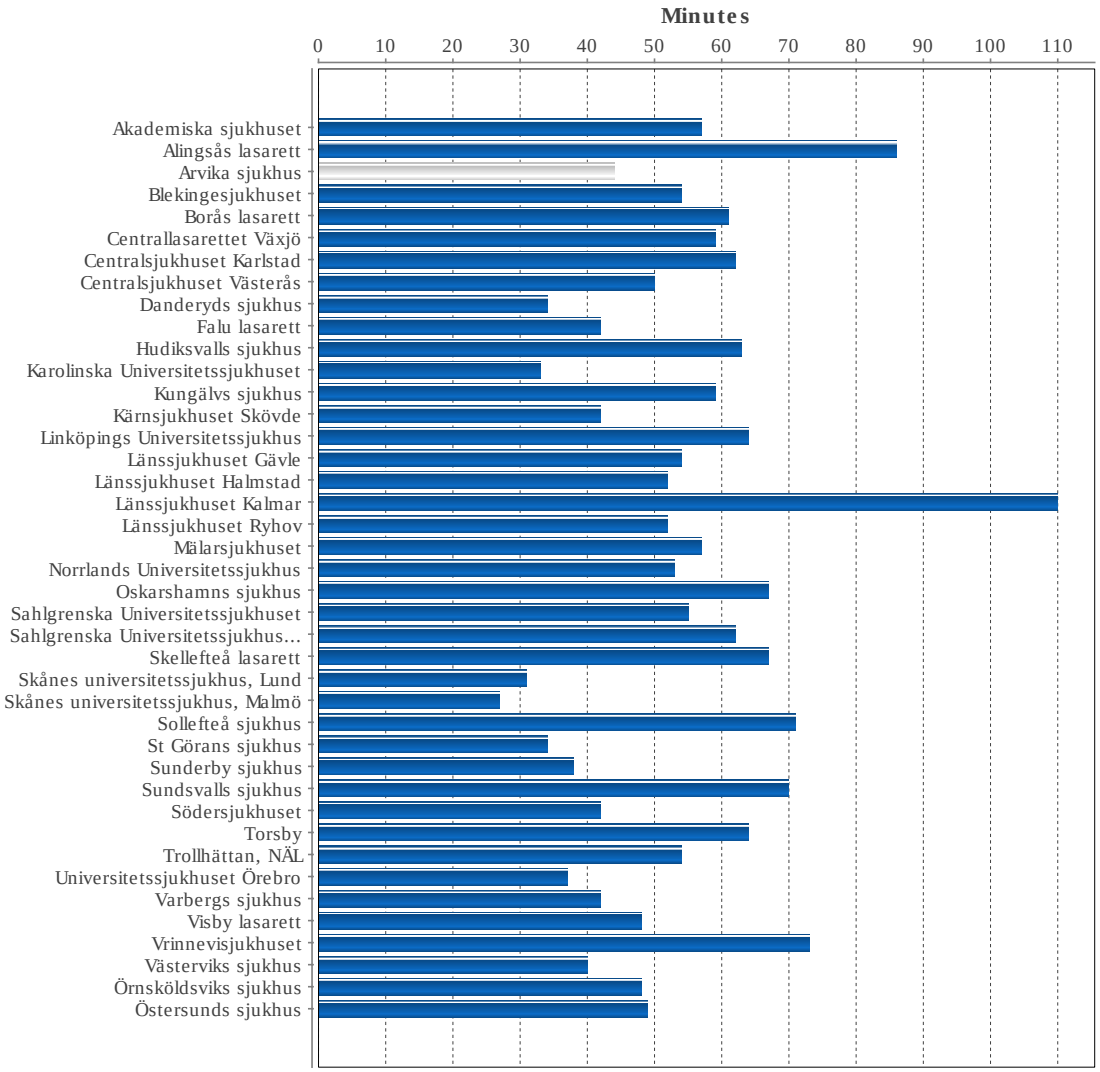
Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI/ VVIR



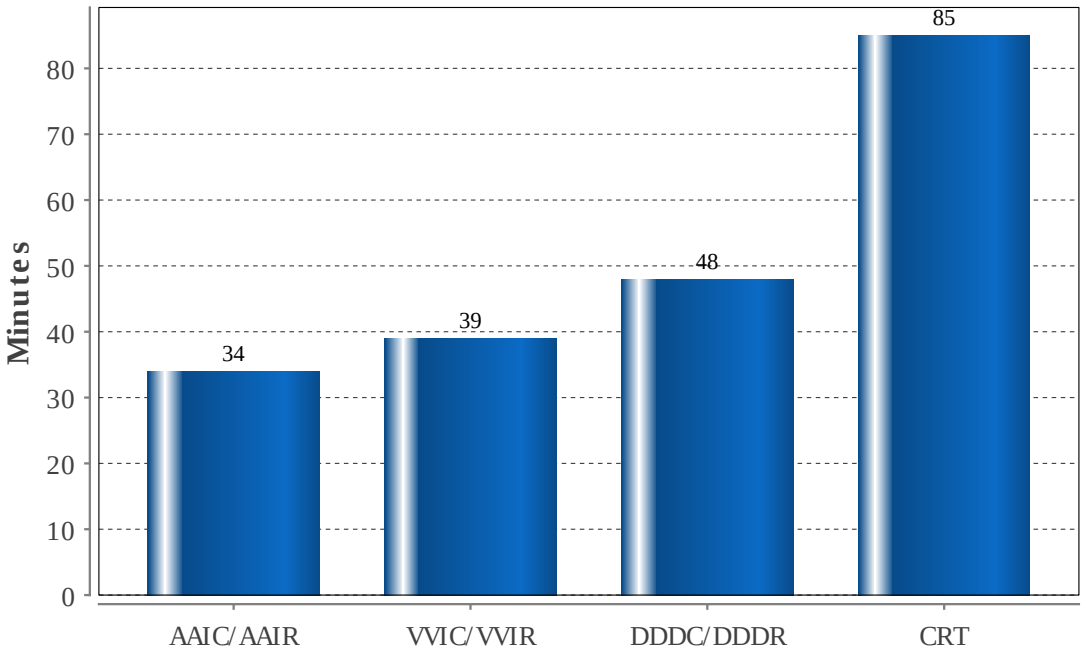
Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

DDD/ DDDR



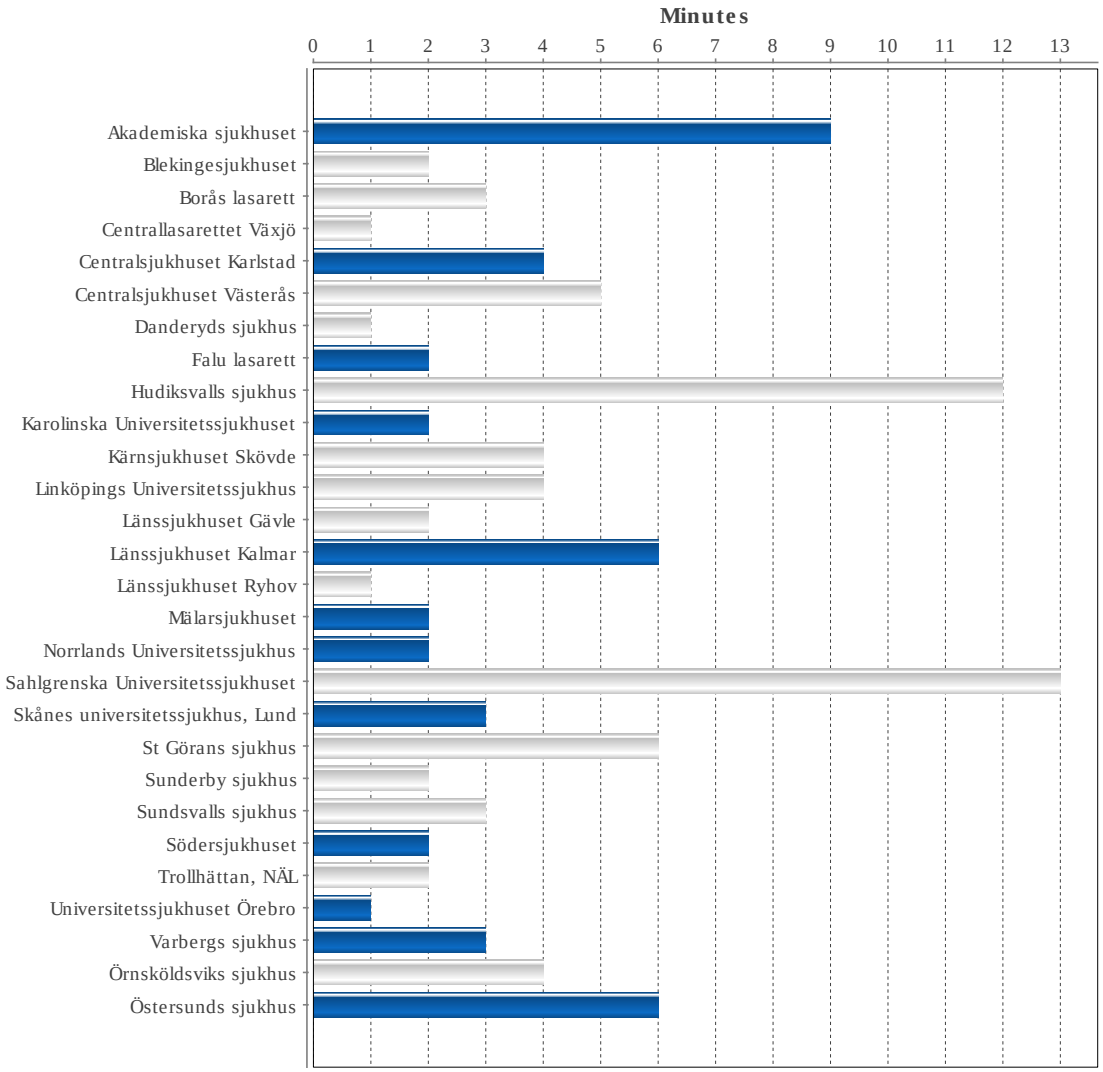
National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
AAIC/AAIR	34	14.9
VVIC/VVIR	39	22.4
DDDC/DDDR	48	23.9
CRT	85	37.6



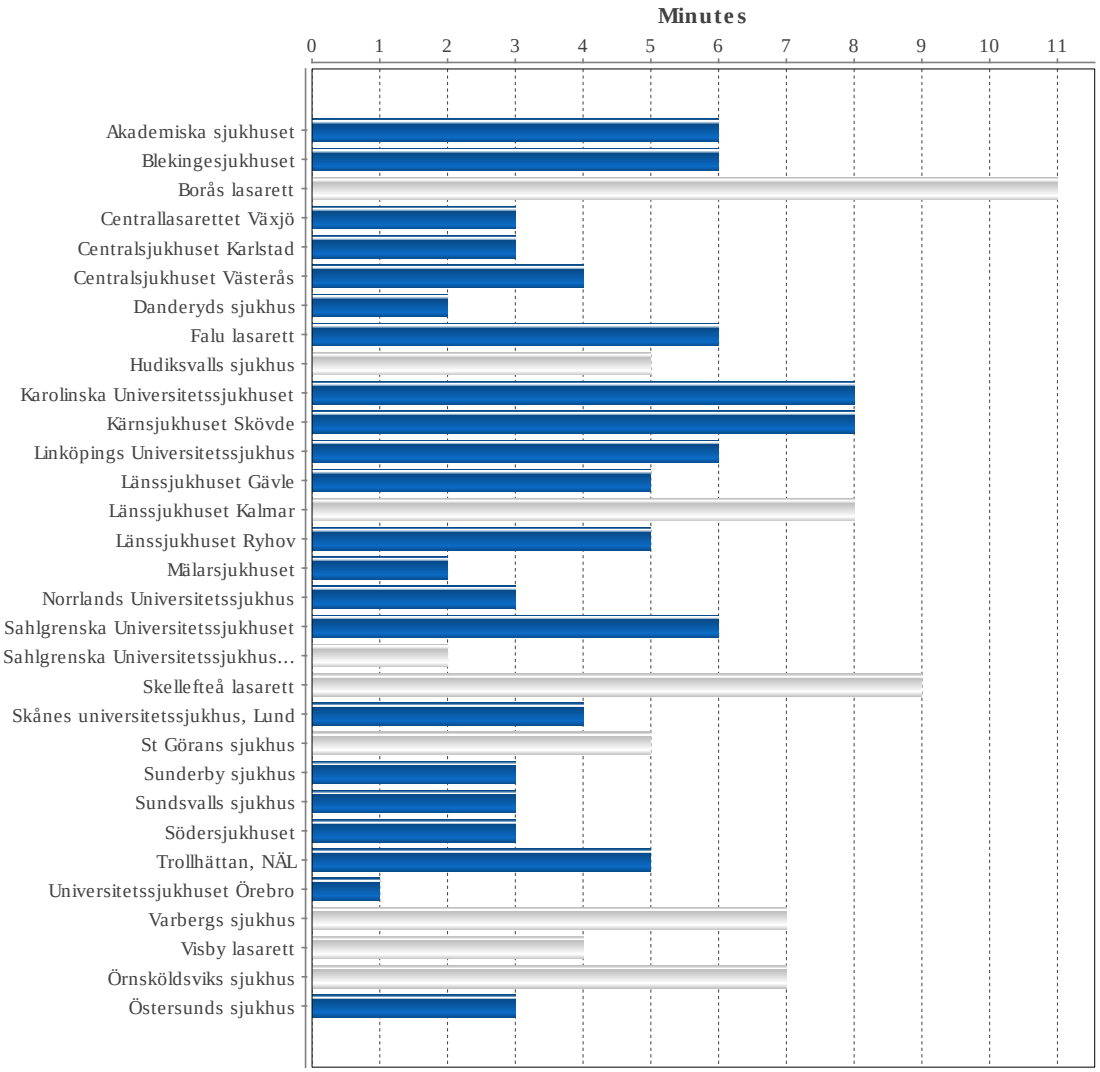
Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVIC/ VVIR



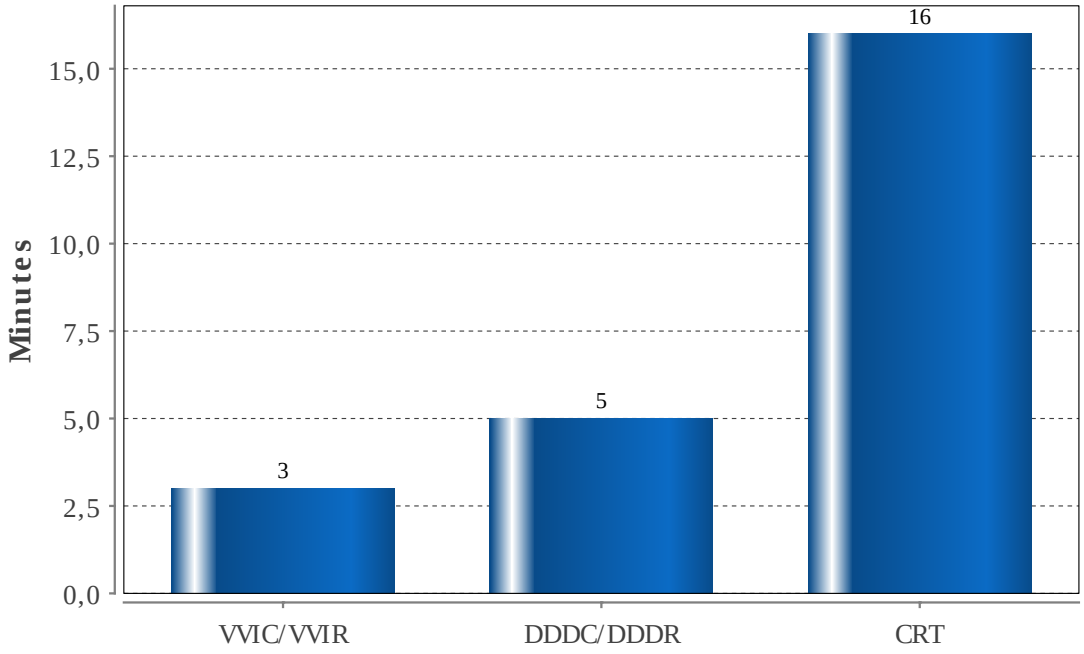
Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

DDDC/ DDDR

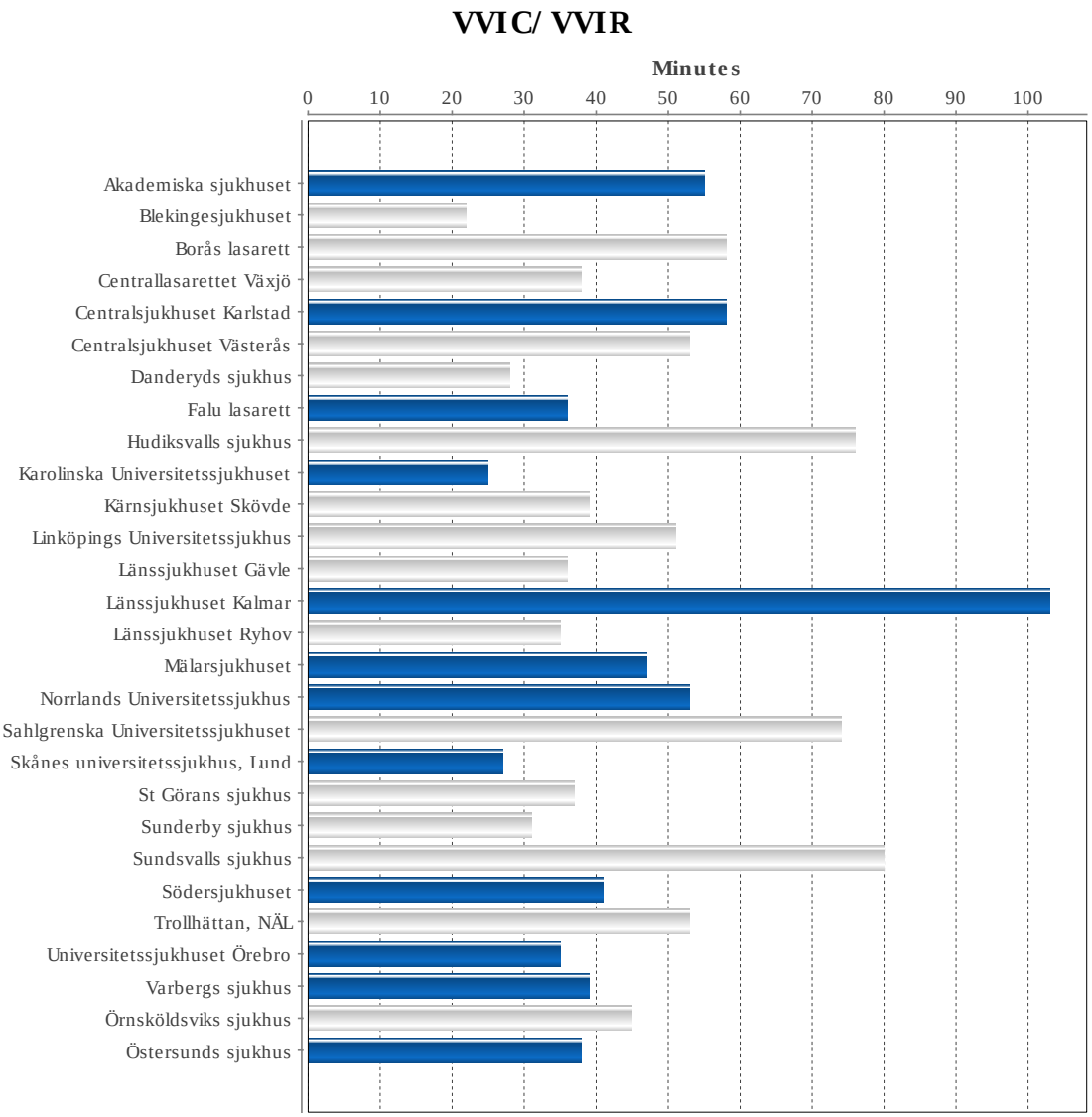


National mean skin to skin duration for a new implant of different subtypes

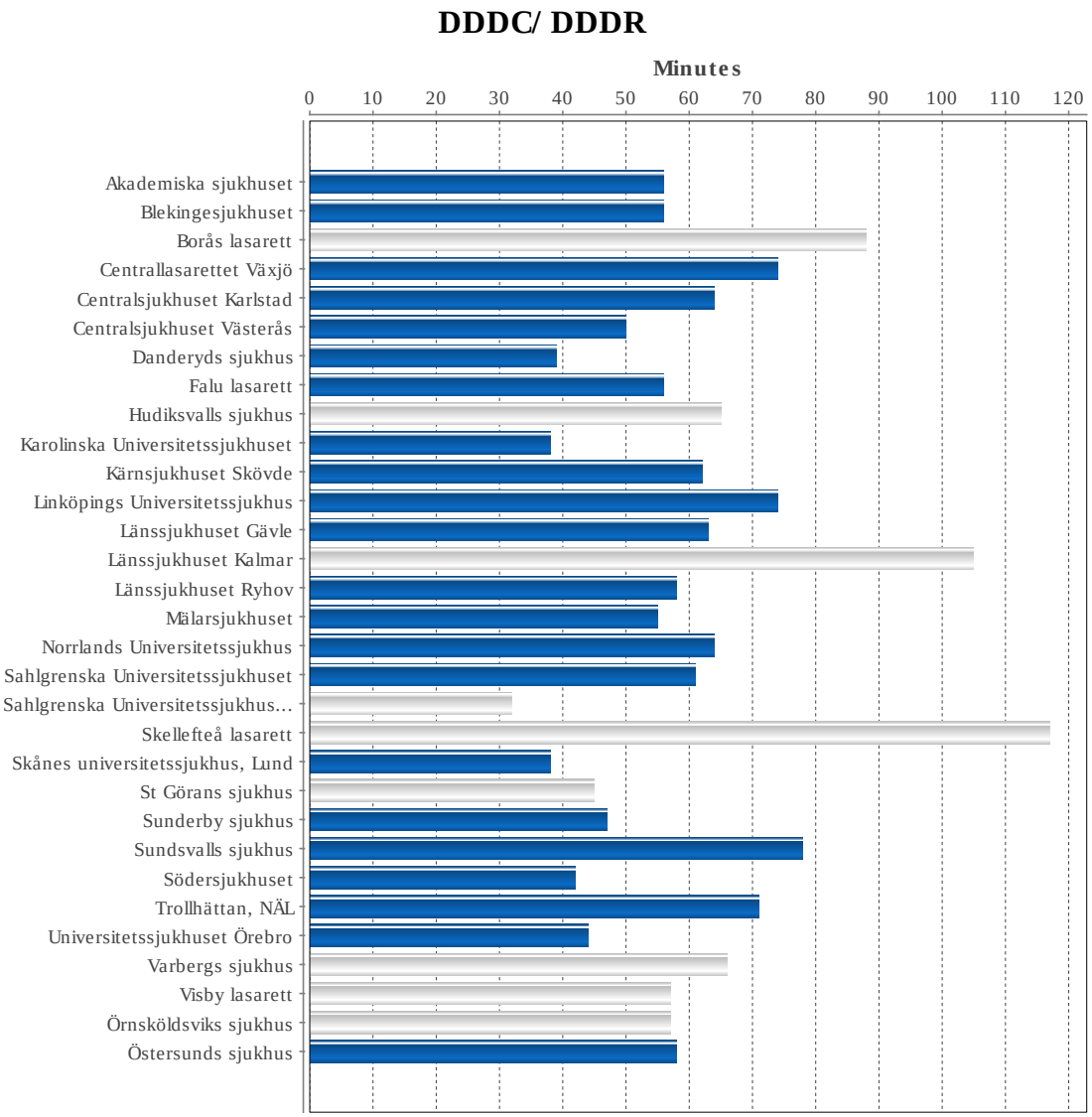
Knife time	Average	Standard deviation
VVIC/VVIR	3	5.9
DDDC/DDDR	5	12.5
CRT	16	14.0



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.

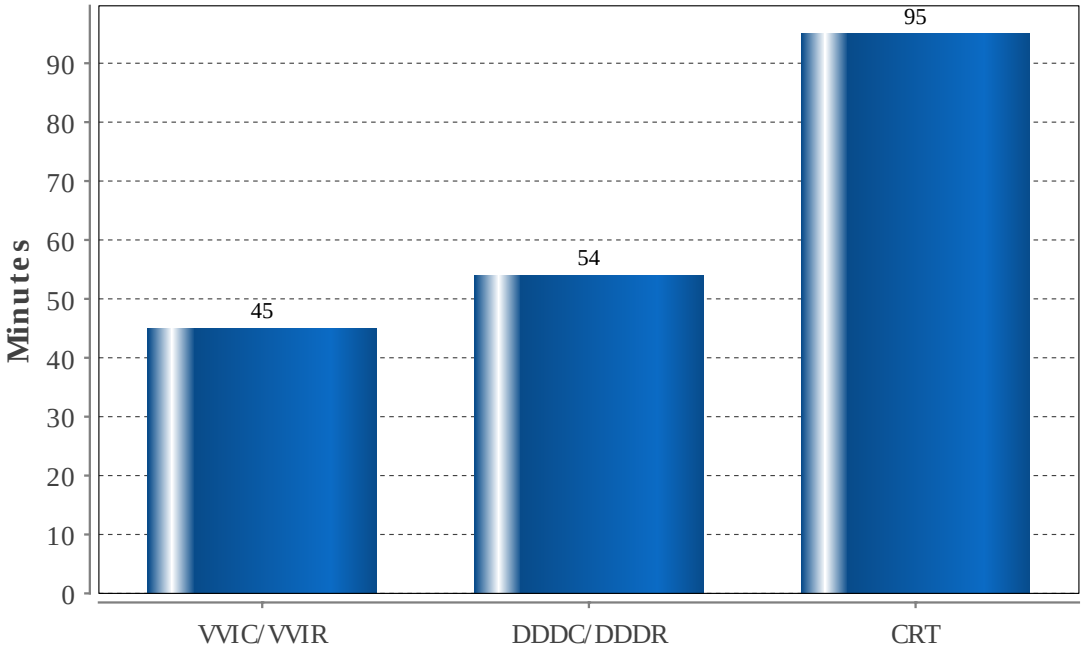


Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

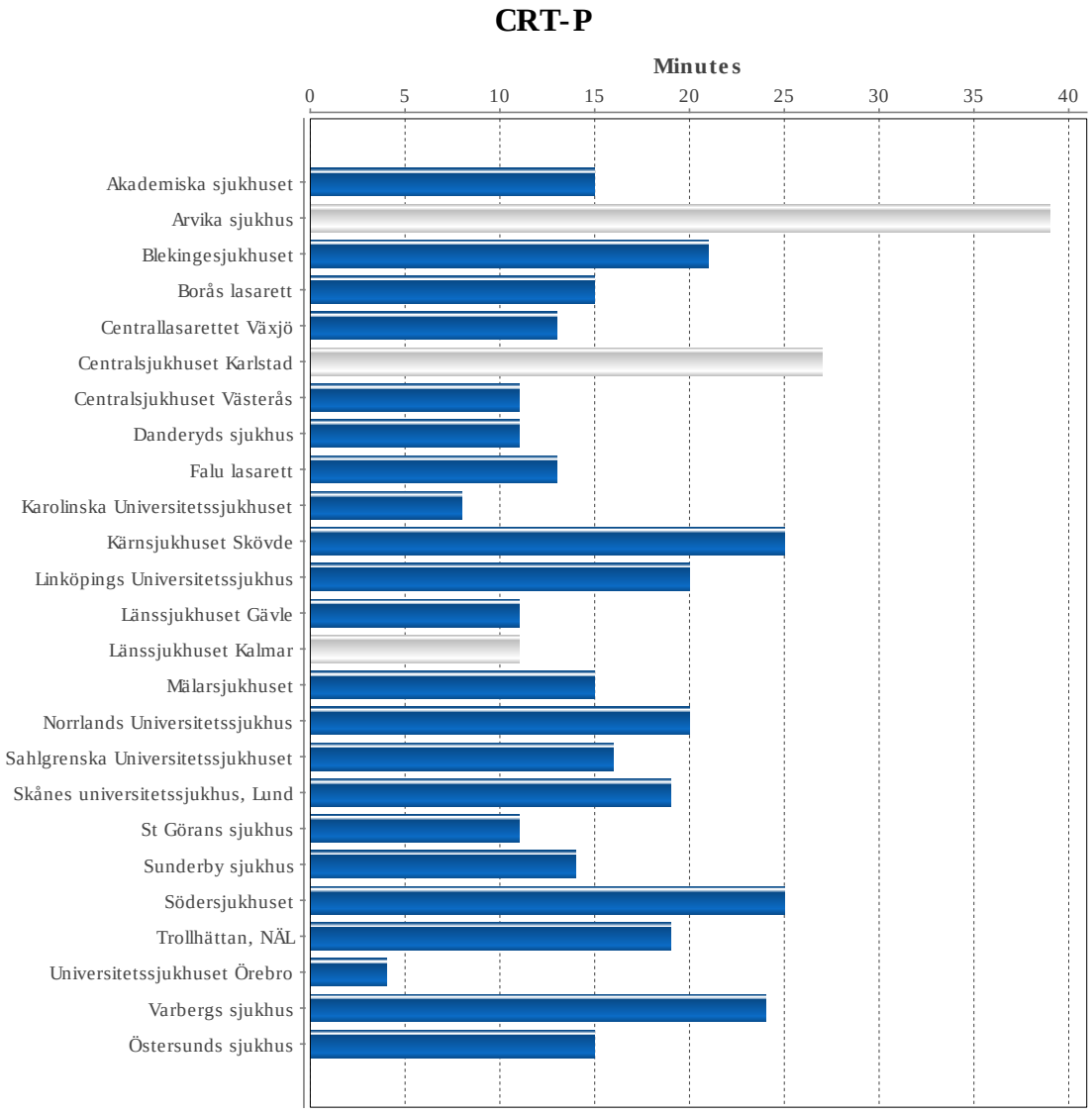


National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
VVIC/VVIR	45	31.0
DDDC/DDDR	54	25.8
CRT	95	43.9

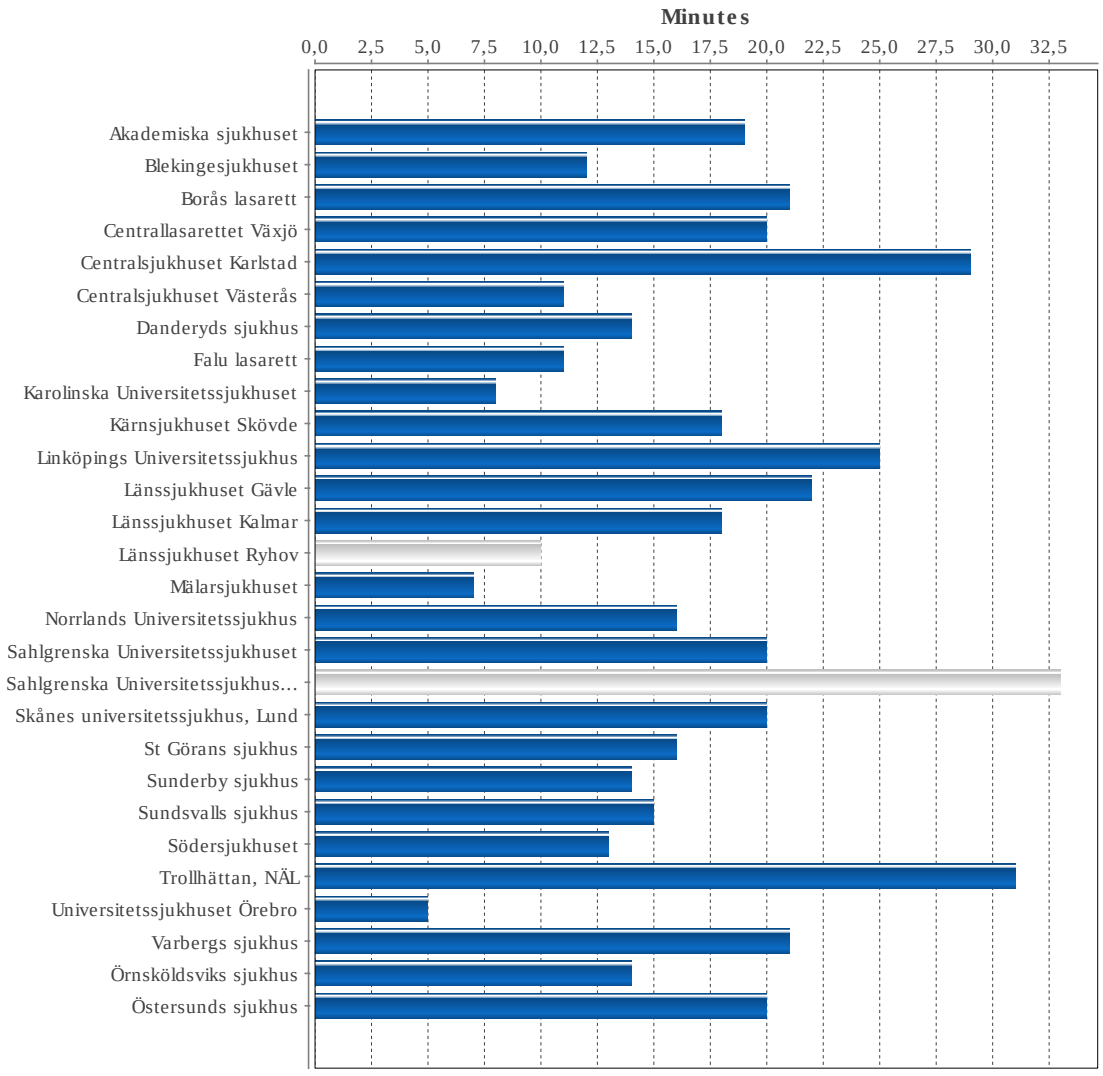


Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less then 10 observations

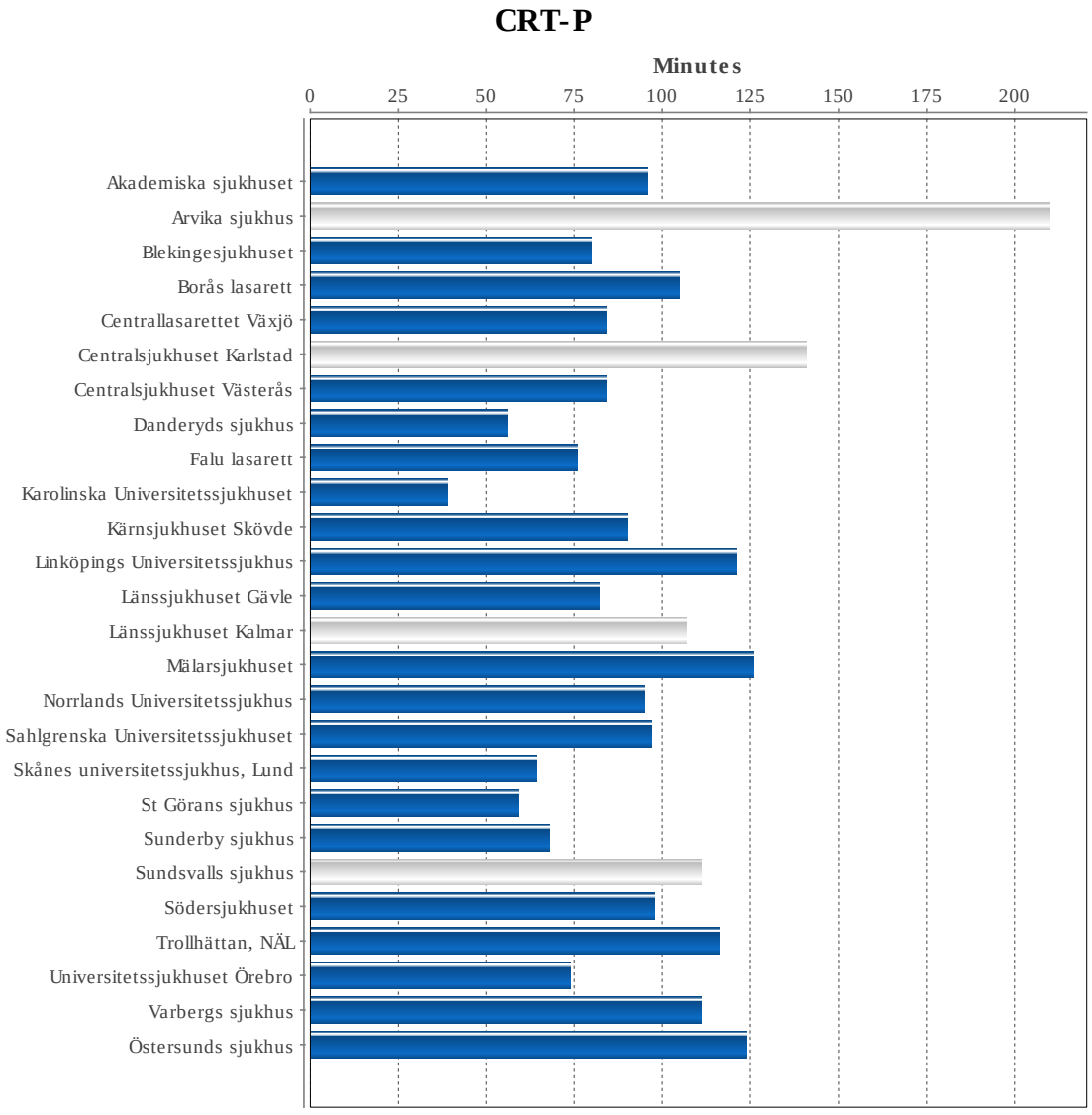


Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less then 10 observations

CRT-D

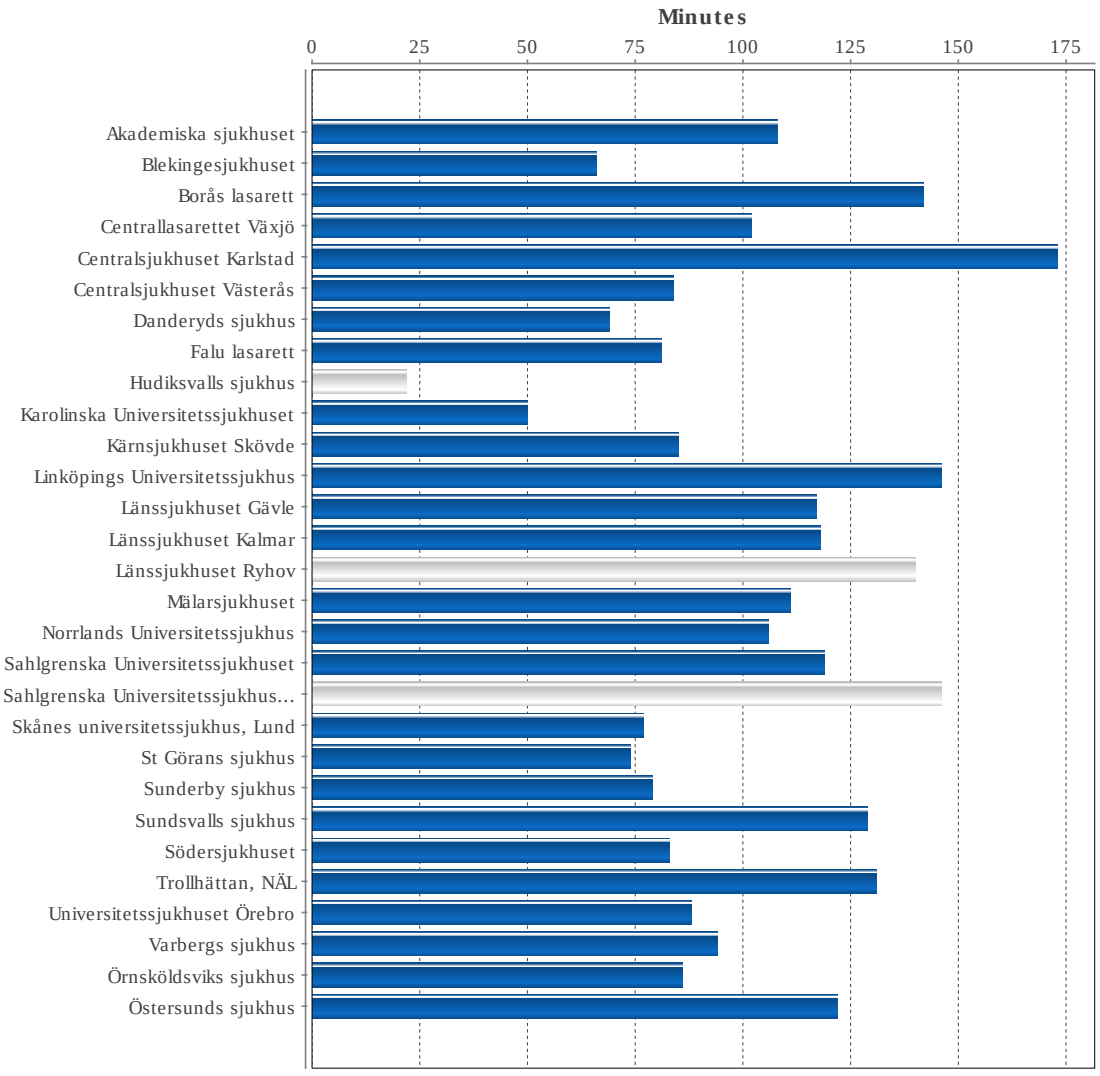


Mean skin to skin duration per subtype and hospital. Bars colored in grey are based on less then 10 observations



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

CRT-D

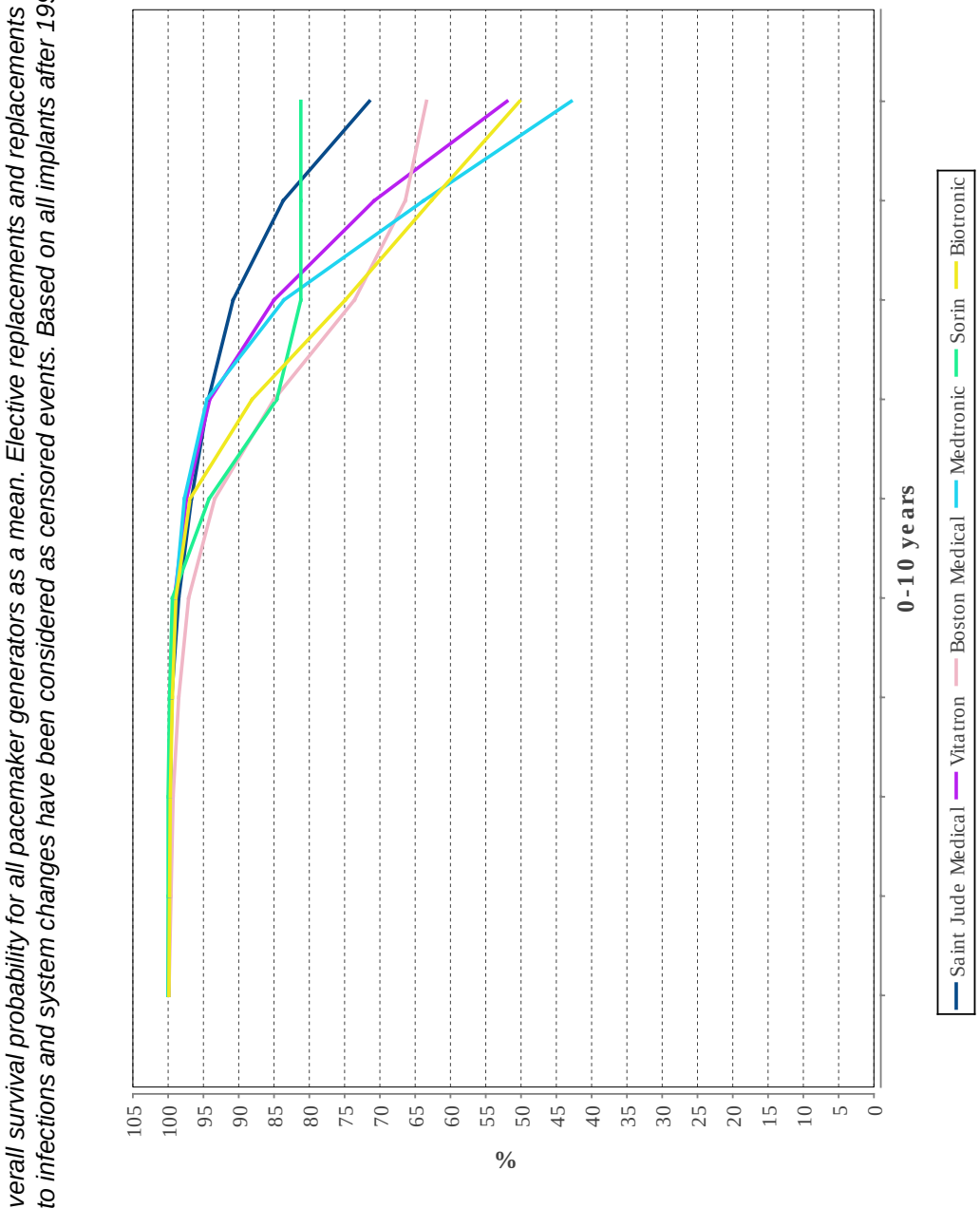


Year	At risk	Survival probability %
1	149221	100.0
2	126151	99.9
3	105972	99.8
4	87828	99.6
5	71746	99.1
6	57003	97.3
7	42469	92.9
8	27869	81.3
9	14659	60.5
10	5518	37.6

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 1990

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	59242	100.0	1842	99.9	3489	99.9	17054	100.0	25827	99.9	10488	100.0	542	100.0
2	49697	99.8	1546	99.8	2815	99.6	14571	99.9	21565	99.8	8684	99.9	516	100.0
3	42792	99.7	1338	99.7	2378	99.3	12629	99.8	18504	99.7	7444	99.8	499	100.0
4	36864	99.4	1122	99.4	2079	98.5	10996	99.5	15674	99.5	6507	99.6	486	99.8
5	31688	98.7	953	98.9	1809	97.1	9548	99.0	13141	98.5	5763	99.1	474	99.4
6	26914	96.1	794	96.9	1597	93.4	8130	97.7	10839	96.7	5115	97.4	439	94.2
7	22375	90.1	592	88.1	1357	85.0	6856	94.5	8768	94.3	4414	94.1	388	84.6
8	15006	81.5	379	74.9	601	73.6	4593	83.6	6347	90.8	2951	85.0	135	81.2
9	8075	71.4	185	62.7	267	66.4	2342	63.8	3856	83.7	1371	70.8	54	81.2
10	3210	60.2	70	50.2	87	63.4	871	42.9	1666	71.5	507	52.0	9	81.2

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



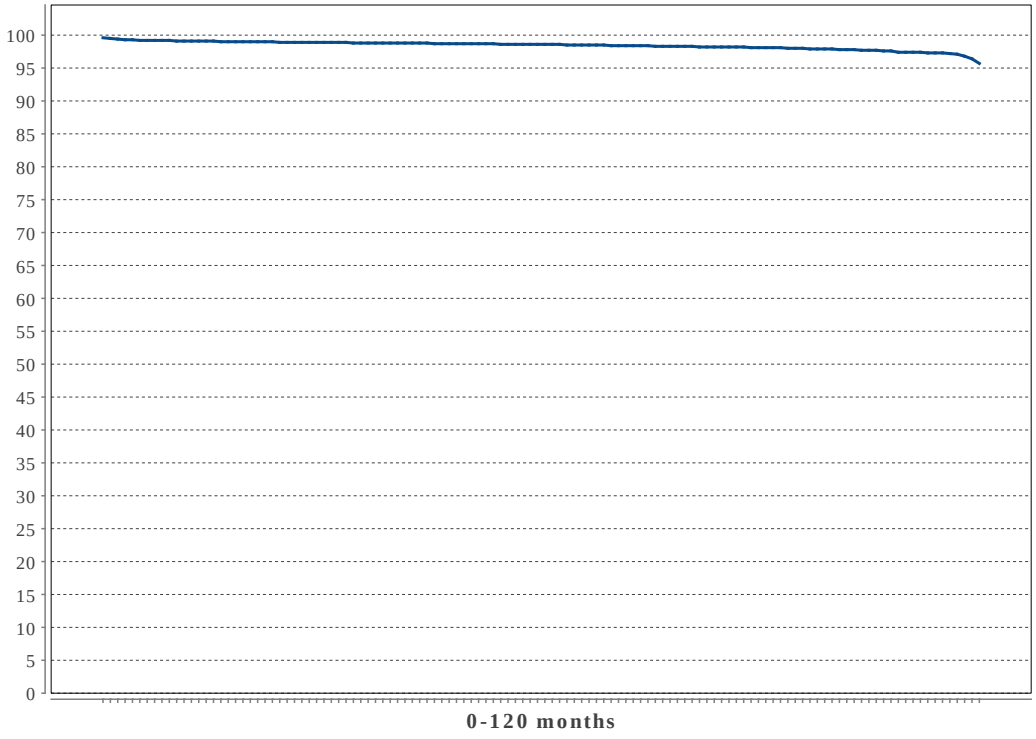
Models that have at least 100 implants and 50 explants

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Y60-BP	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Boston Scientific	4471	98.0	97.7	97.7	97.7	97.7	97.5	97.5	97.5	97.5
Boston Scientific	4457	99.4	99.4	99.2	99.0	99.0	99.0	99.0	99.0	99.0
Boston Scientific	4473	99.3	99.1	99.1	99.1	99.0	99.0	99.0	98.7	98.7
Boston Scientific	4474	99.6	99.1	98.8	98.5	98.3	98.2	98.1	97.8	97.8
Boston Scientific	4470	99.4	99.3	99.3	99.2	99.2	99.1	99.1	99.0	98.4
Intermedics	438-07	100.0	100.0	100.0	100.0	100.0	100.0	95.7	95.7	95.7
Intermedics	435-05	100.0	100.0	99.5	99.5	98.8	98.8	98.8	94.7	94.7
Intermedics	438-10	99.7	99.2	99.2	99.2	99.2	99.2	98.7	98.7	97.5
Intermedics	435-07	99.7	99.6	99.4	99.4	99.4	99.1	98.7	98.7	98.7
Medtronic	4965 CapSure	98.8	98.8	98.8	97.9	96.8	95.4	95.4	95.4	95.4
Medtronic	4057M	98.7	98.7	97.4	96.9	96.3	95.6	95.6	94.4	94.4
Medtronic	4524	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	96.5
Medtronic	4968 CapSure	99.6	99.2	98.8	98.8	98.1	98.1	97.6	96.9	95.8
Medtronic	4193 Attain OTW	95.4	94.7	94.3	94.1	93.8	93.4	93.0	92.2	92.2
Medtronic	4068	99.2	98.6	98.3	98.3	98.3	98.3	98.3	98.3	98.3
Medtronic	4033	99.6	99.6	99.4	99.4	99.4	99.4	99.4	99.4	99.4
Medtronic	5068 CapSure	100.0	99.6	99.3	99.3	99.3	99.3	99.3	99.3	99.3
Medtronic	N/A	99.5	99.4	99.4	99.0	98.8	98.8	98.1	97.6	97.6
Medtronic	5034	100.0	99.7	99.7	99.7	99.7	99.3	99.3	99.3	98.4
Medtronic	5024M	99.8	99.7	99.7	99.7	99.7	99.7	99.7	99.7	98.3
Medtronic	5092 Capsure SP	98.9	98.7	98.7	98.6	98.4	98.4	98.3	98.0	98.0
Medtronic	4023 Capsure SP	99.6	99.5	99.5	99.3	99.3	99.3	99.3	98.9	98.3
Medtronic	5033 CapSure Z	99.6	99.4	99.1	98.6	98.0	97.6	97.4	95.7	92.5
Medtronic	5054 CapSure Z	99.1	98.9	98.7	98.7	98.4	98.3	98.3	96.9	96.9
Medtronic	4074 Capsure	99.2	99.1	99.1	99.1	99.1	98.9	98.9	98.9	98.9
Medtronic	5023M	99.7	99.6	99.5	99.4	99.3	99.0	98.6	98.0	97.4
Medtronic	5076 CapSureFix MRI	99.0	98.9	98.8	98.6	98.6	98.5	98.4	98.3	98.0
Medtronic	4076 CapSure	99.5	99.4	99.4	99.3	99.3	99.2	99.1	99.1	98.9
Osypka	KY1166C	99.5	99.5	99.0	99.0	98.2	97.0	94.3	94.3	94.3
Osypka	KY1167C	99.2	99.2	99.2	98.9	98.0	96.1	96.1	96.1	94.7
St. Jude Medical	1010T	100.0	100.0	100.0	100.0	98.8	97.5	93.2	93.2	93.2
St. Jude Medical	423S	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
St. Jude Medical	1148T	98.1	98.1	97.2	96.2	96.2	96.2	96.2	96.2	96.2
St. Jude Medical	1388K Tendril DX	98.8	98.8	98.8	98.8	98.8	98.8	98.8	98.8	98.8
St. Jude Medical	1156T Quickflex	97.4	96.9	96.3	96.3	95.6	95.6	95.6	NaN	NaN

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
St. Jude Medical	1056T QuickSite	97.0	96.4	95.8	95.3	95.1	94.9	94.9	94.9	94.0
St. Jude Medical	1458Q Quartet	97.5	96.3	96.3	96.3	96.3	NaN	NaN	NaN	NaN
St. Jude Medical	1450K	99.3	99.1	99.0	99.0	99.0	99.0	98.4	97.6	97.6
St. Jude Medical	1699TC OptiSense	99.0	98.7	98.6	98.5	98.5	98.4	98.4	98.4	98.4
St. Jude Medical	1452T Membrane E	99.2	99.1	98.8	98.7	98.5	98.5	97.1	96.6	95.4
St. Jude Medical	1452K Membrane	99.9	99.7	99.6	99.6	99.2	98.1	97.2	96.4	95.6
St. Jude Medical	1788TC Tendril ST	97.9	97.8	97.8	97.7	97.6	97.6	97.6	NaN	NaN
St. Jude Medical	1480T	99.0	98.6	98.5	98.5	98.4	98.3	98.1	98.1	98.1
St. Jude Medical	1258T QuickFlex	98.2	98.0	97.9	97.7	96.9	NaN	NaN	NaN	NaN
St. Jude Medical	424K	99.8	99.7	99.6	99.6	99.5	99.5	98.4	98.0	98.0
St. Jude Medical	1888TC Tendril ST	98.7	98.6	98.6	98.6	98.6	98.6	98.6	NaN	NaN
St. Jude Medical	1788T Tendril ST	98.5	98.1	97.9	97.7	97.7	97.7	97.7	97.7	97.7
St. Jude Medical	1388T Tendril DX	99.5	99.5	99.3	99.3	99.0	98.6	97.8	97.6	96.2
St. Jude Medical	1450T Membrane E	99.5	99.5	99.5	99.4	99.3	98.8	98.8	98.6	97.3
St. Jude Medical	1636T Isoflex	98.3	98.1	97.9	97.9	97.7	97.6	97.6	97.3	96.7
St. Jude Medical	1403K	100.0	100.0	99.9	99.7	99.6	99.5	99.5	99.0	98.3
St. Jude Medical	1948 Isoflex	99.1	99.0	99.0	98.8	98.6	98.6	NaN	NaN	NaN
St. Jude Medical	1488T TendrilSDX	98.7	98.3	98.1	97.9	97.7	97.4	97.2	96.5	95.8
St. Jude Medical	1688T TendrilSDX	98.0	97.7	97.5	97.3	97.1	96.9	96.9	96.7	96.7
St. Jude Medical	1646T Isoflex	98.7	98.6	98.4	98.4	98.3	98.3	98.3	98.2	98.2
St. Jude Medical	1999 Optisense	99.2	98.9	98.8	98.8	98.8	98.8	NaN	NaN	NaN
St. Jude Medical	2088TC Tendril	99.3	99.1	99.1	99.0	99.0	NaN	NaN	NaN	NaN
Stöckert	SU00-100	100.0	99.4	99.4	98.7	97.8	96.5	94.7	91.9	82.2
Telectronics	033-856	99.5	97.5	97.5	97.5	96.2	96.2	96.2	93.1	93.1
Vitatron	ISP13	98.6	98.6	98.6	97.1	97.1	95.9	95.9	95.9	89.0
Vitatron	IMG49	99.0	99.0	98.5	98.2	98.2	96.5	95.5	92.6	86.6
Vitatron	IHP09B	98.4	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
Vitatron	ICF09 Crystalline	97.7	97.5	97.5	97.4	97.3	97.1	96.8	96.8	96.5
Vitatron	ICM09B Crystalline	99.0	98.9	98.9	98.9	98.8	98.6	98.6	98.6	98.4
Vitatron	ICQ09B Crystalline	99.4	99.3	99.3	99.3	99.2	99.2	99.2	99.2	99.2

Based on all implants after 1990

Year	At risk	Survival probabilty %
1	185650	99.6
2	154899	99.1
3	128061	98.9
4	103702	98.8
5	82166	98.7
6	63299	98.6
7	46203	98.4
8	31767	98.2
9	19494	97.9
10	9006	97.4



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	Dromos DR	100.0	100.0	98.6	97.1	93.9	80.8	67.4	67.4	67.4
Biotronik	Metros TC 01	100.0	100.0	100.0	100.0	100.0	100.0	98.1	90.9	66.5
Biotronik	Actros DR	100.0	100.0	100.0	100.0	96.4	65.1	27.6	0.0	NaN
Biotronik	Pikos LPE 01	99.6	99.6	99.6	99.6	98.8	96.6	91.4	85.2	73.4
Biotronik	Actros SR	100.0	99.6	99.1	99.1	95.6	85.2	56.1	29.0	9.1
Biotronik	Philos II DR	100.0	100.0	99.7	99.3	98.9	97.1	86.2	55.0	20.7
Biotronik	Philos DR	99.6	99.6	99.4	99.1	98.6	92.6	78.0	46.3	17.5
Boston Scientific	1130 Vigor SR	100.0	100.0	98.6	98.6	87.8	42.2	25.8	25.8	25.8
Boston Scientific	1284 Discovery	100.0	100.0	98.8	98.8	95.9	77.4	37.7	7.4	NaN
Boston Scientific	1230 Vigor DR	99.1	99.1	99.1	99.1	97.5	64.8	28.8	16.9	16.9
Boston Scientific	1274 Discovery	99.2	99.2	99.2	98.1	97.0	80.9	20.7	9.0	2.2
Boston Scientific	1280 Pulsar Max	100.0	100.0	100.0	99.3	97.6	81.9	50.4	9.6	0.0
Boston Scientific	1194 Insignia I	99.1	99.1	98.6	97.2	95.7	86.6	65.4	42.0	20.5
Boston Scientific	H140 Contak	100.0	100.0	99.4	98.5	93.5	80.5	54.9	19.7	-12.3
Boston Scientific	1291 Insignia I	99.7	99.7	99.7	99.5	98.7	96.7	92.0	78.7	62.3
Boston Scientific	1298 Insignia I	99.8	99.4	97.8	96.9	85.6	63.1	37.9	16.4	3.9
Boston Scientific	S404 EL Altrua 40	100.0	99.9	99.8	99.5	98.9	NaN	NaN	NaN	NaN
Boston Scientific	1190 Insignia	99.8	99.3	98.8	98.4	97.7	94.0	82.7	63.9	44.8
Boston Scientific	1290 Insignia I	99.9	99.8	99.6	98.1	92.1	77.6	55.0	28.2	11.7
ELA Medical	212 Brio DR	100.0	100.0	100.0	100.0	87.6	56.0	14.3	6.8	0.0
ELA Medical	7234 Chorum	100.0	99.1	99.1	99.1	99.1	90.9	77.0	53.2	23.8
ELA Medical	6244 Chorus II	100.0	100.0	100.0	100.0	96.8	67.6	44.2	8.3	3.7
ELA Medical	4534 Opus RM	100.0	100.0	99.1	98.0	98.0	81.9	57.4	36.1	15.7
ELA Medical	7334 Chorum	100.0	100.0	100.0	100.0	96.6	88.6	63.2	39.4	17.6
ELA Medical	113 Talent	100.0	100.0	100.0	100.0	98.7	86.0	34.7	15.7	10.8
ELA Medical	7034 Chorus RM	100.0	100.0	100.0	100.0	97.0	82.6	52.7	30.2	12.2
ELA Medical	213 Talent DR	99.8	99.7	99.3	97.8	80.0	34.0	13.3	5.6	4.4
Intermedics	292-07 Unity	99.0	99.0	99.0	97.4	95.5	89.7	80.6	56.5	42.4
Intermedics	281-05 Nova II	99.6	99.6	99.1	98.5	98.5	95.3	94.1	88.1	64.6
Intermedics	292-03 Dash	99.1	98.7	98.7	97.2	93.9	86.9	75.8	59.3	48.0
Intermedics	294-03 Relay	100.0	100.0	100.0	97.9	93.2	85.6	69.0	60.1	36.2
Intermedics	284-05 Cosmos II	100.0	99.4	99.4	98.3	93.8	83.5	73.6	56.2	32.5
Intermedics	294-09 Marathon	100.0	100.0	99.7	99.5	98.0	96.0	85.4	52.0	9.8

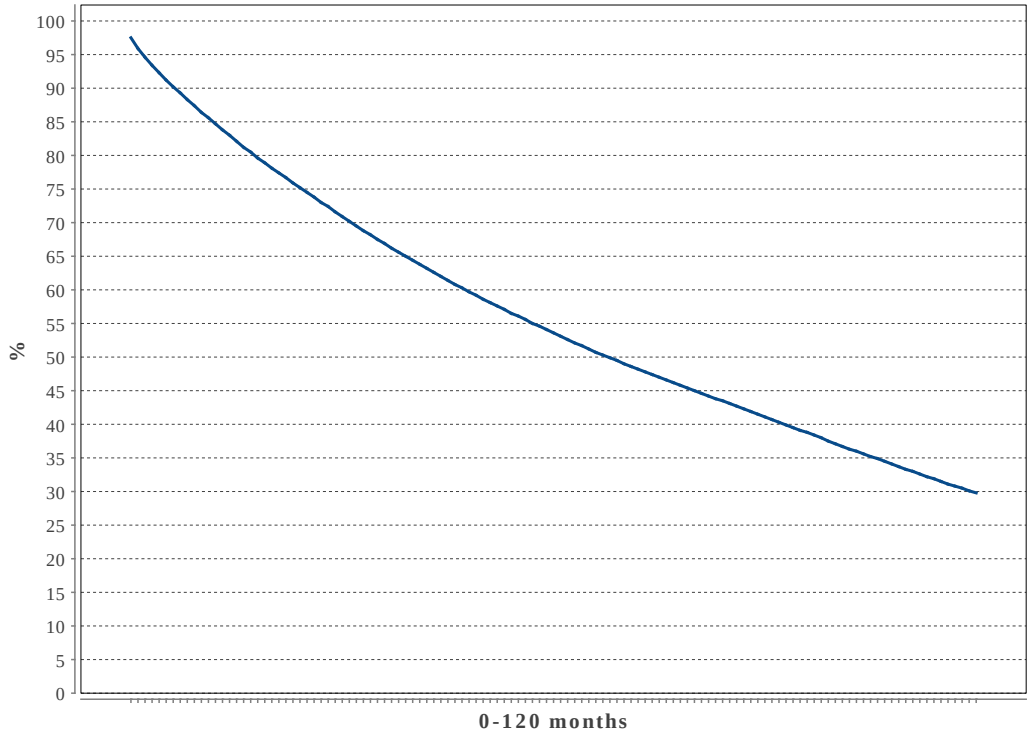
Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Medtronic	KDR700 Kappa DR	100.0	100.0	100.0	100.0	97.5	94.8	81.5	45.9	13.0
Medtronic	7950 Thera DR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	83.3
Medtronic	8940 Thera SR	100.0	98.9	98.9	98.9	95.8	94.0	81.5	56.1	27.2
Medtronic	AT501	100.0	100.0	99.0	95.7	59.1	18.5	9.7	6.5	NaN
Medtronic	P1501DR EnRhythm	100.0	99.2	99.2	99.2	95.1	80.7	53.0	35.4	11.2
Medtronic	8417 Legend	100.0	99.1	99.1	99.1	99.1	99.1	99.1	99.1	82.4
Medtronic	7940 Thera DR	100.0	99.2	99.2	99.2	99.2	95.9	92.1	79.2	35.6
Medtronic	7964 Thera D	100.0	100.0	100.0	100.0	100.0	100.0	100.0	89.9	54.4
Medtronic	KSR703 Kappa SR	100.0	100.0	99.5	97.3	95.0	82.7	62.9	29.5	0.0
Medtronic	KDR401 Kappa DR	99.6	99.6	99.6	99.6	99.0	96.3	77.1	33.6	15.9
Medtronic	7108 Minuet	100.0	100.0	100.0	99.3	97.7	97.7	94.3	92.8	78.0
Medtronic	KD701 Kappa D	100.0	100.0	100.0	100.0	100.0	98.9	85.5	44.2	7.3
Medtronic	8160 Prodigy SR	100.0	100.0	100.0	100.0	100.0	97.1	93.5	82.4	68.9
Medtronic	7864 Prodigy	100.0	100.0	100.0	99.6	99.6	97.0	95.6	87.2	63.9
Medtronic	8424 Legend II	100.0	100.0	100.0	100.0	100.0	100.0	97.9	95.1	82.7
Medtronic	E2SR01 EnPulse	100.0	100.0	100.0	99.2	96.7	93.3	56.8	20.0	11.4
Medtronic	KDR703 Kappa DR	100.0	100.0	100.0	100.0	98.8	95.0	82.4	38.3	8.7
Medtronic	ADDR01 Adapta	100.0	99.8	99.6	99.3	98.6	98.3	94.7	77.3	NaN
Medtronic	8960i Thera SR	99.8	99.5	98.3	97.6	97.2	95.4	92.7	81.4	53.8
Medtronic	VEDR01 Versa	100.0	99.7	99.5	99.3	99.3	97.5	93.2	75.9	NaN
Medtronic	7860i Prodigy	100.0	99.7	99.7	99.1	98.2	95.4	91.0	81.6	49.5
Medtronic	SS303 Sigma S	100.0	100.0	100.0	99.1	98.4	96.9	94.8	90.7	71.5
Medtronic	KSR901 Kappa SR	99.5	99.2	98.8	98.8	97.7	93.1	59.8	24.6	6.5
Medtronic	SESR01 Sensia	99.9	99.9	99.9	99.5	98.5	95.5	92.4	NaN	NaN
Medtronic	KSR701 Kappa SR	100.0	100.0	99.7	99.2	98.3	94.5	63.9	24.2	4.8
Medtronic	7960i Thera DR	100.0	100.0	99.9	99.5	99.4	96.3	90.3	75.5	45.2
Medtronic	8042 InSync	100.0	99.6	98.9	97.9	93.8	86.5	66.9	34.6	14.1
Medtronic	RESR01 Relia SR	99.7	99.7	99.7	99.3	98.9	97.5	NaN	NaN	NaN
Medtronic	KDR901 Kappa DR	99.9	99.9	99.9	99.7	99.0	96.7	80.8	44.3	16.2

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Medtronic	E2DR01 EnPulse	100.0	100.0	99.9	99.5	98.7	96.8	87.3	56.8	22.4
Medtronic	SEDRL1 Sensia	99.9	99.9	99.8	99.8	99.5	99.1	98.2	96.8	NaN
Medtronic	KDR701 Kappa DR	100.0	99.9	99.8	99.4	98.4	95.0	76.1	37.0	9.5
Medtronic	REDR01 Relia DR	99.9	99.8	99.7	99.6	99.5	99.5	99.5	NaN	NaN
Sorin Group	DR233 Talent II	100.0	100.0	100.0	98.3	74.1	30.5	14.6	7.6	5.0
Sorin Group	Reply DR	99.7	99.6	99.6	99.6	99.6	98.4	98.4	NaN	NaN
St. Jude Medical	285K Genisis	98.6	98.6	98.6	98.6	98.6	96.1	89.9	78.1	59.5
St. Jude Medical	2350L Trilogy DR	99.2	99.2	99.2	97.4	94.3	93.1	80.1	56.8	14.4
St. Jude Medical	5326 Entity XL DR	100.0	99.2	99.2	97.0	97.0	88.9	66.1	55.1	35.4
St. Jude Medical	2091 Polarity	100.0	100.0	100.0	99.0	99.0	97.7	95.9	87.0	77.1
St. Jude Medical	2525T Microny II	98.9	98.9	98.9	93.5	88.8	81.1	72.5	69.4	49.1
St. Jude Medical	2425T Microny SR	100.0	100.0	100.0	100.0	97.8	94.7	75.3	67.4	46.5
St. Jude Medical	2028 Synchrony	99.5	99.5	99.5	96.0	86.9	77.2	66.1	53.8	39.7
St. Jude Medical	748	100.0	100.0	100.0	99.1	98.5	97.8	97.8	97.8	97.8
St. Jude Medical	2038 Dialog II	99.5	99.5	99.5	99.5	98.4	97.1	95.5	92.9	85.8
St. Jude Medical	5366 Integrity	100.0	100.0	99.4	98.8	95.0	93.3	92.3	81.1	54.2
St. Jude Medical	5130 Affinity	100.0	100.0	100.0	100.0	99.1	99.1	94.6	89.1	78.1
St. Jude Medical	2318L Trilogy DC	99.6	99.6	99.2	98.6	96.8	93.2	82.7	50.5	13.0
St. Jude Medical	5180 Identity	100.0	100.0	99.1	98.6	93.7	80.0	56.5	24.3	8.8
St. Jude Medical	5380 Identity	100.0	99.6	92.4	75.2	56.9	34.9	12.4	4.6	2.7
St. Jude Medical	688	99.8	99.8	99.8	99.8	99.8	99.4	98.6	97.7	94.3
St. Jude Medical	5172 Identity	99.7	99.7	99.3	95.9	87.4	67.9	48.5	25.1	16.5
St. Jude Medical	2010 Paragon	100.0	100.0	100.0	99.4	98.8	97.0	97.0	93.9	84.6
St. Jude Medical	5370 Identity	100.0	99.7	98.5	80.4	39.6	18.5	4.7	2.0	0.0
St. Jude Medical	5596 Frontier II	100.0	100.0	99.4	97.0	90.4	79.6	62.1	45.1	19.7
St. Jude Medical	2034 Sensolog	99.6	99.6	99.6	99.6	99.6	97.9	95.3	92.6	80.0
St. Jude Medical	3212 Anthem	99.6	99.1	98.3	96.1	92.9	NaN	NaN	NaN	NaN
St. Jude Medical	2022T Synchrony	99.6	99.3	99.3	98.7	98.7	97.2	94.0	85.7	70.3
St. Jude Medical	5330 Affinity	99.8	99.6	99.4	98.9	98.1	93.6	82.5	57.3	35.3
St. Jude Medical	2364L Trilogy DR	100.0	100.0	99.7	99.3	97.8	90.3	78.7	46.5	16.8
St. Jude Medical	5376 Identity XL	100.0	99.8	99.8	99.5	98.4	94.8	89.4	70.4	39.3
St. Jude Medical	2040 Multilog	99.8	99.8	99.8	99.8	99.5	99.2	99.2	96.9	93.0
St. Jude Medical	5626 Zephyr XL	99.9	99.6	99.6	99.4	99.0	99.0	99.0	NaN	NaN
St. Jude Medical	2016T Paragon II	100.0	100.0	100.0	99.7	99.3	97.9	95.5	91.5	75.3

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
St. Jude Medical	2033 Sensolog	99.9	99.7	99.7	99.7	99.4	98.3	96.9	93.1	76.9
St. Jude Medical	5142 Integrity	99.9	99.8	99.8	99.5	99.3	97.1	95.0	92.5	82.3
St. Jude Medical	2400L Regency SR	99.9	99.9	99.8	99.8	99.0	97.9	95.6	94.1	87.5
St. Jude Medical	2037 Dialog II	100.0	100.0	100.0	100.0	100.0	99.4	98.1	94.6	88.7
St. Jude Medical	2404L Regency SR	99.6	99.5	99.1	98.9	98.6	96.8	93.0	87.5	76.3
St. Jude Medical	5346 Integrity	100.0	100.0	99.7	99.6	97.3	94.3	88.7	70.6	37.6
St. Jude Medical	5386 Identity ADx XL DR	99.8	99.5	99.4	99.2	98.1	96.7	93.5	83.9	70.5
St. Jude Medical	2045 Sensorithm	99.9	99.9	99.9	99.5	98.2	96.7	93.1	85.9	67.2
St. Jude Medical	5826 Zephyr XL	99.8	99.7	99.6	99.5	99.3	99.1	96.2	NaN	NaN
St. Jude Medical	5156 Verity	99.9	99.9	99.8	99.6	99.4	99.2	98.8	97.8	95.5
St. Jude Medical	5816 Victory XL	99.8	99.7	99.7	99.6	99.3	98.2	92.6	86.9	80.5
Telectronics	1256	98.5	98.5	98.5	98.5	97.1	92.2	92.2	88.1	65.2
Telectronics	1206	97.9	97.9	97.2	93.9	83.4	74.2	70.4	63.6	63.6
Telectronics	8218	99.8	99.8	99.8	99.8	99.8	99.8	94.6	83.6	60.0
Telectronics	8224	99.8	99.5	99.5	99.2	97.7	93.3	81.6	60.6	35.7
Telectronics	1254	99.6	99.6	99.0	98.2	97.2	89.9	72.9	51.8	43.3
Telectronics	158	99.5	99.5	99.3	98.1	97.5	96.7	94.2	88.8	82.0
Vitatron	740	100.0	100.0	98.7	98.7	98.7	97.0	87.3	80.5	32.9
Vitatron	703	100.0	100.0	100.0	100.0	100.0	100.0	91.9	84.0	70.0
Vitatron	600	100.0	100.0	100.0	98.5	85.3	59.1	46.4	41.8	41.8
Vitatron	620 Ceryx	99.3	99.3	99.3	99.3	99.3	98.0	92.4	73.1	43.6
Vitatron	710	100.0	100.0	100.0	99.3	99.3	93.7	87.1	62.7	30.5
Vitatron	700	100.0	100.0	100.0	97.8	96.6	95.1	90.4	81.0	61.2
Vitatron	520	100.0	99.5	99.5	99.5	97.3	93.8	91.6	74.6	45.9
Vitatron	800	100.0	100.0	100.0	100.0	99.2	94.6	91.7	73.9	41.1
Vitatron	640	100.0	100.0	100.0	98.5	98.0	95.9	88.6	66.0	19.6
Vitatron	920	100.0	100.0	100.0	99.5	96.5	88.4	59.7	32.4	10.2
Vitatron	540 Topaz 3	100.0	100.0	99.7	99.7	99.4	99.0	95.2	88.0	53.0
Vitatron	340	99.8	99.8	99.8	99.5	99.5	97.6	95.3	83.4	52.2
Vitatron	9000	99.8	99.8	99.6	98.6	95.2	89.4	65.0	32.5	10.7
Vitatron	T20SR	99.9	99.7	99.7	99.4	98.6	96.8	96.1	93.4	91.0
Vitatron	820	100.0	99.6	99.6	99.0	96.7	90.4	74.5	51.1	17.5
Vitatron	840	100.0	99.7	99.5	99.3	97.9	93.8	73.3	39.7	10.9
Vitatron	C70DR	100.0	100.0	100.0	100.0	99.7	97.7	82.3	50.4	14.0
Vitatron	T70DR	99.6	99.4	99.4	99.1	97.3	91.5	72.1	39.9	20.7
Vitatron	T60DR	99.9	99.9	99.7	99.3	98.2	94.7	80.7	45.7	21.0
Vitatron	860	100.0	99.9	99.7	99.2	97.6	92.4	73.1	40.1	18.5
Vitatron	C20SR	100.0	99.9	99.9	99.9	99.5	98.5	97.6	96.4	86.1
Vitatron	G70A1	99.9	99.9	99.9	99.9	99.9	99.9	99.9	NaN	NaN
Vitatron	C60DR	99.9	99.8	99.7	99.4	98.3	94.4	77.7	43.7	16.1

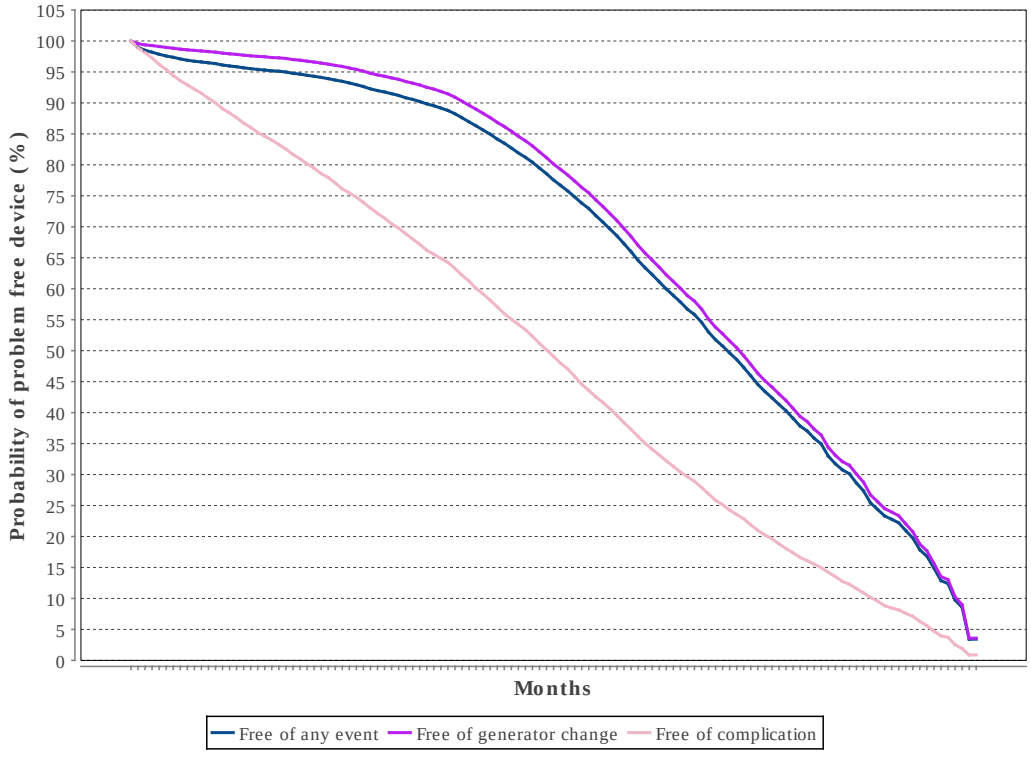
Based on all implants after 1990

Year	At risk	Survival probability %
1	74694	97.5
2	64230	84.7
3	56556	75.2
4	49889	66.9
5	43979	59.7
6	38377	53.6
7	32790	48.2
8	23473	43.5
9	15926	38.8
10	10646	34.1



Probablility of event free ICD-device

Year	At risk	Free of any event %	Free of generator change %	Free of complication %
1	16703	96.4	98.2	90.0
2	13913	94.7	96.9	81.0
3	11232	91.8	94.3	71.4
4	8699	86.9	89.6	61.2
5	5882	77.6	80.1	49.1
6	3429	64.6	67.0	36.2
7	1730	50.8	52.7	25.1
8	756	37.0	38.6	16.1
9	233	22.8	24.0	8.5
10	10	3.4	3.6	0.9

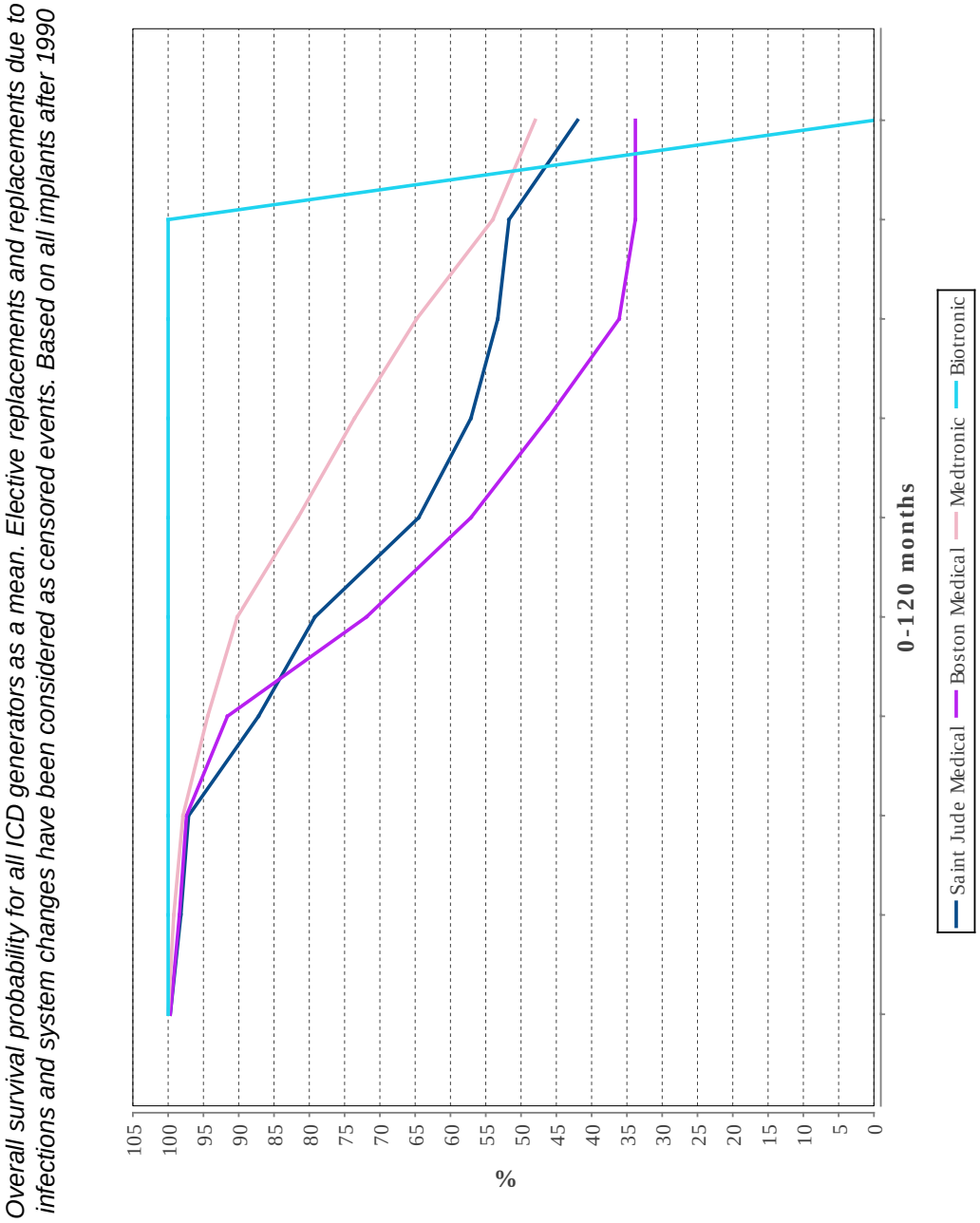


Year	At risk	Survival probability %
1	15237	99.9
2	12586	99.6
3	10122	99.2
4	7825	97.4
5	5741	92.6
6	3695	81.0
7	2039	64.7
8	981	46.1
9	419	29.5
10	129	15.7

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

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	2489	133.1	18	100.0	652	99.7	1117	100.0	702	99.7
2	2191	131.9	16	100.0	586	98.4	985	99.2	604	98.2
3	1977	130.8	15	100.0	531	97.4	884	97.9	547	97.1
4	1701	124.4	14	100.0	456	91.6	775	94.4	456	87.2
5	1398	113.8	14	100.0	312	71.9	686	90.2	386	79.2
6	1119	101.1	14	100.0	230	57.1	571	81.6	304	64.5
7	913	92.3	14	100.0	168	46.2	467	73.6	264	57.1
8	441	84.7	2	100.0	57	36.1	282	64.8	100	53.3
9	174	79.8	1	100.0	22	33.8	106	54.0	45	51.7
10	56	41.3	0	0.0	3	33.8	45	48.0	8	42.0

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

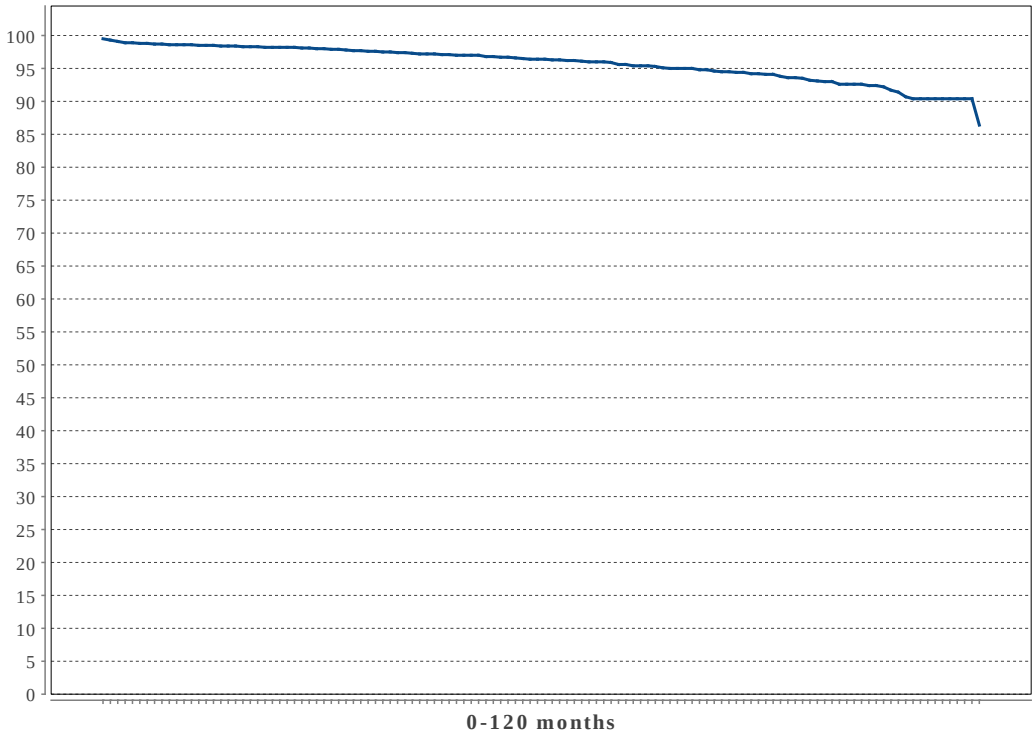


Models that have at least 50 implants and 20 explants

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Linox Smart SD 65/18	97.8	97.3	95.5	95.5	94.1	94.1	88.8	88.8	NaN
Biotronik	Linox Smart S 75	98.5	98.2	98.2	98.2	NaN	NaN	NaN	NaN	NaN
Medtronic	6943 Sprint	95.1	95.1	92.3	92.3	92.3	92.3	87.7	81.5	81.5
Medtronic	6932 Sprint	97.1	95.6	94.0	92.3	92.3	90.0	90.0	85.5	85.5
Medtronic	6948 Sprint F	98.3	98.3	94.4	92.8	92.3	91.0	87.4	84.3	82.8
Medtronic	6935 Sprint Quattro	99.6	99.6	99.6	99.0	99.0	99.0	NaN	NaN	NaN
Medtronic	6944 Sprint	98.2	97.9	96.9	96.5	95.2	93.0	89.9	85.7	85.7
Medtronic	6949 Sprint F	98.5	97.3	96.3	94.1	93.3	91.4	90.3	90.0	88.2
Medtronic	6947 Sprint Quattro	99.2	99.2	99.2	99.0	98.4	98.0	98.0	94.1	94.1
St. Jude Medical	7001 Riata ST	97.4	97.4	97.4	97.4	97.4	96.5	95.5	95.5	NaN
St. Jude Medical	1581 Riata	95.0	95.0	95.0	94.1	93.2	92.2	92.2	89.6	89.6
St. Jude Medical	1571 Riata	99.4	99.4	99.4	98.6	98.6	98.6	98.6	98.6	95.9
St. Jude Medical	7170 Durata	98.6	97.8	97.4	96.4	96.4	96.4	NaN	NaN	NaN
St. Jude Medical	7122 Durata	99.3	99.1	98.5	98.5	98.5	96.1	NaN	NaN	NaN
St. Jude Medical	7120Q Durata	98.3	98.0	97.6	97.6	97.6	NaN	NaN	NaN	NaN
St. Jude Medical	7120 Durata	98.0	97.6	97.5	97.3	97.3	97.3	NaN	NaN	NaN
St. Jude Medical	7122Q Durata	98.6	98.2	98.0	97.6	97.6	NaN	NaN	NaN	NaN

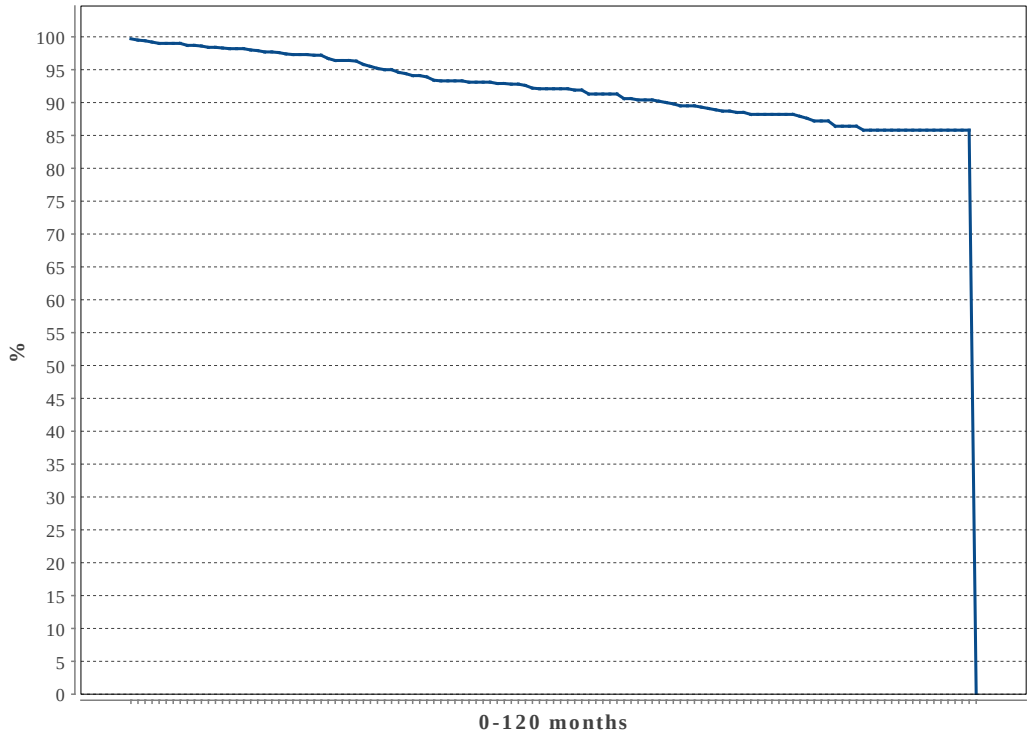
Overall survival probability for all ICD leads as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990

Year	At risk	Survival probabilty %
1	11507	99.5
2	9437	98.6
3	7582	98.2
4	5891	97.6
5	4431	97.0
6	3179	96.4
7	2127	95.4
8	1329	94.5
9	713	93.2
10	313	91.4



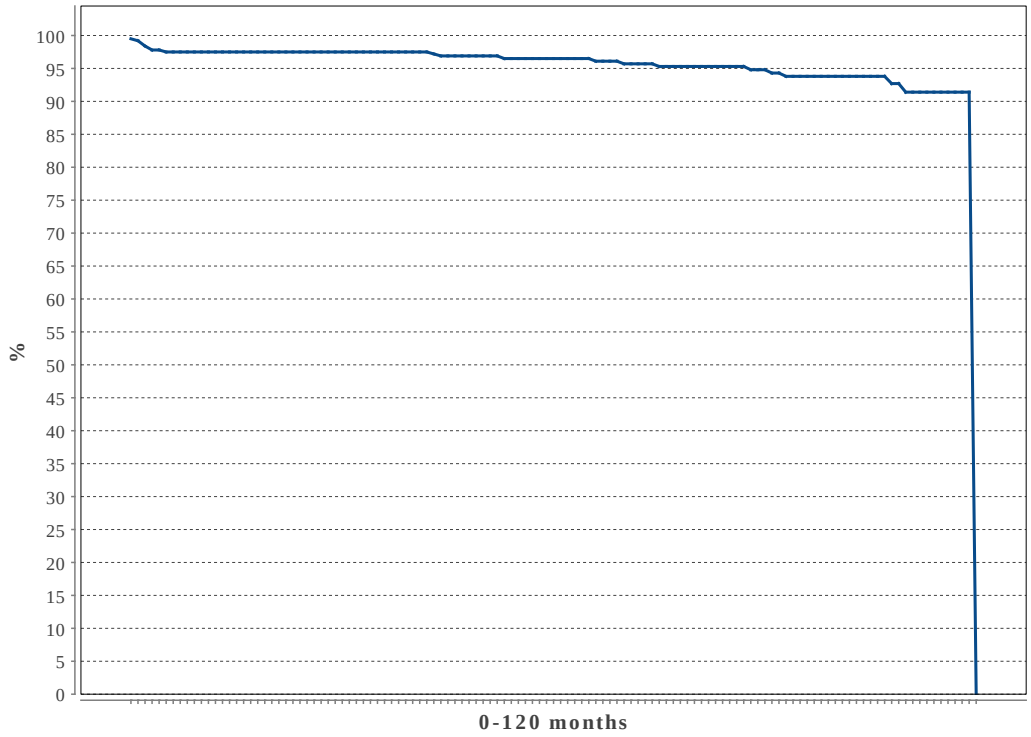
Survival probability for ICD lead Medtronic Sprint Fidelis. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	780	99.7
2	722	98.4
3	679	97.3
4	611	95.0
5	561	93.1
6	513	92.1
7	463	90.4
8	409	88.7
9	255	87.6
10	114	85.8



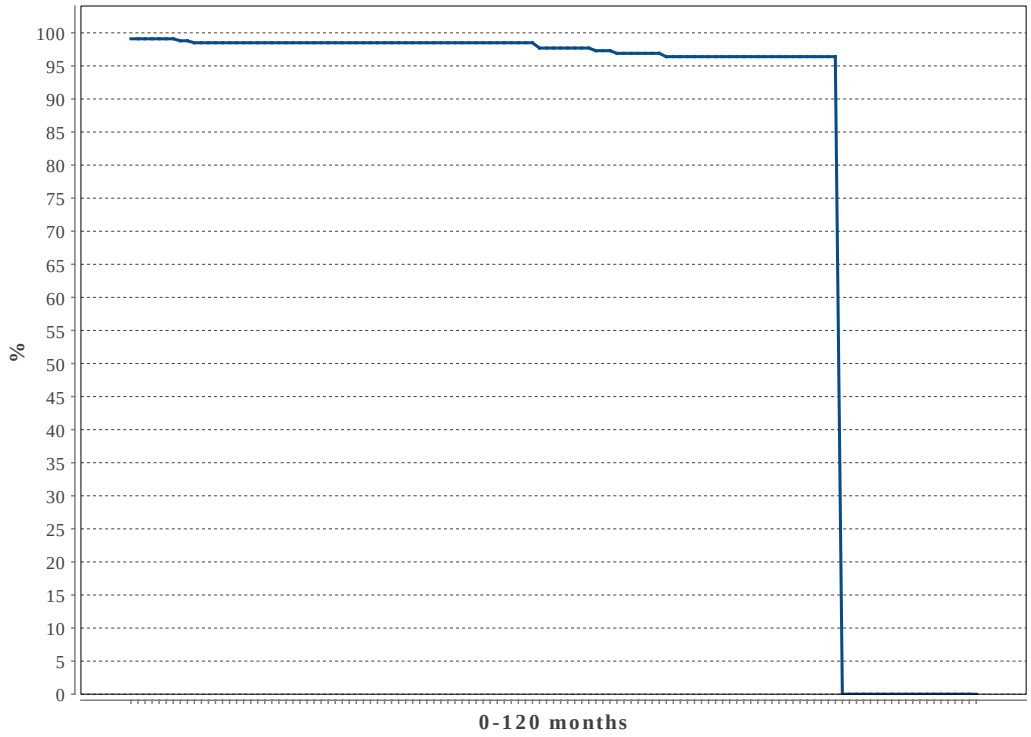
Survival probability for SJM lead type 1561,1570,1571,1572,1580,1581,1582,1591. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	369	99.5
2	343	97.5
3	325	97.5
4	307	97.5
5	287	96.9
6	262	96.5
7	229	95.7
8	208	95.3
9	184	93.8
10	85	92.7



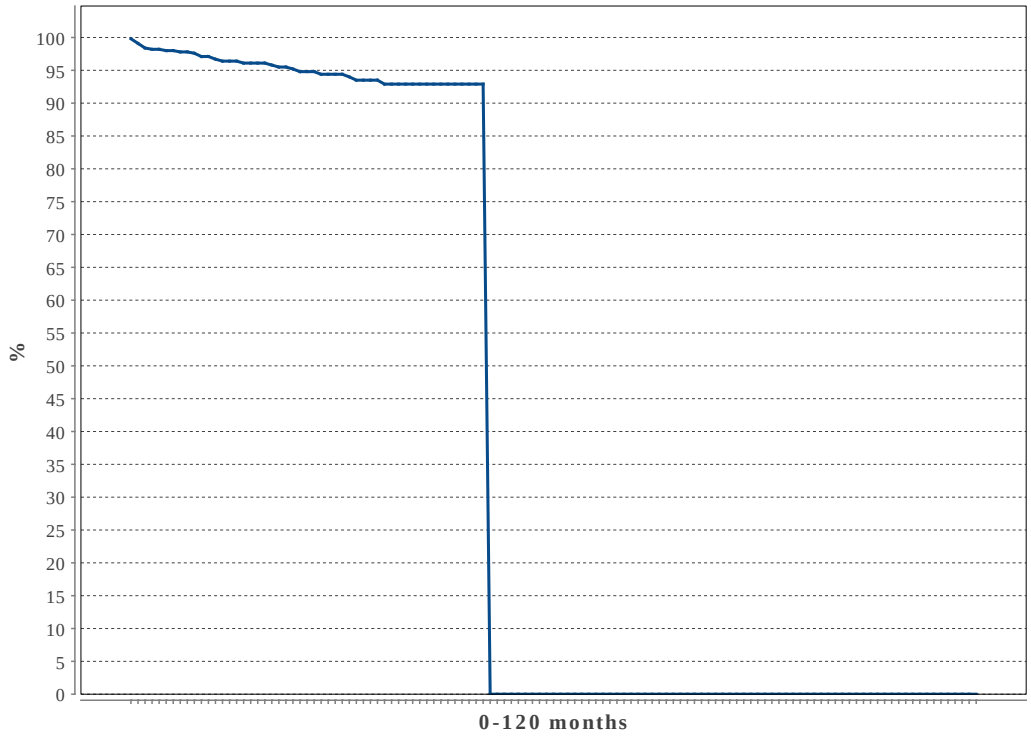
Survival probability for SJM lead type 7000,7001,7002,7040,7041,7042. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	351	99.1
2	315	98.5
3	303	98.5
4	288	98.5
5	266	98.5
6	244	97.7
7	226	96.9
8	184	96.4
9	32	96.4
10	0	0.0



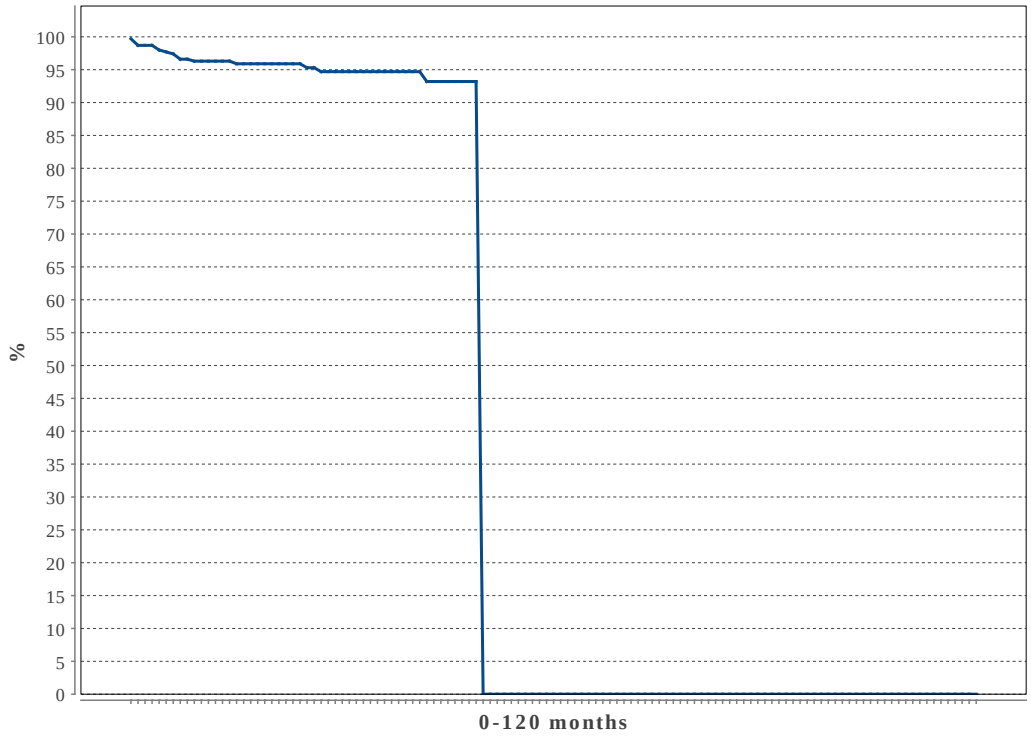
Survival probability for SJM ICD Fortify. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	566	99.8
2	402	96.7
3	270	94.8
4	155	92.9
5	29	92.9
6	0	0.0
7	0	0.0
8	0	0.0
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	314	99.7
2	248	96.3
3	177	95.9
4	98	94.7
5	17	93.2
6	0	0.0
7	0	0.0
8	0	0.0
9	0	0.0
10	0	0.0

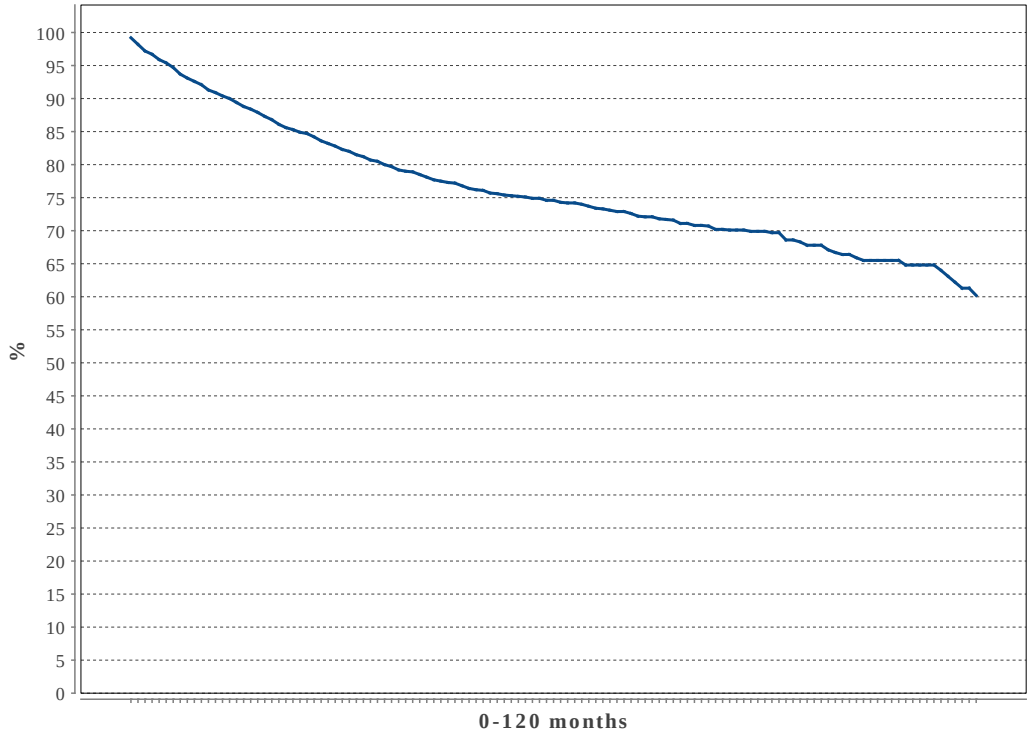


Models that have at least 100 implants and 50 explants

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Boston Scientific	T167 Vitality 2	100.0	100.0	99.1	97.4	87.4	75.0	64.4	48.7	NaN
Medtronic	7278 Maximo	99.1	96.3	96.3	92.1	85.1	62.9	28.5	2.5	NaN
Medtronic	7304 Maximo	100.0	98.9	96.3	76.6	31.4	10.6	10.6	10.6	NaN
Medtronic	7271 GEM DR	100.0	100.0	97.8	90.6	84.2	74.7	66.2	48.8	36.8
Medtronic	C174AWK Concerto	99.5	99.0	97.8	91.3	65.4	40.5	21.6	NaN	NaN
Medtronic	7227Cx Gem	100.0	100.0	100.0	99.2	96.0	90.4	73.6	56.7	42.1
Medtronic	D164AWG Virtuoso	100.0	98.7	98.7	96.6	88.4	76.8	63.1	49.3	NaN
Medtronic	7298 Sentry	100.0	99.6	94.8	78.6	44.4	19.6	10.6	3.8	3.8
Medtronic	7288 Intrinsic	100.0	99.6	97.9	97.0	89.8	67.0	24.6	3.2	2.8
Medtronic	7232Cx Maximo VR	100.0	99.7	98.4	97.7	96.1	93.9	89.1	74.0	39.3
Medtronic	D284DRG Maximo II	99.8	99.8	99.3	99.0	95.2	75.4	75.4	75.4	75.4
Medtronic	D284TRK Maximo II	99.8	99.8	98.5	88.7	54.4	18.4	NaN	NaN	NaN
St. Jude Medical	V-341 Atlas + DR	98.1	98.1	97.0	85.8	60.6	31.3	24.6	9.3	NaN
St. Jude Medical	V-193 Atlas + VR	98.5	98.5	98.5	97.6	93.7	91.5	89.2	67.6	25.7
St. Jude Medical	V-367 Atlas II	99.5	98.2	94.8	83.2	54.1	31.9	18.9	4.7	NaN
St. Jude Medical	V-243 Atlas + DR	99.0	98.5	96.5	95.4	93.7	85.4	65.2	44.5	9.4
St. Jude Medical	V-268 Atlas II	100.0	100.0	99.1	98.1	87.8	62.7	20.4	NaN	NaN
St. Jude Medical	3213-36 Promote HF	99.6	99.3	98.0	96.6	85.6	57.3	30.5	NaN	NaN

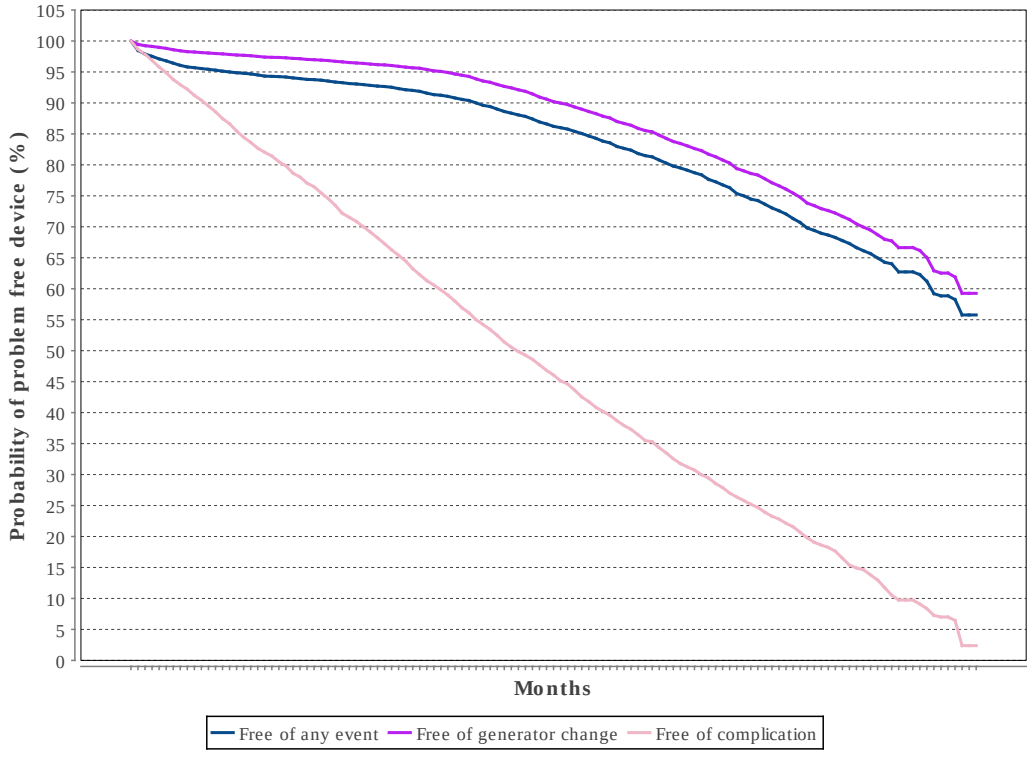
Based on all implants after 1990

Year	At risk	Survival probability %
1	2594	99.2
2	2291	90.9
3	2073	84.9
4	1788	80.0
5	1476	76.4
6	1190	74.6
7	983	72.2
8	475	70.2
9	232	67.8
10	117	65.5



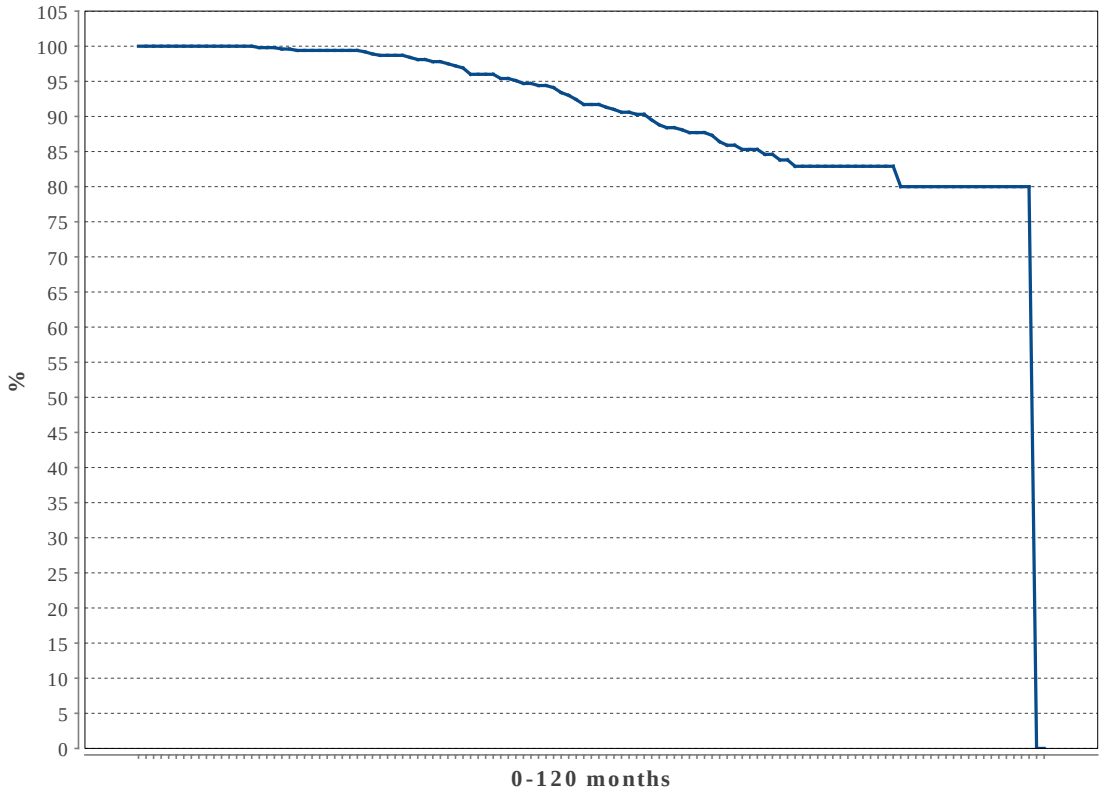
Probablility of event free CRT-device

Year	At risk	Free of any event %	Free of generator change %	Free of complication %
1	24459	95.3	98.0	88.6
2	18977	93.9	97.1	78.0
3	14368	92.7	96.1	67.3
4	10257	90.4	94.3	56.1
5	7045	86.2	90.2	46.1
6	4603	81.8	85.9	36.4
7	2758	76.8	80.8	27.9
8	1464	69.8	73.8	19.8
9	566	64.0	67.7	10.5
10	18	55.8	59.3	2.4



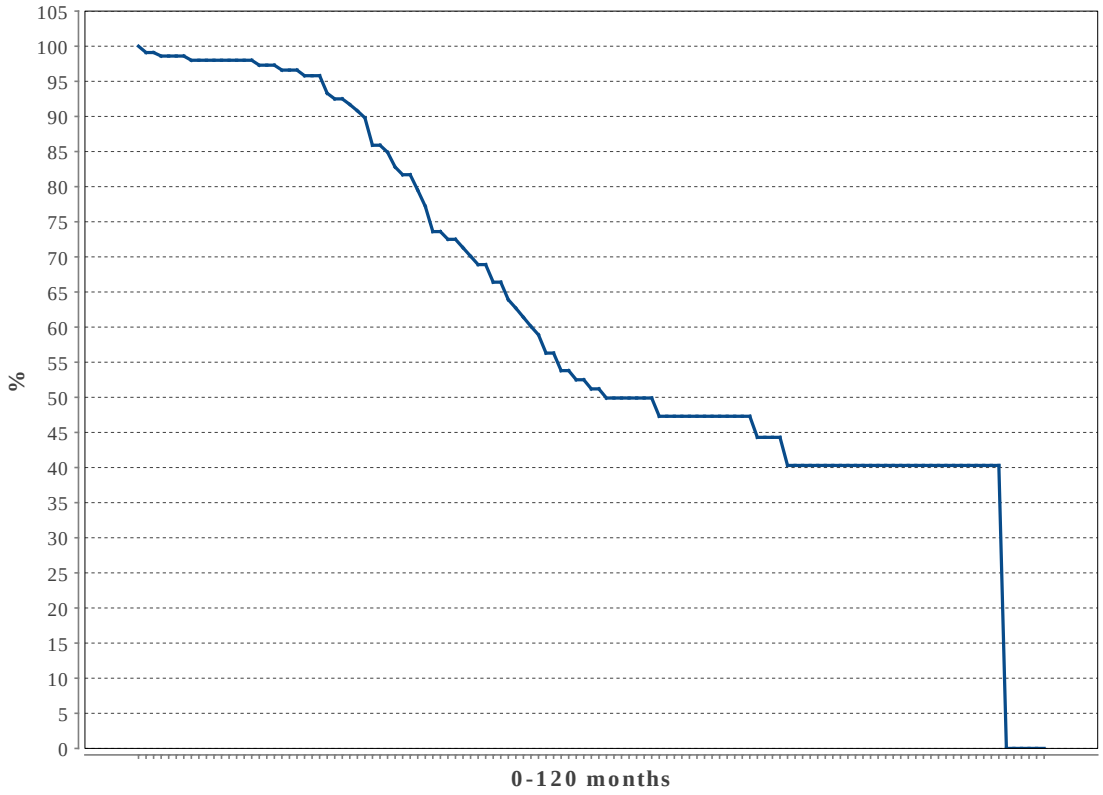
Overall CRT-P generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990

Year	At risk	Survival probability %
1	806	100.0
2	607	100.0
3	465	99.4
4	360	98.4
5	301	95.4
6	266	91.7
7	240	88.1
8	120	84.6
9	48	82.9
10	9	80.0



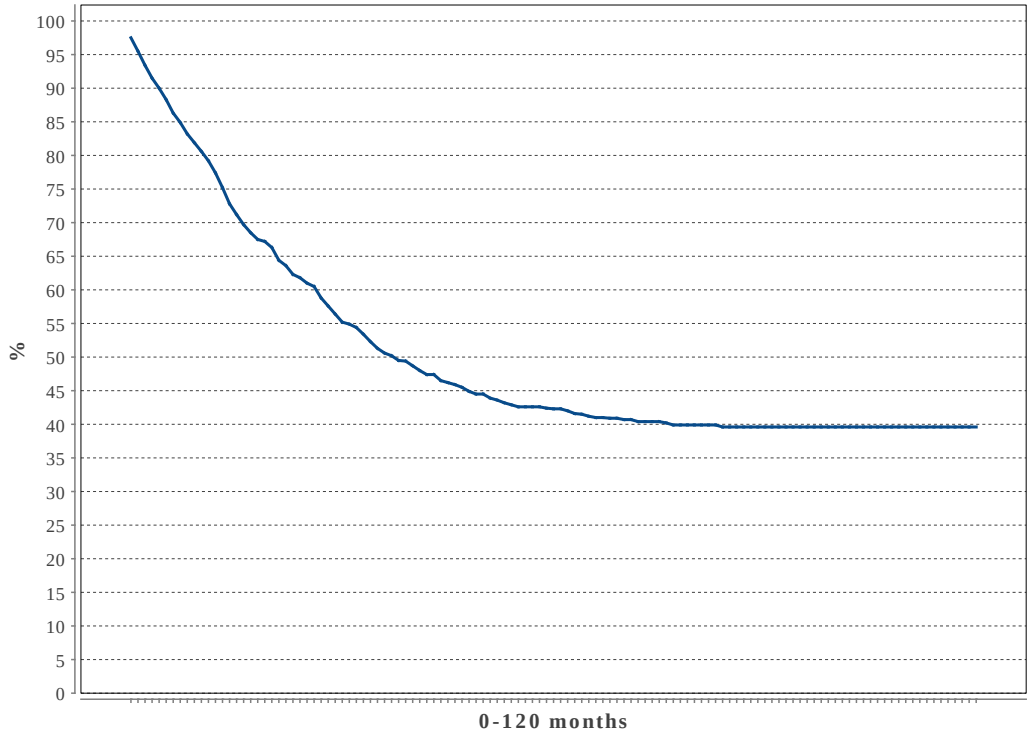
Overall CRT-D generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 1990

Year	At risk	Survival probability %
1	223	100.0
2	161	98.0
3	120	95.8
4	77	81.7
5	55	66.4
6	41	51.2
7	38	47.3
8	13	44.3
9	6	40.3
10	3	40.3



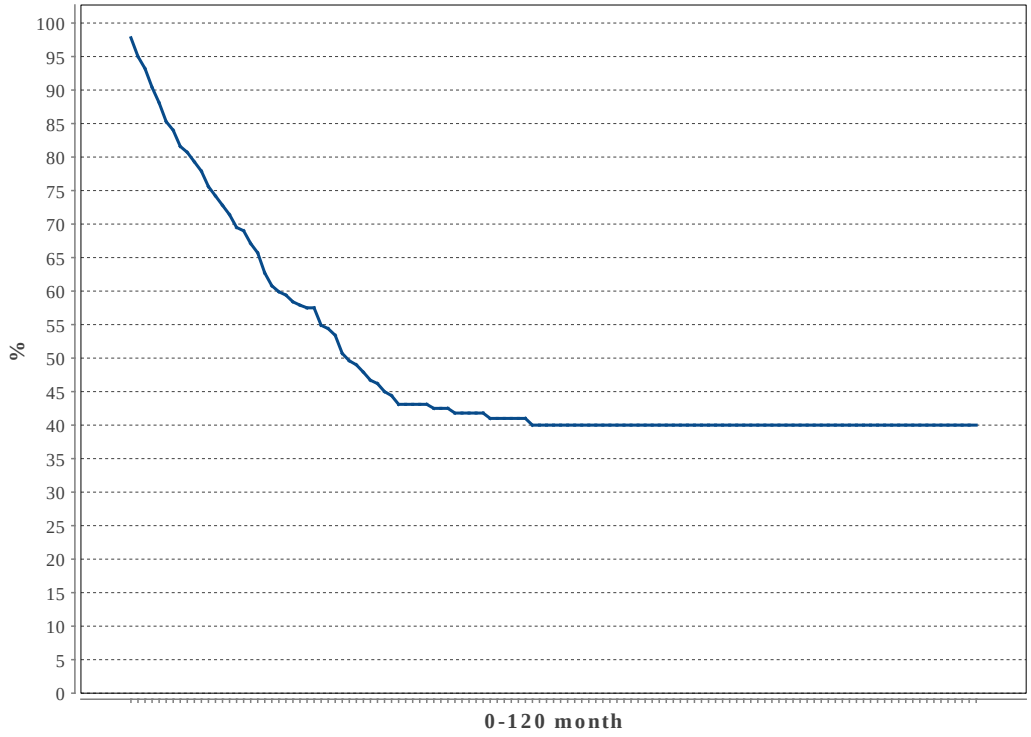
Overall patient survival probability for patients receiving CRT-P therapy. Based on all implants after 1990

Year	At risk	Survival probability %
1	816	97.5
2	617	77.4
3	475	61.8
4	370	50.6
5	311	44.9
6	276	42.3
7	250	40.4
8	120	39.6
9	52	39.6
10	15	39.6



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

Year	At risk	Survival probability %
1	225	97.8
2	163	74.2
3	122	57.9
4	79	45.0
5	57	41.8
6	43	40.0
7	40	40.0
8	14	40.0
9	8	40.0
10	5	40.0



QUALITY – DEAD WITHIN ONE YEAR FROM IMPLANT

Ratio of patients being dead one year after implantation

Type	Implants in 2014	Death within year	%
PM	9654	858	8.9
ICD	1926	74	3.8
CRT-P	442	43	9.7
CRT-D	518	21	4.1