KAROLINSKA HOSPITAL
DEPARTMENT OF CARDIOLOGY
SWEDEN

ANNUAL STATISTICAL REPORT 2020

SWEDISH ICD & PACEMAKER REGISTRY

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Foreword

We are proud to present the annual report for 2020 regarding Pacemaker and ICD treatment in Sweden. We have over the last years focused on longevity of devices, leads and complications triggered by the current events. We have also increased the data collected regarding lead extractions which are rapidly increasing in Sweden..
Complications are shown for each type of implantation for the country, for the region and hospital. There is also an ongoing discussion regarding concentration of therapy to fewer centers to improve outcomes by increasing the number of procedures per operator. To aid in this transformation we publish data on number of interventions for all individual implanters.
Lead extractions are reported per hospital using the definition by ACC, the removal of a lead with an implant duration of > one year regardless of the method and leads of < than one year if tools are used. All hospitals performing lead extractions are now sending complete data.
The report contains data from all implanting hospitals and > 95% of all procedures are reported when validated against the Patient care registry from The National Board of Welfare, Socialstyrelsen, in an annual validation process.

Implant rates Pacemaker

There were 60692 active pacemaker patients in Sweden at the end of 2020. As always, there are regional differences with the highest implant rates in the large northern region of Västernorrland, 1178 per million and the lowest Västmanland region and Stockholm. Stockholm has a low implant rate due to a younger population than the national average.
The overall implant rate decreased somewhat from 712 to 692 new implants per million. The Swedish population has also increased to 10,4 million and the total number of first implants increased in total.
The number of implanting hospitals was 41 in 2020.

Age and Gender distribution of pacemaker treatment

The average age for females receiving pacemaker treatment is 77 years and males 76 years and 5 patients over 100 years of age received primary implants. There is a male predominance with 60% of the new implants going to male patients but generator changes are more common in females due to the higher average survival of females in the country. There is no change in this distribution compared to previous years.

Pacemakers and leads

The manufacturers´ shares of the market show only slight redistribution and all regions are bound by tenders for 1-3 years. St Jude Medical is now Abbot and again largest with 48%, and Medtronic with the brand Vitatron is in second place with 27% market share. Boston Scientific has decreased its market shares to 12% in brady segment. Biotronik is still increasing and now up to 19% .
Right side pacemaker leads are now solely bipolar. Active fixation is used to 99.9% in the atrium and 96.2% in the ventricle where passive leads are used more commonly than in the US for example. We now have active fixation LV leads and 28% of the LV leads were active fixation, the same as in 2019 and increasing every year. Medtronic is the sole manufacturer with active fixation LV-leads. Quadripolar lead technology for CRT has rapidly increased and 86% of the LV leads are now quadripolar, an increase from 65% in 2016.
16117 leads were implanted all together.
Only a small number of epicardial systems are implanted in small children and patients without venous access and in some CRT patients. Venous access is almost equal between cephalic cut-down technique, 45%, and direct subclavian puncture 33% and 21% axillary punction which has increased as access route.
The leadless pacemaker systems are new in clinical use and Medtronic Micras were implanted in 13 patients in 2020.

Pacemakers

All pacemakers implanted have RR capability and DDD-R is the most common subtype, 77%. CRT-P is used in small numbers, 6% but increased since 2016.
The rate of MRI safe systems increases rapidly. Approximately 98% of the new systems implanted are MRI safe. The trend from the manufacturers to label older leads together with new pulse generators as MRI safe has made it difficult to keep correct track of the actual percentage.
The most common aethiology for pacemaker treatment is still the “conductive tissue fibrosis” 80% and ischaemic disease is more common in males, 6.9 vs 3,9%. The usage of the term “conductive tissue fibrosis” is most probably too high and only represents a lack of proper diagnosis when entering registry data.
System upgrade is at a steady state, especially in brady-paced patients with heart failure and in 2016 a total of 239 patients were upgraded from normal brady pacing to CRT compared to 255 in 2020.
The most common symptom is syncope followed closely by dizziness and dyspne. ECG indications are in 2020, as before, mainly related to sinus node disease with AV conduction disorders second. Sinus node disease is slightly more common as an indication in women than in men.
Smaller hospitals tend to use VVI-R pacing more often than larger hospitals for AV-block and SSS.
Generators are used to ERI criteria in 64% of the cases and 1.6% exhibit premature EOL, Boston´s Proponent generators being the most common 2020. Lead failures are uncommon and survival rates are very good with a 10 year survival of 98%.

Implanting organisation

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

Implant rates ICD

There were 13521 active ICD patients in Sweden in 2020, the number increasing slowly over the years and could be an effect of better heart failure management. The number of centers implanting ICDs is 31 and represents roughly 2/3 of the PM implanting centers although 4 centers do <20 implants per year, well below recommendations by ESC and the Swedish national society. The national implant rate is lower in 2020 than in 2019, 140 vs 146 per million. The northern and middle regions are the only regions that have increased their implant rates, all others show a small decrease. Otherwise implant rates show the same regional differences as in pacemakers with the highest rates in the north, 248 in Norrbotten and the lowest in the Västra Götaland region with 92 per million.
About 38% of the ICD procedures are replacements but could be expected to go further down with generators now showing increased longevity.
As with PM the regions are bound by ICD purchasing tenders and the manufacturers ´ shares show only slight variations over the previous years. SJM is the largest with 43.5% market share, Medtronic second with 36%. Boston Scientific with 14.9% and Biotronik is smallest with 5.5% market share.
A small number of S-ICD devices, 34 were implanted, but numbers are not increasing.

ICD Subtypes and leads

96% of the leads were single coil and 99% were active fixation. An increase in single coil use from 65% in 2015. Venous access is comparable to PM implants with an equal distribution between cephalic cut-down and direct subclavian puncture. Subtypes are 39% DDDR devices and 32% CRT-D devices, an increase from 35% in 2015.
Only 57% of the ICDs are used until normal EOL/ERI, 11% are system changes due to system upgrade to a CRT system. Technical recalls stand for 0.8% of all box changes and premature EOL is 1.6%.
ICD leads display larger failure rates compared to pacemaker leads but overall longevity is still good. Specific statistics for Sprint Fidelis and Durata leads is displayed in the quality section.
The number of procedures display the same large variation in volumes as in pacemaker procedures at different hospitals and some are clearly below the recommended volumes.

ICD Patients

The average age for an ICD implant is stable at 64 years in males and 60 years in females for new implants, unchanged from previous years. 80 patients in the age group 80-89 received a first ICD implant. 37 of them were primary prevention.
Clinical indication for all ICD implants was secondary prevention in 36.2% and primary in 63.8%.
Aethiology was ischaemic heart disease in 56% of all patients but more common in males, 68% vs 32% in females.
Medication at the start of therapy is displayed in tables.

CRT implant rates

Implant rates of CRT system decreased in 2020 vs. 2019, 58 per million CRT-Ds and 53 CRTPs.
The number of centers performing CRT implantations is less than the number doing ICDs, 22 vs 32. The number of CRT procedures per implanter ranges from 1-67 and only 3 implanters performed >50 implants and 15 implanters out of 72 perform > 20 implants per year which is the recommended minimum.
The distribution between CRT-D and CRT-P systems 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 77 years and CRT-D patients 68 years with a large male predominance, the same as last year. Medication for patients receiving CRT for the first time is given in tables.

ILR

1116 ILRs were implanted in Sweden 2020 which is up from 847 in 2016 with the main indication being dizzy spells and syncope. At the end of the ILR investigation period 73% of the patients were found to have a PM indication and 8% an ICD indication, the rest showed no pathological rhythm during the FU. In 7% a new ILR was implanted to extend the monitoring period.

Quality of device treatment, pacemakers, pacing modes

In high degree AV block only 5% of the patients receive VVI-R system on average.
The use of pacing mode in sinus node disease show 6% VVI-R systems on average and the same in small and large hospitals.

Lead extraction

The number of lead extractions is increasing and there are now 5 centers performing regular assisted lead extractions. Karolinska, 188 leads, Sahlgrenska 63 leads, Uppsala 48 leads, Lund 139 leads and Linköping 13 leads. The numbers are expected to increase further in 2021.
The most common reason is infection. Preventive extractions of leads with problems such as Medtronic Sprint Fidelis and SJM Riata are also performed in a lower number of cases in 2020 than before, due to decreasing number of leads still in use.
Methods and success rates are displayed for those hospitals that have complete reporting.

Complications Pacemaker

The total complication rate for pacemaker procedures is 4% vs 5.4% in 2016 with lead dislodgement being the most common. Passive atrial leads show the highest dislodgement rate with 3% vs 1.5 for active fix atrial leads. LV leads show the same tendency with 2% dislodgement for all passive types and 0,8% for the Medtronic screw-in type SC lead.
There is a variation among the operating hospitals with possible underreporting in many cases. Hospitals that have registered <3% in total complication can be regarded as not having complete registration. This is based on literature regarding pacemaker procedure complications with a common rate of 5-15%.

Complications and gender

Infections are more common during generator changes than new implants and most common in CRT system changes, 1.3%. In PMR female sex is associated with less complications of all types but perforation,pneumothorax and infections after upgrade to CRT. This is different from the literature that usually has an overrepresentation of females in all types of complications.

Complications ICD

The overall complication rate to ICD treatment is 6.1% and is down slightly from 6.8% in 2019. The most common complication is lead dislodgement 2.2% followed by infection and electrical dysfunction with 0.9%.
The rate between hospitals is also given in tables and as with pacemaker treatment <3% overall complication rate is considered incomplete registration.

Complications CRT

This is presented as a both CRT-D and CRT-P complications. Both figures 6,5% and 4.9% are very low and do not compare well with literature findings of up to 15% complications. Most common is as with ICDs and PMs lead dislodgement 1,7% vs 3.6% for CRT-P and CRT-D. Most commonly it is the sc lead that dislodges.

Procedures

Duration of fluoroscopy and procedure times are given for all types and hospitals in tables. The procedures that have been performed in less than 10 procedures at different sites are marked as not reliable for comparison.
A single chamber device takes as a mean 38-45 minutes to implant VVI-AAI, and a dual chamber device 48 min and a CRT system 92 min on average.

Device longevity ICD and PM

Generators have generally very good longevity with an average for Pacemakers of 99.4% after 5 years and 56.3% after 10 years but there are large differences between models and manufacturers. Each model is given in the tables.
Pacemaker lead survival is very good with a survival rate of 98,1% after 10 years with very little difference between models.
ICD generator survival is more heterogenous than PM generator survival with larger differences between manufacturers and models and an average of 96.7% after 5 years and 21.2 %after 10 years.
SJM Fortify and Unify were identified as problem generators in 2014 in our registry, long before the SJM alert and survival curves were given for each model.
ICD lead survival is also shorter than pacemaker lead survival, 95% vs 98% after 10 years.
The Medtronic Sprint Fidelis models were implanted in 903 cases in Sweden and the survival rate is 67% after 10 years and decreased rapidly, as expected, from previous years but seems to be steady now.
In the St Jude Riata models failures are increasing and 10 year survival is now down to 73%, down from 77% in 2016.
The Biotronik Linox leads have also a decreased longevity compared to the average ICD lead and

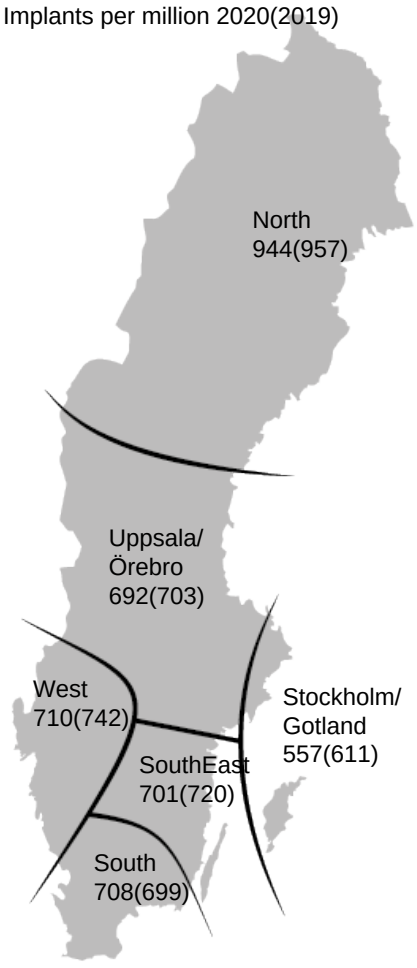
Patients

The ICD patient survival is 68% after 5 years for ICD patients vs 74% for pacemaker patients.
The heart failure patients treated with CRT have also the shortest expected survival rate among the PM and ICD patients. CRT-P patients have a 71.5% 5 year survival rate and CRT-D patients 32.8%.
One-year mortality is 9% in PM patients, 5% in ICD patients, 11% in CRT-P patients and 3% in CRT-D patients.

Fredrik Gadler
Manager Swedish National ICD and Pacemaker Registry

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

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2452114	1366	557	12102
Uppsala/Örebro	2128642	1473	692	13287
South-East Sweden	1078178	756	701	6056
Southern Sweden	1891025	1338	708	11177
Western Sweden	1930821	1371	710	11297
Northern Sweden	898515	848	944	6650
Total	10379295	7152	689	60569



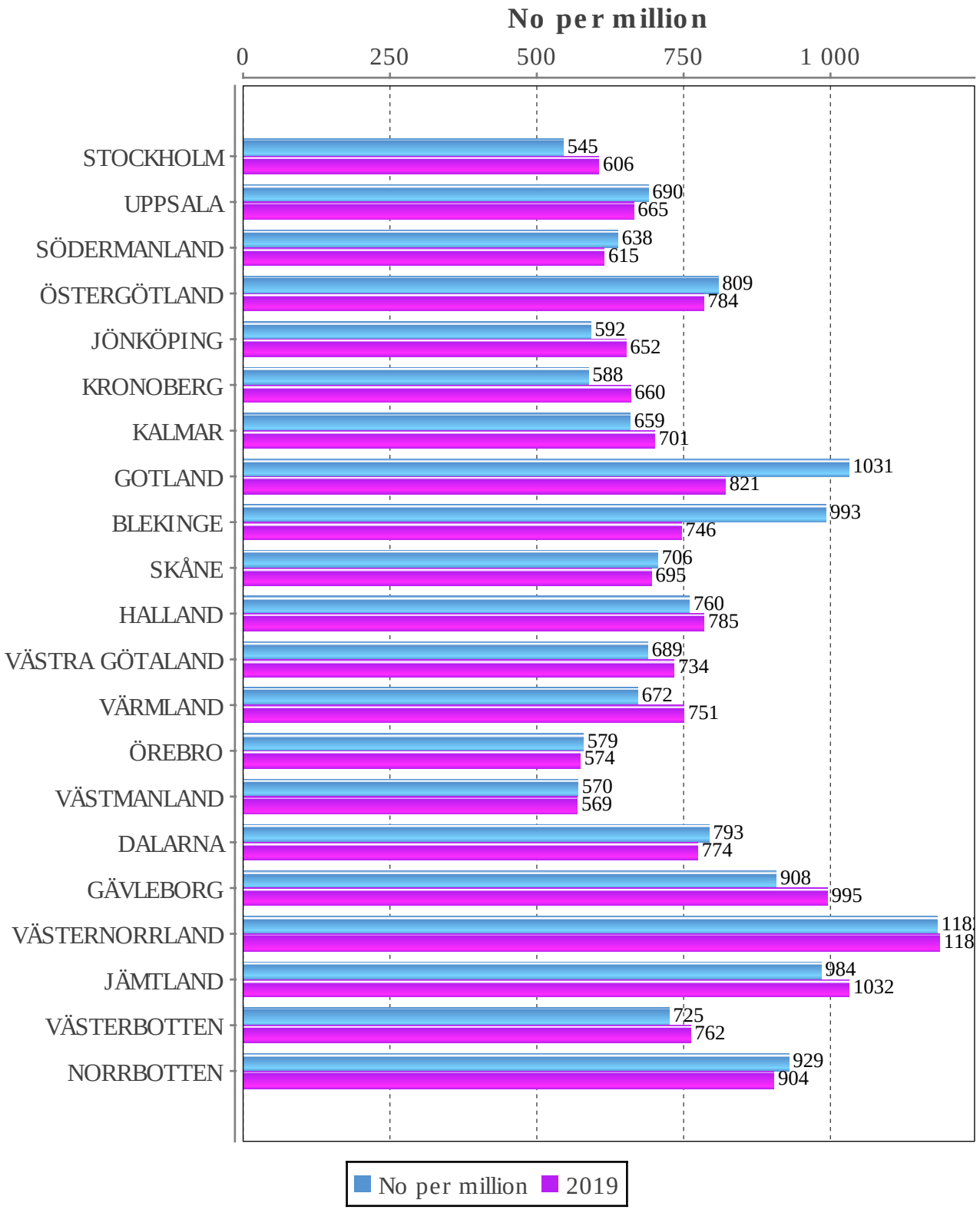
First implants per hospital

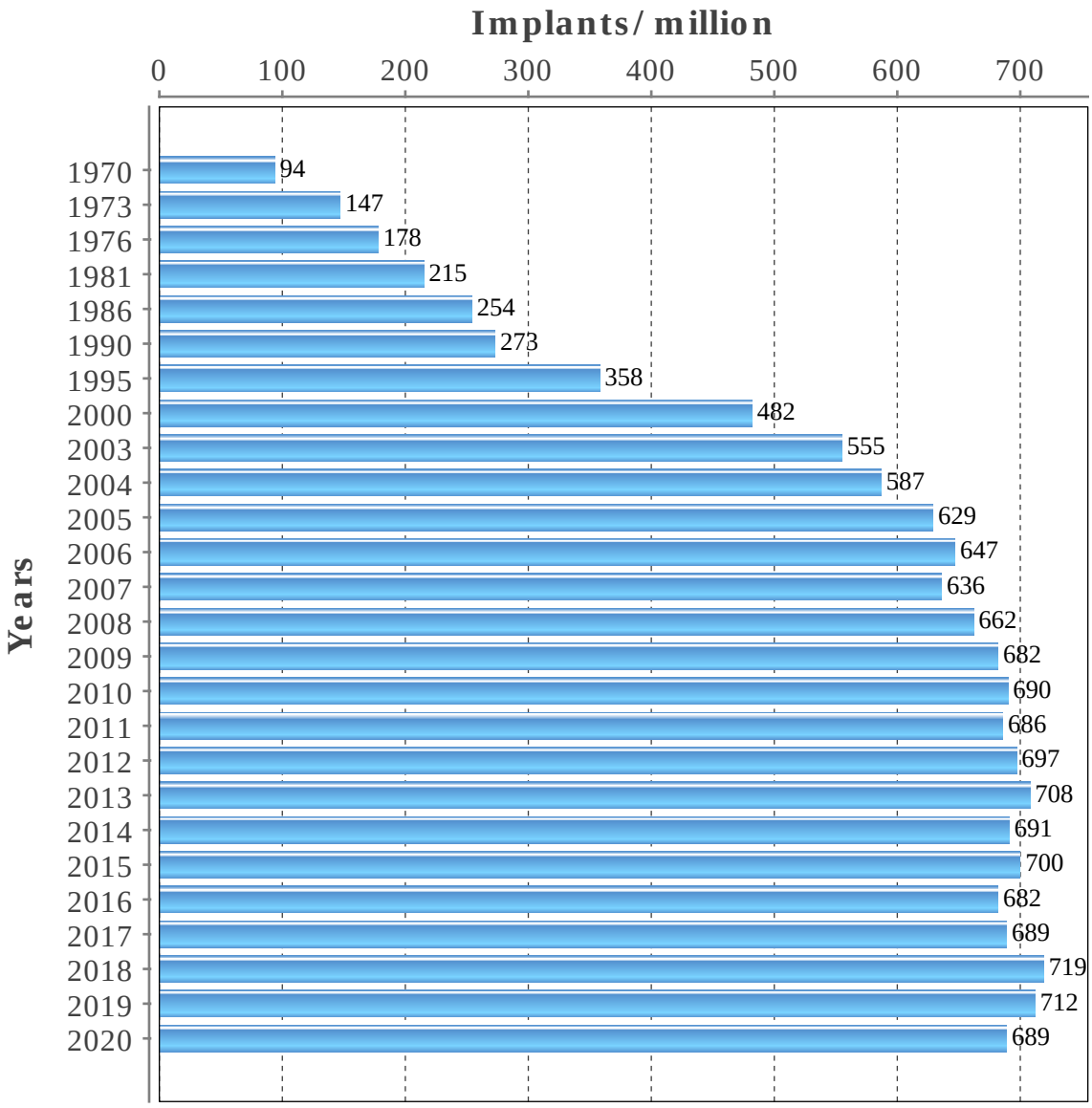
Region	Hospital	2020	2019
Northern Sweden	Norrlands Universitetssjukhus	174	173
	Skellefteå lasarett	49	57
	Sollefteå sjukhus	16	16
	Sunderby sjukhus	230	218
	Sundsvalls sjukhus	217	220
	Örnsköldsviks sjukhus	68	63
	Östersunds sjukhus	138	136
Southern Sweden	Blekingesjukhuset	162	132
	Centrallasarettet Växjö	108	127
	Centralsjukhuset Kristianstad	268	238
	Helsingborgs lasarett	181	224
	Länssjukhuset Halmstad	78	117
	Skånes universitetssjukhus, Lund	371	317
	Skånes universitetssjukhus, Malmö	199	202
	Varbergs sjukhus	164	128
South-East Sweden	Linköpings Universitetssjukhus	392	424
	Länssjukhuset Kalmar	120	97
	Länssjukhuset Ryhov	201	218
	Västerviks sjukhus	43	63
Stockholm/Gotland	Danderyds sjukhus	410	458
	Karolinska Universitetssjukhuset	432	418
	St Görans sjukhus	261	302
	Södersjukhuset	249	298
	Visby lasarett	32	21
Uppsala/Örebro	Akademiska sjukhuset	299	288
	Centralsjukhuset Karlstad	158	167
	Centralsjukhuset Västerås	148	145
	Falu lasarett	222	225
	Gävle sjukhus	199	213
	Hudiksvalls sjukhus	54	62
	Mälarsjukhuset	167	168
	Torsby sjukhus	35	45
	Universitetssjukhuset Örebro	190	182
Western Sweden	Alingsås lasarett	73	56
	Drottning Silvias Bus	10	8
	Kungälvs sjukhus	110	97
	Sahlgrenska Universitetssjukhuset	434	480
	Sahlgrenska Universitetssjukhuset /Östra	13	62
	Skaraborgs sjukhus Skövde	184	186
	Södra Älvsborgs sjukhus	163	174
	Trollhättan, NÄL	231	237

STATISTICS – PACEMAKER – IMPLANTS PER COUNTY

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

County	Population	No of first	No per million	Active patients
STOCKHOLM	2391990	1304	545	11621
UPPSALA	388394	268	690	2296
SÖDERMANLAND	299401	191	638	1780
ÖSTERGÖTLAND	467158	378	809	2832
JÖNKÖPING	365010	216	592	1954
KRONOBERG	202263	119	588	1011
KALMAR	246010	162	659	1270
GOTLAND	60124	62	1031	481
BLEKINGE	159056	158	993	1210
SKÅNE	1389336	981	706	8238
HALLAND	336748	256	760	1879
VÄSTRA GÖTALAND	1734443	1195	689	10135
VÄRMLAND	282885	190	672	1672
ÖREBRO	305643	177	579	1619
VÄSTMANLAND	277141	158	570	1495
DALARNA	287676	228	793	1981
GÄVLEBORG	287502	261	908	2444
VÄSTERNORRLAND	244554	289	1182	1938
JÄMTLAND	131155	129	984	986
VÄSTERBOTTEN	273192	198	725	1761
NORRBOTTEN	249614	232	929	1965
Total	10379295	7152	689	60568


No per million
0
250
500
750
1 000
STOCKHOLM
545
606
UPPSALA
690
665
SÖDERMANLAND
638
615
ÖSTERGÖTLAND
809
784
JÖNKÖPING
592
652
KRONOBERG
588
660
KALMAR
659
701
GOTLAND
1031
821
BLEKINGE
993
746
SKÅNE
706
695
HALLAND
760
785
VÄSTRA GÖTALAND
689
734
VÄRMLAND
672
751
ÖREBRO
579
574
VÄSTMANLAND
570
569
DALARNA
793
774
GÄVLEBORG
908
995
VÄSTERNORRLAND
118
118
JÄMTLAND
984
1032
VÄSTERBOTTEN
725
762
NORRBOTTEN
929
904
No per million
2019


Implants/ million
0
100
200
300
400
500
600
700
Years
1970
1973
1976
1981
1986
1990
1995
2000
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
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2020
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147
178
215
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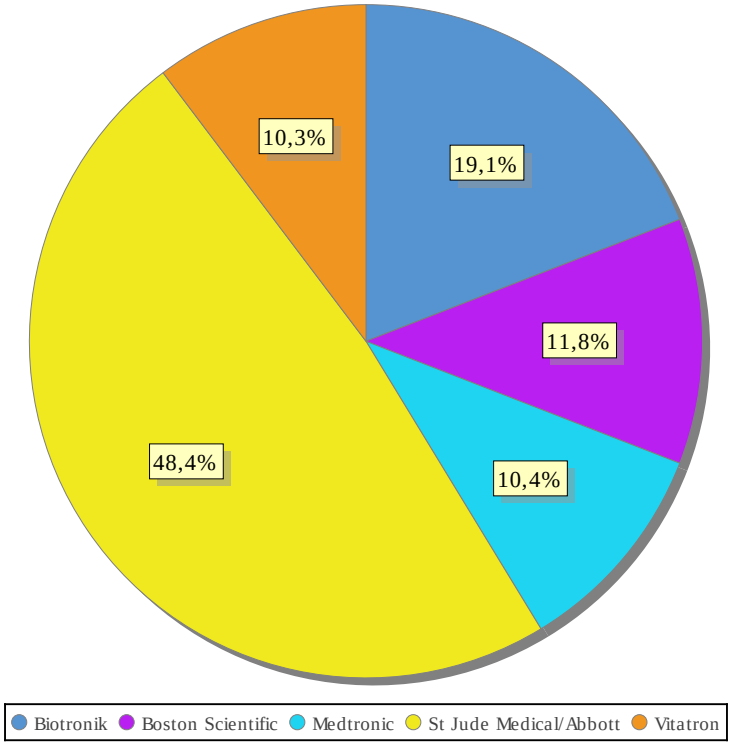
273
358
482
555
587
629
647
636
662
682
690
686
697
708
691
700
682
689
719
712
689

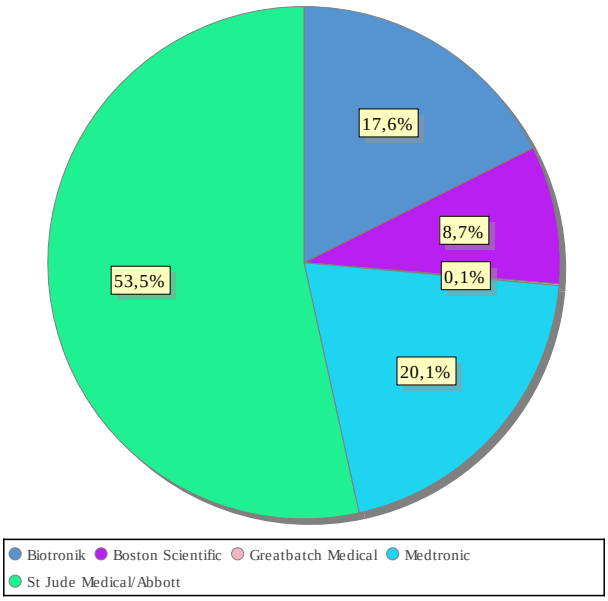
Market share per manufacturer in Sweden. Medtronic and Vitatron regarded as separat companies

Manufacturer	2017 %	2018 %	2019 %	2020 %
Biotronik	14.4	18.9	18.2	19.1
Boston Scientific	14.7	10.2	11.5	11.8
Medtronic	19.6	11.5	11.3	10.4
Sorin/LivaNova	1.4	0.5	0.1	-
St. Jude Medical	45.4	48.7	48.1	48.4
Vitatron	4.6	10.2	4.9	10.3
Impulse Dynamics	-	-	-	-



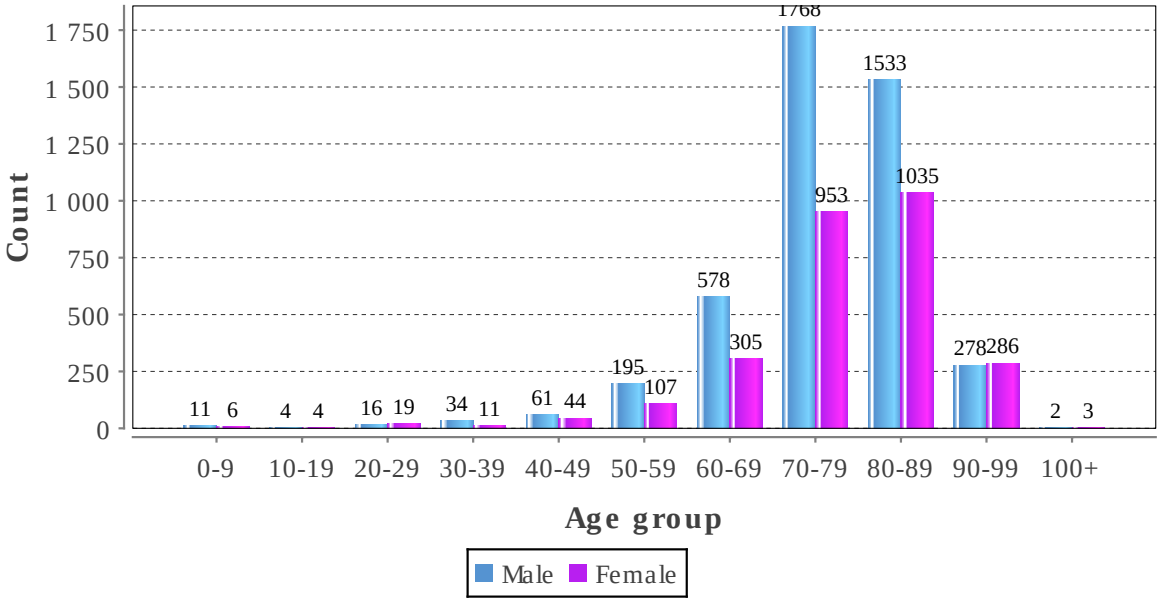
Market share per manufacturer in Sweden. Medtronic and Vitatron regarded as separat companies. From 2011 even including leads implanted in ICD systems.

Manufacturer	2017 %	2018 %	2019 %	2020 %
Biotronik	9.8	13.7	15.3	17.6
Boston Scientific	13.6	9.1	8.7	8.7
Medtronic	22.7	22.2	23.2	20.1
St. Jude Medical	53.5	54.8	52.7	53.4
Vitatron	0.2	-	-	-
Sorin/LivaNova	0.2	0.1	-	-
Greatbatch Medical	-	-	-	0.1



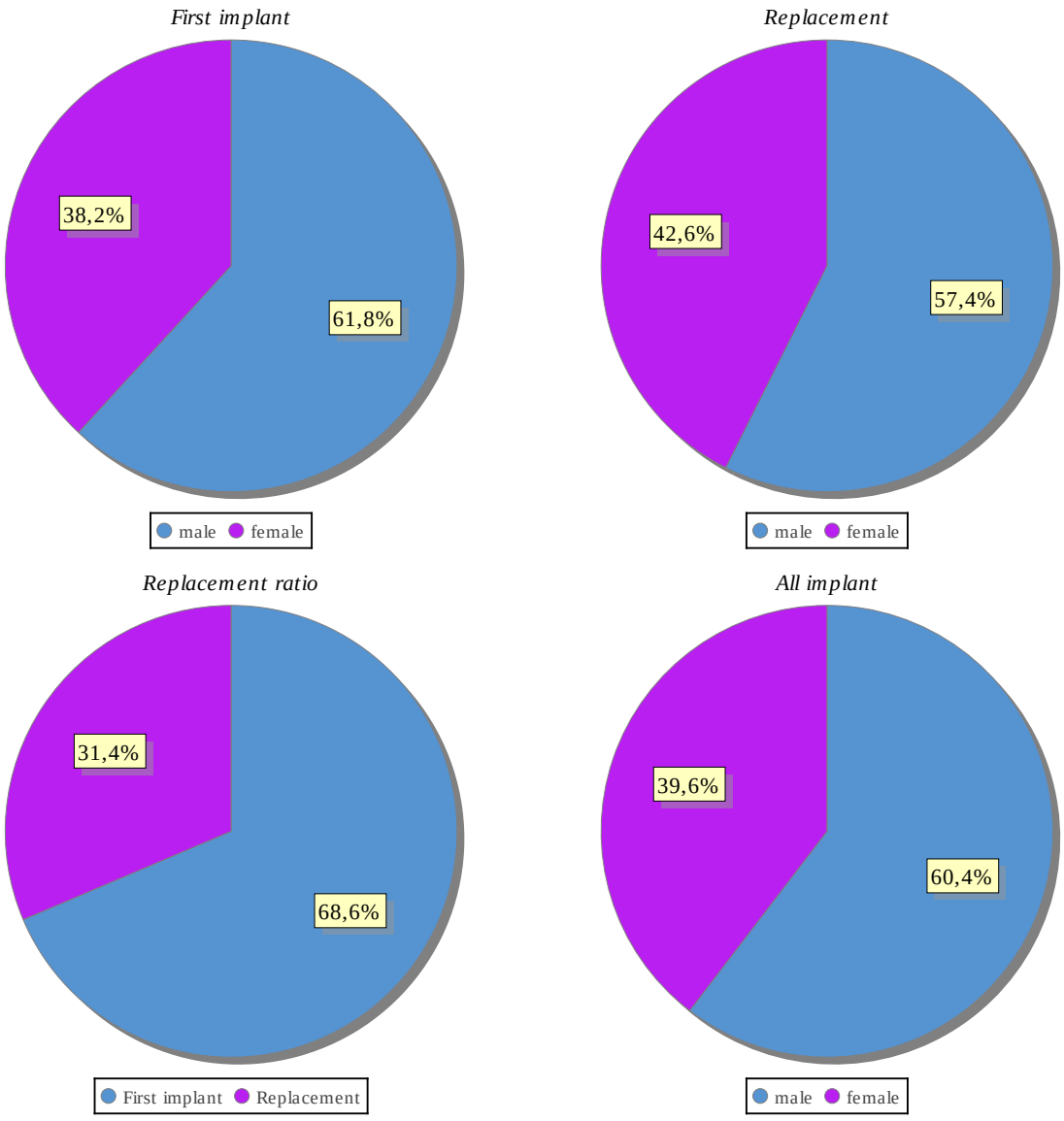
Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
0-9	17	0.2	11	6
10-19	8	0.1	4	4
20-29	35	0.5	16	19
30-39	45	0.6	34	11
40-49	105	1.4	61	44
50-59	302	4.2	195	107
60-69	883	12.2	578	305
70-79	2721	37.5	1768	953
80-89	2568	35.4	1533	1035
90-99	564	7.8	278	286
100+	5	0.1	2	3
Average age	76	0.0	76	77
				Total number of implants: 7253



Ratio of new implants versus generator changes

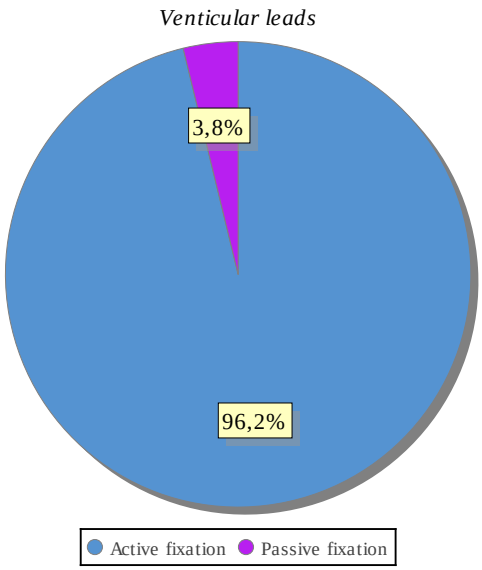
	Total		Male		Female	
	no	%	no	%	no	%
First implant	7253	68.6	4480	61.8	2773	38.2
Replacement	3325	31.4	1908	57.4	1417	42.6
Total	10578	100.0	6388	60.4	4190	39.6

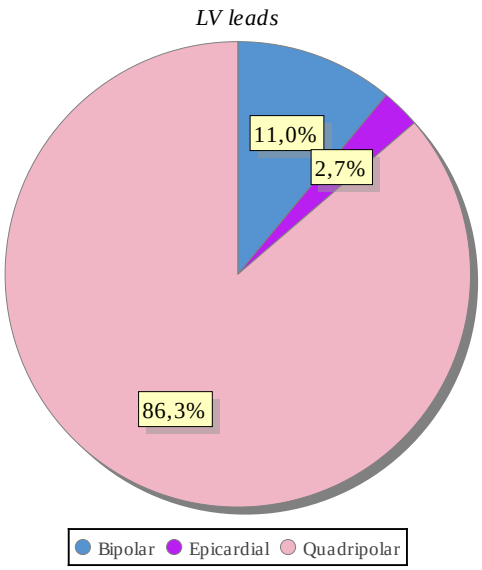


Lead type distribution for atrial and venticular use for first implants and replacements including all pace leads, pace and ICD systems

	Atrial		Venticular		LV-lead	
	no	**%**	**no**	**%**	**no**	**%**
Bipolar	7105	99.7	7686	99.3	138	11.0
Epicardial	23	0.3	49	0.6	34	2.7
Quadripolar	-	-	3	-	1078	86.2

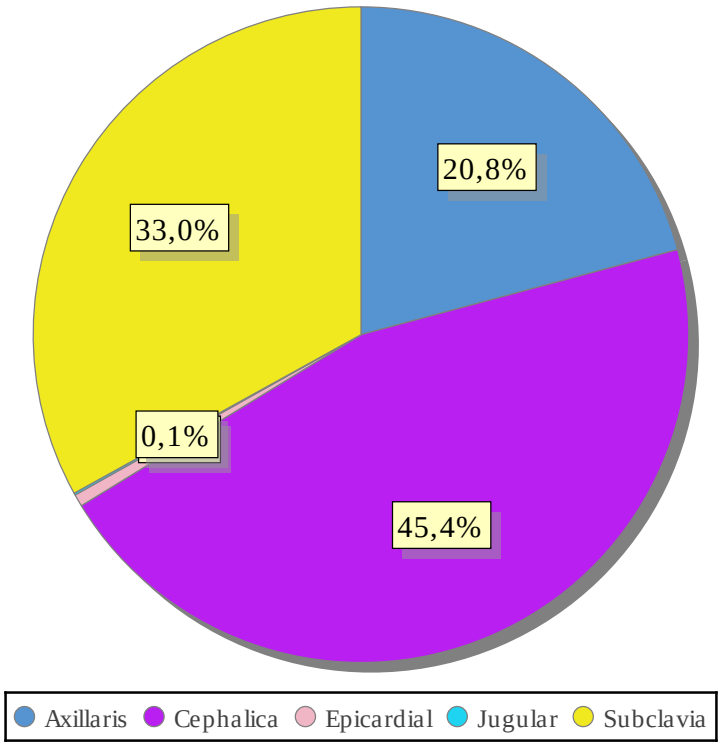
	Atrial		Venticular		LV-lead	
	no	**%**	**no**	**%**	**no**	**%**
Active fixation	7123	99.9	7444	96.2	349	27.9
Passive fixation	5	0.1	295	3.8	901	72.1
						Total number of leads: 16117





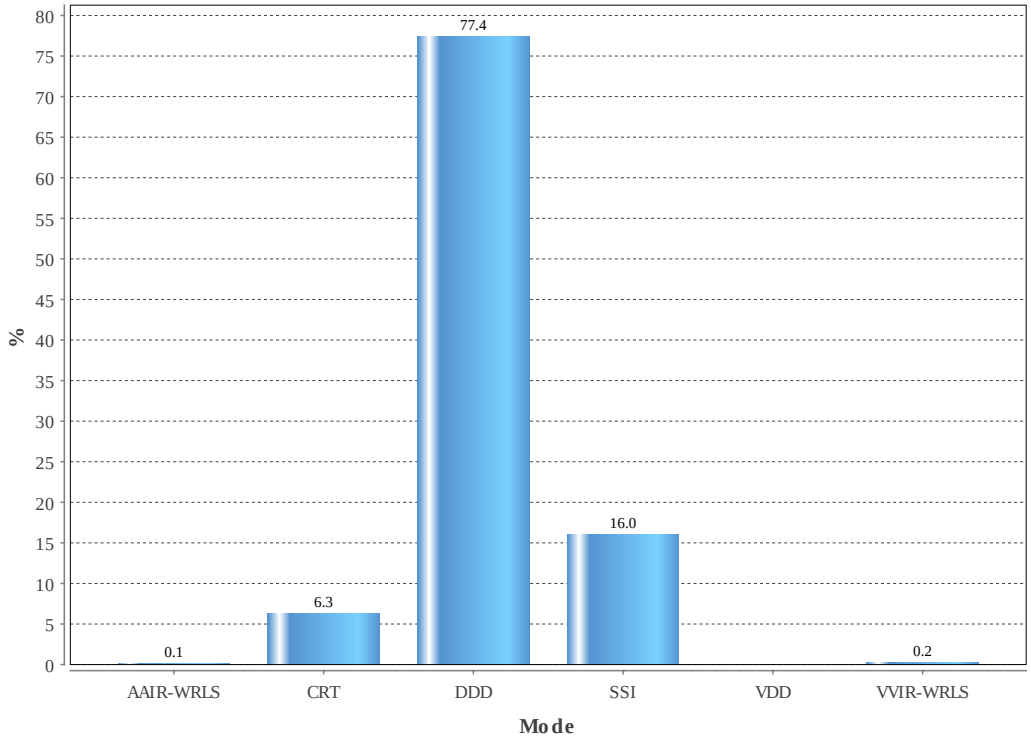
Venous access for first implants and replacements, all types of pace leads.

Lead access	No	%
Axillaris	3347	20.8
Cephalica	7319	45.4
Epicardial	104	0.6
Jugular	18	0.1
N/A	3	0.0
Subclavia	5326	33.0



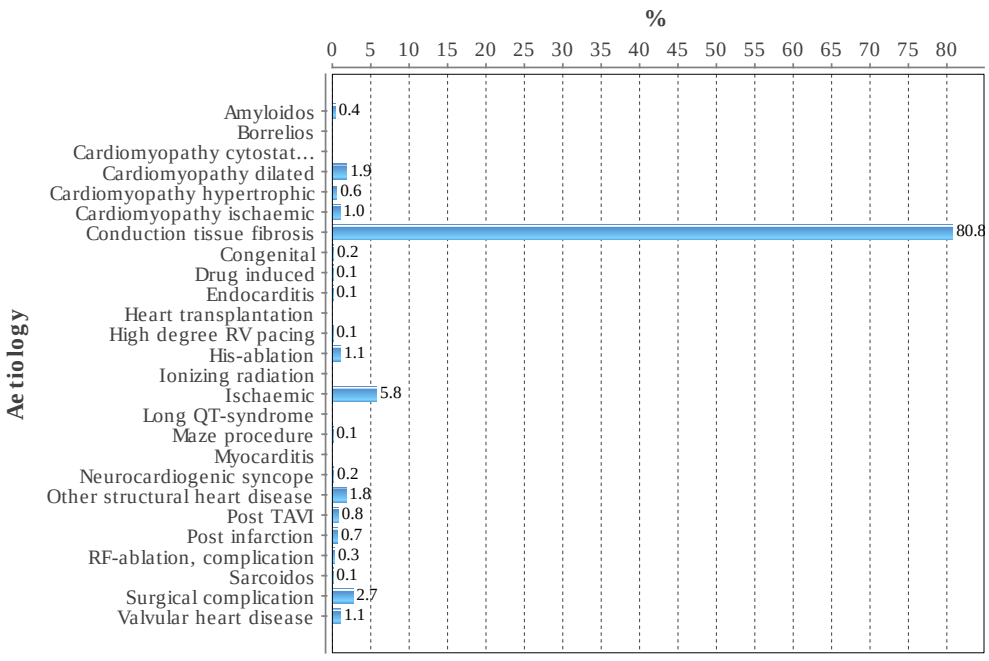
Implants by subtype (WRLS: wireless)

Mode	%	No
AAIR-WRLS	0.1	6
CRT	6.3	459
DDD	77.4	5611
SSI	16.0	1163
VDD	0.0	1
VVIR-WRLS	0.2	13
Total number of first implants 7253		



Main aetiology for implanting pacemakers

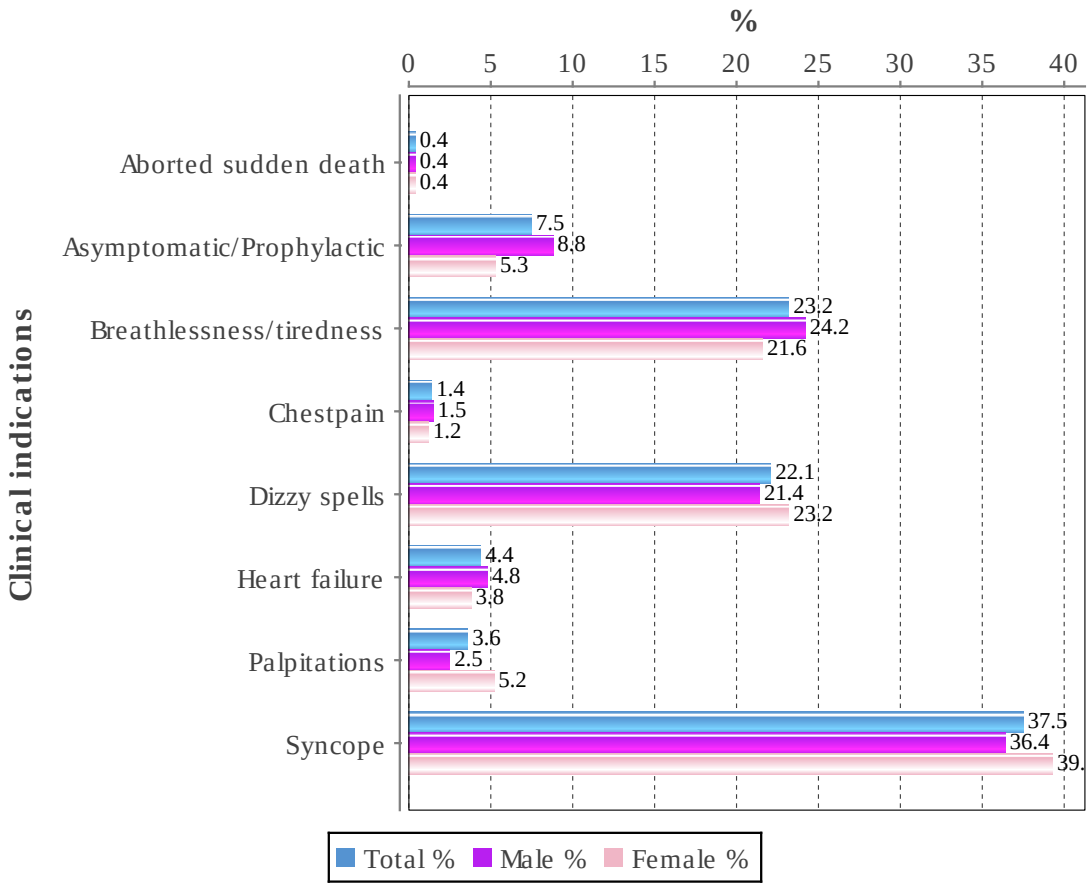
Aetiology	Total %	Male %	Female %
Amyloidos	0.4	0.4	0.5
Borrelios	0.0	0.0	0.0
Cardiomyopathy cytostatic induced	0.0	0.0	0.0
Cardiomyopathy dilated	1.9	1.9	1.8
Cardiomyopathy hypertrophic	0.6	0.4	0.7
Cardiomyopathy ischaemic	1.0	1.3	0.5
Conduction tissue fibrosis	80.8	79.4	83.3
Congenital	0.2	0.2	0.3
Drug induced	0.1	0.1	0.1
Endocarditis	0.1	0.1	0.0
Heart transplantation	0.0	0.0	0.0
High degree RV pacing	0.1	0.1	0.0
His-ablation	1.1	0.7	1.8
Ionizing radiation	0.0	0.0	0.1
Ischaemic	5.8	6.9	3.9
Long QT-syndrome	0.0	0.0	0.1
Maze procedure	0.1	0.1	0.1
Myocarditis	0.0	0.0	0.0
Neurocardiogenic syncope	0.2	0.1	0.4
Other structural heart disease	1.8	1.6	2.1
Post TAVI	0.8	0.8	0.7
Post infarction	0.7	0.8	0.5
RF-ablation, complication	0.3	0.3	0.3
Sarcoidos	0.1	0.1	0.1
Surgical complication	2.7	3.2	1.8
Valvular heart disease	1.1	1.3	0.8

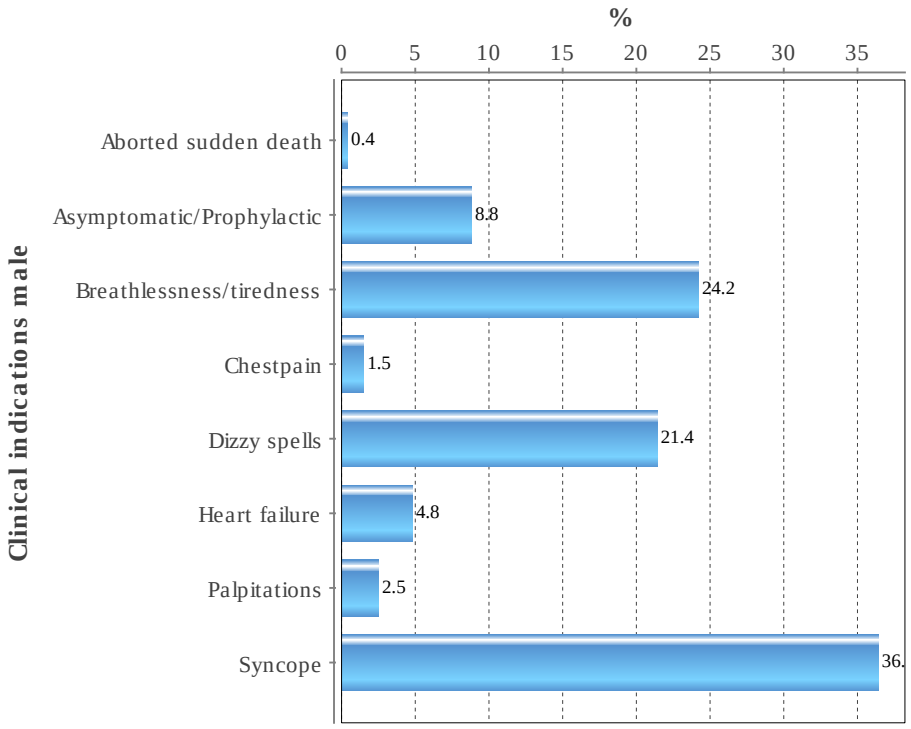


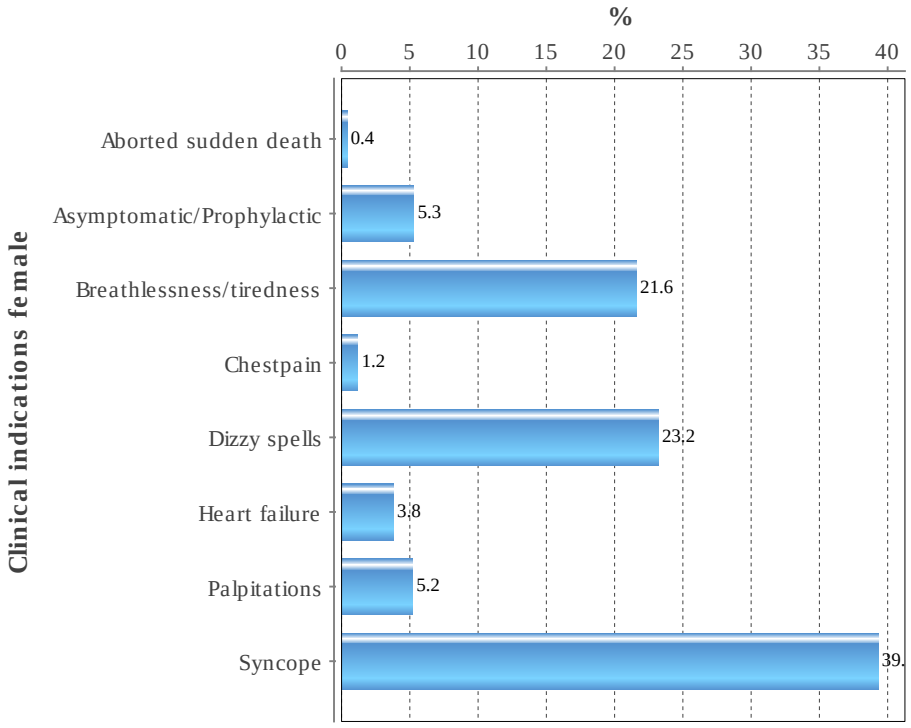
	2020	2019	2018	2017	2016	2015
VVI to VVIR	3	3	4	3	5	5
AAI/AAIR to DDD/DDDR	21	21	21	21	21	21
VVI/VVIR to DDD/DDDR	28	35	23	24	22	22
VVI/VVIR/DDD/DDDR to CRT	255	260	274	221	239	216

Main symptom for implanting pacemakers

Indication	Total %	Male %	Female %
Aborted sudden death	0.4	0.4	0.4
Asymptomatic/Prophylactic	7.5	8.8	5.3
Breathlessness/tiredness	23.2	24.2	21.6
Chestpain	1.4	1.5	1.2
Dizzy spells	22.1	21.4	23.2
Heart failure	4.4	4.8	3.8
Palpitations	3.6	2.5	5.2
Syncope	37.5	36.4	39.3

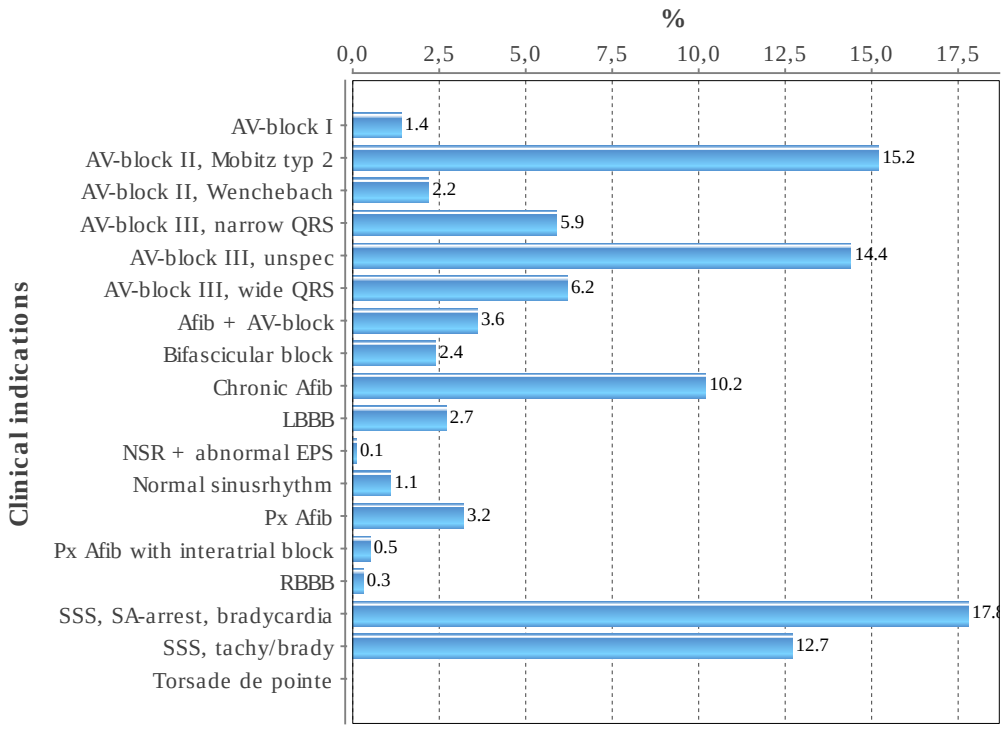



%
0
5
10
15
20
25
30
35
Clinical indications male
Aborted sudden death
0.4
Asymptomatic/Prophylactic
8.8
Breathlessness/tiredness
24.2
Chestpain
1.5
Dizzy spells
21.4
Heart failure
4.8
Palpitations
2.5
Syncope
36.


%
0
5
10
15
20
25
30
35
40
Clinical indications female
Aborted sudden death
0.4
Asymptomatic/Prophylactic
5.3
Breathlessness/tiredness
21.6
Chestpain
1.2
Dizzy spells
23.2
Heart failure
3.8
Palpitations
5.2
Syncope
39.

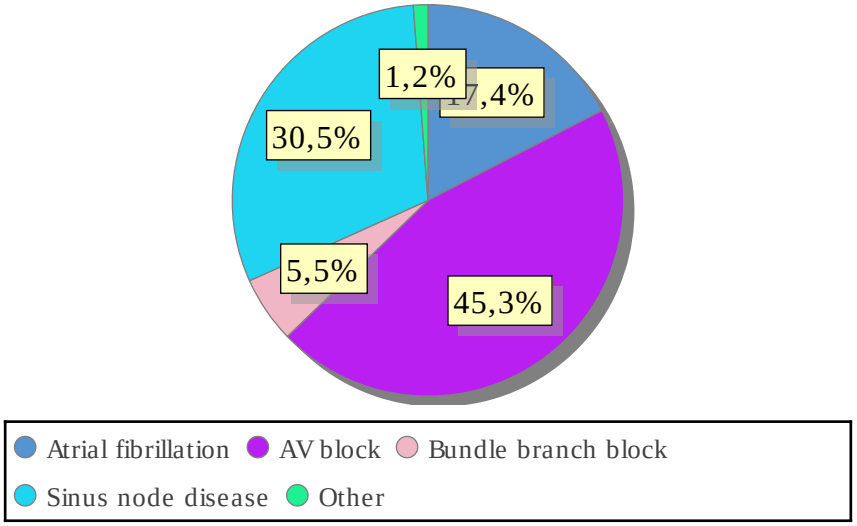
Main ECG indication, total

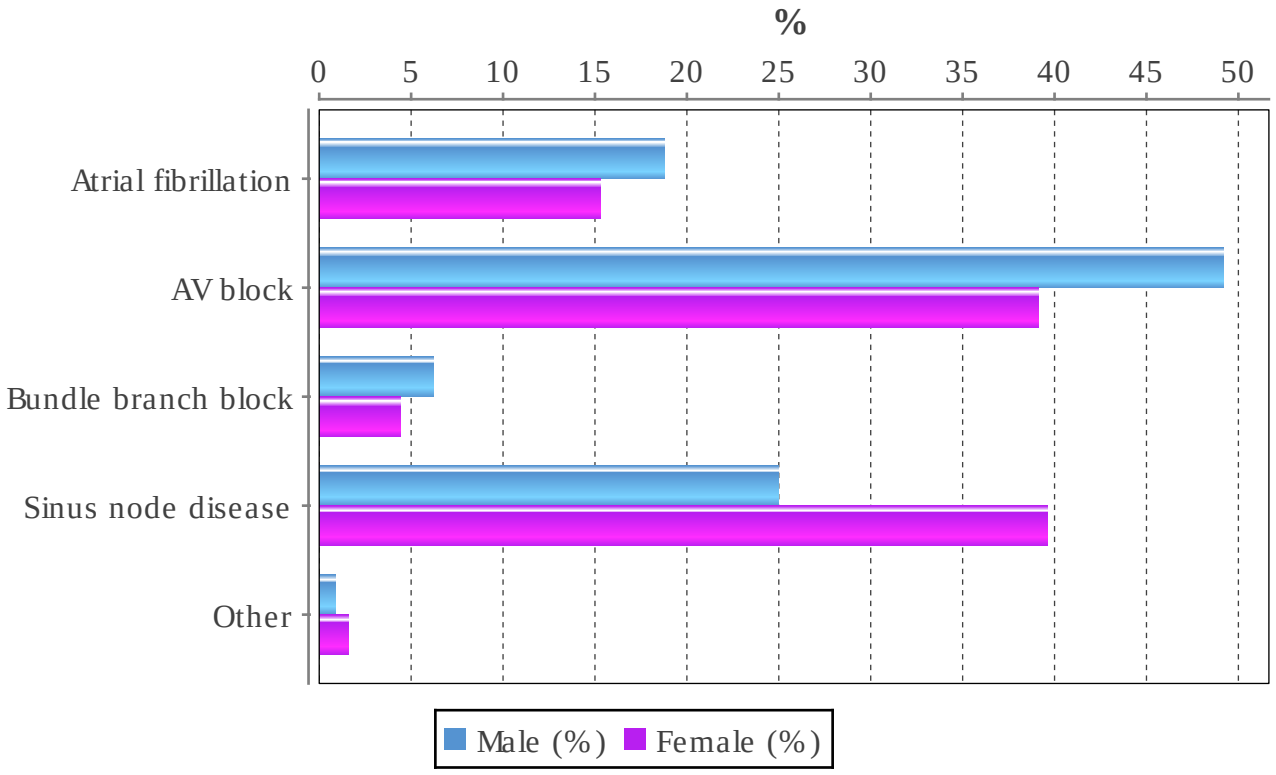
Indication	%
AV-block I	1.4
AV-block II, Mobitz typ 2	15.2
AV-block II, Wenchebach	2.2
AV-block III, narrow QRS	5.9
AV-block III, unspec	14.4
AV-block III, wide QRS	6.2
Afib + AV-block	3.6
Bifascicular block	2.4
Chronic Afib	10.2
LBBB	2.7
NSR + abnormal EPS	0.1
Normal sinusrhythm	1.1
Px Afib	3.2
Px Afib with interatrial block	0.5
RBBB	0.3
SSS, SA-arrest, bradycardia	17.8
SSS, tachy/brady	12.7
Torsade de pointe	0.0



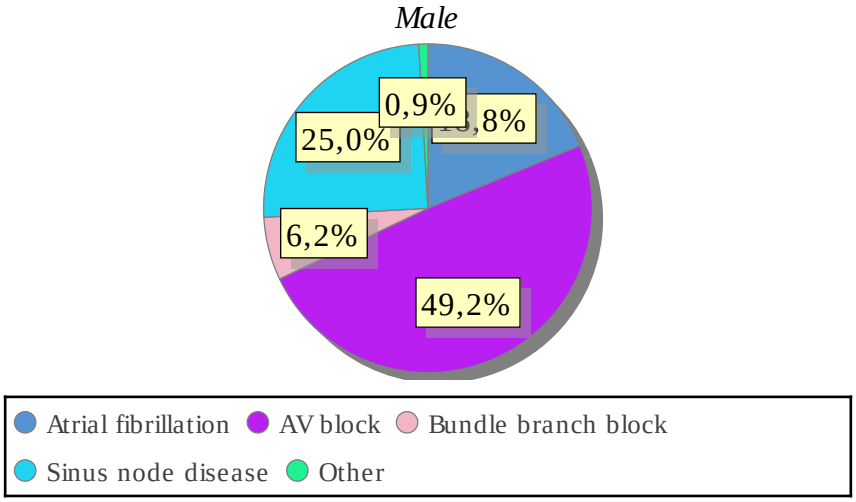
Main ECG indication by gender and for patients < 18 years of age

Indication	No	%	Male (%)	Female (%)	Younger than 18 (%)
Atrial fibrillation	1265	17.4	18.8	15.3	0.0
AV block	3289	45.3	49.2	39.1	78.3
Bundle branch block	398	5.5	6.2	4.4	4.3
Sinus node disease	2215	30.5	25.0	39.6	17.4
Other	86	1.2	0.9	1.6	0.0
					Total number of implants 7253

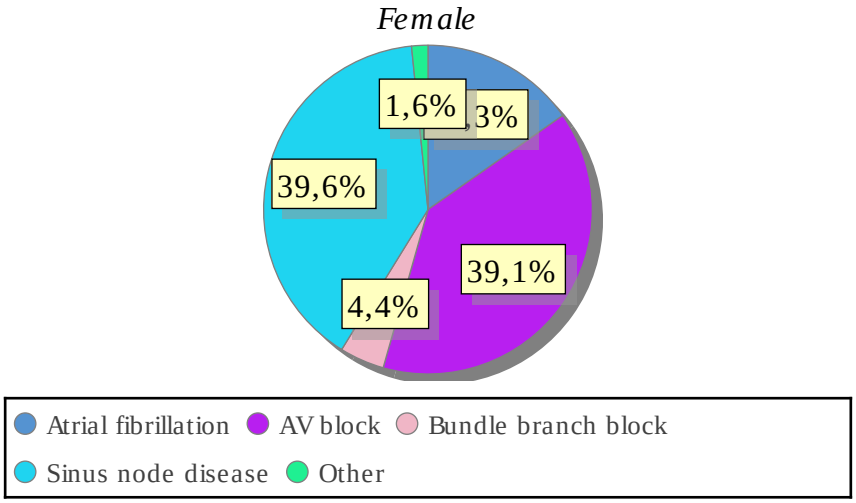




Male



Female



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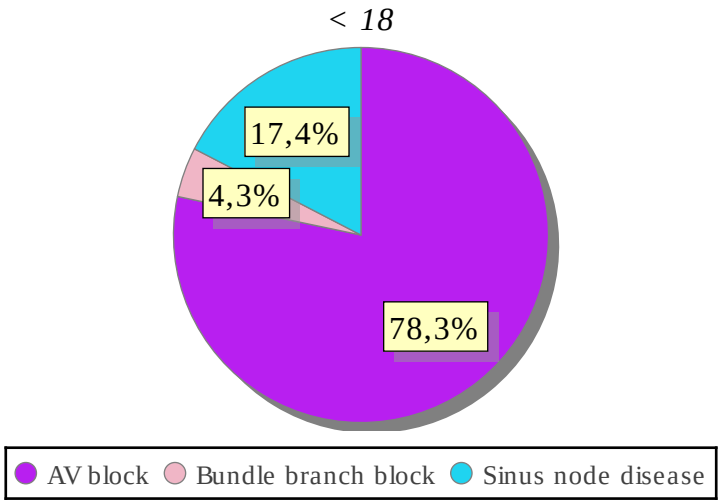
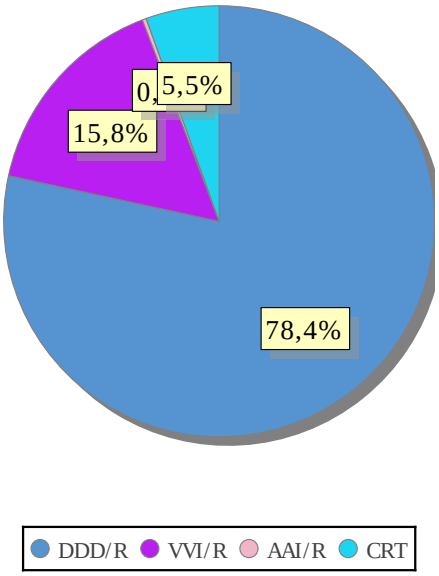


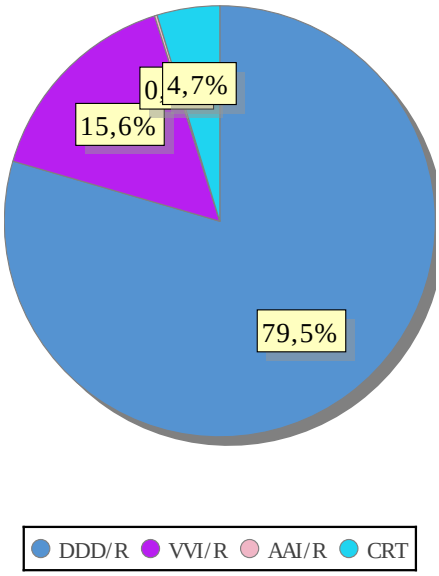
Use of pacemaker subtype for all indications per hospital size (number of new implants/year and hospital)

Size	Hospitals	DDD %	VVI %	AAI %	CRT %
Large	14	77.3	15.8	0.3	6.7
Medium	18	79.5	15.6	0.2	4.7
Small	10	82.1	17.4	0.5	0.0
Total	42	78.4	15.8	0.3	5.5

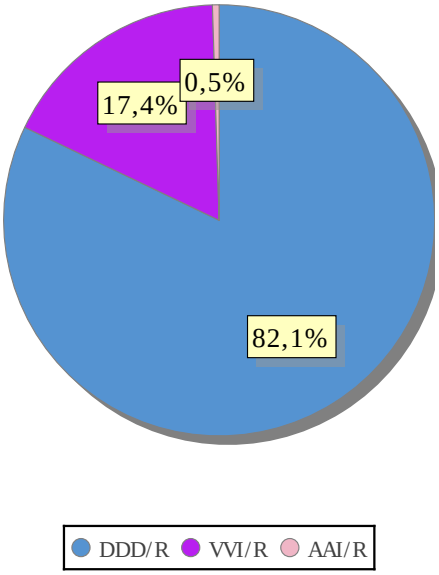
All hospitals



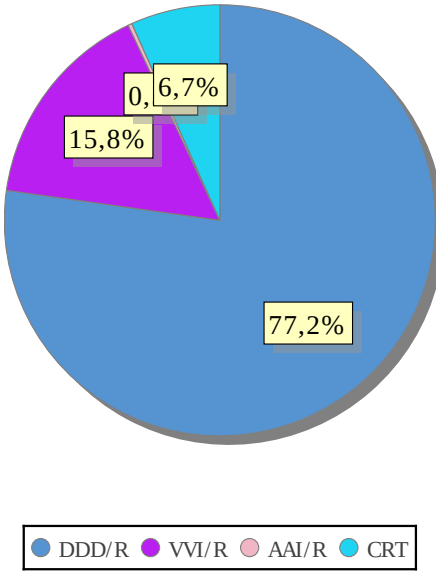
Medium hospitals



Small hospitals



Large hospitals



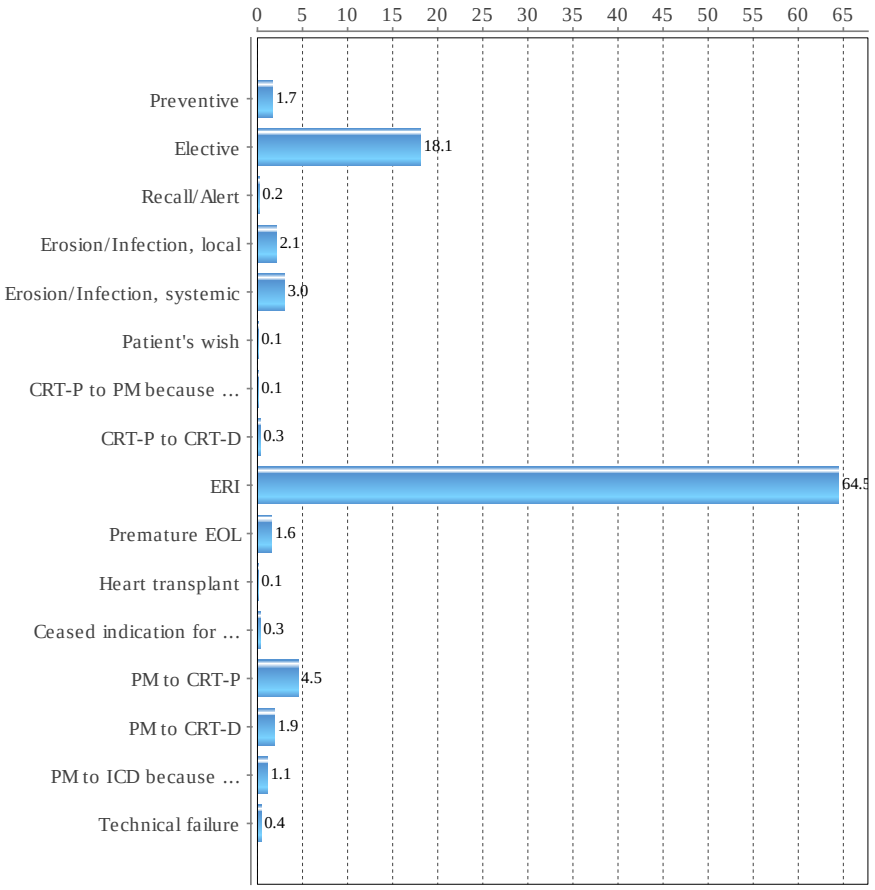
STATISTICS – PACEMAKER – USE OF PACING
MODES FIRST IMPLANT PER HOSPITAL

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

Hospital	Number	DDD %	VVI %	AAI %	CRT %
Akademiska sjukhuset	299	77.6	15.1	0.0	7.4
Alingsås lasarett	73	72.6	27.4	0.0	0.0
Blekingesjukhuset	162	85.2	13.6	0.0	1.2
Centrallasarettet Växjö	108	80.6	15.7	0.9	2.8
Centralsjukhuset Karlstad	158	84.8	12.0	0.0	3.2
Centralsjukhuset Kristianstad	268	82.1	17.5	0.4	0.0
Centralsjukhuset Västerås	148	74.3	23.0	0.0	2.7
Danderyds sjukhus	410	80.0	15.4	0.0	4.6
Drottning Silvias Bus	9	66.7	22.2	11.1	0.0
Falu lasarett	222	73.9	22.5	0.5	3.2
Gävle sjukhus	198	80.8	15.7	0.0	3.5
Helsingborgs lasarett	181	81.2	17.7	0.6	0.6
Hudiksvalls sjukhus	54	75.9	24.1	0.0	0.0
Karolinska Universitetssjukhuset	432	77.1	13.7	0.7	8.6
Kungälvs sjukhus	110	80.9	19.1	0.0	0.0
Linköpings Universitetssjukhus	392	78.6	9.4	0.3	11.7
Länssjukhuset Halmstad	78	87.2	12.8	0.0	0.0
Länssjukhuset Kalmar	118	57.6	35.6	0.8	5.9
Länssjukhuset Ryhov	201	77.6	22.4	0.0	0.0
Mälarsjukhuset	167	77.2	13.8	0.0	9.0
Norrlands Universitetssjukhus	174	72.4	17.8	1.1	8.6
Sahlgrenska Universitetssjukhuset	421	76.2	10.7	0.7	12.4
Sahlgrenska Universitetssjukhuset /Östra	13	92.3	7.7	0.0	0.0
Skaraborgs sjukhus Skövde	184	71.2	9.2	0.0	19.6
Skellefteå lasarett	49	83.7	16.3	0.0	0.0
Skånes universitetssjukhus, Lund	367	78.5	9.5	0.3	11.7
Skånes universitetssjukhus, Malmö	199	85.4	14.6	0.0	0.0
Sollefteå sjukhus	16	81.3	18.8	0.0	0.0
St Görans sjukhus	261	83.9	14.6	0.0	1.5
Sunderby sjukhus	229	76.4	17.0	0.0	6.6
Sundsvalls sjukhus	217	82.0	16.6	0.5	0.9
Södersjukhuset	249	73.5	20.1	0.8	5.6
Södra Älvsborgs sjukhus	163	79.8	14.1	0.0	6.1
Torsby sjukhus	35	80.0	20.0	0.0	0.0
Trollhättan, NÄL	231	68.0	27.7	0.0	4.3
Universitetssjukhuset Örebro	190	84.2	14.2	0.0	1.6
Varbergs sjukhus	164	81.1	11.0	0.0	7.9
Visby lasarett	32	90.6	9.4	0.0	0.0
Västerviks sjukhus	43	88.4	11.6	0.0	0.0
Örnsköldsviks sjukhus	68	89.7	8.8	1.5	0.0
Östersunds sjukhus	138	76.8	17.4	0.0	5.8

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

Reason	All hospitals %	(large) %	(medium) %	(small) %
Preventive	1.7	1.4	2.2	1.5
Elective	18.1	14.3	24.4	10.3
Recall/Alert	0.2	0.3	0.0	0.0
Erosion/Infection, local	2.1	2.9	1.2	1.0
Erosion/Infection, systemic	3.0	4.5	1.2	0.0
Patient's wish	0.1	0.2	0.1	0.0
CRT-P to PM because of discontinued CRT-indication	0.1	0.1	0.0	0.0
CRT-P to CRT-D	0.3	0.2	0.6	0.0
ERI	64.5	64.1	62.4	84.6
Premature EOL	1.6	2.3	0.8	1.0
Heart transplant	0.1	0.1	0.0	0.0
Ceased indication for PM therapy	0.3	0.4	0.2	0.0
PM to CRT-P	4.5	5.4	3.7	0.0
PM to CRT-D	1.9	2.0	1.9	0.5
PM to ICD because of arrhythmia	1.1	1.3	0.9	0.5
Technical failure	0.4	0.4	0.3	0.5

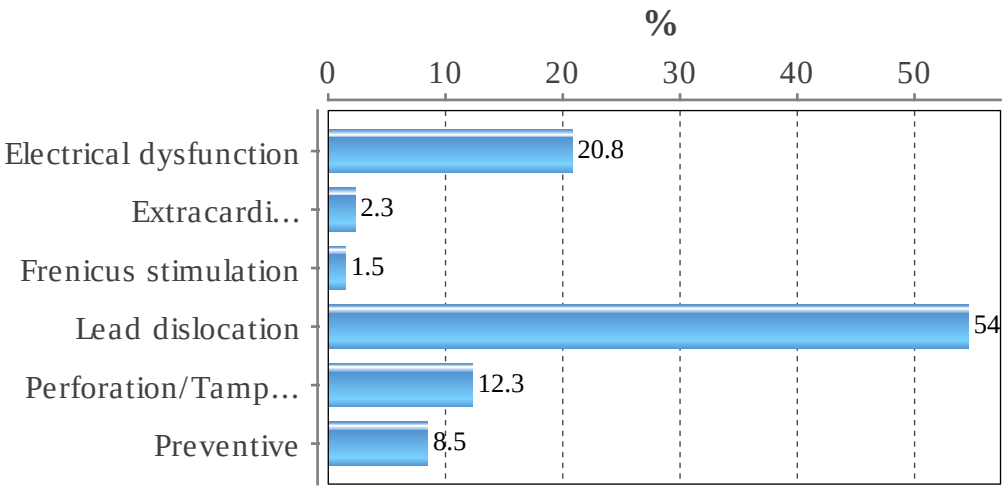


Historical explant indications

Reason	2016 %	2017 %	2018 %	2019 %	2020 %
Preventive	3.6	3.7	2.1	2.7	1.7
Elective	11.7	12.6	13.7	15.9	18.1
System change hemodynamic	0.9	0.7	0.9	0.2	0.0
Recall/Alert	1.2	0.0	0.1	0.2	0.2
Erosion/Infection, local	2.9	2.8	2.7	2.0	2.1
Erosion/Infection, systemic	2.9	3.5	3.8	3.3	3.0
Patient's wish	0.2	0.4	0.1	0.1	0.1
CRT-P to CRT-D	0.5	0.6	0.5	0.8	0.3
ERI	64.8	66.4	66.2	65.9	64.5
Premature EOL	0.8	0.8	0.6	0.7	1.6
Heart transplant	0.1	0.0	0.1	0.1	0.1
Ceased indication for PM therapy	0.5	0.3	0.5	0.2	0.3
PM to CRT-P	5.6	4.9	5.6	5.1	4.5
PM to CRT-D	2.4	1.9	2.0	1.5	1.9
PM to ICD because of arrhythmia	1.3	1.2	0.9	0.9	1.1
Technical failure	0.6	0.1	0.2	0.4	0.4
CRT-P to PM because of discontinued CRT-indication	0.0	0.0	0.1	0.0	0.1

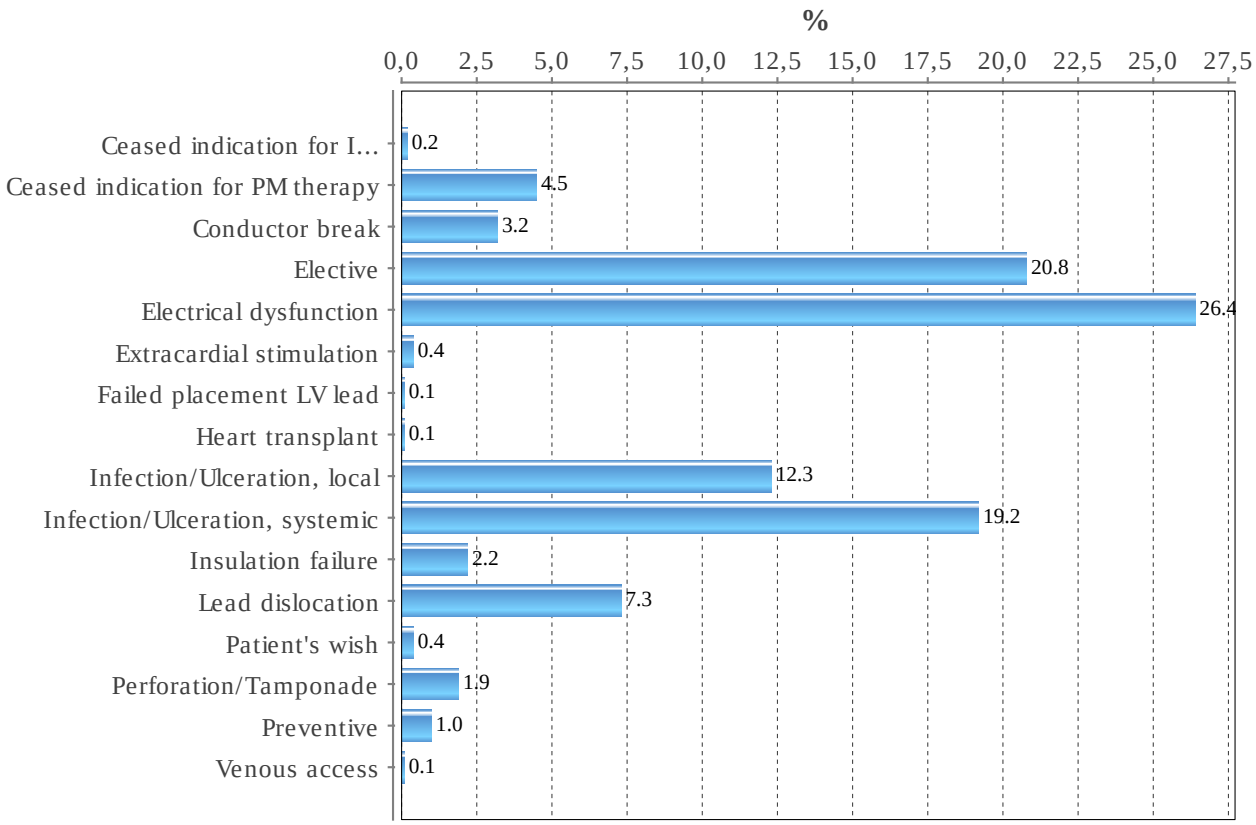
Reason for lead correction/reoperation by hospital size (number of new implants/ year and hospital) Electrical dysfunction including undersense and threshold increase.

Reason	All hospital (%)	Small (%)	Medium (%)	Large (%)
Electrical dysfunction	20.8	10.0	22.8	20.6
Extracardial stimulation	2.3	0.0	1.8	3.2
Frenicus stimulation	1.5	0.0	1.8	1.6
Lead dislocation	54.6	80.0	49.1	55.6
Perforation/Tamponade	12.3	0.0	15.8	11.1
Preventive	8.5	10.0	8.8	7.9
				Total no 130



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

Reason	All hospitals(%)	Small (%)	Medium (%)	Large (%)
Ceased indication for ICD therapy	0.2	-	0.7	-
Ceased indication for PM therapy	4.5	7.7	5.9	3.8
Conductor break	3.2	7.7	4.9	2.3
Elective	20.8	23.1	19.9	21.0
Electrical dysfunction	26.4	48.1	30.1	23.6
Extracardial stimulation	0.4	-	0.3	0.5
Failed placement LV lead	0.1	-	0.3	-
Heart transplant	0.1	-	-	0.1
Infection/Ulceration, local	12.3	1.9	9.5	14.1
Infection/Ulceration, systemic	19.2	-	11.4	23.5
Insulation failure	2.2	5.8	2.6	1.8
Lead dislocation	7.3	5.8	11.1	5.9
Patient's wish	0.4	-	0.7	0.4
Perforation/Tamponade	1.9	-	1.3	2.3
Preventive	1.0	-	1.3	0.9
Venous access	0.1	-	-	0.1
				Total no 1155



Procedures per operator (exclusive CRT)

Hospital	Operator	No
Akademiska sjukhuset	Alessio	115
	Arvanitis	71
	Benedik	17
	Hellgren	1
	Jidéus	3
	Melki	1
	Ostrowska	18
	Schiller	3
	Sciaraffia	98
	Teder	99
	Thorén	1
	Vali	1
	Zemgulis	4
Alingsås lasarett	Anders Holmdahl	45
	Westerberg	61
Arvika sjukhus	Westbom	1
Ålands centralsjukhus	Ove Carlström	3
	Slotte	29
Blekingesjukhuset	Anders Ericsson	25
	Genadi Kaninski	20
	Jan-Olov Borg	32
	Martin Stefanik	84
	Michael Ringborn	46
	Nicoleta Sora	12
	Per Landelius	13
Centrallasarettet Växjö	Annan	11
	Carin Påhlman	54
	Johansson P	29
	Jonasson	9
	Rosén Helena	22
	Strandberg	26
Centralsjukhuset Karlstad	Khalili	61
	Mahknov	2
	Niklas Aldergård	131
	Saidi	53
Centralsjukhuset Kristianstad	Babiak	117
	Bakos	153
	Östenson	65
	Tudor	34
Centralsjukhuset Västerås	Amra Kåregren	57
	SkoglundAndersson	55
	Wiberg	105
Danderyds sjukhus	1	160
	2	105
	3	115
	4	197
	6	8
Drottning Silvias Bus	Hallhagen	2
	Hans Lidén	9
	Nilsson B	1
	Oskar Väärt	5
	Piotr Szamlewski	2
	Synnergren	4
Falu lasarett	Monheim	111
	Svedberg	8
	Albin Hedman	2
	Berglund	81
	Forsgren	71
	MFO	6
	Niclas Svedberg	23
Gävle sjukhus	Falck	3
	Johansson Staffan	29
	Kastberg	64
	Magnusson Peter	96
	Mati Jalakas	95
Helsingborgs lasarett	Bläckberg	55
	Jacobsson	51
	Petrik	1
	Rorsman	89
	Utter	96
Hudiksvalls sjukhus	Roussinne	76
Karolinska Universitetssjukhus	Annan	2
	Gadler	245
	Hörnsten	186
	Ingibjörg Kristjansdottir	1
	Ingibjörg/Gadler	3
	Ingibjörg/Reistam	7
	Reistam	177
Kungälvs sjukhus	Schultz	158
Länssjukhuset Halmstad	Martin Löfgren	82
	Rikard Berggren	48
Länssjukhuset Kalmar	David Olsson	81
	Hendrik Schreyer	62
	Jörg Carlsson	2
Länssjukhuset Ryhov	Asking	1
	Lagerberg	127
	Stumpf	99
	Walid El-Saadi	57
Linköpings universitetssjukhus	Pinna C	121
	Säfström K	102
	Sonesson L	103
	Svenson A	35
	Szymanowski A	81
Mälarsjukhuset	Carl Westholm	56

Hospital	Operator	No
	Georgios Matthaiou	20
	Kave Keshavarz	89
	Linda Ärlehag	60
Norrlands Universitetssjukhus	Andersson	43
	Annan	11
	Höglund	14
	Ioannis Katsoularis	43
	Jensen	20
	Kesek	27
	Landström	16
	Landström/ Jensen	1
	Lauri Salonen	18
	Rönn	19
Örnsköldsviks sjukhus	Ehlin	54
	Meidell	36
Östersunds sjukhus	Björklund	26
	Björklund Friberg	2
	Christian Gjessing	18
	F.Björklund/ C.Gjessing	1
	Friberg	44
	Friberg/Gjessing	4
	Hansson	61
	Hansson/ Björklund	1
	Hansson/ Gjessing	2
Sahlgrenska universitetssjukhuset	Alice David	31
	Ammar Taha	95
	Annan	2
	David Morales	70
	Gäbel/ Szamlewski	1
	Jakob Gäbel	2
	Johansson B	3
	Konstantinos Liakatsidas	100
	Piotr Szamlewski	103
	Shabbar Jamaly	61
	Stefan Jakobsson	80
Sahlgrenska universitetssjukhuset / Östra	Johansson B	14
	Johansson/ Morales Martinez	4
	Morales Martinez	5
Skaraborgs sjukhus Skövde	Anna Widunder	57
	Falmer	2
	Heberlein	1
	Lorentzen	89
	Paulsson	37
	Winterfeldt	41
Skånes universitetssjukhus, Lund	Annan	3
	David Mörtsell	44
	Erik Ljungström	1
	Jesper van der Pals	2
	Johan Brandt	157
	LingWei Wang	50
	Maiwand Farouq	21
	Patrycja Näsgaard	1
	Pyotr Platonov	27
	Rasmus Borgquist	38
	Steen Jensen	8
	Uzma Chaudry	118
Skånes universitetssjukhus, Malmö	Annan	118
	Ingrid Litterfeldt	1
	Torbjörn Persson	115
Skellefteå lasarett	Annan	25
	C Nilzon	1
	E Bygdén	21
	G Lindqvist	19
	L Hedlund	12
Sollefteå sjukhus	Åström	25
	Rudenstam	8
Södersjukhuset	Bäckström I	1
	Jonsson J-E	78
	Kjellman B	100
	Olson J	69
	Rydlund K	104
	Scorza R	1
Södra Älvsborgs sjukhus	Heinze	37
	Lodin	75
	Riemer	63
	Widfeldt	58
St Görans sjukhus	1	129
	2	128
	3	106

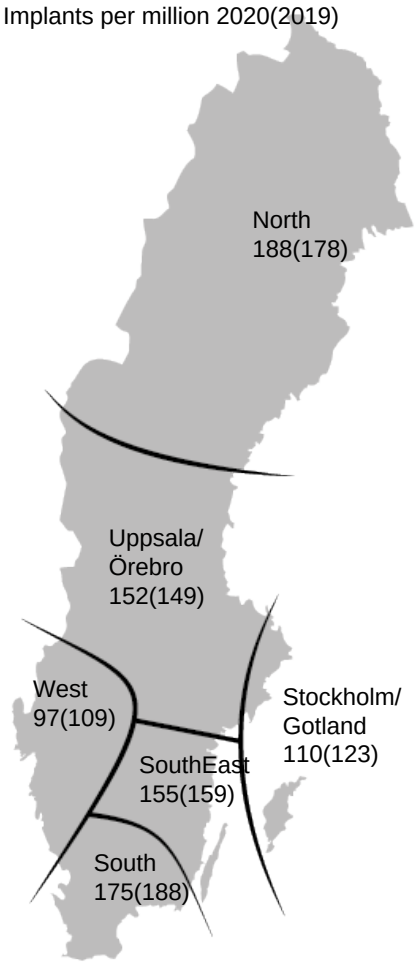
Hospital	Operator	No
Sunderby sjukhus	Agneta Johansson	69
	Annan	4
	Annica Wennberg	58
	Baas och Rangson	2
	Marcus Baas	66
	Peter Johansson	8
	Peter Rangson	61
Sundsvalls sjukhus	Benedik Erik	41
	Ciubine Alessio	40
	Haupt Jan	6
	Hayder Kadhim	62
	Khadhim Negham	54
	Olsson David	11
	Pinna Claudio	3
	Schryder Henrik	8
	Sundelin Torbjörn	23
	Teder Priit	13
	Westholm Carl	2
Torsby sjukhus	Bentjerodt	47
Trollhättan, NÄL	Dinu Dusceac	1
	Jabbar	42
	Javid	113
	Orsolya Bene	97
	Söderbergh	33
	Wetterling	62
Universitetssjukhuset Örebro	Anna Björkenheim	107
	Barbara Kurt	34
	Lindell	126
	Örjan Friberg	1
	Soon-Ok Cha	1
Varbergs sjukhus	Emma Sandgren	32
	Rorsman	143
	Verdin	2
	Verstraaten	9
Västerviks sjukhus	Emil Tomov	24
	Joachim Starck	28
Visby lasarett	Gadler	11
	Jacobsson L	32
	Litorell	5

First implants per hospital (inclusive CRT)

Region	Hospital	2020	2019
Northern Sweden	Norrlands Universitetssjukhus	42	37
	Skellefteå lasarett	2	2
	Sunderby sjukhus	59	49
	Sundsvalls sjukhus	41	44
	Örnsköldsviks sjukhus	5	5
	Östersunds sjukhus	25	17
Southern Sweden	Blekingesjukhuset	48	52
	Centrallasarettet Växjö	15	26
	Helsingborgs lasarett	22	12
	Skånes universitetssjukhus, Lund	185	229
	Skånes universitetssjukhus, Malmö	40	12
	Varbergs sjukhus	47	70
South-East Sweden	Linköpings Universitetssjukhus	83	92
	Länssjukhuset Kalmar	54	47
	Länssjukhuset Ryhov	31	32
Stockholm/Gotland	Danderyds sjukhus	61	70
	Karolinska Universitetssjukhuset	141	144
	St Görans sjukhus	41	35
	Södersjukhuset	36	58
Uppsala/Örebro	Akademiska sjukhuset	46	47
	Centralsjukhuset Karlstad	40	38
	Centralsjukhuset Västerås	25	30
	Falu lasarett	66	47
	Gävle sjukhus	57	52
	Hudiksvalls sjukhus	9	9
	Mälarsjukhuset	34	34
	Universitetssjukhuset Örebro	40	54
Western Sweden	Sahlgrenska Universitetssjukhuset	68	87
	Skaraborgs sjukhus Skövde	29	26
	Södra Älvsborgs sjukhus	33	20
	Trollhättan, NÄL	31	38

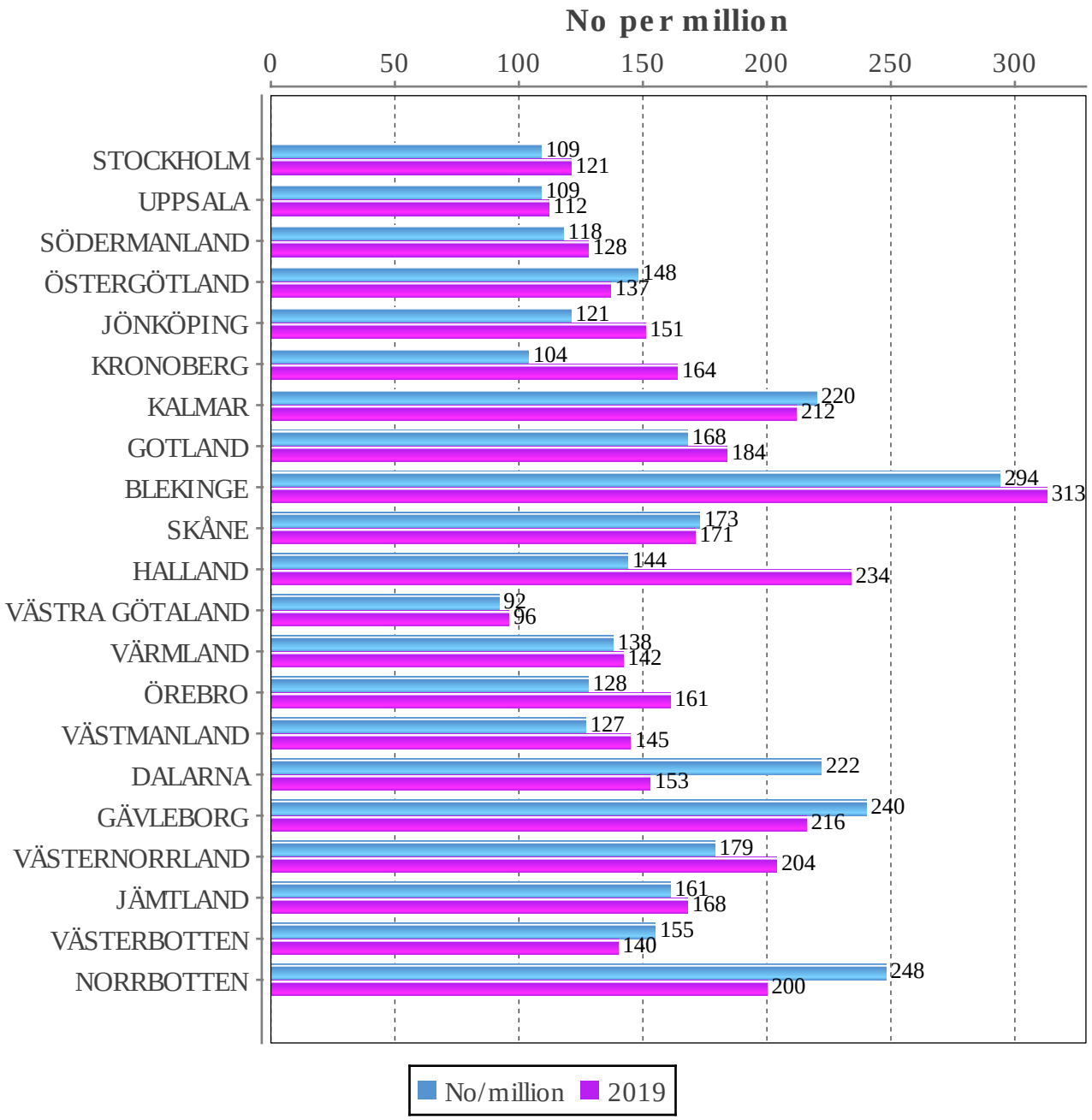
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2436767	268	110	2862
Uppsala/Örebro	2119665	323	152	3102
South-East Sweden	1074540	167	155	1466
Southern Sweden	1878387	328	175	2681
Western Sweden	1920244	187	97	1885
Northern Sweden	897986	169	188	1525
Total	10327589	1442	140	13521



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

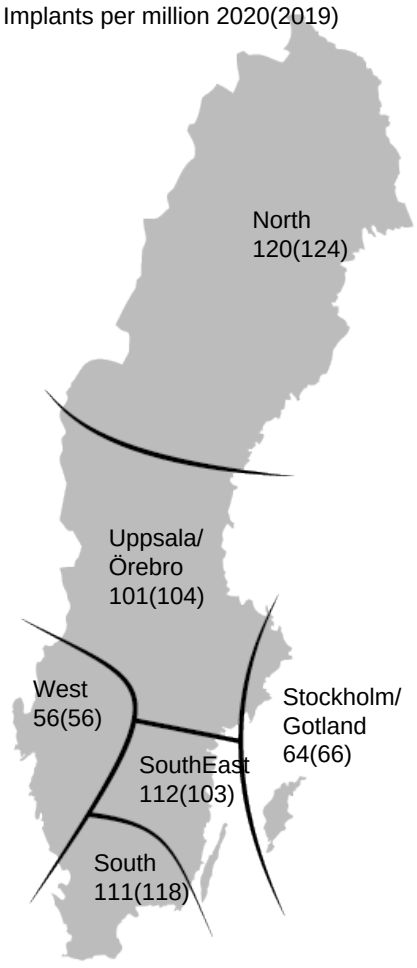
County	Population	No of first	No/million	Active patients
STOCKHOLM	2377081	258	109	2745
UPPSALA	383713	42	109	541
SÖDERMANLAND	297540	35	118	369
ÖSTERGÖTLAND	465495	69	148	587
JÖNKÖPING	363599	44	121	467
KRONOBERG	201469	21	104	289
KALMAR	245446	54	220	412
GOTLAND	59686	10	168	117
BLEKINGE	159606	47	294	308
SKÅNE	1377827	239	173	1862
HALLAND	333848	48	144	468
VÄSTRA GÖTALAND	1725881	158	92	1639
VÄRMLAND	282414	39	138	333
ÖREBRO	304805	39	128	429
VÄSTMANLAND	275845	35	127	365
DALARNA	287966	64	222	492
GÄVLEBORG	287382	69	240	573
VÄSTERNORRLAND	245347	44	179	397
JÄMTLAND	130810	21	161	208
VÄSTERBOTTEN	271736	42	155	422
NORRBOTTEN	250093	62	248	498
Total	10327589	1440	139	13521


No per million
0
50
100
150
200
250
300
STOCKHOLM
109
121
UPPSALA
109
112
SÖDERMANLAND
118
128
ÖSTERGÖTLAND
148
137
JÖNKÖPING
121
151
KRONOBERG
104
164
KALMAR
220
212
GOTLAND
168
184
BLEKINGE
294
313
SKÅNE
173
171
HALLAND
144
234
VÄSTRA GÖTALAND
92
96
VÄRMLAND
138
142
ÖREBRO
128
161
VÄSTMANLAND
127
145
DALARNA
222
153
GÄVLEBORG
240
216
VÄSTERNORRLAND
179
204
JÄMTLAND
161
168
VÄSTERBOTTEN
155
140
NORRBOTTEN
248
200
No/million
2019

STATISTICS – ICD – PRIMARY PREVENTION PER REGION

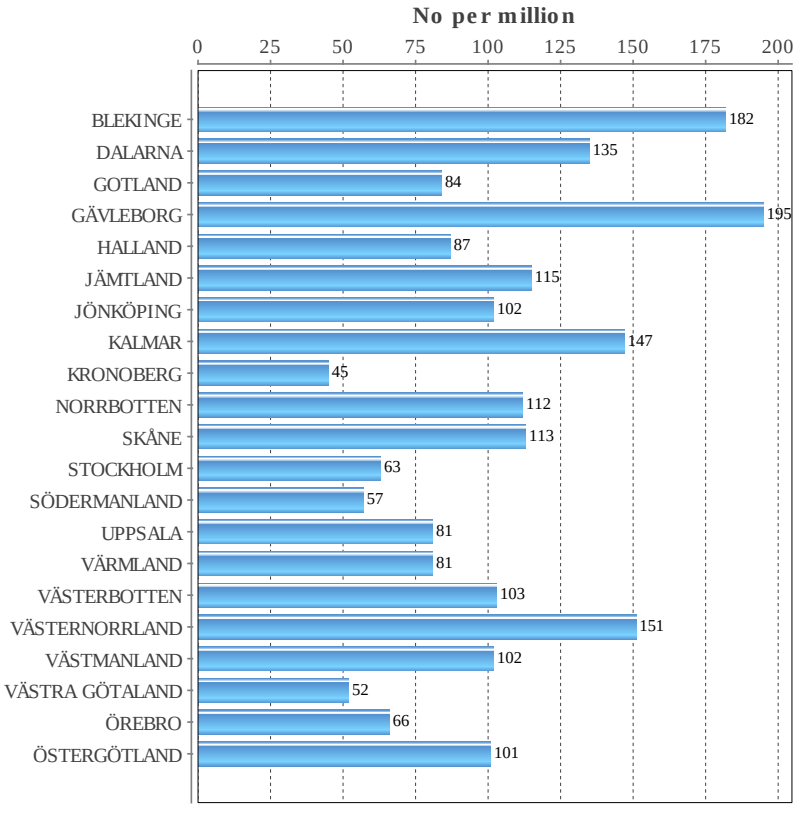
The regions are based on where the patients live, not where they are treated

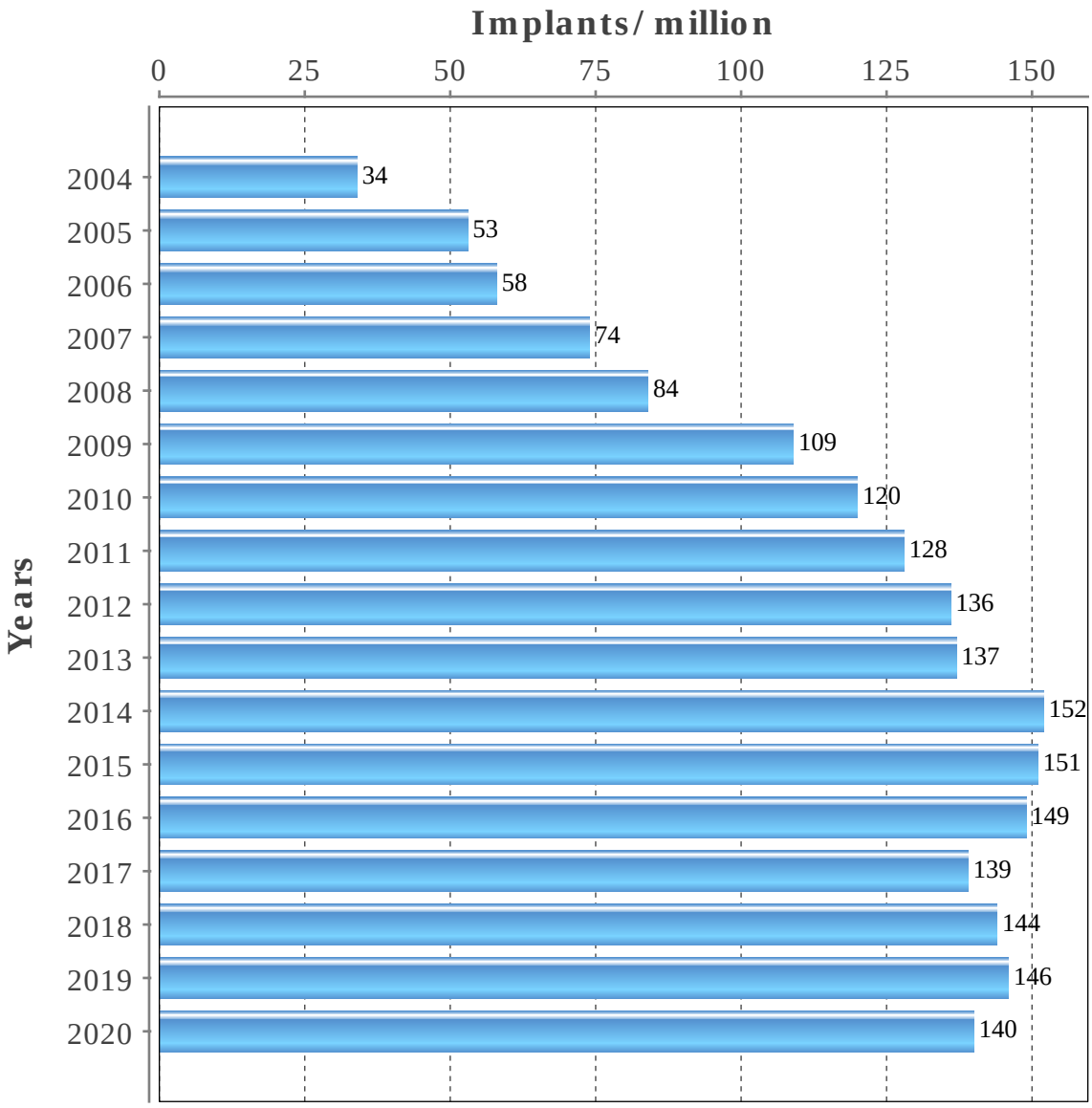
Region	Population	No of first impl	No per million	Active patients
Stockholm/Gotland	2436767	155	64	1670
Uppsala/Örebro	2119665	214	101	1848
South-East Sweden	1074540	120	112	903
Southern Sweden	1878387	208	111	1576
Western Sweden	1920244	107	56	930
Northern Sweden	897986	108	120	865
Total	10327589	912	88	7792



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

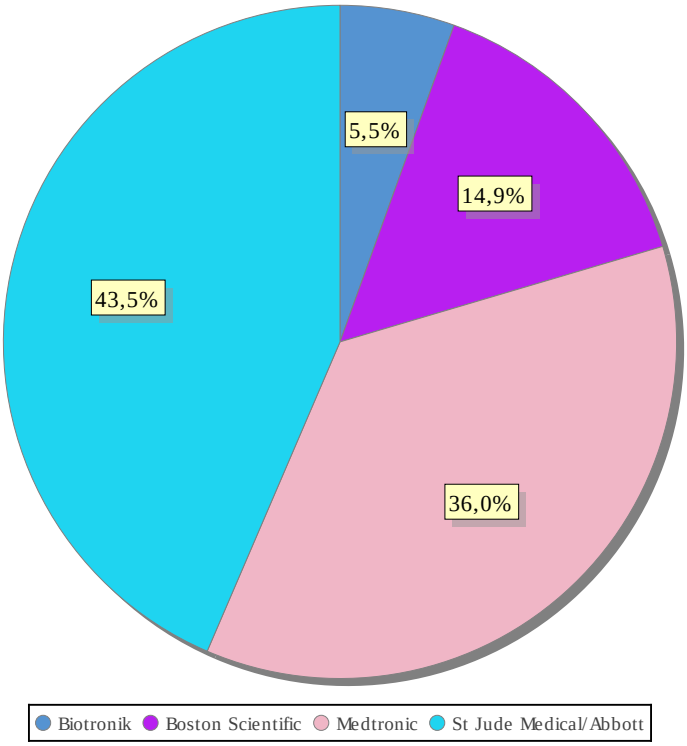
County	Population	No of first	No/million
BLEKINGE	159606	29	182
DALARNA	287966	39	135
GOTLAND	59686	5	84
GÄVLEBORG	287382	56	195
HALLAND	333848	29	87
JÄMTLAND	130810	15	115
JÖNKÖPING	363599	37	102
KALMAR	245446	36	147
KRONOBERG	201469	9	45
NORRBOTTEN	250093	28	112
SKÅNE	1377827	156	113
STOCKHOLM	2377081	150	63
SÖDERMANLAND	297540	17	57
UPPSALA	383713	31	81
VÄRMLAND	282414	23	81
VÄSTERBOTTEN	271736	28	103
VÄSTERNORRLAND	245347	37	151
VÄSTMANLAND	275845	28	102
VÄSTRA GÖTALAND	1725881	90	52
ÖREBRO	304805	20	66
ÖSTERGÖTLAND	465495	47	101
Total	10327589	910	88




Implants/ million
0
25
50
75
100
125
150
Years
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
34
53
58
74
84
109
120
128
136
137
152
151
149
139
144
146
140

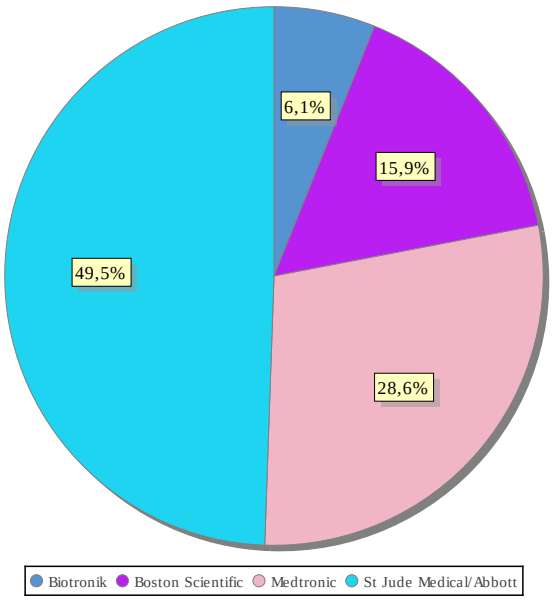
Market share per manufacturer in Sweden

Manufacturer	2017 %	2018 %	2019 %	2020 %
Biotronik	4.7	3.9	5.3	5.5
Boston Scientific	11.6	14.6	14.4	14.9
Medtronic	38.3	39.6	41.0	36.0
St. Jude Medical	45.3	41.8	39.2	43.5
Boston Scientific includes Cameron Health from 2015				



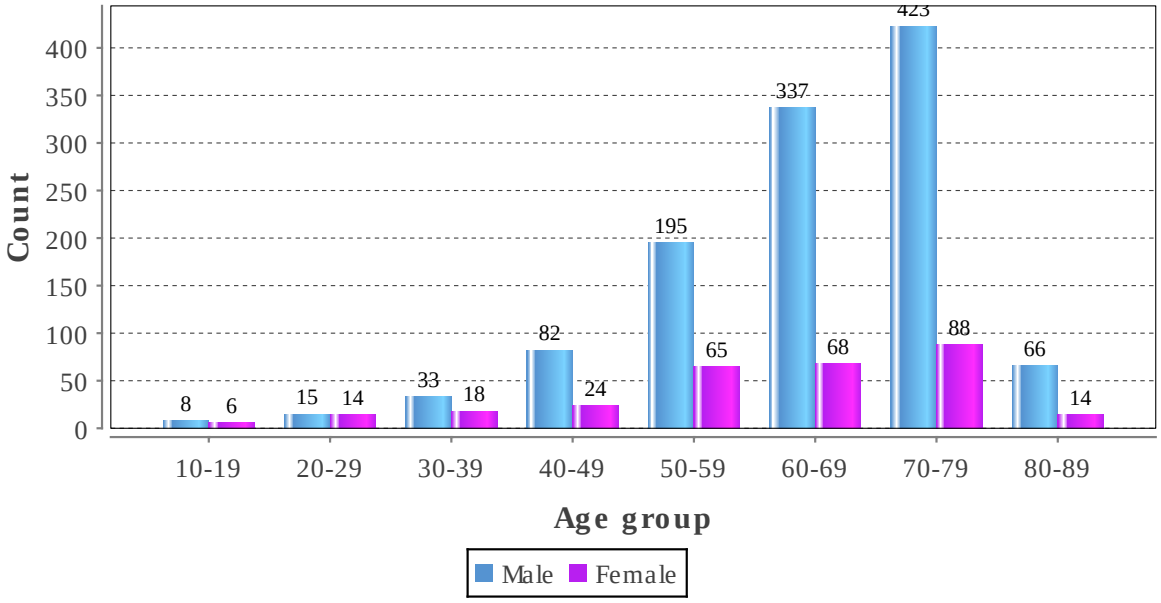
Market share per manufacturer in Sweden

Manufacturer	2017 %	2018 %	2019 %	2020 %
Biotronik	4.3	3.8	5.5	6.1
Boston Scientific	11.0	12.9	15.5	15.9
Medtronic	30.8	34.5	35.4	28.6
St. Jude Medical	53.8	48.8	43.5	49.5
Boston Scientific includes Cameron Health from 2015				



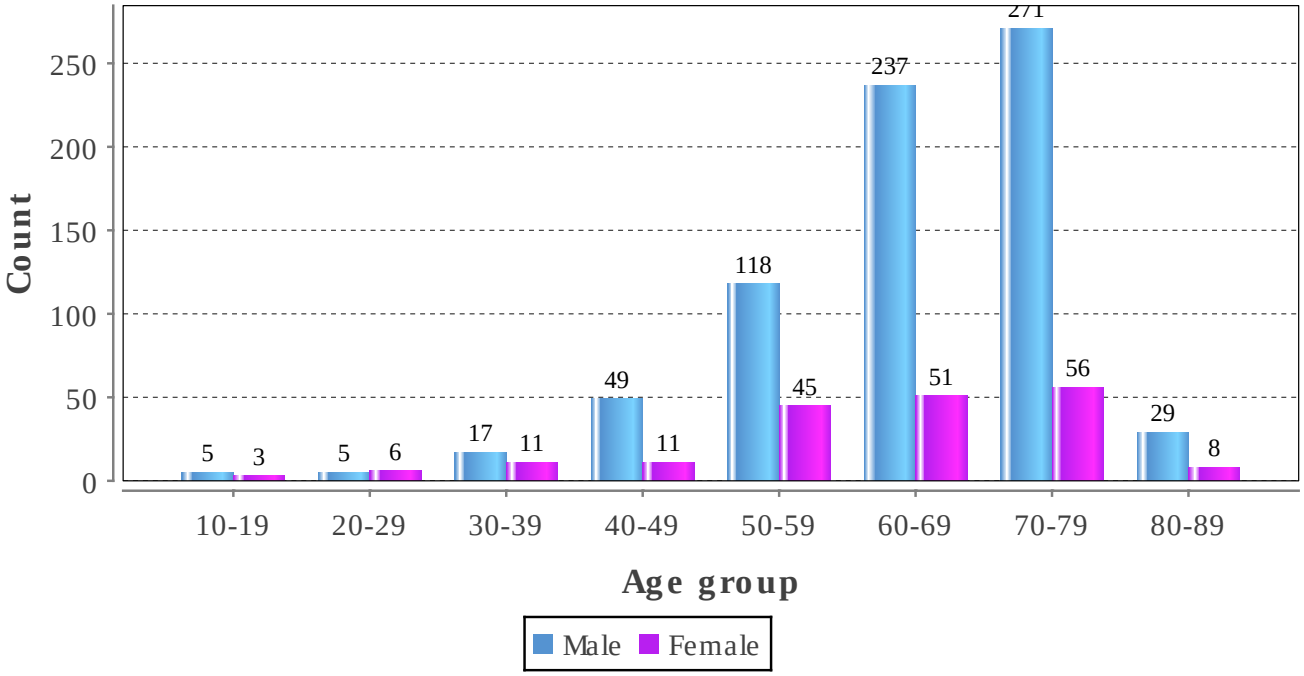
Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
10-19	14	1.0	8	6
20-29	29	2.0	15	14
30-39	51	3.5	33	18
40-49	106	7.3	82	24
50-59	260	17.9	195	65
60-69	405	27.8	337	68
70-79	511	35.1	423	88
80-89	80	5.5	66	14
Average age	64	-	64	60
			Total number of implants: 1456	



Primary prevention divided by gender and age.

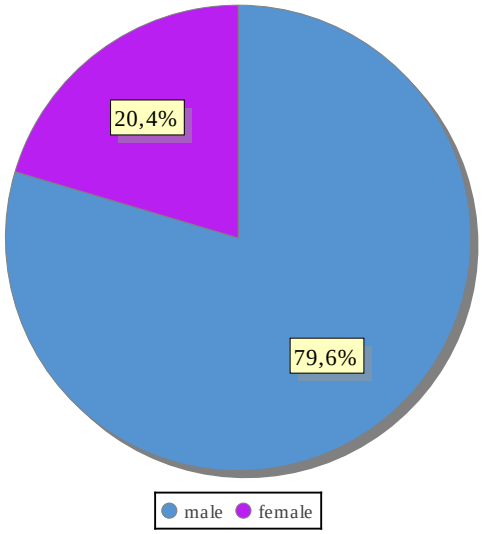
Age (years)	Total no	%	Male	Female
10-19	8	0.9	5	3
20-29	11	1.2	5	6
30-39	28	3.0	17	11
40-49	60	6.5	49	11
50-59	163	17.7	118	45
60-69	288	31.2	237	51
70-79	327	35.5	271	56
80-89	37	4.0	29	8
Average age	64	-	65	61
				Total number of implants: 922



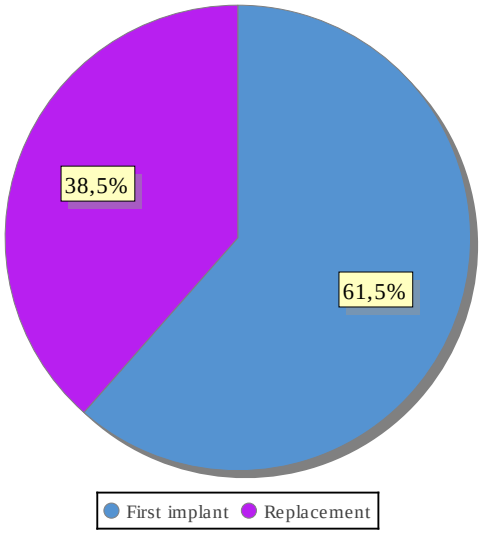
Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1456	61.5	1159	79.6	297	20.4
Replacement	911	38.5	703	77.2	208	22.8
Total	2367	100.0	1862	78.7	505	21.3

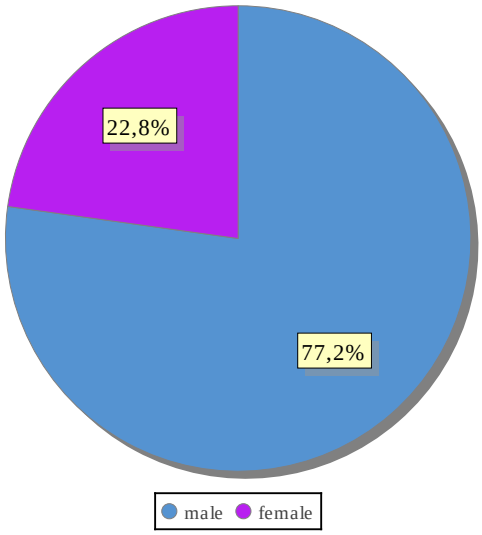
First implant



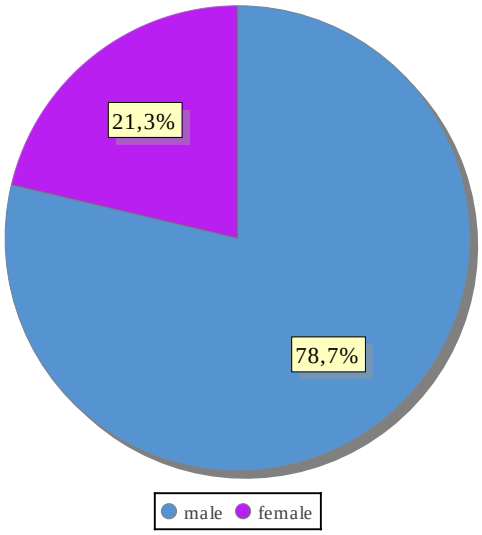
Replacement ratio



Replacement

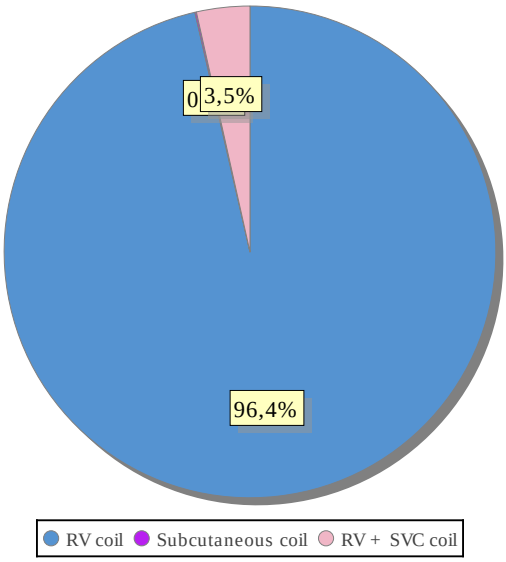


All implant



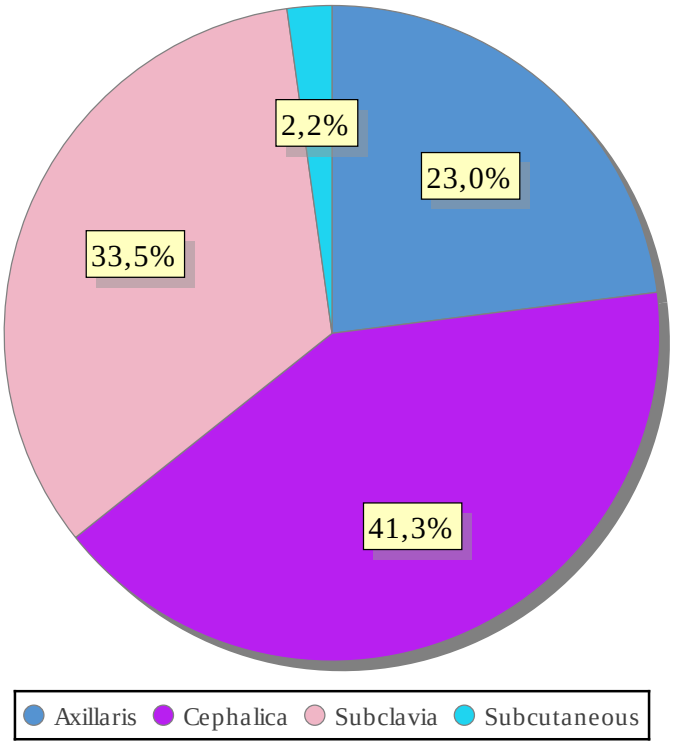
Lead type distribution for atrial and venticular use for new implants and replacements.

	2020		2019	
	no	%	no	%
RV coil	1523	96.4	1524	92.9
Subcutaneous coil	1	0.1	2	0.1
RV + SVC coil	56	3.5	113	6.9
Active fixation	1572	99.5	1619	98.7
Passive fixation	8	0.5	20	1.2
Total number of leads - 2020: 1580, 2019: 1639				



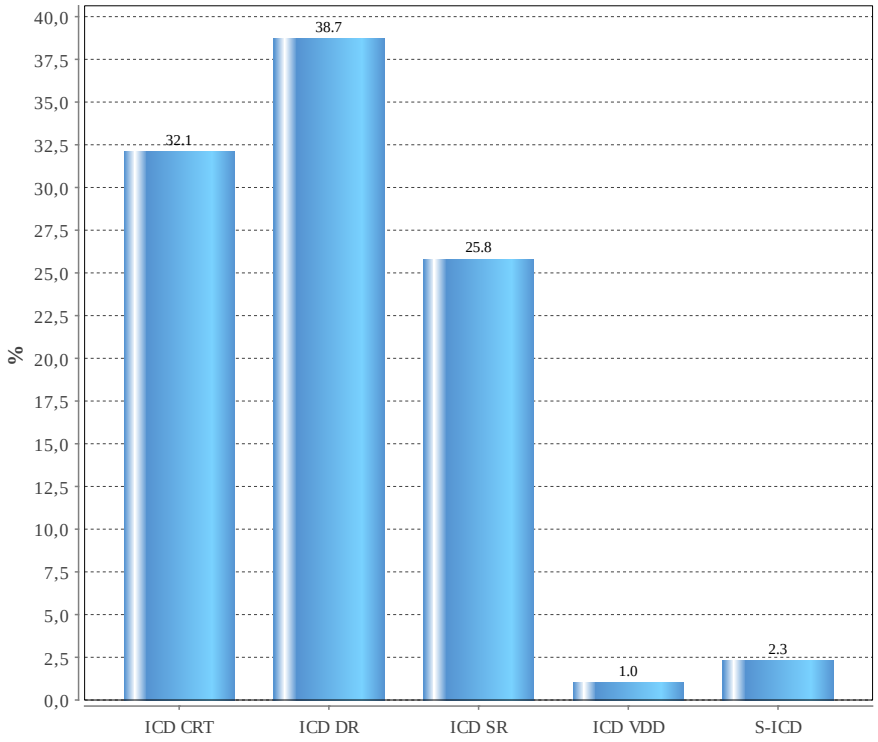
Venous access for new implants and replacements, all type of pacemakers

Lead access	No	%
Axillaris	372	23.0
Cephalica	666	41.3
Subclavia	541	33.5
Subcutaneous	35	2.2



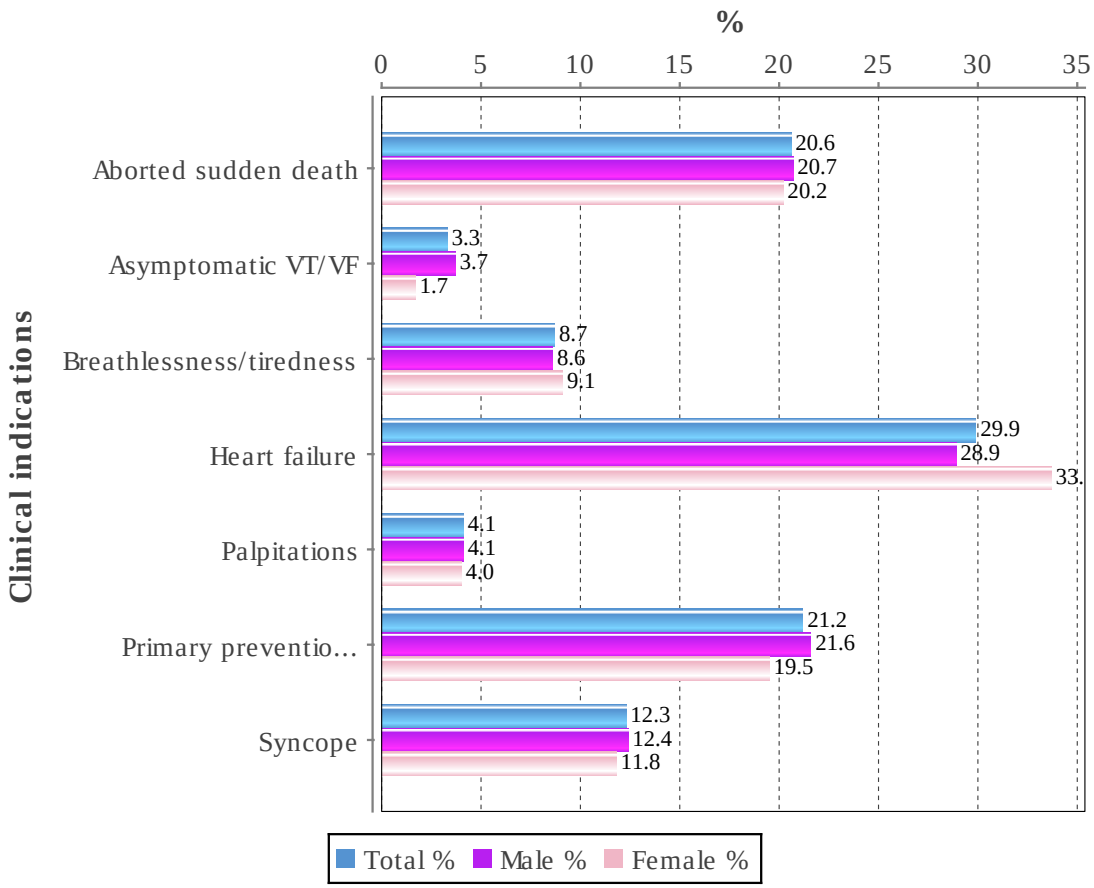
ICD subtype for new implants

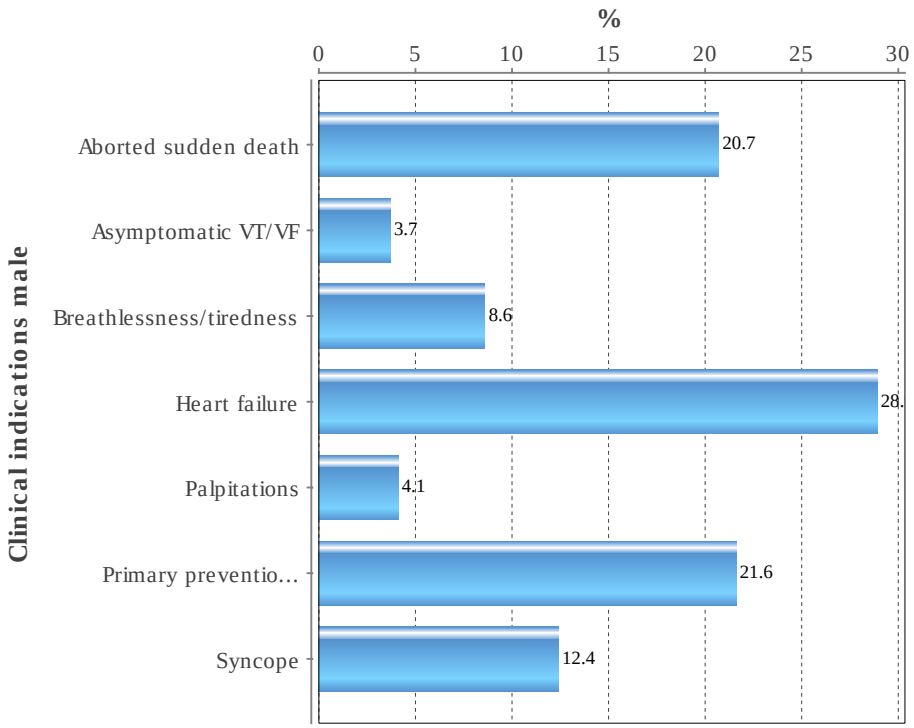
Mode	%	No
ICD CRT	32.1	467
ICD DR	38.7	564
ICD SR	25.8	376
ICD VDD	1.0	15
S-ICD	2.3	34

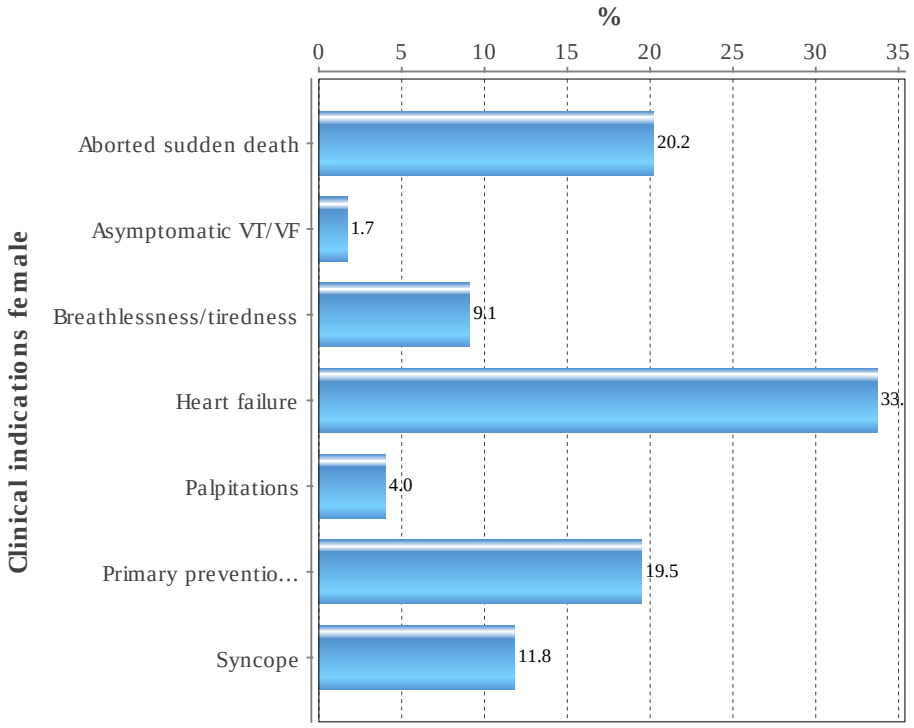


Main symptom for implanting ICDs

Indication	Total %	Male %	Female %
Aborted sudden death	20.6	20.7	20.2
Asymptomatic VT/VF	3.3	3.7	1.7
Breathlessness/tiredness	8.7	8.6	9.1
Heart failure	29.9	28.9	33.7
Palpitations	4.1	4.1	4.0
Primary prevention, asymptomatic	21.2	21.6	19.5
Syncope	12.3	12.4	11.8




%
0
5
10
15
20
25
30
Clinical indications male
Aborted sudden death
20.7
Asymptomatic VT/VF
3.7
Breathlessness/tiredness
8.6
Heart failure
28.
Palpitations
4.1
Primary preventio...
21.6
Syncope
12.4

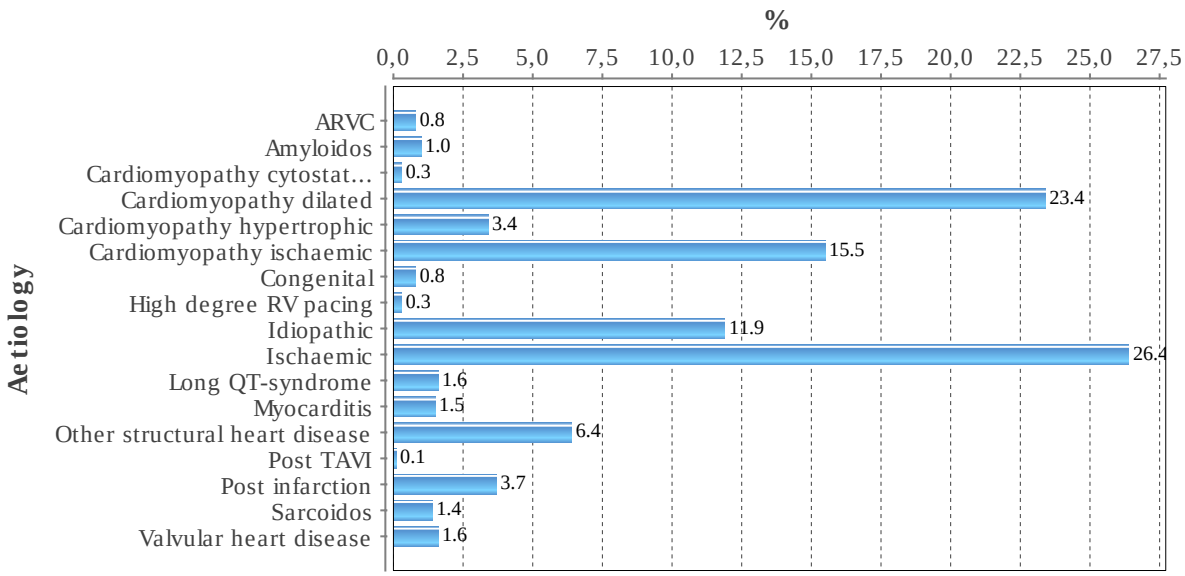

%
0
5
10
15
20
25
30
35
Clinical indications female
Aborted sudden death
20.2
Asymptomatic VT/VF
1.7
Breathlessness/tiredness
9.1
Heart failure
33.
Palpitations
4.0
Primary preventio...
19.5
Syncope
11.8

Main symptom for implanting ICDs, historical distribution

Indication	2019 %	2020 %
Aborted sudden death	21.6	20.6
Asymptomatic VT/VF	2.9	3.3
Primary prevention	62.7	63.8
Syncope	12.8	12.3

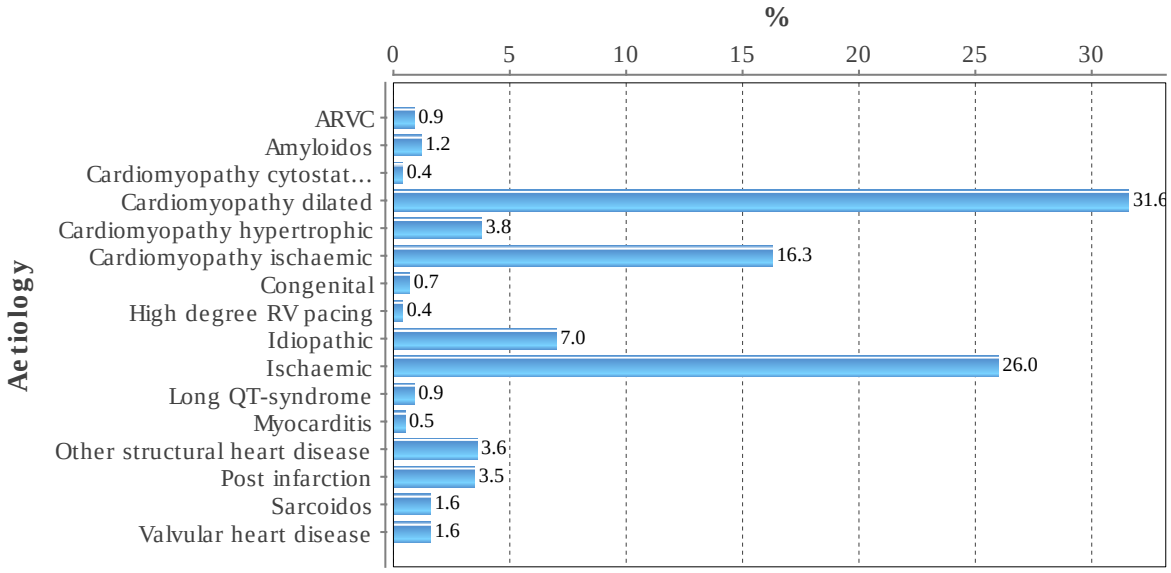
Main aetiology for implanting pacemakers

Aetiology	Total %	Male %	Female %
ARVC	0.8	0.7	1.0
Amyloidos	1.0	1.0	0.7
Cardiomyopathy cytostatic induced	0.3	0.2	1.0
Cardiomyopathy dilated	23.4	21.4	31.3
Cardiomyopathy hypertrophic	3.4	3.0	4.7
Cardiomyopathy ischaemic	15.5	17.3	8.1
Congenital	0.8	0.6	1.7
High degree RV pacing	0.3	0.4	0.0
Idiopathic	11.9	11.1	14.8
Ischaemic	26.4	28.4	18.5
Long QT-syndrome	1.6	0.9	4.4
Myocarditis	1.5	1.6	1.0
Other structural heart disease	6.4	6.0	7.7
Post TAVI	0.1	0.1	0.0
Post infarction	3.7	4.2	1.7
Sarcoidos	1.4	1.5	1.0
Valvular heart disease	1.6	1.4	2.4



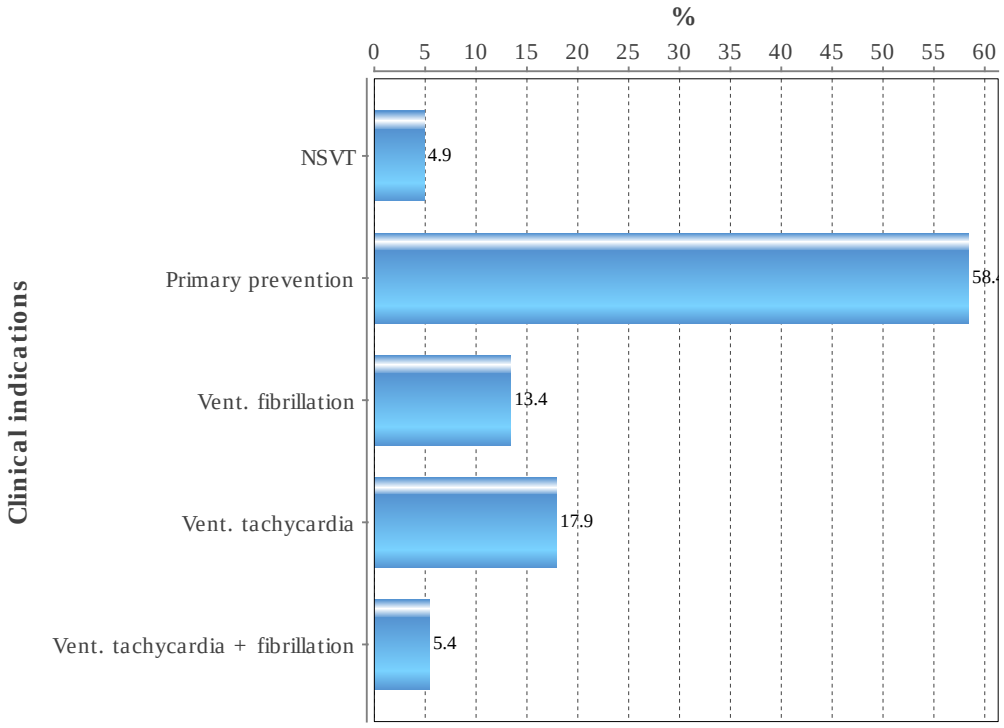
Main aetiology for implanting ICDs due to primary prevention

Aetiology	Total %	Male %	Female %
ARVC	0.9	0.8	1.0
Amyloidos	1.2	1.2	1.0
Cardiomyopathy cytostatic induced	0.4	0.1	1.6
Cardiomyopathy dilated	31.6	28.2	44.5
Cardiomyopathy hypertrophic	3.8	3.7	4.2
Cardiomyopathy ischaemic	16.3	18.2	8.9
Congenital	0.7	0.4	1.6
High degree RV pacing	0.4	0.5	0.0
Idiopathic	7.0	7.3	6.3
Ischaemic	26.0	27.9	18.8
Long QT-syndrome	0.9	0.5	2.1
Myocarditis	0.5	0.7	0.0
Other structural heart disease	3.6	3.6	3.7
Post infarction	3.5	3.8	2.1
Sarcoidos	1.6	1.9	0.5
Valvular heart disease	1.6	1.1	3.7



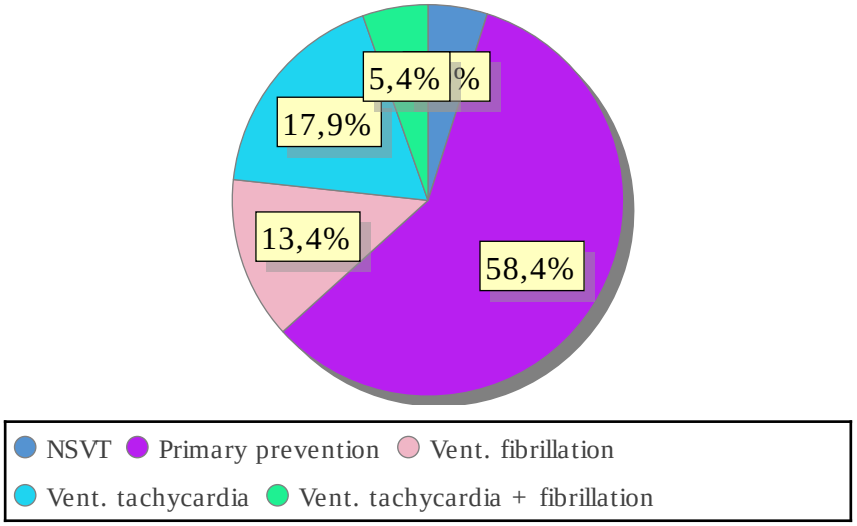
Documented ECG leading to ICD implant. (NSVT=non sustained VT)

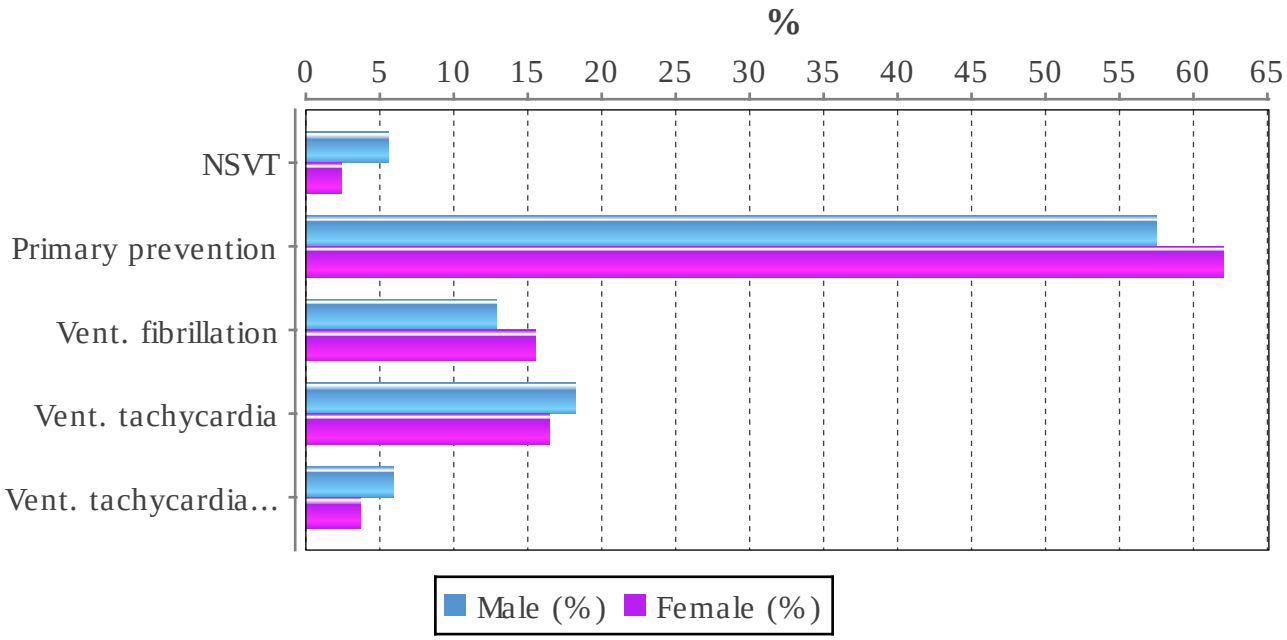
Indication	%
NSVT	4.9
Primary prevention	58.4
Vent. fibrillation	13.4
Vent. tachycardia	17.9
Vent. tachycardia + fibrillation	5.4



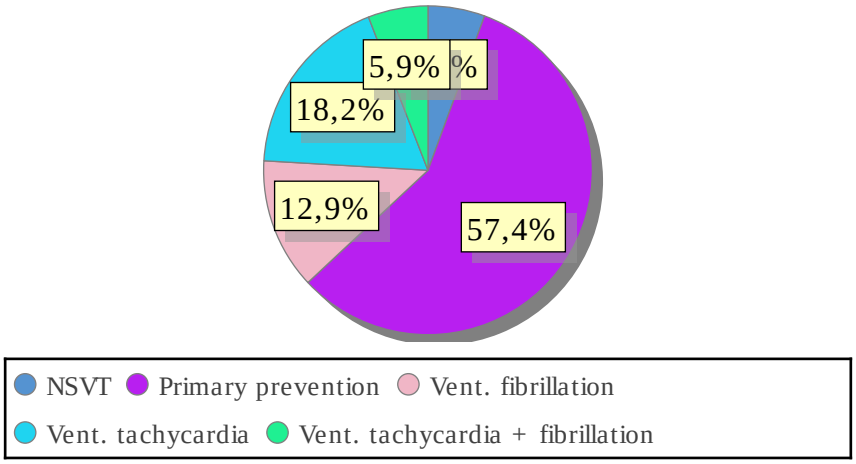
Documented ECG leading to ICD implant.(NSVT = non sustained VT) by gender and patients < 18 years

Indication	No	Total %	Male (%)	Female (%)	lt 18 (%)
NSVT	72	4.9	5.6	2.4	0.0
Primary prevention	850	58.4	57.5	62.0	57.1
Vent. fibrillation	195	13.4	12.9	15.5	42.9
Vent. tachycardia	260	17.9	18.2	16.5	0.0
Vent. tachycardia + fibrillation	79	5.4	5.9	3.7	0.0
					Total number of implants 1456

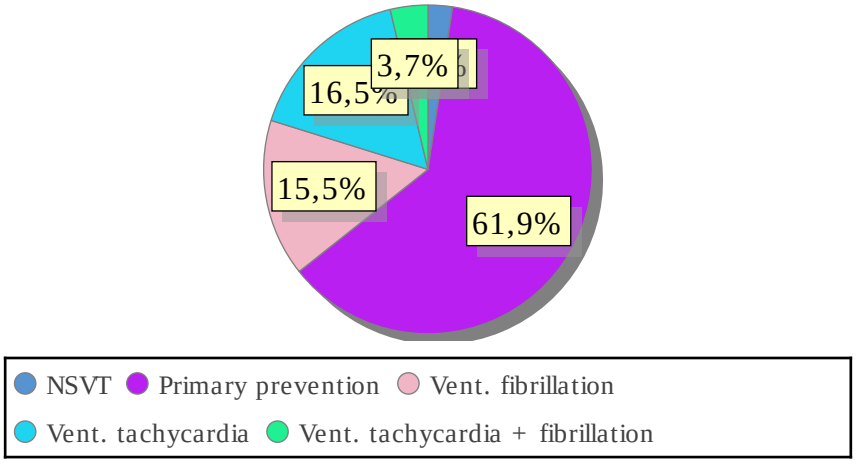




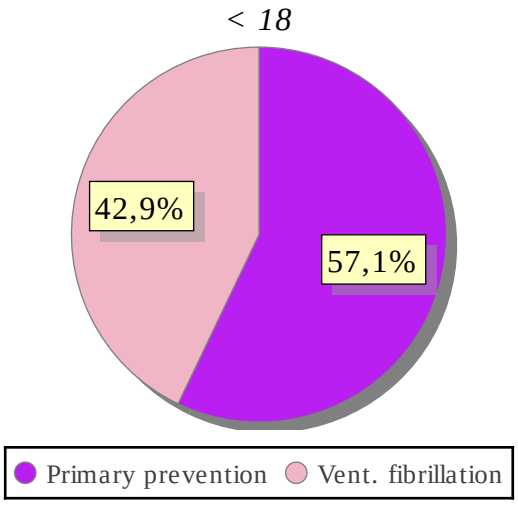
Male



Female



< 18

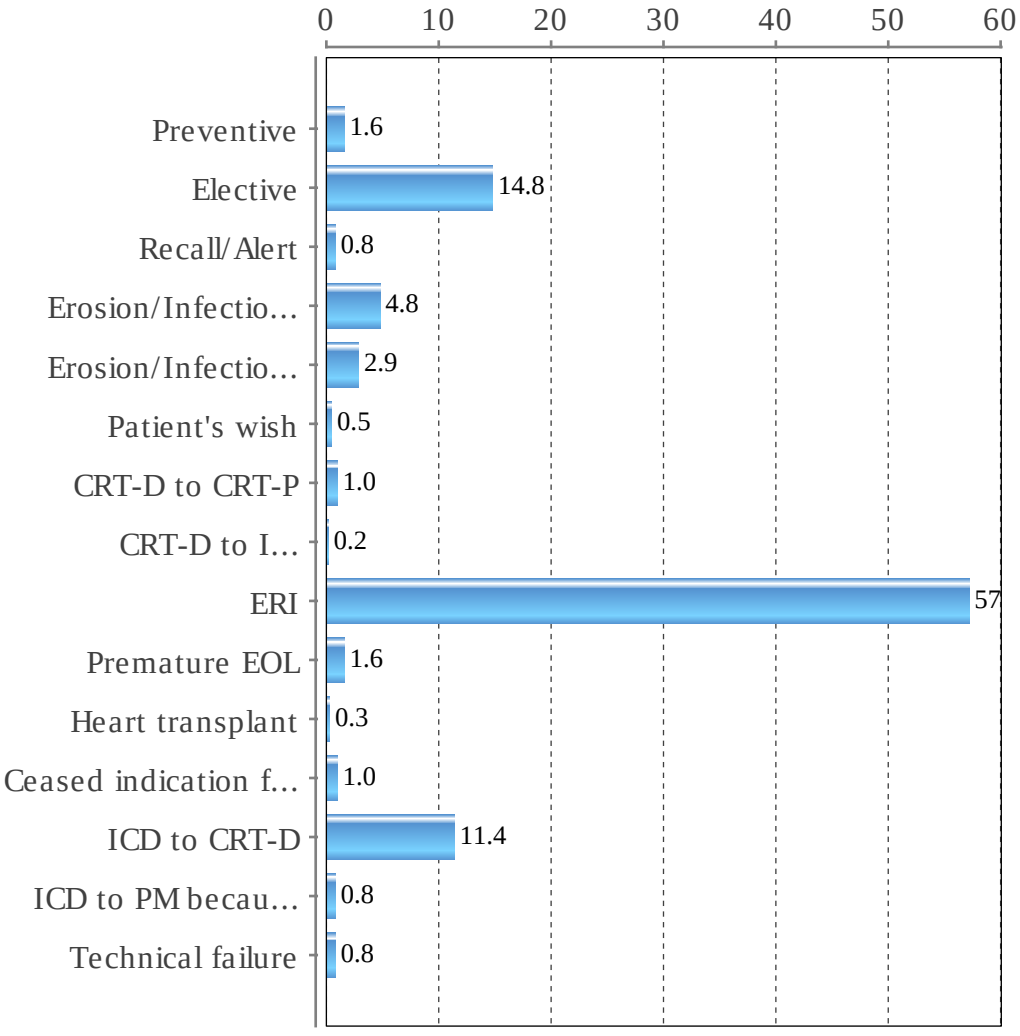


Use of ICD sub type for all indications per hospital (number of new implants / year and hospital))

Hospital	Number	ICD DR %	ICD SR %	ICD CRT %
Akademiska sjukhuset	46	23.9	32.6	43.5
Blekingesjukhuset	45	48.9	11.1	40.0
Centrallasarettet Växjö	15	73.3	20.0	6.7
Centralsjukhuset Karlstad	40	25.0	50.0	25.0
Centralsjukhuset Västerås	25	24.0	56.0	20.0
Danderyds sjukhus	61	37.7	18.0	44.3
Falu lasarett	66	31.8	39.4	28.8
Gävle sjukhus	57	36.8	17.5	45.6
Helsingborgs lasarett	22	54.5	45.5	0.0
Hudiksvalls sjukhus	9	66.7	33.3	0.0
Karolinska Universitetssjukhuset	141	55.3	22.7	22.0
Linköpings Universitetssjukhus	80	42.5	8.8	48.8
Länssjukhuset Kalmar	49	14.3	46.9	38.8
Länssjukhuset Ryhov	31	64.5	35.5	0.0
Mälarsjukhuset	34	23.5	50.0	26.5
Norrlands Universitetssjukhus	42	26.2	35.7	38.1
Sahlgrenska Universitetssjukhuset	57	52.6	21.1	26.3
Skaraborgs sjukhus Skövde	28	39.3	7.1	53.6
Skellefteå lasarett	2	100.0	0.0	0.0
Skånes universitetssjukhus, Lund	171	36.8	21.1	42.1
Skånes universitetssjukhus, Malmö	40	70.0	30.0	0.0
St Görans sjukhus	41	51.2	24.4	24.4
Sunderby sjukhus	58	69.0	1.7	29.3
Sundsvalls sjukhus	41	24.4	26.8	48.8
Södersjukhuset	36	33.3	55.6	11.1
Södra Älvsborgs sjukhus	25	56.0	4.0	40.0
Trollhättan, NÄL	30	53.3	10.0	36.7
Universitetssjukhuset Örebro	39	28.2	56.4	15.4
Varbergs sjukhus	47	19.1	44.7	36.2
Örnsköldsviks sjukhus	5	60.0	0.0	40.0
Östersunds sjukhus	25	72.0	12.0	16.0

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

Reason	All hospitals %	(large) %	(medium) %	(small) %
Preventive	1.6	1.6	1.9	0.0
Elective	14.8	16.9	11.4	5.3
Recall/Alert	0.8	0.5	1.3	5.3
Erosion/Infection, local	4.8	6.8	1.3	0.0
Erosion/Infection, systemic	2.9	3.8	1.3	0.0
Patient's wish	0.5	0.6	0.3	0.0
CRT-D to CRT-P	1.0	1.1	0.9	0.0
CRT-D to ICD because of ceased CRT-indication	0.2	0.2	0.3	0.0
ERI	57.2	52.0	66.6	73.7
Premature EOL	1.6	2.2	0.3	5.3
Heart transplant	0.3	0.3	0.0	5.3
Ceased indication for ICD therapy	1.0	0.8	1.6	0.0
ICD to CRT-D	11.4	12.1	10.7	0.0
ICD to PM because of ceased indication	0.8	0.6	1.3	0.0
Technical failure	0.8	0.6	0.9	5.3

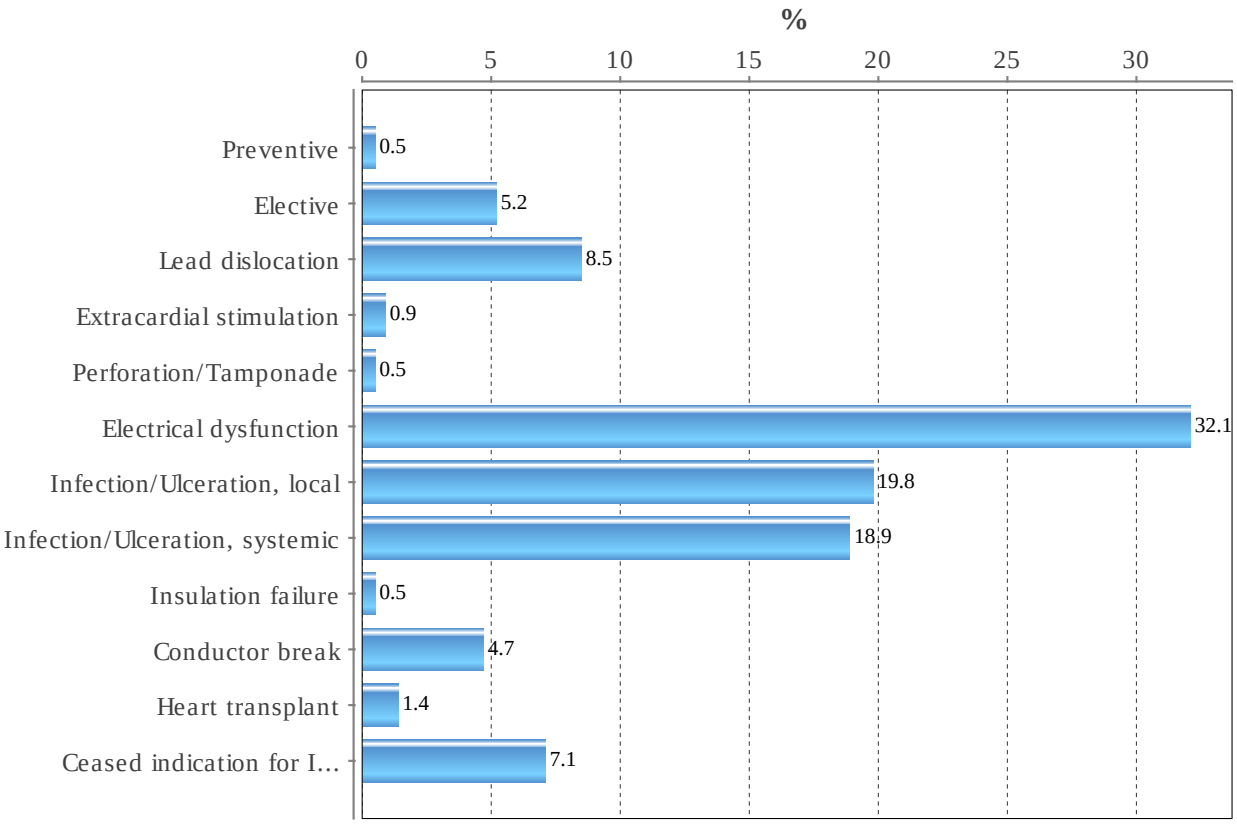


Historical explants indications

Reason	2018 %	2019 %	2020 %
Preventive	2.4	3.2	1.6
Elective	10.2	9.3	14.8
System change hemodynamic	0.9	0.5	0.0
Recall/Alert	1.2	0.5	0.8
Erosion/Infection, local	4.1	4.6	4.8
Erosion/Infection, systemic	4.5	5.3	2.9
Patient's wish	0.4	0.6	0.5
CRT-D to CRT-P	0.2	1.1	1.0
ERI	62.4	58.1	57.2
Premature EOL	3.4	2.0	1.6
Heart transplant	0.3	1.0	0.3
Ceased indication for ICD therapy	1.1	1.9	1.0
ICD to CRT-D	6.7	9.8	11.4
ICD to PM because of ceased indication	0.9	0.6	0.8
ICD to CRT-P because of heart failure	0.2	0.2	0.0
Technical failure	1.1	1.0	0.8
CRT-D to ICD because of ceased CRT-indication	0.0	0.1	0.2

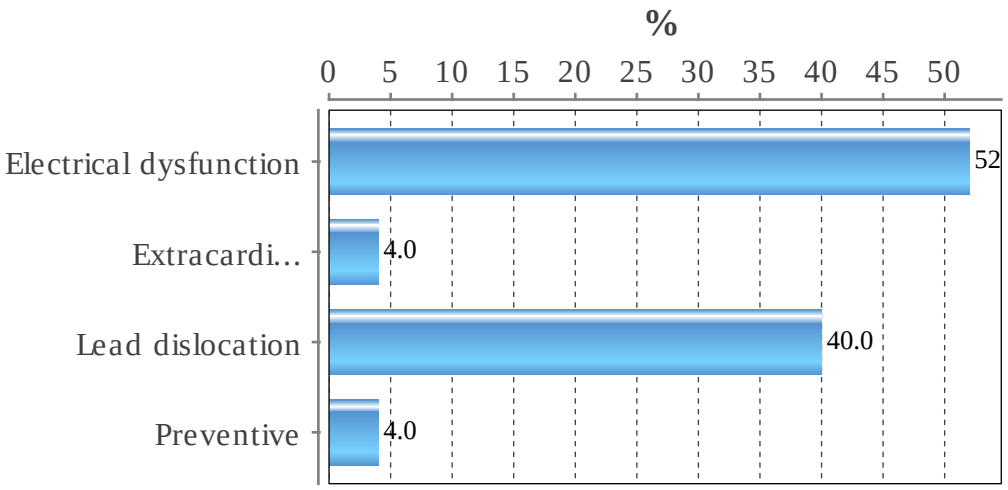
Historical lead explants indications

Reason	2018 %	2019 %	2020 %
Preventive	0.4	0.4	0.5
Elective	3.4	3.6	5.2
Lead dislocation	6.4	6.0	8.5
Perforation/Tamponade	1.7	1.2	0.5
Electrical dysfunction	38.0	32.8	32.1
Recall/Alert	0.4	0.0	0.0
Infection/Ulceration, local	16.7	18.0	19.8
Infection/Ulceration, systemic	18.8	22.8	18.9
Patient's wish	1.3	0.8	0.0
Insulation failure	2.1	2.0	0.5
Conductor break	5.6	2.4	4.7
Heart transplant	1.3	4.0	1.4
Ceased indication for ICD therapy	3.8	6.0	7.1
Extracardial stimulation	0.0	0.0	0.9



Lead correction indications

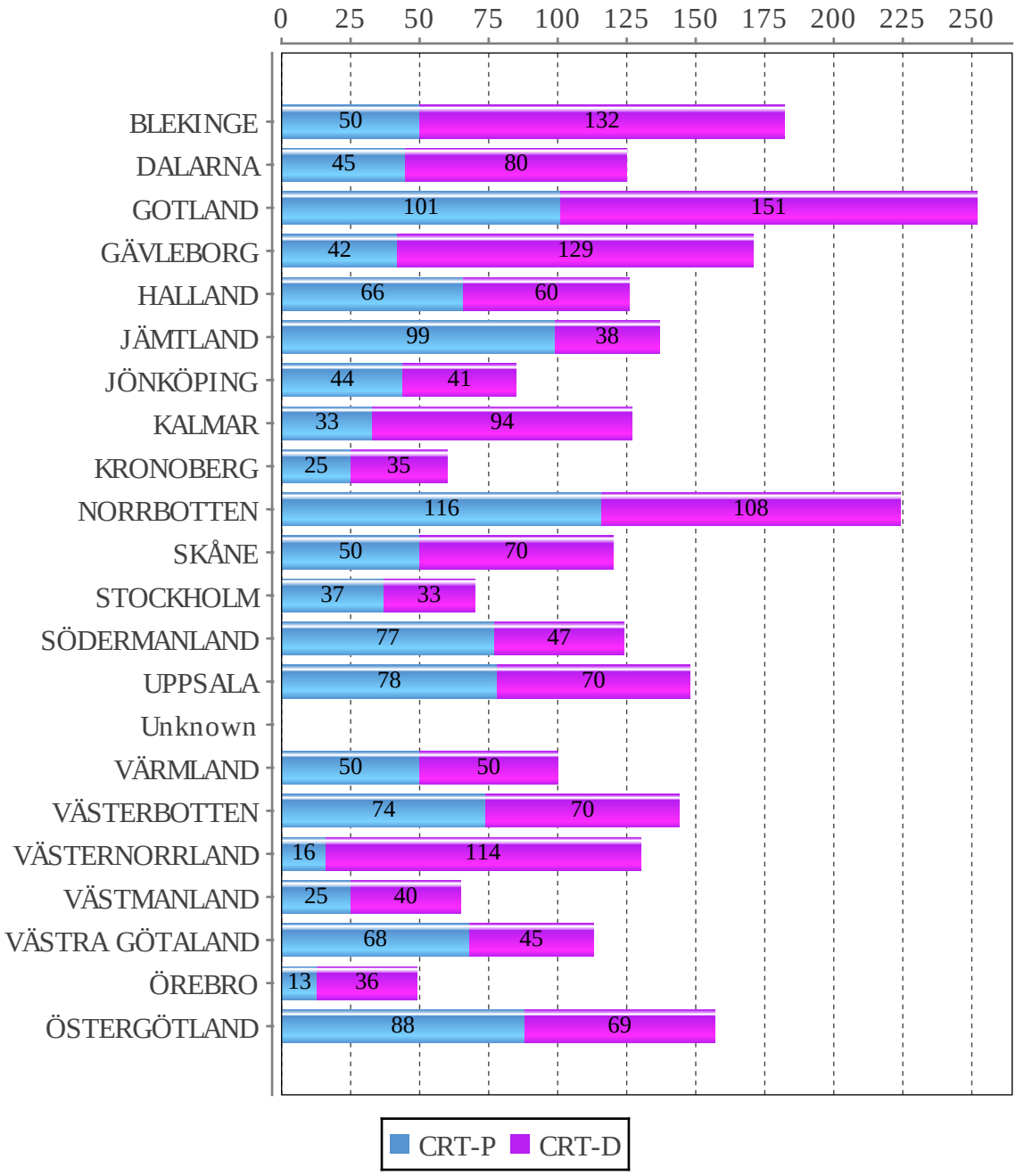
Reason	%
Electrical dysfunction	52.0
Extracardial stimulation	4.0
Lead dislocation	40.0
Preventive	4.0
	Total no 25



Procedures per operator (exclusive CRT)

Hospital	Operator	No
Akademiska sjukhuset	Alessio	11
	Arvanitis	8
	Benedik	1
	Sciaraffia	12
	Teder	9
Blekingesjukhuset	Anders Ericsson	2
	Genadi Kaninski	4
	Jan-Olov Borg	11
	Martin Stefanik	4
	Michael Ringborn	10
	Nicoleta Sora	7
Centrallasarettet Växjö	Annan	1
	Carin Påhlman	5
	Johansson P	7
	Jonasson	3
	Rosén Helena	2
	Strandberg	7
Centralsjukhuset Karlstad	Khalili	12
	Niklas Aldergård	21
	Saidi	5
Centralsjukhuset Västerås	Amra Kåregren	7
	SkoglundAndersson	10
	Wiberg	14
Danderyds sjukhus	1	11
	2	12
	3	11
	4	29
Falu lasarett	Monheim	24
	Berglund	16
	Forsgren	19
	MFO	1
	Niclas Svedberg	1
Gävle sjukhus	Falck	2
	Johansson Staffan	5
	Kastberg	18
	Magnusson Peter	12
	Mati Jalakas	11
Helsingborgs lasarett	Bläckberg	3
	Jacobsson	4
	Rorsman	9
	Utter	17
Hudiksvalls sjukhus	Roussinne	10
Karolinska Universitetssjukhus	Gadler	88
	Hörnsten	45
	Ingibjörg/Gadler	1
	Ingibjörg/Reistam	2
	Reistam	45
Länssjukhuset Kalmar	David Olsson	18
	Hendrik Schreyer	22
Länssjukhuset Ryhov	Lagerberg	20
	Stumpf	8
	Walid El-Saadi	12
Linköpings universitetssjukhus	Pinna C	13
	Säfström K	15
	Sonesson L	22
	Svenson A	1
	Szymanowski A	14
Mälarsjukhuset	Carl Westholm	9
	Georgios Matthaiou	5
	Kave Keshavarz	9
	Linda Ärlehag	14
Norrlands Universitetssjukhus	Andersson	5
	Annan	2
	Höglund	5
	Ioannis Katsoularis	5
	Jensen	2
	Kesek	4
	Landström	4
	Landström/ Jensen	1
	Lauri Salonen	3
	Rönn	5
Örnsköldsviks sjukhus	Ehlin	5
Östersunds sjukhus	Björklund	4
	Christian Gjessing	2
	Friberg	12
	Friberg/Gjessing	1
	Friberg/Hansson	1
	Hansson	8
Sahlgrenska universitetssjukhuset	Alice David	3
	Ammar Taha	8
	Konstantinos Liakatsidas	17
	Piotr Szamlewski	31
	Shabbar Jamaly	13
	Stefan Jakobsson	14
Skaraborgs sjukhus Skövde	Anna Widunder	3
	Lorentzen	13
	Paulsson	5
	Winterfeldt	4

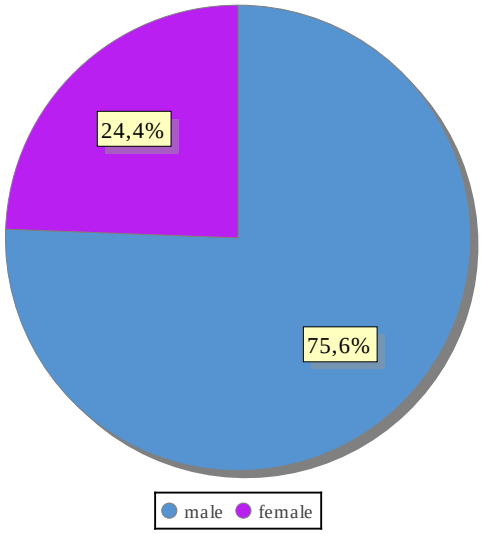
Hospital	Operator	No
Skånes universitetssjukhus, Lund	David Mörtsell	21
	Johan Brandt	56
	LingWei Wang	27
	Maiwand Farouq	6
	Pyotr Platonov	9
	Rasmus Borgquist	23
	Steen Jensen	5
	Uzma Chaudry	24
Skånes universitetssjukhus, Malmö	Annan	21
	Torbjörn Persson	21
Skellefteå lasarett	Annan	1
	E Bygdén	5
	G Lindqvist	2
Södersjukhuset	Jonsson J-E	12
	Kjellman B	16
	Olson J	13
	Rydlund K	14
Södra Älvsborgs sjukhus	Lodin	13
	Riemer	18
St Görans sjukhus	1	22
	2	10
	3	12
Sunderby sjukhus	Agneta Johansson	19
	Annica Wennberg	6
	Baas och Rangson	1
	Marcus Baas	18
	Peter Johansson	2
	Peter Rangson	11
Sundsvalls sjukhus	Benedik Erik	5
	Ciubine Alessio	3
	Haupt Jan	5
	Hayder Kadhim	4
	Khadhim Negham	4
	Olsson David	1
	Pinna Claudio	1
	Schryder Henrik	2
	Sundelin Torbjörn	4
	Teder Priit	2
Trollhättan, NÄL	Jabbar	8
	Javid	7
	Orsolya Bene	14
Universitetssjukhuset Örebro	Anna Björkenheim	20
	Barbara Kurt	7
	Lindell	25
Varbergs sjukhus	Emma Sandgren	12
	Rorsman	35
Visby lasarett	Jacobsson L	3


0
25
50
75
100
125
150
175
200
225
250
BLEKINGE
50
132
DALARNA
45
80
GOTLAND
101
151
GÄVLEBORG
42
129
HALLAND
66
60
JÄMTLAND
99
38
JÖNKÖPING
44
41
KALMAR
33
94
KRONOBERG
25
35
NORRBOTTEN
116
108
SKÅNE
50
70
STOCKHOLM
37
33
SÖDERMANLAND
77
47
UPPSALA
78
70
Unknown
VÄRMLAND
50
50
VÄSTERBOTTEN
74
70
VÄSTERNORRLAND
16
114
VÄSTMANLAND
25
40
VÄSTRA GÖTALAND
68
45
ÖREBRO
13
36
ÖSTERGÖTLAND
88
69
CRT-P
CRT-D

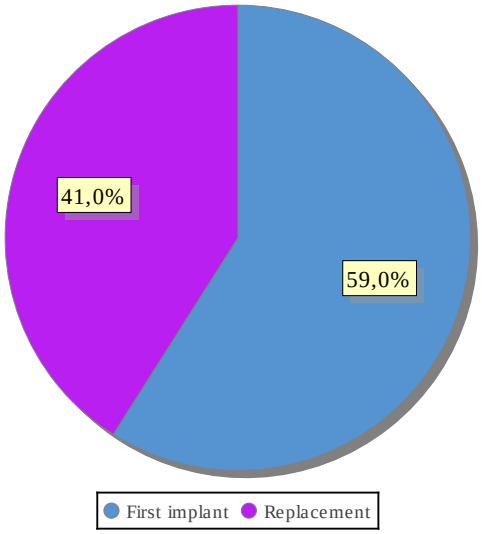
Based on both CRT-P and CRT-D

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1162	59.0	879	75.6	283	24.4
Replacement	809	41.0	601	74.3	208	25.7
Total	1971	100.0	1480	75.1	491	24.9

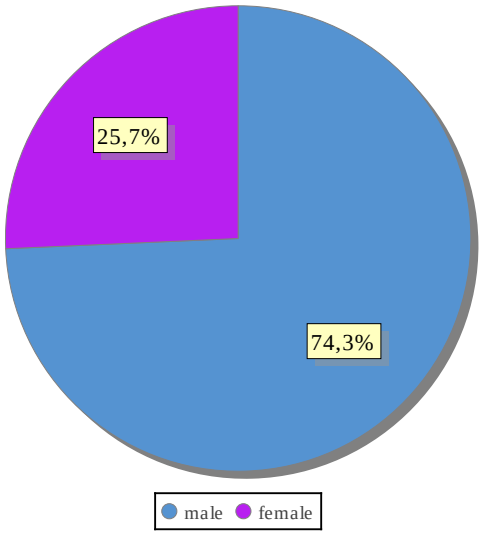
First implant



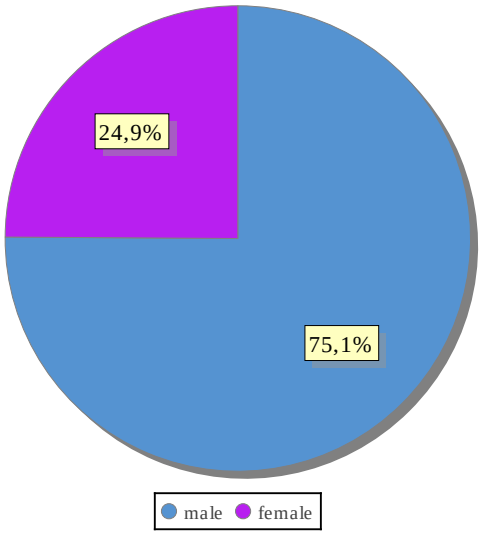
Replacement ratio



Replacement



All implant



CRT Historical implant rates per hundred thousand residents

			CRT-P		CRT-D	
Year	**Population**	**No First Impl**	**No**	**Rate**	**No**	**Rate**
2016	9995153	1138	479	4.8	659	6.6
2017	10120242	1191	549	5.4	642	6.3
2018	10230185	1209	611	6.0	598	5.8
2019	10327589	1312	650	6.3	662	6.4
2020	10379295	1162	563	5.4	599	5.8

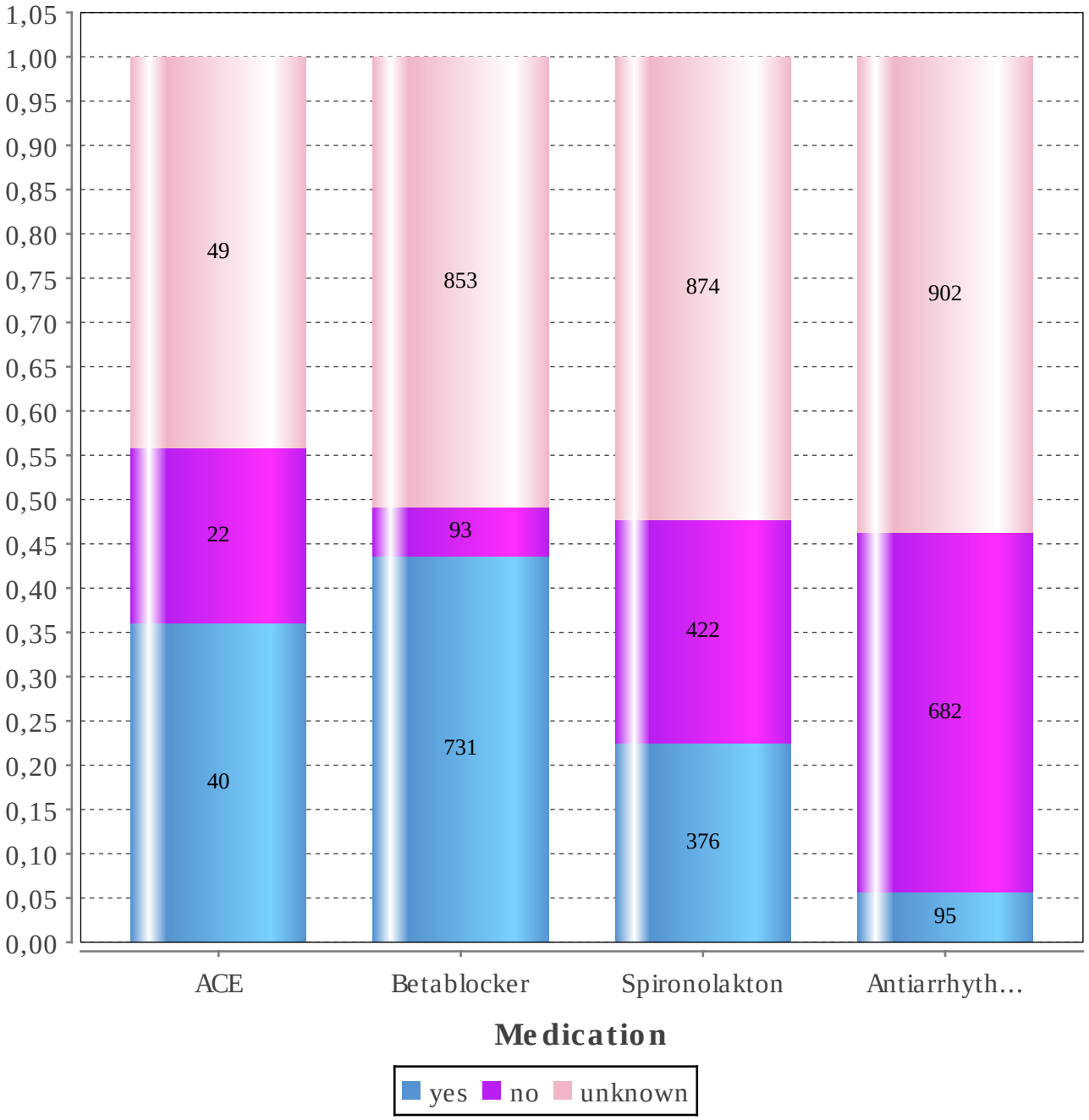
CRT-P (generator)

Status	First implant	Replacement
SC-lead plugged	12	3
SC-lead failed implant	7	1
SC-lead active system	567	361

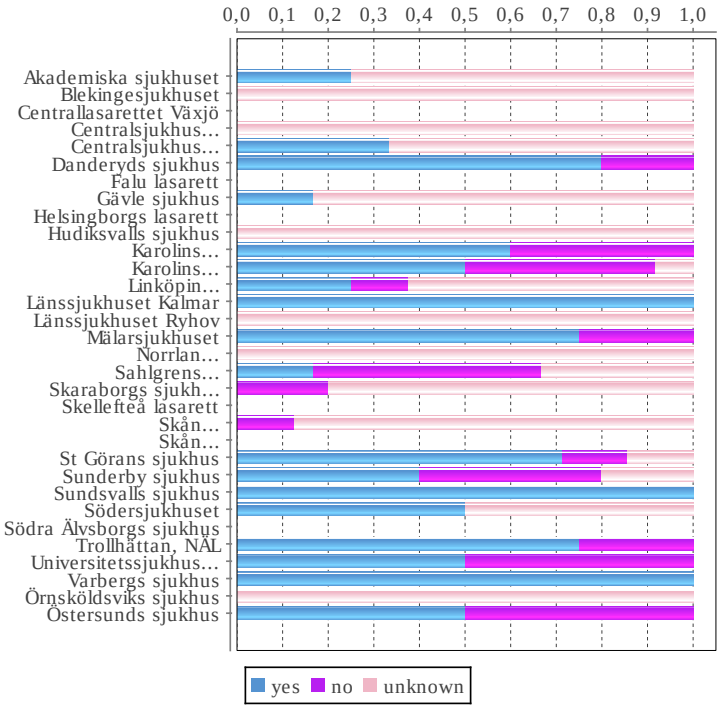
CRT-D (generator)

Status	First implant	Replacement
SC-lead plugged	7	6
SC-lead failed implant	18	8
SC-lead active system	601	447

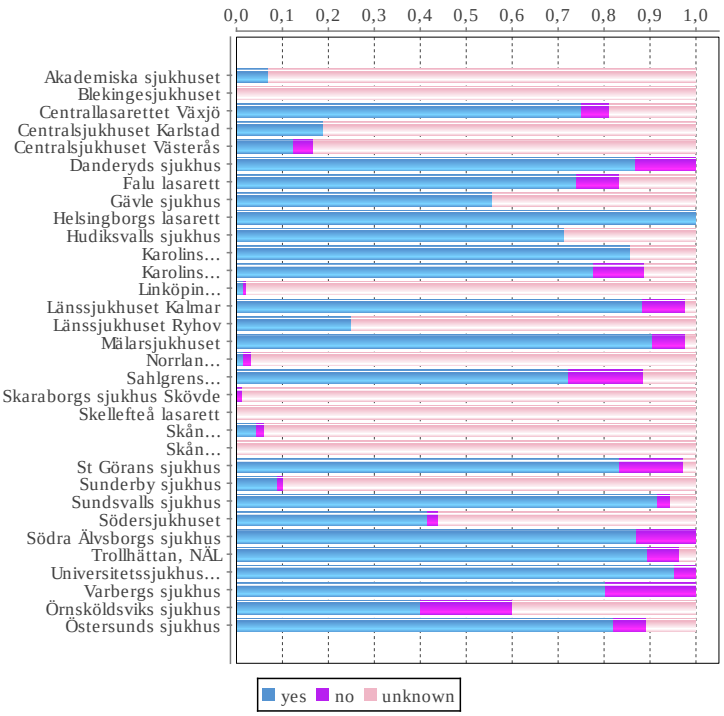
Previous medication for patients having CRT implant



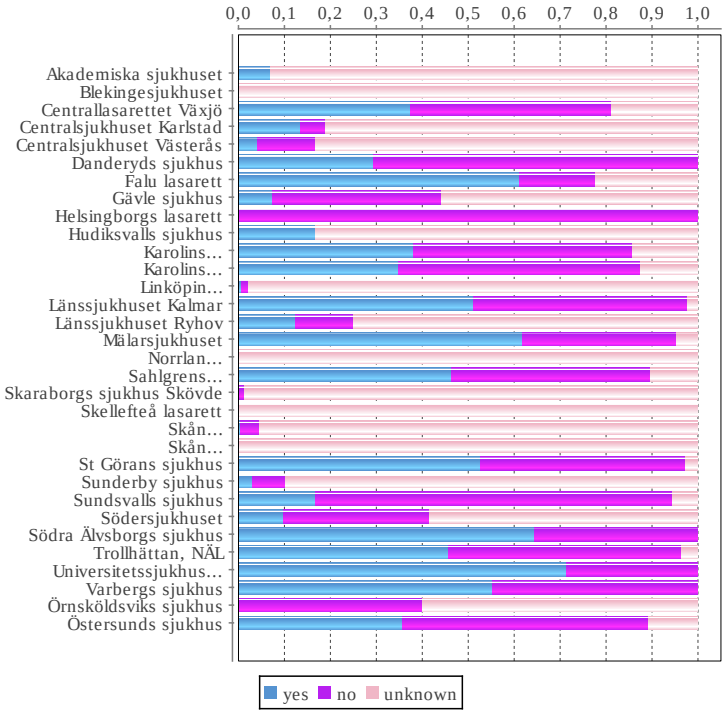
ACE



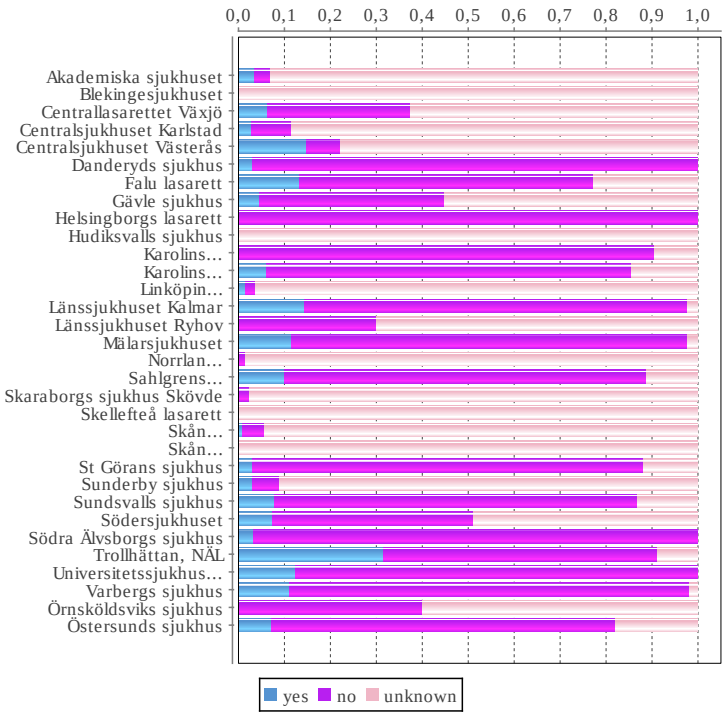
Betablocker



Spironolakton



Antiarrhythmica



Procedures per operator

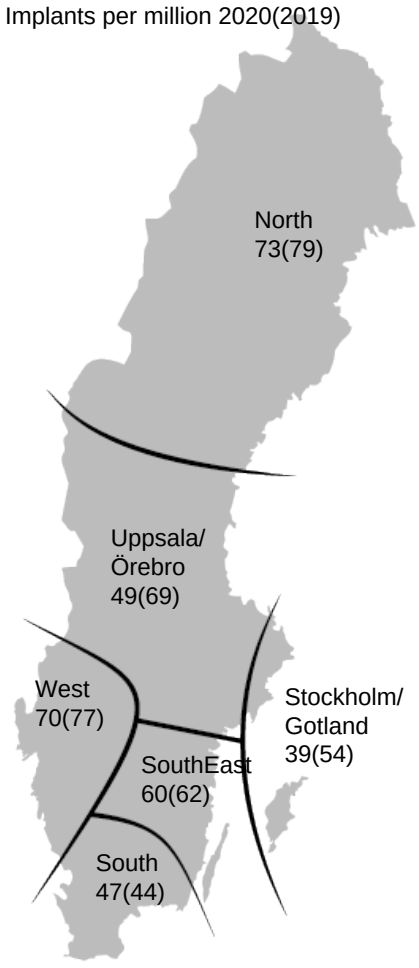
Hospital	Operator	No
Akademiska sjukhuset	Alessio	9
	Arvanitis	11
	Melki	1
	Teder	14
Ålands centralsjukhus	Slotte	1
Blekingesjukhuset	Genadi Kaninski	2
	Jan-Olov Borg	5
	Nicoleta Sora	1
Centrallasarettet Växjö	Johansson P	2
	Strandberg	1
	Strandberg-Jonasson	1
Centralsjukhuset Karlstad	Niklas Aldergård	13
Centralsjukhuset Västerås	Wiberg	5
Danderyds sjukhus	3	6
	4	16
Falu lasarett	Monheim	3
	Forsgren	13
Gävle sjukhus	Falck	4
	Johansson Staffan	1
	Kastberg	6
Helsingborgs lasarett	Rorsman	1
Karolinska Universitetssjukhus	Annan	1
	Gadler	27
	Hörnsten	14
	Reistam	10
Länssjukhuset Kalmar	David Olsson	7
	Hendrik Schreyer	2
Linköpings universitetssjukhus	Pinna C	7
	Säfström K	23
	Sonesson L	19
	Szymanowski A	13
Mälarsjukhuset	Carl Westholm	22
Norrlands Universitetssjukhus	Andersson	6
	Höglund	3
	Jensen	3
	Kesek	1
	Landström	7
	Rönn	4
Östersunds sjukhus	Björklund	4
	Björklund Friberg	1
	F.Björklund/ C.Gjessing	1
	Friberg	3
	Friberg/Gjessing	1
	Friberg/Hansson	1
	Hansson	3
Sahlgrenska universitetssjukhuset	Gäbel/ Szamlewski	3
	Jakob Gäbel	2
	Konstantinos Liakatsidas	9
	Piotr Szamlewski	35
	Shabbar Jamaly	5
	Stefan Jakobsson	6
Skaraborgs sjukhus Skövde	Anna Widunder	7
	Lorentzen	25
	Paulsson	9
Skånes universitetssjukhus, Lund	Annan	2
	David Mörtsell	18
	Johan Brandt	17
	LingWei Wang	22
	Maiwand Farouq	10
	Rasmus Borgquist	13
Södersjukhuset	Jonsson J-E	4
	Kjellman B	6
	Olson J	9
Södra Älvsborgs sjukhus	Riemer	12
St Görans sjukhus	1	4
	1+2	1
	2	1
Sunderby sjukhus	Marcus Baas	17
	Peter Johansson	9
Sundsvalls sjukhus	Ciubine Alessio	2
Trollhättan, NÄL	Javid	8
	Orsolya Bene	6
Universitetssjukhuset Örebro	Anna Björkenheim	1
	Lindell	5
Varbergs sjukhus	Emma Sandgren	7
	Rorsman	12

Procedures per operator

Hospital	Operator	No
Akademiska sjukhuset	Alessio	1
	Arvanitis	14
	Teder	15
Ålands centralsjukhus	Slotte	3
Blekingesjukhuset	Genadi Kaninski	7
	Jan-Olov Borg	11
	Nicoleta Sora	3
Centrallasarettet Växjö	Johansson P	1
	Jonasson	1
	Strandberg	1
Centralsjukhuset Karlstad	Niklas Aldergård	15
Centralsjukhuset Västerås	SkoglundAndersson	3
	Wiberg	4
Danderyds sjukhus	3	8
	4	21
Falu lasarett	Monheim	5
	Forsgren	21
Gävle sjukhus	Falck	14
	Kastberg	21
Karolinska Universitetssjukhus	Gadler	24
	Hörnsten	24
	Reistam	7
	Reistam/ Hörnsten	1
Länssjukhuset Kalmar	David Olsson	9
	Hendrik Schreyer	12
Linköpings universitetssjukhus	Pinna C	4
	Säfström K	15
	Sonesson L	18
	Szymanowski A	11
Mälarsjukhuset	Carl Westholm	13
Norrlands Universitetssjukhus	Andersson	6
	Höglund	2
	Jensen	3
	Kesek	2
	Landström	6
Örnsköldsviks sjukhus	Ehlin	2
Östersunds sjukhus	Björklund	3
	Björklund Friberg	1
	Friberg/Hansson	1
	Hansson	1
Sahlgrenska universitetssjukhuset	Ammar Taha	2
	Konstantinos Liakatsidas	3
	Piotr Szamlewski	16
	Stefan Jakobsson	1
Skaraborgs sjukhus Skövde	Anna Widunder	4
	Lorentzen	12
	Paulsson	7
Skånes universitetssjukhus, Lund	Annan	2
	David Mörtsell	27
	Johan Brandt	16
	LingWei Wang	45
	Maiwand Farouq	10
	Rasmus Borgquist	20
Södersjukhuset	Jonsson J-E	1
	Kjellman B	2
	Olson J	2
Södra Älvsborgs sjukhus	Riemer	15
St Görans sjukhus	1	7
	1+2	1
	2	3
Sunderby sjukhus	Agneta Johansson	1
	Baas och Rangson	2
	Marcus Baas	16
	Peter Johansson	5
	Peter Rangson	3
Sundsvalls sjukhus	Benedik Erik	1
	Ciubine Alessio	5
	Haupt Jan	3
	Teder Priit	10
	Westholm Carl	7
Trollhättan, NÄL	Javid	17
	Orsolya Bene	3
Universitetssjukhuset Örebro	Anna Björkenheim	4
	Lindell	10
Varbergs sjukhus	Emma Sandgren	5
	Rorsman	16

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

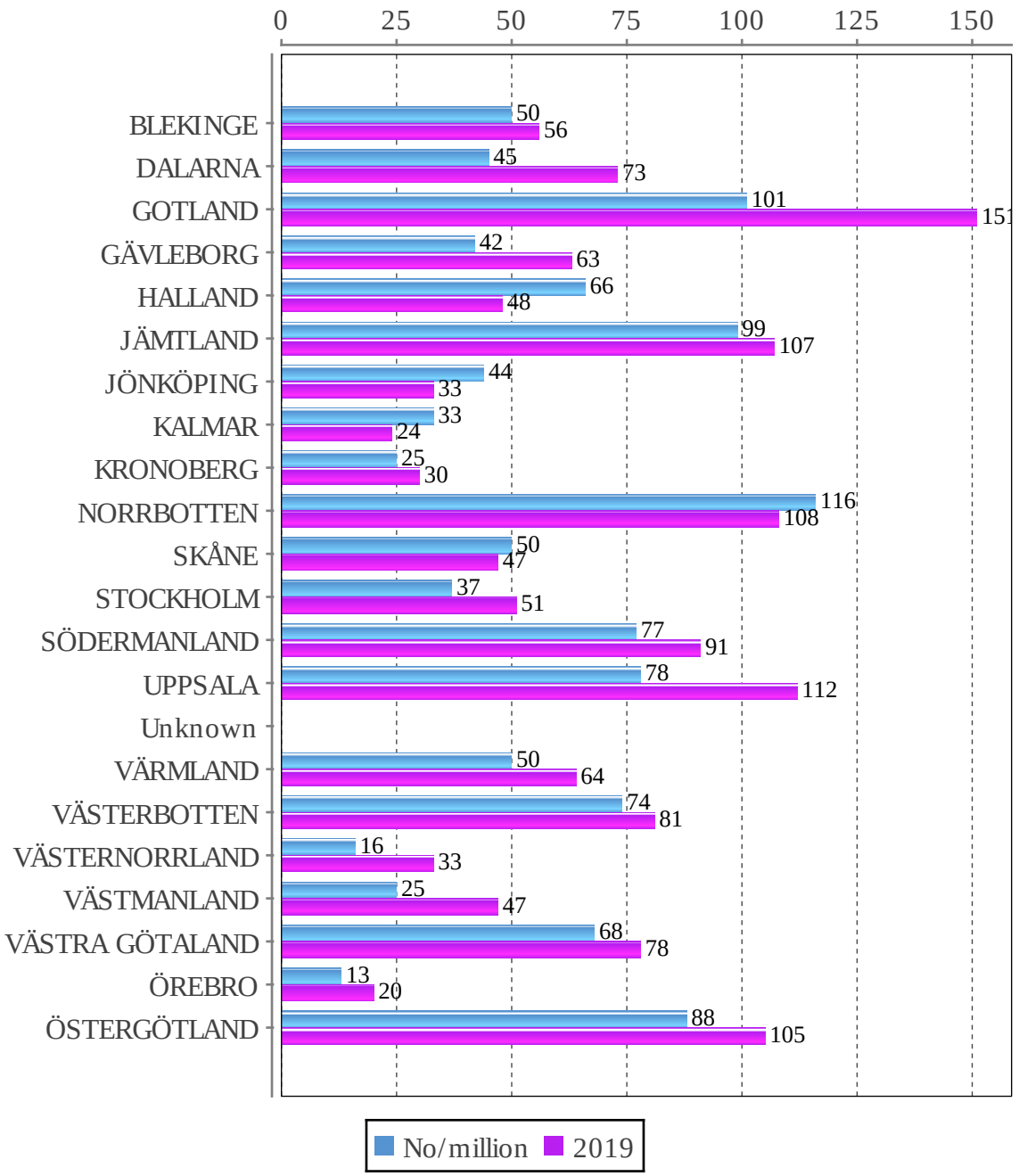
Region	Population	No of first impl	No per million
Stockholm/Gotland	2436767	94	39
Uppsala/Örebro	2119665	103	49
South-East Sweden	1074540	65	60
Southern Sweden	1878387	88	47
Western Sweden	1920244	134	70
Northern Sweden	897986	66	73
Total	10327589	550	53



STATISTICS – CRT-P – IMPLANTS PER COUNTY

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

	Population	No first impl	No/million
BLEKINGE	159606	8	50
DALARNA	287966	13	45
GOTLAND	59686	6	101
GÄVLEBORG	287382	12	42
HALLAND	333848	22	66
JÄMTLAND	130810	13	99
JÖNKÖPING	363599	16	44
KALMAR	245446	8	33
KRONOBERG	201469	5	25
NORRBOTTEN	250093	29	116
SKÅNE	1377827	69	50
STOCKHOLM	2377081	88	37
SÖDERMANLAND	297540	23	77
UPPSALA	383713	30	78
Unknown	0	14	0
VÄRMLAND	282414	14	50
VÄSTERBOTTEN	271736	20	74
VÄSTERNORRLAND	245347	4	16
VÄSTMANLAND	275845	7	25
VÄSTRA GÖTALAND	1725881	118	68
ÖREBRO	304805	4	13
ÖSTERGÖTLAND	465495	41	88
Total	10327589	564	55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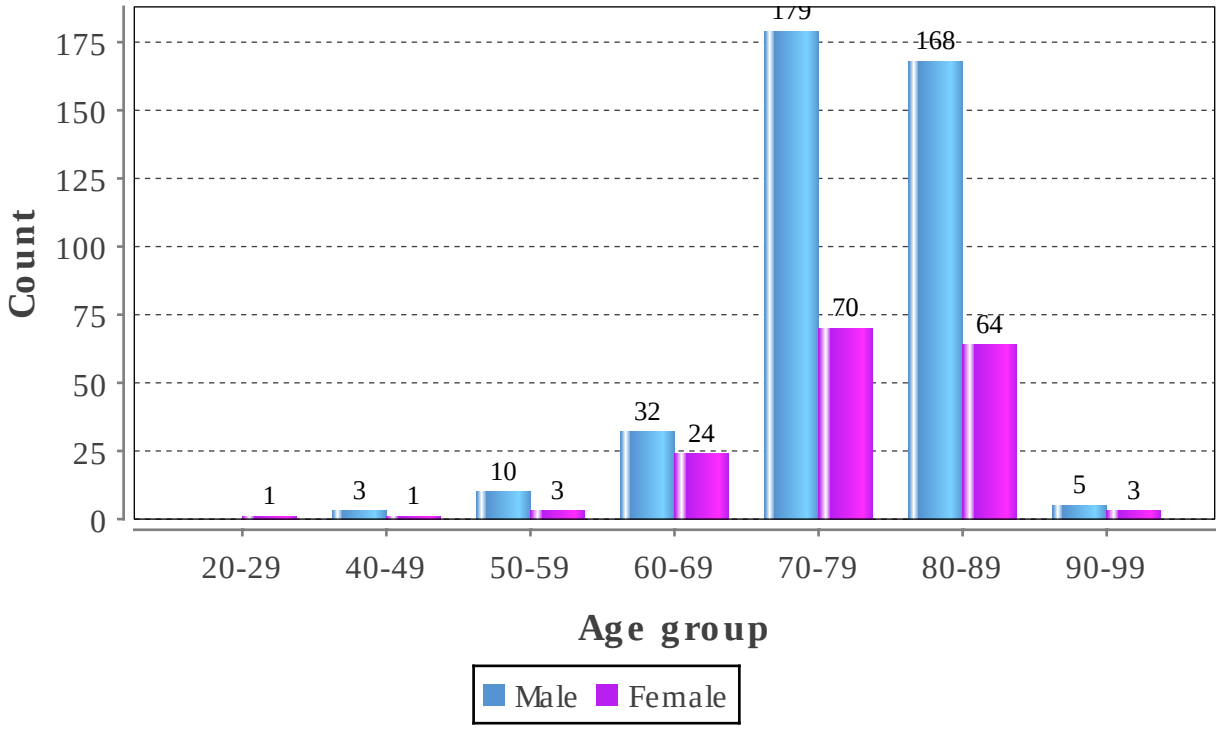
25
50
75
100
125
150
BLEKINGE
50
56
DALARNA
45
73
GOTLAND
101
151
GÄVLEBORG
42
63
HALLAND
66
48
JÄMTLAND
99
107
JÖNKÖPING
44
33
KALMAR
33
24
KRONOBERG
25
30
NORRBOTTEN
116
108
SKÅNE
50
47
STOCKHOLM
37
51
SÖDERMANLAND
77
91
UPPSALA
78
112
Unknown
VÄRMLAND
50
64
VÄSTERBOTTEN
74
81
VÄSTERNORRLAND
16
33
VÄSTMANLAND
25
47
VÄSTRA GÖTALAND
68
78
ÖREBRO
13
20
ÖSTERGÖTLAND
88
105
No/million
2019

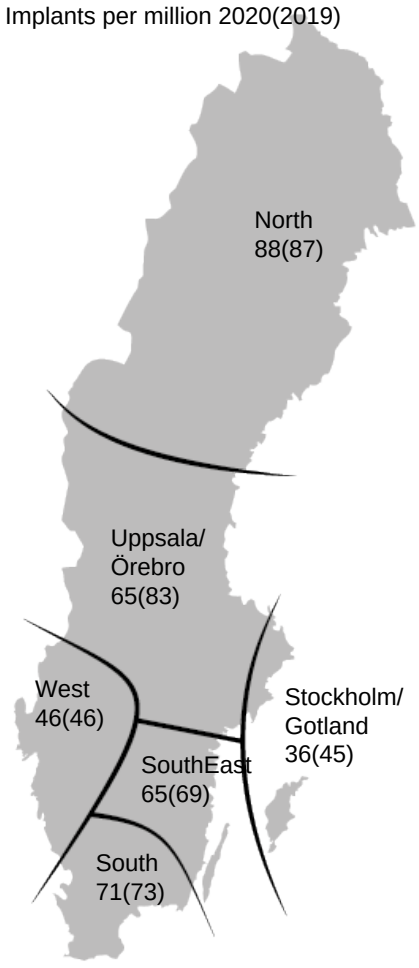
Age and gender distribution for new implants, total numbers

Age (years)	Total no	%	Male	Female
20-29	1	0.2	0	1
40-49	4	0.7	3	1
50-59	13	2.3	10	3
60-69	56	9.9	32	24
70-79	249	44.2	179	70
80-89	232	41.2	168	64
90-99	8	1.4	5	3
Average age	77	0.0	77	76
				Total number of implants: 563



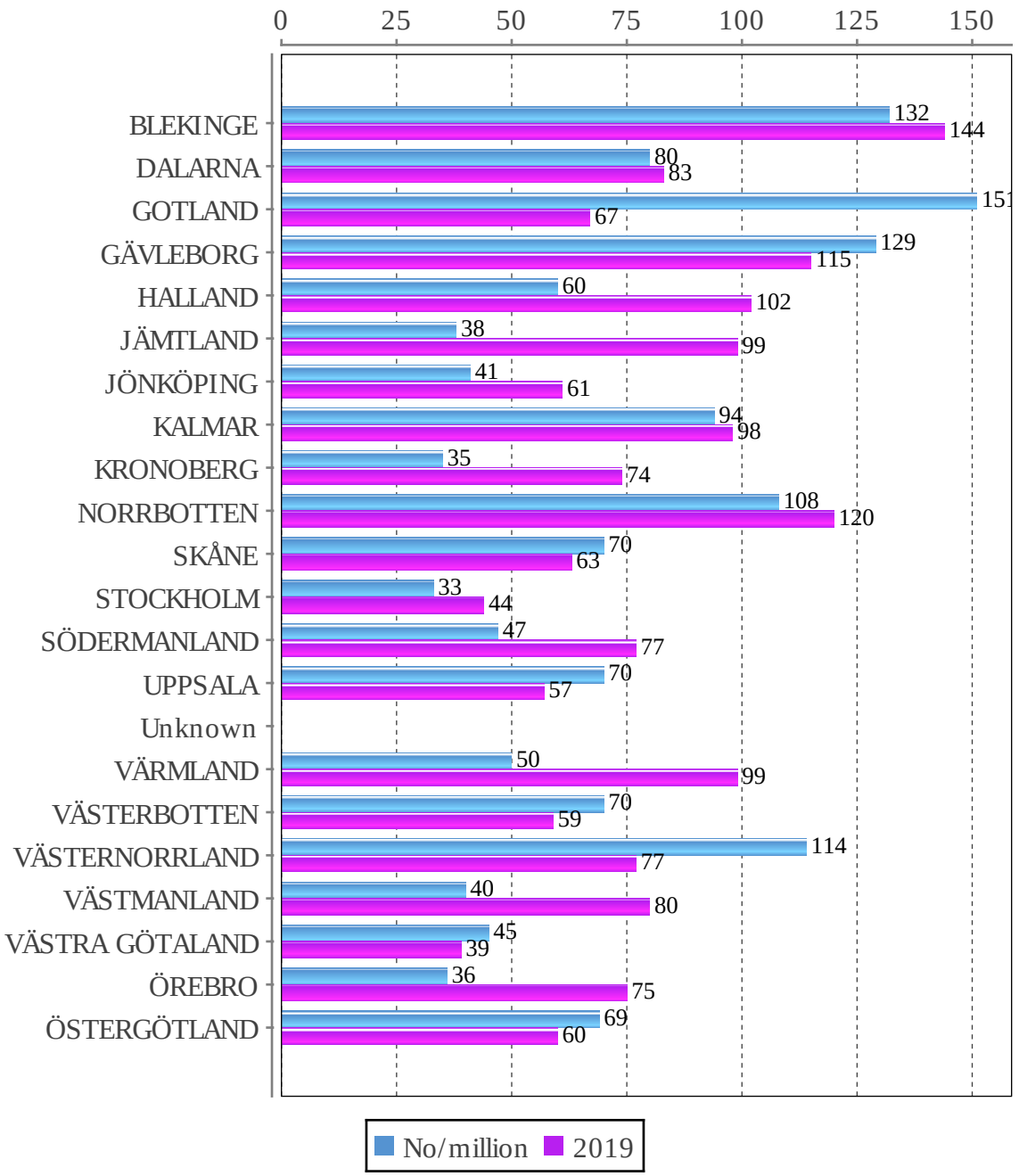
The regions are based on where the patients live, not where they are treated

Region	Population	No of first impl	No per million
Stockholm/Gotland	2436767	87	36
Uppsala/Örebro	2119665	137	65
South-East Sweden	1074540	70	65
Southern Sweden	1878387	133	71
Western Sweden	1920244	88	46
Northern Sweden	897986	79	88
Total	10327589	594	58



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

	Population	No first impl	No/million
BLEKINGE	159606	21	132
DALARNA	287966	23	80
GOTLAND	59686	9	151
GÄVLEBORG	287382	37	129
HALLAND	333848	20	60
JÄMTLAND	130810	5	38
JÖNKÖPING	363599	15	41
KALMAR	245446	23	94
KRONOBERG	201469	7	35
NORRBOTTEN	250093	27	108
SKÅNE	1377827	96	70
STOCKHOLM	2377081	78	33
SÖDERMANLAND	297540	14	47
UPPSALA	383713	27	70
Unknown	0	8	0
VÄRMLAND	282414	14	50
VÄSTERBOTTEN	271736	19	70
VÄSTERNORRLAND	245347	28	114
VÄSTMANLAND	275845	11	40
VÄSTRA GÖTALAND	1725881	77	45
ÖREBRO	304805	11	36
ÖSTERGÖTLAND	465495	32	69
Total	10327589	602	58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125
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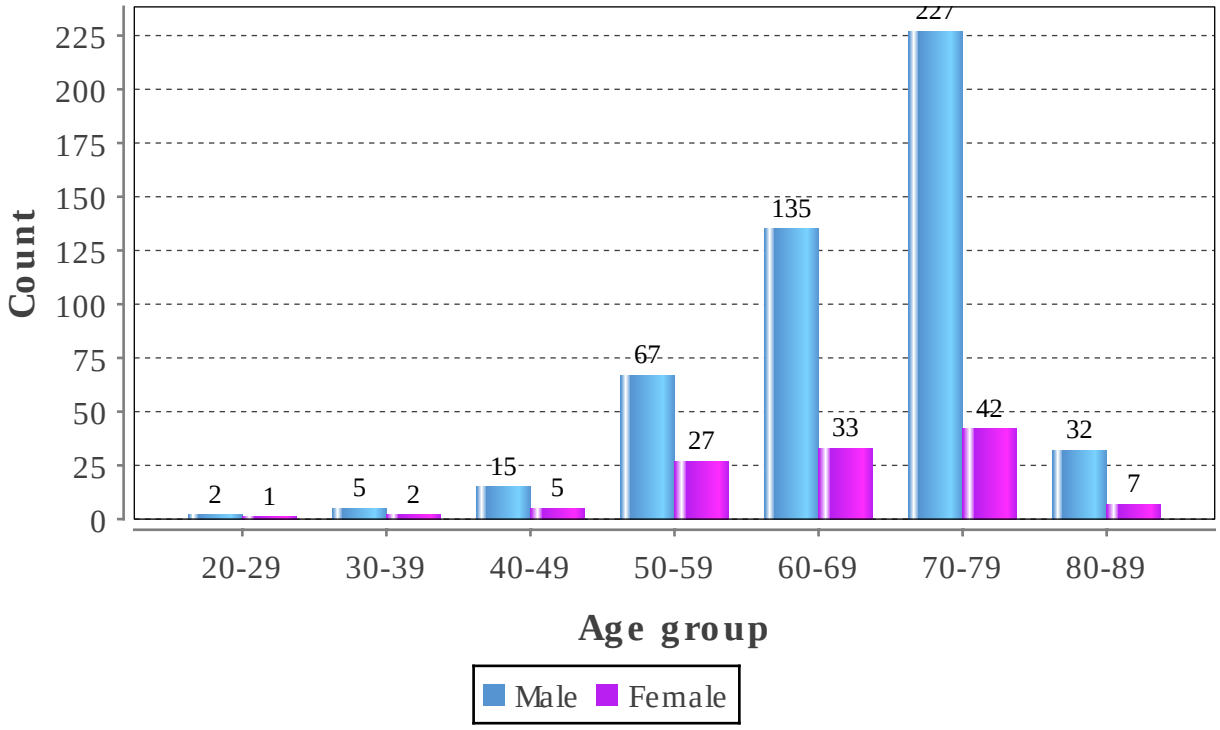
BLEKINGE
DALARNA
GOTLAND
GÄVLEBORG
HALLAND
JÄMTLAND
JÖNKÖPING
KALMAR
KRONOBERG
NORRBOTTEN
SKÅNE
STOCKHOLM
SÖDERMANLAND
UPPSALA
Unknown
VÄRMLAND
VÄSTERBOTTEN
VÄSTERNORRLAND
VÄSTMANLAND
VÄSTRA GÖTALAND
ÖREBRO
ÖSTERGÖTLAND
132
144
80
83
151
67
129
115
60
102
38
99
41
61
94
98
35
74
108
120
70
63
33
44
47
77
70
57
50
99
70
59
114
77
40
80
45
39
36
75
69
60
No/million
2019

Age and gender distribution for new implants, total numbers

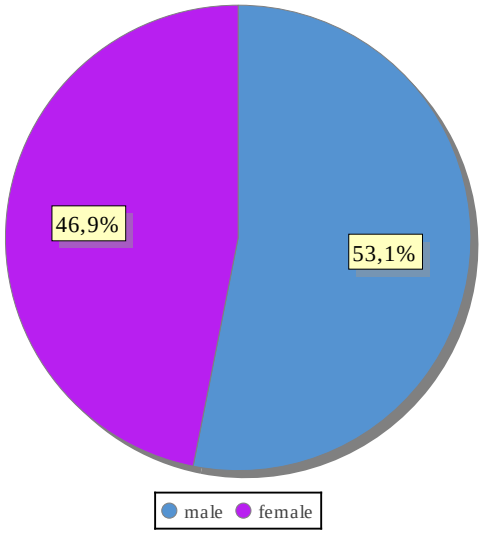
Age (years)	Total no	%	Male	Female
20-29	3	0.5	2	1
30-39	7	1.2	5	2
40-49	20	3.3	15	5
50-59	94	15.7	67	27
60-69	168	28.0	135	33
70-79	269	44.8	227	42
80-89	39	6.5	32	7
Average age	68	0.0	68	65
				Total number of implants: 600



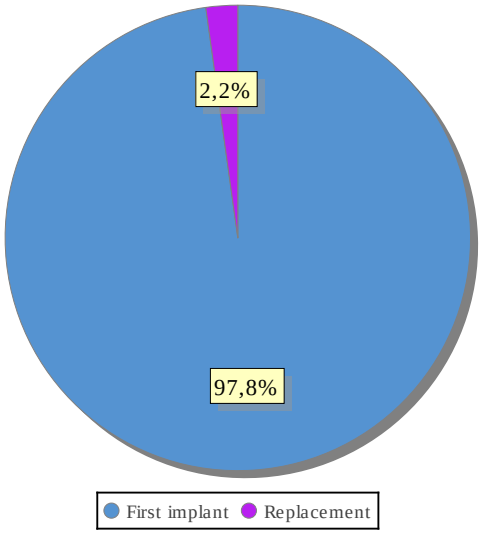
Ratio of new implants versus generator changes

	Total		Male		Female	
	no	%	no	%	no	%
First implant	1092	97.8	580	53.1	512	46.9
Replacement	24	2.2	11	45.8	13	54.2
Total	1116	100.0	591	53.0	525	47.0

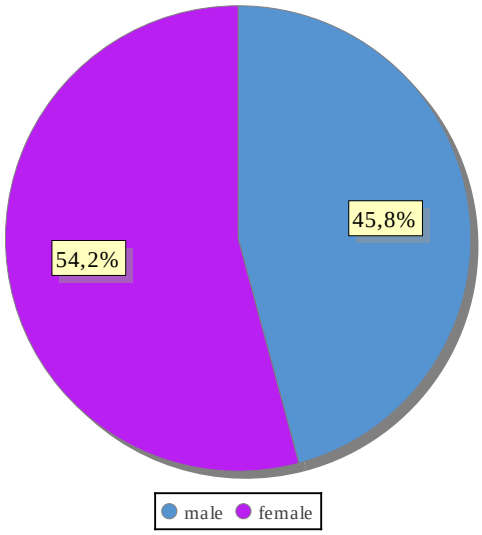
First implant



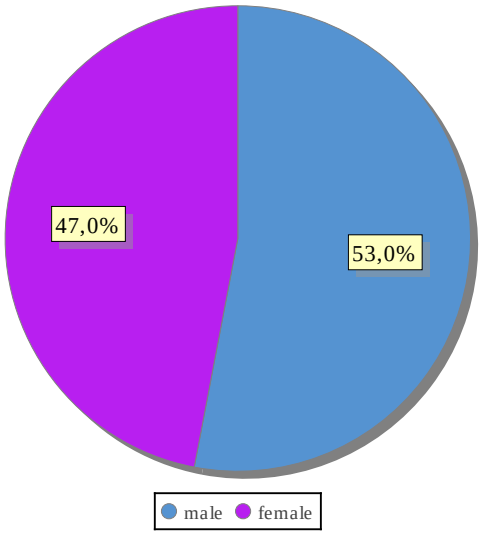
Replacement ratio



Replacement

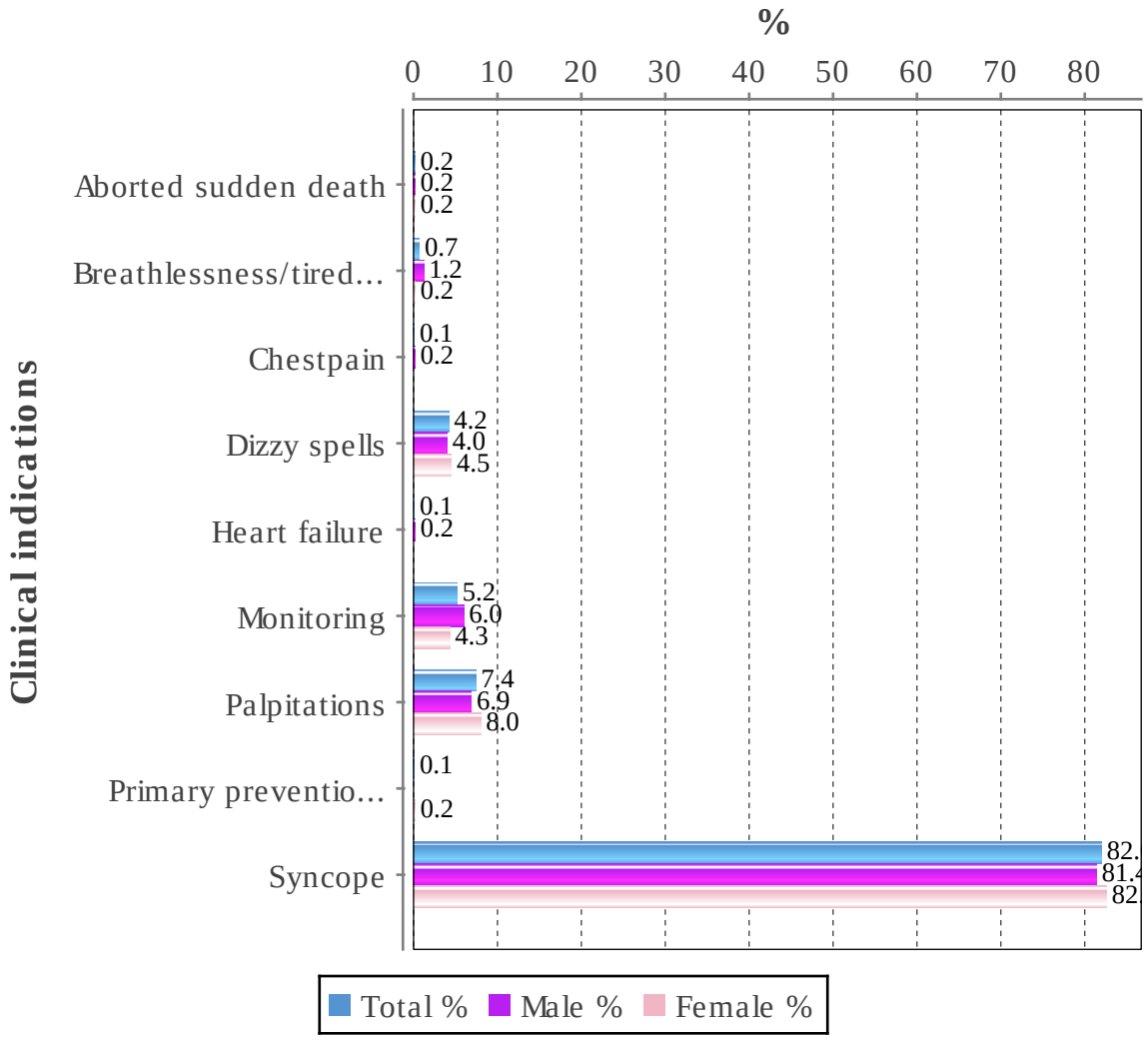


All implant



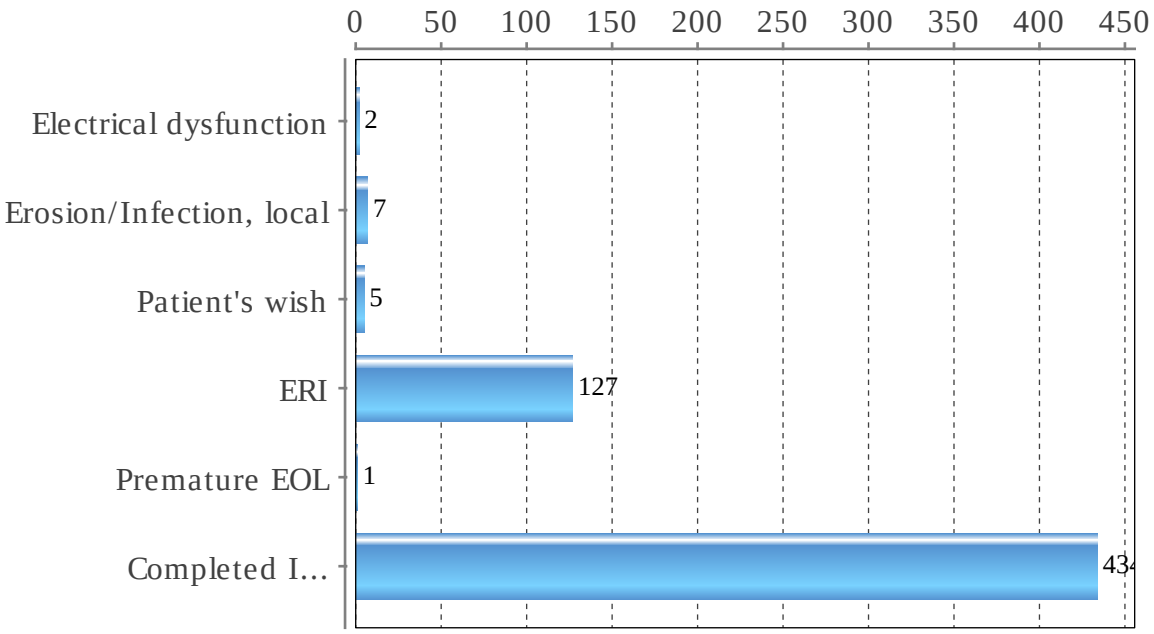
Main symptom for implanting ILR

Indication	Total %	Male %	Female %
Aborted sudden death	0.2	0.2	0.2
Breathlessness/tiredness	0.7	1.2	0.2
Chestpain	0.1	0.2	0.0
Dizzy spells	4.2	4.0	4.5
Heart failure	0.1	0.2	0.0
Monitoring	5.2	6.0	4.3
Palpitations	7.4	6.9	8.0
Primary prevention, asymptomatic	0.1	0.0	0.2
Syncope	82.0	81.4	82.6



Reason for generator removal

Reason	No	%
Electrical dysfunction	2	0.3
Erosion/Infection, local	7	1.2
Patient's wish	5	0.9
ERI	127	22.0
Premature EOL	1	0.2
Completed ILR investigation	434	75.3

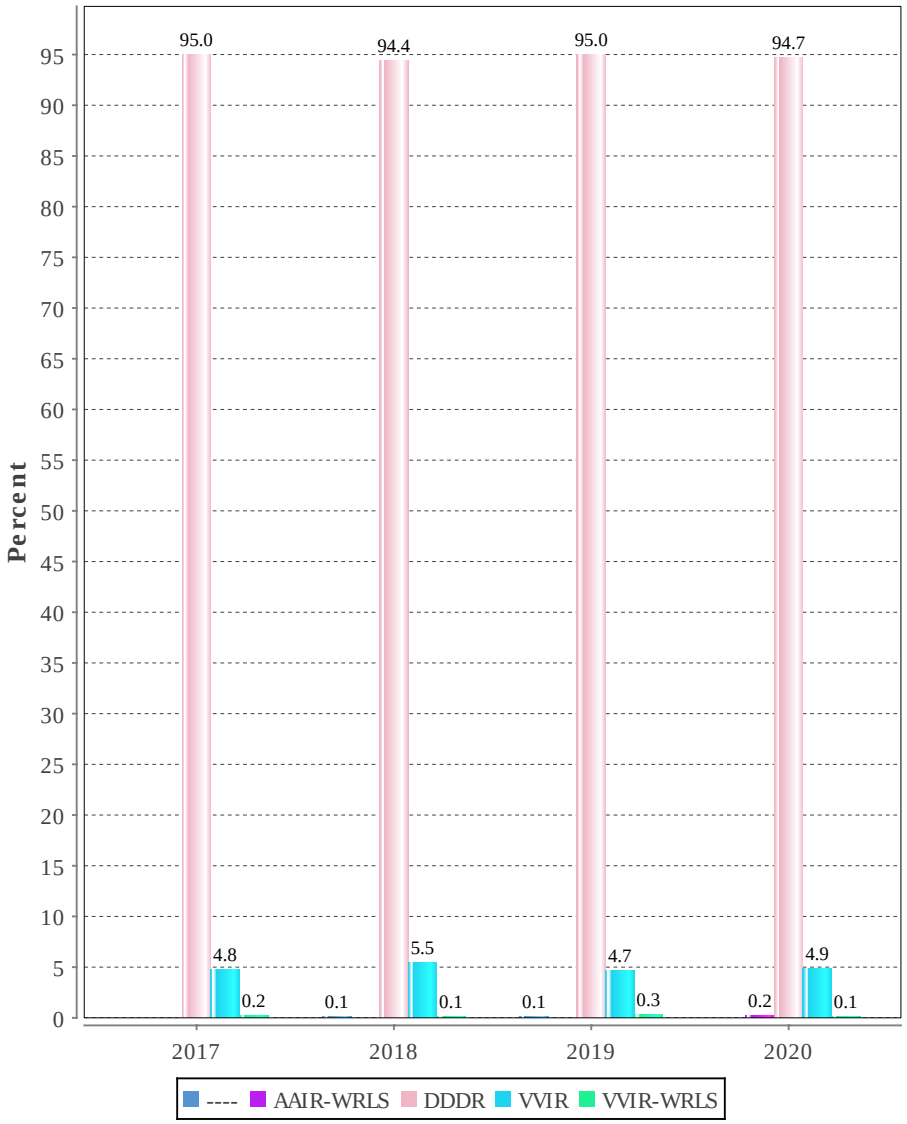


Investigation after first ILR implant in % of completed ILR investigation

Action	No	%
Pacemaker implant	319	73.5
ICD implant	35	8.1
New ILR implant	30	6.9

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

Mode %	2017	2018	2019	2020
----	0.0	0.1	0.1	0.0
AAIR-WRLS	0.0	0.0	0.0	0.2
DDDR	95.0	94.4	95.0	94.7
VVIR	4.8	5.5	4.7	4.9
VVIR-WRLS	0.2	0.1	0.3	0.1



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

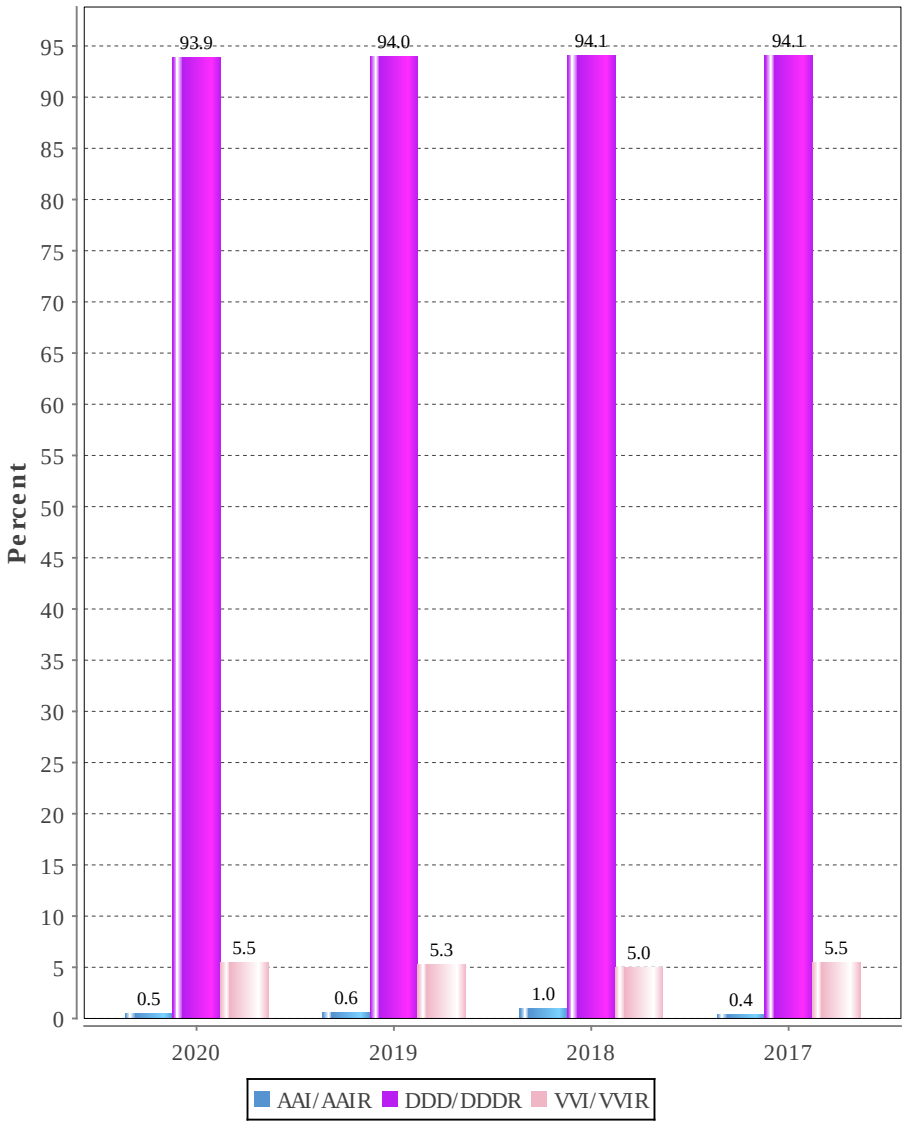
Hospital (%)	DDD	VVI
Akademiska sjukhuset	95.9	4.1
Alingsås lasarett	100.0	-
Blekingesjukhuset	94.7	5.3
Centrallasarettet Växjö	94.9	5.1
Centralsjukhuset Karlstad	97.7	2.3
Centralsjukhuset Kristianstad	98.9	1.1
Centralsjukhuset Västerås	93.8	6.3
Danderyds sjukhus	99.0	1.0
Drottning Silvias Bus	85.7	14.3
Falu lasarett	95.2	4.8
Gävle sjukhus	96.5	3.5
Helsingborgs lasarett	93.3	6.7
Hudiksvalls sjukhus	82.6	17.4
Karolinska Universitetssjukhuset	97.2	2.8
Kungälvs sjukhus	84.2	15.8
Linköpings Universitetssjukhus	97.2	2.8
Länssjukhuset Halmstad	100.0	-
Länssjukhuset Kalmar	68.3	31.7
Länssjukhuset Ryhov	95.7	4.3
Mälarsjukhuset	96.1	3.9
Norrlands Universitetssjukhus	92.1	7.9
Sahlgrenska Universitetssjukhuset	95.4	4.6
Sahlgrenska Universitetssjukhuset /Östra	100.0	-
Skaraborgs sjukhus Skövde	98.8	1.2
Skellefteå lasarett	94.1	5.9
Skånes universitetssjukhus, Lund	96.9	3.1
Skånes universitetssjukhus, Malmö	100.0	-
Sollefteå sjukhus	80.0	20.0
St Görans sjukhus	94.5	5.5
Sunderby sjukhus	94.9	5.1
Sundsvalls sjukhus	91.3	8.7
Södersjukhuset	97.5	2.5
Södra Älvsborgs sjukhus	98.6	1.4
Torsby sjukhus	100.0	-
Trollhättan, NÄL	79.8	20.2
Universitetssjukhuset Örebro	99.0	1.0
Varbergs sjukhus	91.9	8.1
Visby lasarett	100.0	-
Västerviks sjukhus	100.0	-
Örnsköldsviks sjukhus	97.7	2.3
Östersunds sjukhus	100.0	-

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

Year	Mode	All hospitals (%)	Large (%)	Medium (%)	Small (%)
2020	DDD	95.1	95.8	94.0	95.0
	VVI	4.9	4.2	6.0	5.0
2019	DDD	95.3	94.4	96.7	97.8
	VVI	4.7	5.6	3.3	2.2
2018	DDD	94.5	94.8	95.3	91.3
	VVI	5.5	5.2	4.7	8.7
2017	DDD	95.2	95.0	97.5	89.7
	VVI	4.8	5.0	2.5	10.3
2016	DDD	95.1	95.9	95.4	88.8
	VVI	4.9	4.1	4.6	11.2
2015	DDD	95.2	95.9	96.0	85.7
	VVI	4.8	4.1	4.0	14.3
2014	DDDR	95.7	97.0	94.2	89.3
	DDDC	-	-	-	-
	VVIC	-	0.1	-	-
	VVIR	4.3	2.9	5.8	10.7
2013	DDDR	94.4	95.8	92.9	90.1
	DDDC	-	0.1	-	-
	VVIC	-	-	-	-

Use of pacing mode for Sinus Node Disease, historical data

Mode (%)	2020	2019	2018	2017
AAI/AAIR	0.5	0.6	1.0	0.4
DDD/DDDR	93.9	94.0	94.1	94.1
VVI/VVIR	5.5	5.3	5.0	5.5



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 %
2020	AAI	0.5	1.6	0.6	0.4
	VVI	5.5	4.1	6.7	5.1
	DDD	93.9	94.3	92.7	94.5
2019	AAI	0.6	0.7	0.8	0.6
	VVI	5.3	6.7	5.9	5.0
	DDD	94.0	92.7	93.3	94.5
2018	AAI	1.0	1.6	1.5	0.6
	VVI	5.0	10.5	3.1	4.7
	DDD	94.1	87.9	95.4	94.7
2017	AAI	0.4	2.8	0.2	0.2
	VVI	5.5	17.9	2.4	5.1
	DDD	94.1	79.3	97.4	94.7
2016	AAI	0.5	2.4	0.3	0.3
	VVI	5.7	17.1	6.5	3.8
	DDD	93.8	80.6	93.2	95.9
2015	AAI	0.4	1.9	0.3	0.3
	VVI	5.1	12.3	6.5	3.8
	DDD	94.5	85.8	93.2	95.9
2014	AAIR	0.8	1.1	0.9	0.8
	VVIR	5.9	16.1	7.7	4.1
	DDDR	93.3	82.8	91.4	95.1
2013	AAIR	1.1	0.9	1.0	1.2
	VVIR	6.6	12.8	8.7	4.7
	DDDR	92.2	86.3	90.0	94.2
	DDDC	-	-	0.1	-
	VVIC	-	-	0.1	-
2012	AAIC	-	-	-	-
	DDDC	-	-	-	-
	AAIR	1.2	0.6	1.3	1.2
	VVIC	-	0.6	-	-
	VVIR	7.8	13.4	8.6	6.1
	DDDR	91.0	85.4	90.2	92.6
2011	AAIC	-	-	-	-
	AAIR	1.4	0.4	1.0	2.3
	VVIC	0.1	0.4	0.1	-
	VVIR	7.5	19.6	8.3	2.8
	DDDR	91.0	79.6	90.6	95.0
2010	AAIR	3.4	2.5	2.9	4.2
	VVIC	0.1	1.2	-	-
	VVIR	9.2	20.1	10.3	6.1
	DDDR	87.3	76.2	86.8	89.7
2009	AAIR	5.1	6.3	4.8	5.2
	VVIC	0.2	-	0.1	-
	VVIR	9.3	17.6	11.9	5.6
	DDDR	85.4	73.9	83.2	89.2

QUALITY – PACEMAKER – FIRST IMPLANT
SINUS NODE DYSFUNCTION PER HOSPITAL

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

Hospital (%)	DDD	VVI	AAI
Akademiska sjukhuset	94.0	6.0	-
Alingsås lasarett	95.8	4.2	-
Blekingesjukhuset	96.2	3.8	-
Centrallasarettet Växjö	83.3	12.5	4.2
Centralsjukhuset Karlstad	85.7	14.3	-
Centralsjukhuset Kristianstad	96.9	3.1	-
Centralsjukhuset Västerås	87.5	12.5	-
Danderyds sjukhus	96.7	3.3	-
Drottning Silvias Bus	-	-	100.0
Falu lasarett	90.0	10.0	-
Gävle sjukhus	88.9	11.1	-
Helsingborgs lasarett	86.2	12.1	1.7
Hudiksvalls sjukhus	91.3	8.7	-
Karolinska Universitetssjukhuset	98.0	1.0	1.0
Kungälvs sjukhus	97.6	2.4	-
Linköpings Universitetssjukhus	98.5	0.8	0.8
Länssjukhuset Halmstad	93.8	6.3	-
Länssjukhuset Kalmar	64.5	32.3	3.2
Länssjukhuset Ryhov	83.1	16.9	-
Mälarsjukhuset	100.0	-	-
Norrlands Universitetssjukhus	85.7	14.3	-
Sahlgrenska Universitetssjukhuset	95.0	2.8	2.1
Sahlgrenska Universitetssjukhuset /Östra	100.0	-	-
Skaraborgs sjukhus Skövde	97.7	2.3	-
Skellefteå lasarett	92.3	7.7	-
Skånes universitetssjukhus, Lund	100.0	-	-
Skånes universitetssjukhus, Malmö	98.7	1.3	-
Sollefteå sjukhus	100.0	-	-
St Görans sjukhus	95.3	4.7	-
Sunderby sjukhus	95.4	4.6	-
Sundsvalls sjukhus	84.8	15.2	-
Södersjukhuset	88.7	7.5	3.8
Södra Älvsborgs sjukhus	98.3	1.7	-
Torsby sjukhus	92.3	7.7	-
Trollhättan, NÄL	93.5	6.5	-
Universitetssjukhuset Örebro	100.0	-	-
Varbergs sjukhus	100.0	-	-
Visby lasarett	100.0	-	-
Västerviks sjukhus	100.0	-	-
Örnsköldsviks sjukhus	92.9	-	7.1
Östersunds sjukhus	100.0	-	-

Dislocation rate for different lead types in atrial or ventricular placement. Based on all implants implanted 2007 and later and explanted/corrected 2020 or earlier

Type	Right atrium %	Right ventricle %	Left ventricle %	Total %
Fixed screw	1.5	0.9	0.8	1.3
Retractable screw	1.5	0.9	0.8	1.3
Passive	3.3	1.6	2.0	1.3
All	1.6	1.0	1.7	1.3

Extractions per hospital

Hospital	No of leads
Akademiska sjukhuset	48
Falu lasarett	7
Karolinska Solna	188
Linköpings universitetssjukhus	13
Sahlgrenska universitetssjukhuset	63
Skånes universitetssjukhus, Lund	139
Universitetssjukhuset Örebro	9

Extractions per type

Type	Extractions
ICD lead	82
Pacemaker lead	419

Extractions per model (more then 5 extractions)

Manfacturer	Model	Extractions
Biotronik	Solia S53 MRI	16
Biotronik	Solia S60 MRI	12
Boston Scientific	4470 Fineline II Sterox EZ MRI	14
Boston Scientific	4474 Fineline II Sterox EZ MRI	6
Medtronic	4076 CapSureFix Novus MRI	40
Medtronic	4296 Attain Ability MRI	6
Medtronic	5076 CapSureFix MRI	19
Medtronic	6935M Sprint Quattro S MRI DF4	9
St Jude Medical/ Abbott	1258T QuickFlex	14
St Jude Medical/ Abbott	1458Q Quartet MRI	22
St Jude Medical/ Abbott	1646T Isoflex	8
St Jude Medical/ Abbott	1788TC Tendril ST	7
St Jude Medical/ Abbott	1948 Isoflex MRI	9
St Jude Medical/ Abbott	1999 Optisense	33
St Jude Medical/ Abbott	2088TC Tendril STS MRI	109
St Jude Medical/ Abbott	7122Q Durata	17
St Jude Medical/ Abbott	LDA210Q Optisure DF4	14
Vitatron	ICQ09B Crystalline	8

Extractions per reason

Reason	Extractions
Ceased indication for ICD therapy	6
Conductor break	9
Elective	38
Electrical dysfunction	74
Infection/Ulceration, local	140
Infection/Ulceration, systemic	186
Insulation failure	7
Lead dislocation	21
Preventive	8

*Extraction positions**

Hospital	Femoral	Left superior	N/A	Right superior
Akademiska sjukhuset	2	39	0	7
Falu lasarett	0	7	0	0
Karolinska Solna	2	168	0	18
Linköpings universitetssjukhus	0	13	0	0
Skånes universitetssjukhus, Lund	9	130	0	0
Universitetssjukhuset Örebro	0	9	0	0
*Hospital Sahlgrenska and Sunderby excluded				

*Extraction problems**

Hospital	I	E	O	P	X	D
Akademiska sjukhuset	0	0	0	0	0	0
Falu lasarett	0	0	0	0	0	0
Karolinska Solna	1	1	1	0	0	1
Linköpings universitetssjukhus	0	0	0	0	0	0
Skånes universitetssjukhus, Lund	0	0	0	0	0	0
Universitetssjukhuset Örebro	0	0	0	0	0	0

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

*Extraction results**

Hospital	Failed	Partially successfull	Successfull
Akademiska sjukhuset	0	1	47
Falu lasarett	0	0	7
Karolinska Solna	0	5	183
Linköpings universitetssjukhus	0	0	13
Skånes universitetssjukhus, Lund	0	3	136
Universitetssjukhuset Örebro	0	0	9

*Hospital Sahlgrenska and Sunderby excluded

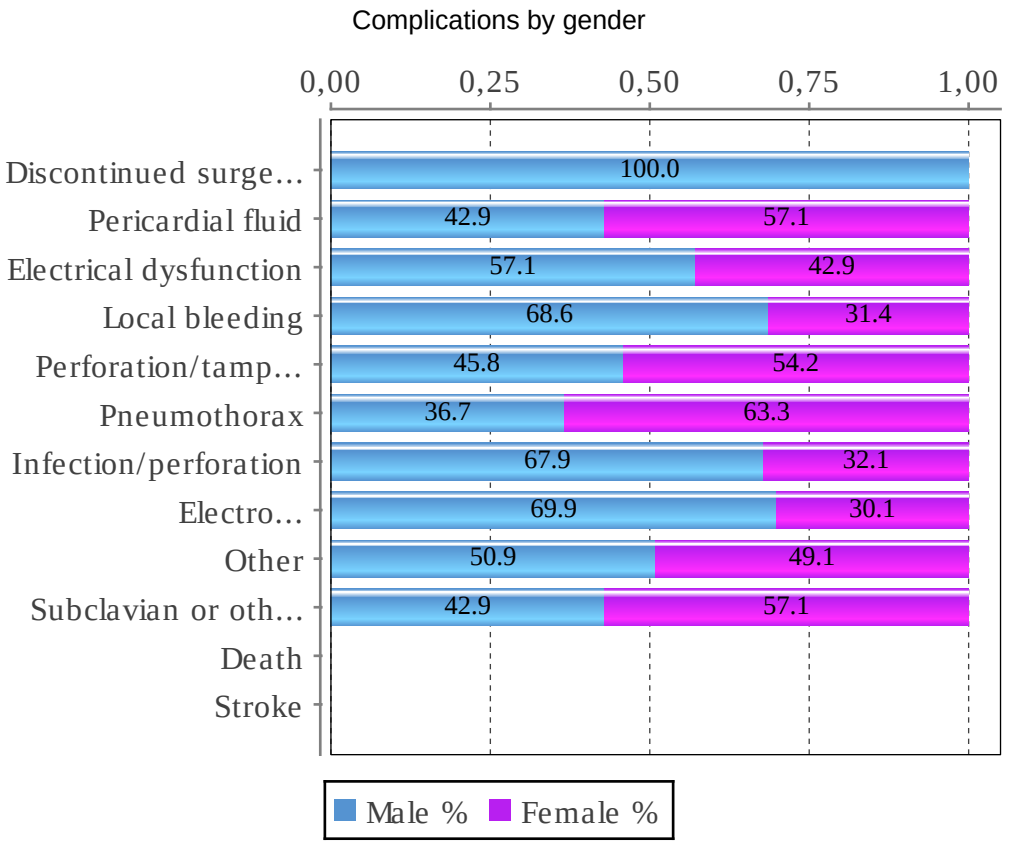
*Extraction tools**

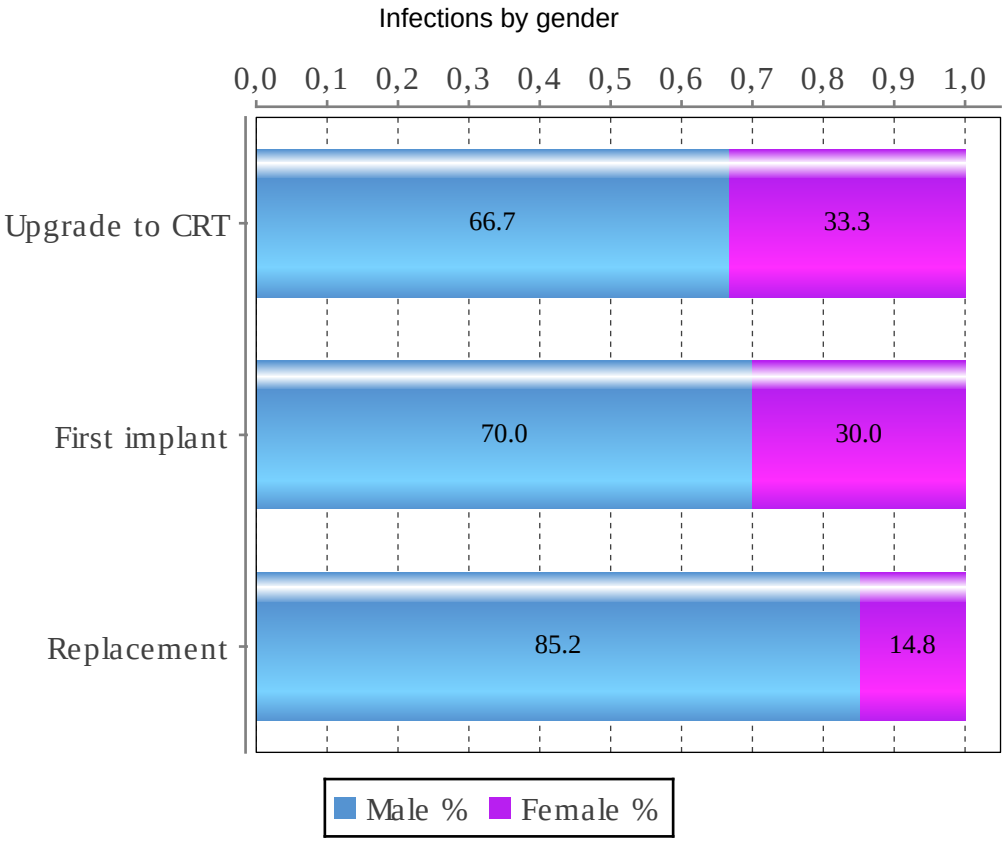
Hospital	SS	LS	PS	AM	L	S	PK	EK	AL
Akademiska sjukhuset	13	29	5	28	0	0	0	0	3
Falu lasarett	0	0	0	0	0	0	0	0	0
Karolinska Solna	24	20	23	82	1	1	0	0	0
Linköpings universitetssjukhus	10	0	0	0	0	0	0	0	1
Skånes universitetssjukhus, Lund	29	7	6	79	0	4	0	0	0
Universitetssjukhuset Örebro	4	0	0	0	0	0	0	0	0

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

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

Complication	2019 %	2020 %	Based on
Discontinued surgery due to hemodynamic reasons	0.0	0.0	A
Pericardial fluid	0.1	0.1	A
Electrical dysfunction	0.5	0.4	B
Local bleeding	0.4	0.3	A
Perforation/tamponade	0.4	0.3	B
Pneumothorax	0.4	0.4	B
Infection/perforation	0.4	0.5	A
Electrode displacement	1.2	1.3	B
Other	0.3	0.5	A
Subclavian or other related thrombosis	0.0	0.1	B
Death	0.0	0.0	A
Stroke	0.0	0.0	A
Discontinued surgery due to lack of venous access	0.0	0.0	A
Discontinued surgery due to LV-lead impl. failure	0.1	0.1	A
Total	3.8	4.0	
Based on A=10578 (all implants) alternatively B=7841 (first implants + lead replacement) validated events			

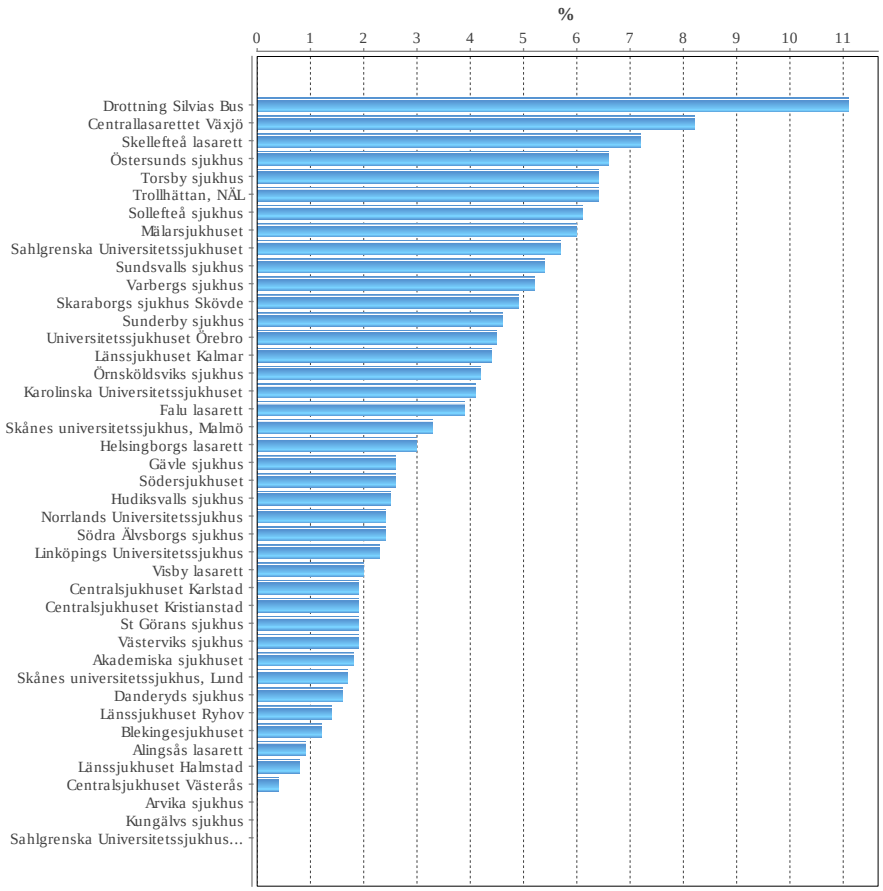




Infections related to all interventions by gender

Reason	Male %	Female %
First implant	*0.8*	*0.5*
Replacement	*1.2*	*0.3*
Upgrade to CRT	*1.3*	*1.7*

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	490	-	-	0.2	0.8	0.2	-
Alingsås lasarett	108	-	-	-	-	-	-
Arvika sjukhus	1	-	-	-	-	-	-
Blekingesjukhuset	249	-	-	0.4	-	-	-
Centrallasarettet Växjö	159	-	-	-	4.4	0.6	-
Centralsjukhuset Karlstad	267	-	-	0.7	0.4	-	-
Centralsjukhuset Kristianstad	368	-	-	-	0.5	0.5	-
Centralsjukhuset Västerås	227	-	-	-	-	-	-
Danderyds sjukhus	617	-	-	0.3	0.5	0.2	0.2
Drottning Silvias Bus	27	-	-	3.7	3.7	-	-
Falu lasarett	332	-	-	0.6	0.6	0.3	-
Gävle sjukhus	307	-	-	0.3	0.3	0.3	-
Helsingborgs lasarett	298	-	-	-	0.7	-	0.3
Hudiksvalls sjukhus	81	-	-	-	-	1.2	-
Karolinska Universitetssjukhuset	701	-	0.1	0.7	0.9	0.7	0.1
Kungälvs sjukhus	158	-	-	-	-	-	-
Linköpings Universitetssjukhus	531	-	-	0.2	1.1	0.2	-
Länssjukhuset Halmstad	130	-	-	-	-	-	-
Länssjukhuset Kalmar	158	-	-	-	1.3	-	-
Länssjukhuset Ryhov	291	-	-	-	0.3	0.7	-
Mälarsjukhuset	252	-	-	-	2.4	1.2	-
Norrlands Universitetssjukhus	249	-	-	0.4	1.2	0.4	-
Sahlgrenska Universitetssjukhuset	630	-	-	0.6	2.2	0.6	-
Sahlgrenska Universitetssjukhuset /Östra	23	-	-	-	-	-	-
Skaraborgs sjukhus Skövde	286	-	-	0.7	0.7	0.7	-
Skellefteå lasarett	83	-	-	1.2	2.4	1.2	-
Skånes universitetssjukhus, Lund	572	-	-	0.2	0.5	0.3	-
Skånes universitetssjukhus, Malmö	239	-	-	0.4	1.7	0.4	-
Sollefteå sjukhus	33	-	-	-	6.1	-	-
St Görans sjukhus	374	-	-	-	0.8	0.8	0.3
Sunderby sjukhus	304	-	-	-	1.0	0.7	-
Sundsvalls sjukhus	276	-	-	0.4	1.4	0.4	0.4
Södersjukhuset	386	-	-	0.5	1.0	0.3	-
Södra Älvsborgs sjukhus	253	-	-	0.8	0.4	0.4	-
Torsby sjukhus	47	-	-	-	-	-	-
Trollhättan, NÄL	373	-	-	-	1.9	2.7	0.5
Universitetssjukhuset Örebro	286	-	-	-	1.0	1.7	-
Varbergs sjukhus	212	-	-	0.9	1.4	-	-
Visby lasarett	49	-	-	2.0	-	-	-
Västerviks sjukhus	52	-	-	-	-	-	-
Örnsköldsviks sjukhus	95	-	-	-	1.1	-	-
Östersunds sjukhus	182	-	-	0.5	1.6	1.6	-

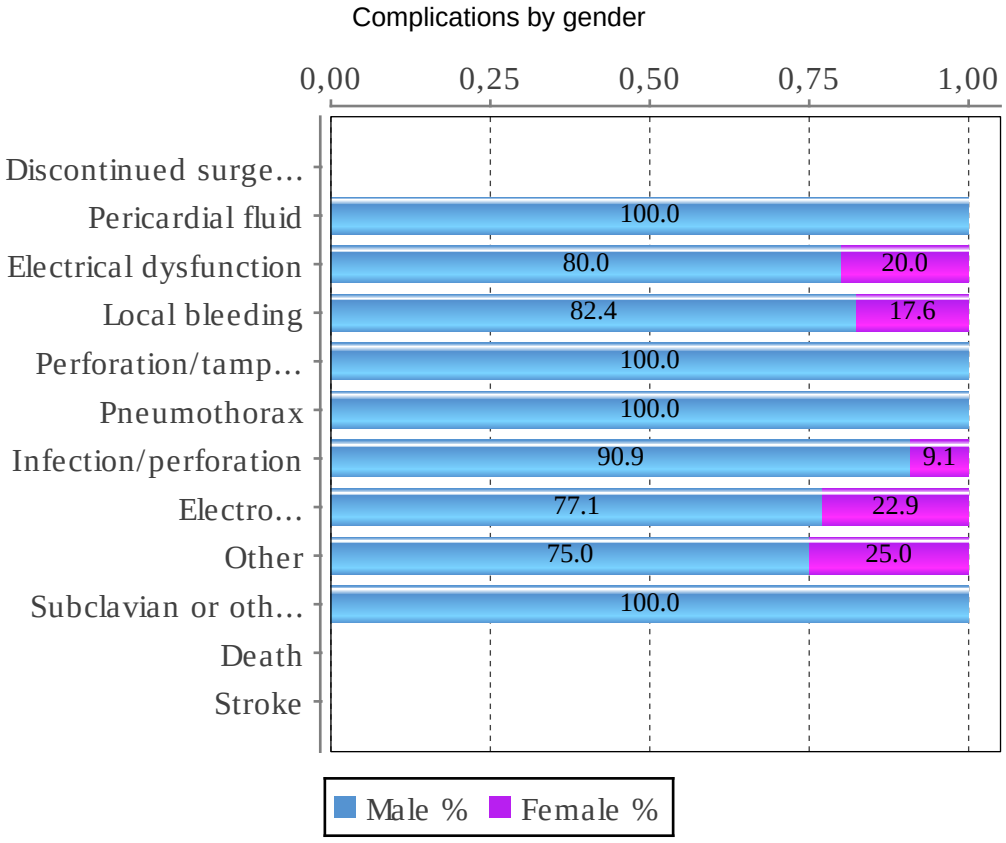
QUALITY – PACEMAKER – COMPLICATIONS PER HOSPITAL

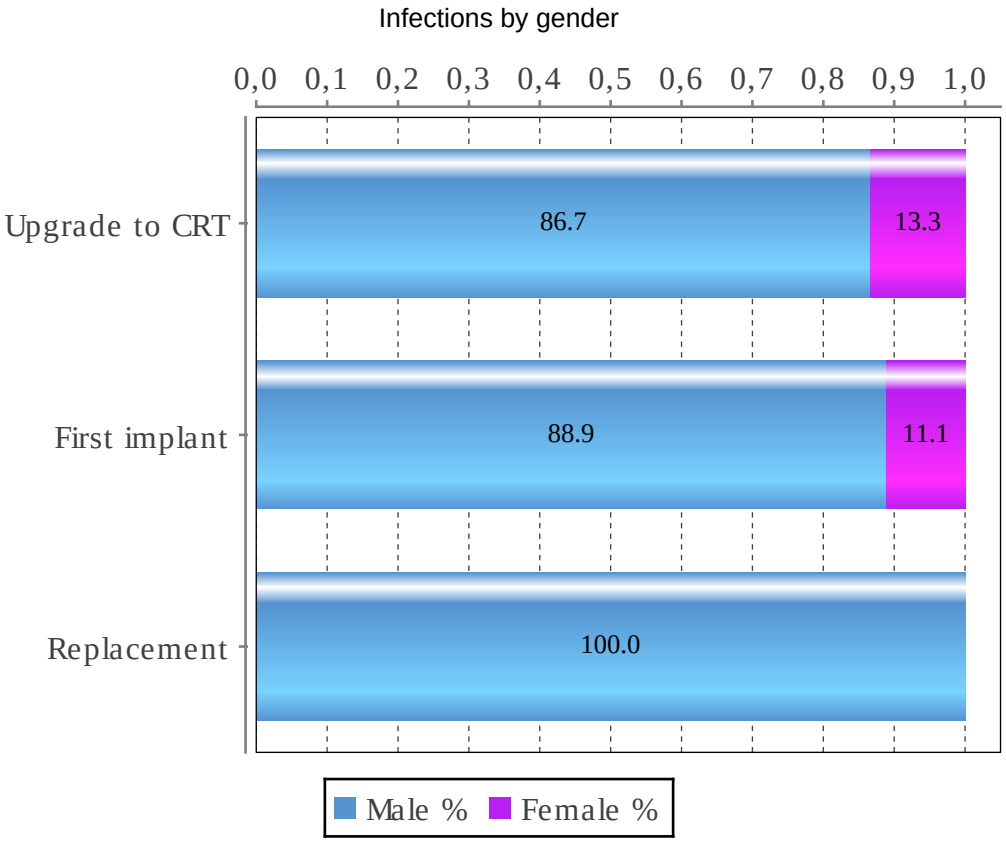
Bl.: Bleeding, **Ot.**: Other, **Tm.**: Perforation/Tamponade, **Pn.**: Pneumothorax, **Pf.**: Pericardial fluid, **St.**: Stroke

Hospital	No	Bl. %	Ot. %	Tm. %	Pn. %	Pf. %	St. %	All %
Akademiska sjukhuset	490	-	0.4	0.2	-	-	-	1.8
Alingsås lasarett	108	-	-	0.9	-	-	-	0.9
Arvika sjukhus	1	-	-	-	-	-	-	-
Blekingesjukhuset	249	0.8	-	-	-	-	-	1.2
Centrallasarettet Växjö	159	0.6	1.9	0.6	-	-	-	8.2
Centralsjukhuset Karlstad	267	-	0.4	0.4	-	-	-	1.9
Centralsjukhuset Kristianstad	368	-	0.5	-	0.3	-	-	1.9
Centralsjukhuset Västerås	227	-	0.4	-	-	-	-	0.4
Danderyds sjukhus	617	-	0.5	-	-	-	-	1.6
Drottning Silvias Bus	27	-	3.7	-	-	-	-	11.1
Falu lasarett	332	-	2.1	0.3	-	-	-	3.9
Gävle sjukhus	307	0.7	0.7	-	-	0.3	-	2.6
Helsingborgs lasarett	298	1.3	-	0.3	0.3	-	-	3.0
Hudiksvalls sjukhus	81	-	1.2	-	-	-	-	2.5
Karolinska Universitetssjukhuset	701	1.0	-	0.3	0.3	-	-	4.1
Kungälvs sjukhus	158	-	-	-	-	-	-	-
Linköpings Universitetssjukhus	531	0.2	0.2	-	0.2	0.2	-	2.3
Länssjukhuset Halmstad	130	-	0.8	-	-	-	-	0.8
Länssjukhuset Kalmar	158	0.6	0.6	-	1.9	-	-	4.4
Länssjukhuset Ryhov	291	-	-	0.3	-	-	-	1.4
Mälarsjukhuset	252	0.8	0.4	0.4	0.8	-	-	6.0
Norrlands Universitetssjukhus	249	-	-	0.4	-	-	-	2.4
Sahlgrenska Universitetssjukhuset	630	0.5	1.4	0.3	-	-	-	5.7
Sahlgrenska Universitetssjukhuset /Östra	23	-	-	-	-	-	-	-
Skaraborgs sjukhus Skövde	286	1.4	0.3	1.0	-	-	-	4.9
Skellefteå lasarett	83	2.4	-	-	-	-	-	7.2
Skånes universitetssjukhus, Lund	572	-	0.2	0.2	0.2	0.2	-	1.7
Skånes universitetssjukhus, Malmö	239	-	0.4	-	0.4	-	-	3.3
Sollefteå sjukhus	33	-	-	-	-	-	-	6.1
St Görans sjukhus	374	-	-	-	-	-	-	1.9
Sunderby sjukhus	304	-	1.0	1.0	1.0	-	-	4.6
Sundsvalls sjukhus	276	0.7	-	0.4	1.4	0.4	-	5.4
Södersjukhuset	386	0.3	0.3	0.3	-	-	-	2.6
Södra Älvsborgs sjukhus	253	0.4	-	-	0.4	-	-	2.4
Torsby sjukhus	47	-	2.1	-	2.1	2.1	-	6.4
Trollhättan, NÄL	373	-	0.5	-	0.8	-	-	6.4
Universitetssjukhuset Örebro	286	0.3	0.3	0.3	0.3	0.3	-	4.5
Varbergs sjukhus	212	0.5	1.4	-	0.9	-	-	5.2
Visby lasarett	49	-	-	-	-	-	-	2.0
Västerviks sjukhus	52	-	-	1.9	-	-	-	1.9
Örnsköldsviks sjukhus	95	-	-	1.1	1.1	1.1	-	4.2
Östersunds sjukhus	182	-	1.6	-	1.1	-	-	6.6

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

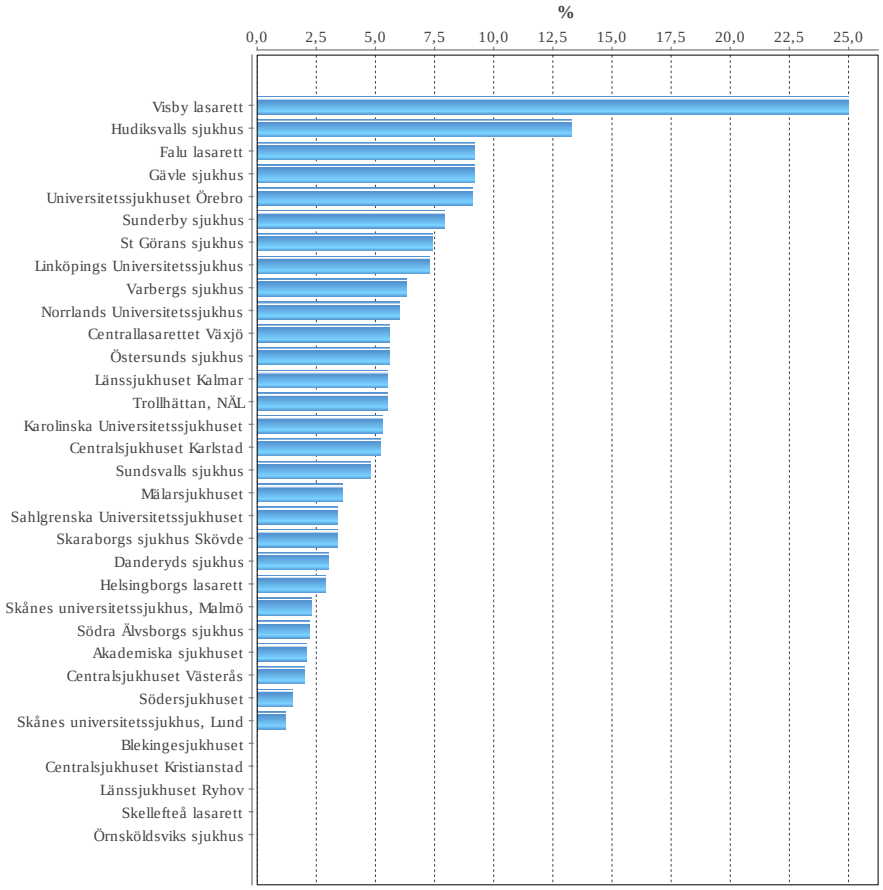
Complication	2019 %	2020 %
Discontinued surgery due to hemodynamic reasons	0.1	0.0
Electrical dysfunction	0.8	0.9
Local bleeding	0.5	0.7
Perforation/tamponade	0.6	0.1
Pneumothorax	0.7	0.1
Infection/perforation	1.3	0.9
Electrode displacement	1.9	2.2
Other	0.5	0.5
Subclavian or other related thrombosis	0.1	0.0
Death	0.0	0.0
Pericardial fluid	0.0	0.0
Stroke	0.0	0.0
Discontinued surgery due to lack of venous access	0.0	0.1
Discontinued surgery due to LV-lead impl. failure	0.3	0.6
Total	6.8	6.1
Based on 2367 (all implants) alternatively 1601 (first implants + lead replacements) validated events		





Infections related to all interventions by gender

Reason	Male %	Female %
First implant	*1.4*	*0.7*
Replacement	*1.8*	*0.0*
Upgrade to CRT	*2.1*	*1.6*


%
0,0
2,5
5,0
7,5
10,0
12,5
15,0
17,5
20,0
22,5
25,0
Visby lasarett
Hudiksvalls sjukhus
Falu lasarett
Gävle sjukhus
Universitetssjukhuset Örebro
Sunderby sjukhus
St Görans sjukhus
Linköpings Universitetssjukhus
Varbergs sjukhus
Norrlands Universitetssjukhus
Centrallasarettet Växjö
Östersunds sjukhus
Länssjukhuset Kalmar
Trollhättan, NÄL
Karolinska Universitetssjukhuset
Centralsjukhuset Karlstad
Sundsvalls sjukhus
Mälarsjukhuset
Sahlgrenska Universitetssjukhuset
Skaraborgs sjukhus Skövde
Danderyds sjukhus
Helsingborgs lasarett
Skånes universitetssjukhus, Malmö
Södra Älvsborgs sjukhus
Akademiska sjukhuset
Centralsjukhuset Västerås
Södersjukhuset
Skånes universitetssjukhus, Lund
Blekingesjukhuset
Centralsjukhuset Kristianstad
Länssjukhuset Ryhov
Skellefteå 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	96	-	-	-	1.0	-	-	-
Blekingesjukhuset	64	-	-	-	-	-	-	-
Centrallasarettet Växjö	36	-	-	-	2.8	-	-	2.8
Centralsjukhuset Karlstad	58	-	-	1.7	-	3.4	-	-
Centralsjukhuset Kristianstad	1	-	-	-	-	-	-	-
Centralsjukhuset Västerås	51	-	-	-	-	-	-	2.0
Danderyds sjukhus	101	-	-	1.0	1.0	-	-	-
Falu lasarett	98	-	-	2.0	5.1	-	-	1.0
Gävle sjukhus	98	-	-	-	6.1	1.0	1.0	1.0
Helsingborgs lasarett	34	-	-	-	2.9	-	-	-
Hudiksvalls sjukhus	15	-	-	-	-	-	-	-
Karolinska Universitetssjukhuset	265	-	-	0.4	1.1	2.6	-	1.1
Linköpings Universitetssjukhus	137	-	-	0.7	3.6	-	-	-
Länssjukhuset Kalmar	73	-	-	1.4	1.4	-	-	-
Länssjukhuset Ryhov	47	-	-	-	-	-	-	-
Mälarsjukhuset	55	-	-	-	-	1.8	-	-
Norrlands Universitetssjukhus	67	-	-	1.5	1.5	1.5	-	1.5
Sahlgrenska Universitetssjukhuset	118	-	-	0.8	-	-	-	2.5
Skaraborgs sjukhus Skövde	58	-	-	-	-	-	-	3.4
Skellefteå lasarett	9	-	-	-	-	-	-	-
Skånes universitetssjukhus, Lund	328	-	-	0.3	0.6	0.3	-	-
Skånes universitetssjukhus, Malmö	43	-	-	-	2.3	-	-	-
St Görans sjukhus	68	-	-	-	4.4	2.9	-	-
Sunderby sjukhus	89	-	-	-	4.5	2.2	-	1.1
Sundsvalls sjukhus	62	-	-	1.6	-	1.6	-	-
Södersjukhuset	66	-	-	-	-	-	-	-
Södra Älvsborgs sjukhus	46	-	-	-	2.2	-	-	-
Trollhättan, NÄL	55	-	-	1.8	1.8	-	-	-
Universitetssjukhuset Örebro	77	-	-	1.3	2.6	3.9	-	1.3
Varbergs sjukhus	80	-	-	2.5	1.3	-	-	2.5
Visby lasarett	4	-	-	25.0	-	-	-	-
Örnsköldsviks sjukhus	9	-	-	-	-	-	-	-
Östersunds sjukhus	36	-	-	-	2.8	2.8	-	-

QUALITY – ICD – COMPLICATIONS PER HOSPITAL

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

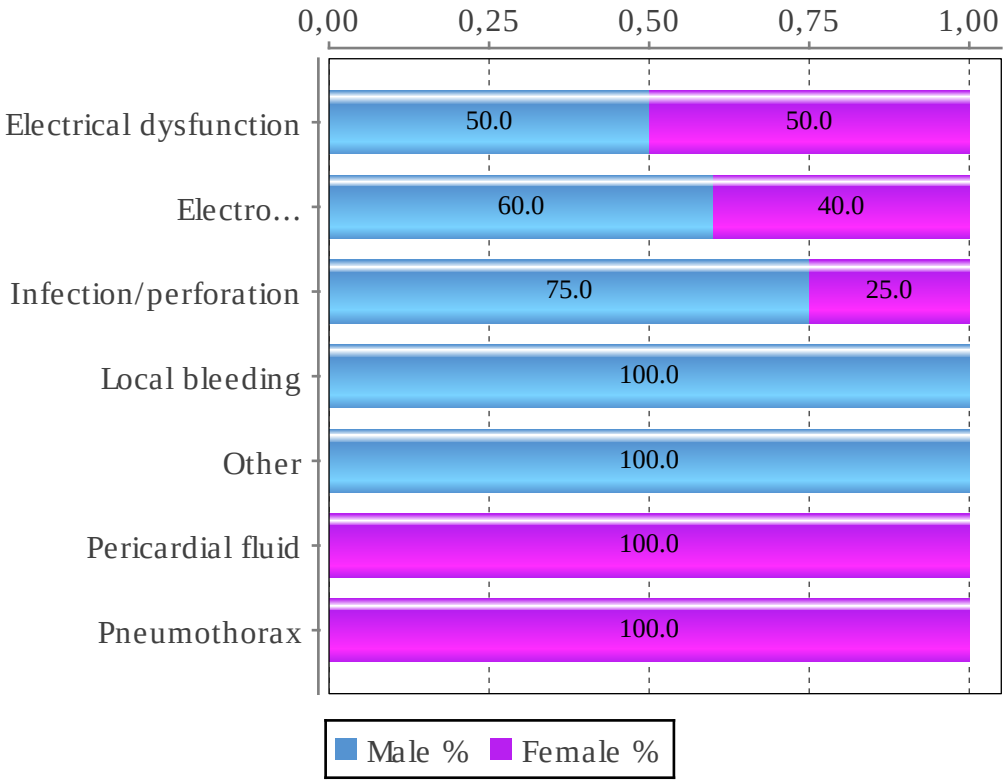
Hospital	No	Ot. %	Pa. %	Tm. %	Pn. %	Pf. %	St. %	All %
Akademiska sjukhuset	96	-	-	1.0	-	-	-	2.1
Blekingesjukhuset	64	-	-	-	-	-	-	-
Centrallasarettet Växjö	36	-	-	-	-	-	-	5.6
Centralsjukhuset Karlstad	58	-	-	-	-	-	-	5.2
Centralsjukhuset Kristianstad	1	-	-	-	-	-	-	-
Centralsjukhuset Västerås	51	-	-	-	-	-	-	2.0
Danderyds sjukhus	101	1.0	-	-	-	-	-	3.0
Falu lasarett	98	-	-	-	1.0	-	-	9.2
Gävle sjukhus	98	-	-	-	-	-	-	9.2
Helsingborgs lasarett	34	-	-	-	-	-	-	2.9
Hudiksvalls sjukhus	15	13.3	-	-	-	-	-	13.3
Karolinska Universitetssjukhuset	265	-	-	-	-	-	-	5.3
Linköpings Universitetssjukhus	137	2.2	-	-	0.7	-	-	7.3
Länssjukhuset Kalmar	73	2.7	-	-	-	-	-	5.5
Länssjukhuset Ryhov	47	-	-	-	-	-	-	-
Mälarsjukhuset	55	1.8	-	-	-	-	-	3.6
Norrlands Universitetssjukhus	67	-	-	-	-	-	-	6.0
Sahlgrenska Universitetssjukhuset	118	-	-	-	-	-	-	3.4
Skaraborgs sjukhus Skövde	58	-	-	-	-	-	-	3.4
Skellefteå lasarett	9	-	-	-	-	-	-	-
Skånes universitetssjukhus, Lund	328	-	-	-	-	-	-	1.2
Skånes universitetssjukhus, Malmö	43	-	-	-	-	-	-	2.3
St Görans sjukhus	68	-	-	-	-	-	-	7.4
Sunderby sjukhus	89	-	-	-	-	-	-	7.9
Sundsvalls sjukhus	62	1.6	-	-	-	-	-	4.8
Södersjukhuset	66	1.5	-	-	-	-	-	1.5
Södra Älvsborgs sjukhus	46	-	-	-	-	-	-	2.2
Trollhättan, NÄL	55	1.8	-	-	-	-	-	5.5
Universitetssjukhuset Örebro	77	-	-	-	-	-	-	9.1
Varbergs sjukhus	80	-	-	-	-	-	-	6.3
Visby lasarett	4	-	-	-	-	-	-	25.0
Örnsköldsviks sjukhus	9	-	-	-	-	-	-	-
Östersunds sjukhus	36	-	-	-	-	-	-	5.6

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

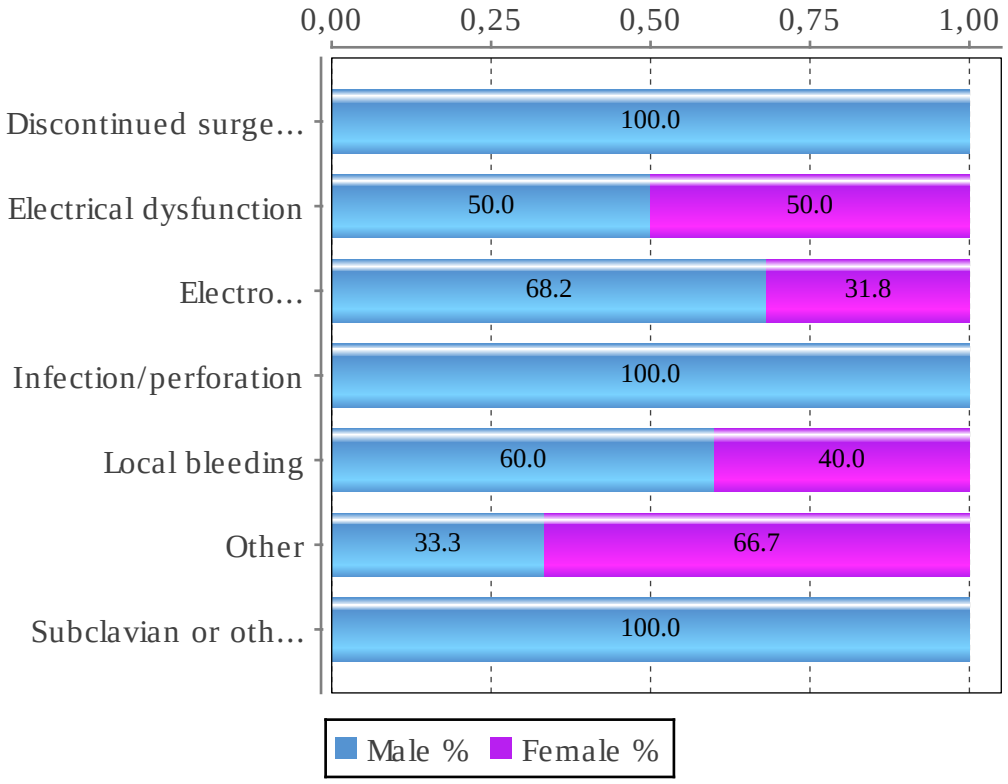
CRT-P Complication	%
Death	-
Discontinued surgery due to LV-lead impl. failure	-
Discontinued surgery due to hemodynamic reasons	-
Discontinued surgery due to lack of venous access	-
Electrical dysfunction	0.3
Electrode displacement	1.7
Infection/perforation	0.7
Local bleeding	0.7
Other	0.9
Perforation/tamponade	-
Pericardial fluid	0.2
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	0.3
Stroke	-
Subclavian or other related thrombosis	-
Total	4.9
Total no of implants	577

CRT-D Complication	%
Death	-
Discontinued surgery due to LV-lead impl. failure	-
Discontinued surgery due to hemodynamic reasons	-
Discontinued surgery due to lack of venous access	0.2
Electrical dysfunction	1.0
Electrode displacement	3.6
Infection/perforation	0.3
Local bleeding	0.8
Other	0.5
Perforation/tamponade	-
Pericardial fluid	-
Peroperative arrhythmia requiring acute medication	-
Pneumothorax	-
Stroke	-
Subclavian or other related thrombosis	0.2
Total	6.5
Total no of implants	612

CRT-P complications by gender

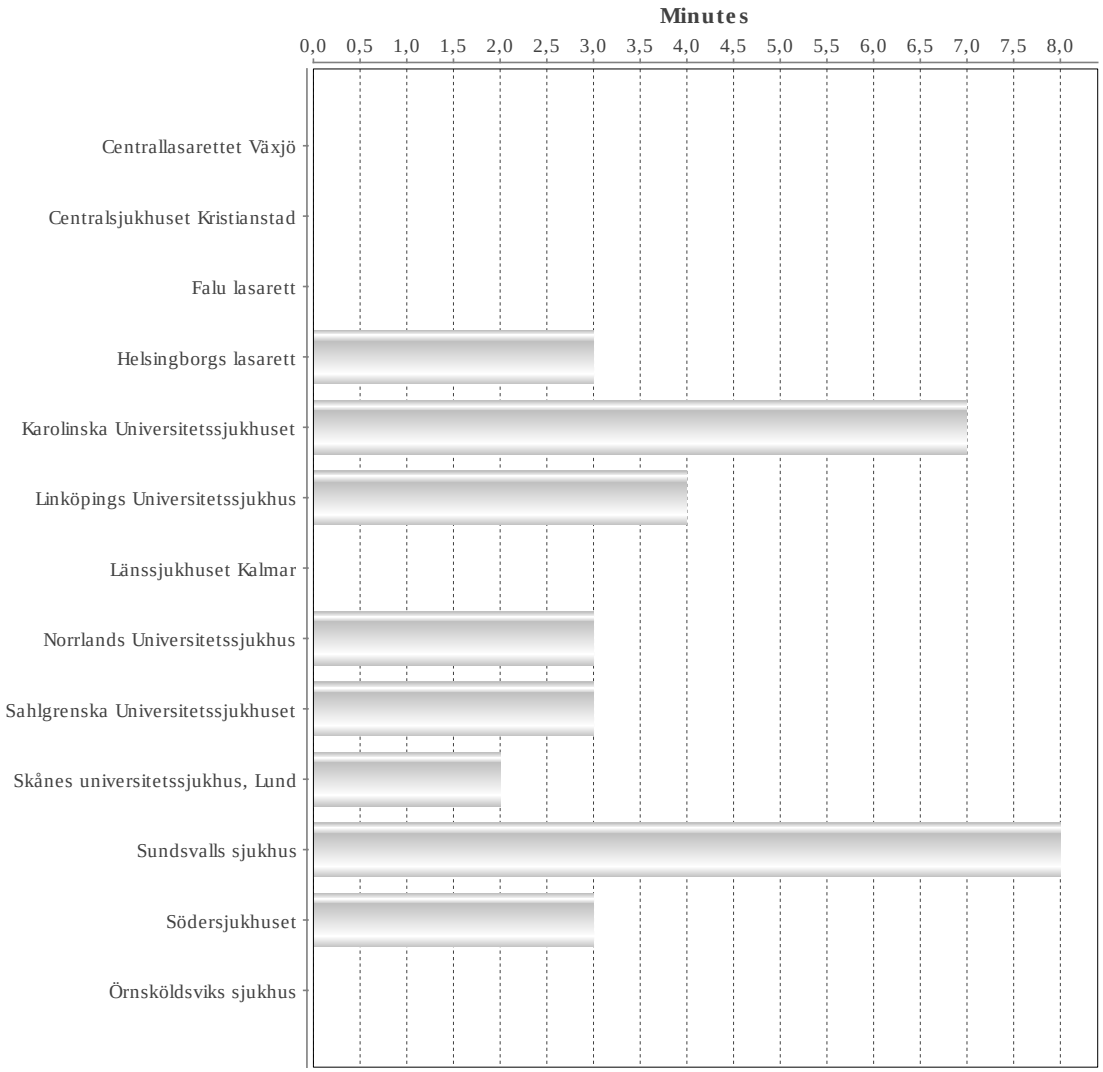


CRT-D complications by gender



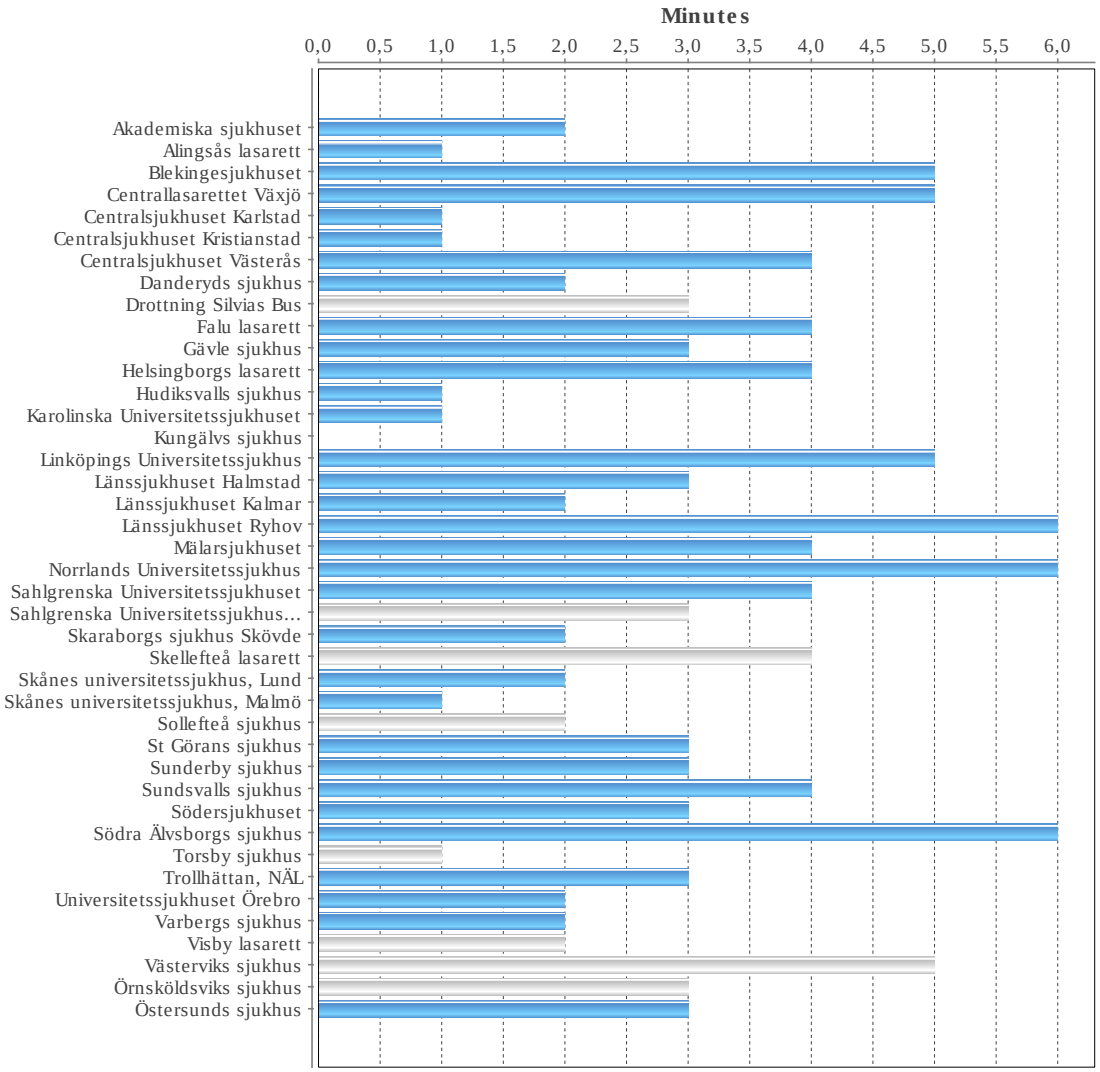
Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

AAI

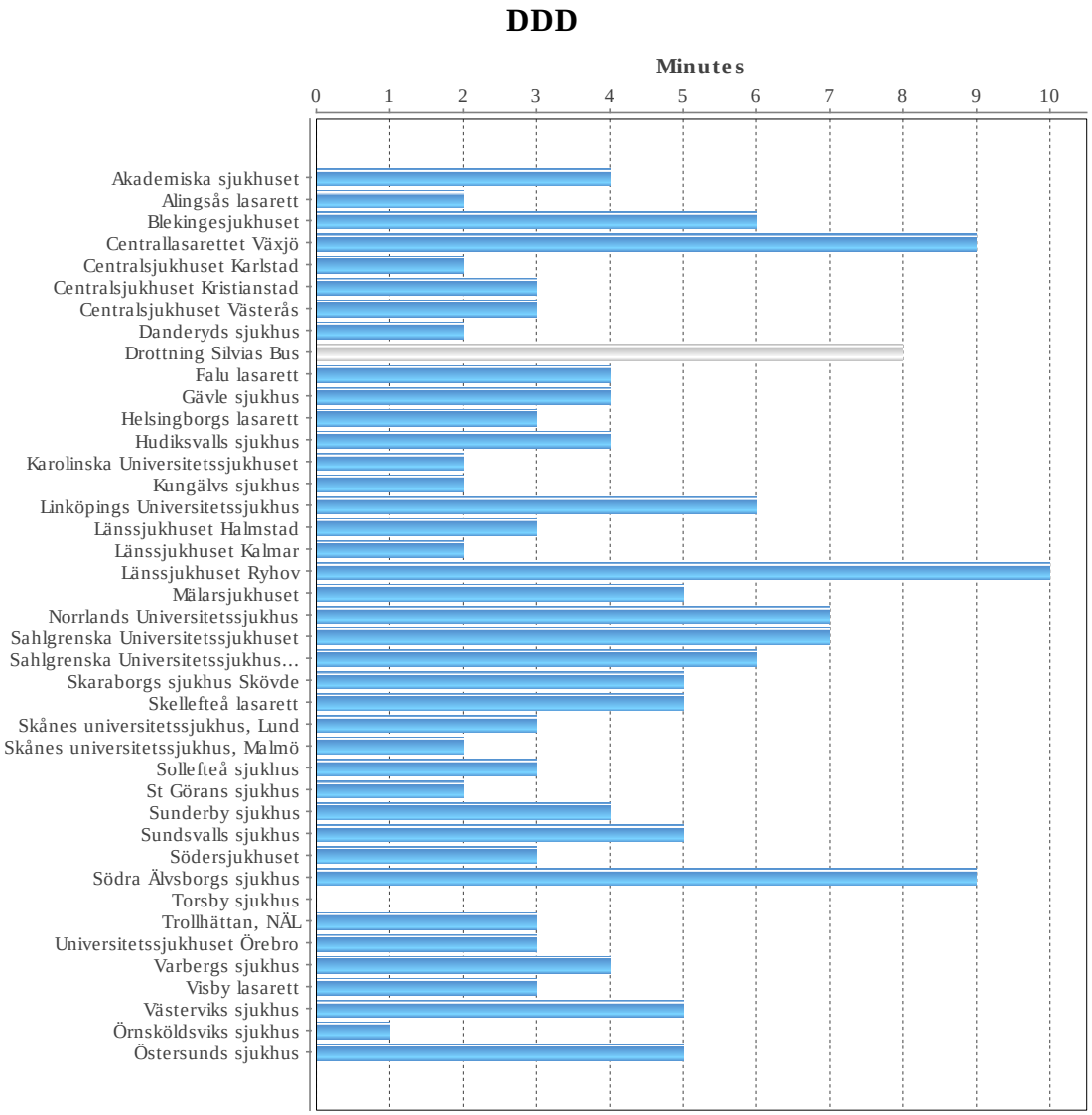


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI

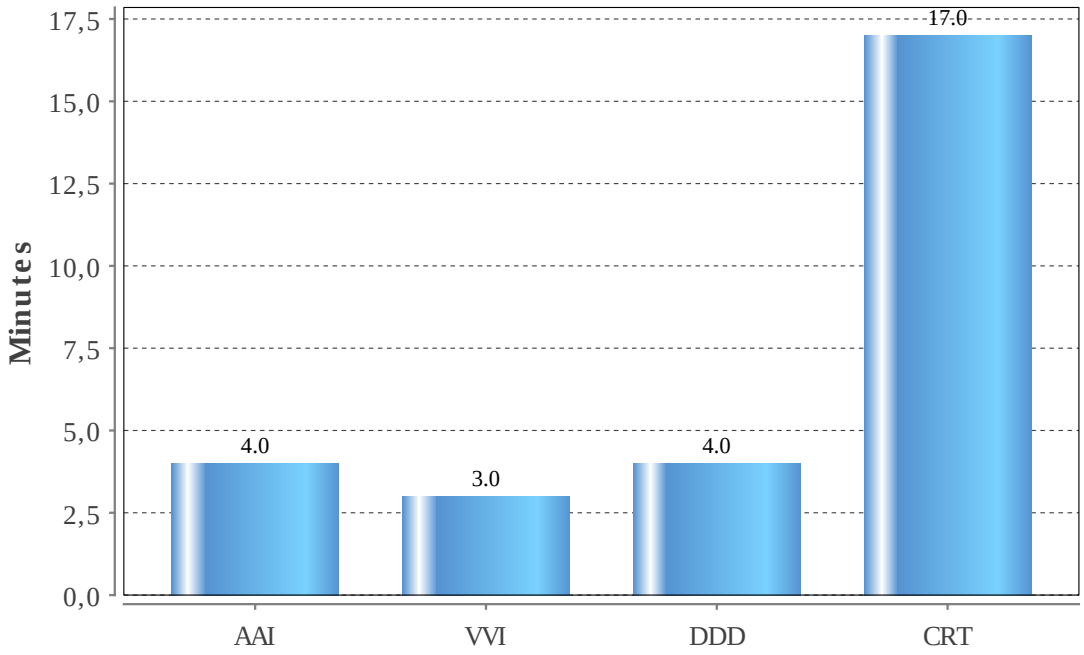


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.



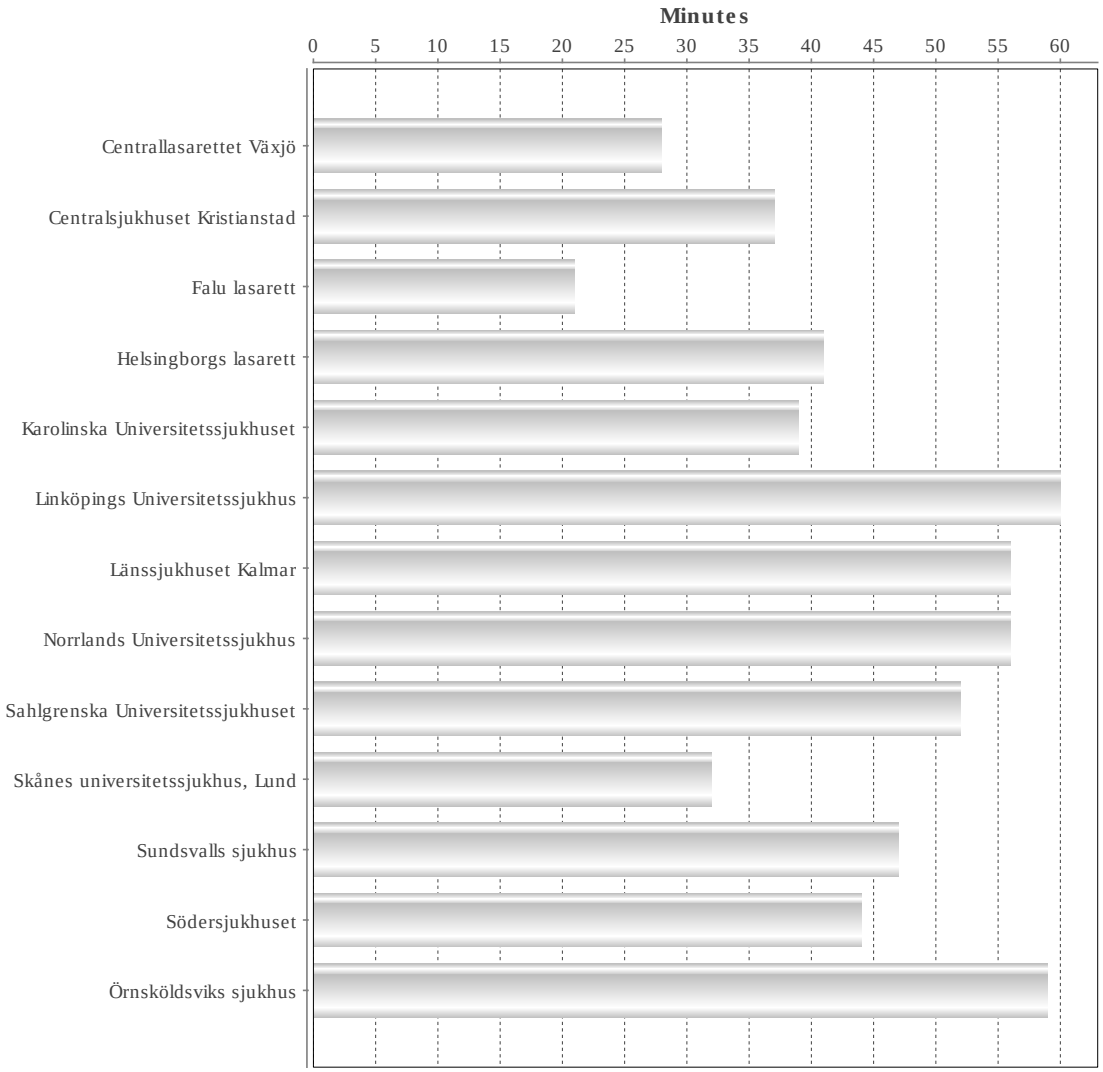
National mean fluoroscopy duration for a new implant of different subtypes

Fluoroscopy time	Average	Standard deviation
AAI	4.0	5.6
VVI	3.0	5.1
DDD	4.0	4.9
CRT	17.0	13.8



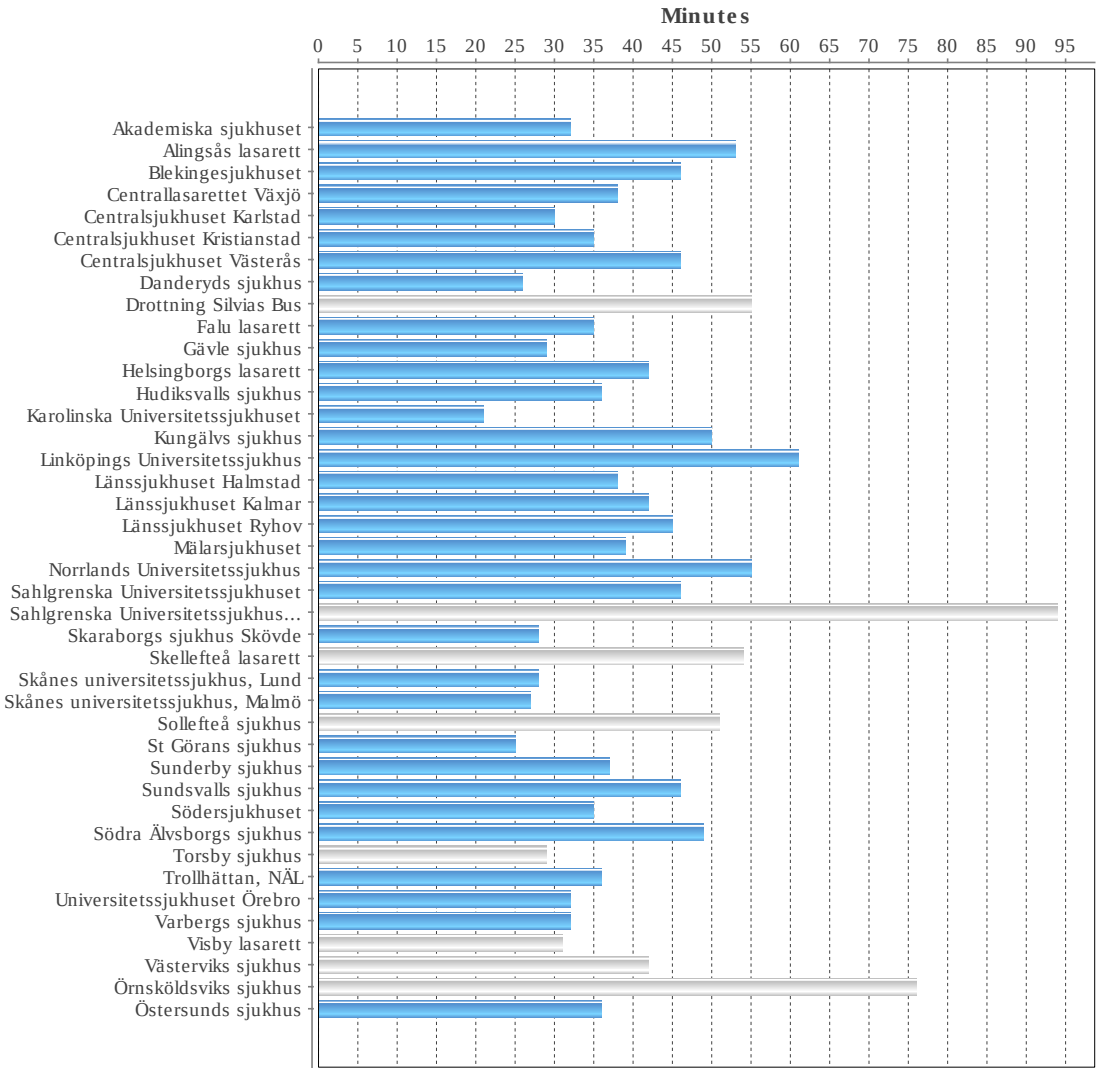
Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

AAI

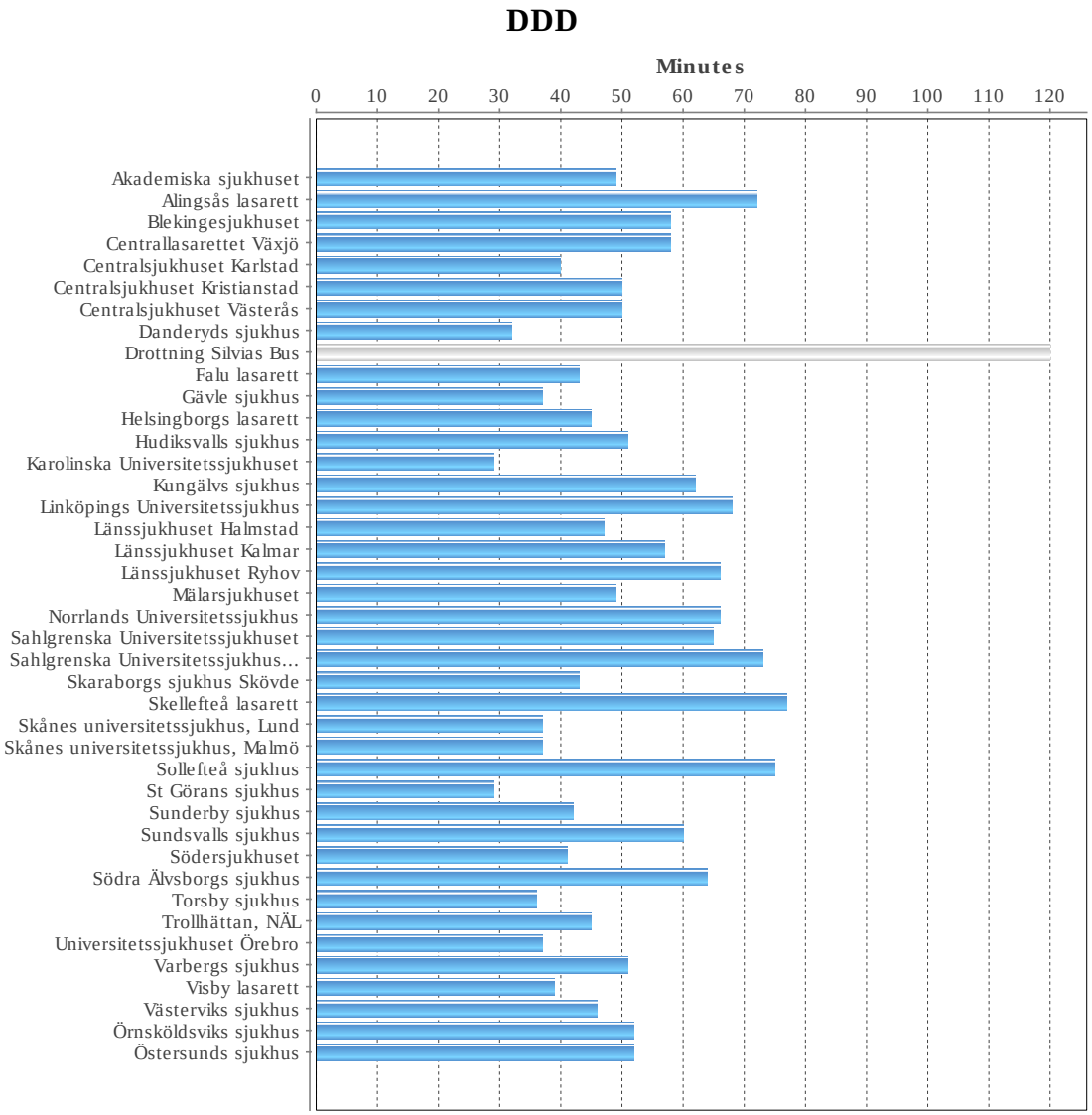


Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI

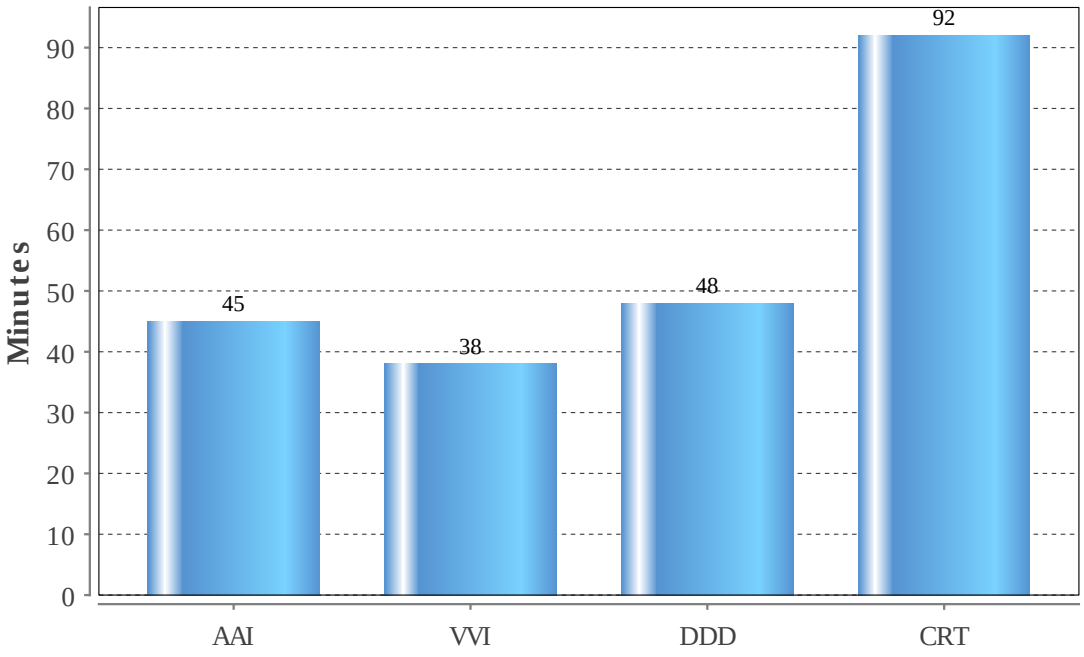


Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.



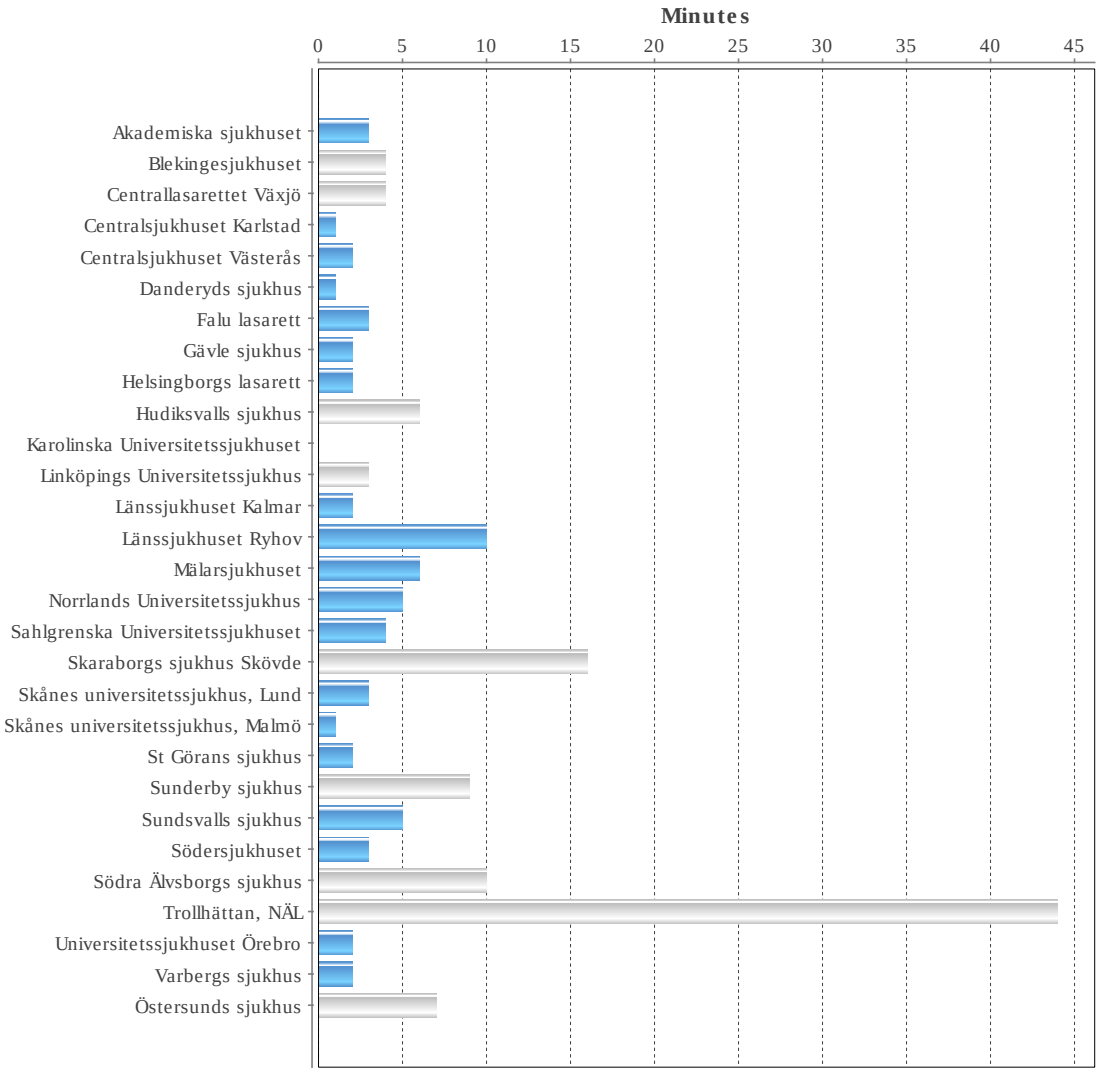
National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
AAI	45	15.1
VVI	38	21.0
DDD	48	22.4
CRT	92	43.5

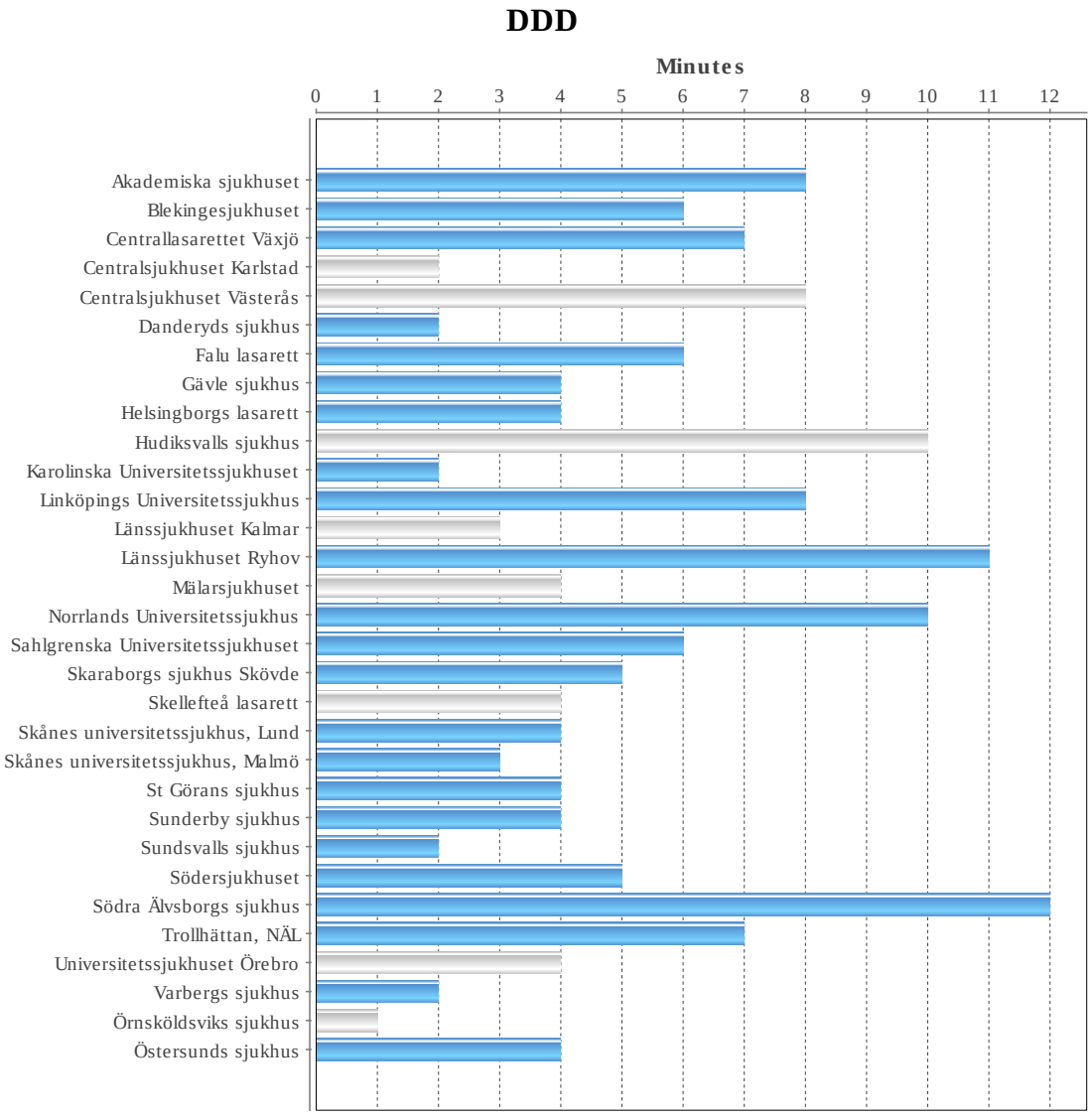


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI

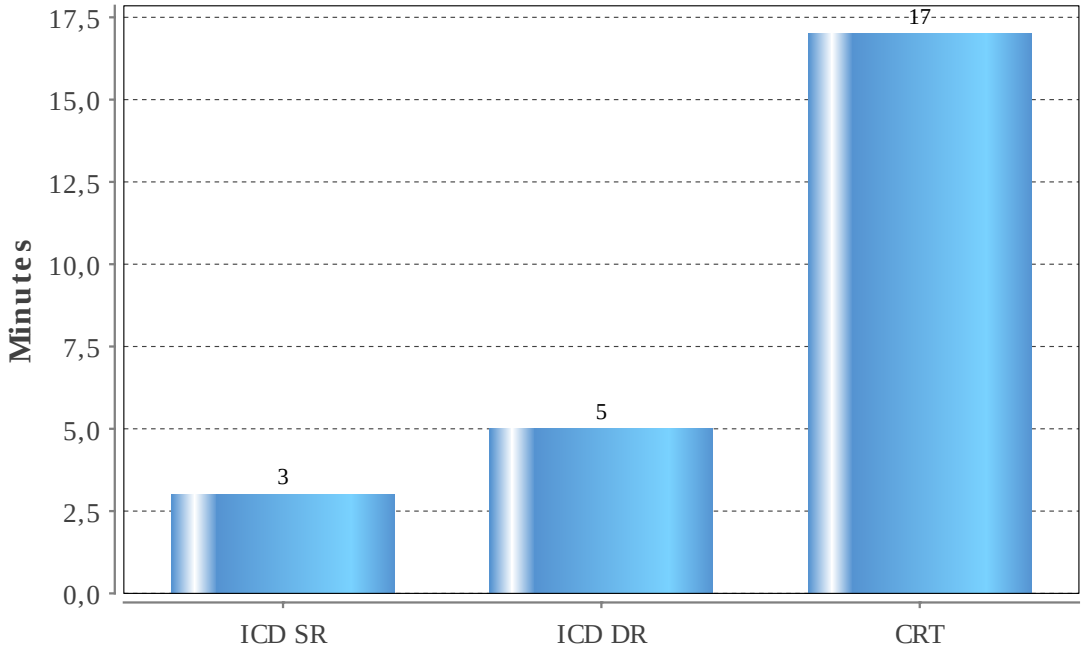


Mean fluoroscopy duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.



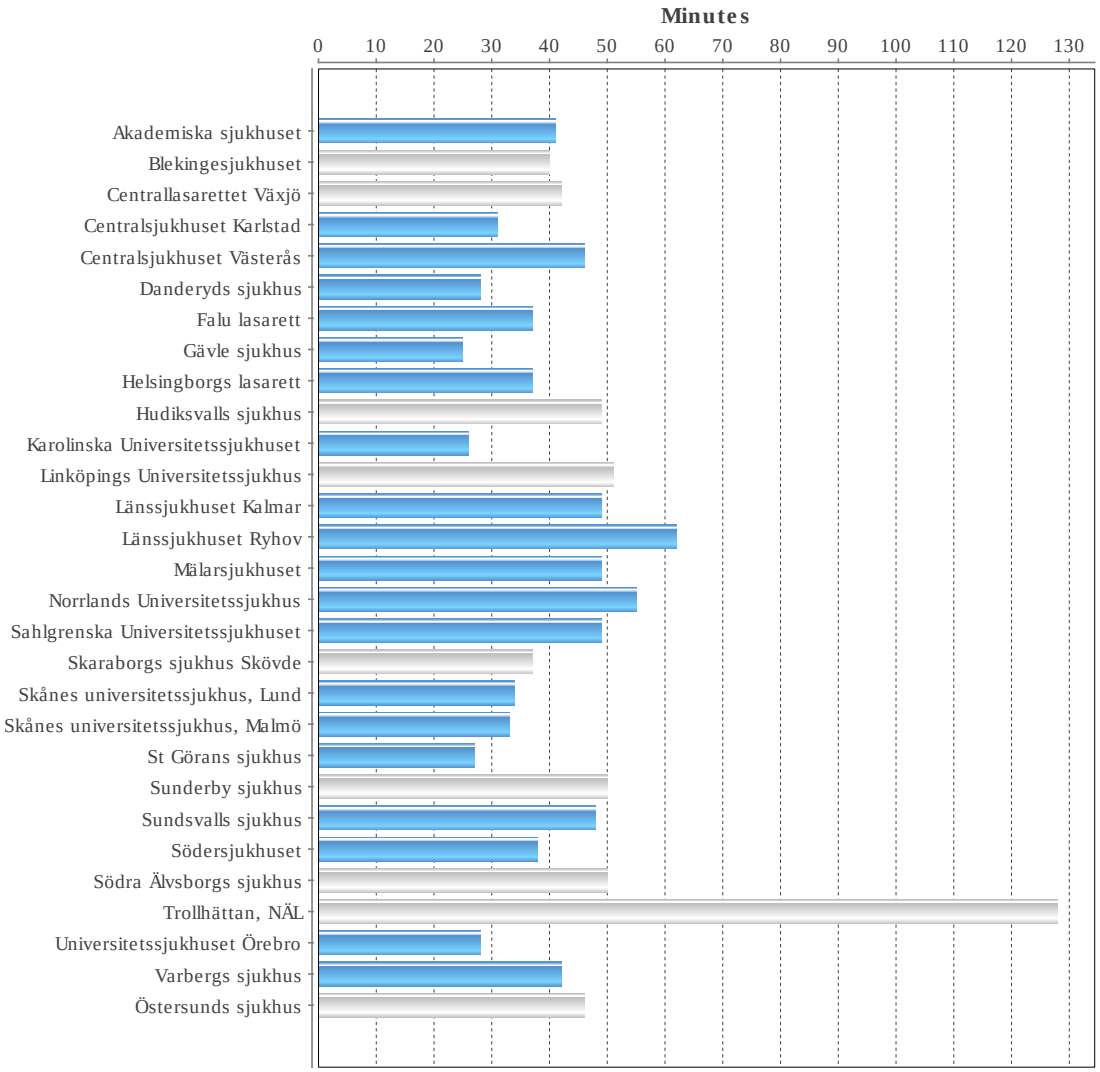
National mean fluoroscopy duration for a new implant of different subtypes

Fluoroscopy time	Average	Standard deviation
ICD SR	3	6.8
ICD DR	5	6.2
CRT	17	14.5

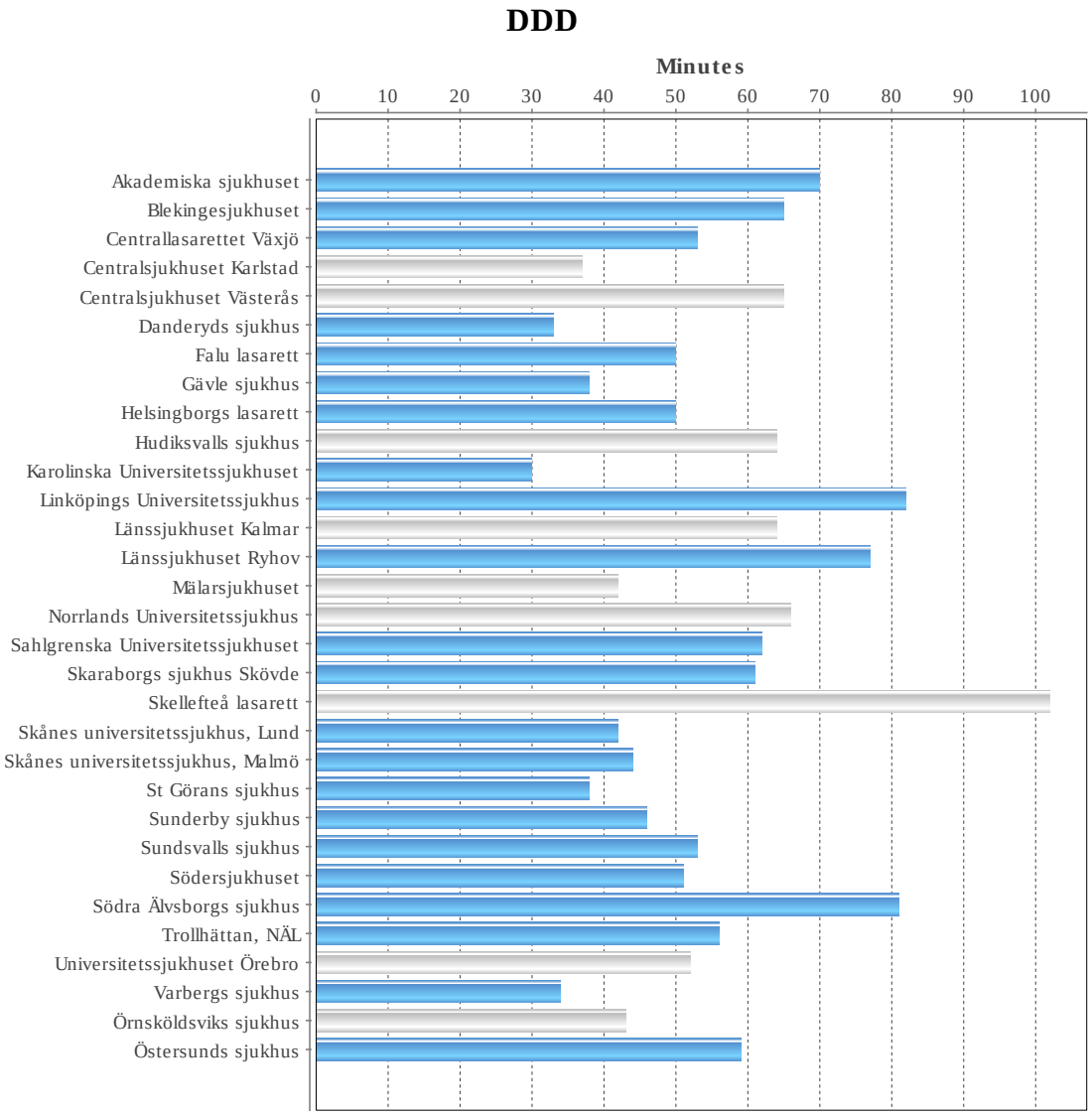


Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

VVI

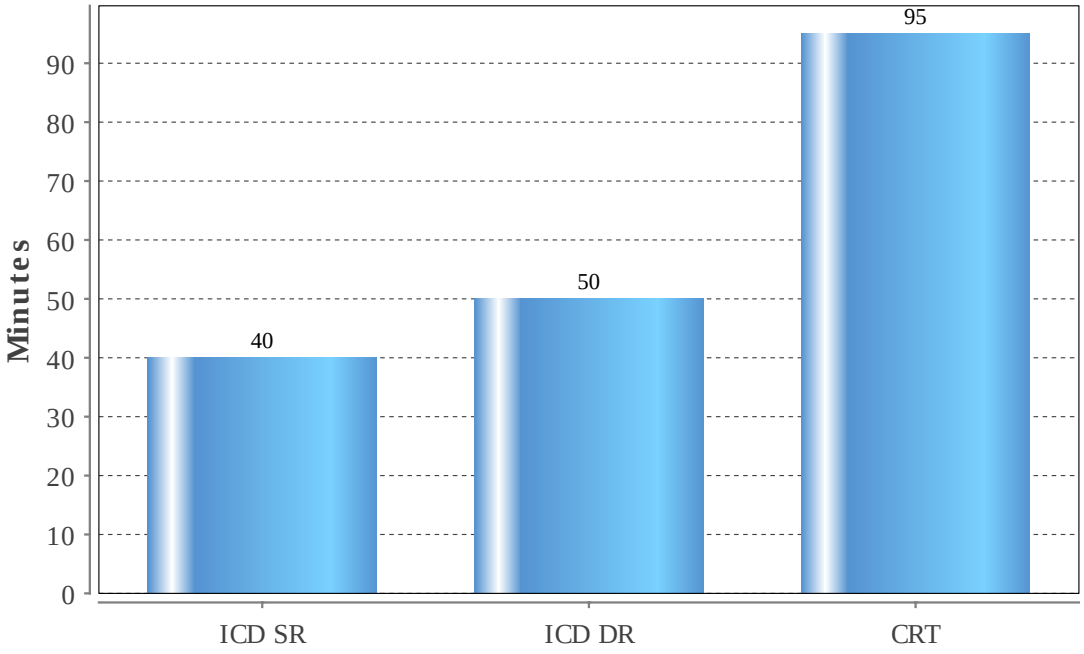


Mean duration for a new implant of different subtypes per hospital. Hospitals with less than 10 implants of a specific subtype are marked in grey, blue indicates 10 or more implants of this subtype, performed yearly at this hospital.

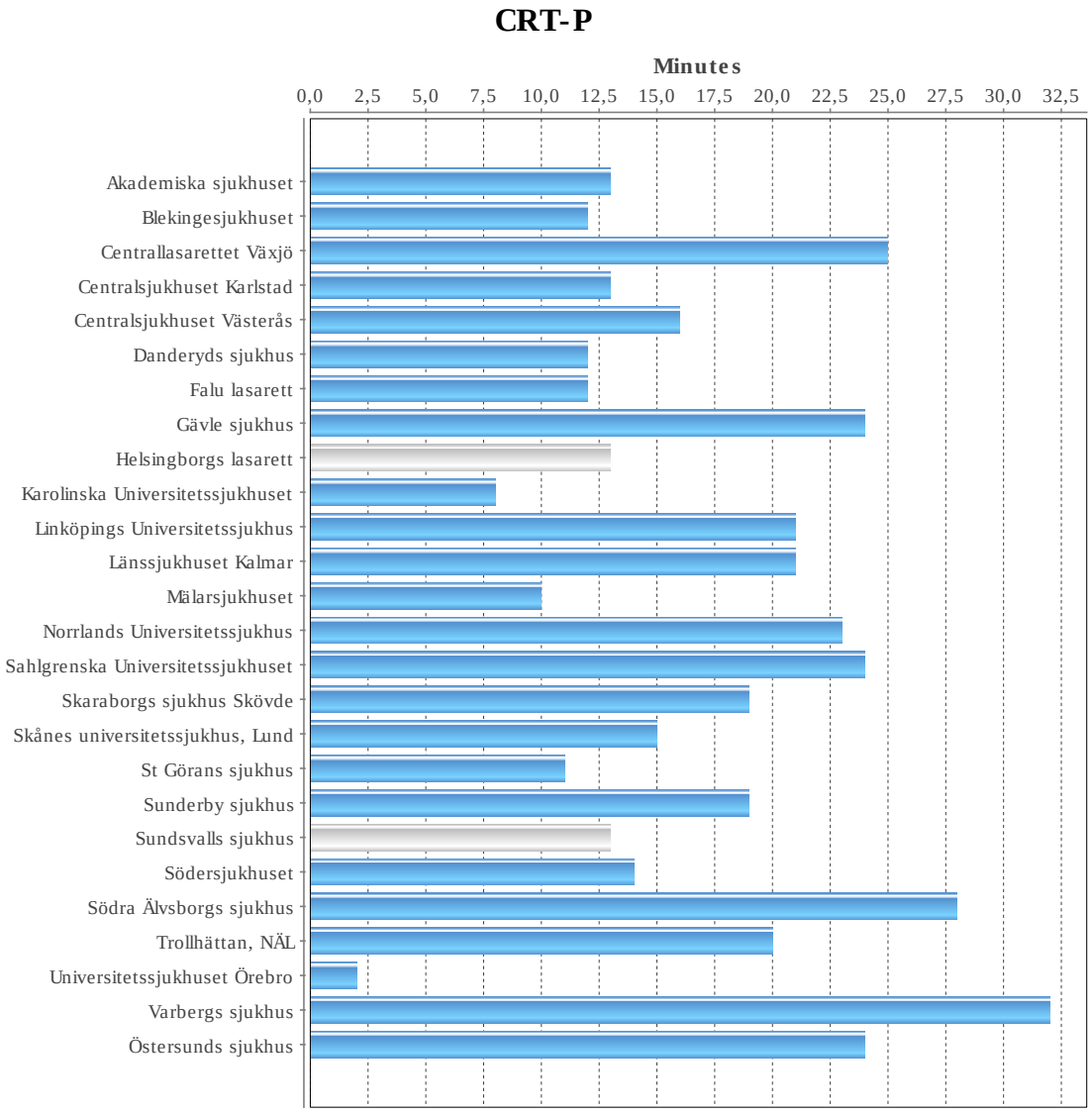


National mean skin to skin duration for a new implant of different subtypes

Knife time	Average	Standard deviation
ICD SR	40	20.7
ICD DR	50	26.4
CRT	95	42.6

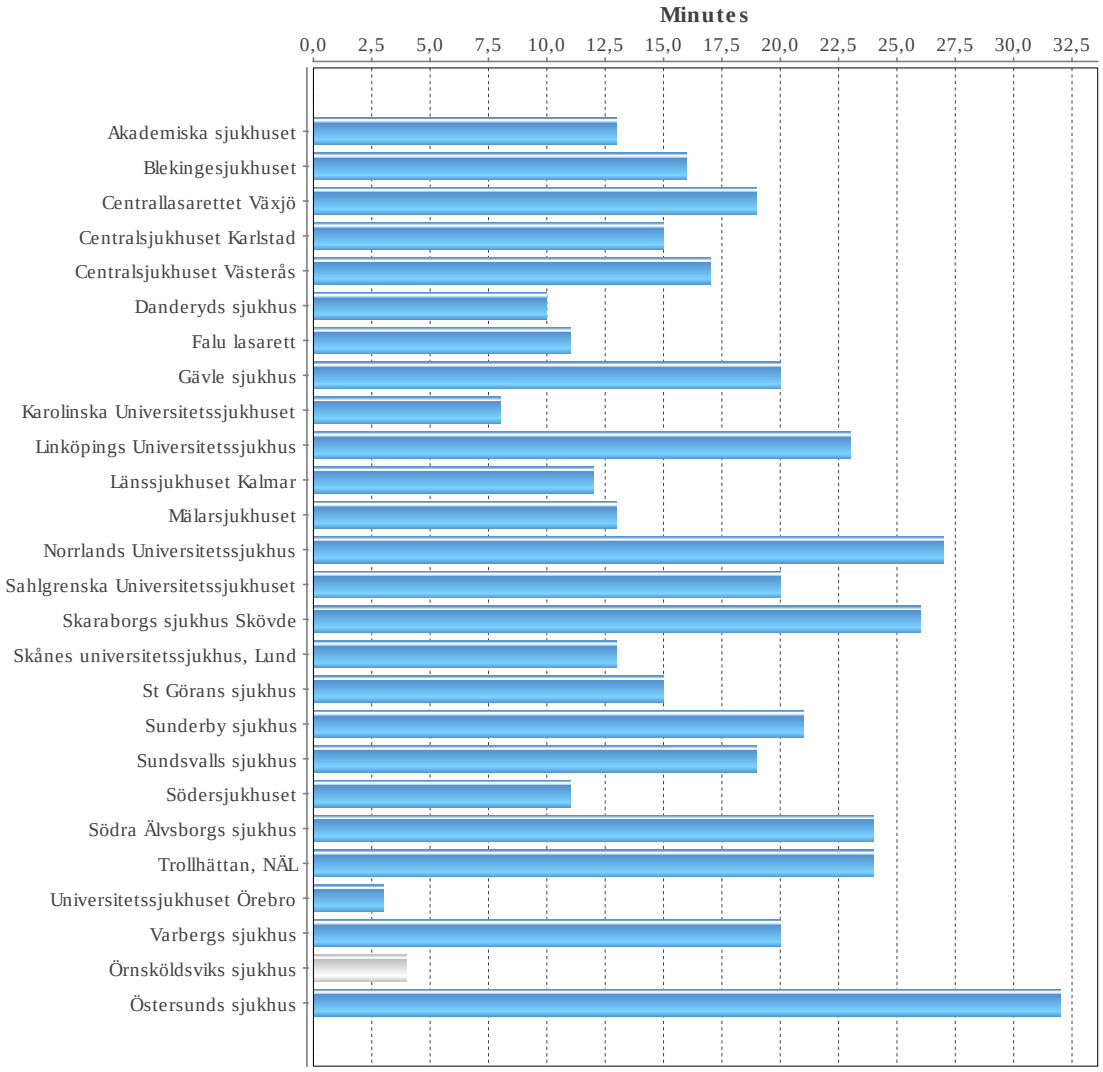


Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less then 10 observations

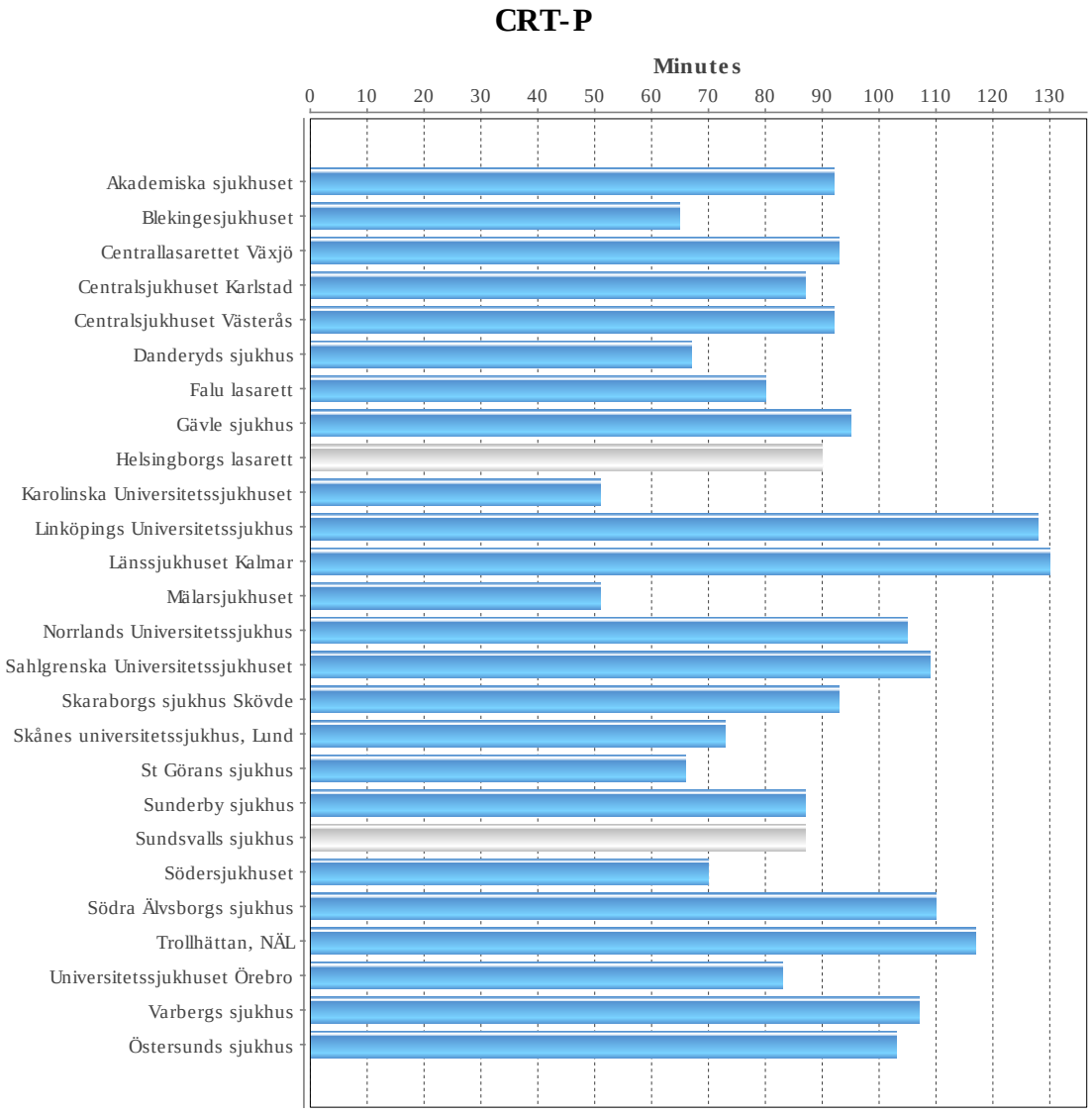


Mean fluoroscopy duration per different CRT implantation per hospital. Bars colored in grey are based on less then 10 observations

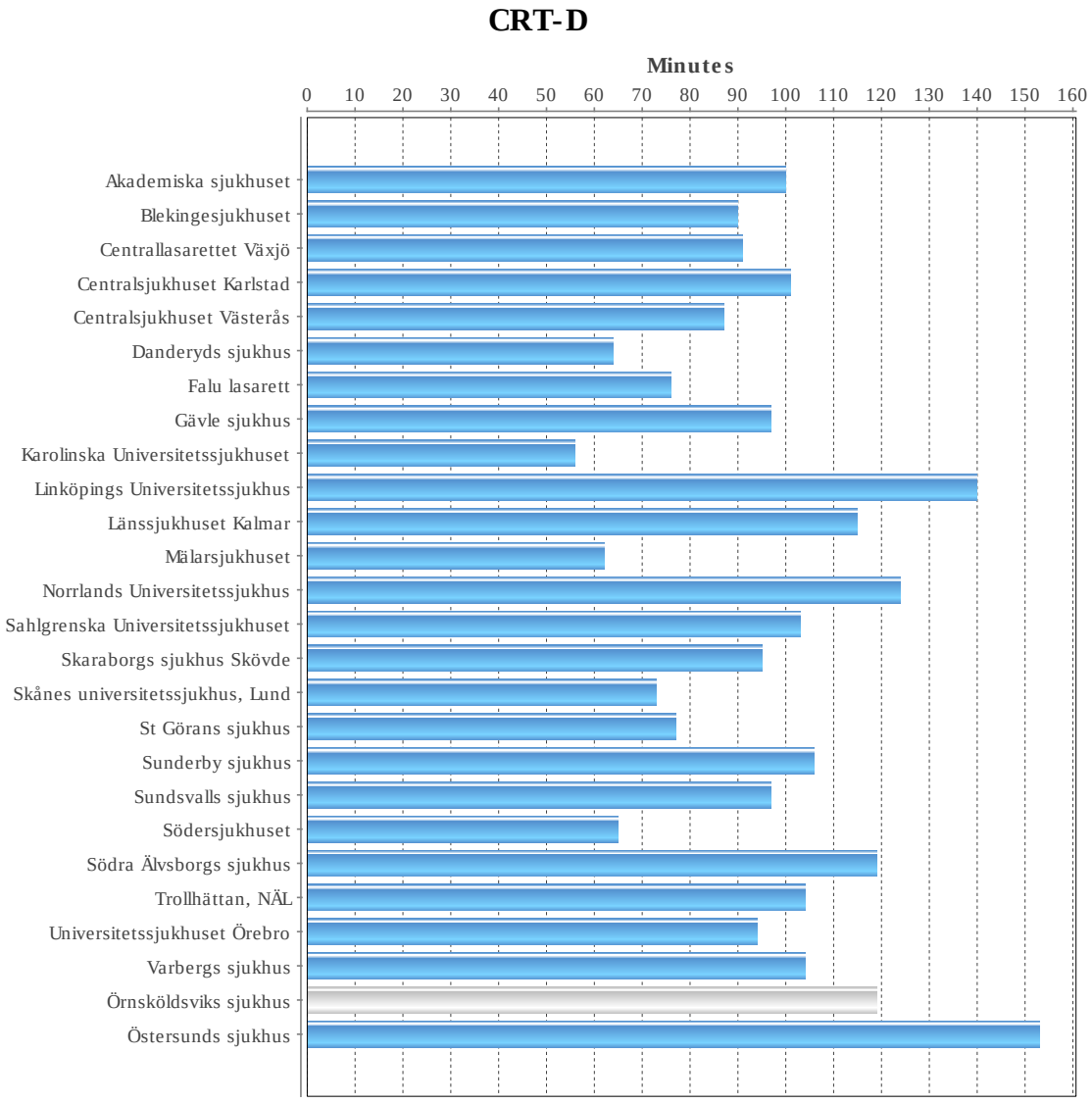
CRT-D



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



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

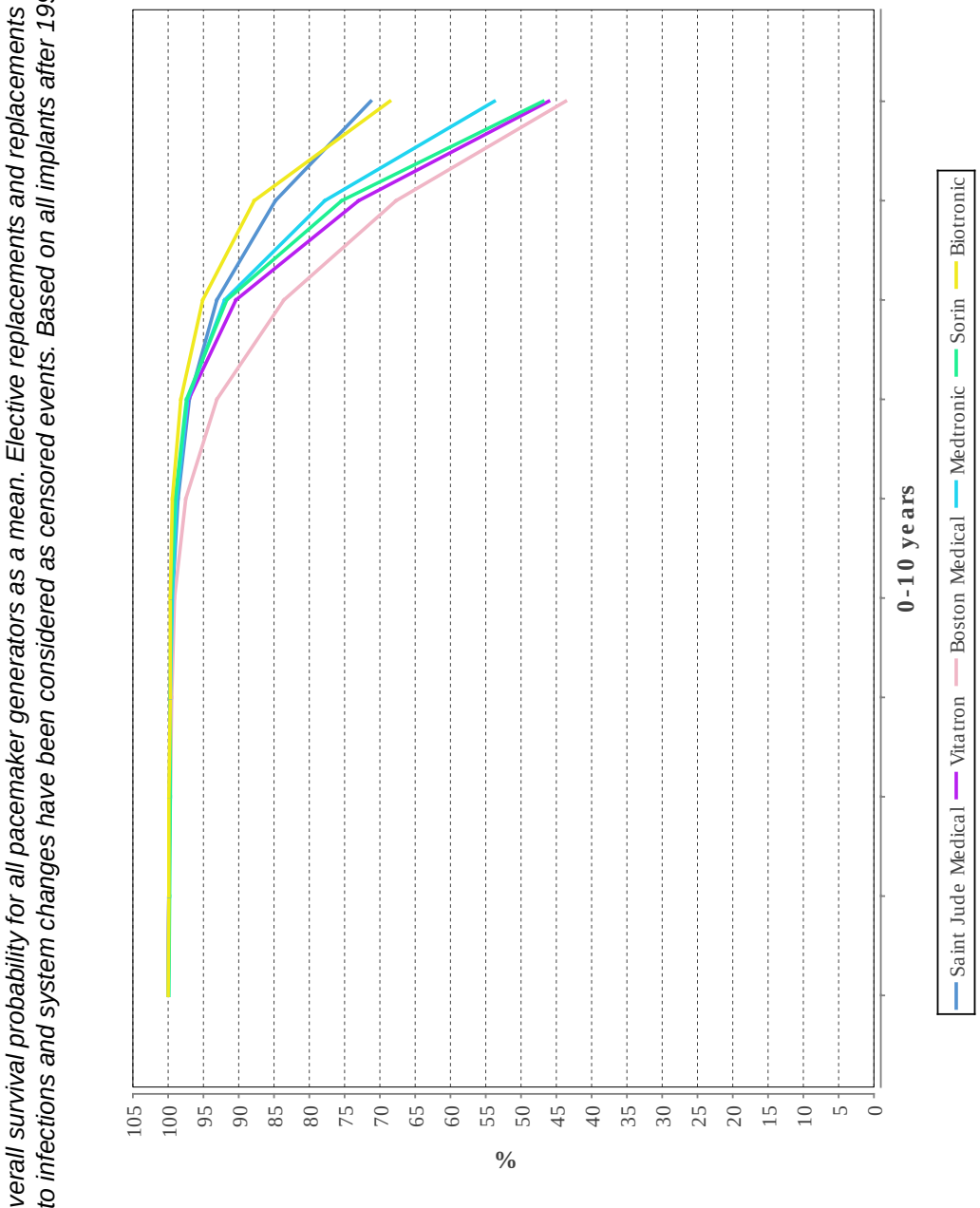


Year	At risk	Survival probability %
1	114804	100.0
2	101741	99.9
3	90587	99.8
4	75374	99.7
5	60749	99.4
6	47994	98.6
7	36649	96.7
8	25692	91.2
9	14806	78.1
10	5986	56.3

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

Year	Total		Biotronic		Boston Scient		Medtronic		St Jude Medical		Vitatron		Sorin	
	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %
1	114771	100.0	9625	100.0	14527	100.0	28618	100.0	39334	100.0	18432	100.0	4235	99.9
2	101713	99.9	8444	99.9	12997	99.9	25530	99.9	34892	99.9	16000	99.9	3850	99.8
3	90560	99.8	7376	99.9	11719	99.7	22738	99.8	31072	99.8	14110	99.8	3545	99.7
4	75351	99.7	5320	99.7	10016	99.5	19798	99.7	25081	99.7	11866	99.7	3270	99.7
5	60731	99.5	3630	99.7	8083	99.1	16534	99.4	19297	99.4	10272	99.5	2915	99.6
6	47976	98.7	2643	99.4	5875	97.5	13386	98.8	14633	98.6	8857	98.9	2582	99.0
7	36635	96.7	1862	98.2	3949	93.1	10494	97.2	10879	97.0	7289	97.1	2162	97.4
8	25687	91.0	1329	95.1	2671	83.6	7630	92.0	7734	93.1	4770	90.4	1553	91.7
9	14806	77.8	789	87.8	1452	67.7	4779	77.8	4386	84.8	2490	73.0	910	75.4
10	5986	55.1	228	68.6	550	43.7	2207	53.8	1925	71.3	723	46.1	353	46.9

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



Models that have at least 100 implants and 50 explants

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Biotronik	Philos SR	100.0	100.0	100.0	100.0	100.0	100.0	96.0	96.0	96.0
Biotronik	Axios SR	100.0	100.0	100.0	100.0	100.0	94.7	77.3	71.3	61.1
Biotronik	Evia DR-T ProMRI	100.0	100.0	100.0	100.0	100.0	100.0	97.6	96.2	88.9
Biotronik	Ecuro DR-T	100.0	100.0	99.2	99.2	99.2	99.2	99.2	NaN	NaN
Biotronik	Estella DR-T ProMRI	100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.5	98.6
Biotronik	Etrinsa 8 DR-T ProMRI	99.8	99.8	99.8	99.8	99.8	NaN	NaN	NaN	NaN
Biotronik	Enitra 8 SR-T ProMRI	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN	NaN
Biotronik	Philos II DR-T	99.7	99.7	99.3	99.3	99.3	98.4	94.1	79.6	46.6
Biotronik	Philos II DR	100.0	100.0	99.6	99.2	98.8	97.2	87.0	63.6	42.9
Biotronik	Enitra 6 SR-T ProMRI	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN	NaN
Biotronik	Etrinsa 6 DR-T ProMRI	99.9	99.7	99.7	99.7	99.7	99.7	NaN	NaN	NaN
Biotronik	Effecta DR	100.0	100.0	99.9	99.7	99.4	99.4	99.4	98.8	98.8
Biotronik	Talos SR	99.8	99.8	99.8	99.8	99.8	99.4	96.4	81.4	36.9
Biotronik	Effecta SR	99.9	99.9	99.8	99.8	99.4	99.4	99.4	99.4	99.4
Biotronik	Enitra 8 DR-T ProMRI	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN	NaN
Biotronik	Enitra 6 DR-T ProMRI	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN	NaN
Boston Scientific	1294 Insignia I	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	58.8
Boston Scientific	1297 Insignia I	100.0	100.0	100.0	100.0	96.7	96.7	92.1	85.9	72.5
Boston Scientific	1192 Insignia	100.0	100.0	100.0	100.0	97.8	97.8	97.8	88.0	64.0
Boston Scientific	J172 Ingenio	98.7	98.7	98.7	98.7	96.8	96.8	96.8	96.8	NaN
Boston Scientific	J174 Ingenio EL	100.0	100.0	100.0	100.0	100.0	99.2	99.2	96.9	NaN
Boston Scientific	J062 Advantio	99.4	98.8	98.8	98.8	98.8	97.7	96.4	96.4	NaN
Boston Scientific	J065 Advantio	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN
Boston Scientific	U225 Visionist CRT-P	100.0	99.4	98.6	97.4	97.4	NaN	NaN	NaN	NaN
Boston Scientific	W173 Invive CRT	100.0	100.0	99.4	98.8	97.5	95.3	87.0	78.5	NaN
Boston Scientific	U228 Visonist X4 CRT-P	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN
Boston Scientific	S601 Altrua 60	100.0	99.5	99.0	99.0	99.0	95.5	84.9	60.7	42.0
Boston Scientific	S603 Altrua 60	100.0	100.0	99.5	98.5	96.8	87.7	59.9	37.3	11.0
Boston Scientific	S402 Altrua 40	99.6	99.6	99.6	99.6	98.8	98.8	95.7	89.3	70.1
Boston Scientific	J064 Adventio EL	99.8	99.8	99.8	99.8	99.8	98.9	98.9	98.9	NaN
Boston Scientific	S606 Altrua 60	99.7	99.7	99.7	99.2	98.3	96.6	93.6	87.1	75.8

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Boston Scientific	H140 Contak Renewal TR2	100.0	100.0	99.4	98.6	95.3	85.3	59.8	29.0	10.6
Boston Scientific	1291 Insignia I	99.4	99.4	99.4	99.4	98.3	95.7	92.7	80.6	52.3
Boston Scientific	S602 Altrua 60	100.0	99.4	99.4	99.0	98.1	95.4	90.4	79.7	51.9
Boston Scientific	S501 Altrua 50	100.0	100.0	99.1	99.1	98.7	97.2	92.9	78.7	53.0
Boston Scientific	J277 Vitalio MRI	99.5	99.2	99.2	99.2	99.2	99.2	99.0	NaN	NaN
Boston Scientific	S404 EL Altrua 40	100.0	99.9	99.7	99.3	98.8	98.1	95.6	86.7	67.2
Boston Scientific	L210 Proponent MRI SR	100.0	99.8	99.8	99.6	97.5	94.9	NaN	NaN	NaN
Boston Scientific	1190 Insignia	99.9	99.0	98.5	98.3	96.6	92.9	84.4	64.3	41.2
Boston Scientific	1290 Insignia I	99.9	99.8	99.6	98.6	92.9	79.3	57.7	32.2	8.7
Boston Scientific	L231 Proponent MRI EL DR	99.9	99.8	99.7	99.3	98.1	97.0	NaN	NaN	NaN
Medtronic	KDR931 Kappa DR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.1	58.7
Medtronic	SS303 Sigma S	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN
Medtronic	P1501DR EnRhythm	100.0	100.0	100.0	100.0	97.2	78.7	45.2	26.9	15.9
Medtronic	ADSR01 Adapta	100.0	99.1	99.1	99.1	99.1	99.1	77.3	42.3	17.2
Medtronic	KSR703 Kappa SR	100.0	100.0	100.0	97.1	93.8	79.4	49.4	29.3	10.1
Medtronic	E2DR31 EnPulse	100.0	100.0	100.0	98.8	98.8	98.8	97.2	92.0	75.9
Medtronic	E2SR01 EnPulse	100.0	100.0	100.0	99.3	96.6	91.5	53.4	13.1	4.4
Medtronic	KSR901 Kappa SR	98.6	98.6	98.6	98.6	98.6	89.5	45.0	15.6	6.8
Medtronic	SEDR01 Sensia	100.0	100.0	100.0	100.0	99.6	99.1	95.9	77.9	50.8
Medtronic	EN1SR01 Ensura SR MRI	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN
Medtronic	ADDR01 Adapta	100.0	99.8	99.6	99.3	98.5	98.2	94.8	78.8	40.8
Medtronic	C2TR01 Syncra CRT	99.8	99.7	99.3	98.4	94.7	87.7	73.4	60.5	40.5
Medtronic	VEDR01 Versa	100.0	99.6	99.4	99.2	99.0	96.9	93.1	72.4	39.7
Medtronic	X2DR01 Astra XT DR MRI	100.0	100.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN

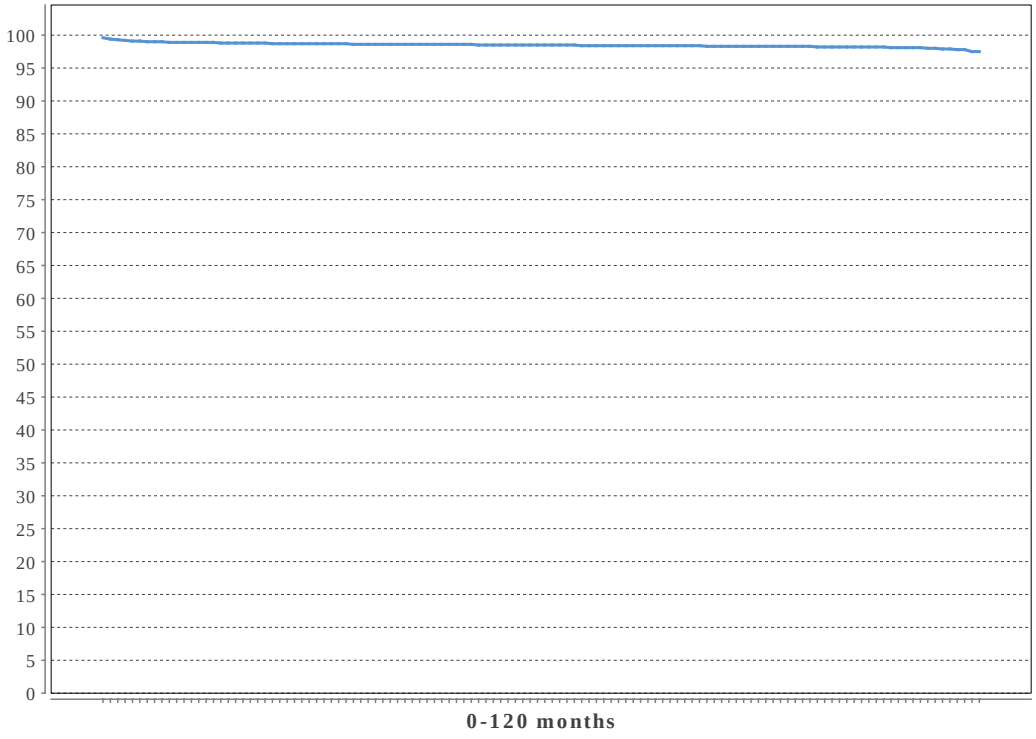
Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Medtronic	A3DR01 Advisa DR MRI	100.0	100.0	100.0	100.0	100.0	99.5	95.9	82.4	64.6
Medtronic	8042 InSync III	100.0	99.8	99.0	97.9	95.8	87.4	68.3	37.2	10.2
Medtronic	E2DR01 EnPulse	100.0	99.8	99.7	99.1	98.4	96.5	88.9	60.1	21.7
Medtronic	SESR01 Sensia	99.8	99.8	99.7	99.3	98.4	97.1	91.9	69.7	44.4
Medtronic	RESR01 Relia SR	99.7	99.7	99.7	99.3	98.5	97.0	89.9	70.9	41.7
Medtronic	ADDRL1 Adapta	99.9	99.8	99.6	99.6	99.5	99.0	98.7	95.9	84.8
Medtronic	EN1DR01 Ensura DR MRI	99.9	99.8	99.7	99.6	99.1	98.3	94.9	82.2	66.6
Medtronic	SEDRL1 Sensia	99.9	99.9	99.8	99.8	99.6	99.4	98.7	97.3	93.1
Medtronic	REDR01 Relia DR	99.8	99.8	99.7	99.5	99.2	98.3	96.1	85.6	60.3
Sorin/LivaNova	Esprit SR	100.0	100.0	100.0	100.0	100.0	100.0	97.1	97.1	97.1
Sorin/LivaNova	2530 Rhapsody	100.0	100.0	100.0	100.0	100.0	97.4	94.6	85.6	62.4
Sorin/LivaNova	Reply 200 SR	100.0	100.0	100.0	100.0	99.0	95.5	95.5	NaN	NaN
Sorin/LivaNova	Kora 250 DR	100.0	99.4	98.7	98.7	91.7	NaN	NaN	NaN	NaN
Sorin/LivaNova	Reply SR	100.0	100.0	100.0	100.0	98.6	97.0	95.1	92.7	73.3
Sorin/LivaNova	Esprit DR	100.0	100.0	100.0	99.6	99.6	98.1	87.6	71.2	49.0
Sorin/LivaNova	2550 Symphony DR	100.0	100.0	100.0	100.0	99.4	98.7	96.0	90.4	72.8
Sorin/LivaNova	Reply 200 DR	99.9	99.6	99.5	99.5	99.1	96.1	89.5	NaN	NaN
Sorin/LivaNova	Reply DR	99.7	99.6	99.6	99.5	98.9	97.9	92.3	73.3	40.7
St Jude Medical/ Abbott	5157 M/S Verity ADx XL SR	100.0	100.0	100.0	100.0	100.0	90.5	90.5	90.5	90.5
St Jude Medical/ Abbott	5610 Victory	100.0	100.0	100.0	100.0	97.1	84.0	46.9	12.4	NaN
St Jude Medical/ Abbott	2525T Microny II	98.7	98.7	98.7	94.7	80.8	77.9	65.5	45.0	25.3
St Jude Medical/ Abbott	3112 Anthem	100.0	100.0	98.9	97.7	93.7	89.5	76.2	58.1	43.1
St Jude Medical/ Abbott	5180 Identity ADx SR	100.0	100.0	97.9	97.9	88.2	77.7	51.1	13.9	4.6
St Jude Medical/ Abbott	1110 Accent SR	100.0	100.0	100.0	100.0	100.0	100.0	98.8	98.8	98.8
St Jude Medical/ Abbott	5810 Victory DR	100.0	100.0	94.4	87.4	69.2	42.5	26.5	14.7	11.0
St Jude Medical/ Abbott	2162 Endurity DR	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN
St Jude Medical/ Abbott	2240 Assurity DR	99.6	99.6	99.6	99.1	99.1	98.5	NaN	NaN	NaN

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
St Jude Medical/ Abbott	1136 Sustain XL	100.0	100.0	100.0	99.2	99.2	99.2	99.2	97.6	NaN
St Jude Medical/ Abbott	5356 Verity ADx XL DR	100.0	100.0	100.0	99.0	96.4	96.4	96.4	93.2	63.1
St Jude Medical/ Abbott	3262 Quadra Allure MP RF	100.0	100.0	99.6	99.2	99.2	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	1172 Endurity MRI SR	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	2136 Sustain XL DR	99.5	99.5	99.5	99.2	98.8	98.4	97.6	93.0	NaN
St Jude Medical/ Abbott	3242 Allure RF	99.8	99.8	99.8	99.8	98.7	93.8	91.0	NaN	NaN
St Jude Medical/ Abbott	1162 Endurity SR	99.8	99.8	99.8	99.8	99.5	99.5	NaN	NaN	NaN
St Jude Medical/ Abbott	5596 Frontier II	100.0	100.0	99.3	97.3	89.7	79.0	59.0	37.3	20.3
St Jude Medical/ Abbott	2172 Endurity MRI DR	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	2160 Endurity	99.6	99.6	99.6	99.6	99.2	99.2	99.2	NaN	NaN
St Jude Medical/ Abbott	2224 Accent DR MRI	99.8	99.8	99.8	99.5	99.5	99.1	99.1	98.3	93.5
St Jude Medical/ Abbott	2212 Accent DR	99.8	99.6	99.6	98.9	98.1	97.6	94.2	85.0	66.0
St Jude Medical/ Abbott	1160 Endurity SR	99.9	99.7	99.7	99.7	99.7	99.7	99.4	NaN	NaN
St Jude Medical/ Abbott	3212 Anthem	99.6	99.1	98.3	97.2	92.8	81.2	71.2	51.5	31.8
St Jude Medical/ Abbott	5386 Identity ADx XL DR	98.9	98.5	98.0	98.0	95.1	94.4	90.9	75.2	54.2
St Jude Medical/ Abbott	3562 Quadra Allure MP RF	100.0	100.0	100.0	99.4	NaN	NaN	NaN	NaN	NaN
St Jude Medical/ Abbott	3222 Allure RF	99.8	99.6	99.6	98.2	95.6	90.9	89.3	NaN	NaN
St Jude Medical/ Abbott	5626 Zephyr XL SR	99.8	99.6	99.6	99.3	99.1	99.1	98.9	97.2	94.1
St Jude Medical/ Abbott	2112 Accent DR	99.9	99.9	99.9	99.8	99.7	98.9	97.8	94.5	84.0
St Jude Medical/ Abbott	2260 Assurity + DR	99.7	99.7	99.6	99.5	99.1	98.8	98.0	NaN	NaN
St Jude Medical/ Abbott	5156 Verity ADx XL SR	99.9	99.9	99.9	99.6	99.5	98.7	98.5	97.7	94.2
St Jude Medical/ Abbott	1272 Assurity MRI SR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NaN
St Jude Medical/ Abbott	5826 Zephyr XL DR	99.8	99.7	99.5	99.4	99.0	98.0	91.6	80.2	69.2
St Jude Medical/ Abbott	5816 Victory XL	99.8	99.6	99.6	99.4	98.8	97.3	90.7	80.9	63.5
St Jude Medical/ Abbott	2272 Assurity MRI DR	99.9	99.9	99.9	99.8	99.6	99.6	NaN	NaN	NaN
Vitatron	T20SR	99.8	99.8	99.8	99.1	97.7	94.7	91.2	86.7	78.2

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Vitatron	G20A2 SR MRI	100.0	99.0	99.0	NaN	NaN	NaN	NaN	NaN	NaN
Vitatron	C10S	99.9	99.9	99.7	99.4	99.0	98.4	95.9	92.8	90.4
Vitatron	C70DR	100.0	100.0	100.0	100.0	99.8	97.5	86.0	59.8	21.3
Vitatron	T70DR	99.5	99.3	99.3	98.9	96.8	91.6	70.5	41.4	17.5
Vitatron	E60A1 DR	100.0	100.0	100.0	99.7	99.3	98.5	97.0	87.7	72.4
Vitatron	C20SR	100.0	99.9	99.9	99.9	98.9	96.4	93.9	91.1	75.8
Vitatron	T60DR	100.0	100.0	99.6	99.2	98.1	95.4	82.0	54.3	28.7
Vitatron	Q80A2 DR MRI	99.5	99.5	99.5	NaN	NaN	NaN	NaN	NaN	NaN
Vitatron	G20A1	99.9	99.9	99.9	99.5	99.0	97.3	90.5	73.7	63.9
Vitatron	C60DR	99.9	99.8	99.6	99.3	98.2	95.4	83.2	55.7	25.5
Vitatron	G70A1	99.9	99.9	99.8	99.7	99.5	99.0	98.3	93.9	85.8

Based on all implants after 1990

Year	At risk	Survival probabilty %
1	154582	99.6
2	139615	98.9
3	128425	98.7
4	106973	98.6
5	85039	98.6
6	65582	98.5
7	48492	98.4
8	33617	98.3
9	20449	98.3
10	9251	98.1



Models that have at least 50 implants and 10 explants

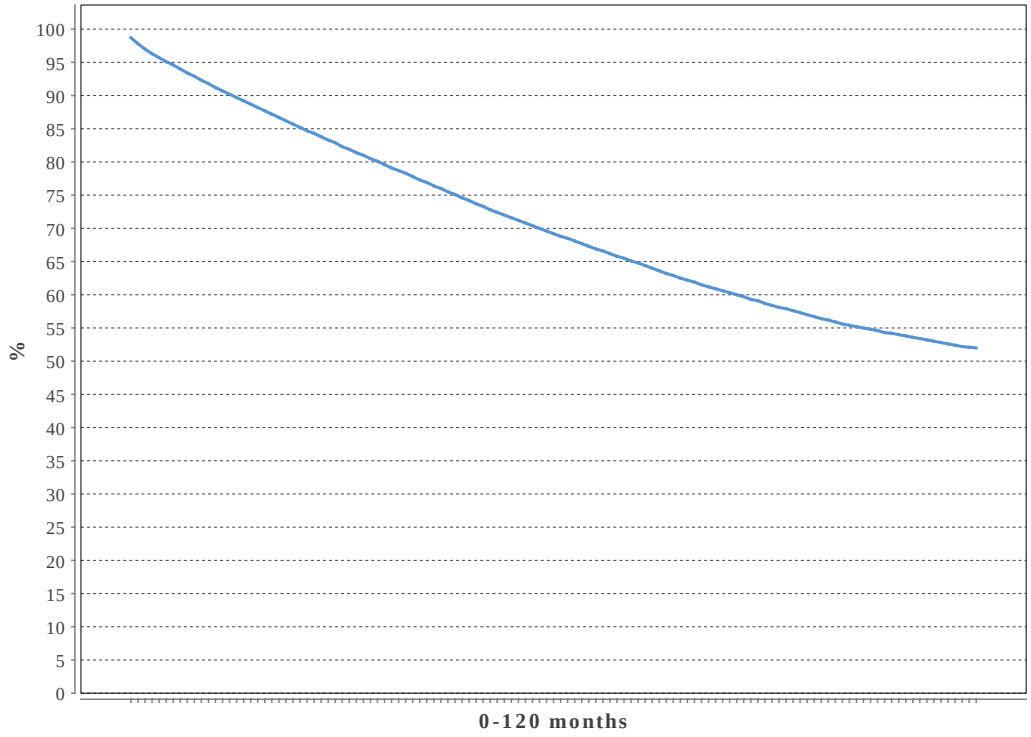
Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Y53-BP	100.0	100.0	100.0	100.0	100.0	95.0	95.0	95.0	95.0
Biotronik	Selox SR 60	97.4	97.4	95.5	95.5	95.5	95.5	95.5	95.5	95.5
Biotronik	PX60-UP	99.9	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Biotronik	Selox ST 60	100.0	100.0	100.0	98.9	98.9	98.9	98.9	98.9	98.9
Biotronik	Safio ProMRI S53	99.0	98.6	98.3	98.3	98.3	98.3	98.3	98.3	98.3
Biotronik	Y60-BP	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Biotronik	PX60-BP	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8
Biotronik	Safio ProMRI S60	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1
Biotronik	Siello S60	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4
Biotronik	Siello S53	98.5	98.4	98.3	98.3	98.3	98.3	98.3	98.3	98.3
Biotronik	Solia S60 MRI	99.2	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1
Biotronik	Solia S53 MRI	99.1	98.9	98.8	98.8	98.8	98.3	98.3	98.3	98.3
Boston Scientific	4480 Fineline II Sterox EZ MRI	95.8	95.8	95.2	94.5	94.5	94.5	94.5	94.5	94.5
Boston Scientific	4542 Easytrak	95.7	94.4	92.9	91.2	91.2	88.3	88.3	88.3	88.3
Boston Scientific	7732 Ingevity MRI	98.6	98.2	98.2	98.2	98.2	98.2	NaN	NaN	NaN
Boston Scientific	4474 Fineline II Sterox EZ MRI	99.5	99.0	98.6	98.3	98.0	97.9	97.7	97.3	97.3
Boston Scientific	4471 Fineline II Sterox EZ MRI	97.3	97.1	97.1	97.1	97.0	96.6	96.6	96.6	95.6
Boston Scientific	4457 Fineline II Sterox EZ MRI	99.4	99.3	99.2	99.1	99.1	99.0	99.0	99.0	99.0
Boston Scientific	4473 Fineline II Sterox EZ MRI	99.0	98.8	98.7	98.7	98.6	98.6	98.6	98.4	98.4
Boston Scientific	7742 Ingevity MRI	98.8	98.7	98.7	98.7	98.6	98.6	NaN	NaN	NaN
Boston Scientific	7741 Ingevity MRI	98.5	98.4	98.4	98.4	98.4	98.4	NaN	NaN	NaN
Boston Scientific	4470 Fineline II Sterox EZ MRI	99.3	99.2	99.2	99.2	99.2	99.1	99.1	99.0	98.8
Medtronic	4195 Attain StarFix	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	70.3
Medtronic	4073 CapSure Sense	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.4
Medtronic	4396 Attain Ability MRI	98.7	98.7	98.7	98.7	98.7	98.7	98.7	98.7	98.7
Medtronic	4965 CapSure Epi	98.5	98.5	98.5	97.3	96.0	92.9	92.9	92.9	92.9

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Medtronic	3830 SelectSecure MRI	95.7	95.7	95.7	95.7	80.1	80.1	80.1	80.1	40.1
Medtronic	4194 Attain OTW	94.2	93.6	93.6	92.1	92.1	90.9	88.9	88.9	88.9
Medtronic	4196 Attain Ability MRI	97.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1
Medtronic	4193 Attain OTW	94.4	93.4	92.9	92.5	91.6	90.9	90.2	88.6	88.6
Medtronic	5092 Capsure SP Novus	98.7	98.4	98.4	98.3	98.1	98.1	97.7	97.2	97.2
Medtronic	4598 Attain Performa MRI	98.8	98.8	98.8	98.8	98.8	98.8	98.8	98.8	NaN
Medtronic	5086 CapSureFix MRI	98.5	98.5	98.5	98.5	98.5	98.1	98.1	98.1	98.1
Medtronic	4296 Attain Ability MRI	96.9	96.0	96.0	96.0	96.0	95.6	95.6	95.6	95.6
Medtronic	4796 Attain Stability MRI	99.0	98.5	98.3	98.3	98.3	98.3	98.3	98.3	98.3
Medtronic	4798 Attain Stability Quad MRI	97.7	97.7	97.7	NaN	NaN	NaN	NaN	NaN	NaN
Medtronic	4968 CapSure Epi	99.5	99.1	98.3	98.3	97.4	97.4	96.4	95.7	92.0
Medtronic	5054 CapSure Z Novus	98.9	98.7	98.5	98.5	98.3	98.2	98.2	97.8	97.8
Medtronic	4074 Capsure Sense MRI	99.0	98.9	98.9	98.8	98.8	98.7	98.7	98.6	98.6
Medtronic	5076 CapSureFix MRI	99.0	98.9	98.8	98.7	98.7	98.7	98.5	98.4	97.9
Medtronic	4076 CapSureFix Novus MRI	99.3	99.3	99.2	99.2	99.1	99.1	99.0	99.0	98.9
N/A	N/A	99.5	99.4	99.4	99.0	98.9	98.4	97.4	96.6	96.6
Osypka	KY-5	93.1	88.2	86.0	82.3	80.5	80.5	77.6	77.6	77.6
St Jude Medical/ Abbott	1058T	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5
St Jude Medical/ Abbott	1699T OptiSense	97.7	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4
St Jude Medical/ Abbott	1056K QuickSite	96.8	96.2	95.5	94.5	94.5	94.5	90.5	90.5	90.5
St Jude Medical/ Abbott	1084T Myodex	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2	99.2
St Jude Medical/ Abbott	1456Q Quartet MRI	95.4	95.4	95.4	95.4	95.4	95.4	95.4	NaN	NaN
St Jude Medical/ Abbott	1480T	98.8	98.2	98.1	98.1	97.9	97.7	97.5	97.5	97.5
St Jude Medical/ Abbott	1488T Tendril SDX	98.5	98.2	97.9	97.7	97.5	97.1	96.9	96.0	95.1

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
St Jude Medical/ Abbott	1156T Quickflex	96.2	95.4	94.6	94.6	93.7	93.7	93.7	93.7	92.3
St Jude Medical/ Abbott	1056T QuickSite	95.9	95.2	94.3	93.5	93.2	92.8	92.8	92.8	87.4
St Jude Medical/ Abbott	1699TC OptiSense	98.1	97.5	97.3	96.9	96.9	96.6	96.1	96.1	96.1
St Jude Medical/ Abbott	1636T Isoflex	97.5	97.2	96.9	96.8	96.5	96.1	96.1	95.4	94.1
St Jude Medical/ Abbott	LPA1200M52cm TendrilMRI	98.2	98.1	97.9	97.8	97.8	97.7	97.4	96.9	96.9
St Jude Medical/ Abbott	1788TC Tendril ST	96.1	95.9	95.9	95.7	95.3	95.3	95.3	95.3	94.2
St Jude Medical/ Abbott	LPA1200M58cm TendrilMRI	99.2	99.0	98.9	98.8	98.7	98.5	98.5	98.1	98.1
St Jude Medical/ Abbott	1788T Tendril ST	97.3	96.5	95.9	95.6	95.6	95.6	95.6	95.6	95.6
St Jude Medical/ Abbott	1888TC Tendril ST	97.7	97.5	97.4	97.4	97.4	97.2	97.0	97.0	97.0
St Jude Medical/ Abbott	1688T Tendril SDX	97.1	96.5	96.2	95.9	95.4	95.0	95.0	94.4	94.1
St Jude Medical/ Abbott	1258T QuickFlex	98.0	97.6	97.5	97.3	96.9	96.5	96.3	96.1	95.9
St Jude Medical/ Abbott	1458Q Quartet MRI	98.1	97.6	97.3	97.0	96.9	96.9	96.9	96.9	96.9
St Jude Medical/ Abbott	1646T Isoflex	98.3	98.1	97.8	97.8	97.7	97.7	97.6	97.4	97.0
St Jude Medical/ Abbott	1948 Isoflex MRI	98.8	98.7	98.6	98.5	98.4	98.3	98.2	98.2	98.2
St Jude Medical/ Abbott	1999 Optisense	99.1	98.8	98.7	98.6	98.6	98.5	98.4	98.3	98.1
St Jude Medical/ Abbott	2088TC Tendril STS MRI	99.4	99.2	99.1	99.1	99.0	99.0	98.9	98.9	98.9
Vitatron	ICM09JB Crystalline	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Vitatron	ICL08 Crystalline	97.3	96.8	96.8	96.8	96.8	95.9	94.6	94.6	94.6
Vitatron	ICF09 Crystalline	97.4	97.2	97.2	97.0	96.8	96.6	96.3	96.3	95.6
Vitatron	IHP09B	98.0	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8
Vitatron	ICF09B Crystalline	98.2	97.9	97.9	97.9	97.9	97.9	97.9	97.9	97.9
Vitatron	ICM09B Crystalline	98.6	98.6	98.5	98.5	98.4	98.2	98.2	98.2	98.0
Vitatron	ICQ09B Crystalline	99.0	98.8	98.7	98.7	98.6	98.5	98.5	98.5	98.5

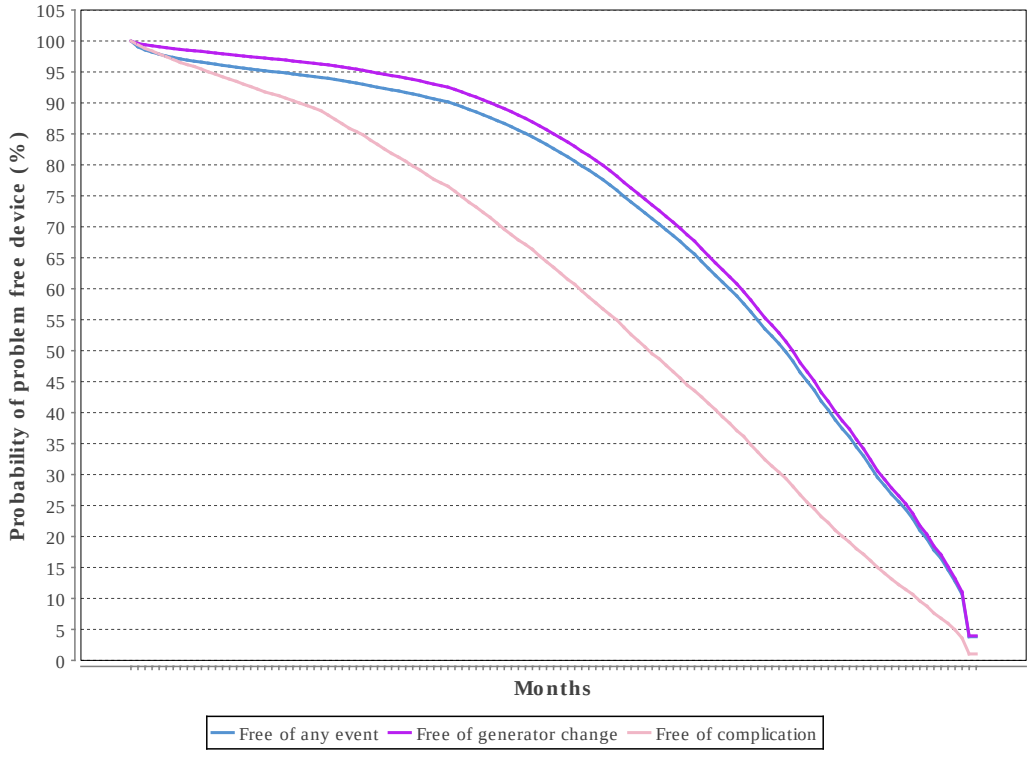
Based on all implants after 1990

Year	At risk	Survival probability %
1	123374	98.7
2	109961	91.2
3	98702	85.2
4	82972	79.6
5	68351	74.2
6	55628	69.2
7	44293	64.8
8	33308	60.6
9	22435	57.0
10	13730	54.2



Probablility of event free ICD-device

Year	At risk	Free of any event %	Free of generator change %	Free of complication %
1	33045	96.3	98.1	94.6
2	30217	94.5	96.7	90.0
3	26353	92.3	94.6	82.6
4	21999	88.9	91.3	74.0
5	16822	82.6	85.0	63.5
6	11594	73.1	75.4	51.6
7	7069	61.1	63.1	39.3
8	3287	45.1	46.6	25.5
9	984	26.8	27.8	13.1
10	39	3.8	4.0	1.0

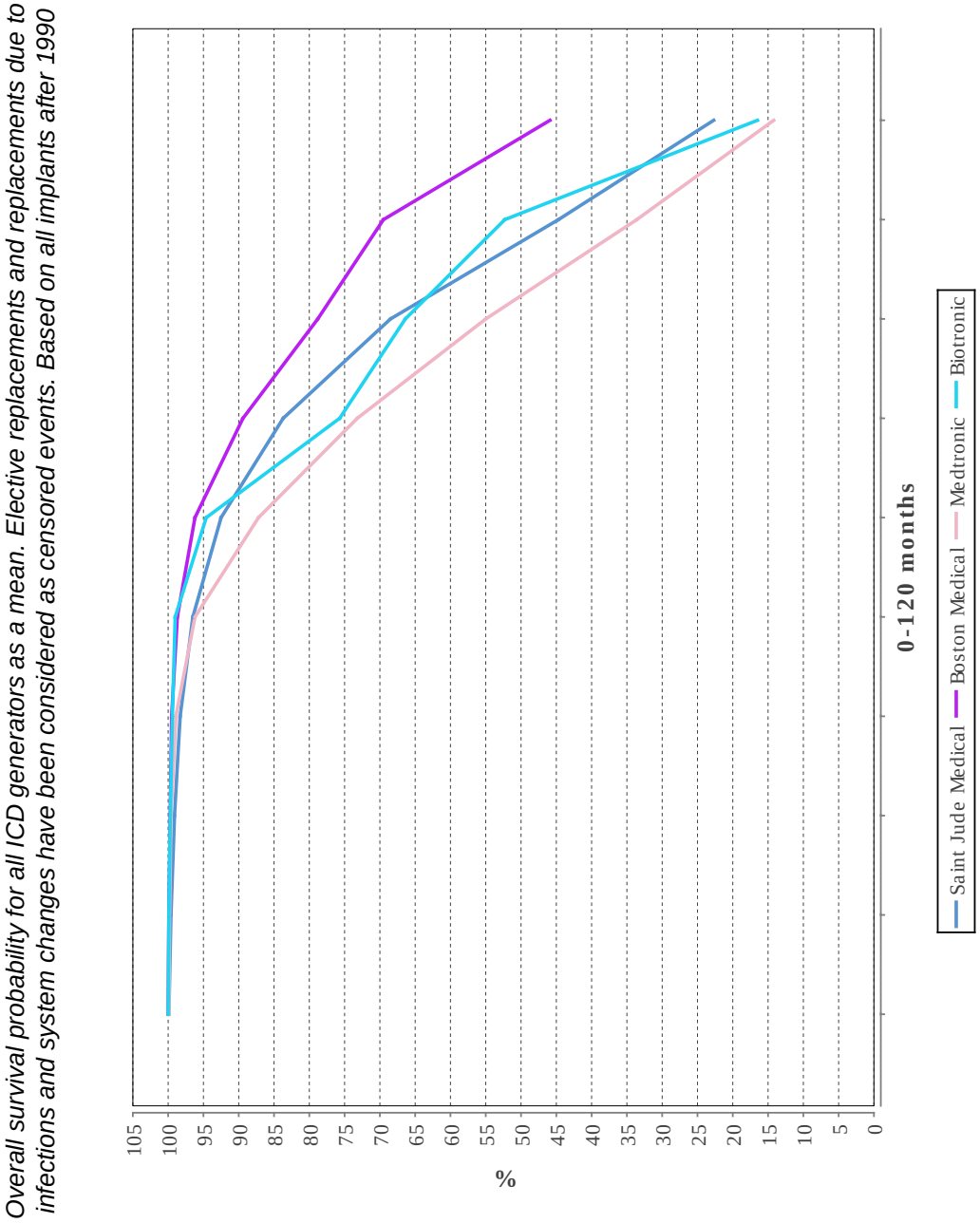


Year	At risk	Survival probability %
1	23282	99.9
2	21099	99.7
3	19042	99.4
4	15955	98.7
5	12732	96.7
6	9366	90.7
7	6199	79.4
8	3594	63.7
9	1528	42.9
10	420	21.2

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

Year	Total		Biotronic		Boston Scientific		Medtronic		St Jude Medical	
	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %	At risk	Surv. prob. %
1	23215	133.3	995	100.0	2470	100.0	9797	99.9	9953	99.9
2	21037	133.1	930	99.9	2233	99.9	8898	99.8	8976	99.6
3	18984	132.7	849	99.7	2029	99.7	7993	99.6	8113	99.1
4	15899	132.0	721	99.4	1629	99.5	6732	98.9	6817	98.3
5	12678	130.1	571	99.0	1272	98.7	5449	96.2	5386	96.5
6	9320	123.5	432	94.6	956	96.2	3902	87.2	4030	92.5
7	6184	107.3	266	75.7	687	89.4	2429	73.2	2802	83.7
8	3591	89.6	174	66.4	463	78.8	1269	55.0	1685	68.5
9	1528	66.7	78	52.3	255	69.5	516	33.6	679	44.7
10	420	33.1	16	16.5	82	45.9	139	14.2	183	22.7

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



Models that have at least 50 implants and 10 explants

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Biotronik	Lumax 540 VR-T	100.0	100.0	100.0	100.0	97.5	97.5	97.5	94.1	36.9
Biotronik	Lumax 340 DR-T	100.0	100.0	98.3	96.6	79.7	10.3	5.1	5.1	5.1
Biotronik	Lumax 540 DR-T	100.0	98.9	98.9	97.6	97.6	96.1	91.2	47.9	NaN
Boston Scientific	F140 Energen	100.0	98.6	98.6	97.1	97.1	97.1	95.3	95.3	95.3
Boston Scientific	F142 Energen	100.0	100.0	100.0	100.0	98.5	95.3	91.2	91.2	91.2
Boston Scientific	F102 Teligen	100.0	100.0	100.0	100.0	100.0	96.0	78.5	73.9	61.4
Boston Scientific	F111 Teligen	100.0	100.0	100.0	100.0	96.1	91.7	84.5	84.5	84.5
Boston Scientific	P108 Cognis CRT	100.0	100.0	100.0	95.4	92.0	90.3	78.8	72.6	34.6
Boston Scientific	H247 Livian	100.0	100.0	100.0	100.0	93.8	71.6	34.6	28.5	0.0
Boston Scientific	P107 Cognis CRT	98.9	98.9	98.9	98.9	95.4	93.4	79.5	75.7	47.8
Boston Scientific	T167 Vitality 2	100.0	100.0	98.8	97.6	95.1	81.9	77.4	62.8	14.6
Boston Scientific	D176 Autogen EL	100.0	100.0	99.5	99.5	99.5	99.5	NaN	NaN	NaN
Boston Scientific	D174 Autogen EL	99.5	99.5	99.5	99.5	99.5	99.5	NaN	NaN	NaN
Boston Scientific	F110 Teligen	100.0	99.2	99.2	98.1	96.0	89.3	79.8	69.8	66.7
Medtronic	D354VRM Protecta	100.0	100.0	98.0	98.0	95.8	95.8	95.8	82.1	NaN
Medtronic	D354VRG Protecta	100.0	98.3	98.3	98.3	96.0	96.0	92.8	58.6	23.4
Medtronic	D264VRM Maximo II	100.0	100.0	100.0	100.0	100.0	97.7	92.6	81.0	NaN
Medtronic	D364DRM Protecta	100.0	100.0	100.0	100.0	98.2	91.7	45.3	35.3	NaN
Medtronic	DTBC2QQ Brava	100.0	98.7	97.4	96.0	89.8	87.7	51.2	NaN	NaN
Medtronic	DTBA2D1 Viva XT DF1/ IS1	100.0	98.7	96.9	95.1	89.9	74.2	69.2	57.7	NaN
Medtronic	D154ATG EnTrust	100.0	100.0	100.0	98.2	86.1	56.1	18.3	1.1	NaN
Medtronic	D264TRM Maximo II	100.0	100.0	100.0	92.1	59.4	22.7	-Infinity	NaN	NaN
Medtronic	D164VWC Virtuoso	100.0	100.0	98.0	96.0	91.4	88.8	79.8	50.8	30.1
Medtronic	DTBA2D4 Viva XT DF4/ IS1	100.0	100.0	100.0	99.0	93.9	88.7	77.0	41.1	NaN
Medtronic	7278 Maximo	100.0	100.0	100.0	94.5	85.2	66.6	10.3	Infinity	NaN
Medtronic	D354TRM Protecta	100.0	100.0	98.8	96.0	63.4	34.4	5.2	5.2	NaN
Medtronic	DTBC2D4 Brava	99.2	99.2	98.2	98.2	95.9	81.4	60.9	40.0	NaN
Medtronic	7304 Maximo	100.0	98.8	97.4	74.6	34.6	7.5	5.0	-Infinity	NaN

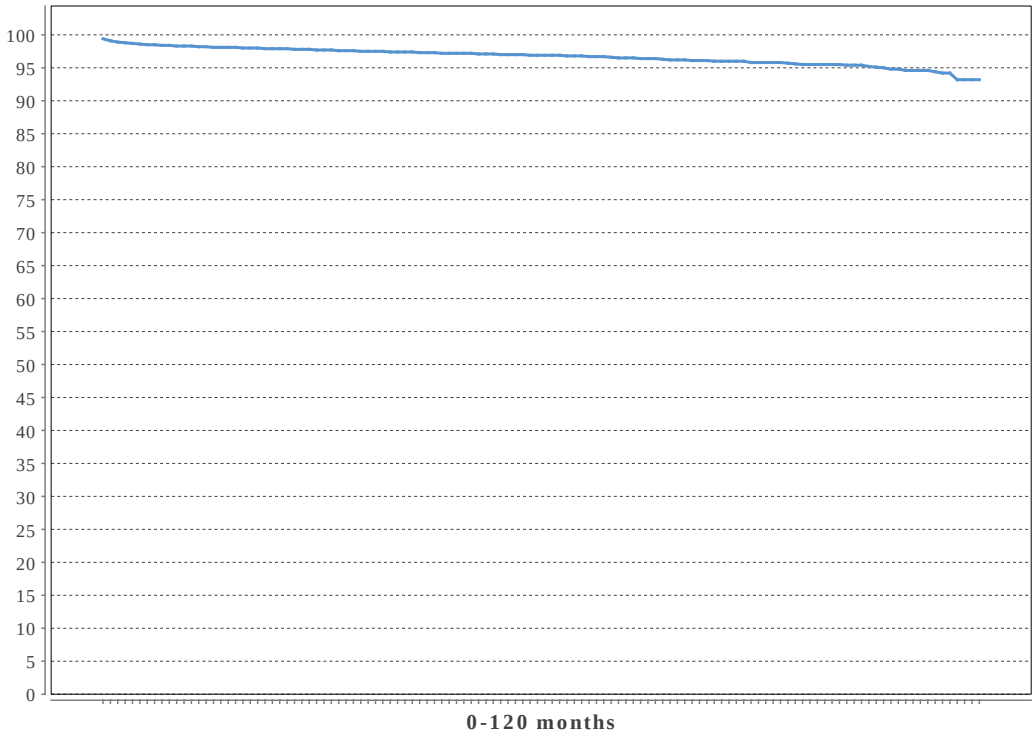
Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Medtronic	DVMC3D4 Evera S MRI VR DF4	100.0	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN
Medtronic	DVBC3D1 Evera S VR	100.0	100.0	99.2	99.2	99.2	99.2	99.2	NaN	NaN
Medtronic	DTBA2QQ Viva XT DF4/ IS4	100.0	100.0	99.3	96.6	92.8	81.4	61.6	NaN	NaN
Medtronic	D354DRG Protecta	100.0	100.0	100.0	99.1	93.7	86.6	49.3	12.5	NaN
Medtronic	D264DRM Maximo II	100.0	100.0	100.0	100.0	97.9	88.1	61.2	24.0	12.0
Medtronic	DVBC3D4 Evera S VR	100.0	100.0	100.0	100.0	99.4	99.4	99.4	NaN	NaN
Medtronic	D354DRM Protecta	100.0	100.0	100.0	100.0	98.5	90.3	65.8	8.1	8.1
Medtronic	D354TRG Protecta	100.0	99.3	94.6	85.9	59.4	33.5	16.8	16.8	16.8
Medtronic	DTMC2D4 Compia MRI DF4 CRT-D	100.0	99.4	98.6	98.6	NaN	NaN	NaN	NaN	NaN
Medtronic	7288 Intrinsic	100.0	98.9	97.6	97.6	88.8	61.2	17.2	NaN	NaN
Medtronic	DTMC2QQ Compia MRI Quad CRT-D	97.9	97.9	97.9	97.9	NaN	NaN	NaN	NaN	NaN
Medtronic	7298 Sentry	100.0	99.1	93.9	68.8	31.7	4.9	0.8	NaN	NaN
Medtronic	D364VRG Protecta	99.5	99.5	99.5	98.3	96.9	96.9	90.6	77.1	41.7
Medtronic	C174AWK Concerto	99.5	98.9	97.7	91.0	64.5	38.9	20.1	9.7	0.0
Medtronic	DTBC2D1 Brava	100.0	100.0	97.9	97.2	87.7	80.0	64.0	NaN	NaN
Medtronic	DDMC3D1 Evera S MRI DR DF1	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN	NaN
Medtronic	DTMB2QQ Amplia MRI Quad CRT-D	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN
Medtronic	DDBC3D1 Evera S DR DF1	100.0	99.4	98.8	98.8	98.1	96.3	96.3	NaN	NaN
Medtronic	D364TRG Protecta	100.0	99.5	96.9	86.0	58.2	27.0	11.0	8.5	8.5
Medtronic	DDBC3D4 Evera S DR DF4	99.5	99.5	99.5	99.1	98.4	96.9	93.3	NaN	NaN
Medtronic	D164AWG Virtuoso	100.0	98.7	98.7	96.6	88.3	76.0	61.6	29.1	2.1
Medtronic	7232Cx Maximo VR	100.0	100.0	98.9	98.4	97.1	95.8	87.0	53.0	14.5
Medtronic	DVFC3D4 Visia AF MRI S VR DF4	100.0	100.0	100.0	100.0	100.0	NaN	NaN	NaN	NaN

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
Medtronic	D284VRC Maximo II	99.7	99.7	99.4	99.4	98.2	96.4	90.8	73.1	38.1
Medtronic	D364DRG Protecta	99.5	99.5	99.0	98.2	94.7	77.1	50.7	24.9	9.5
Medtronic	D284TRK Maximo II	99.8	99.8	98.9	87.2	54.8	13.7	7.9	3.9	2.6
Medtronic	D284DRG Maximo II	99.8	99.8	99.4	98.8	94.1	78.3	44.5	16.0	0.0
Medtronic	DDMC3D4 Evera S MRI DR DF4	99.7	99.7	99.7	99.7	99.3	99.3	NaN	NaN	NaN
St Jude Medical/ Abbott	1233-40 Fortify	100.0	100.0	97.6	97.6	97.6	94.6	91.1	83.1	68.9
St Jude Medical/ Abbott	3367-40C Quadra Assura	100.0	94.6	92.5	90.1	87.6	81.3	81.3	NaN	NaN
St Jude Medical/ Abbott	1211-36 Current VR	100.0	100.0	100.0	100.0	100.0	97.5	94.1	76.9	29.3
St Jude Medical/ Abbott	2277-36Q Ellipse	100.0	98.8	98.8	98.8	97.1	95.2	83.7	65.6	NaN
St Jude Medical/ Abbott	3251-40 Unify Quadra	98.6	98.6	96.9	92.9	82.7	74.4	56.3	27.6	NaN
St Jude Medical/ Abbott	2233-40 Fortify DR	100.0	100.0	100.0	97.2	94.0	89.2	85.9	84.1	75.8
St Jude Medical/ Abbott	1377-36C Ellipse VR	100.0	98.9	98.9	98.9	98.9	98.9	98.9	NaN	NaN
St Jude Medical/ Abbott	V-341 Atlas + DR	98.5	98.5	98.5	88.1	65.0	39.8	35.8	10.6	0.0
St Jude Medical/ Abbott	V-193 Atlas + VR	98.0	98.0	98.0	95.6	95.6	95.6	89.6	75.7	17.8
St Jude Medical/ Abbott	1359-40C Fortify Assura	100.0	100.0	97.8	96.2	90.1	90.1	90.1	NaN	NaN
St Jude Medical/ Abbott	1233-40Q Fortify	100.0	100.0	99.0	99.0	96.5	92.6	85.3	85.3	83.3
St Jude Medical/ Abbott	3239-40Q Promote	99.3	99.3	99.3	99.3	98.2	95.0	91.5	73.9	41.7
St Jude Medical/ Abbott	1211-36Q Current VR	99.2	99.2	99.2	99.2	97.1	96.0	94.5	90.2	58.7
St Jude Medical/ Abbott	3235-40Q Unify	100.0	100.0	100.0	98.8	93.6	82.2	64.8	37.9	25.2
St Jude Medical/ Abbott	V-168 Atlas 2 VR	100.0	100.0	100.0	97.4	94.7	88.3	76.6	28.6	NaN
St Jude Medical/ Abbott	3215-36 Promote HF	99.2	98.3	98.3	94.0	90.4	65.4	8.6	0.0	NaN
St Jude Medical/ Abbott	2377-36C Ellipse DR	100.0	100.0	100.0	100.0	100.0	100.0	90.9	NaN	NaN
St Jude Medical/ Abbott	3211-36 Promote	99.3	99.3	97.4	96.3	87.6	37.7	9.4	4.7	NaN
St Jude Medical/ Abbott	2211-36 Current + DR	99.3	99.3	98.5	98.5	98.5	89.7	67.8	29.4	13.6

Manuf	Model	Year 1 %	Year 2 %	Year 3 %	Year 4 %	Year 5 %	Year 6 %	Year 7 %	Year 8 %	Year 9 %
St Jude Medical/ Abbott	3371- 40C Quadra Assura MP	99.5	99.5	98.6	97.1	97.1	75.5	NaN	NaN	NaN
St Jude Medical/ Abbott	V-243 Atlas + DR	100.0	100.0	100.0	98.7	97.2	92.6	73.6	42.1	0.0
St Jude Medical/ Abbott	1359-40QC Fortify Assura	100.0	98.8	98.8	98.8	92.5	90.9	90.9	NaN	NaN
St Jude Medical/ Abbott	3211-36Q Promote	99.4	99.4	99.4	97.1	91.1	62.8	18.6	6.3	4.2
St Jude Medical/ Abbott	1207-36 Current VR	100.0	100.0	99.2	96.9	95.2	94.2	93.2	83.8	53.4
St Jude Medical/ Abbott	2359-40C Fortify Assura	97.9	95.7	94.2	93.0	91.3	91.3	91.3	NaN	NaN
St Jude Medical/ Abbott	3367-40QC Quadra Assura	100.0	98.3	94.6	93.6	91.0	87.1	85.1	NaN	NaN
St Jude Medical/ Abbott	3235-40 Unify	100.0	100.0	98.7	94.4	84.5	72.4	61.1	21.7	7.3
St Jude Medical/ Abbott	2233-40Q Fortify DR	99.5	99.0	98.4	94.8	92.1	84.7	80.1	77.4	62.4
St Jude Medical/ Abbott	V-367 Atlas II	99.5	98.2	94.8	83.2	54.0	29.9	14.2	0.5	0.5
St Jude Medical/ Abbott	V-268 Atlas II	100.0	100.0	99.1	98.1	87.1	64.4	14.9	NaN	NaN
St Jude Medical/ Abbott	3251-40Q Unify Quadra	99.7	97.5	96.4	94.8	91.8	89.1	73.7	38.7	22.6
St Jude Medical/ Abbott	3361-40QC Unify Assura	99.4	98.3	97.5	94.4	94.4	87.4	87.4	NaN	NaN
St Jude Medical/ Abbott	3361-40C Unify Assura	99.5	97.1	95.1	92.7	88.7	81.3	67.2	NaN	NaN
St Jude Medical/ Abbott	3213-36 Promote HF	99.6	99.3	98.0	96.6	86.2	57.4	19.2	7.5	1.7
St Jude Medical/ Abbott	2207-36 Current DR	99.6	99.6	99.6	96.7	95.0	90.7	79.7	35.8	0.0
St Jude Medical/ Abbott	2359-40QC Fortify Assura	99.8	99.5	98.5	95.7	94.4	92.5	91.5	NaN	NaN
St Jude Medical/ Abbott	2211-36Q Current + DR	100.0	100.0	99.7	99.7	98.4	94.2	85.1	42.3	7.2
St Jude Medical/ Abbott	1377-36QC Ellipse VR	100.0	100.0	99.7	99.7	99.7	99.7	99.7	NaN	NaN
St Jude Medical/ Abbott	2377-36QC Ellipse DR	99.7	99.5	99.5	99.3	99.3	98.6	96.7	NaN	NaN
St Jude Medical/ Abbott	3371-40QC Quadra Assura MP	99.6	99.4	98.9	98.1	97.2	92.7	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	14719	99.4
2	13488	98.3
3	12619	97.9
4	10697	97.5
5	8685	97.2
6	6803	96.9
7	5021	96.5
8	3419	96.0
9	2056	95.5
10	947	94.8



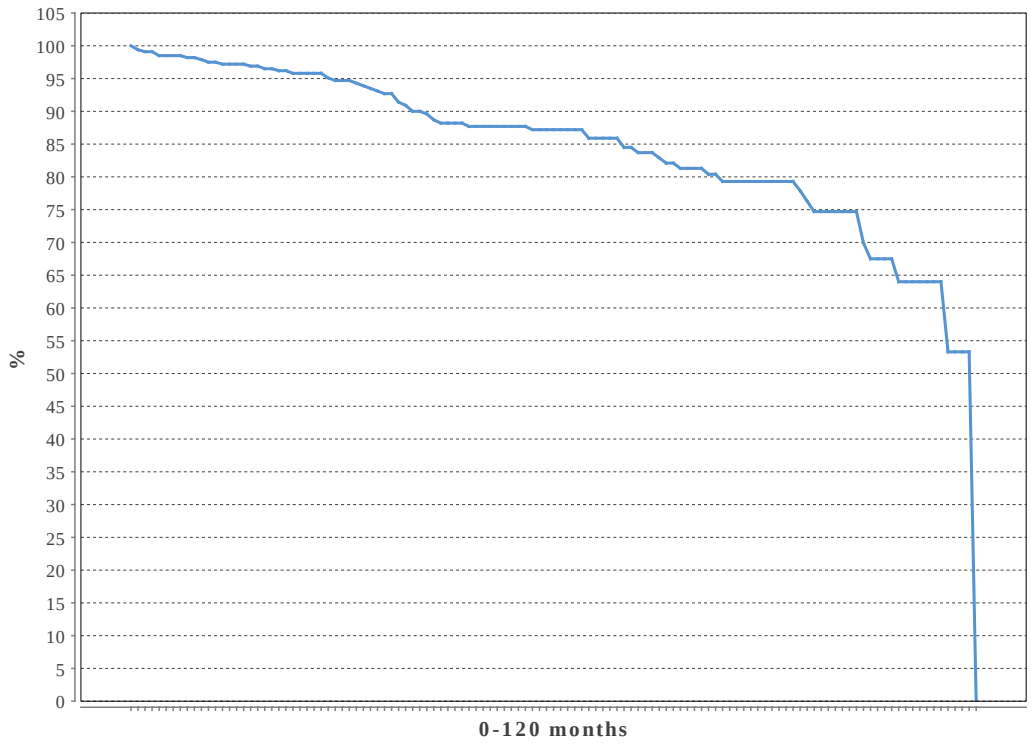
Models that have at least 50 implants and 20 explants

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
Biotronik	Protego DF4 ProMRI SD 65/18	96.6	96.6	95.6	94.5	94.5	93.1	93.1	NaN	NaN
Biotronik	Linox Smart ProMRI S65	99.5	99.5	97.6	97.6	96.9	96.9	96.9	96.9	NaN
Biotronik	Linox Smart SD 65/18	96.5	95.7	93.1	93.1	91.1	90.0	88.7	88.7	88.7
Biotronik	Linox Smart S75	98.2	97.9	97.9	97.9	97.9	97.4	96.9	95.9	94.6
Boston Scientific	0174 Reliance	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9
Boston Scientific	0292 Reliance	99.5	99.0	98.4	98.4	98.4	98.4	98.4	98.4	98.4
Boston Scientific	0692 Reliance	98.3	98.0	98.0	97.8	97.8	97.8	97.8	97.8	NaN
Medtronic	6948 Sprint Fidelis DF1	98.1	98.1	94.5	90.4	90.4	88.3	82.8	74.1	66.7
Medtronic	6944 Sprint Quattro DF1	97.5	96.8	96.0	96.0	92.8	90.1	88.7	88.7	88.7
Medtronic	6949 Sprint Fidelis DF1	97.0	94.7	92.0	85.9	84.9	81.3	76.8	76.8	68.3
Medtronic	6935 Sprint Quattro S MRI DF1	99.4	99.4	99.4	98.8	98.5	98.1	97.7	97.7	97.7
Medtronic	6947M Sprint Quattro S MRI DF4	99.2	99.1	99.1	99.1	98.9	98.9	98.9	98.9	98.9
Medtronic	6947 Sprint Quattro S MRI DF1	99.0	98.8	98.3	98.1	97.8	97.8	97.4	96.9	96.9
Medtronic	6935M Sprint Quattro S MRI DF4	99.5	99.5	99.3	99.1	98.9	98.9	98.9	98.9	NaN
St Jude Medical/ Abbott	1571 Riata	96.7	96.7	96.7	91.8	91.8	91.8	91.8	91.8	91.8
St Jude Medical/ Abbott	1581 Riata	95.9	95.9	95.9	93.1	90.1	86.5	86.5	73.6	55.2
St Jude Medical/ Abbott	7041 Riata ST	97.6	97.6	97.6	97.6	86.1	86.1	86.1	68.9	68.9
St Jude Medical/ Abbott	7172Q Durata	99.3	97.8	96.2	96.2	96.2	95.0	95.0	95.0	90.5
St Jude Medical/ Abbott	7001 Riata ST	94.5	94.5	94.5	94.5	94.5	91.1	86.3	86.3	86.3
St Jude Medical/ Abbott	7170 Durata	96.6	95.1	94.3	92.2	92.2	92.2	92.2	92.2	92.2
St Jude Medical/ Abbott	7122 Durata	99.0	98.5	97.5	97.5	97.2	96.7	96.0	94.3	92.8
St Jude Medical/ Abbott	7120Q Durata	98.3	97.8	97.7	97.5	97.3	96.7	96.2	96.2	96.2
St Jude Medical/ Abbott	7120 Durata	96.5	96.0	95.8	95.3	95.1	94.8	94.4	93.9	93.9
St Jude Medical/ Abbott	LDA210Q Optisure DF4	97.5	97.2	97.0	96.7	96.7	96.7	NaN	NaN	NaN

Manufacturer	Model	Years								
		1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)
St Jude Medical/ Abbott	7122Q Durata	98.1	97.7	97.4	97.3	97.3	97.3	97.0	97.0	97.0

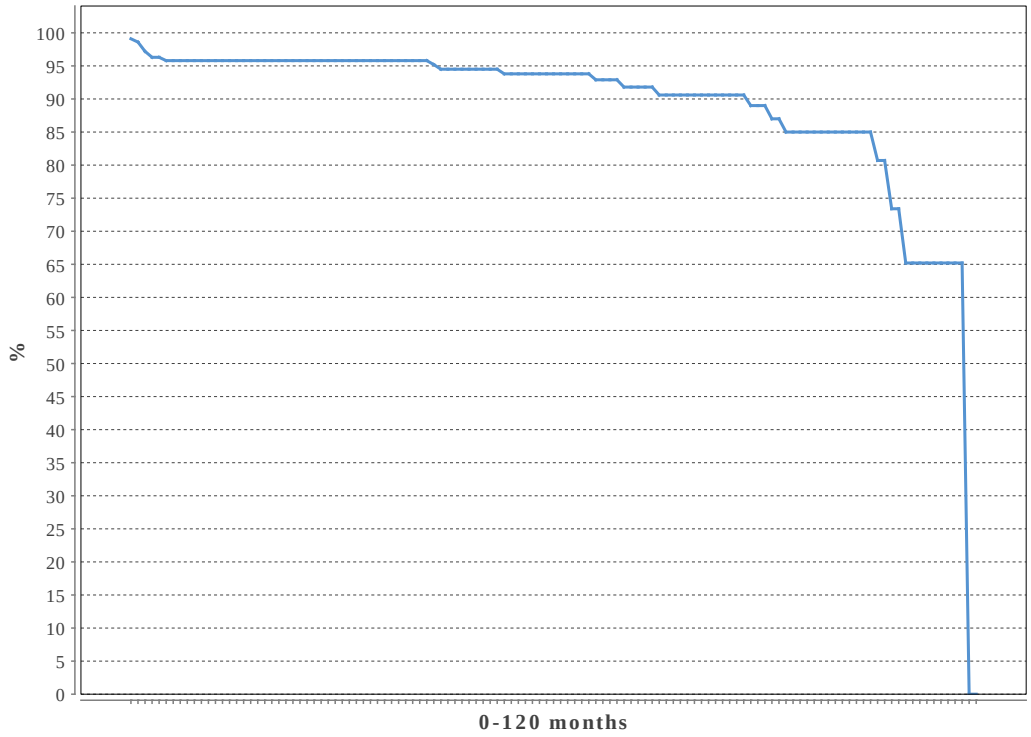
Survival probability for ICD lead Medtronic Sprint Fidelis. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	344	100.0
2	300	97.5
3	268	95.8
4	220	92.7
5	180	87.7
6	151	87.2
7	115	83.7
8	80	79.3
9	49	76.3
10	23	67.5



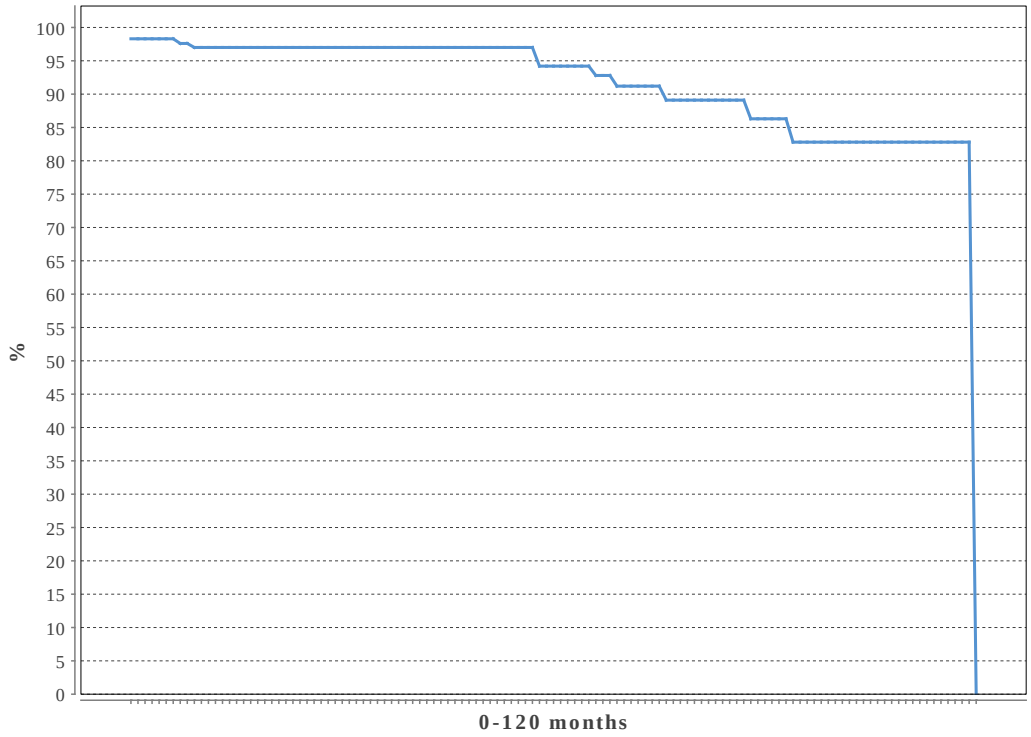
Survival probability for SJM lead type 1561,1570,1571,1572,1580,1581,1582,1591. Elective replacement and replacements due to infections and system changes have been considered as censored events.

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



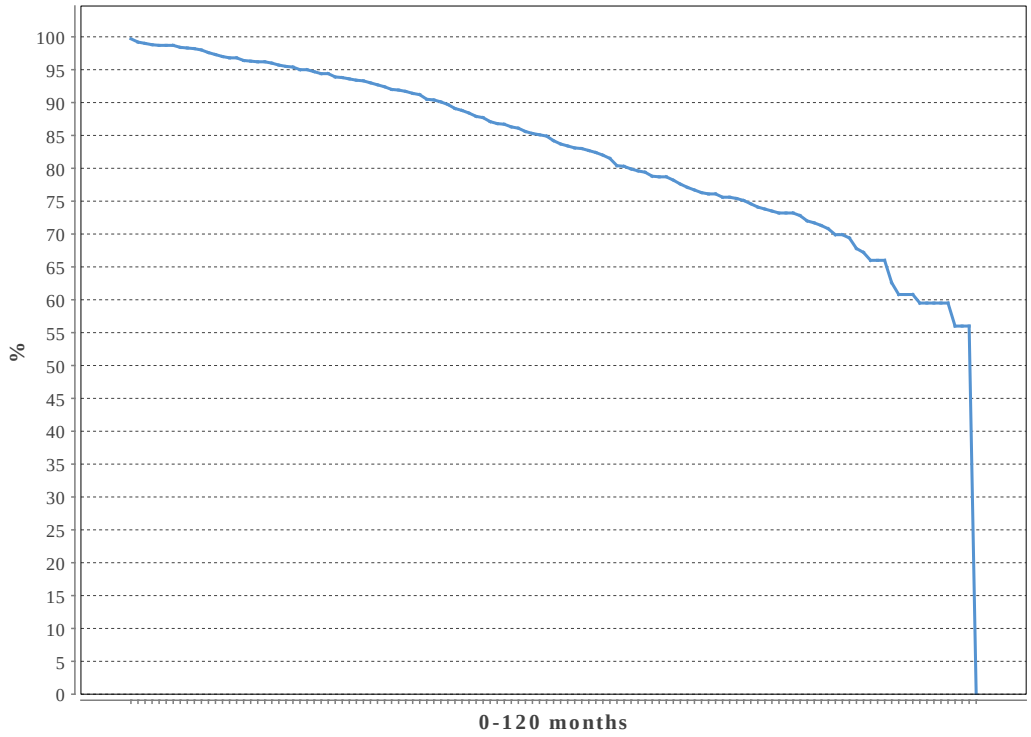
Survival probability for SJM lead type 7000,7001,7002,7040,7041,7042. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	175	98.3
2	139	97.0
3	127	97.0
4	113	97.0
5	91	97.0
6	69	94.2
7	53	91.2
8	38	89.1
9	22	82.8
10	12	82.8



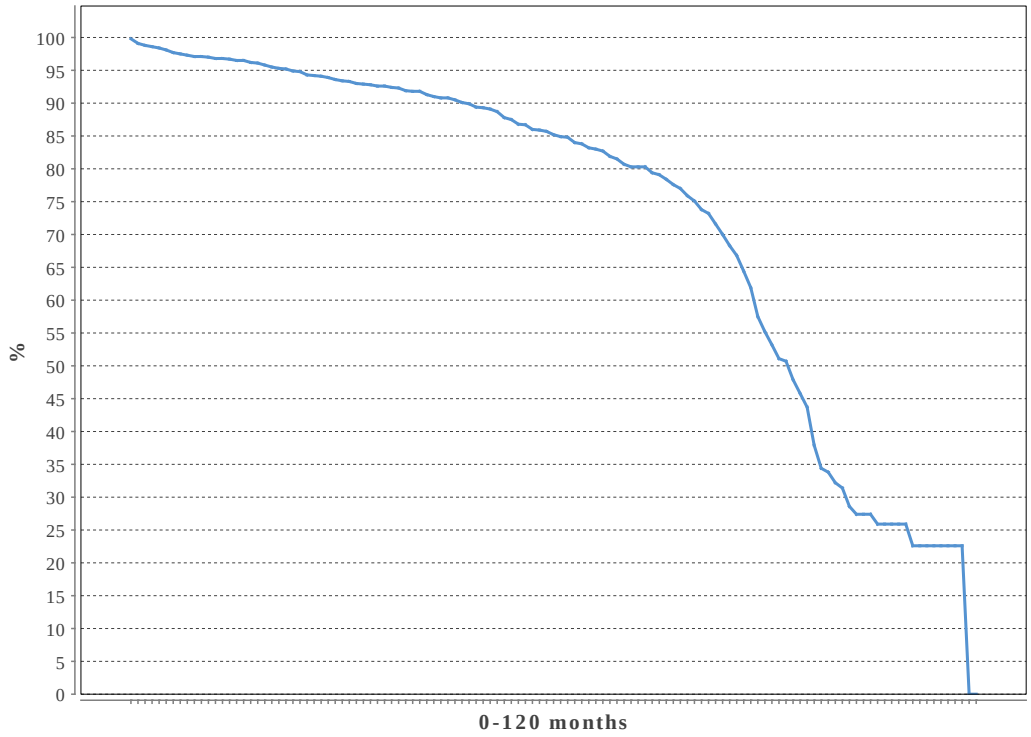
Survival probability for SJM ICD Fortify. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	1881	99.7
2	1727	97.3
3	1582	95.0
4	1402	92.4
5	1098	88.4
6	814	84.2
7	556	79.6
8	341	75.6
9	194	72.0
10	79	62.6



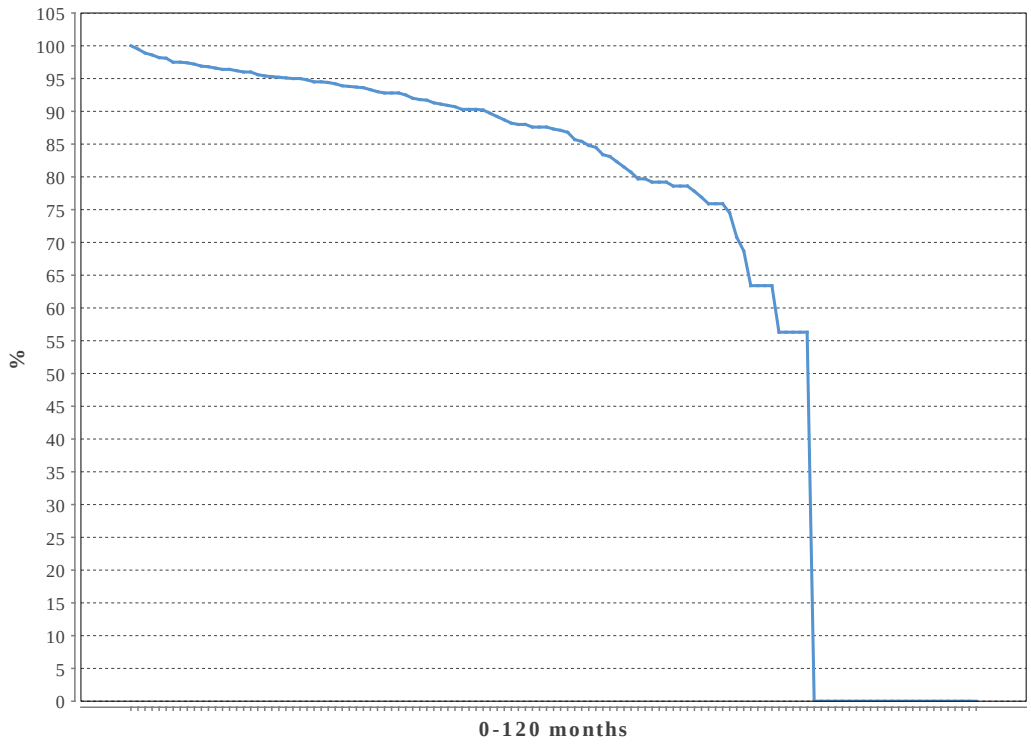
Survival probability for SJM ICD Unify. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	1842	99.8
2	1621	96.8
3	1435	94.8
4	1219	92.6
5	1005	89.9
6	723	85.2
7	506	80.3
8	308	70.0
9	90	43.7
10	14	25.9



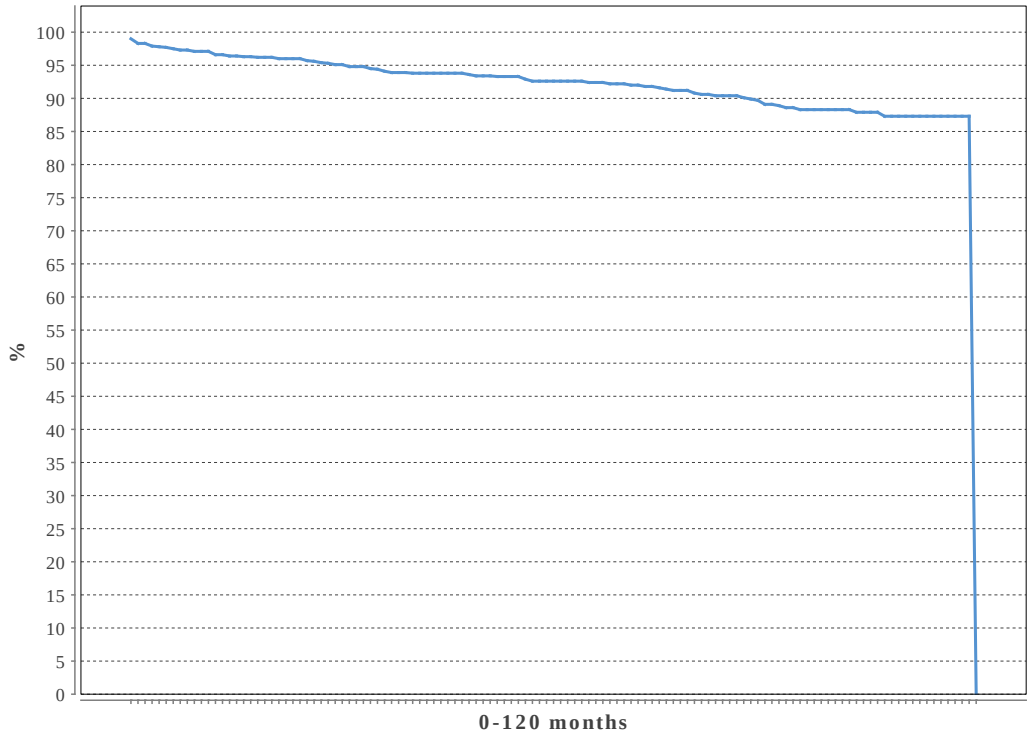
Survival probability for SJM ICD Quadra. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	1735	100.0
2	1464	96.6
3	1274	95.0
4	973	92.8
5	660	90.3
6	369	87.3
7	173	79.7
8	63	75.9
9	1	56.3
10	0	0.0



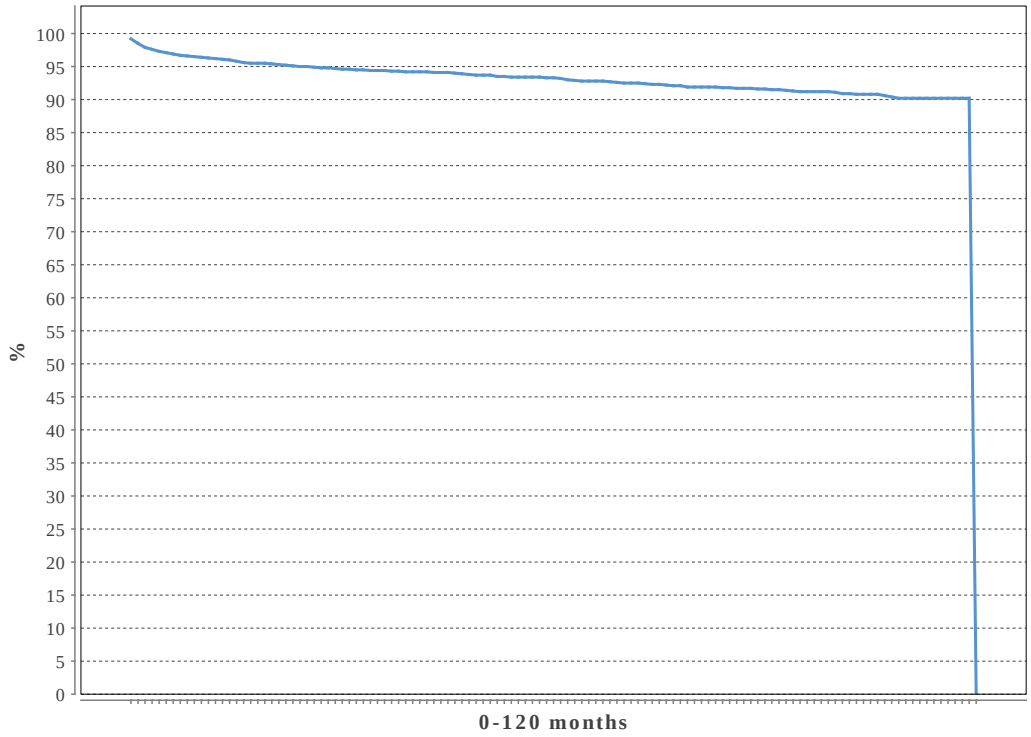
Survival probability for Biotronic ICD Linox. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	774	99.0
2	706	96.6
3	669	96.0
4	609	94.1
5	575	93.6
6	533	92.6
7	480	92.0
8	410	90.4
9	289	88.3
10	145	87.3



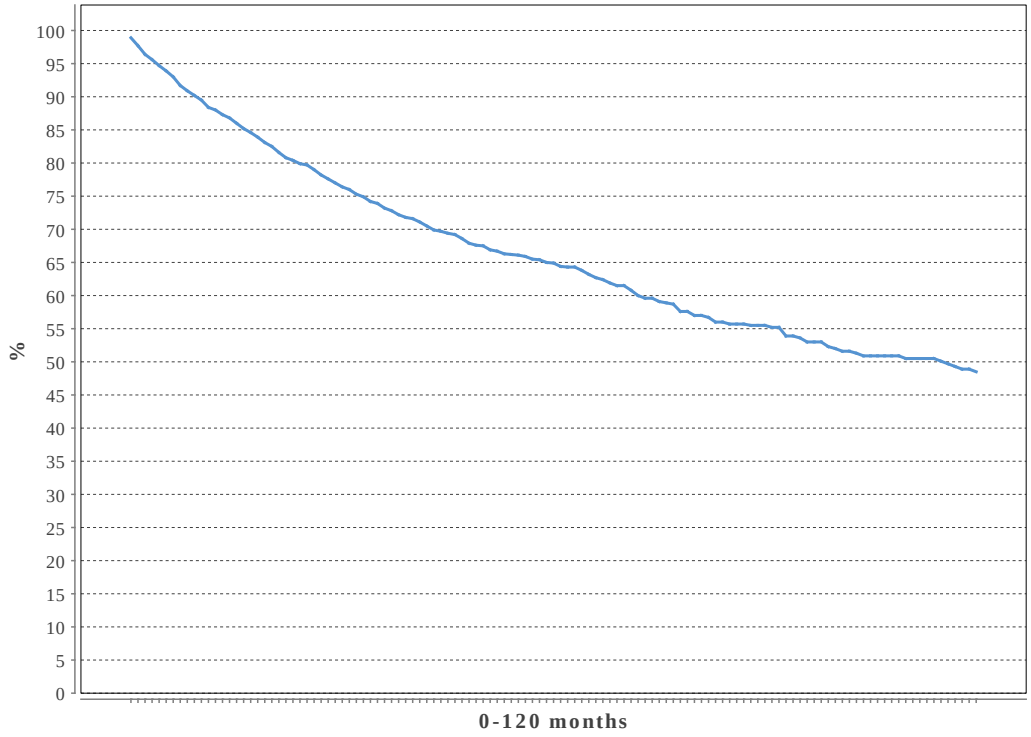
Survival probability for SJM ICDLEAD Durata. Elective replacement and replacements due to infections and system changes have been considered as censored events.

Year	At risk	Survival probability %
1	5401	99.2
2	4894	96.2
3	4570	95.0
4	4077	94.4
5	3481	93.8
6	2890	93.3
7	2180	92.5
8	1559	91.8
9	893	91.2
10	431	90.4



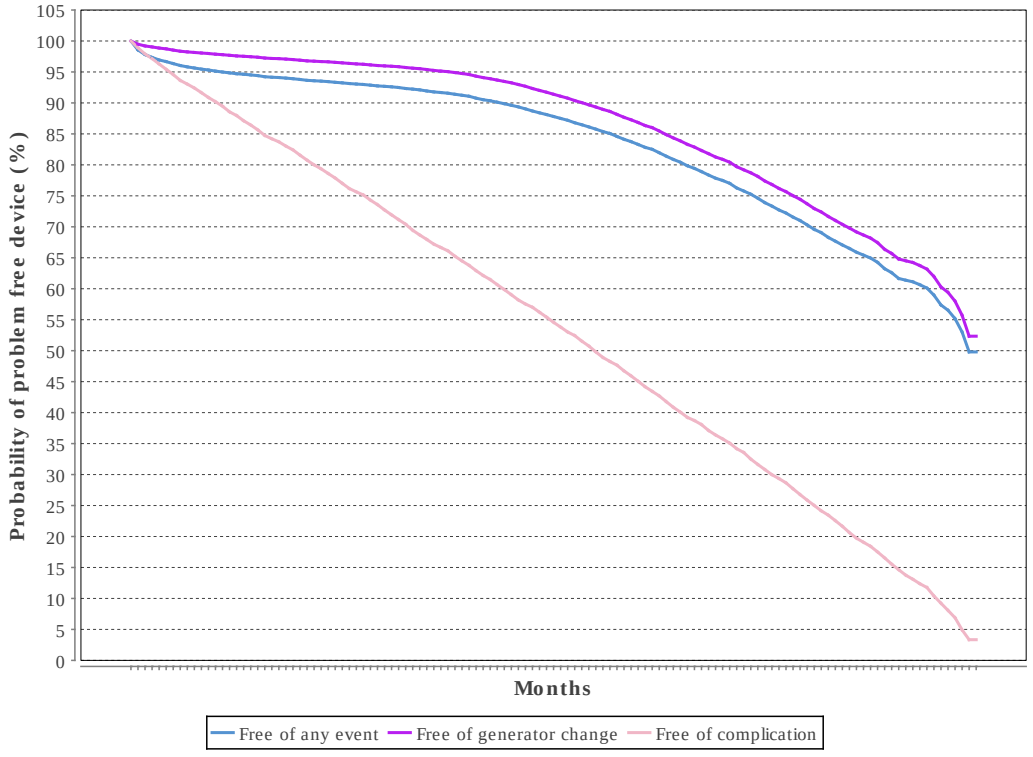
Based on all implants after 1990

Year	At risk	Survival probability %
1	1974	98.9
2	1671	88.0
3	1454	79.9
4	1169	73.2
5	855	67.9
6	566	64.9
7	358	60.0
8	225	56.0
9	167	53.0
10	138	50.9



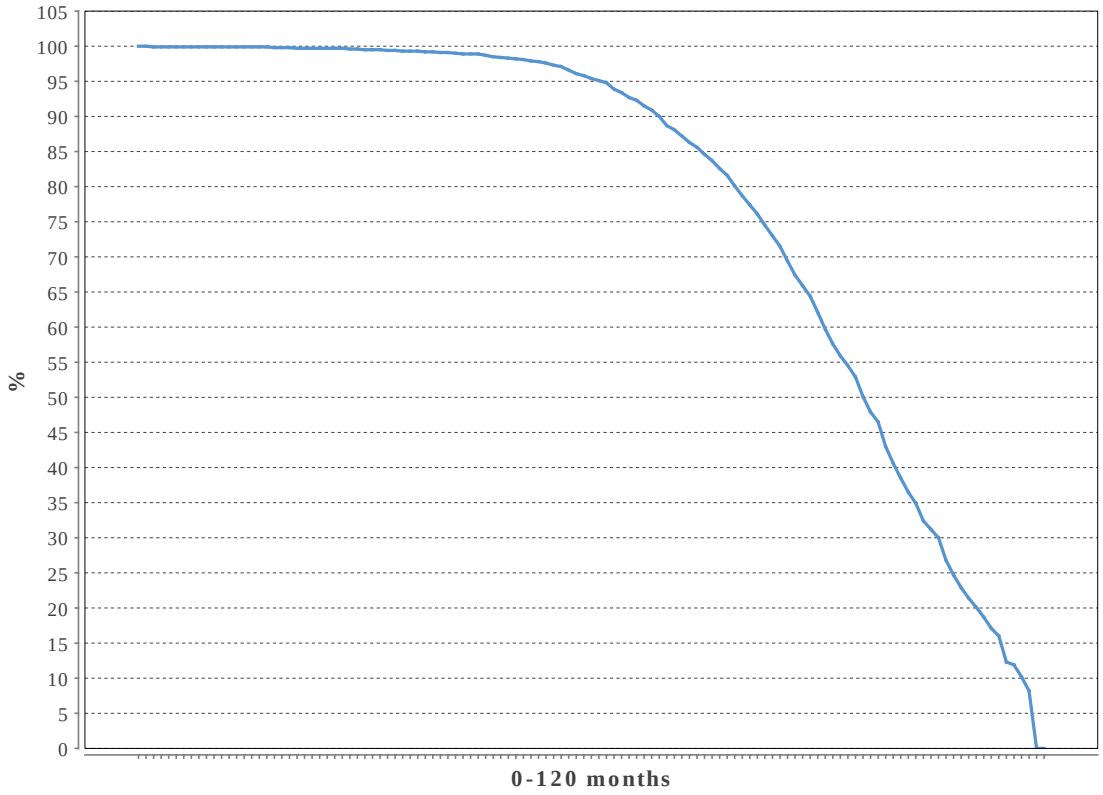
Probablility of event free CRT-device

Year	At risk	Free of any event %	Free of generator change %	Free of complication %
1	47865	95.1	97.9	90.2
2	39496	93.8	96.9	81.6
3	31897	92.7	96.0	72.7
4	24905	91.1	94.6	63.8
5	18613	87.8	91.4	54.6
6	12968	83.3	86.8	45.1
7	8200	77.5	80.9	35.8
8	4494	70.3	73.7	25.9
9	1832	62.6	65.7	15.5
10	149	49.8	52.3	3.3



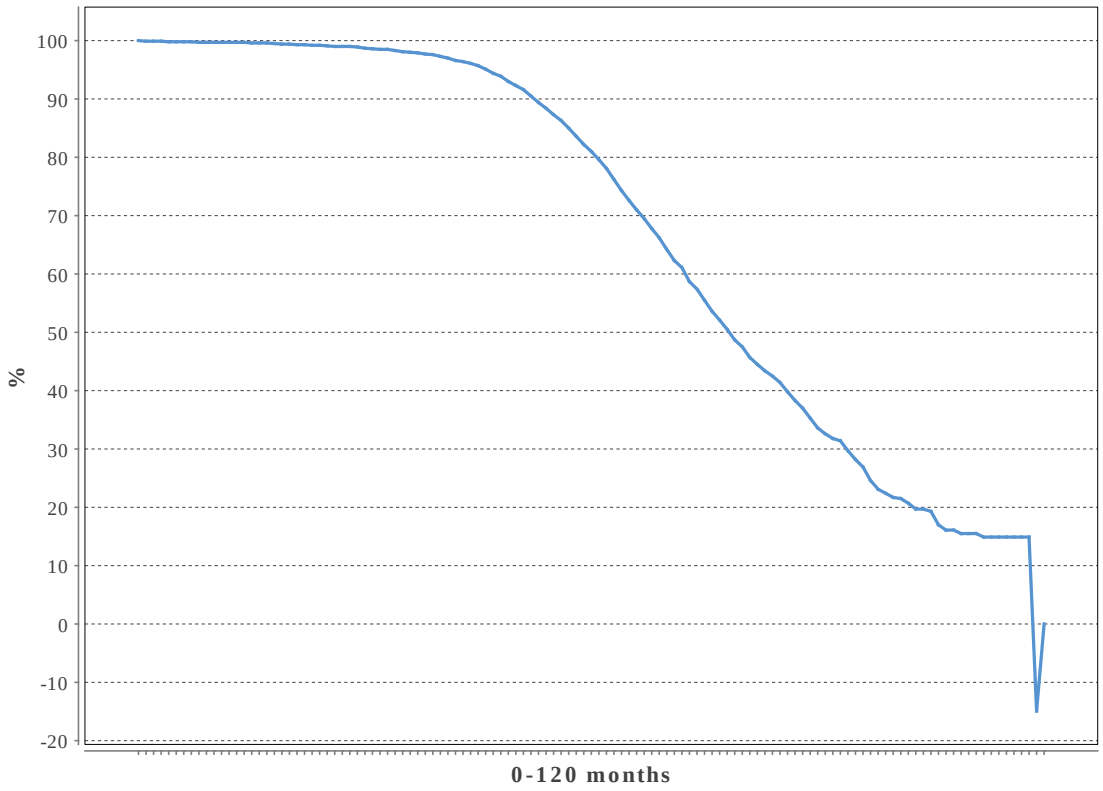
Overall CRT-P generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006

Year	At risk	Survival probability %
1	7188	100.0
2	6197	99.9
3	5316	99.7
4	4241	99.3
5	3278	98.4
6	2451	95.4
7	1642	87.2
8	995	73.0
9	435	50.1
10	117	24.7



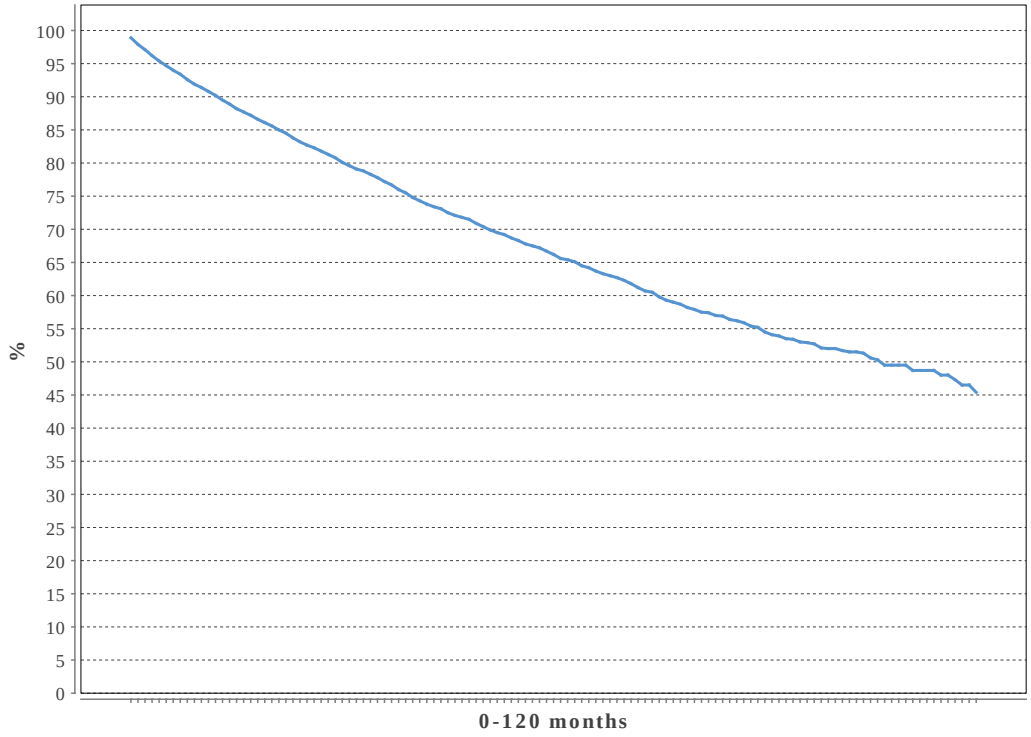
Overall CRT-D generator survival as a mean. Elective replacements and replacements due to infections and system changes have been considered as censored events. Based on all implants after 2006

Year	At risk	Survival probability %
1	8233	100.0
2	7286	99.7
3	6414	99.2
4	5250	98.0
5	3987	93.9
6	2524	81.0
7	1327	61.1
8	590	42.5
9	176	26.9
10	31	16.1



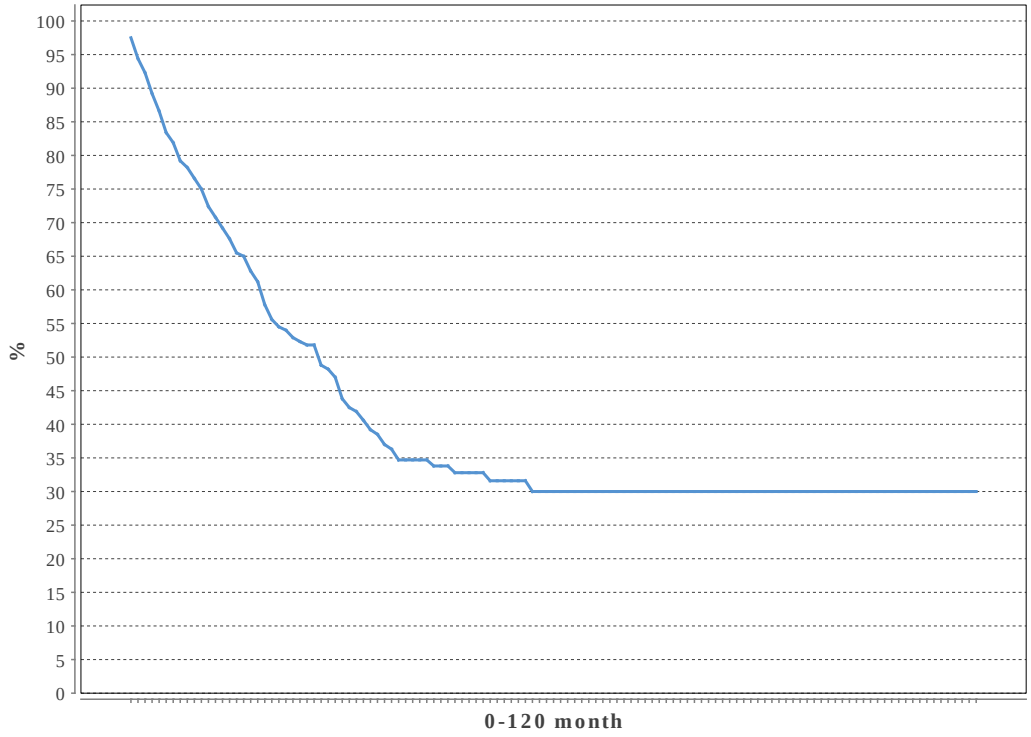
Overall patient survival probability for patients receiving CRT-P therapy. Based on all implants after 2006

Year	At risk	Survival probability %
1	7316	98.9
2	6271	90.2
3	5374	83.2
4	4265	77.2
5	3315	71.5
6	2471	66.2
7	1679	61.2
8	1043	56.9
9	468	52.9
10	165	49.5



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

Year	At risk	Survival probability %
1	200	97.5
2	138	70.8
3	97	52.3
4	54	37.0
5	32	32.8
6	18	30.0
7	15	30.0
8	14	30.0
9	13	30.0
10	13	30.0



QUALITY – DEAD WITHIN ONE YEAR FROM IMPLANT

Ratio of patients being dead one year after implantation

Type	Implants in 2020	Death within year	%
PM	10747	979	9.1
ICD	2410	117	4.9
CRT-P	670	71	10.6
CRT-D	659	22	3.3

Intervention ratio (primary/correction)

Region	Hospital	Type	Count
Norra Sverige	Norrlands Universitetssjukhus	PFE	248
	Norrlands Universitetssjukhus	PFG	63
	Örnsköldsviks sjukhus	PFE	94
	Örnsköldsviks sjukhus	PFG	9
	Östersunds sjukhus	PFE	177
	Östersunds sjukhus	PFG	36
	Skellefteå lasarett	PFE	81
	Skellefteå lasarett	PFG	9
	Sollefteå sjukhus	PFE	33
	Sunderby sjukhus	PFE	297
	Sunderby sjukhus	PFG	85
	Sundsvalls sjukhus	PFE	268
	Sundsvalls sjukhus	PFG	60
Södra Sverige	Blekingesjukhuset	PFE	248
	Blekingesjukhuset	PFG	62
	Centrallasarettet Växjö	PFE	157
	Centrallasarettet Växjö	PFG	36
	Centralsjukhuset Kristianstad	PFE	369
	Helsingborgs lasarett	PFE	293
	Helsingborgs lasarett	PFG	33
	Länssjukhuset Halmstad	PFE	130
	Skånes universitetssjukhus, Lund	PFE	568
	Skånes universitetssjukhus, Lund	PFG	321
	Skånes universitetssjukhus, Malmö	PFE	237
	Skånes universitetssjukhus, Malmö	PFG	42
	Varbergs sjukhus	PFE	210
	Varbergs sjukhus	PFG	78
Stockholm/Gotland	Danderyds sjukhus	PFE	612
	Danderyds sjukhus	PFG	101
	Karolinska Huddinge	PFE	291
	Karolinska Huddinge	PFG	97
	Karolinska Solna	PFE	397
	Karolinska Solna	PFG	158
	Södersjukhuset	PFE	379
	Södersjukhuset	PFG	66
	St Görans sjukhus	PFE	374
	St Görans sjukhus	PFG	67
	Visby lasarett	PFE	49
	Visby lasarett	PFG	4
Sydöstra Sverige	Länssjukhuset Kalmar	PFE	156
	Länssjukhuset Kalmar	PFG	70
	Länssjukhuset Ryhov	PFE	289
	Länssjukhuset Ryhov	PFG	47
	Linköpings universitetssjukhus	PFE	514
	Linköpings universitetssjukhus	PFG	125
	Västerviks sjukhus	PFE	52
Uppsala/Örebro	Akademiska sjukhuset	PFE	475
	Akademiska sjukhuset	PFG	90
	Arvika sjukhus	PFE	1
	Centralsjukhuset Karlstad	PFE	263

Region	Hospital	Type	Count
	Centralsjukhuset Karlstad	PFG	57
	Centralsjukhuset Västerås	PFE	225
	Centralsjukhuset Västerås	PFG	51
	Falu lasarett	PFE	321
	Falu lasarett	PFG	92
	Gävle sjukhus	PFE	302
	Gävle sjukhus	PFG	96
	Hudiksvalls sjukhus	PFE	79
	Hudiksvalls sjukhus	PFG	13
	Mälarsjukhuset	PFE	248
	Mälarsjukhuset	PFG	54
	Torsby sjukhus	PFE	47
	Universitetssjukhuset Örebro	PFE	283
	Universitetssjukhuset Örebro	PFG	74
Utland	Ålands centralsjukhus	PFE	33
	Ålands centralsjukhus	PFG	3
	Utland	PFE	5
	Utland	PFG	4
Västra Sverige	Alingsås lasarett	PFE	106
	Drottning Silvias Bus	PFE	23
	Kungälvs sjukhus	PFE	158
	Sahlgrenska universitetssjukhuset	PFE	616
	Sahlgrenska universitetssjukhuset	PFG	115
	Sahlgrenska universitetssjukhuset /Östra	PFE	23
	Skaraborgs sjukhus Skövde	PFE	273
	Skaraborgs sjukhus Skövde	PFG	57
	Södra Älvsborgs sjukhus	PFE	246
	Södra Älvsborgs sjukhus	PFG	46
	Trollhättan, NÄL	PFE	366
	Trollhättan, NÄL	PFG	53