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The EHRA White Book 2016

The Current Status of Cardiac Electrophysiology
in ESC Member Countries

G. Hindricks, J. Camm, B. Merkely, P. Raatikainen, D. O. Arnar



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Preface – The EHRA White Book 2016

The ninth edition of the White Book of the European Heart Rhythm Association (EHRA) provides comprehensive data on electrophysiological procedures and implantation of cardiac implantable electronic devices (CIEDs) in the European Society of Cardiology (ESC) area. The White Book has become a key reference for those seeking information about invasive arrhythmia therapies. No other publication provides up-to-date information on the procedure numbers and educational requirements along with key demographic information and national healthcare statistics.

The EHRA White Book represents a successful and tangible attempt by the leading European professional arrhythmia society to serve its principal mission – to improve the quality of life of the European population by reducing the impact of cardiac arrhythmias and reduce sudden cardiac death. The EHRA White Book is an important reference to monitor the trends in treatment of cardiac arrhythmias in ESC countries as well as to identify possible obstacles to ESC Guidelines implementation in each country.

The data collection is mostly the result of voluntary participation of each National Working Group on Arrhythmias or the National Cardiac Societies. In the vast

majority of the ESC countries, well established centralised databases of both CIEDs and catheter ablation procedures do exist. The databases are often created and maintained by the National Working Group on Arrhythmias and Electrophysiology and/or the National Cardiac Society. However, in some ESC countries no registries are available and the data may be limited. In these cases estimates are provided and clearly indicated where this is the case. The EHRA White Book might serve as motivation and a template for these countries to adopt a systematic approach to key data on arrhythmia therapy. Despite the heterogeneous source of information, there is consistency in the data collection over the years that enables comparison on a year to year basis. This year's edition includes data from 50 countries of the 56 ESC countries.

The EHRA White Book has been made possible thanks to the efforts of several key contributors. EHRA is grateful to the chairs and co-chairs of the National Working Groups for their continuous support and contribution to White Book. We also like to thank the EHRA staff at the European Heart House, and last but not least the project sponsor, BIOTRONIK SE & Co. KG company and in particular Anja Thümen and Robert Wüstenberg. To all of them, we extend our deepest gratitude and appreciation.

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2. Scope and Methodology



2. Scope and Methodology

The EHRA White Book 2016 is the 9th edition of a project that was launched in an attempt to understand the national realities with regard to treatment of cardiac arrhythmias.

Every year EHRA invites all the countries member of the European Society of Cardiology to participate in this project. This year the data were collected in the period from February 2016 to May 2016. Like in the past most of the ESC countries provided up-to-date data for this year's edition.

In this edition, the following sections are available for all participating countries:

1. **Statistics information**
2. **Country**
3. **Healthcare system**
4. **Education & Quality Control**
5. **Pacemakers**
6. **Cardiac resynchronization therapy devices**
7. **Implantable cardiac defibrillator**
8. **Loop recorders**
9. **Lead extractions**
10. **Device specific information**
11. **Interventional electrophysiology**
12. **Guidelines**
13. **Sources**

Since the beginning of the project in 2008 the data for the EHRA White Book have been collected by surveying national cardiology societies and working groups of cardiac pacing and electrophysiology of each country.

The chairmen of the societies and/or working groups were responsible for compiling information about their country based on a questionnaire. The data gathered by the societies and working groups were mainly from national registries and national health institutions.

Simultaneously, a secondary investigation was conducted to cross verify and build the quantitative and qualitative information contained in the book. Once the data collection was complete, the national societies or working groups were asked to authorise the publication of the information.

3. Sources for Demographic Information



3. Sources for demographic information

The demographic information for each country was taken from the following sources:

Age pyramid

United States Census Bureau (Homepage)	http://www.census.gov/ipc/www/idb/informationGateway.php	February 12, 2016
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Healthcare data

Hospitals (per 100 000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfad/	February 16, 2016
Beds (per 100 000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfad/	February 16, 2016
Density of physicians (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfad/	February 16, 2016
Density of nurses (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfad/	February 16, 2016

Demographic information

Population	United States Census Bureau (Homepage) http://www.census.gov/ipc/www/idb/informationGateway.php	February 17, 2016
Population annual growth rate (%)	United States Census Bureau (Homepage) http://www.census.gov/ipc/www/idb/informationGateway.php	February 17, 2016
Life expectancy at birth (in years)	United States Census Bureau (Homepage) http://www.census.gov/ipc/www/idb/informationGateway.php	February 17, 2016
Death rate (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfad/	February 16, 2016
Live births (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfad/	February 17, 2016

Economic information

Gross domestic product (U.S. dollar-billions)	International Monetary Fund (IMF) http://www.imf.org/external/ns/cs.aspx?id=28	February 17, 2016
Gross domestic product per capita (U.S. dollar-units)	International Monetary Fund (IMF) http://www.imf.org/external/ns/cs.aspx?id=28	February 17, 2016
Total expenditure on health as % of GDP	European health for all database (HFA-DB) http://data.euro.who.int/hfad/	February 17, 2016
General government expenditure on health as % of total expenditure on health	WHO -World Health Statistics Report 2015; Section 7;	February 17, 2016
Private expenditure on health as % of total expenditure on health	WHO -World Health Statistics Report 2015; Section 7;	February 17, 2016

4. ESC Countries Overview

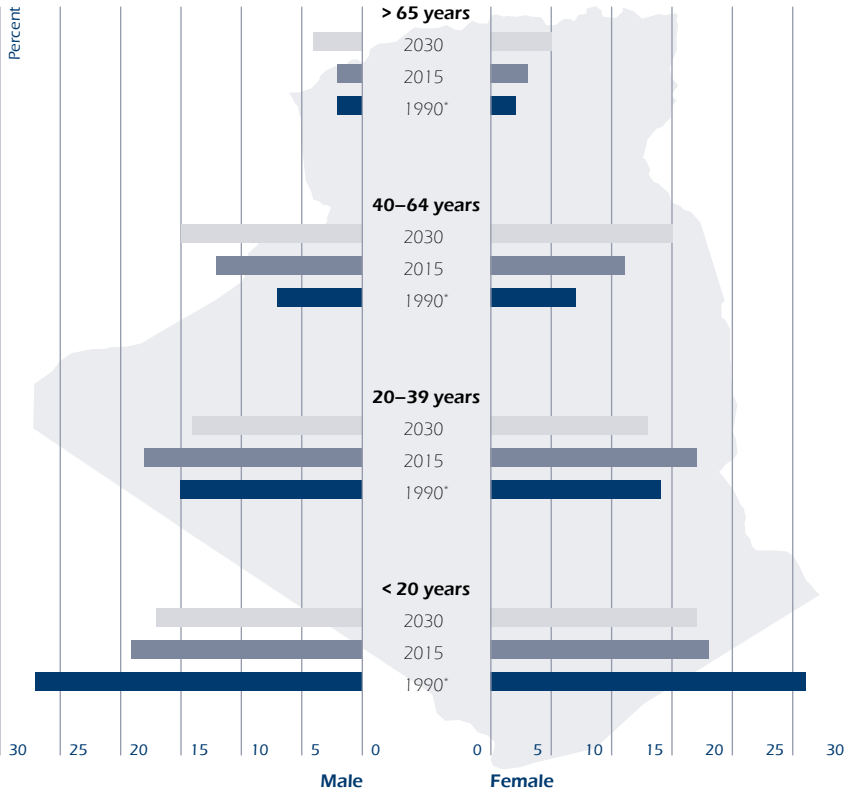


ALGERIA



1. Statistics

Age pyramid for Algeria



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available

Demographic information		Year
Population	39.542.166	2015
Population annual growth rate (%)	1,9	2015
Life expectancy at birth (in years)	77	2015
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available

Economic information		Year
Gross domestic product (U.S dollar-billions)	175,08	2015*
Gross domestic product per capita (U.S dollar-units)	4.345,43	2015*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	73,5	2012
Private expenditure on health as % of total expenditure on health	26,5	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

Public facilities and some small to middle sized private clinics

Basic insurance availability	Yes
Requirements for citizens to qualify for public insurance: To provide vaccinations, coverage of communicable diseases and the main chronic diseases (diabetes...)	

Percentage of insured and uninsured citizens	2014	2015
Insured citizens	70%	70%
Uninsured citizens	30%	30%

Distribution of insurance modality	2014	2015
Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	Yes
Ablation	No

Comments: Pacemakers in private structures. ICD and ablation only in public hospitals

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: Physicians receive salaries in public structures; Coverage by hospitals according to their own budget



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: Consensus between physicians to follow ESC guidelines

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Yes	Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No

Suggested period of training to perform implantations	Yes
	1 year

National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
To be defined	
Training centres availability	
Pacemaker	11
ICD implantation	7
CRT implantation	3
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	10
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	19	19
Total Pacemaker units implanted	2.508	2.915
Thereof, Leadless Pacemaker	not available	0
First implants	1.957	2.303
Replacements	551	612
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	8	8
Total CRT units implanted	56	108
Thereof, CRT pacemaker	20	53
Thereof, CRT ICD	36	55
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	8	9
Total ICD units implanted	60	91
Thereof, Single chamber	25	76
Thereof, Dual chamber	35	15
Thereof, Subcutaneous ICD	not available	0
First implants	50	85
Replacements	10	6
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	1
Total loop recorders implanted	6	15
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	2	3
Total lead extraction procedures	56	41

Specialist performing lead extractions		
Cardiologists	Yes	97%
Surgeons	Yes	3%

10. Device specific

Availability of remote monitoring of devices		No answer
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	2	3
Number of ablations performed	240	303
Mean number of ablations per centre	120	101
Number of AF ablations	0	0
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	5	8
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	3	5
Number of physicians under training to become independent electrophysiologists	5	4

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Algerian Society of Cardiology Working Group on Cardiac arrhythmias

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Survey from professional association

Sales data

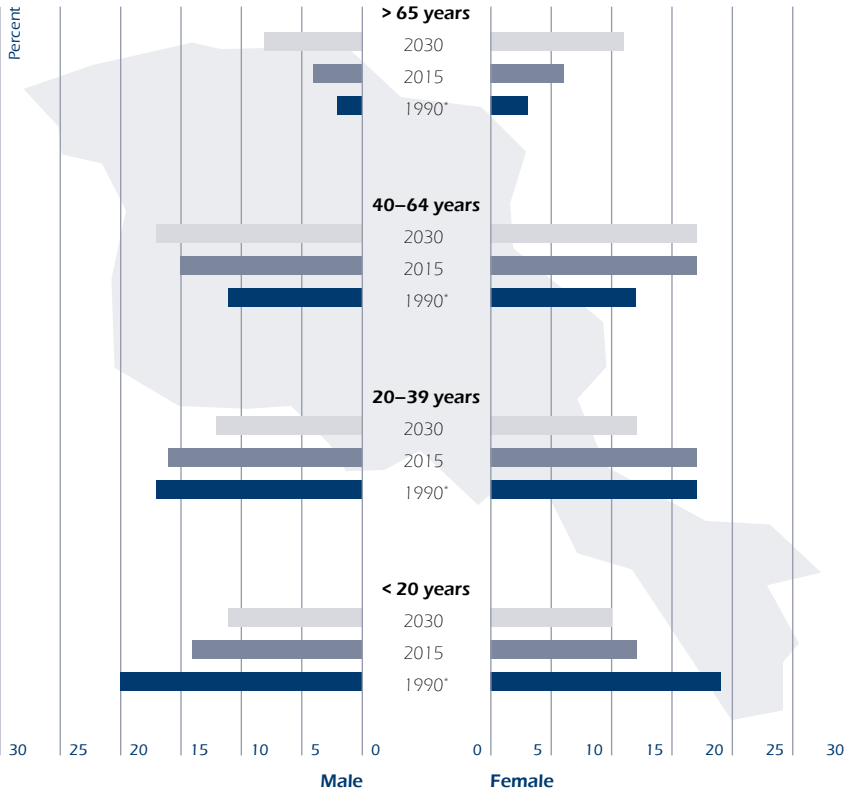
Estimation

ARMENIA



1. Statistics

Age pyramid for Armenia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	4,3	2013
Beds (per 100.000 population)	406,0	2013
Density of physicians (per 1.000 population)	2,8	2013
Density of nurses (per 1.000 population)	5,0	2013

Demographic information		Year
Population	3.056.382	2015
Population annual growth rate (%)	-0,1	2015
Life expectancy at birth (in years)	74	2015
Death rate (per 1.000 population)	9,1	2012
Live births (per 1.000 population)	13,8	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	10,61	2015*
Gross domestic product per capita (U.S dollar-units)	3,546,95	2015*
Total expenditure on health as % of GDP	4,5	2013
General government expenditure on health as % of total expenditure on health	41,8	2012
Private expenditure on health as % of total expenditure on health	58,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	48%	48%

3. Healthcare System

The Armenian healthcare system contains of two parts: state and private health system. Medical care is financed by state in some: 1) children 0-7 years old, 2) some emergency medical care (co-payment); 3) military men (co-payment); 4) risk groups (very few income).

Basic insurance availability	No
-------------------------------------	-----------

Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	25%	33%
Uninsured citizens	75%	67%

Distribution of insurance modality		
	2014	2015
Public insurance company	0%	0%
Private insurance company	100%	100%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cardiology
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yerevan State medical University after M.Heracy

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for	
	Specialist
Catheter ablation	No
ICD or pacemaker implants	No

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No
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Willingness to install quality control system	Yes
Responsible person for quality control	
Perhaps the Armenian Arrhythmological Association	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	1
Percentage of academic centres among all practicing EP centres	50%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	2
Total Pacemaker units implanted	129	117
Thereof, Leadless Pacemaker	not available	0
First implants	101	107
Replacements	28	10
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	2
Total CRT units implanted	4	10
Thereof, CRT pacemaker	0	1
Thereof, CRT ICD	4	9

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	3
Total ICD units implanted	25	21
Thereof, Single chamber	4	5
Thereof, Dual chamber	21	16
Thereof, Subcutaneous ICD	not available	0
First implants	14	17
Replacements	11	4

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total loop recorders implanted	12	0

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	0	0
Total lead extraction procedures	0	0

Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices	No
Reasons why remote monitoring is not available: We have not the monitoring system of devices	

National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
--	----



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	3	3
Number of ablations performed	132	48
Mean number of ablations per centre	44	16
Number of AF ablations	11	1
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	12	2
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	8	4
Number of physicians under training to become independent electrophysiologists	1	2

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National						No
U.S.						No
European						Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Armenian Arrhythmological Association

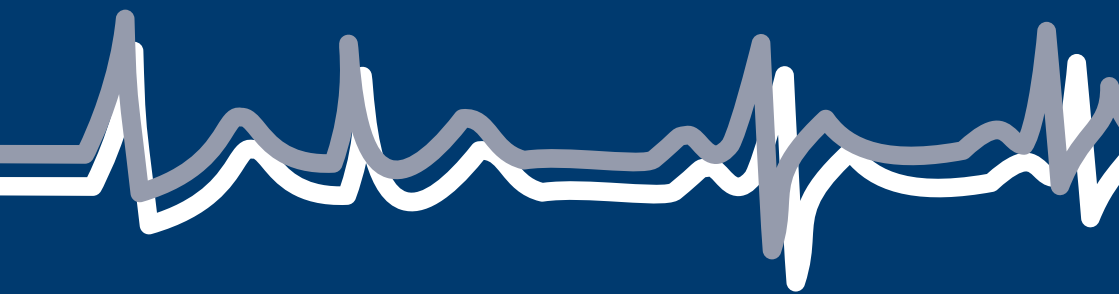
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

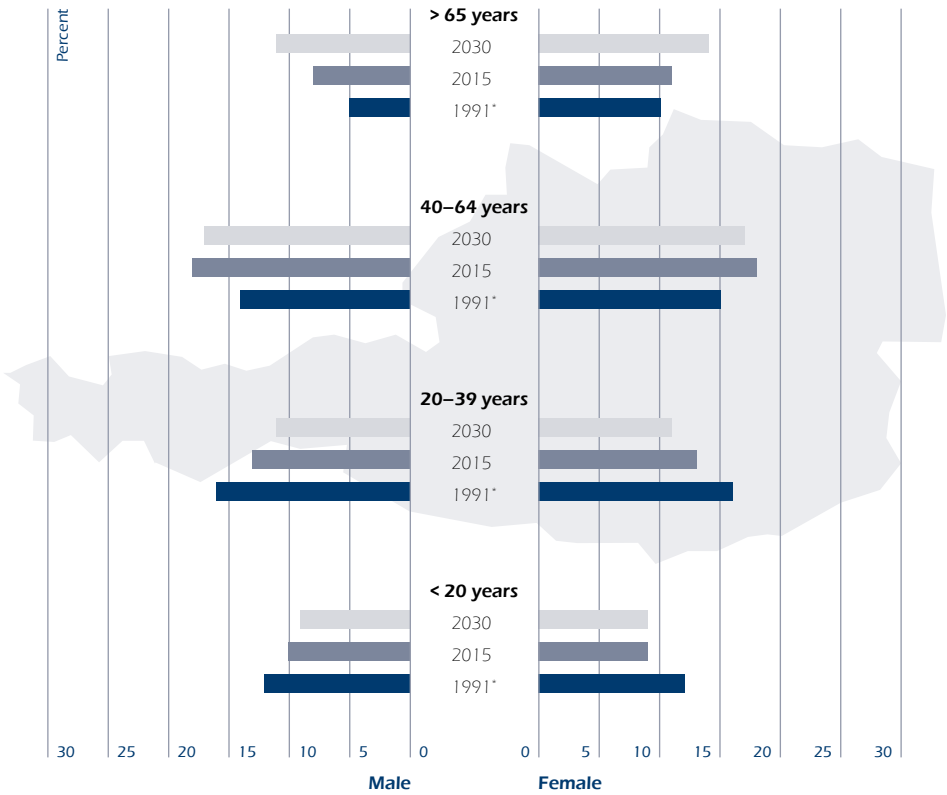
Survey from professional association

AUSTRIA



1. Statistics

Age pyramid for Austria



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,3	2013
Beds (per 100.000 population)	764,7	2013
Density of physicians (per 1.000 population)	5,0	2013
Density of nurses (per 1.000 population)	8,0	2013

Demographic information		Year
Population	8.665.550	2015
Population annual growth rate (%)	0,6	2015
Life expectancy at birth (in years)	81	2015
Death rate (per 1.000 population)	9,2	2014
Live births (per 1.000 population)	9,6	2014

Economic information		Year
Gross domestic product (U.S dollar-billions)	372,61	2015*
Gross domestic product per capita (U.S dollar-units)	43.546,60	2015*
Total expenditure on health as % of GDP	11,0	2013
General government expenditure on health as % of total expenditure on health	75,9	2012
Private expenditure on health as % of total expenditure on health	24,1	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	43%	42%

3. Healthcare System

The Austrian healthcare system is characterized by the federalist structure of the country, the delegation of competencies to self-governing stakeholders in the social insurance system as well as by cross-stakeholder structures at federal and Länder level which possess competencies in cooperative planning, coordination and financing. According to the Federal Constitution, almost all areas of the healthcare system are primarily the regulatory responsibility of the federal government. The most important exception is the hospital sector. In this area, the federal government is only responsible for enacting basic law, legislation on implementation and enforcement is the responsibility of the nine Länder. In the outpatient sector, but also in the rehabilitation sector and in the field of medicines, healthcare is organized by negotiations between the 21 health insurance funds and the Federation of Austrian Social Insurance Institutions on the one hand and the chambers of physicians and pharmacists (which are organized as public-law bodies) and the statutory professional associations of midwives or other health professions on the other. The various sectors of the health care system have traditionally been characterized by different stakeholders and regulation- and financing mechanisms. However, in recent years there have been increased efforts to introduce decision-making and financing flows which are effective across all sectors. Since 2002, all the Länder (except Vienna) as well as some of the private non-profit owners have privatized their hospitals, mainly in the form of organizational privatizations. The various private operating companies have one thing in common: they are responsible for the management of hospitals, whereas the Länder or local authorities as (majority) owners usually act as a guarantor. The Austrian healthcare system has developed almost completely into a model which is mainly based on decentralized contracts with all service providers. [Health systems in transition, Hofmarcher 2006]

Basic insurance availability		Yes
All citizens with a minimum salary / payment of 416 Euro qualify for public healthcare insurance.		
Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	98%	98%
Uninsured citizens	2%	2%
Distribution of insurance modality		
	2014	2015
Public insurance company	65%	99%
Private insurance company	0%	0%
Private co-payment	35%	0%
Possibility to subscribing to private health insurance plans		Yes
Co-payment necessary for the following therapy		
ICD devices		No
Pacemakers		No
Ablation		No



Reimbursement availability for physicians and hospitals									
	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer		
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital	
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ICD and PM Accreditation
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EP Accreditation
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, surgeon
Official national competency guidelines for electrophysiological studies or catheter ablation		No
Required period of training to perform implantations		No
Suggested period of training to perform implantations		No
National quality control system availability		No
Willingness to install quality control system		Yes
Responsible person for quality control		
No answer		
Training centres availability		
Pacemaker		57
ICD implantation		not available
CRT implantation		not available
Electrophysiological studies and catheter ablation		19
Atrial fibrillation ablation		13
Number of universities (Schools of Medicine)		5
Percentage of academic centres among all practicing EP centres		26%
Percentage of academic centres among all practicing implanting devices centres		9%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	57	57
Total Pacemaker units implanted	8.272	7.905
Thereof, Leadless Pacemaker	not available	not available
First implants	5.944	5.711
Replacements	2.328	2.194

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	18	18
Total CRT units implanted	1.236	1.364
Thereof, CRT pacemaker	420	470
Thereof, CRT ICD	816	894

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	21	21
Total ICD units implanted	1.362	1.393
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	976	1.045
Replacements	386	348

Specialist performing implants		
Cardiologists	Yes	10%
Surgeons	Yes	90%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	25	25
Total loop recorders implanted	509	893

Specialist performing implants		
Cardiologists	Yes	80%
Surgeons	Yes	20%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	5
Total lead extraction procedures	280	250

Specialist performing lead extractions		
Cardiologists	Yes	10%
Surgeons	Yes	90%



10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for

		Official name
ICD	Yes	
Pacing	Yes	
Electrophysiology	Yes	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
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11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	17	19
Number of ablations performed	2.622	2.777
Mean number of ablations per centre	154	146
Number of AF ablations	878	966
Number of ablation centres (> 50 AF ablations)	12	8
Number of VT/VF ablations	83	95
Number of ablation centres (> 10 VT ablations on structural heart diseases)	3	4
Number of LAA closures	not available	50
Number of centres (LAA closures)	not available	10

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	35	46
Number of physicians under training to become independent electrophysiologists	10	17

Availability of a national registry for interventional electrophysiology	Yes
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Official name: EP Registry of the Working Group of Rhythmology

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle

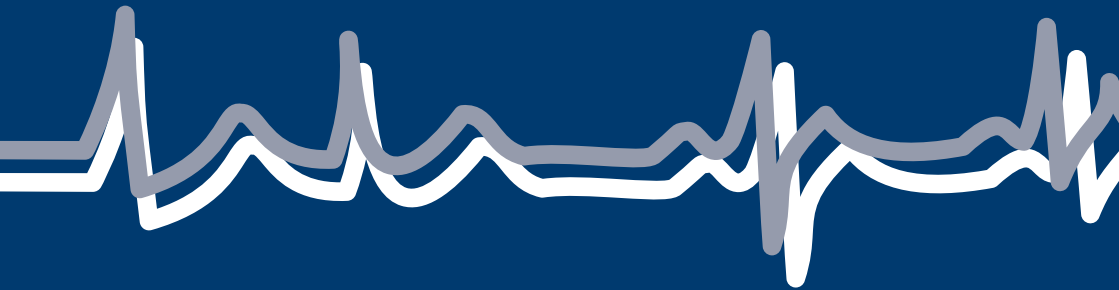
1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Working Group of Rhythmology, Austrian Society of Cardiology

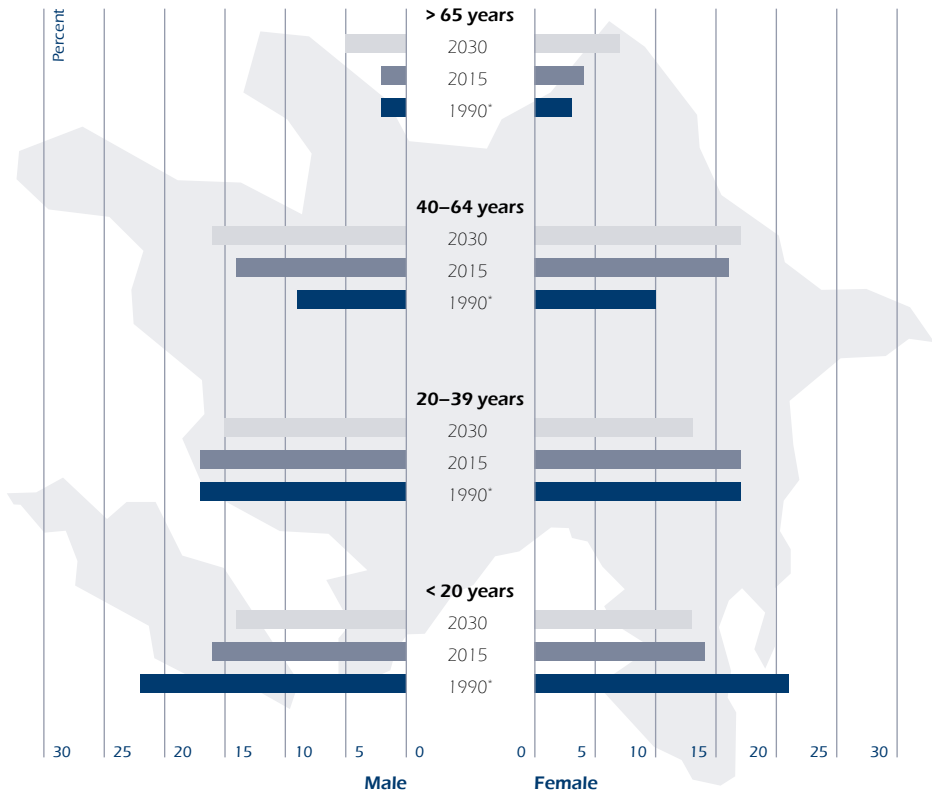
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Official statistics
Survey from professional association
Estimation

AZERBAIJAN



1. Statistics

Age pyramid for Azerbaijan



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	5,9	2013
Beds (per 100.000 population)	468,8	2013
Density of physicians (per 1.000 population)	3,4	2013
Density of nurses (per 1.000 population)	6,6	2013

Demographic information		Year
Population	9.780.780	2015
Population annual growth rate (%)	1,0	2015
Life expectancy at birth (in years)	72	2015
Death rate (per 1.000 population)	5,9	2007
Live births (per 1.000 population)	18,3	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	63,98	2015*
Gross domestic product per capita (U.S dollar-units)	6.794,43	2015*
Total expenditure on health as % of GDP	5,6	2013
General government expenditure on health as % of total expenditure on health	22,6	2012
Private expenditure on health as % of total expenditure on health	77,4	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	50%

3. Healthcare System

Medicine is free of charge for all citizens in governmental hospitals.

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality	2014	2015
Public insurance company	80%	80%
Private insurance company	10%	10%
Private co-payment	10%	10%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	Yes
Pacemakers	No
Ablation	Yes

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification of the Ministry of Health
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	No	
ICD or pacemaker implants	No	

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
Ministry of health	
Training centres availability	
Pacemaker	6
ICD implantation	3
CRT implantation	1
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	1
Percentage of academic centres among all practicing EP centres	2%
Percentage of academic centres among all practicing implanting devices centres	6%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	10	8
Total Pacemaker units implanted	184	395
Thereof, Leadless Pacemaker	not available	0
First implants	not available	352
Replacements	not available	43
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	2
Total CRT units implanted	18	24
Thereof, CRT pacemaker	0	0
Thereof, CRT ICD	18	24

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	7	7
Total ICD units implanted	20	21
Thereof, Single chamber	8	8
Thereof, Dual chamber	12	13
Thereof, Subcutaneous ICD	not available	0
First implants	not available	not available
Replacements	not available	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total loop recorders implanted	1	1

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	1	1
Total lead extraction procedures	8	5

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Unclear		

National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		
		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	3	5
Number of ablations performed	384	398
Mean number of ablations per centre	128	80
Number of AF ablations	2	6
Number of ablation centres (> 50 AF ablations)	2	not available
Number of VT/VF ablations	56	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2
Number of LAA closures	not available	0
Number of centres (LAA closures)	0	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	2	2
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Azerbaijan Society of Cardiology, Arrhythmia Working Group

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

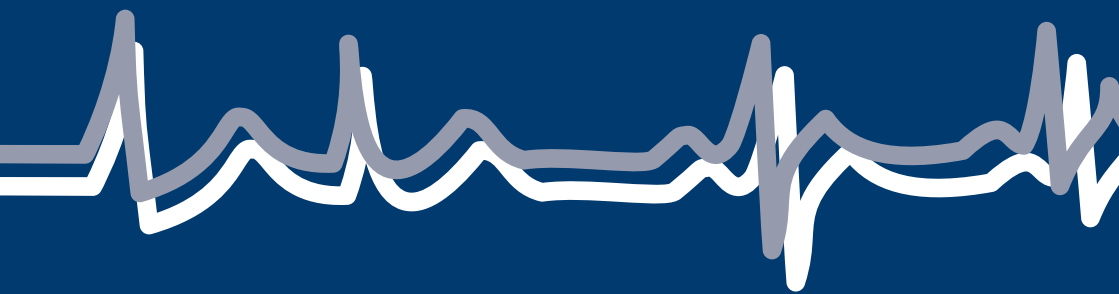
EHRA White Book 2015

Official statistics

Survey from professional association

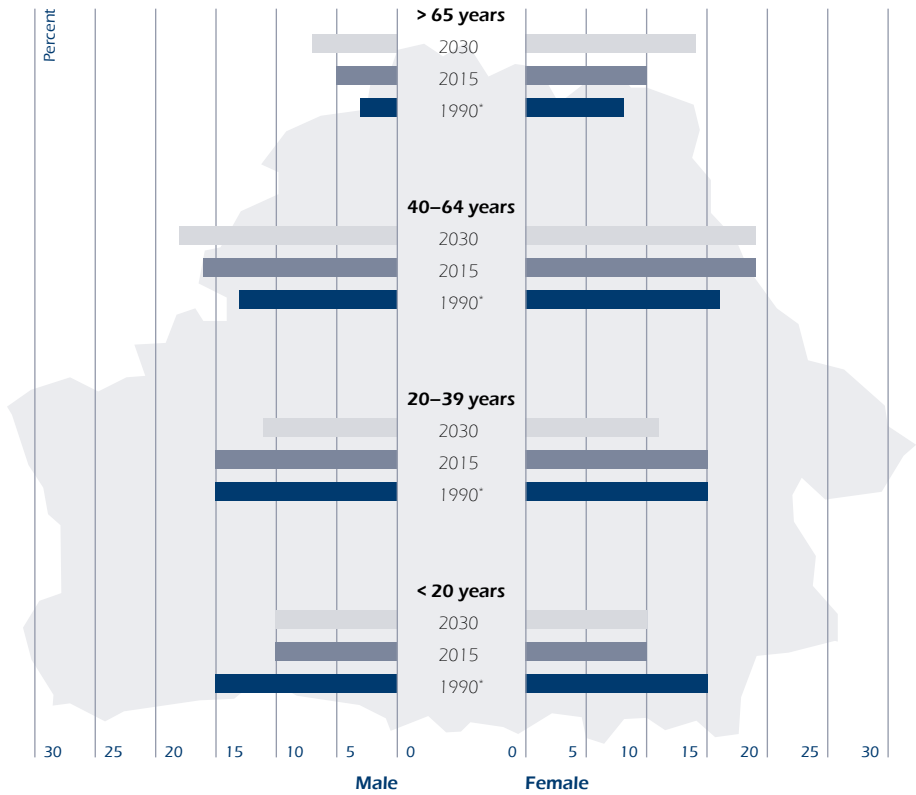
Sales data

BELARUS



1. Statistics

Age pyramid for Belarus



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	6,8	2013
Beds (per 100.000 population)	1.104,6	2013
Density of physicians (per 1.000 population)	2,2	2013
Density of nurses (per 1.000 population)	6,2	2013

Demographic information		Year
Population	9.589.689	2015
Population annual growth rate (%)	-0,2	2015
Life expectancy at birth (in years)	73	2015
Death rate (per 1.000 population)	14,3	2011
Live births (per 1.000 population)	12,5	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	62,02	2015*
Gross domestic product per capita (U.S dollar-units)	6.583,39	2015*
Total expenditure on health as % of GDP	6,1	2013
General government expenditure on health as % of total expenditure on health	77,2	2012
Private expenditure on health as % of total expenditure on health	22,8	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	54,3%	55,15%

3. Healthcare System

National Health System

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: Citizenship

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	100%	100%
Private insurance company	not available	not available
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: Leadless Pacing and Subcutaneous ICD not available in the country



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Roentgen-Endovascular surgery Diploma
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Roentgen-Endovascular surgery Diploma
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Yes	Specialist
Catheter ablation	Yes	Roentgen-Endovascular surgery Diploma
ICD or pacemaker implants	Yes	Roentgen-Endovascular surgery Diploma

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	Yes
	4 months
Suggested period of training to perform implantations	Yes
	1 year
National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	
Health Ministry	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	60%
Percentage of academic centres among all practicing implanting devices centres	80%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	10	10
Total Pacemaker units implanted	2.970	3.149
Thereof, Leadless Pacemaker	not available	not available
First implants	2.417	2.607
Replacements	553	542
Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	6	6
Total CRT units implanted	49	100
Thereof, CRT pacemaker	not available	not available
Thereof, CRT ICD	not available	not available

Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	10	10
Total ICD units implanted	172	133
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	not available	not available
Replacements	not available	not available

Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total loop recorders implanted	58	57

Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	10	3
Total lead extraction procedures	6	11

Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
	Official name	
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	6	7
Number of ablations performed	807	993
Mean number of ablations per centre	135	142
Number of AF ablations	69	106
Number of ablation centres (> 50 AF ablations)	1	2
Number of VT/VF ablations	20	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	0
Number of LAA closures	5	12
Number of centres (LAA closures)	1	2

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	1	0

Availability of a national registry for interventional electrophysiology		No
--	--	----

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	No

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Belorussian Heart Rhythm Association a branch of Belorussian Scientific Society of Cardiologists

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

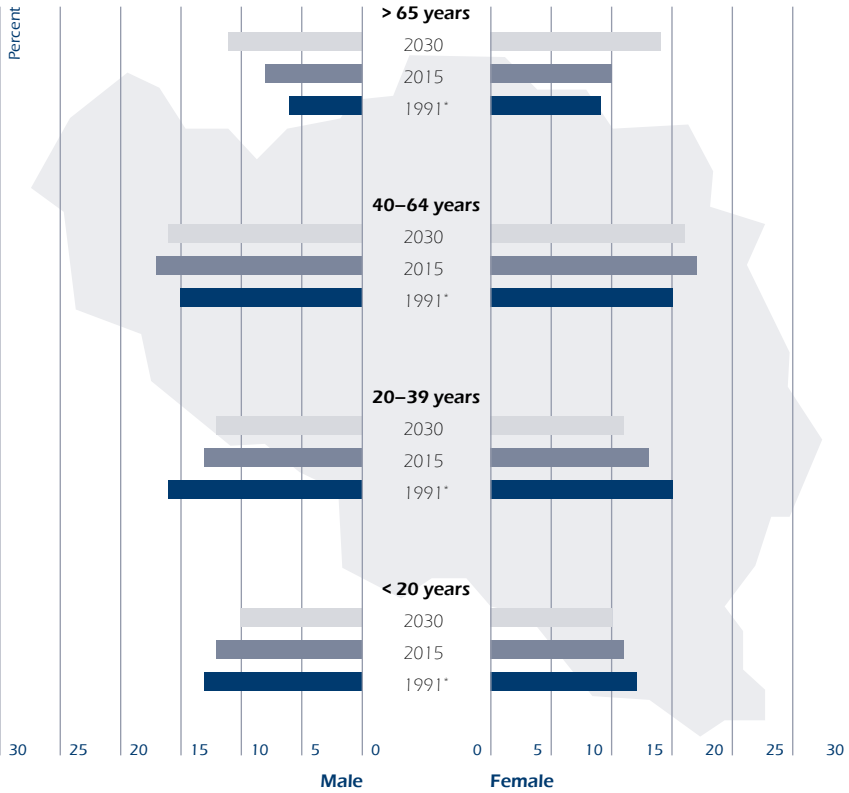
Estimation

BELGIUM



1. Statistics

Age pyramid for Belgium



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,7	2014
Beds (per 100.000 population)	622,9	2014
Density of physicians (per 1.000 population)	3,0	2013
Density of nurses (per 1.000 population)	9,7	2010

Demographic information		Year
Population	11.323.973	2015
Population annual growth rate (%)	0,8	2015
Life expectancy at birth (in years)	81	2015
Death rate (per 1.000 population)	9,8	2012
Live births (per 1.000 population)	11,2	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	458,65	2015*
Gross domestic product per capita (U.S dollar-units)	40.456,32	2015*
Total expenditure on health as % of GDP	11,2	2013
General government expenditure on health as % of total expenditure on health	75,2	2012
Private expenditure on health as % of total expenditure on health	24,8	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

National and obligatory for everybody

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: citizenship

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	99%	99%
Uninsured citizens	1%	1%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	90%	90%
Private insurance company	0%	0%
Private co-payment	10%	10%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	Yes

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: ICD: prescription under national guidelines and limited budget per center; ILR: recorder reimbursed for a limited number per year, physician and hospital not reimbursed.

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiac surgery has to be on site
ICD or pacemaker implants	Yes Cardiac surgery has to be on site

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Ministry healthcare	

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Cathether ablation	Yes

Responsible person for quality control

PM and ICD: Ministry Healthcare • Ablation: Working Group (BehRA)

Training centres availability

Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available

Number of universities (Schools of Medicine)

7

Percentage of academic centres among all practicing EP centres

20%

Percentage of academic centres among all practicing implanting devices centres

7%

5. Pacemakers

Pacemaker units implanted and number of implanting centres

	2014	2015
Implanting centres	104	104
Total Pacemaker units implanted	12.912	13.073
Thereof, Leadless Pacemaker	not available	0
First implants	8.935	9.094
Replacements	3.977	not available

Specialist performing implants

Cardiologists	Yes	not available
Surgeons	Yes	not available



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	40	40
Total CRT units implanted	1.332	1.485
Thereof, CRT pacemaker	458	528
Thereof, CRT ICD	874	957

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	23	23
Total ICD units implanted	1.636	1.531
Thereof, Single chamber	980	907
Thereof, Dual chamber	631	542
Thereof, Subcutaneous ICD	25	82
First implants	1.188	1.081
Replacements	448	450

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total loop recorders implanted	not available	400

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	not available
Surgeons	Yes	not available

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	QERMID@DEFIBRILLATORS
Pacing	Yes	QERMID@PACEMAKERS
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	44	not available
Number of ablations performed	6.126	7.091
Mean number of ablations per centre	139	not available
Number of AF ablations	2.560	3.273
Number of ablation centres (> 50 AF ablations)	22	16
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		Yes
BEHRA national ablation database		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

BeHRA

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

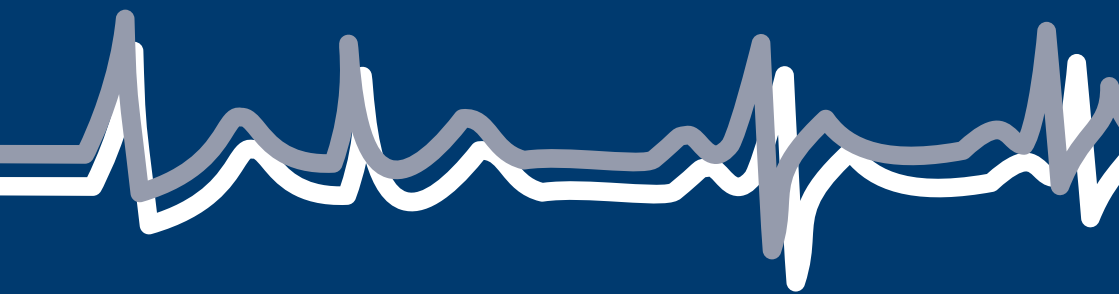
EHRA White Book 2015

Official statistics

Survey from professional association

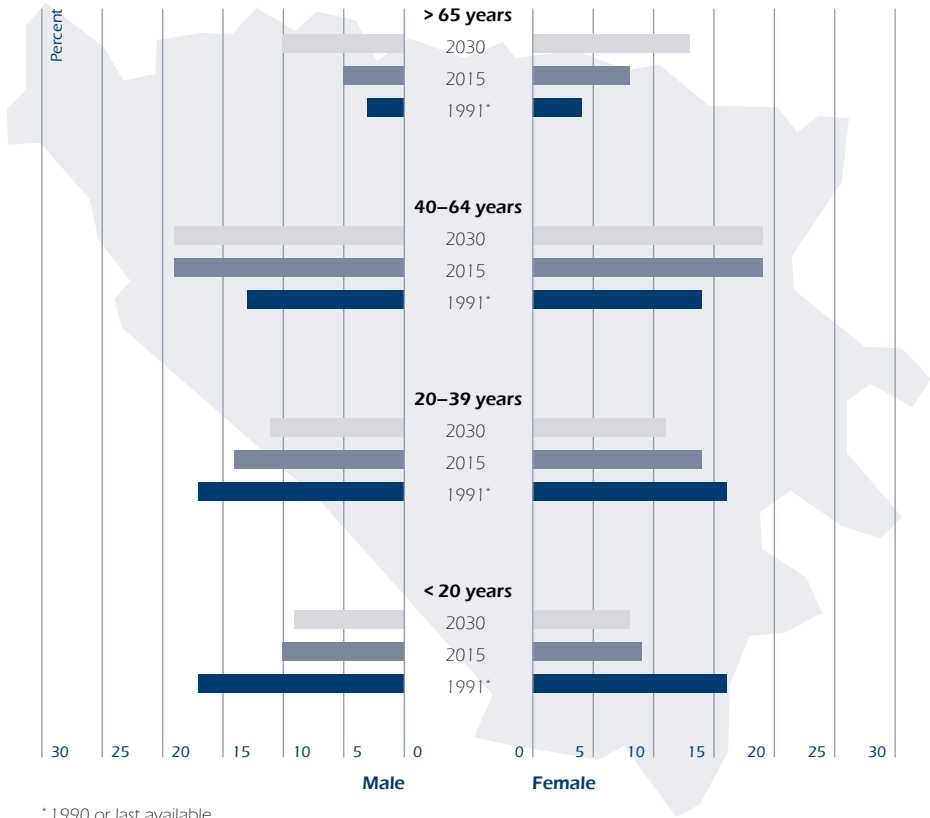
Estimation

BOSNIA & HERZEGOVINA



1. Statistics

Age pyramid for Bosnia & Herzegovina





Healthcare data		Year
Hospitals (per 100.000 population)	1,0	2013
Beds (per 100.000 population)	349,9	2013
Density of physicians (per 1.000 population)	1,9	2013
Density of nurses (per 1.000 population)	5,5	2013

Demographic information		Year
Population	3.867.055	2015
Population annual growth rate (%)	-0,1	2015
Life expectancy at birth (in years)	77	2015
Death rate (per 1.000 population)	9,1	2011
Live births (per 1.000 population)	7,8	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	15,57	2015*
Gross domestic product per capita (U.S dollar-units)	4.029,85	2015*
Total expenditure on health as% of GDP	9,6	2013
General government expenditure on health as% of total expenditure on health	71,2	2012
Private expenditure on health as% of total expenditure on health	28,8	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	53%	52%

3. Healthcare System

The National Healthcare system in BH is provided through an established network of health centers of Family Medicine (primary care). As a secondary and tertiary care, General hospitals, University Clinical Centers, University hospitals and special institutions are providing services. A few private healthcare providers are incorporated into the healthcare system.

Basic insurance availability	No	
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	75%	75%
Uninsured citizens	25%	25%

Distribution of insurance modality		
	2014	2015
Public insurance company	75%	75%
Private insurance company	0%	not available
Private co-payment	25%	25%

Possibility to subscribing to private health insurance plans	No
---	-----------

Co-payment necessary for the following therapy	
ICD devices	Yes
Pacemakers	Yes
Ablation	No answer

Comments: It is mandatory the payment of 20% of all implant costs for patients under 65 years old.

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	No answer	
ICD or pacemaker implants	Yes	Cardiologist, Surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	Yes

Suggested period of training to perform implantations	No answer

National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible person for quality control	
Head of the Pacemaker Center/Department	
Training centres availability	
Pacemaker	0
ICD implantation	0
CRT implantation	0
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	0%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	5	6
Total Pacemaker units implanted	831	854
Thereof, Leadless Pacemaker	not available	0
First implants	758	793
Replacements	73	61
Specialist performing implants		
Cardiologists	Yes	85%
Surgeons	Yes	15%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total CRT units implanted	23	17
Thereof, CRT pacemaker	13	11
Thereof, CRT ICD	10	6
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	5	6
Total ICD units implanted	55	87
Thereof, Single chamber	45	78
Thereof, Dual chamber	10	9
Thereof, Subcutaneous ICD	not available	0
First implants	48	81
Replacements	7	6
Specialist performing implants		
Cardiologists	Yes	85%
Surgeons	Yes	15%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total loop recorders implanted	11	5
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	0	0
Total lead extraction procedures	0	0

Specialist performing lead extractions		
Cardiologists	No	not available
Surgeons	No	not available

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	0	1
Number of ablations performed	0	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	0	0
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	0	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	not available
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	0	0
Number of physicians under training to become independent electrophysiologists	0	2

Availability of a national registry for interventional electrophysiology	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Working Group for Cardiac Pacing / Association of Cardiologist in Bosnia and Herzegovina
(President: Asist. Prof. Dr. Boris Goronja, FESC)

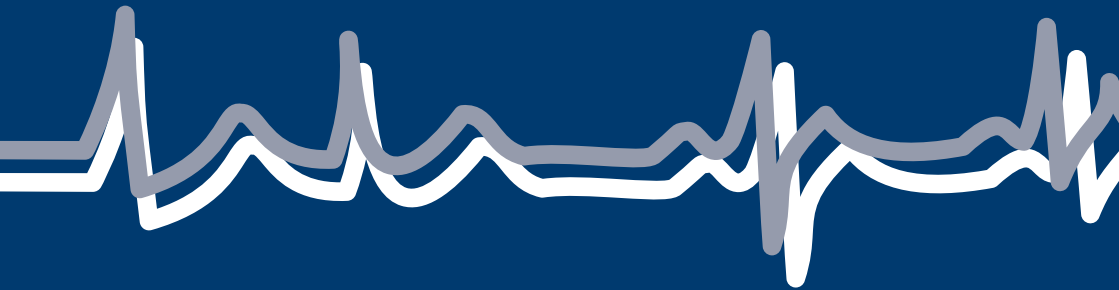
Working Group for Cardiac Pacing / Cardiac Sociaty of Republic of Srpska
(President: Asist. Prof. Dr. Dragan Uncanin, FESC; FACC)

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

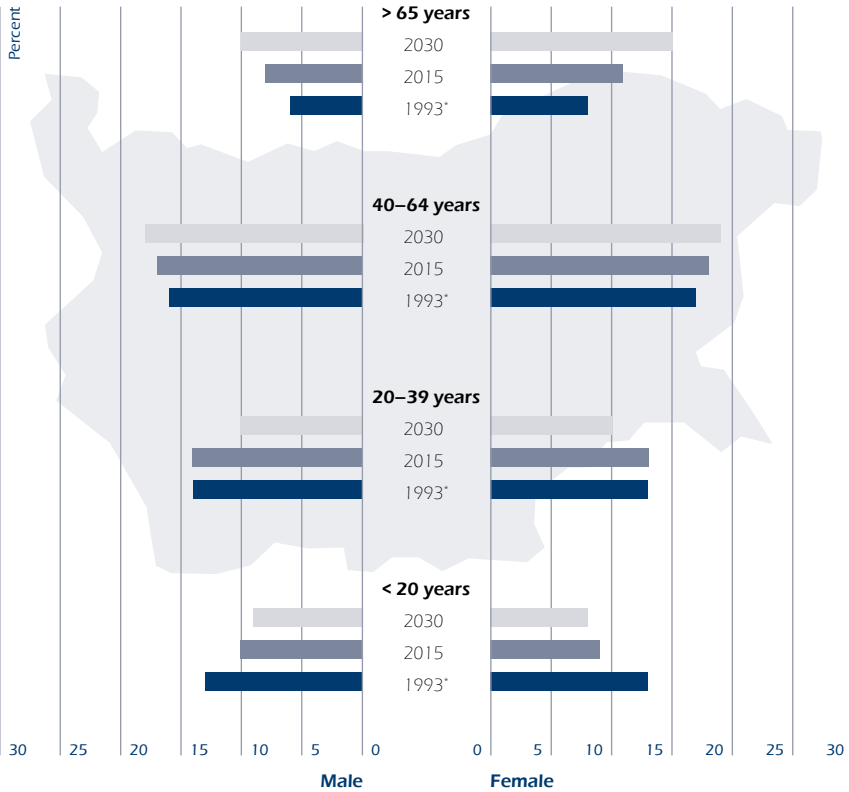
Survey from professional association

BULGARIA



1. Statistics

Age pyramid for Bulgaria



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	4,7	2013
Beds (per 100.000 population)	681,6	2013
Density of physicians (per 1.000 population)	4,0	2013
Density of nurses (per 1.000 population)	4,9	2013

Demographic information		Year
Population	7.186.893	2015
Population annual growth rate (%)	-0,6	2015
Life expectancy at birth (in years)	74	2015
Death rate (per 1.000 population)	15,0	2012
Live births (per 1.000 population)	9,4	2014

Economic information		Year
Gross domestic product (U.S dollar-billions)	47,17	2015*
Gross domestic product per capita (U.S dollar-units)	6.581,91	2015*
Total expenditure on health as % of GDP	7,6	2013
General government expenditure on health as % of total expenditure on health	56,3	2012
Private expenditure on health as % of total expenditure on health	43,7	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	64%	65%

3. Healthcare System

The healthcare system is financed by a single health insurance fund – The National Health Insurance Fund. Paying health insurance to this fund is mandatory for all Bulgarian citizens in the age 18-retirement age. This fund covers the outpatient and inpatient healthcare. In addition there are some private funds that are used as additional health insurance funds to provide higher level of health insurance. Paying installments to the latter is not mandatory.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: all citizens qualify for public insurance. In citizens in working age (aged 18 until retirement) are insured if they pay the installments regularly. Children, minors and the retired are insured by the state.

Percentage of insured and uninsured citizens		
	2014	2015

Insured citizens	80%	80%
Uninsured citizens	20%	20%

Distribution of insurance modality		
	2014	2015

Public insurance company	75%	75%
Private insurance company	1%	1%
Private co-payment	24%	24%

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
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ICD devices	Yes
Pacemakers	No
Ablation	Yes

Comments: ICD implantation needs co-payment because the reimbursement rate is too low to cover the whole cost for the implant. • Pacemaker implantation does not require co-payment in the majority of the centers. • Some ablation procedure (usually complex ablations requiring three dimensional mapping) were co-paid at some centers.



Reimbursement availability for physicians and hospitals

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: ICD implantation is reimbursed only partially so that the hospital receives reimbursement which does not cover the whole cost of the device. • CRT-P devices are fully reimbursed. • Ablations are reimbursed with a fixed amount of money not taking into account the real cost of all the consumables. • Leadless pacing, S-ICDs and ILRs were not reimbursed. As an exception partial reimbursement could be possible.

Treatment availability

No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The National standard for device therapy and invasive electrophysiology
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The National standard for device therapy and invasive electrophysiology
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The National standard for device therapy and invasive electrophysiology
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The National standard for device therapy and invasive electrophysiology

Comments: There is limited reimbursement for ICDs and CRT-D devices. Co-payment needed.

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, Cardiac surgeon could perform pacemaker implantation only

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
The National standard for device therapy and invasive electrophysiology	

Required period of training to perform implantations	Yes
	2 years

Suggested period of training to perform implantations	Yes
	2 years

National quality control system availability	No

Willingness to install quality control system	Yes

Responsible person for quality control
There is nobody specifically responsible for quality control in the field of EP and devices

Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	1
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2



Number of universities (Schools of Medicine)	5
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Percentage of academic centres among all practicing EP centres	60%
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Percentage of academic centres among all practicing implanting devices centres	37%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	17	19
Total Pacemaker units implanted	3.726	3.953
Thereof, Leadless Pacemaker	not available	0
First implants	3.128	3.269
Replacements	598	605
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	7	9
Total CRT units implanted	303	296
Thereof, CRT pacemaker	268	253
Thereof, CRT ICD	35	43
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	9	10
Total ICD units implanted	47	51
Thereof, Single chamber	24	35
Thereof, Dual chamber	23	16
Thereof, Subcutaneous ICD	not available	0
First implants	32	36
Replacements	15	15

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	not available
Total loop recorders implanted	5	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	0	not available
Total lead extraction procedures	0	not available

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%



10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for

		Official name
ICD	Yes	Professional National Registry – “Bg Pace”
Pacing	Yes	Professional National Registry – “Bg Pace”
Electrophysiology	Yes	Professional National Registry – “Bg Ephy”

Availability of a national quality insurance system or complication registry	Yes
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Official name: Professional National Registry – “Bg Pace” Professional National Registry – “Bg Ephy”

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
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11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	4	5
Number of ablations performed	663	961
Mean number of ablations per centre	166	192
Number of AF ablations	79	147
Number of ablation centres (> 50 AF ablations)	1	1
Number of VT/VF ablations	18	6
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	0
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	6	10
Number of physicians under training to become independent electrophysiologists	7	5

Availability of a national registry for interventional electrophysiology	Yes
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Official name: Professional National Registry – “Bg Ephy”

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

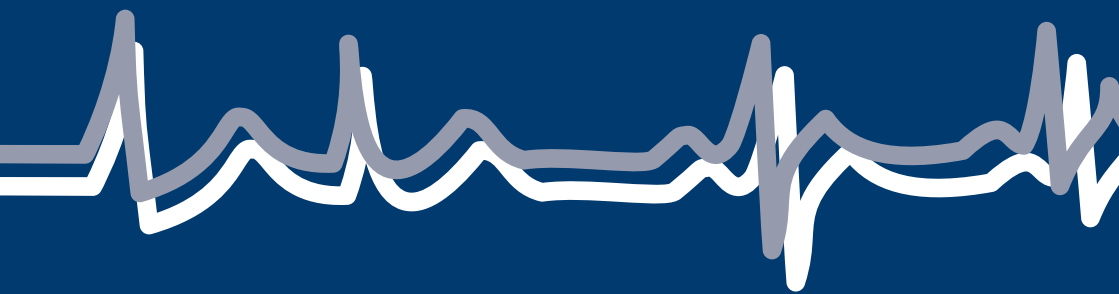
1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Professional association Electrophysiology and Cardiac Pacing

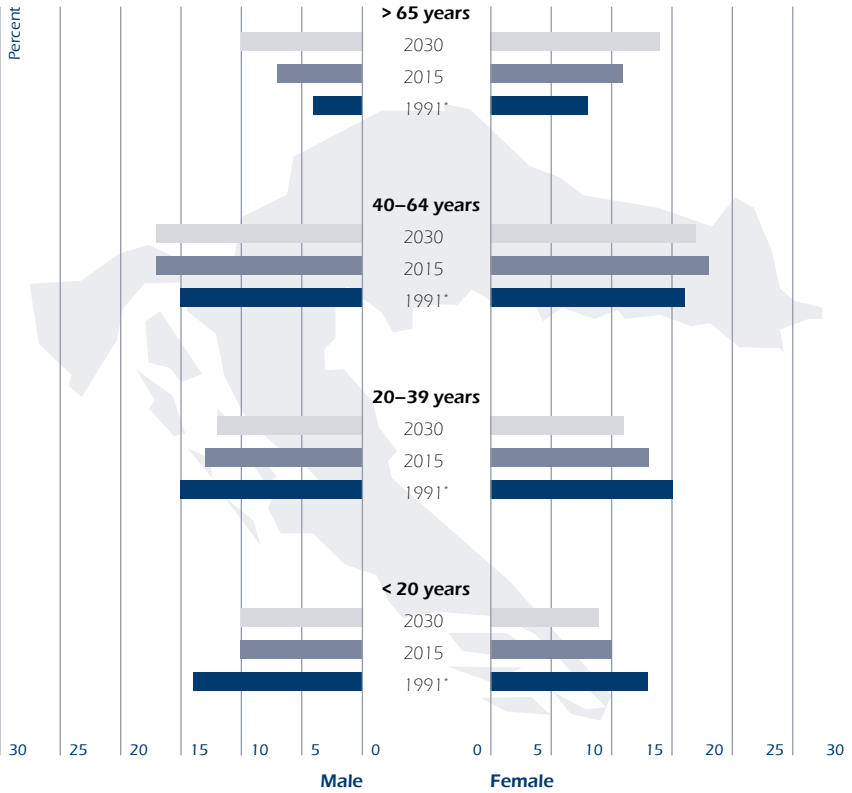
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Official statistics
Survey from professional association
Other

CROATIA



1. Statistics

Age pyramid for Croatia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100 000 population)	1,6	2013
Beds (per 100 000 population)	585,9	2013
Density of physicians (per 1000 population)	3,0	2013
Density of nurses (per 1000 population)	6,6	2013

Demographic information		Year
Population	4.464.844	2015
Population annual growth rate (%)	-0,1	2015
Life expectancy at birth (in years)	77	2015
Death rate (per 1000 population)	11,8	2013
Live births (per 1000 population)	9,4	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	48,93	2015*
Gross domestic product per capita (U.S dollar-units)	11.551,37	2015*
Total expenditure on health as % of GDP	7,3	2013
General government expenditure on health as % of total expenditure on health	80,1	2012
Private expenditure on health as % of total expenditure on health	19,9	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	49%	49%

3. Healthcare System

The Croatian healthcare system is based on the state owned Health Insurance Institute in addition to poorly developed private insurances.

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	90%	90%
Uninsured citizens	10%	10%

Distribution of insurance modality		
	2014	2015
Public insurance company	90%	90%
Private insurance company	5%	5%
Private co-payment	5%	5%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist or Surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	
National Cardiac Society	
Training centres availability	
Pacemaker	5
ICD implantation	5
CRT implantation	5
Electrophysiological studies and catheter ablation	4
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	80%
Percentage of academic centres among all practicing implanting devices centres	58%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	18	17
Total Pacemaker units implanted	2.601	2.855
Thereof, Leadless Pacemaker	not available	not available
First implants	2.180	2.416
Replacements	421	439
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	11	8
Total CRT units implanted	124	261
Thereof, CRT pacemaker	85	125
Thereof, CRT ICD	39	136
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	12	11
Total ICD units implanted	173	388
Thereof, Single chamber	135	344
Thereof, Dual chamber	38	44
Thereof, Subcutaneous ICD	not available	0
First implants	152	348
Replacements	21	40
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	6	6
Total loop recorders implanted	17	24
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	6	5
Total lead extraction procedures	31	49

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		No
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	5	6
Number of ablations performed	852	1.348
Mean number of ablations per centre	170	225
Number of AF ablations	223	385
Number of ablation centres (> 50 AF ablations)	3	3
Number of VT/VF ablations	28	40
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2
Number of LAA closures	not available	2
Number of centres (LAA closures)	not available	1

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	9	10
Number of physicians under training to become independent electrophysiologists	3	7

Availability of a national registry for interventional electrophysiology		No
		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National						No
U.S.						No answer
European						Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Croatian Cardiac Society, Working Group on Arrhythmias and Cardiac Pacing

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Croatian Health Insurance Institute

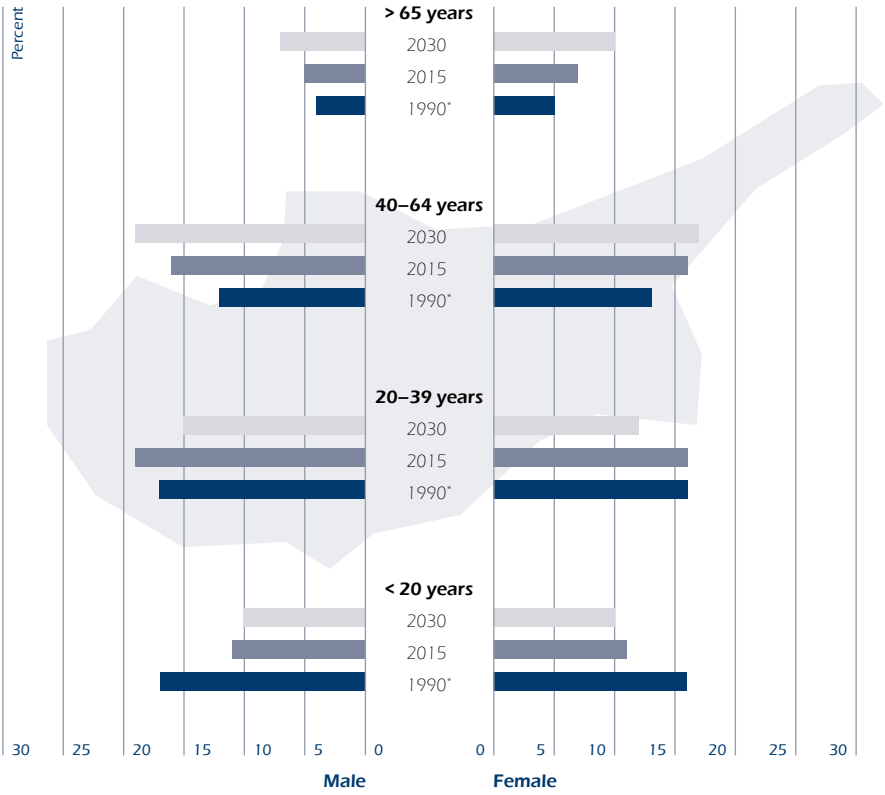
Working Group on Arrhythmias and Cardiac Pacing of Croatian Cardiac Society

CYPRUS



1. Statistics

Age pyramid for Cyprus



* 1990 or last available



Healthcare data		Year
Hospitals (per 100 000 population)	9,5	2013
Beds (per 100 000 population)	341,7	2013
Density of physicians (per 1000 population)	3,2	2013
Density of nurses (per 1000 population)	5,2	2013

Demographic information		Year
Population	1.189.197	2015
Population annual growth rate (%)	1,4	2015
Life expectancy at birth (in years)	79	2015
Death rate (per 1000 population)	6,4	2012
Live births (per 1000 population)	10,8	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	19,38	2015*
Gross domestic product per capita (U.S dollar-units)	21.531,02	2015*
Total expenditure on health as % of GDP	7,4	2013
General government expenditure on health as % of total expenditure on health	47,0	2012
Private expenditure on health as % of total expenditure on health	53,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	30%	30%

3. Healthcare System

Free medical care is provided by government hospitals and health centres based on income criteria.

Basic insurance availability	No
-------------------------------------	-----------

Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	85 %	85 %
Uninsured citizens	15%	15%

Distribution of insurance modality		
	2014	2015
Public insurance company	100%	85%
Private insurance company	0%	15%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
	Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: The above applies to the state sector only. In state hospitals the physician is given a flat salary for all work carried out. Private centres operate with varying incentives • The state hospitals provide the therapies as judged by the physicians. The therapies are paid for centrally by the ministry of health.



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for			Specialist
Catheter ablation	Yes		Electrophysiologist
ICD or pacemaker implants	Yes		Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No
	<input type="checkbox"/>

Required period of training to perform implantations	No
	<input type="checkbox"/>

Suggested period of training to perform implantations	No
	<input type="checkbox"/>

National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	
The medical centers where the procedure takes place	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	3
Percentage of academic centres among all practicing EP centres	33%
Percentage of academic centres among all practicing implanting devices centres	20%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	5	5
Total Pacemaker units implanted	250	280
Thereof, Leadless Pacemaker	not available	0
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	4	4
Total CRT units implanted	29	30
Thereof, CRT pacemaker	not available	not available
Thereof, CRT ICD	not available	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	4	4
Total ICD units implanted	73	75
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	0
First implants	not available	not available
Replacements	not available	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	5
Total loop recorders implanted	12	15

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	1	2
Total lead extraction procedures	3	4

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Short distances and close relationship between patient and doctor render unnecessary remote monitoring.		

National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	3	3
Number of ablations performed	142	60
Mean number of ablations per centre	47	20
Number of AF ablations	53	10
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	5	5
Number of physicians under training to become independent electrophysiologists	0	0

Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National						No
U.S.						No
European						Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Cyprus Working Group on Cardiac Electrophysiology and Pacing

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

Survey from professional association

Sample short survey

Estimation

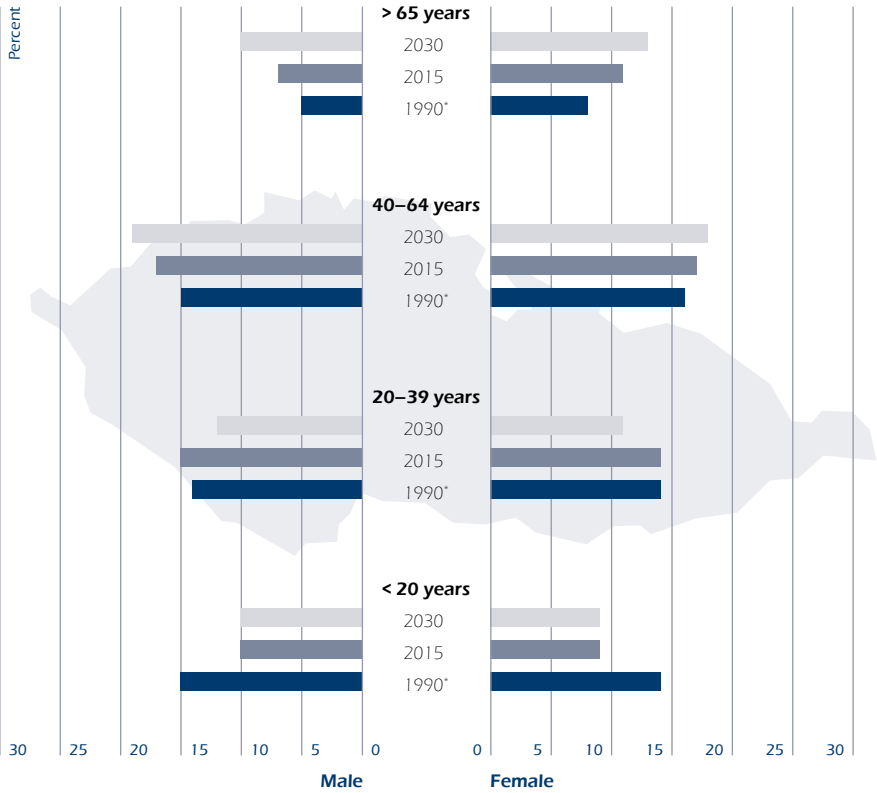
Personal communication

CZECH REPUBLIC



1. Statistics

Age pyramid for Czech Republic



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,4	2013
Beds (per 100.000 population)	645,9	2013
Density of physicians (per 1.000 population)	3,7	2013
Density of nurses (per 1.000 population)	8,4	2013

Demographic information		Year
Population	10.644.842	2015
Population annual growth rate (%)	0,2	2015
Life expectancy at birth (in years)	79	2015
Death rate (per 1.000 population)	10,4	2013
Live births (per 1.000 population)	10,2	2013

Economic information		Year
Gross domestic product (U.S. dollar-billions)	182,46	2015*
Gross domestic product per capita (U.S. dollar-units)	17.330,08	2015*
Total expenditure on health as % of GDP	7,2	2013
General government expenditure on health as % of total expenditure on health	84,0	2012
Private expenditure on health as % of total expenditure on health	16,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	0%

3. Healthcare System

National Health System

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	99,9 %	99,9 %
Uninsured citizens	0,1 %	0,1 %

Distribution of insurance modality		
	2014	2015
Public insurance company	99,8%	99,8%
Private insurance company	0,1 %	0,1 %
Private co-payment	0,1 %	0,1 %

Possibility to subscribing to private health insurance plans	No
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Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
	Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ICD and PM Accreditation
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EP Accreditation
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist, licence for EP, licence for ablation
ICD or pacemaker implants	Yes	Cardiologist, licence for device implantation

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Czech Society of Cardiology, Czech Heart Rhythm Association	

Required period of training to perform implantations	Yes
	Requires certain number of implantations

Suggested period of training to perform implantations	No
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National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	
State Institute for Drug Control	
Training centres availability	
Pacemaker	37
ICD implantation	17
CRT implantation	17
Electrophysiological studies and catheter ablation	10
Atrial fibrillation ablation	10
Number of universities (Schools of Medicine)	7
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	37	37
Total Pacemaker units implanted	9.447	8.969
Thereof, Leadless Pacemaker	not available	not available
First implants	6.614	6.377
Replacements	2.833	2.592
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	17	18
Total CRT units implanted	1.872	1.952
Thereof, CRT pacemaker	416	465
Thereof, CRT ICD	1.456	1.487
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	17	18
Total ICD units implanted	2.138	2.039
Thereof, Single chamber	1.588	1.475
Thereof, Dual chamber	550	564
Thereof, Subcutaneous ICD	not available	not available
First implants	1.618	1.627
Replacements	520	412
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	20	not available
Total loop recorders implanted	650	280
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	6
Total lead extraction procedures	180	300

Specialist performing lead extractions		
Cardiologists	Yes	80%
Surgeons	Yes	20%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	ICD online registry
Pacing	Yes	PM online registry
Electrophysiology	Yes	Catheter ablation online registry
Availability of a national quality insurance system or complication registry		Yes
Official name: State Institute for Drug Control		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
State Institute for Drug Control		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	22	23
Number of ablations performed	5,855	6,158
Mean number of ablations per centre	266	268
Number of AF ablations	2,297	2,537
Number of ablation centres (> 50 AF ablations)	10	12
Number of VT/VF ablations	289	297
Number of ablation centres (> 10 VT ablations on structural heart diseases)	9	7
Number of LAA closures	not available	94
Number of centres (LAA closures)	4	7

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		Yes
Catheter ablation online registry		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					Ranking of importance
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Czech Society of Cardiology, Czech Heart Rhythm Association

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

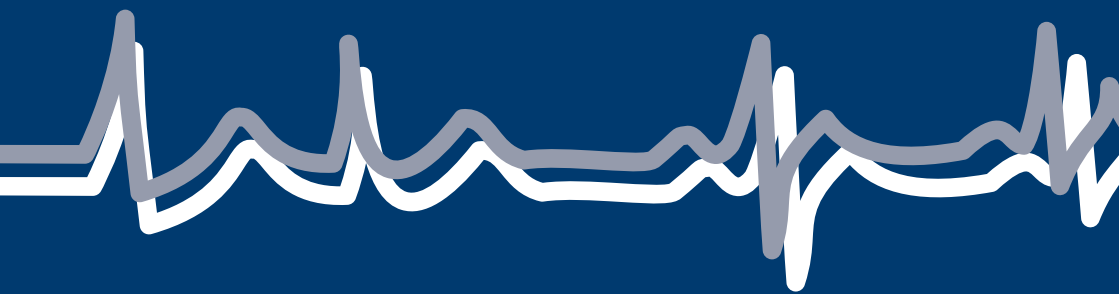
EHRA White Book 2015

Sales data

Estimation

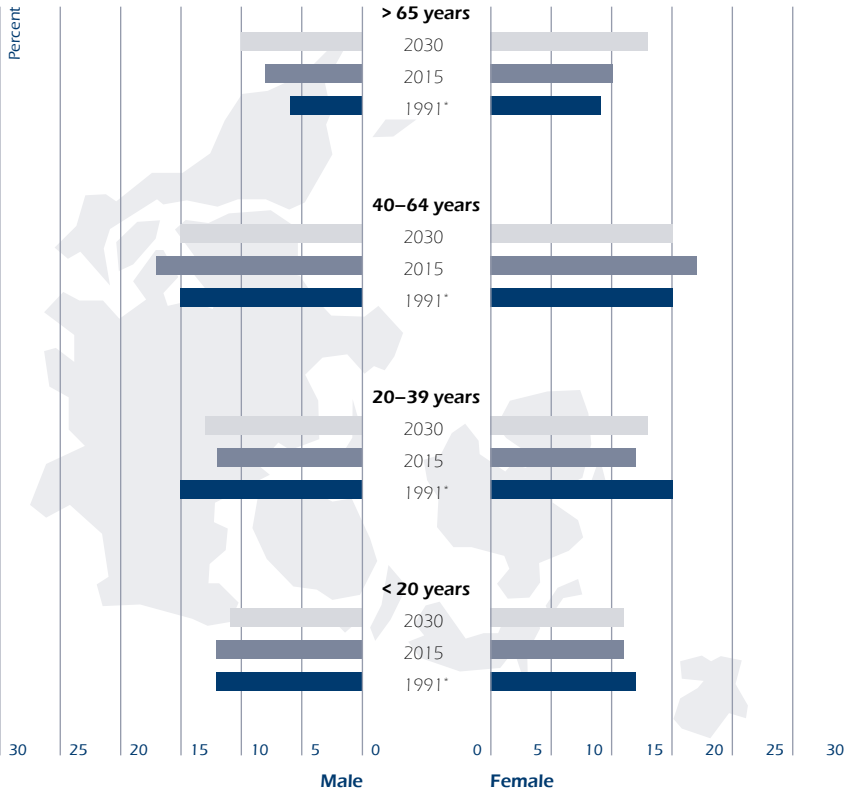
ICD, PM and Catheter ablation registries

DENMARK



1. Statistics

Age pyramid for Denmark



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	307,4	2013
Density of physicians (per 1.000 population)	3,6	2012
Density of nurses (per 1.000 population)	16,6	2012

Demographic information		Year
Population	5.581.503	2015
Population annual growth rate (%)	0,2	2015
Life expectancy at birth (in years)	79	2015
Death rate (per 1.000 population)	9,3	2012
Live births (per 1.000 population)	10,0	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	291,04	2015*
Gross domestic product per capita (U.S dollar-units)	51.423,61	2015*
Total expenditure on health as% of GDP	10,6	2013
General government expenditure on health as% of total expenditure on health	85,8	2012
Private expenditure on health as% of total expenditure on health	14,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	21 %

3. Healthcare System

There is a tax financed public healthcare system.

Basic insurance availability	Yes
-------------------------------------	------------

Percentage of insured and uninsured citizens	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality	2014	2015
Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: There are no restrictions for device implants, but only for ablation procedures.

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Yes	Specialist
Catheter ablation	Yes	Cardiologist with special training/education in invasive electrophysiology
ICD or pacemaker implants	Yes	Cardiologist with special training/education in device implantation

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
---	-----------

Suggested period of training to perform implantations	Yes
	1 year
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Cathether ablation	Yes
Responsible person for quality control	
Danish Health Authority	
Training centres availability	
Pacemaker	13
ICD implantation	6
CRT implantation	5
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	6
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	83%
Percentage of academic centres among all practicing implanting devices centres	45%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	11	15
Total Pacemaker units implanted	4.823	4.818
Thereof, Leadless Pacemaker	not available	3
First implants	3.654	3.802
Replacements	1.169	1.013
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	5	5
Total CRT units implanted	965	985
Thereof, CRT pacemaker	415	441
Thereof, CRT ICD	550	544
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	6	6
Total ICD units implanted	1.208	1.208
Thereof, Single chamber	945	918
Thereof, Dual chamber	263	275
Thereof, Subcutaneous ICD	not available	15
First implants	882	887
Replacements	326	321
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	11	13
Total loop recorders implanted	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	4	4
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	85%
Surgeons	Yes	15%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	Danish Pacemaker and ICD Register
Pacing	Yes	Danish Pacemaker and ICD Register
Electrophysiology	Yes	ablation.dk
Availability of a national quality insurance system or complication registry		Yes
Official name: Danish Health Authority; State Agency of Medicine		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: "Regarding device recalls: Danish Pacemaker and ICD Registry; Regarding lead extractions: none"		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	6	6
Number of ablations performed	3.867	3.925
Mean number of ablations per centre	645	654
Number of AF ablations	1.698	1.882
Number of ablation centres (> 50 AF ablations)	6	6
Number of VT/VF ablations	148	145
Number of ablation centres (> 10 VT ablations on structural heart diseases)	5	5
Number of LAA closures	not available	not available
Number of centres (LAA closures)	3	4

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	25	27
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		Yes
Official name: ablation.dk		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Danish Society of Cardiology (DCS), DCS Working Group on Arrhythmia, Pacemaker and ICD

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics – Danish Pacemaker and ICD Register, ablation.dk

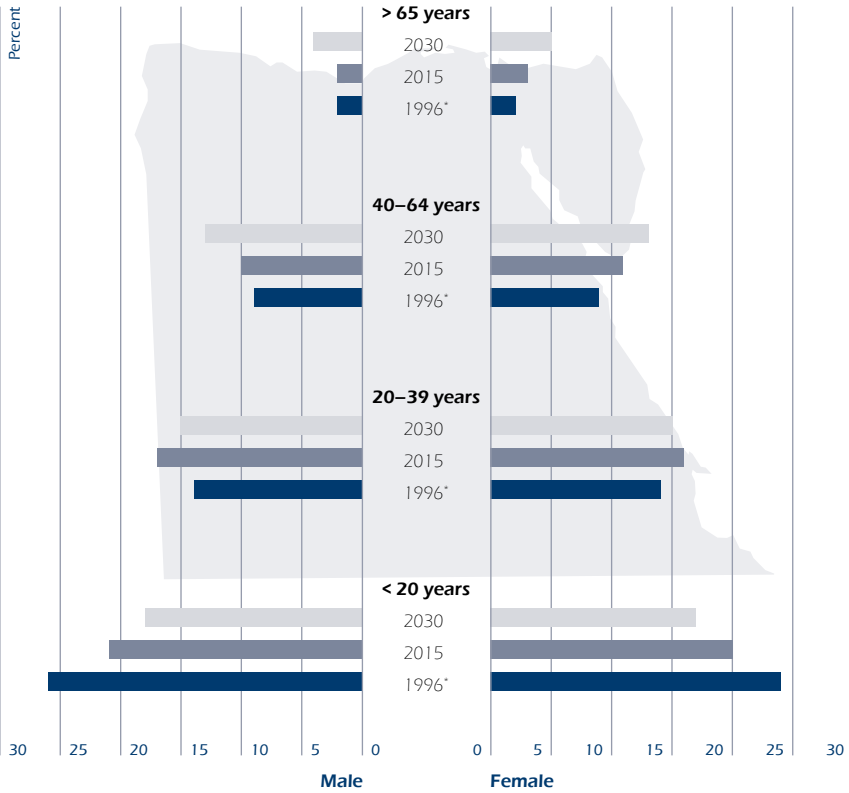
Survey from professional association – Danish Society of Cardiology,
Working Group on Arrhythmia, Pacemaker and ICD

EGYPT



1. Statistics

Age pyramid for Egypt



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available

Demographic information		Year
Population	88.487.396	2015
Population annual growth rate (%)	1,8	2015
Life expectancy at birth (in years)	74	2015
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available

Economic information		Year
Gross domestic product (U.S dollar-billions)	not available	2015*
Gross domestic product per capita (U.S dollar-units)	not available	2015*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	39,0	2012
Private expenditure on health as % of total expenditure on health	61,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

Egypt has a heterogeneous health system: there are different public/private providers and financing agents. The main agents are: the governmental sector (including ministry of health institutes, university and teaching hospitals, the military and police hospitals), the public sector (known as health insurance organization, the curative care organization) and finally the private sector.

Basic insurance availability			No
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	67%	65%
Uninsured citizens	33%	35%

Distribution of insurance modality		
	2014	2015
Public insurance company	64%	64%
Private insurance company	1%	1%
Private co-payment	35%	35%

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

Comments: it depends on the insurance plan, in certain insurance plan the patient should pay certain percentage of the bill of whatever medical service he's receiving

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: Though the physicians receive reimbursement in governmental & university hospitals the reimbursements are quite insufficient



Treatment availability	
No restrictions	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EPS and Pacing Diploma of the ECRA
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EPS and pacing Diploma of the ECRA
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologist/electrophysiologist, with the exception of one center, which is critical care unit, Cairo university, where critical care specialists are allowed to train in & perform EP & device implantation procedures
ICD or pacemaker implants	Yes	Cardiologists or electrophysiologists, except in only one centre which is critical care unit, Cairo university where critical care specialists are allowed to train in & practice device therapy

Official national competency guidelines for electrophysiological studies or catheter ablation	No
Required period of training to perform implantations	Yes 3 years
Suggested period of training to perform implantations	Yes 3 years
National quality control system availability	No
Willingness to install quality control system	No
Responsible person for quality control	None
Training centres availability	
Pacemaker	28
ICD implantation	13
CRT implantation	13
Electrophysiological studies and catheter ablation	11
Atrial fibrillation ablation	4
Number of universities (Schools of Medicine)	22
Percentage of academic centres among all practicing EP centres	60%
Percentage of academic centres among all practicing implanting devices centres	70%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	33	33
Total Pacemaker units implanted	3,320	3,552
Thereof, Leadless Pacemaker	not available	not available
First implants	3,040	3,222
Replacements	280	330

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%
Other	Critical Care Physicians	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	16	17
Total CRT units implanted	530	545
Thereof, CRT pacemaker	420	429
Thereof, CRT ICD	110	116

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	No	0%
Other	Critical Care Physicians, Cairo University	30%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	16	17
Total ICD units implanted	236	253
Thereof, Single chamber	188	201
Thereof, Dual chamber	48	52
Thereof, Subcutaneous ICD	not available	0
First implants	212	224
Replacements	24	29

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	No	0%
Other	Critical Care Physicians, Cairo University	10%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	5	0
Total loop recorders implanted	7	0

Specialist performing implants		
Cardiologists	No	0%
Surgeons	No	0%
Other	None	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	4	3
Total lead extraction procedures	28	20

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	No	0%
Other	Critical Care Physicians, Cairo University	10%



10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for

		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
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11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	15	15
Number of ablations performed	1,354	1,448
Mean number of ablations per centre	90	97
Number of AF ablations	60	65
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	10	13
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	19	not available
Number of centres (LAA closures)	3	not available

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	22	22
Number of physicians under training to become independent electrophysiologists	15	4

Availability of a national registry for interventional electrophysiology	No
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12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Egyptian Society of Cardiology, Egyptian Cardiac Rhythm Association (ECRA)

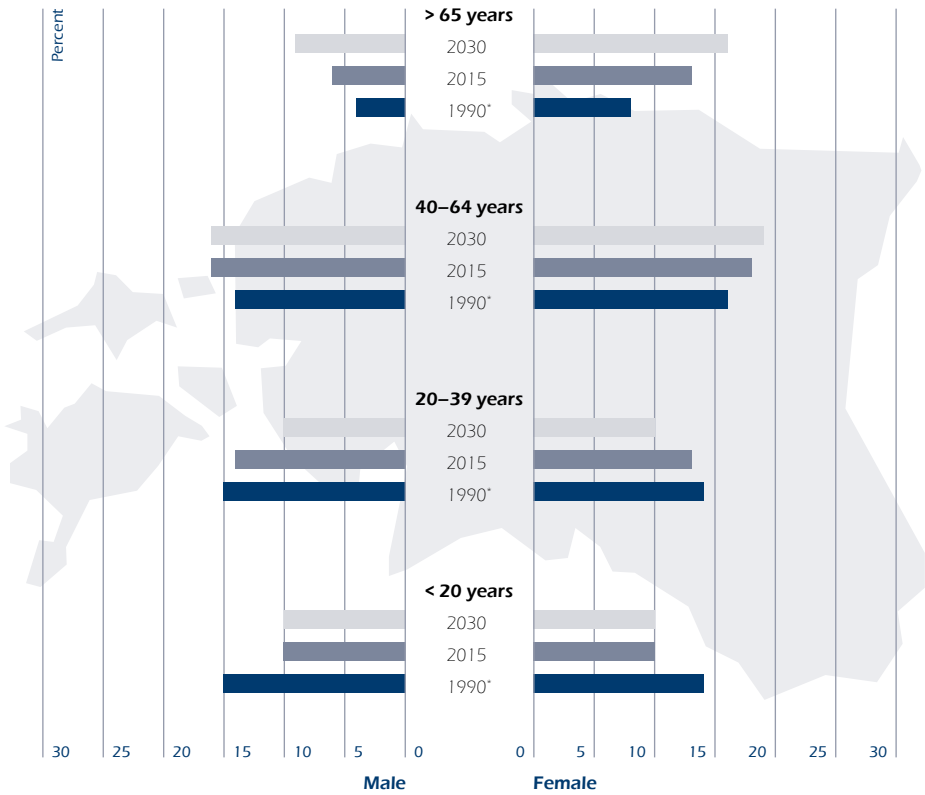
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Survey from professional association
Sales data
Estimation

ESTONIA



1. Statistics

Age pyramid for Estonia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,4	2013
Beds (per 100.000 population)	500,5	2013
Density of physicians (per 1.000 population)	3,3	2013
Density of nurses (per 1.000 population)	6,5	2013

Demographic information		Year
Population	1.265.420	2015
Population annual growth rate (%)	-0,6	2015
Life expectancy at birth (in years)	77	2015
Death rate (per 1.000 population)	11,4	2011
Live births (per 1.000 population)	10,3	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	22,93	2015*
Gross domestic product per capita (U.S dollar-units)	17.425,30	2015*
Total expenditure on health as% of GDP	5,7	2013
General government expenditure on health as% of total expenditure on health	78,7	2012
Private expenditure on health as% of total expenditure on health	21,3	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

Estonian health insurance relies on the principle of solidarity. The Health Insurance Fund covers the costs of health services required by the person in case of illness regardless of the amount of social tax paid for the person concerned. The Fund uses the social tax paid for the working population, also for covering the cost of health services provided to persons who have no income with regard to work activities. The employers are required by the law to pay social tax for all persons employed, whereby the rate of this tax is 33% of the taxable amount, and of which 20% is allocated for pension insurance and 13% for health insurance.

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: An insured person is a permanent resident of the Republic of Estonia or a person living in Estonia by virtue of a temporary residence permit or by the right of permanent residence, who pays the social tax for himself/herself or for whom the payer of social tax is required to pay social tax. Insured persons are: a person working on the basis of an employment contract; a public servant; a member of the management or supervisory board of a legal entity; a person employed on the basis of a contract under the law of obligations; a person registered at Estonian Unemployment Insurance Fund; a person, who participated in the elimination of the consequences of a nuclear disaster, a conscript, the non-working spouse of a diplomat or a public servant, the curator of a disabled person; a person receiving child care allowance, a dependant spouse, for whom the government pays social tax, a person receiving social allowance. According to the Health Insurance Act persons for whom no social tax is paid are considered as having equal status to the insured person. The persons having equal status are: a pregnant woman, a person under 19 years of age, a person receiving state pension granted in Estonia, an insured person's dependent spouse, who is no more than 5 years away from attaining the age limit for old-age pension, pupils (there are age limits), a student, who is permanent resident.

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	95%	not available
Uninsured citizens	5%	not available

Distribution of insurance modality		
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	2014	2015
Public insurance company	100%	not available
Private insurance company	0%	not available
Private co-payment	0%	not available

Possibility to subscribing to private health insurance plans	No answer
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Co-payment necessary for the following therapy	
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ICD devices	No
Pacemakers	No
Ablation	No



Reimbursement availability for physicians and hospitals

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Treatment availability

No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system

Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist
Official national competency guidelines for electrophysiological studies or catheter ablation		No
Required period of training to perform implantations		Yes
		100 implantations
Suggested period of training to perform implantations		Yes
		100 implantations
National quality control system availability		No
Willingness to install quality control system		No
Responsible person for quality control		
Head of department of cardiology		
Training centres availability		
Pacemaker		2
ICD implantation		2
CRT implantation		2
Electrophysiological studies and catheter ablation		2
Atrial fibrillation ablation		1
Number of universities (Schools of Medicine)		1
Percentage of academic centres among all practicing EP centres		50%
Percentage of academic centres among all practicing implanting devices centres		20%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	5	5
Total Pacemaker units implanted	1.054	1.085
Thereof, Leadless Pacemaker	not available	0
First implants	912	954
Replacements	142	131

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total CRT units implanted	51	73
Thereof, CRT pacemaker	27	49
Thereof, CRT ICD	24	24

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total ICD units implanted	96	91
Thereof, Single chamber	13	22
Thereof, Dual chamber	83	69
Thereof, Subcutaneous ICD	not available	0
First implants	88	85
Replacements	8	6

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total loop recorders implanted	6	3

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	not available
Surgeons	Yes	not available

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	



Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: State Agency of Medicine

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	2	2
Number of ablations performed	411	426
Mean number of ablations per centre	206	213
Number of AF ablations	98	110
Number of ablation centres (> 50 AF ablations)	1	1
Number of VT/VF ablations	7	13
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	1
Number of LAA closures	2	not available
Number of centres (LAA closures)	1	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	5	5
Number of physicians under training to become independent electrophysiologists	0	0

Availability of a national registry for interventional electrophysiology	No
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12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Estonian Society of Cardiology, Working Group of Arrhythmias

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

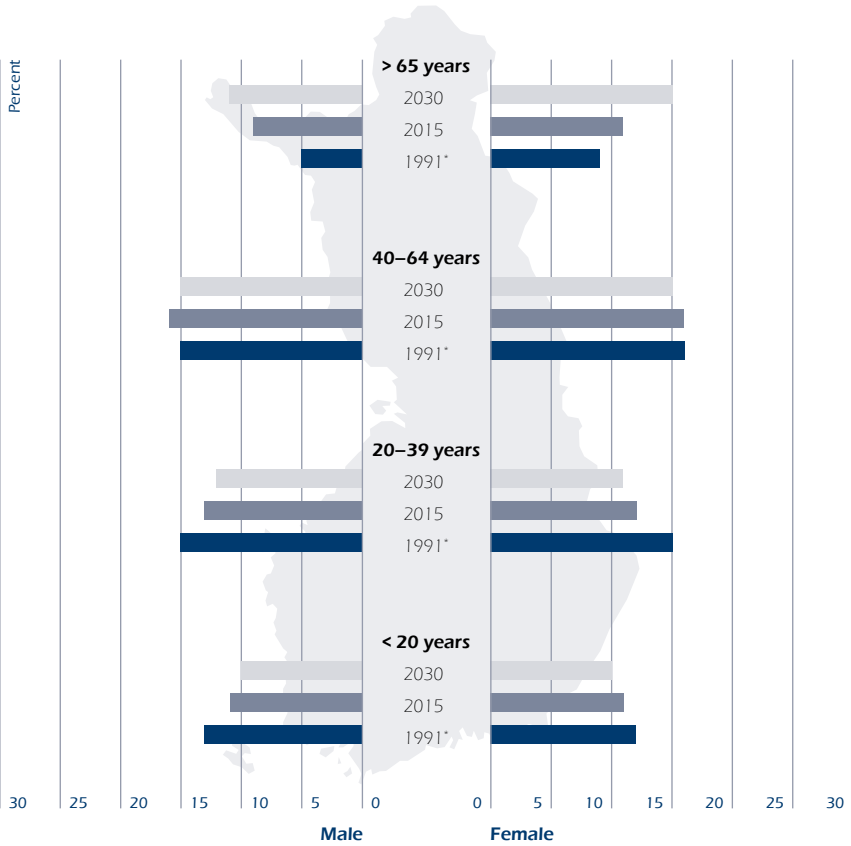
Survey from professional association

FINLAND



1. Statistics

Age pyramid for Finland



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	4,8	2013
Beds (per 100.000 population)	485,9	2013
Density of physicians (per 1.000 population)	3,0	2013
Density of nurses (per 1.000 population)	14,5	2012

Demographic information		Year
Population	5.476.922	2015
Population annual growth rate (%)	0,4	2015
Life expectancy at birth (in years)	81	2015
Death rate (per 1.000 population)	9,5	2013
Live births (per 1.000 population)	10,7	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	230,69	2015*
Gross domestic product per capita (U.S dollar-units)	42.159,31	2015*
Total expenditure on health as % of GDP	9,4	2013
General government expenditure on health as % of total expenditure on health	75,0	2012
Private expenditure on health as % of total expenditure on health	25,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	39%	23%

3. Healthcare System

Finland has a compulsory health care system which is tax based. It provides comprehensive coverage for the entire population. The Ministry of Social Affairs and Health issues the legislation on health and social care policies and monitors the implementation. At local level, the municipal health committee and council make decisions on the planning and organization of healthcare.

Basic insurance availability	Yes
-------------------------------------	------------

Percentage of insured and uninsured citizens	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality	2014	2015
Public insurance company	75,2%	75,6%
Private insurance company	3%	3%
Private co-payment	21,8%	21,4%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: "The physicians do not receive any additional reimbursement for any procedures performed in the public health care hospitals."; "The hospital charge the municipalities for services according to annually set prices. Billing is usually based on DRG, but per procedure billing is used by some hospitals."



Treatment availability	
No restrictions	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for	
	Specialist
Catheter ablation	No
ICD or pacemaker implants	No

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
--	-----------

National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible person for quality control	
National Supervisory Authority for Welfare and Health	
Training centres availability	
Pacemaker	20
ICD implantation	19
CRT implantation	15
Electrophysiological studies and catheter ablation	9
Atrial fibrillation ablation	8
Number of universities (Schools of Medicine)	
5	
Percentage of academic centres among all practicing EP centres	
56%	
Percentage of academic centres among all practicing implanting devices centres	
25%	

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	20	20
Total Pacemaker units implanted	5.536*	5.821
Thereof, Leadless Pacemaker	not available	not available
First implants	4.253*	4.578
Replacements	1.283*	1.243
*CRT-P included		
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	15	15
Total CRT units implanted	526	527
Thereof, CRT pacemaker	181	184
Thereof, CRT ICD	345	343
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	19	18
Total ICD units implanted	1.161	1.198
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	16
First implants	839	887
Replacements	322	311
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	20	19
Total loop recorders implanted	295	368
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	5
Total lead extraction procedures	17	not available

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	Yes	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		Yes
Official name: National Supervisory Authority for Welfare and Health (Valvira)		

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: National Supervisory Authority for Welfare and Health (Valvira)		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	9	9
Number of ablations performed	2,222	2,550
Mean number of ablations per centre	247	283
Number of AF ablations	736	926
Number of ablation centres (> 50 AF ablations)	5	6
Number of VT/VF ablations	82	162
Number of ablation centres (> 10 VT ablations on structural heart diseases)	5	4
Number of LAA closures	63	123
Number of centres (LAA closures)	5	5

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	15	21
Number of physicians under training to become independent electrophysiologists	8	7

Availability of a national registry for interventional electrophysiology	No
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

The Finnish Cardiac Society, National Working Group for Arrhythmias and Pacing

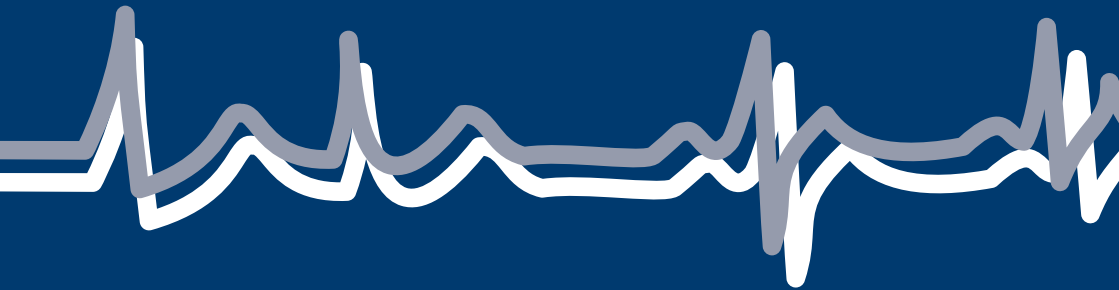
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics – Statistics Finland, Ministry of Social Affairs and Health

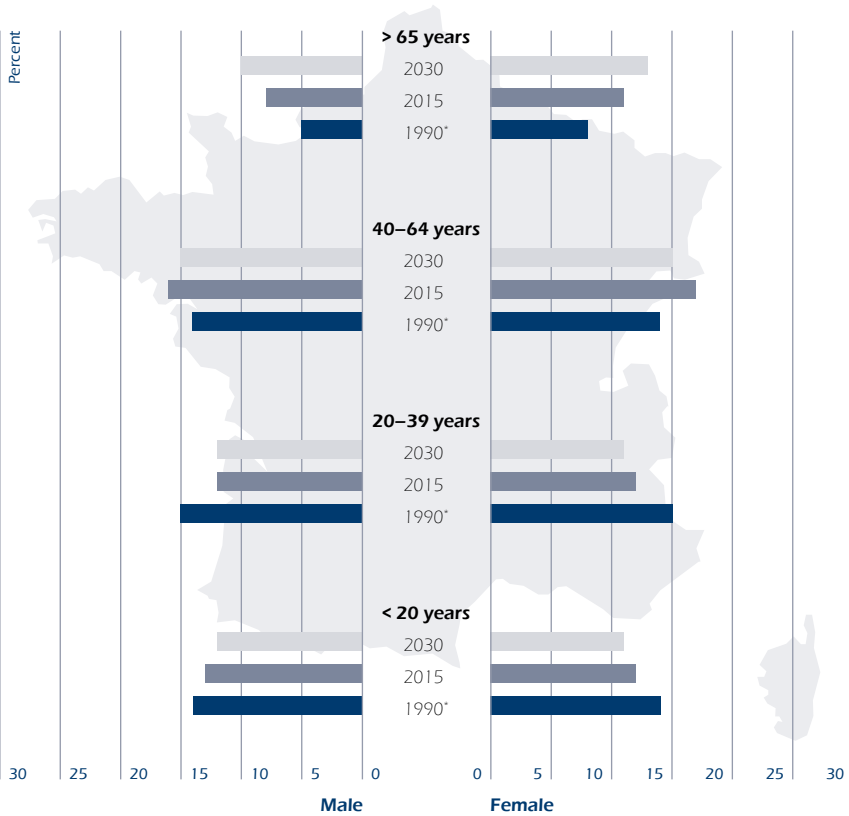
Survey from professional association – Finnish Cardiac Society Estimation

FRANCE



1. Statistics

Age pyramid for France



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	5,3	2013
Beds (per 100.000 population)	647,7	2013
Density of physicians (per 1.000 population)	3,2	2014
Density of nurses (per 1.000 population)	10,3	2014

Demographic information		Year
Population	66.553.766	2015
Population annual growth rate (%)	0,4	2015
Life expectancy at birth (in years)	82	2015
Death rate (per 1.000 population)	8,5	2011
Live births (per 1.000 population)	12,3	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	2.422,65	2015*
Gross domestic product per capita (U.S dollar-units)	37.728,41	2015*
Total expenditure on health as % of GDP	11,7	2013
General government expenditure on health as % of total expenditure on health	77,4	2012
Private expenditure on health as % of total expenditure on health	22,6	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	26%	22,6%*

* 2011-2013 data

3. Healthcare System

Sécurité sociale: French National Health System

Basic insurance availability	Yes
-------------------------------------	------------

Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2014	2015
Public insurance company	55%	100%
Private insurance company	0%	not available
Private co-payment	45%	not available

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
	Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: This reimbursement only concerns private hospitals. There is no physician reimbursement in public hospitals unless the activity is performed during private practice.



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Diplôme Inter Universitaire (DIU) de rythmologie et de stimulation cardiaque
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DIU de rythmologie et de stimulation cardiaque
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist with dedicated certification
ICD or pacemaker implants	Yes	Cardiologist with dedicated certification

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Official name: Cardiac Rhythm and Pacing Group of the French Society of Cardiology	

Required period of training to perform implantations	Yes
	2 years
Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
The HAS (Haute Autorité de Santé) agency	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	47
Percentage of academic centres among all practicing EP centres	55%
Percentage of academic centres among all practicing implanting devices centres	60%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	451	453
Total Pacemaker units implanted	67.000	64.176
Thereof, Leadless Pacemaker	not available	124
First implants	55.000	not available
Replacements	12.000	not available
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	146	174
Total CRT units implanted	9.570	10.432
Thereof, CRT pacemaker	3.500	3.888
Thereof, CRT ICD	6.070	6.544
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	162	161
Total ICD units implanted	13.700	7.825
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	11.000	not available
Replacements	2.700	not available
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	80	not available
Total loop recorders implanted	not available	3.600

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	50	30
Total lead extraction procedures	2.200	3.000

Specialist performing lead extractions		
Cardiologists	Yes	90%
Surgeons	Yes	10%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	Yes
---	------------

Official name: Agence Nationale de Sécurité des Médicaments et des Produits de santé

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
---	-----------



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	130	196
Number of ablations performed	33.300	39.596
Mean number of ablations per centre	256	202
Number of AF ablations	11.000	10.138
Number of ablation centres (> 50 AF ablations)	70	57
Number of VT/VF ablations	not available	741
Number of ablation centres (> 10 VT ablations on structural heart diseases)	50	23
Number of LAA closures	not available	700
Number of centres (LAA closures)	not available	47

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Official name: Groupe de Rythmologie et de Stimulation de la Société Française de Cardiologie

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

Survey from professional association

Sales data

Estimation

GEORGIA



1. Statistics

Age pyramid for Georgia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	5,3	2013
Beds (per 100.000 population)	258,5	2013
Density of physicians (per 1.000 population)	4,1	2013
Density of nurses (per 1.000 population)	3,4	2013

Demographic information		Year
Population	4.931.226	2015
Population annual growth rate (%)	-0,1	2015
Life expectancy at birth (in years)	76	2015
Death rate (per 1.000 population)	13,2	2014
Live births (per 1.000 population)	16,3	2014

Economic information		Year
Gross domestic product (U.S dollar-billions)	13,75	2015*
Gross domestic product per capita (U.S dollar-units)	3.719,98	2015*
Total expenditure on health as % of GDP	9,4	2013
General government expenditure on health as % of total expenditure on health	18,0	2012
Private expenditure on health as % of total expenditure on health	82,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	38	not available

3. Healthcare System

National Health System and private insurance

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: Every citizen has basic insurance

Percentage of insured and uninsured citizens	2014	2015
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Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality	2014	2015
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Public insurance company	not available	not available
Private insurance company	not available	not available
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
---	--

ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: Reimbursement is only for the retired people, the population living below poverty level and some target groups (e.g. students, etc.)



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					Official name
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Subspecialty "Cardiac electrophysiology and the management of arrhythmias"
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Subspecialty "Cardiac electrophysiology and the management of arrhythmias"
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accreditation for training in subspecialty "Cardiac electrophysiology and the management of arrhythmias"

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiac electrophysiologist
ICD or pacemaker implants	Yes	Cardiac electrophysiologist or cardiac surgeon
Official national competency guidelines for electrophysiological studies or catheter ablation		No
Required period of training to perform implantations		No
Suggested period of training to perform implantations		No
National quality control system availability		No
Willingness to install quality control system		Yes
Responsible person for quality control		
Hospitals		
Training centres availability		
Pacemaker		1
ICD implantation		1
CRT implantation		1
Electrophysiological studies and catheter ablation		1
Atrial fibrillation ablation		1
Number of universities (Schools of Medicine)		4
Percentage of academic centres among all practicing EP centres		50%
Percentage of academic centres among all practicing implanting devices centres		30%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	9	15
Total Pacemaker units implanted	608	817
Thereof, Leadless Pacemaker	not available	0
First implants	not available	not available
Replacements	not available	not available

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	7	10
Total CRT units implanted	55	62
Thereof, CRT pacemaker	11	10
Thereof, CRT ICD	44	52

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	8	12
Total ICD units implanted	104	140
Thereof, Single chamber	81	118
Thereof, Dual chamber	23	22
Thereof, Subcutaneous ICD	not available	0
First implants	100	135
Replacements	4	5

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	9	not available
Total loop recorders implanted	4	5

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	1	not available
Total lead extraction procedures	3	not available

Specialist performing lead extractions		
Cardiologists	Yes	not available
Surgeons	Yes	not available

10. Device specific

Availability of remote monitoring of devices	No
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National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	



Availability of a national quality insurance system or complication registry	No
---	-----------

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
---	-----------

11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	7	8
Number of ablations performed	356	403
Mean number of ablations per centre	51	50
Number of AF ablations	50	64
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	0	not available
Number of centres (LAA closures)	0	not available

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	7	8
Number of physicians under training to become independent electrophysiologists	1	not available

Availability of a national registry for interventional electrophysiology	No
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12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants

National	No
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

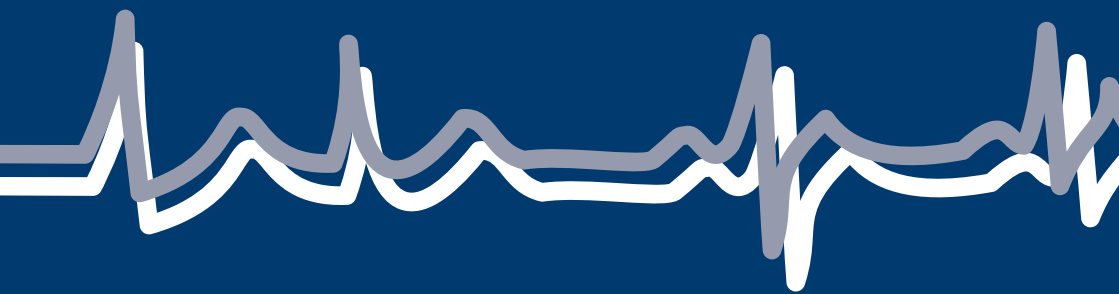
Georgian Heart Rhythm Association

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

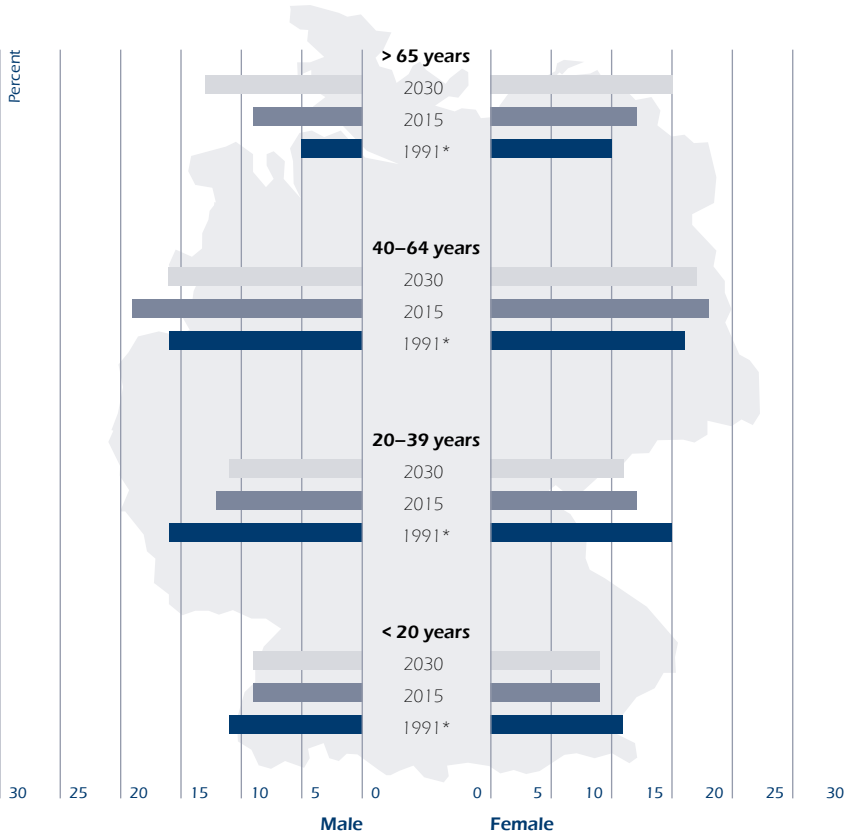
Georgian Heart Rhythm Association

GERMANY



1. Statistics

Age pyramid for Germany



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	4,0	2013
Beds (per 100.000 population)	827,8	2013
Density of physicians (per 1.000 population)	4,1	2013
Density of nurses (per 1.000 population)	13,2	2013

Demographic information		Year
Population	80.854.408	2015
Population annual growth rate (%)	-0,2	2015
Life expectancy at birth (in years)	81	2015
Death rate (per 1.000 population)	11,1	2013
Live births (per 1.000 population)	8,5	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	3.371,00	2015*
Gross domestic product per capita (U.S dollar-units)	41.267,31	2015*
Total expenditure on health as% of GDP	11,3	2013
General government expenditure on health as% of total expenditure on health	76,7	2012
Private expenditure on health as% of total expenditure on health	23,3	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	40%	44,7%

3. Healthcare System

public insurance full cover, in addition private insurance companies

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: general coverage

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	99%	99%
Uninsured citizens	1%	1%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	87%	87%
Private insurance company	11%	13%
Private co-payment	2%	not available

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
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ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals							
--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sachkunde Device-Therapie, Curriculum Aktive Rhythmusimplantate
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curriculum Elektrophysiologie
Allied professionals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, cardiac or thoracic surgeon, internal medicine

Official national competency guidelines for electrophysiological studies or catheter ablation	No
Required period of training to perform implantations	No
Suggested period of training to perform implantations	Yes
	18 months
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	No
Responsible person for quality control	
AQUA institute	
Training centres availability	
Pacemaker	136
ICD implantation	136
CRT implantation	136
Electrophysiological studies and catheter ablation	108
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	37
Percentage of academic centres among all practicing EP centres	20%
Percentage of academic centres among all practicing implanting devices centres	10%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	980	1.135
Total Pacemaker units implanted	92.021	106.700
Thereof, Leadless Pacemaker	not available	not available
First implants	75.575	81.092
Replacements	17.740	25.608

Specialist performing implants		
Cardiologists	Yes	60%
Surgeons	Yes	28%
Other	Internal Medicine	12%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	670	250
Total CRT units implanted	10.378	21.139
Thereof, CRT pacemaker	1.294	3.305
Thereof, CRT ICD	9.084	17.834

Specialist performing implants		
Cardiologists	Yes	68%
Surgeons	Yes	20%
Other	Internal Medicine	12%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	670	745
Total ICD units implanted	23.898	28.914
Thereof, Single chamber	12.186	18.241
Thereof, Dual chamber	6.365	10.673
Thereof, Subcutaneous ICD	not available	0
First implants	18.551	18.805
Replacements	5.347	9.109

Specialist performing implants		
Cardiologists	Yes	67%
Surgeons	Yes	21%
Other:	Internal Medicine	12%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	843
Total loop recorders implanted	not available	16.900

Specialist performing implants		
Cardiologists	Yes	92%
Surgeons	Yes	2%
Other	Neurologist	6%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	560	126
Total lead extraction procedures	4.963	2.357

Specialist performing lead extractions		
Cardiologists	Yes	17%
Surgeons	Yes	83%



10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for

		Official name
ICD	No	
Pacing	Yes	German pacemaker Registry
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	Yes
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Official name: AQUA

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
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11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	100	346
Number of ablations performed	60.000	63.790
Mean number of ablations per centre	600	184
Number of AF ablations	40.000	33.628
Number of ablation centres (> 50 AF ablations)	80	156
Number of VT/VF ablations	not available	6.686
Number of ablation centres (> 10 VT ablations on structural heart diseases)	10	138
Number of LAA closures	3.500	4.428
Number of centres (LAA closures)	100	212

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology	No
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12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	Yes
European	Yes

	Obstacles to guideline implementation					Ranking of importance
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
German Cardiac Society, Working Group on Arrhythmias

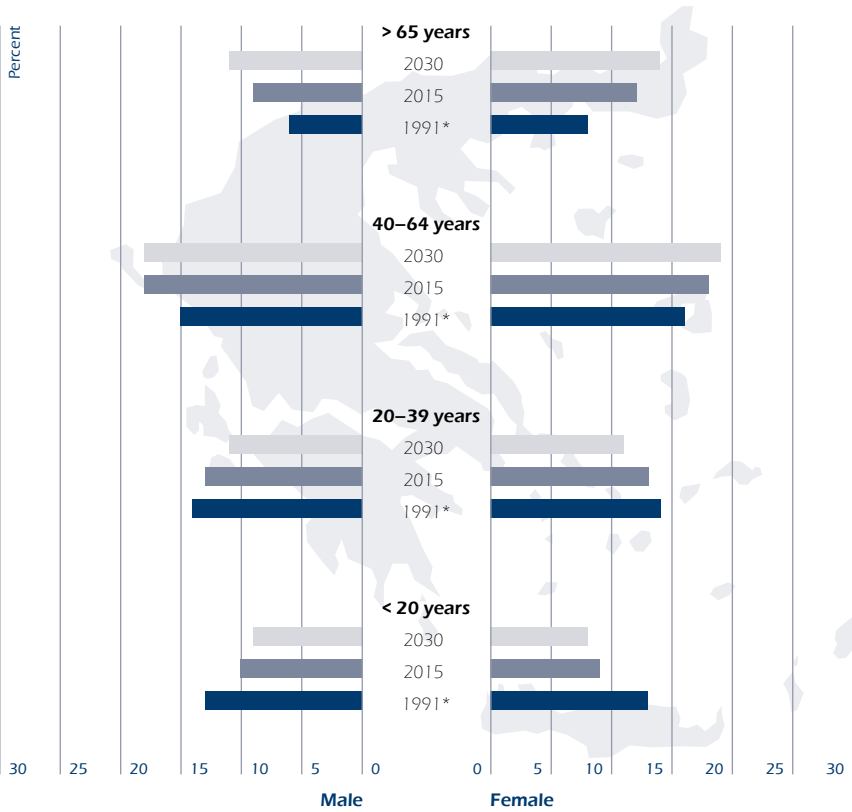
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Deutscher Herzbericht, AQUA, Statistisches Bundesamt
Sales data
Estimation

GREECE



1. Statistics

Age pyramid for Greece



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,8	2011
Beds (per 100.000 population)	475,9	2011
Density of physicians (per 1.000 population)	6,2	2013
Density of nurses (per 1.000 population)	3,8	2011

Demographic information		Year
Population	10.775.643	2015
Population annual growth rate (%)	0,0	2015
Life expectancy at birth (in years)	80	2015
Death rate (per 1.000 population)	10,5	2012
Live births (per 1.000 population)	8,5	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	192,98	2015*
Gross domestic product per capita (U.S dollar-units)	17.656,92	2015*
Total expenditure on health as% of GDP	9,8	2013
General government expenditure on health as% of total expenditure on health	67,1	2012
Private expenditure on health as% of total expenditure on health	32,9	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

The Greek healthcare system is characterized by the coexistence of NHS, a compulsory social insurance and a voluntary private health insurance system. The NHS provides universal coverage to the population and offers equal access to health services for all and social cohesion.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Citizens have to pay yearly their contribution to the public insurance system.

Percentage of insured and uninsured citizens		
	2014	2015

Insured citizens	80%	75%
Uninsured citizens	20%	25%

Distribution of insurance modality		
	2014	2015

Public insurance company	89%	90%
Private insurance company	10%	10%
Private co-payment	1%	0%

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy		
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ICD devices	No answer
Pacemakers	No answer
Ablation	No answer

Reimbursement availability for physicians and hospitals									
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	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification from a Comitee for Pacing and Electrophysiology of the Ministry of Health
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification from a Comitee for Pacing and Electrophysiology of the Ministry of Health
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification from a Comitee for Pacing and Electrophysiology of the Ministry of Health

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist
Official national competency guidelines for electrophysiological studies or catheter ablation		No
Required period of training to perform implantations		Yes
		1 year
Suggested period of training to perform implantations		Yes
		1 year
National quality control system availability		No
Willingness to install quality control system		Yes
Responsible person for quality control		None
Training centres availability		
Pacemaker		15
ICD implantation		8
CRT implantation		8
Electrophysiological studies and catheter ablation		8
Atrial fibrillation ablation		8
Number of universities (Schools of Medicine)		7
Percentage of academic centres among all practicing EP centres		25%
Percentage of academic centres among all practicing implanting devices centres		12%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	56	56
Total Pacemaker units implanted	8.000	8.800
Thereof, Leadless Pacemaker	not available	0
First implants	5.900	6.490
Replacements	2.100	2.310

Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	16	16
Total CRT units implanted	580	638
Thereof, CRT pacemaker	80	88
Thereof, CRT ICD	500	550

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	24	24
Total ICD units implanted	1.080	1.188
Thereof, Single chamber	250	275
Thereof, Dual chamber	830	913
Thereof, Subcutaneous ICD	not available	0
First implants	818	899
Replacements	262	289

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	16	16
Total loop recorders implanted	150	165

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	4	4
Total lead extraction procedures	50	55

Specialist performing lead extractions		
Cardiologists	Yes	90%
Surgeons	Yes	10%



10. Device specific

Availability of remote monitoring of devices	No
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Reasons why remote monitoring is not available: Reasons related to cost

National registry for		Official name
ICD	Yes	Working Group of Electrophysiology and Pacing of Greek Society of Cardiology Registry
Pacing	Yes	Working Group of Electrophysiology and Pacing of Greek Society of Cardiology Registry
Electrophysiology	Yes	Working Group of Electrophysiology and Pacing of Greek Society of Cardiology Registry

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
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11. Interventional electrophysiology

Number of ablations performed and number of centres	2014	2015
Number of ablation centres	29	29
Number of ablations performed	1.653	1.710
Mean number of ablations per centre	57	59
Number of AF ablations	560	650
Number of ablation centres (> 50 AF ablations)	6	6
Number of VT/VF ablations	180	185
Number of ablation centres (> 10 VT ablations on structural heart diseases)	6	6
Number of LAA closures	10	8
Number of centres (LAA closures)	2	2

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	75	76
Number of physicians under training to become independent electrophysiologists	not available	8

Availability of a national registry for interventional electrophysiology	Yes
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Official name: Working Group of Electrophysiology and Pacing of Greek Society of Cardiology Registry

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants
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National	No
U.S.	No
European	Yes

Obstacles to guideline implementation						Ranking of importance
--	--	--	--	--	--	------------------------------

	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
--

Working Group of Electrophysiology and Pacing of Greek Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2016
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EHRA White Book 2015

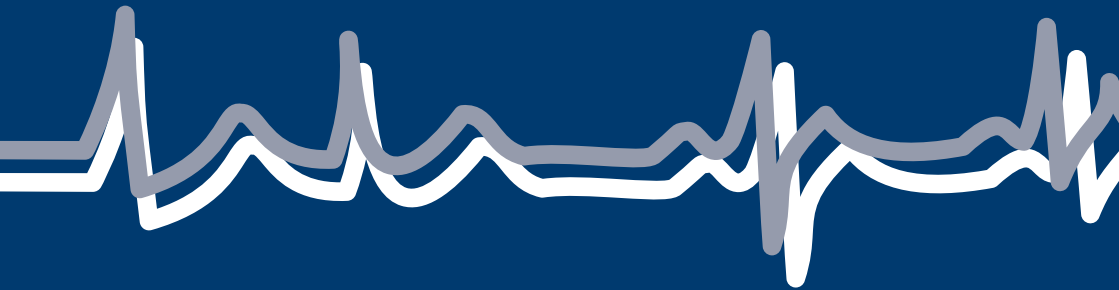
Survey from professional association

Sales data

Estimation

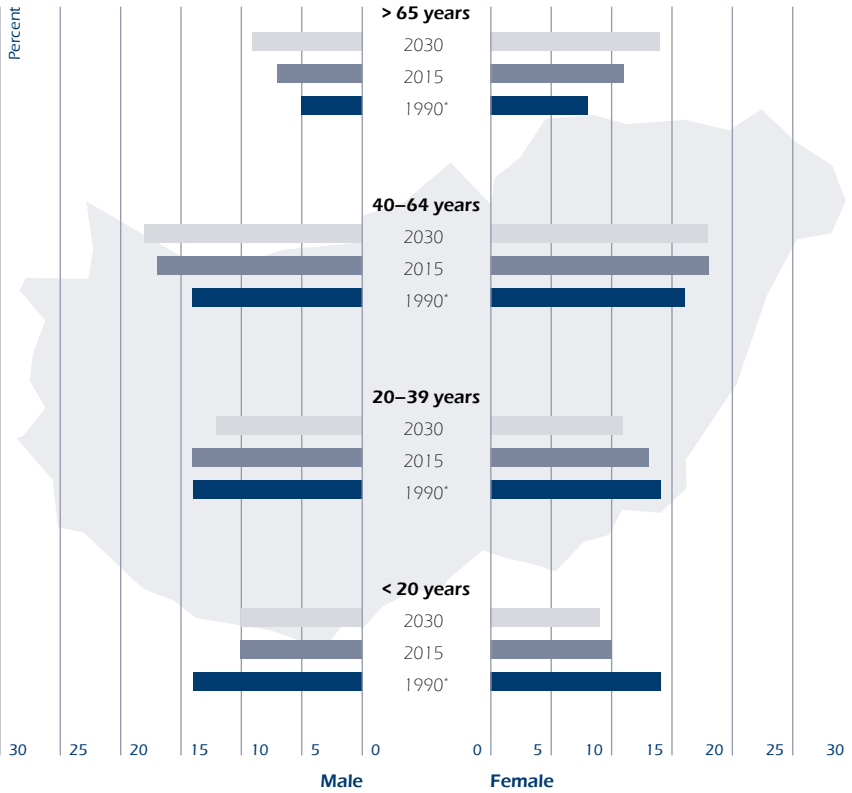
Working Group of Electrophysiology and Pacing of Greek Society of Cardiology

HUNGARY



1. Statistics

Age pyramid for Hungary



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,8	2013
Beds (per 100.000 population)	703,7	2013
Density of physicians (per 1.000 population)	3,2	2013
Density of nurses (per 1.000 population)	6,6	2013

Demographic information		Year
Population	9.897.541	2015
Population annual growth rate (%)	-0,2	2015
Life expectancy at birth (in years)	76	2015
Death rate (per 1.000 population)	12,8	2013
Live births (per 1.000 population)	9,0	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	118,49	2015*
Gross domestic product per capita (U.S dollar-units)	12.020,63	2015*
Total expenditure on health as% of GDP	8,1	2013
General government expenditure on health as% of total expenditure on health	62,6	2012
Private expenditure on health as% of total expenditure on health	37,4	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	46 %

3. Healthcare System

The Hungarian healthcare system is organised through a National Health Insurance Fund which is available for all citizens registered at the Fund.

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: Age under 18 or retired; or valid job contract; or regular payment of the insurance fee.

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	98%	98%
Uninsured citizens	2%	2%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	99%	99%
Private insurance company	1%	1%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Arrhythmologist Licence for Pacemaker/ICD/CRT (Device Therapy)
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Arrhythmologist Licence for Cardiac Electrophysiology and Ablation
Allied professionals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Arrhythmologist Licence for Pacemaker/ICD/CRT (Device Therapy) for Allied Professionals
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist, cardiologist fellow
ICD or pacemaker implants	Yes	Cardiologist, cardiologist fellow, heart surgeon, anaesthesiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Hungarian Society of Cardiology	
Required period of training to perform implantations	No
Suggested period of training to perform implantations	Yes
2 years	
National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	No answer
Training centres availability	
Pacemaker	6
ICD implantation	6
CRT implantation	6
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	6
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	36%
Percentage of academic centres among all practicing implanting devices centres	22%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	18	18
Total Pacemaker units implanted	6.393	6.432
Thereof, Leadless Pacemaker	32	24
First implants	4.880	4.893
Replacements	1.513	1.539

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	13	14
Total CRT units implanted	941	1.091
Thereof, CRT pacemaker	471	496
Thereof, CRT ICD	470	595

Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	13	13
Total ICD units implanted	956	986
Thereof, Single chamber	729	689
Thereof, Dual chamber	227	294
Thereof, Subcutaneous ICD	0	3
First implants	753	835
Replacements	203	151

Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	12	12
Total loop recorders implanted	120	169

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	8	8
Total lead extraction procedures	97	105

Specialist performing lead extractions		
Cardiologists	Yes	95%
Surgeons	Yes	5%

10. Device specific

Availability of remote monitoring of devices	Yes
---	------------

National registry for		
		Official name
ICD	Yes	Hungarian Online Pacemaker Registry
Pacing	Yes	Hungarian Online Pacemaker Registry
Electrophysiology	No	



Availability of a national quality insurance system or complication registry	Yes
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Official name: Hungarian Online Pacemaker Registry and individual paper based data collection from centers

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
---	------------

Official name: National Health Insurance Fund

11. Interventional electrophysiology

Number of ablations performed and number of centres		
--	--	--

	2014	2015
Number of ablation centres	11	11
Number of ablations performed	3.469	3.723
Mean number of ablations per centre	315	338
Number of AF ablations	1.081	1.204
Number of ablation centres (> 50 AF ablations)	6	7
Number of VT/VF ablations	81	87
Number of ablation centres (> 10 VT ablations on structural heart diseases)	4	3
Number of LAA closures	67	33
Number of centres (LAA closures)	6	5

Number of electrophysiologists		
---------------------------------------	--	--

Number of electrophysiologists performed catheter ablation independently	25	25
Number of physicians under training to become independent electrophysiologists	15	not available

Availability of a national registry for interventional electrophysiology	No
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12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
--	--

National	Yes
U.S.	No answer
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Working Group on Cardiac Arrhythmias and Pacing, Hungarian Society of Cardiology

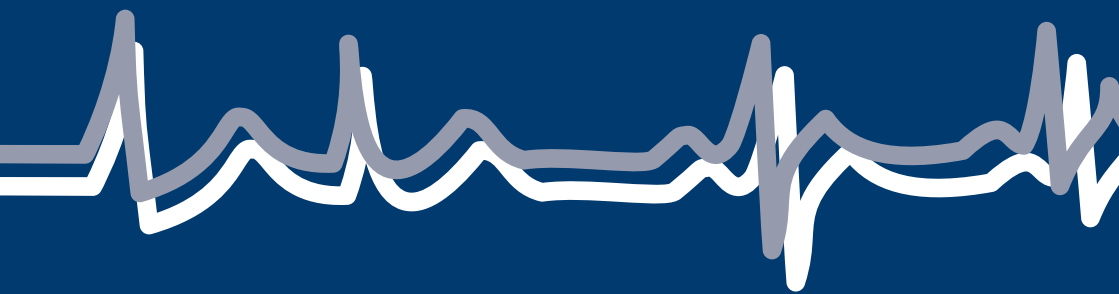
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics – National Health Insurance Fund

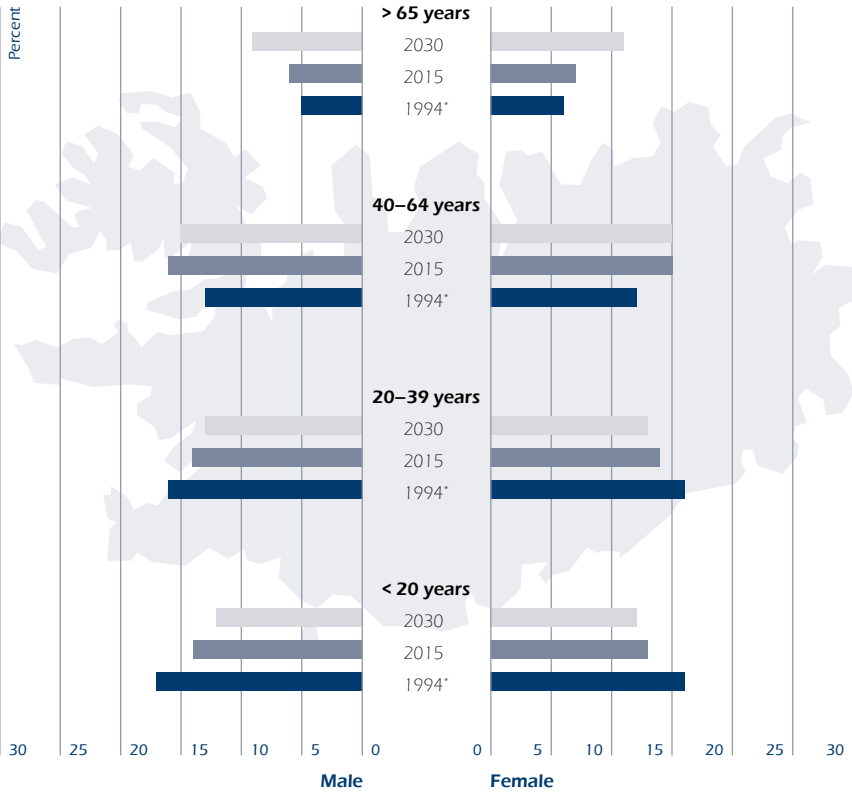
Survey from professional association - Working Group on Cardiac Arrhythmias and Pacing, Hungarian Society of Cardiology

ICELAND



1. Statistics

Age pyramid for Iceland



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,4	2014
Beds (per 100.000 population)	317,1	2014
Density of physicians (per 1.000 population)	3,6	2014
Density of nurses (per 1.000 population)	16,2	2014

Demographic information		Year
Population	331.918	2015
Population annual growth rate (%)	1,2	2015
Life expectancy at birth (in years)	83	2015
Death rate (per 1.000 population)	6,3	2009
Live births (per 1.000 population)	13,4	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	16,74	2015*
Gross domestic product per capita (U.S dollar-units)	51.068,20	2015*
Total expenditure on health as% of GDP	9,1	2013
General government expenditure on health as% of total expenditure on health	80,5	2012
Private expenditure on health as% of total expenditure on health	19,5	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2014	2015
	45%	36%

3. Healthcare System

National Health System with universal access

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: Permanent residency

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	No
---	-----------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: For atrial fibrillation ablations only



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist/Cardiac Surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	No answer
Training centres availability	
Pacemaker	0
ICD implantation	0
CRT implantation	0
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	1
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total Pacemaker units implanted	298	308
Thereof, Leadless Pacemaker	not available	0
First implants	257	263
Replacements	41	45
Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total CRT units implanted	26	21
Thereof, CRT pacemaker	16	13
Thereof, CRT ICD	10	8
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total ICD units implanted	59	59
Thereof, Single chamber	22	25
Thereof, Dual chamber	37	34
Thereof, Subcutaneous ICD	not available	0
First implants	55	40
Replacements	4	19
Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	2
Total loop recorders implanted	4	14

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	1	0
Total lead extraction procedures	1	0

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices	Yes
---	------------

National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
---	-----------



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	1	1
Number of ablations performed	76	78
Mean number of ablations per centre	76	78
Number of AF ablations	33	36
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	6	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	2	3
Number of physicians under training to become independent electrophysiologists	0	0

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Icelandic Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

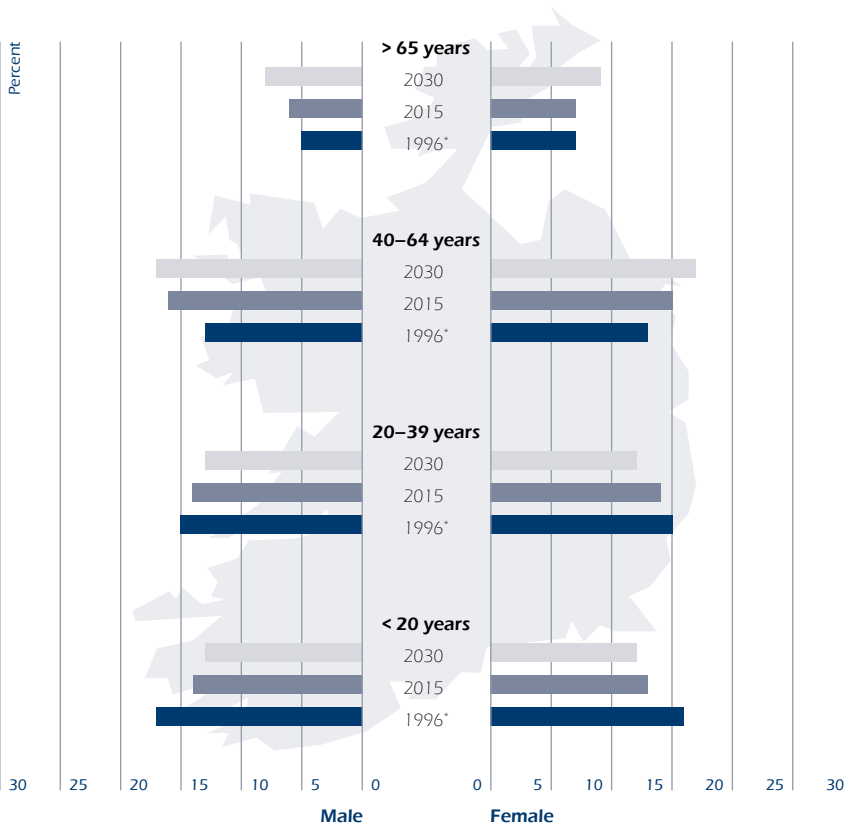
Official statistics

IRELAND



1. Statistics

Age pyramid for Ireland



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,1	2012
Beds (per 100.000 population)	276,1	2013
Density of physicians (per 1.000 population)	2,8	2014
Density of nurses (per 1.000 population)	12,6	2011

Demographic information		Year
Population	4.892.305	2015
Population annual growth rate (%)	1,2	2015
Life expectancy at birth (in years)	81	2015
Death rate (per 1.000 population)	6,4	2012
Live births (per 1.000 population)	15,0	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	227,50	2015*
Gross domestic product per capita (U.S dollar-units)	48.939,68	2015*
Total expenditure on health as% of GDP	8,9	2013
General government expenditure on health as% of total expenditure on health	67,6	2012
Private expenditure on health as% of total expenditure on health	32,4	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	0,19%

3. Healthcare System

Health Services Executive

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: Under the Health act 1970, everyone who is ordinary resident in Ireland qualifies for hospital care

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	48 %	100 %
Uninsured citizens	52 %	0 %

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	48 %	100 %
Private insurance company	52 %	46 %
Private co-payment	0 %	46 %

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: In the public health system all the above procedures are covered with no additional incentive or reimbursement for salaried physicians. In the private insurance system all the above are covered with physician reimbursement.



Treatment availability	
No restrictions	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiac electrophysiologist
ICD or pacemaker implants	Yes	Cardiac electrophysiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	Yes
	6 years

Suggested period of training to perform implantations	Yes
	6 years

National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	
HIQA	
Training centres availability	
Pacemaker	10
ICD implantation	10
CRT implantation	10
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	6
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	50%
Percentage of academic centres among all practicing implanting devices centres	63%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	17	17
Total Pacemaker units implanted	not available	2,277
Thereof, Leadless Pacemaker	not available	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	17	17
Total CRT units implanted	not available	319
Thereof, CRT pacemaker	not available	88
Thereof, CRT ICD	not available	231
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	17	17
Total ICD units implanted	not available	not available
Thereof, Single chamber	not available	403
Thereof, Dual chamber	not available	337
Thereof, Subcutaneous ICD	not available	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	17	17
Total loop recorders implanted	not available	760
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	2	2
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	50%
Surgeons	Yes	50%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	G-pace/Heart Rhythm Ireland but not 100% participation
Pacing	Yes	G-pace/Heart Rhythm Ireland but not 100% participation
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No answer
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: Irish Medicines Board		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	12	12
Number of ablations performed	not available	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	not available	650
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	110
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No answer					
U.S.	Yes					
European	No answer					

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

EP Subgroup of Irish Cardiac Society

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Central Statistics Office, Health Insurance Authority Report

Department of Health, Department of Finance

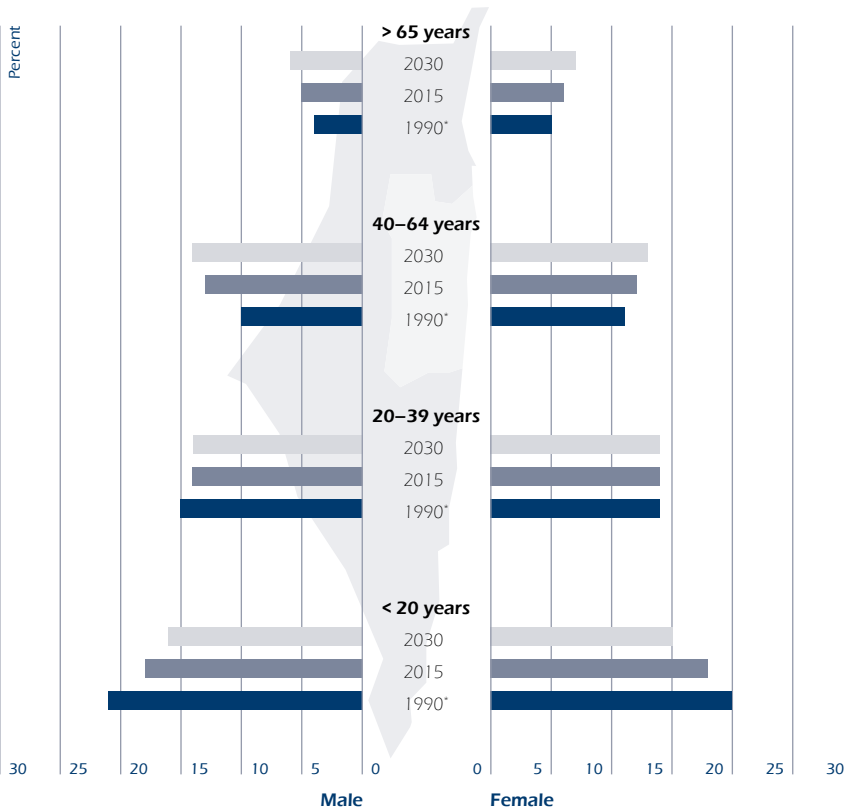
Industry

ISRAEL



1. Statistics

Age pyramid for Israel



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,1	2013
Beds (per 100.000 population)	309,2	2013
Density of physicians (per 1.000 population)	3,3	2012
Density of nurses (per 1.000 population)	5,0	2012

Demographic information		Year
Population	8.049.314	2015
Population annual growth rate (%)	1,6	2015
Life expectancy at birth (in years)	82	2015
Death rate (per 1.000 population)	5,2	2013
Live births (per 1.000 population)	21,4	2014

Economic information		Year
Gross domestic product (U.S dollar-billions)	298,87	2015*
Gross domestic product per capita (U.S dollar-units)	35.702,07	2015*
Total expenditure on health as% of GDP	7,2	2013
General government expenditure on health as% of total expenditure on health	59,8	2012
Private expenditure on health as% of total expenditure on health	40,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	17%

3. Healthcare System

National Health System (National Insurance) with private sector supplements

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2014	2015
Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Yes	Specialist
Catheter ablation	Yes	Electrophysiologist
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible person for quality control	
The ministry of Health	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	6
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	20	20
Total Pacemaker units implanted	4.200	4.250
Thereof, Leadless Pacemaker	not available	10
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	20	20
Total CRT units implanted	1.330	1.452
Thereof, CRT pacemaker	80	115
Thereof, CRT ICD	1.250	1.337
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	20	20
Total ICD units implanted	1.685	1.300
Thereof, Single chamber	708	700
Thereof, Dual chamber	977	600
Thereof, Subcutaneous ICD	not available	0
First implants	1.265	not available
Replacements	420	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	20	20
Total loop recorders implanted	225	310

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	5
Total lead extraction procedures	80	80

Specialist performing lead extractions		
Cardiologists	Yes	99%
Surgeons	Yes	1%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		Official name
ICD	Yes	Israeli ICD Registry
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
---	-----------



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	16	16
Number of ablations performed	not available	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	550	not available
Number of ablation centres (> 50 AF ablations)	4	4
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	4	4
Number of LAA closures	30	not available
Number of centres (LAA closures)	5	7

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	35	35
Number of physicians under training to become independent electrophysiologists	1	2

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

The Israeli Working Group on Pacing and Electrophysiology, Israeli Heart Society

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

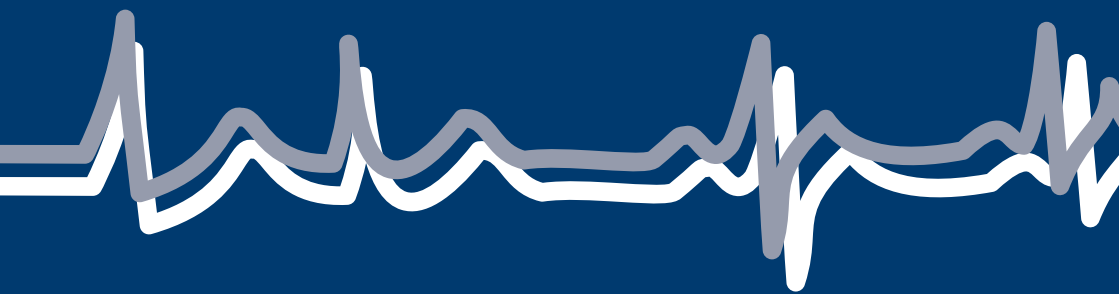
EHRA White Book 2015

Official statistics

Sales data

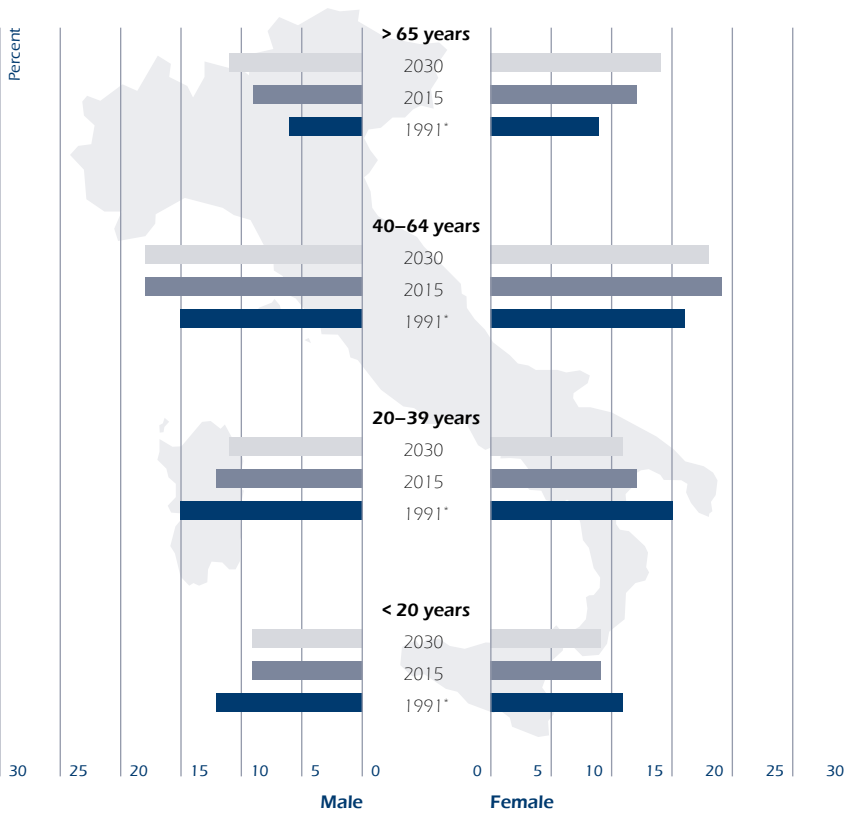
Estimation

ITALY



1. Statistics

Age pyramid for Italy



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,9	2012
Beds (per 100.000 population)	342,2	2012
Density of physicians (per 1.000 population)	3,9	2013
Density of nurses (per 1.000 population)	6,3	2013

Demographic information		Year
Population	61.855.120	2015
Population annual growth rate (%)	0,3	2015
Life expectancy at birth (in years)	82	2015
Death rate (per 1.000 population)	10,3	2012
Live births (per 1.000 population)	8,4	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	1.819,05	2015*
Gross domestic product per capita (U.S dollar-units)	29.847,38	2015*
Total expenditure on health as% of GDP	9,1	2013
General government expenditure on health as% of total expenditure on health	77,3	2012
Private expenditure on health as% of total expenditure on health	22,7	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

National health care system with the possibility of private insurance

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: to be Italian citizen

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Comments: We have no dedicated reimbursement for leadless pacing and S-ICD. The reimbursement for leadless pacing is the same for single chamber pacemaker replacement. The reimbursement for S-ICD is the same for single chamber ICD.



Treatment availability	
No restrictions	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					Official name
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIAC (italian heart rhythm association) certification for cardiac pacing
invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIAC (italian heart rhythm association) certification for electrophysiology
allied professionals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA certification for ap
training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	No	
ICD or pacemaker implants	No	

Official national competency guidelines for electrophysiological studies or catheter ablation	No
	<input type="checkbox"/>

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
Not applicable	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	35
Percentage of academic centres among all practicing EP centres	7%
Percentage of academic centres among all practicing implanting devices centres	10%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	433	435
Total Pacemaker units implanted	63.442	65.234
Thereof, Leadless Pacemaker	not available	not available
First implants	44.409	not available
Replacements	19.033	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	378	380
Total CRT units implanted	12.336	12.815
Thereof, CRT pacemaker	2.112	2.153
Thereof, CRT ICD	10.224	10.662
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	397	396
Total ICD units implanted	13.729	14.709
Thereof, Single chamber	6.128	6.584
Thereof, Dual chamber	7.601	7.574
Thereof, Subcutaneous ICD	not available	551
First implants	9.336	not available
Replacements	4.393	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	400	400
Total loop recorders implanted	3.900	4.000
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	RIP & RID
Pacing	Yes	RIP & RID
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: AIAC		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	not available	not available
Number of ablations performed	not available	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	not available	not available
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

AIAC – Associazione Italiana Aritmologia E Cardioritmo (Italian Heart Rhythm Association)

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

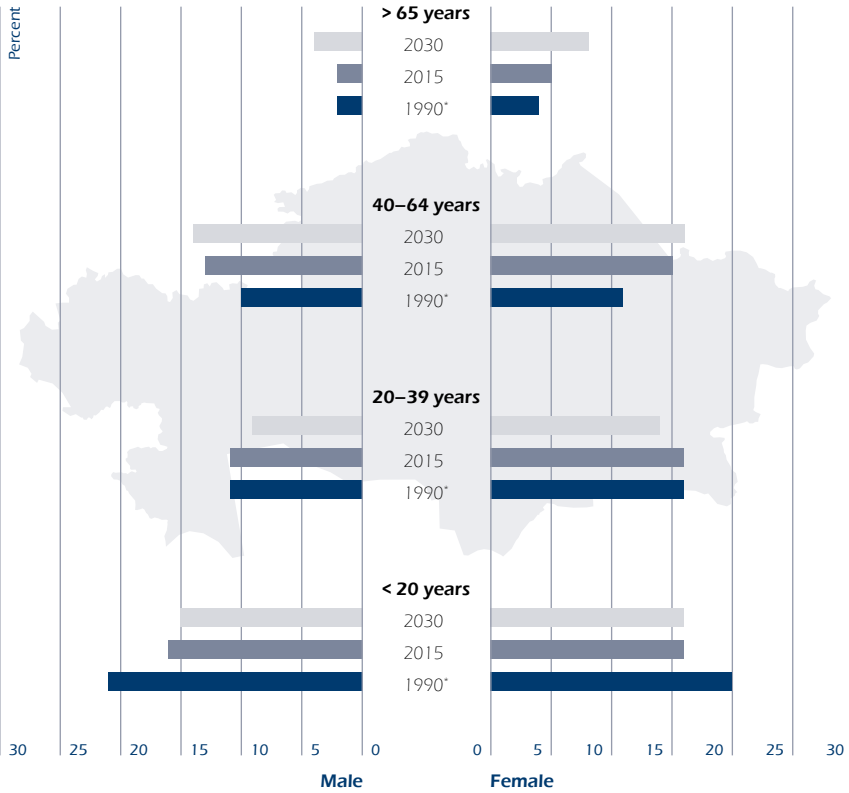
EHRA White Book 2015
Survey from professional association
Sales data
Estimation

KAZAKHSTAN



1. Statistics

Age pyramid for Kazakhstan



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	5,4	2013
Beds (per 100.000 population)	671,8	2013
Density of physicians (per 1.000 population)	3,5	2013
Density of nurses (per 1.000 population)	8,0	2013

Demographic information		Year
Population	18.157.122	2015
Population annual growth rate (%)	1,2	2015
Life expectancy at birth (in years)	71	2015
Death rate (per 1.000 population)	8,5	2012
Live births (per 1.000 population)	22,7	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	195,01	2015*
Gross domestic product per capita (U.S dollar-units)	11.028,07	2015*
Total expenditure on health as% of GDP	4,3	2013
General government expenditure on health as% of total expenditure on health	55,8	2012
Private expenditure on health as% of total expenditure on health	44,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	23,5%	26%

3. Healthcare System

National Health System

Basic insurance availability	No
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality		
	2014	2015
Public insurance company	not available	not available
Private insurance company	not available	not available
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
	Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Interventional cardiologist
ICD or pacemaker implants	Yes	Interventional cardiologist or cardiac surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No

Suggested period of training to perform implantations	Yes
	1 year

National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Cathether ablation	Yes
Responsible person for quality control	
Medical and Pharmaceutical activity Control Committee	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	
7	
Percentage of academic centres among all practicing EP centres	
not available	
Percentage of academic centres among all practicing implanting devices centres	
not available	

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	22	25
Total Pacemaker units implanted	2.355	1.801
Thereof, Leadless Pacemaker	not available	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	13	18
Total CRT units implanted	262	314
Thereof, CRT pacemaker	not available	0
Thereof, CRT ICD	not available	314

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	15	19
Total ICD units implanted	402	527
Thereof, Single chamber	not available	23
Thereof, Dual chamber	not available	504
Thereof, Subcutaneous ICD	not available	not available
First implants	not available	not available
Replacements	not available	not available

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	No	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	5	2
Total loop recorders implanted	27	19

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	0	1
Total lead extraction procedures	0	16

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	Yes	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		Yes
Medical and Pharmaceutical Activity Control Committee		

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	9	13
Number of ablations performed	2,018	2,461
Mean number of ablations per centre	224	189
Number of AF ablations	524	762
Number of ablation centres (> 50 AF ablations)	4	4
Number of VT/VF ablations	298	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	4	not available
Number of LAA closures	not available	81
Number of centres (LAA closures)	4	3

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No answer					
U.S.	No					
European	Yes					

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Association of cardiologists of Kazakhstan, Kazakh Association of arrhythmologists

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

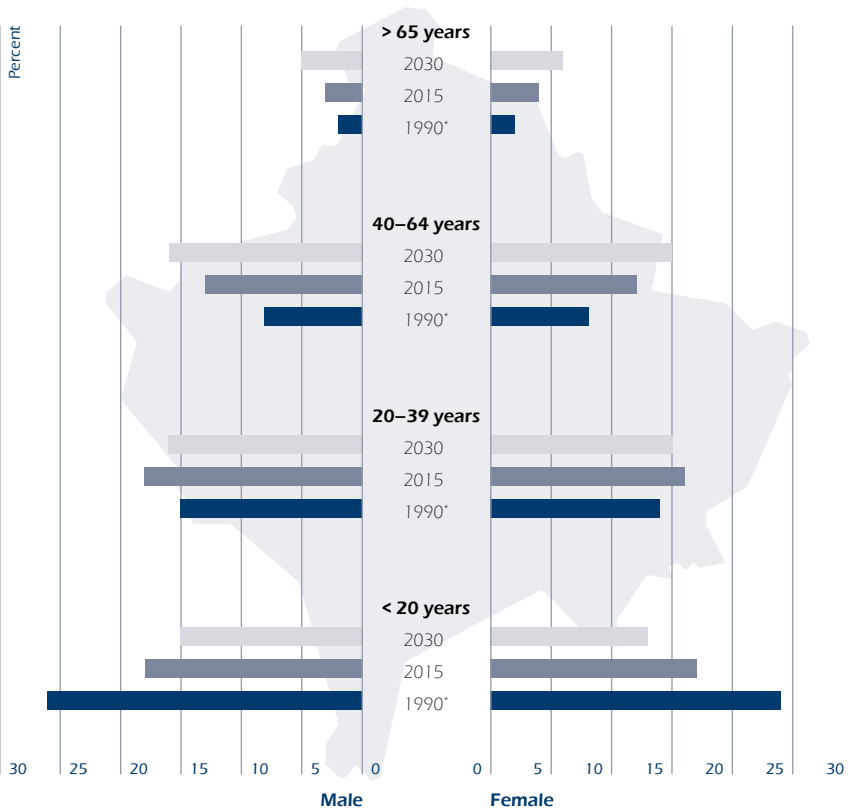
Survey from professional association

KOSOVO



1. Statistics

Age pyramid for Kosovo



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available

Demographic information		Year
Population	1.870.981	2015
Population annual growth rate (%)	0,6	2015
Life expectancy at birth (in years)	71	2015
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available

Economic information		Year
Gross domestic product (U.S dollar-billions)	6,31	2015*
Gross domestic product per capita (U.S dollar-units)	not available	not available
Total expenditure on health as% of GDP	not available	not available
General government expenditure on health as% of total expenditure on health	not available	not available
Private expenditure on health as% of total expenditure on health	not available	not available

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

Health care system in Kosovo is organized in three sectors including: primary, secondary and tertiary health care. The highest health care authority in Kosovo is Ministry of Health of Kosovo.

Basic insurance availability	No
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Percentage of insured and uninsured citizens	2014	2015
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality	2014	2015
Public insurance company	not available	not available
Private insurance company	not available	not available
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	No answer
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Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
		Specialist
Catheter ablation	No answer	
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No answer

Suggested period of training to perform implantations	No answer

National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
University clinical center of Kosovo Clinic of Cardiology	
Training centres availability	
Pacemaker	5
ICD implantation	3
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	1
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	3
Total Pacemaker units implanted	127	122
Thereof, Leadless Pacemaker	not available	not available
First implants	120	116
Replacements	7	6
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	not available
Other		not available



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	0	1
Total CRT units implanted	0	4
Thereof, CRT pacemaker	0	not available
Thereof, CRT ICD	0	4
Specialist performing implants		
Cardiologists	Yes	80%
Surgeons	No	not available
Other	Technical consultant	20%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total ICD units implanted	3	12
Thereof, Single chamber	0	9
Thereof, Dual chamber	3	3
Thereof, Subcutaneous ICD	not available	not available
First implants	not available	12
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	not available
Other		not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	0	not available
Total loop recorders implanted	0	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	0	not available
Total lead extraction procedures	0	not available

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	not available
Other		not available

10. Device specific

Availability of remote monitoring of devices	No
Reasons why remote monitoring is not available: We do not have such a device.	

National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
--	----



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	0	not available
Number of ablations performed	0	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	0	not available
Number of ablation centres (> 50 AF ablations)	0	not available
Number of VT/VF ablations	0	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	not available
Number of LAA closures	0	not available
Number of centres (LAA closures)	0	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	0	not available
Number of physicians under training to become independent electrophysiologists	0	not available

Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

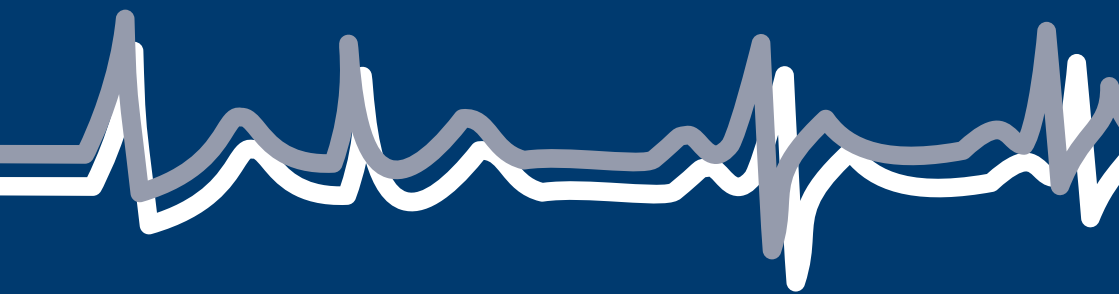
Name of National Cardiac Society, National Working Group or arrhythmia body

Kosovo Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

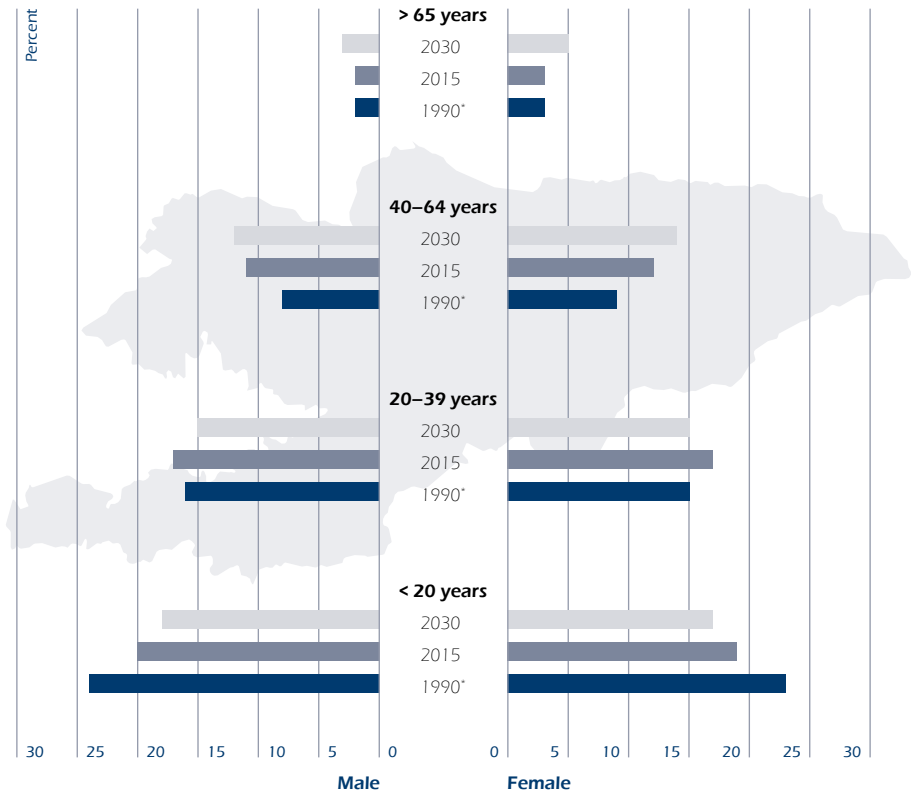
EHRA White Book 2015

KYRGYZSTAN



1. Statistics

Age pyramid for Kyrgyzstan



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,5	2013
Beds (per 100.000 population)	451,2	2013
Density of physicians (per 1.000 population)	1,9	2013
Density of nurses (per 1.000 population)	6,0	2013

Demographic information		Year
Population	5.664.939	2015
Population annual growth rate (%)	1,1	2015
Life expectancy at birth (in years)	70	2015
Death rate (per 1.000 population)	6,1	2013
Live births (per 1.000 population)	27,2	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	7,16	2015*
Gross domestic product per capita (U.S dollar-units)	1.197,76	2015*
Total expenditure on health as% of GDP	6,7	2013
General government expenditure on health as% of total expenditure on health	60,2	2012
Private expenditure on health as% of total expenditure on health	39,8	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	50%	50%

3. Healthcare System

National Health System

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance:

- pensioners at age 70 years and older
- labouring people
- children at age 5 years and less
- invalids at 2nd and 1st groups

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality		
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	2014	2015
Public insurance company	not available	not available
Private insurance company	not available	not available
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
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ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

Comments: Yes, not only in the private sector, at public hospitals too.

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input checked="" type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification commission of Healthcare Ministry
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification commission of Healthcare Ministry

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiosurgeon
ICD or pacemaker implants	Yes	Cardiosurgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No answer
	<input type="checkbox"/>

Required period of training to perform implantations	No answer
Suggested period of training to perform implantations	No answer
National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible person for quality control	
Healthcare Ministry	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	1
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	0%
Percentage of academic centres among all practicing implanting devices centres	0%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total Pacemaker units implanted	126	not available
Thereof, Leadless Pacemaker	not available	0
First implants	not available	0
Replacements	not available	not available
Specialist performing implants		
Cardiologists	No	not available
Surgeons	Yes	not available



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	0	not available
Total CRT units implanted	0	not available
Thereof, CRT pacemaker	0	not available
Thereof, CRT ICD	0	not available

Specialist performing implants		
Cardiologists	No	not available
Surgeons	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	0	2
Total ICD units implanted	0	not available
Thereof, Single chamber	0	not available
Thereof, Dual chamber	0	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	0	not available
Replacements	0	not available

Specialist performing implants		
Cardiologists	No	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total loop recorders implanted	not available	not available

Specialist performing implants		
Cardiologists	No	not available
Surgeons	Yes	not available

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	No	not available
Surgeons	Yes	not available

10. Device specific

Availability of remote monitoring of devices	No answer
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National registry for		Official name
ICD	No answer	
Pacing	No answer	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No answer
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No answer
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11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	2	2
Number of ablations performed	58	59
Mean number of ablations per centre	29	30
Number of AF ablations	not available	not available
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No answer

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National						No answer
U.S.						No answer
European						No answer
Obstacles to guideline implementation					Ranking of importance	
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

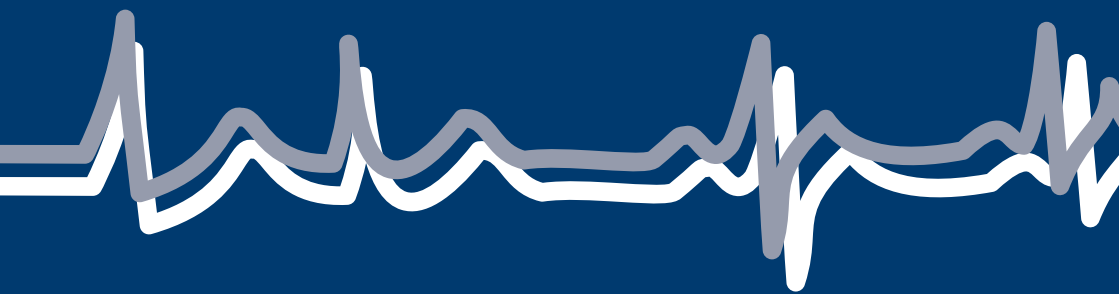
1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Kyrgyz Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Official statistics
Estimation
Other

LATVIA



1. Statistics

Age pyramid for Latvia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,2	2013
Beds (per 100.000 population)	580,0	2013
Density of physicians (per 1.000 population)	3,2	2013
Density of nurses (per 1.000 population)	5,1	2013

Demographic information		Year
Population	1.986.705	2015
Population annual growth rate (%)	-1,1	2015
Life expectancy at birth (in years)	74	2015
Death rate (per 1.000 population)	14,3	2012
Live births (per 1.000 population)	10,2	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	27,82	2015*
Gross domestic product per capita (U.S dollar-units)	13.729,09	2015*
Total expenditure on health as% of GDP	5,7	2013
General government expenditure on health as% of total expenditure on health	60,6	2012
Private expenditure on health as% of total expenditure on health	36,7	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	53,4%	53,1%

3. Healthcare System

National Health System

Basic insurance availability	Yes
-------------------------------------	------------

Percentage of insured and uninsured citizens	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality	2014	2015
Public insurance company	82%	81%
Private insurance company	18%	19%
Private co-payment	0%	not available

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	Yes
Pacemakers	Yes
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Latvian National Society of Cardiology
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Latvian National Society of Cardiology
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Latvian National Society of Cardiology
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Latvian National Society of Cardiology

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Latvian National Society of Cardiology	

Required period of training to perform implantations	Yes
	1 year

Suggested period of training to perform implantations	Yes
	1 year

National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Cathether ablation	Yes

Responsible person for quality control	
National Healthcare System	

Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1

Number of universities (Schools of Medicine)	2
---	----------

Percentage of academic centres among all practicing EP centres	100%
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Percentage of academic centres among all practicing implanting devices centres	100%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	3
Total Pacemaker units implanted	1.236	1.400
Thereof, Leadless Pacemaker	not available	0
First implants	1.023	1.160
Replacements	213	240

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total CRT units implanted	105	107
Thereof, CRT pacemaker	28	22
Thereof, CRT ICD	77	85

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	3
Total ICD units implanted	75	90
Thereof, Single chamber	24	25
Thereof, Dual chamber	51	62
Thereof, Subcutaneous ICD	not available	3
First implants	67	82
Replacements	8	8

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total loop recorders implanted	24	44

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	1	1
Total lead extraction procedures	10	19

Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%



10. Device specific

Availability of remote monitoring of devices	Yes
---	------------

National registry for

		Official name
ICD	Yes	National register of Implantable Devices and EP procedures, National WG of Arrhythmology
Pacing	Yes	National register of Implantable Devices and EP procedures
Electrophysiology	Yes	National register of Implantable Devices and EP procedures

Availability of a national quality insurance system or complication registry	Yes
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Official name: National Healthcare system in collaboration with National Society of Cardiology

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: National Healthcare system in collaboration with National Society of Cardiology

11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	2	2
Number of ablations performed	638	726
Mean number of ablations per centre	319	363
Number of AF ablations	75	88
Number of ablation centres (> 50 AF ablations)	1	1
Number of VT/VF ablations	25	36
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	1
Number of LAA closures	18	28
Number of centres (LAA closures)	1	21

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	5	5
Number of physicians under training to become independent electrophysiologists	2	2

Availability of a national registry for interventional electrophysiology	Yes
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Official name: National Register of Implantable Devices and EP procedures

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No answer
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

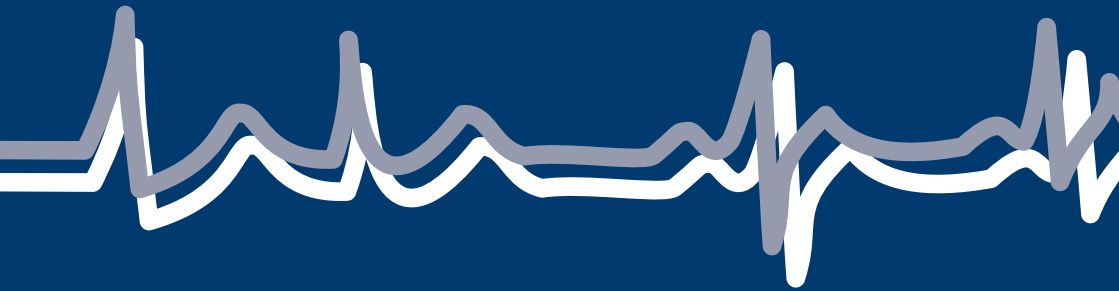
1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Latvian National Society of Cardiology, National Working Group of Arrhythmology

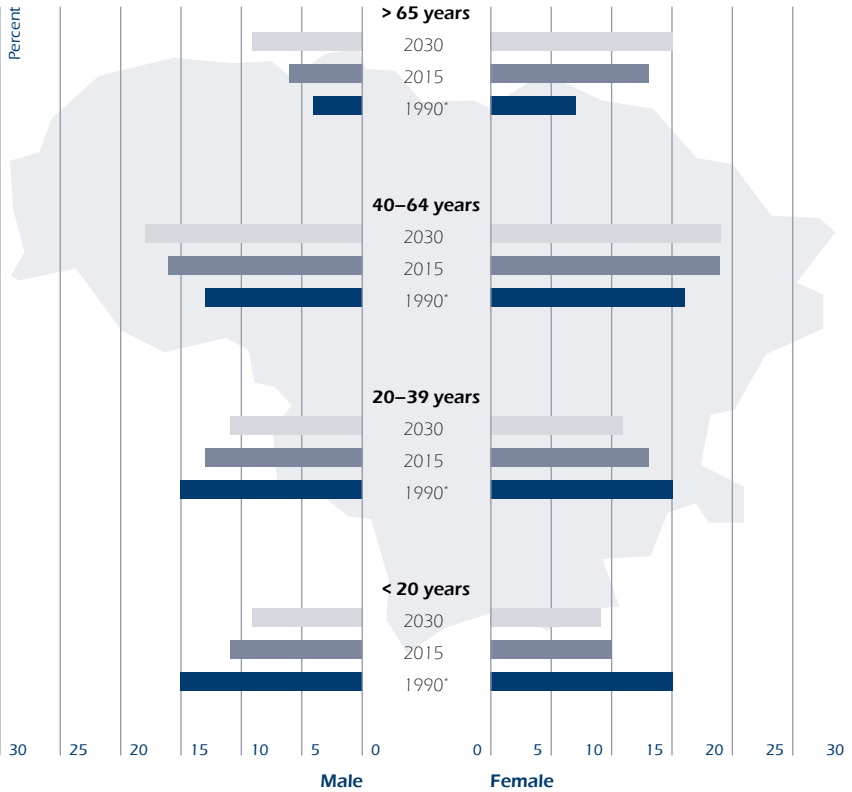
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
National Healthcare System
Latvian National Society of Cardiology
National register of Implantable Devices and EP procedures

LITHUANIA



1. Statistics

Age pyramid for Lithuania



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,4	2013
Beds (per 100.000 population)	728,2	2013
Density of physicians (per 1.000 population)	4,3	2013
Density of nurses (per 1.000 population)	7,9	2013

Demographic information		Year
Population	2.884.433	2015
Population annual growth rate (%)	-1,0	2015
Life expectancy at birth (in years)	75	2015
Death rate (per 1.000 population)	13,7	2012
Live births (per 1.000 population)	10,1	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	41,78	2015*
Gross domestic product per capita (U.S dollar-units)	14.318,08	2015*
Total expenditure on health as% of GDP	6,2	2013
General government expenditure on health as% of total expenditure on health	65,3	2012
Private expenditure on health as% of total expenditure on health	31,1	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

Provision of health services is regulated by National Health Insurance Fund under the Ministry of Health.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance:
 Permanent residents and officially employed, non-permanent residents have basic insurance.

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	not available	100%
Uninsured citizens	not available	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	not available	98%
Private insurance company	not available	2%
Private co-payment	not available	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
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ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: Leadless pacing and subcutaneous ICDs not reimbursed.



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	State Healthcare Accreditation Agency
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	State Healthcare Accreditation Agency
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	State Healthcare Accreditation Agency
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	State Healthcare Accreditation Agency

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Yes	Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, cardiac surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible person for quality control	
State Healthcare Accreditation Agency	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	2
Percentage of academic centres among all practicing EP centres	67%
Percentage of academic centres among all practicing implanting devices centres	40%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	4	5
Total Pacemaker units implanted	2.767	2.583
Thereof, Leadless Pacemaker	not available	0
First implants	2.447	2.350
Replacements	320	233
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	3
Total CRT units implanted	192	195
Thereof, CRT pacemaker	160	150
Thereof, CRT ICD	32	45

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	3
Total ICD units implanted	134	123
Thereof, Single chamber	45	26
Thereof, Dual chamber	89	97
Thereof, Subcutaneous ICD	not available	0
First implants	97	84
Replacements	37	39

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total loop recorders implanted	9	7

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	2	2
Total lead extraction procedures	12	19

Specialist performing lead extractions		
Cardiologists	Yes	95%
Surgeons	Yes	5%

10. Device specific

Availability of remote monitoring of devices	Yes
---	------------

National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	Yes
---	------------

Official name: State Healthcare Accreditation Agency

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
---	------------

Official name: State Healthcare Accreditation Agency



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	3	3
Number of ablations performed	885	1,078
Mean number of ablations per centre	295	359
Number of AF ablations	74	81
Number of ablation centres (> 50 AF ablations)	0	1
Number of VT/VF ablations	6	8
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	2	0
Number of centres (LAA closures)	2	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	14	15
Number of physicians under training to become independent electrophysiologists	1	1

Availability of a national registry for interventional electrophysiology	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Lithuanian Society of Cardiology, Working Group on Pacing and Electrophysiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

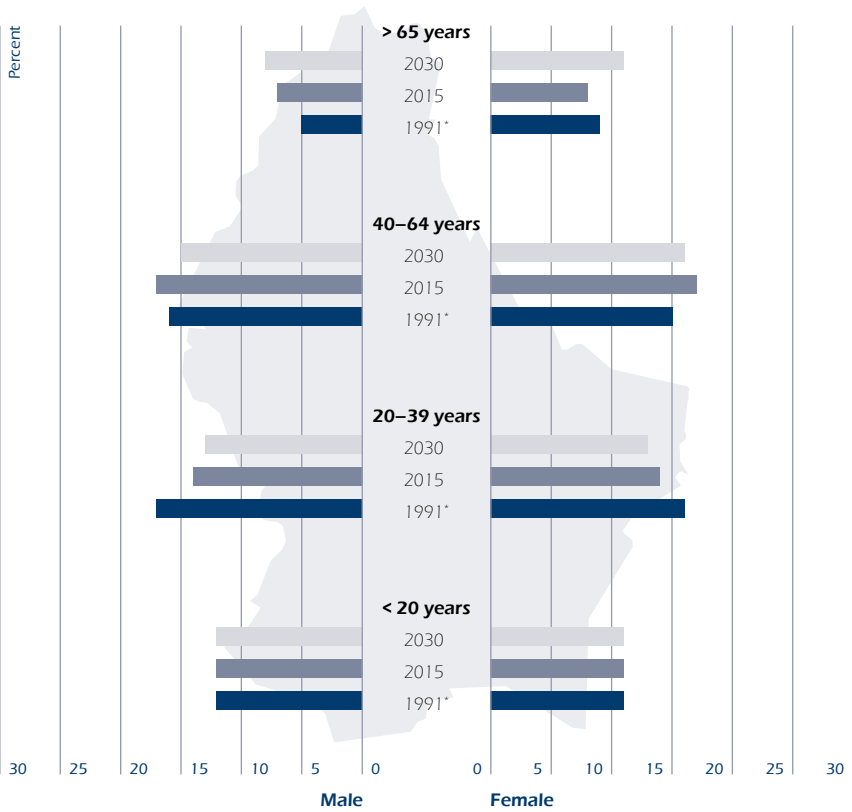
Sample short survey

LUXEMBOURG



1. Statistics

Age pyramid for Luxembourg



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,2	2014
Beds (per 100.000 population)	493,4	2014
Density of physicians (per 1.000 population)	2,9	2014
Density of nurses (per 1.000 population)	12,3	2014

Demographic information		Year
Population	570.252	2015
Population annual growth rate (%)	2,2	2015
Life expectancy at birth (in years)	82	2015
Death rate (per 1.000 population)	6,8	2013
Live births (per 1.000 population)	11,3	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	57,93	2015*
Gross domestic product per capita (U.S dollar-units)	103.186,99	2015*
Total expenditure on health as% of GDP	7,1	2013
General government expenditure on health as% of total expenditure on health	83,5	2012
Private expenditure on health as% of total expenditure on health	16,5	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

National Health System

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance:
 Payed half by yourself and half by your employer.

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	100 %	100 %
Uninsured citizens	0%	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	100%	100%
Private insurance company	not available	not available
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for			Specialist
Catheter ablation	Yes		Trained Cardiologist
ICD or pacemaker implants	Yes		Trained Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No

Suggested period of training to perform implantations	No

National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	
No official quality control	
Training centres availability	
Pacemaker	0
ICD implantation	0
CRT implantation	0
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	0
Percentage of academic centres among all practicing EP centres	0%
Percentage of academic centres among all practicing implanting devices centres	0%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	5	6
Total Pacemaker units implanted	349	393
Thereof, Leadless Pacemaker	not available	not available
First implants	267	281
Replacements	82	112
Specialist performing implants		
Cardiologists	Yes	85%
Surgeons	Yes	15%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total CRT units implanted	34	34
Thereof, CRT pacemaker	10	8
Thereof, CRT ICD	24	26
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total ICD units implanted	62	65
Thereof, Single chamber	53	50
Thereof, Dual chamber	9	15
Thereof, Subcutaneous ICD	not available	0
First implants	45	47
Replacements	17	18
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total loop recorders implanted	23	22
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	1	1
Total lead extraction procedures	7	6

Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	INCCI (Institut National de Chirurgie Cardiaque et de Cardiologie Invasive)
Pacing	No	
Electrophysiology	Yes	INCCI (Institut National de Chirurgie Cardiaque et de Cardiologie Invasive)
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: Ministry of Health		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	1	1
Number of ablations performed	158	145
Mean number of ablations per centre	158	145
Number of AF ablations	57	48
Number of ablation centres (> 50 AF ablations)	1	0
Number of VT/VF ablations	2	6
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	2
Number of centres (LAA closures)	0	1

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	3	3
Number of physicians under training to become independent electrophysiologists	0	0

Availability of a national registry for interventional electrophysiology		Yes
Official name: INCCI (Institut National de Chirurgie Cardiaque et de Cardiologie Invasive)		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Société Luxembourgeoise de Cardiologie

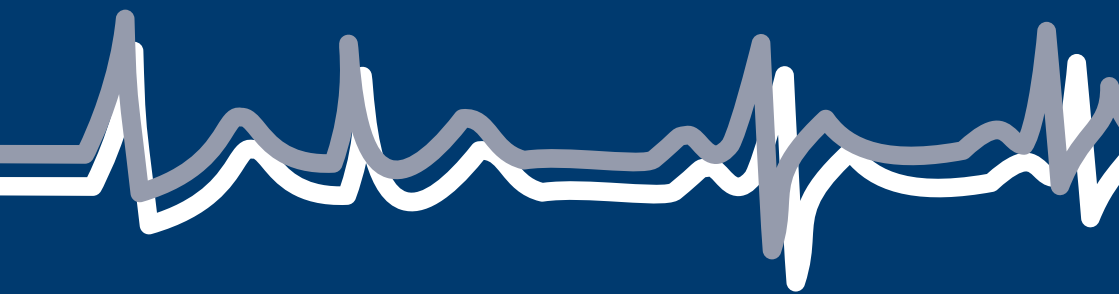
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics - INCCI / Ministry of Health

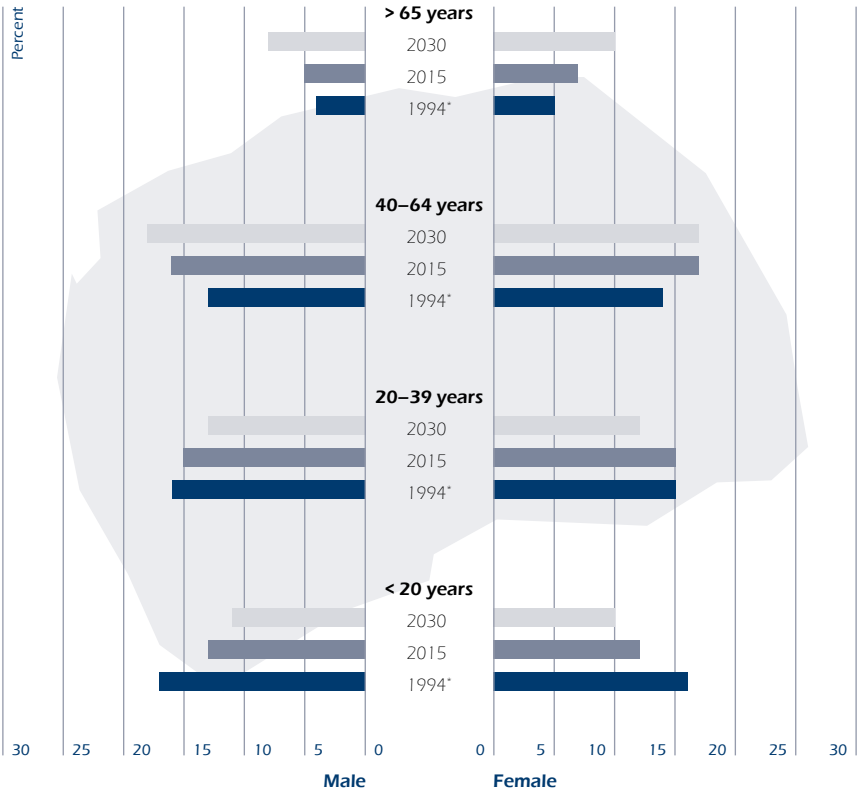
Survey from professional association - Société Luxembourgeoise de Cardiologie

MACEDONIA FYR



1. Statistics

Age pyramid for Macedonia FYR



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,2	2013
Beds (per 100.000 population)	442,8	2013
Density of physicians (per 1.000 population)	2,8	2013
Density of nurses (per 1.000 population)	4,2	2013

Demographic information		Year
Population	2.096.015	2015
Population annual growth rate (%)	0,2	2015
Life expectancy at birth (in years)	76	2015
Death rate (per 1.000 population)	9,3	2010
Live births (per 1.000 population)	11,4	2012

Economic information		Year
Gross domestic product (U.S dollar-billions)	10,09	2015*
Gross domestic product per capita (U.S dollar-units)	4.867,22	2015*
Total expenditure on health as% of GDP	6,4	2013
General government expenditure on health as% of total expenditure on health	65,3	2012
Private expenditure on health as% of total expenditure on health	34,7	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	52%	58%

3. Healthcare System

National Health System The health care system in the Republic of Macedonia is organized on three levels: primary, secondary and tertiary level. The health care is delivered at: health stations, health centers, general and specialized hospitals, clinical hospitals, university clinics and institutes, University Dental Clinical Centre, Maxillofacial Surgery Clinic, Institute of Transfusion Medicine, Institute of Public Health, and 10 centers for public health.

Basic insurance availability	No	
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	90%	90%
Uninsured citizens	10%	10%

Distribution of insurance modality		
	2014	2015
Public insurance company	80%	90%
Private insurance company	10%	10%
Private co-payment	10%	not available

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

Comments: Yes, only in private sector

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Univ St Kliment Ohridski Bitola (http://www.vmsb.uklo.edu.mk/)
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No
	<input type="checkbox"/>

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	No answer
Responsible person for quality control	
Institution where the procedures are performed	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	3
Percentage of academic centres among all practicing EP centres	33%
Percentage of academic centres among all practicing implanting devices centres	33%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	3	3
Total Pacemaker units implanted	356	470
Thereof, Leadless Pacemaker	not available	not available
First implants	296	387
Replacements	60	83
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	3
Total CRT units implanted	28	38
Thereof, CRT pacemaker	25	26
Thereof, CRT ICD	3	12

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	3
Total ICD units implanted	11	29
Thereof, Single chamber	7	14
Thereof, Dual chamber	4	15
Thereof, Subcutaneous ICD	not available	not available
First implants	9	20
Replacements	2	9

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	2	3
Total loop recorders implanted	0	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	2	2
Total lead extraction procedures	0	1

Specialist performing lead extractions		
Cardiologists	Yes	50%
Surgeons	Yes	50%

10. Device specific

Availability of remote monitoring of devices	Yes
---	------------

National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
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11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	3	2
Number of ablations performed	105	166
Mean number of ablations per centre	35	83
Number of AF ablations	0	not available
Number of ablation centres (> 50 AF ablations)	0	not available
Number of VT/VF ablations	0	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	not available
Number of LAA closures	0	not available
Number of centres (LAA closures)	0	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	4	4
Number of physicians under training to become independent electrophysiologists	1	1

Availability of a national registry for interventional electrophysiology	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No answer
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Macedonian Society for Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

Survey from professional association

Estimation

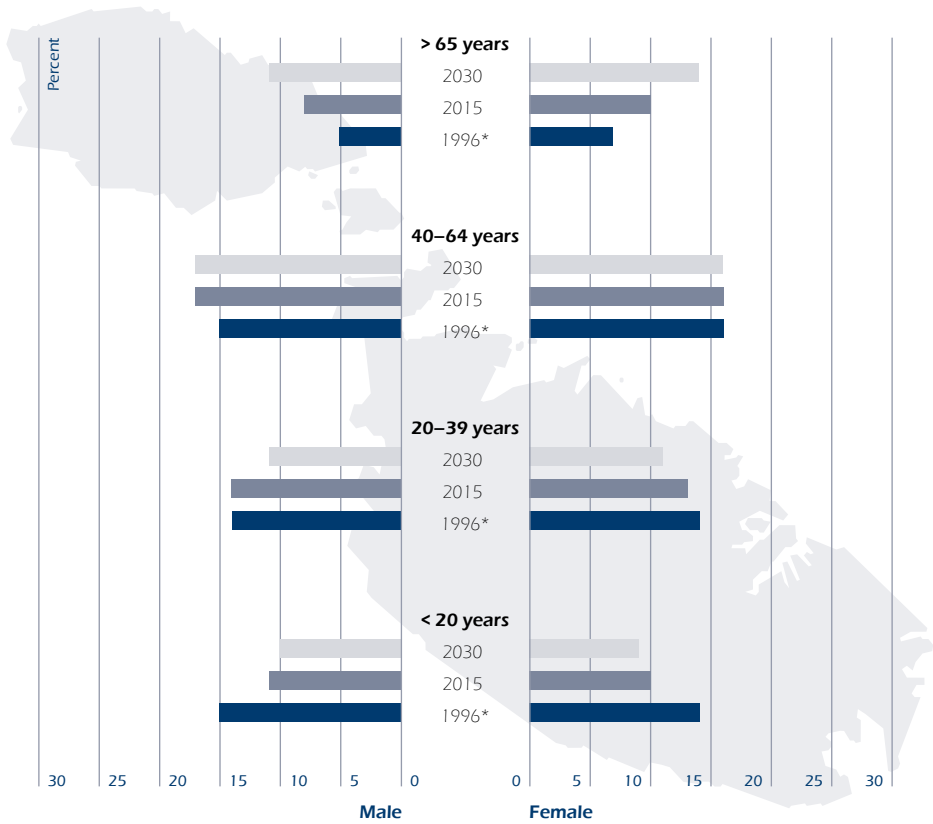
Other

MALTA



1. Statistics

Age pyramid for Malta



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,1	2014
Beds (per 100.000 population)	466,5	2014
Density of physicians (per 1.000 population)	3,7	2014
Density of nurses (per 1.000 population)	8,4	2014

Demographic information		Year
Population	413.965	2015
Population annual growth rate (%)	0,3	2015
Life expectancy at birth (in years)	80	2015
Death rate (per 1.000 population)	7,7	2014
Live births (per 1.000 population)	9,8	2014

Economic information		Year
Gross domestic product (U.S dollar-billions)	9,19	2015*
Gross domestic product per capita (U.S dollar-units)	21.539,91	2015*
Total expenditure on health as% of GDP	8,7	2013
General government expenditure on health as% of total expenditure on health	65,6	2012
Private expenditure on health as% of total expenditure on health	34,4	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	40%	not available

3. Healthcare System

It's a National Health System completely funded by a National Public Health Insurance

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Being a Maltese citizen or taxpayer/wife and children of a taxpayer.

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	90%	not available
Private insurance company	0%	not available
Private co-payment	10%	not available

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA certification
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA certification
Allied professionals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA certification
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist trained in electrophysiology
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No

Suggested period of training to perform implantations	Yes
	2 years

National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
Hospital administration and health department	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	1
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total Pacemaker units implanted	366	400
Thereof, Leadless Pacemaker	not available	0
First implants	240	266
Replacements	126	134
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total CRT units implanted	48	41
Thereof, CRT pacemaker	5	10
Thereof, CRT ICD	43	31
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total ICD units implanted	36	35
Thereof, Single chamber	3	1
Thereof, Dual chamber	33	34
Thereof, Subcutaneous ICD	not available	0
First implants	26	26
Replacements	10	9
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total loop recorders implanted	13	13
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	1	1
Total lead extraction procedures	7	9

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	1	1
Number of ablations performed	30	32
Mean number of ablations per centre	30	32
Number of AF ablations	0	0
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	5
Number of centres (LAA closures)	0	1

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	2	2
Number of physicians under training to become independent electrophysiologists	1	1

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No answer
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Maltese Cardiac Society

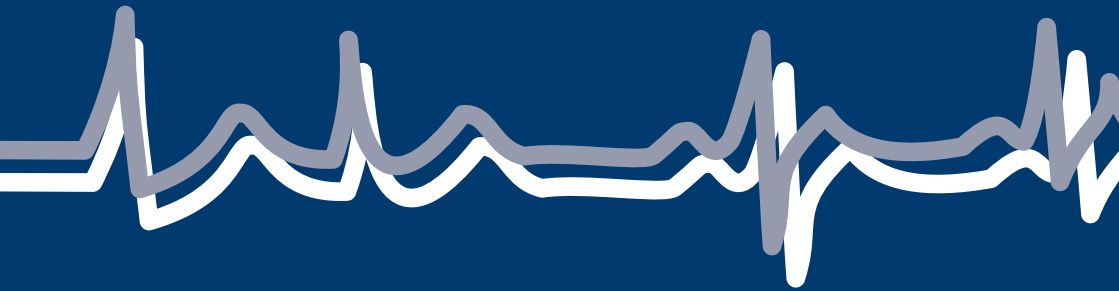
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

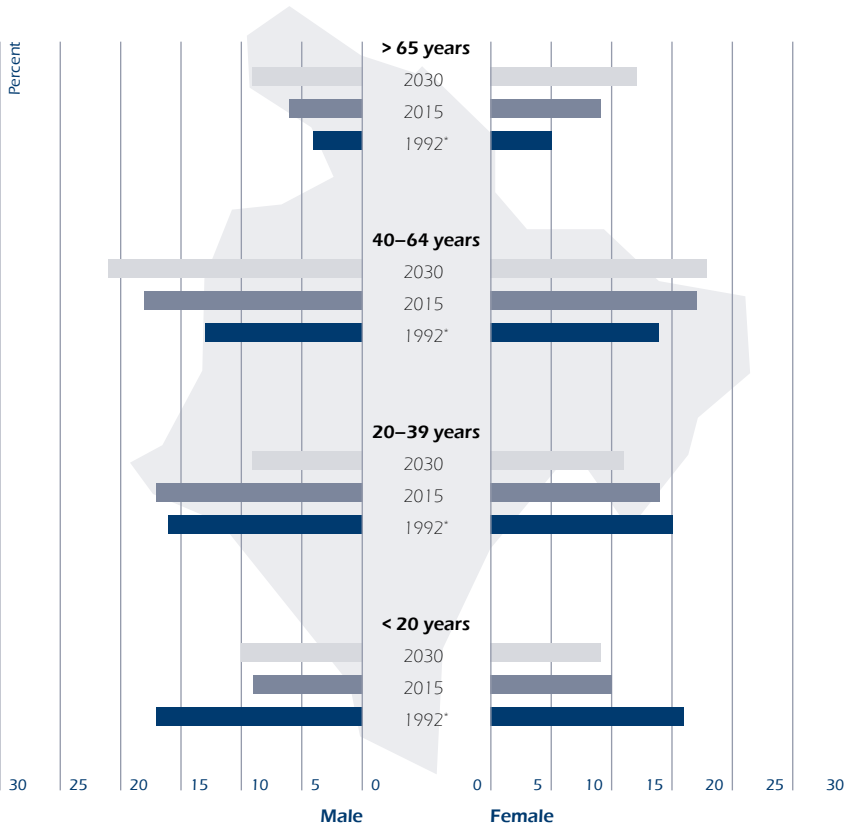
Survey from professional association

MONTENEGRO



1. Statistics

Age pyramid for Montenegro



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,8	2013
Beds (per 100.000 population)	396,5	2012
Density of physicians (per 1.000 population)	2,2	2013
Density of nurses (per 1.000 population)	5,5	2013

Demographic information		Year
Population	647.073	2015
Population annual growth rate (%)	-0,5	2015
Life expectancy at birth (in years)	78	2015
Death rate (per 1.000 population)	9,3	2009
Live births (per 1.000 population)	12,0	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	3,99	2015*
Gross domestic product per capita (U.S dollar-units)	6.372,60	2015*
Total expenditure on health as% of GDP	6,5	2013
General government expenditure on health as% of total expenditure on health	61,7	2012
Private expenditure on health as% of total expenditure on health	38,3	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	54 %	54 %

3. Healthcare System

Healthcare system is organized through NHS Fund.

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: Every citizen who pay the public basic insurance have completely health protection

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	100%	99%
Uninsured citizens	0%	1%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	100%	not available
Private insurance company	0%	not available
Private co-payment	0%	not available

Possibility to subscribing to private health insurance plans	No
---	-----------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input checked="" type="checkbox"/>

Specialist required for		
	Yes	Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation **No**

Required period of training to perform implantations **No**

Suggested period of training to perform implantations **Yes**
6 months

National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
The professionals from different medical fields	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	1
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total Pacemaker units implanted	182	247
Thereof, Leadless Pacemaker	not available	0
First implants	150	197
Replacements	32	50
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total CRT units implanted	22	19
Thereof, CRT pacemaker	12	14
Thereof, CRT ICD	10	5
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total ICD units implanted	41	53
Thereof, Single chamber	27	1
Thereof, Dual chamber	14	1
Thereof, Subcutaneous ICD	not available	0
First implants	35	46
Replacements	6	7
Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	1
Total loop recorders implanted	0	0

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	0	0
Total lead extraction procedures	0	0

Specialist performing lead extractions		
Cardiologists	Yes	50%
Surgeons	Yes	50%

10. Device specific

Availability of remote monitoring of devices	No
Reasons why remote monitoring is not available: We do not have the technical possibility for remote monitoring of devices	

National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
--	----

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
--	----



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	1	1
Number of ablations performed	66	83
Mean number of ablations per centre	66	83
Number of AF ablations	17	18
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	3	7
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	1	1
Number of physicians under training to become independent electrophysiologists	2	2

Availability of a national registry for interventional electrophysiology	No
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National						No
U.S.						No
European						Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Others: Limited financial resources						

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

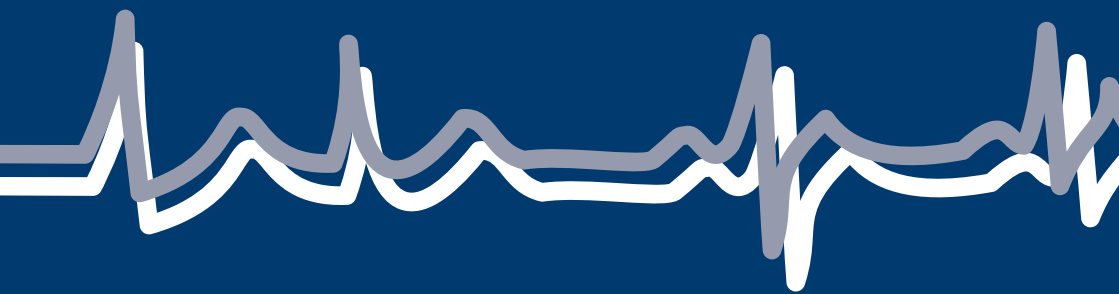
Center for pacemaker and electrophysiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

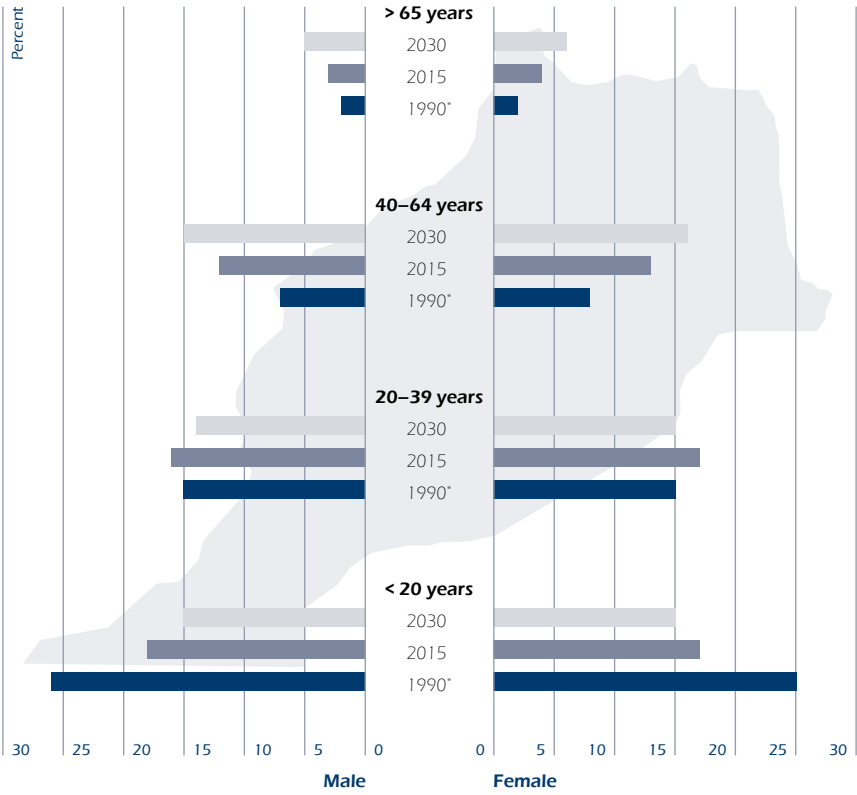
Sample short survey

MOROCCO



1. Statistics

Age pyramid for Morocco



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available

Demographic information		Year
Population	33.322.699	2015
Population annual growth rate (%)	1,0	2015
Life expectancy at birth (in years)	77	2015
Death rate (per 1.000 population)	6,34	2015
Live births (per 1.000 population)	23,41	2015

Economic information		Year
Gross domestic product (U.S dollar-billions)	103,08	2015*
Gross domestic product per capita (U.S dollar-units)	3.076,60	2015*
Total expenditure on health as% of GDP	not available	not available
General government expenditure on health as% of total expenditure on health	35,5	2012
Private expenditure on health as% of total expenditure on health	64,5	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	40%	37,6%

3. Healthcare System

National Health System

Basic insurance availability	No
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	70%	75%
Uninsured citizens	30%	25%

Distribution of insurance modality		
	2014	2015
Public insurance company	80%	80%
Private insurance company	15%	15%
Private co-payment	5%	5%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
	Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: Physicians: only on private practice



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: National health budget

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEU for cardiac pacing
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEU of invasive electrophysiology
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: European DEU

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist and cardiac surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	Yes
	1 year minimum
Suggested period of training to perform implantations	Yes
	1 year minimum
National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible person for quality control	
Health Ministry	
Training centres availability	
Pacemaker	11
ICD implantation	7
CRT implantation	7
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	50%
Percentage of academic centres among all practicing implanting devices centres	40%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	11	11
Total Pacemaker units implanted	1.465	1.801
Thereof, Leadless Pacemaker	not available	0
First implants	not available	1.801
Replacements	not available	0
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	7	6
Total CRT units implanted	62	84
Thereof, CRT pacemaker	45	42
Thereof, CRT ICD	17	42
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	7	6
Total ICD units implanted	27	57
Thereof, Single chamber	16	13
Thereof, Dual chamber	11	44
Thereof, Subcutaneous ICD	not available	0
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	0
Total loop recorders implanted	not available	0

Specialist performing implants		
Cardiologists	No	0%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	2	3
Total lead extraction procedures	10	10

Specialist performing lead extractions		
Cardiologists	Yes	99%
Surgeons	Yes	1%

10. Device specific

Availability of remote monitoring of devices	No
Reasons why remote monitoring is not available: infrastructure	

National registry for			Official name
ICD	No answer		
Pacing	Yes		SMC
Electrophysiology	Yes		SMC

Availability of a national quality insurance system or complication registry	No
--	----

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
--	----



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	5	5
Number of ablations performed	170	60
Mean number of ablations per centre	34	12
Number of AF ablations	not available	not available
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	7	7
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		Yes
Official name: SMC		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

SMC

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

Survey from professional association

Sales data

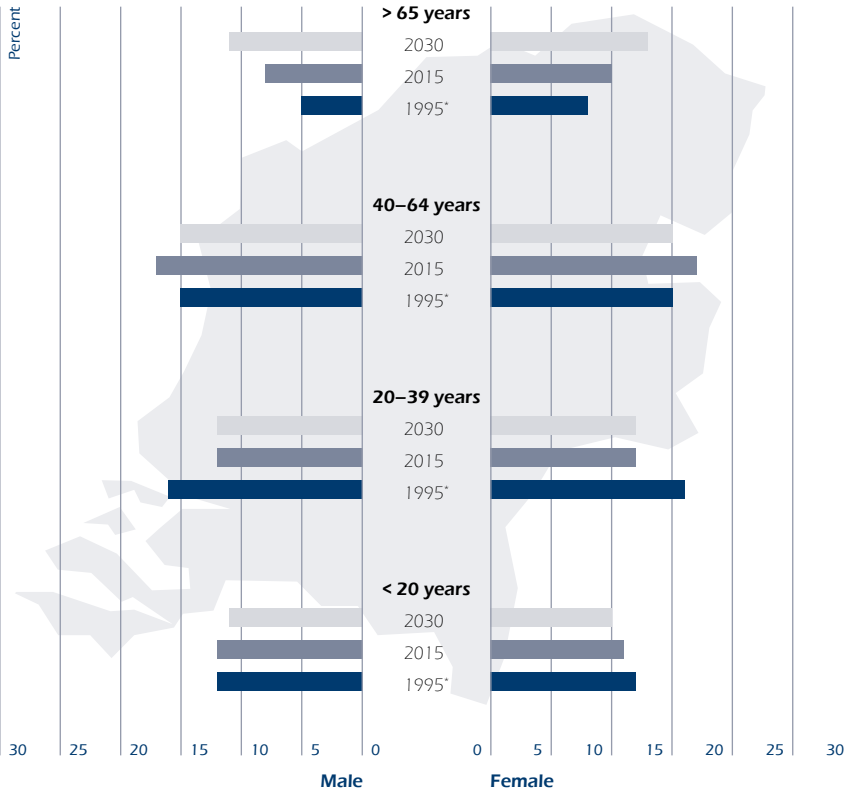
Estimation

NETHERLANDS



1. Statistics

Age pyramid for Netherlands



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,6	2013
Beds (per 100.000 population)	465,7	2009
Density of physicians (per 1.000 population)	3,3	2013
Density of nurses (per 1.000 population)	8,6	2008

Demographic information		Year
Population	16.947.904	2015
Population annual growth rate (%)	0,4	2015
Life expectancy at birth (in years)	81	2015
Death rate (per 1.000 population)	8,4	2013
Live births (per 1.000 population)	10,2	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	750,78	2015*
Gross domestic product per capita (U.S dollar-units)	44.333,15	2015*
Total expenditure on health as% of GDP	12,9	2013
General government expenditure on health as% of total expenditure on health	79,6	2012
Private expenditure on health as% of total expenditure on health	13,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	33%	28%

3. Healthcare System

There is a system of obligatory health Insurance, with private Insurance companies. These Insurance companies are obliged to provide a package with a defined set of insured treatments.

Basic insurance availability	Yes
-------------------------------------	------------

Requirements for citizens to qualify for public insurance: resident in the Netherlands

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	0%	0%
Private insurance company	100%	100%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: The hospital receives the total amount of reimbursement of the Insurance companies. Physicians receive from the hospital a honorarium for each procedure done.



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: In some rare cases the Dutch guidelines are somewhat different from the ESC guidelines.

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA or IHBRE certification
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA certification; at this time the Dutch guidelines to become an electrophysiologist are rewritten
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA certification; at this time the Dutch guidelines are rewritten
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NVVC practice guidelines and NHRA educational document for invasive electrophysiology; at this time these guidelines are rewritten

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologists named in the NHRA (Netherlands Heart Rhythm Association) documents
ICD or pacemaker implants	Yes	Cardiologists named in the NHRA (Netherlands Heart Rhythm Association) documents
Official national competency guidelines for electrophysiological studies or catheter ablation		Yes
NHRA (in name of the NVVC: Nederlands Vereniging voor Cardiologie)		
Required period of training to perform implantations		Yes
		at least 1 year
Suggested period of training to perform implantations		Yes
		2 years
National quality control system availability		Yes
Pacemaker		Yes
ICD implantation		Yes
CRT implantation		Yes
Catheter ablation		Yes
Responsible person for quality control		
NCDR: National Cardiovascular Data Registry		
Training centres availability		
Pacemaker		16
ICD implantation		16
CRT implantation		16
Electrophysiological studies and catheter ablation		16
Atrial fibrillation ablation		16
Number of universities (Schools of Medicine)		8
Percentage of academic centres among all practicing EP centres		47 %
Percentage of academic centres among all practicing implanting devices centres		9 %



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	83	85
Total Pacemaker units implanted	10.132	10.000*
Thereof, Leadless Pacemaker	not available	50
First implants	7.467	7.600*
Replacements	2.665	2.350*

* Leadless Pacemaker included

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	2%
Other:	allied professionals	3%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	31	29
Total CRT units implanted	1.931	2.000
Thereof, CRT pacemaker	514	400
Thereof, CRT ICD	1.417	1.600

Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	28	29
Total ICD units implanted	3,577	3,500*
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	150
First implants	2,373	2,300*
Replacements	1,204	1,050*
* Subcutaneous ICD included		
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	3%
Other:	allied professionals	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	83	85
Total loop recorders implanted	1,500	300
Specialist performing implants		
Cardiologists	Yes	85%
Surgeons	Yes	5%
Other:	allied professionals	10%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	12	12
Total lead extraction procedures	500	120
Specialist performing lead extractions		
Cardiologists	Yes	90%
Surgeons	Yes	10%



10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		Official name
ICD	Yes	NCDR (National Cardiovascular Data Registry, DIPR (Dutch ICD en Pacemaker Registry)
Pacing	Yes	NCDR and DIPR
Electrophysiology	Yes	NCDR and NHRA registry

Availability of a national quality insurance system or complication registry	Yes
NCDR	

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
Official name: Device Committee from the NHRA	

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	16	16
Number of ablations performed	8,358	8,500
Mean number of ablations per centre	522	531
Number of AF ablations	3,413	3,600
Number of ablation centres (> 50 AF ablations)	15	16
Number of VT/VF ablations	850	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	16	16
Number of LAA closures	not available	not available
Number of centres (LAA closures)	4	5
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	48	52
Number of physicians under training to become independent electrophysiologists	12	10
Availability of a national registry for interventional electrophysiology	No	

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6

1 = no obstacle, 5 = great obstacle

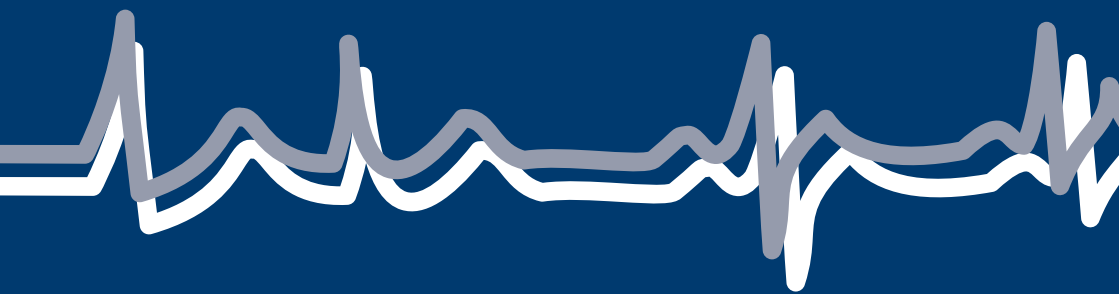
1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Netherlands Heart Rhythm Association

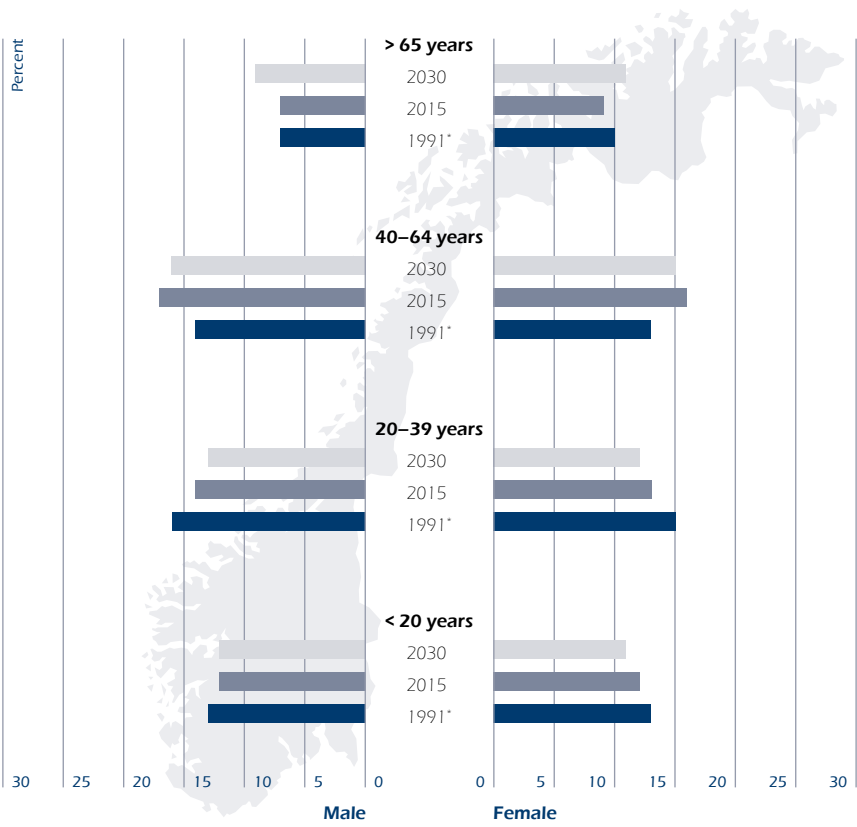
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Official statistics
Survey from professional association
Estimation
Other

NORWAY



1. Statistics

Age pyramid for Norway



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	385,8	2013
Density of physicians (per 1.000 population)	4,3	2013
Density of nurses (per 1.000 population)	17,2	2013

Demographic information		Year
Population	5.207.689	2015
Population annual growth rate (%)	1,2	2015
Life expectancy at birth (in years)	82	2015
Death rate (per 1.000 population)	8,1	2013
Live births (per 1.000 population)	11,6	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	397,59	2015*
Gross domestic product per capita (U.S dollar-units)	76.266,46	2015*
Total expenditure on health as% of GDP	9,6	2013
General government expenditure on health as% of total expenditure on health	85,0	2012
Private expenditure on health as% of total expenditure on health	15,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

National Health Systems

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Norwegian citizen

Percentage of insured and uninsured citizens	2014	2015
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Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality	2014	2015
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Public insurance company	98%	99%
Private insurance company	0%	0%
Private co-payment	2%	1%

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
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ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
National Health register	
Training centres availability	
Pacemaker	5
ICD implantation	5
CRT implantation	4
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	80%
Percentage of academic centres among all practicing implanting devices centres	60%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	23	23
Total Pacemaker units implanted	3.887	4.121
Thereof, Leadless Pacemaker	not available	5
First implants	2.989	3.217
Replacements	898	904
Specialist performing implants		
Cardiologists	Yes	99,7%
Surgeons	No	0,3%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	10	9
Total CRT units implanted	514	562
Thereof, CRT pacemaker	197	214
Thereof, CRT ICD	317	348
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	11	11
Total ICD units implanted	1.134	1.214
Thereof, Single chamber	298	222*
Thereof, Dual chamber	836	696*
Thereof, Subcutaneous ICD	not available	0
First implants	803	891
Replacements	331	323
*First implants only		
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total loop recorders implanted	not available	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	3	3
Total lead extraction procedures	219	194

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		Official name
ICD	Yes	Norwegian Pacemaker- and ICD registry
Pacing	Yes	Norwegian Pacemaker- and ICD registry
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
---	-----------



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	5	5
Number of ablations performed	2,959	3,067
Mean number of ablations per centre	592	613
Number of AF ablations	1,432	1,460
Number of ablation centres (> 50 AF ablations)	5	5
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	3	3
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	15	15
Number of physicians under training to become independent electrophysiologists	2	2

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Norwegian Society of Cardiology, Working group of arrhythmias

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

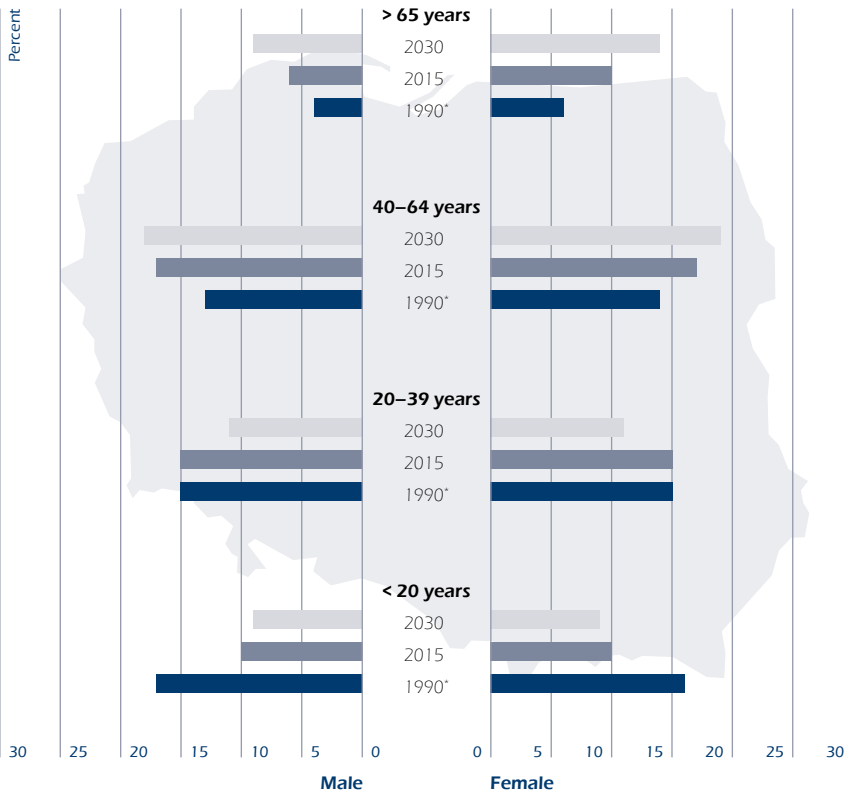
Survey from professional association

POLAND



1. Statistics

Age pyramid for Poland



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,8	2013
Beds (per 100.000 population)	650,0	2013
Density of physicians (per 1.000 population)	2,2	2013
Density of nurses (per 1.000 population)	5,8	2013

Demographic information		Year
Population	38.562.189	2015
Population annual growth rate (%)	-0,1	2015
Life expectancy at birth (in years)	77	2015
Death rate (per 1.000 population)	10,1	2013
Live births (per 1.000 population)	9,6	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	481,24	2015*
Gross domestic product per capita (U.S dollar-units)	12.662,21	2015*
Total expenditure on health as% of GDP	6,7	2013
General government expenditure on health as% of total expenditure on health	69,2	2012
Private expenditure on health as% of total expenditure on health	30,3	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	46%	45%

3. Healthcare System

National Health System

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Monthly health care contribution

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	95%	not available
Uninsured citizens	5%	not available

Distribution of insurance modality		
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	2014	2015
Public insurance company	90%	90%
Private insurance company	5%	0%
Private co-payment	5%	10%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: In the case of reimbursement for IRL and S-ICD implantation decision may be taken individually by the NHS at the request of the hospital. Reimbursement for leadless pacing is at the level of a standard pacemaker



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification of Heart Rhythm Section of Polish Cardiac Society
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certification of Heart Rhythm Section of Polish Cardiac Society
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, cardiac surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No
	<input type="checkbox"/>

Required period of training to perform implantations	No
	<input type="checkbox"/>

Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
Ministry of Health	
Training centres availability	
Pacemaker	41
ICD implantation	26
CRT implantation	12
Electrophysiological studies and catheter ablation	10
Atrial fibrillation ablation	5
Number of universities (Schools of Medicine)	13
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	150	145
Total Pacemaker units implanted	28.470	30.494
Thereof, Leadless Pacemaker	not available	not available
First implants	19.873	21.542
Replacements	8.597	8.952
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	35	not available
Total CRT units implanted	3,718	3,964
Thereof, CRT pacemaker	717	645
Thereof, CRT ICD	3,001	3,319

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	120	122
Total ICD units implanted	8,401	8,344
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	15
First implants	6,687	6,529
Replacements	1,712	1,815

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	No	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	20	not available
Total loop recorders implanted	250	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	10	30
Total lead extraction procedures	600	1,050

Specialist performing lead extractions		
Cardiologists	Yes	99%
Surgeons	No	1%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	83	85
Number of ablations performed	10,922	10,795
Mean number of ablations per centre	132	127
Number of AF ablations	2,169	3,253
Number of ablation centres (> 50 AF ablations)	20	21
Number of VT/VF ablations	not available	693
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	19
Number of LAA closures	200	not available
Number of centres (LAA closures)	15	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	125	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology	No
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Heart Rhythm Section of Polish Cardiac Society

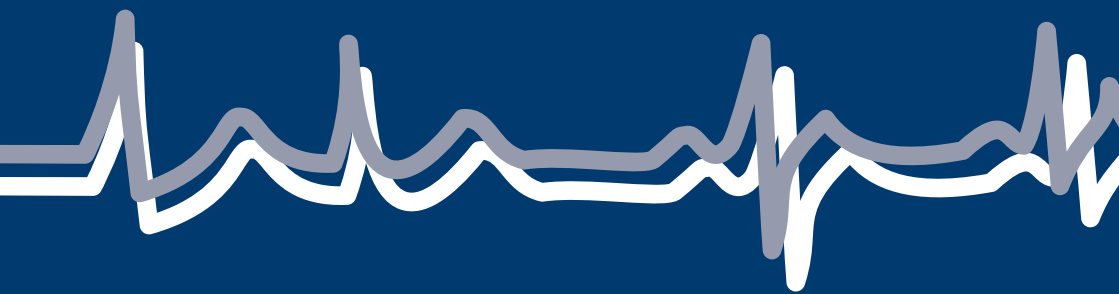
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

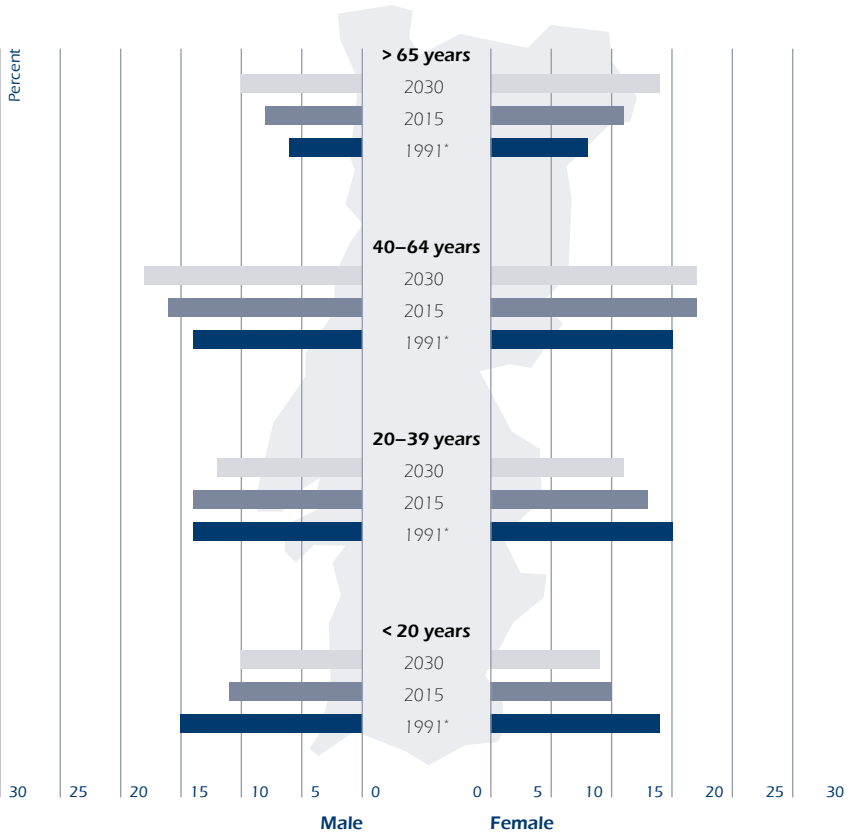
Estimation

PORTUGAL



1. Statistics

Age pyramid for Portugal



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,2	2013
Beds (per 100.000 population)	339,5	2013
Density of physicians (per 1.000 population)	4,3	2013
Density of nurses (per 1.000 population)	6,3	2013

Demographic information		Year
Population	10.825.309	2015
Population annual growth rate (%)	0,1	2015
Life expectancy at birth (in years)	79	2015
Death rate (per 1.000 population)	10,2	2013
Live births (per 1.000 population)	8,0	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	197,51	2015*
Gross domestic product per capita (U.S dollar-units)	18.983,78	2015*
Total expenditure on health as% of GDP	9,7	2013
General government expenditure on health as% of total expenditure on health	64,0	2012
Private expenditure on health as% of total expenditure on health	36,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	30,6%

3. Healthcare System

In 2006, 81,1% of the resident population resorted mostly the National Health Service (NHS) to have access to health services. The second most mentioned subsystem corresponded to the Civil Servants Health Subsystem (ADSE), used by 10,1% of residents in 2006. In the same year private insurances supported 2,4% of the health expenditure and the private health subsystem supported 1,9% of the health expenditure. (source Portuguese National Health Plan 2012–2016, Portuguese Directorate-General of Health, and Organization for Economic Co-operation and Development)

Basic insurance availability	Yes
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All residents in Portugal have access to health care provided by the National Health Service (NHS), financed mainly through taxation. CO-payments have been increasing over time, and the level of cost sharing is highest for pharmaceutical products. • Approximately one-fifth to a quarter of population enjoys a second (or more) layer of health insurance coverage through health subsystems and voluntary health insurance.

Percentage of insured and uninsured citizens		
	2014	2015

Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2014	2015

Public insurance company	not available	100%
Private insurance company	not available	10%
Private co-payment	not available	25%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Comments: co-payment necessary only in the private sector



Reimbursement availability for physicians and hospitals

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: Physician reimbursement only if working in the private sector

Treatment availability

No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: Hospital budgets are drawn up and allocated by the Ministry of Health. At present, public hospitals are allocated global budgets based on contracts (cotraros programa) signed with the Ministry of Health. As the year budget is reached, there may be restrictions on certain number of treatments.

4. Education and Quality Control

National certification availability					Official name
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portuguese Medical Association
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portuguese Medical Association (Ordem dos Médicos), College of Subspecialty in Electrophysiology
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portuguese Medical Association (Ordem dos Médicos)

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, cardiac surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Portuguese Medical Association (Ordem dos Médicos), College of Subspecialty in Electrophysiology	

Required period of training to perform implantations	No

Suggested period of training to perform implantations	No

National quality control system availability	No

Willingness to install quality control system	Yes

Responsible person for quality control	no answer



Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	
	7
Percentage of academic centres among all practicing EP centres	
	20%
Percentage of academic centres among all practicing implanting devices centres	
	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	39	40
Total Pacemaker units implanted	8.830	8.769
Thereof, Leadless Pacemaker	not available	16
First implants	6.966	6.958
Replacements	1.864	1.795
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	24	26
Total CRT units implanted	696	772
Thereof, CRT pacemaker	178	210
Thereof, CRT ICD	518	562
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	31	29
Total ICD units implanted	not available	1,224
Thereof, Single chamber	not available	975
Thereof, Dual chamber	not available	241
Thereof, Subcutaneous ICD	not available	8
First implants	819	1,001
Replacements	not available	223

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	13	40
Total loop recorders implanted	152	320

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	not available
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	not available
Surgeons	Yes	not available



10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		Official name
ICD	Yes	
Pacing	Yes	
Electrophysiology	Yes	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
---	------------

11. Interventional electrophysiology

Number of ablations performed and number of centres	2014	2015
Number of ablation centres	24	25
Number of ablations performed	2.324	2.580
Mean number of ablations per centre	97	103
Number of AF ablations	684	743
Number of ablation centres (> 50 AF ablations)	5	6
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	25
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology	Yes
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12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	No

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Portuguese Association of Arrhythmias, Pacing and Electrophysiology

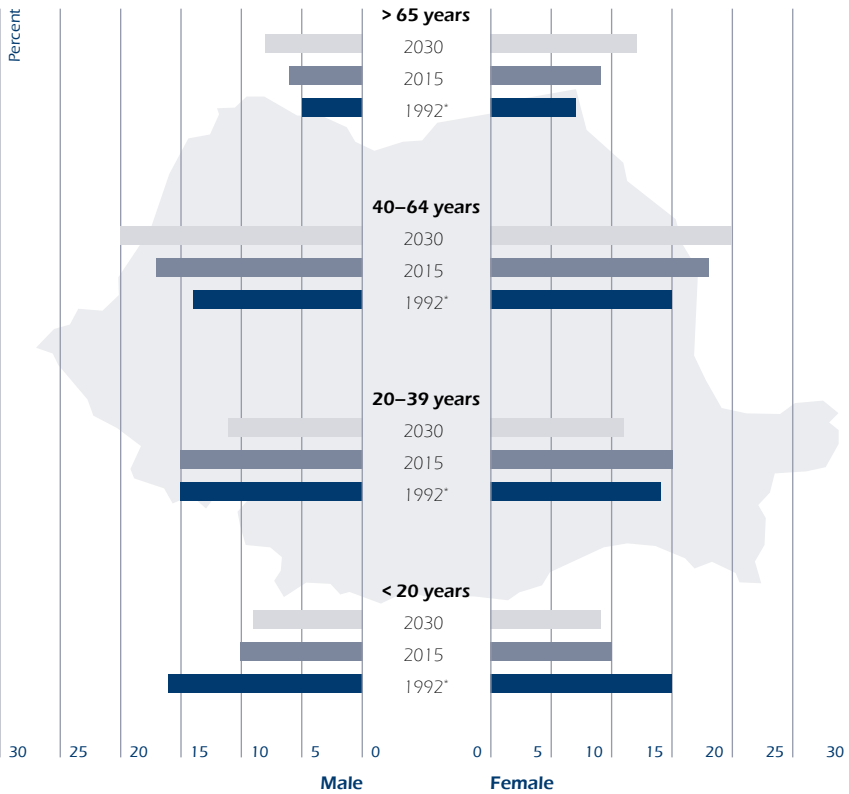
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Official statistics
Survey from professional association
Estimation

ROMANIA



1. Statistics

Age pyramid for Romania



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,5	2013
Beds (per 100.000 population)	627,0	2013
Density of physicians (per 1.000 population)	2,5	2013
Density of nurses (per 1.000 population)	5,8	2013

Demographic information		Year
Population	21.666.350	2015
Population annual growth rate (%)	-0,3	2015
Life expectancy at birth (in years)	75	2015
Death rate (per 1.000 population)	12,0	2012
Live births (per 1.000 population)	9,3	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	174,92	2015*
Gross domestic product per capita (U.S dollar-units)	8.807,33	2015*
Total expenditure on health as% of GDP	5,3	2013
General government expenditure on health as% of total expenditure on health	80,3	2012
Private expenditure on health as% of total expenditure on health	19,7	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	60%	not available

3. Healthcare System

National Health System, some private clinics and hospitals, some of them receiving partial funds from NHS (The Ministry of Health is the coordinator of Health System)

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: to be employed, socially assisted or retired

Percentage of insured and uninsured citizens	2014	2015
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Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality	2014	2015
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Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	No
---	-----------

Co-payment necessary for the following therapy	
---	--

ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

Comments: Yes, only in private sector

Reimbursement availability for physicians and hospitals								
--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: National Programs are available in selected centers, but limited by budget



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: National Programs are available in selected centers, but limited by fixed budget

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: We advanced the formalities for National Certification, and EHRA certification will be homologated as National Certification

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	Yes
	1 year
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
We do not have a quality control system	
Training centres availability	
Pacemaker	9
ICD implantation	9
CRT implantation	9
Electrophysiological studies and catheter ablation	8
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	12
Percentage of academic centres among all practicing EP centres	80%
Percentage of academic centres among all practicing implanting devices centres	85%

5. Pacemakers

Pacemaker units implanted and number of implanting centres	2014	2015
Implanting centres	24	24
Total Pacemaker units implanted	4.258	3.918
Thereof, Leadless Pacemaker	not available	0
First implants	not available	3.538
Replacements	not available	380
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	12	12
Total CRT units implanted	289	276
Thereof, CRT pacemaker	166	156
Thereof, CRT ICD	123	120

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	15	16
Total ICD units implanted	332	300
Thereof, Single chamber	307	210
Thereof, Dual chamber	25	89
Thereof, Subcutaneous ICD	not available	1
First implants	not available	257
Replacements	not available	43

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	1	2
Total loop recorders implanted	2	3

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	2	4
Total lead extraction procedures	10	15

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
---	-----------

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	No
---	-----------



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	12	12
Number of ablations performed	1,358	1,194
Mean number of ablations per centre	113	100
Number of AF ablations	88	132
Number of ablation centres (> 50 AF ablations)	0	1
Number of VT/VF ablations	23	50
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	2
Number of LAA closures	3	not available
Number of centres (LAA closures)	1	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	15	18
Number of physicians under training to become independent electrophysiologists	3	3

Availability of a national registry for interventional electrophysiology	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No answer
U.S.	No answer
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Romanian Society of Cardiology, Working Group on Arrhythmias, Electrophysiology and Implantable Devices

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Survey from professional association

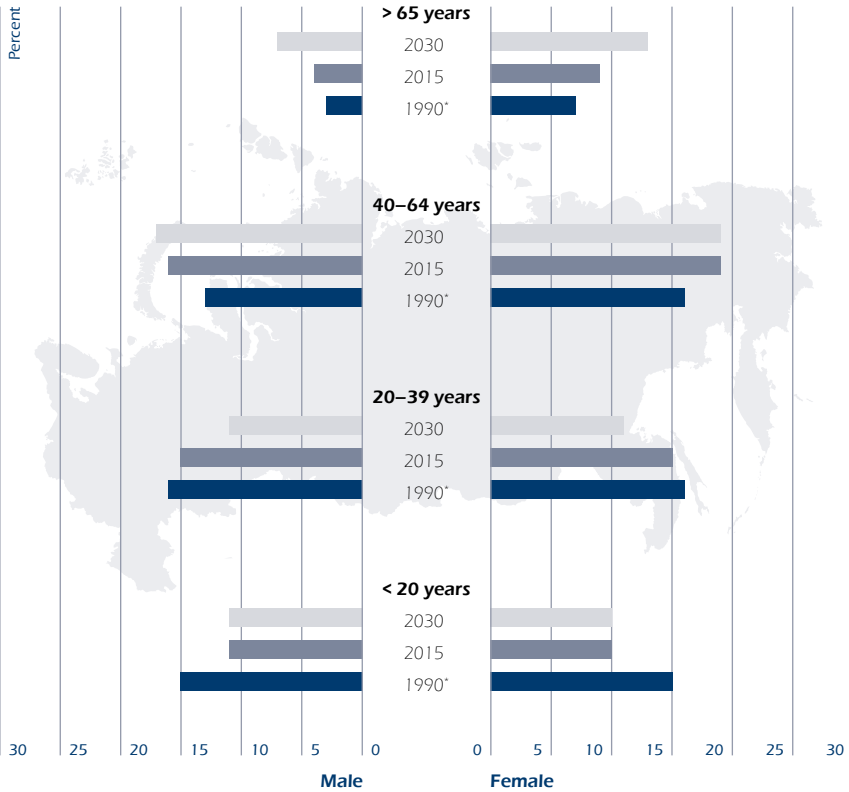
Estimation

RUSSIAN FEDERATION



1. Statistics

Age pyramid for Russian Federation



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,5	2013
Beds (per 100.000 population)	817,5	2013
Density of physicians (per 1.000 population)	2,4	2013
Density of nurses (per 1.000 population)	4,3	2013

Demographic information		Year
Population	142.423.773	2015
Population annual growth rate (%)	0,0	2015
Life expectancy at birth (in years)	71	2015
Death rate (per 1.000 population)	13,5	2011
Live births (per 1.000 population)	12,6	2011

Economic information		Year
Gross domestic product (U.S dollar-billions)	1.235,86	2015*
Gross domestic product per capita (U.S dollar-units)	8.447,42	2015*
Total expenditure on health as% of GDP	6,6	2013
General government expenditure on health as% of total expenditure on health	51,1	2012
Private expenditure on health as% of total expenditure on health	48,9	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	53%	53%

3. Healthcare System

Mandatory health insurance

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: All citizens

Percentage of insured and uninsured citizens	2014	2015
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Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality	2014	2015
---	-------------	-------------

Public insurance company	85%	90%
Private insurance company	15%	7%
Private co-payment	not available	3%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	Yes
Ablation	No

Reimbursement availability for physicians and hospitals	
--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Comments: NICE, Ministry of Health

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NSCA
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NSCA
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NSCA

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiologist, surgeon
ICD or pacemaker implants	Yes	Cardiologist, surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
National (Russian) Society of Cardiac Arrhythmias (NSCA)	

Required period of training to perform implantations	Yes
	3 years

Suggested period of training to perform implantations	Yes
	3 years

National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Cathether ablation	Yes
Responsible person for quality control	
NSCA	
Training centres availability	
Pacemaker	10
ICD implantation	7
CRT implantation	7
Electrophysiological studies and catheter ablation	11
Atrial fibrillation ablation	6
Number of universities (Schools of Medicine)	not available
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	140	140
Total Pacemaker units implanted	37.832	34.492
Thereof, Leadless Pacemaker	not available	not available
First implants	32.199	6.519
Replacements	5.633	0
Specialist performing implants		
Cardiologists	Yes	80%
Surgeons	Yes	18%
Other:		2%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	42	37
Total CRT units implanted	863	1.006
Thereof, CRT pacemaker	45	340
Thereof, CRT ICD	818	666

Specialist performing implants		
Cardiologists	Yes	40%
Surgeons	Yes	60%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	55	48
Total ICD units implanted	1.769	1.553
Thereof, Single chamber	645	563
Thereof, Dual chamber	1.124	990
Thereof, Subcutaneous ICD	not available	not available
First implants	1.516	1.271
Replacements	253	282

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total loop recorders implanted	not available	not available

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

9. Lead extractions

Lead extractions procedures and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	not available
Surgeons	Yes	not available

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Biotronik Home Monitoring, Medtronic CareLink		

National registry for		
		Official name
ICD	Yes	NSCA
Pacing	Yes	NSCA
Electrophysiology	Yes	NSCA

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		
Federal center for interventional and surgical Arrhythmology		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	81	69
Number of ablations performed	23.874	21.482
Mean number of ablations per centre	295	311
Number of AF ablations	6.462	6.329
Number of ablation centres (> 50 AF ablations)	58	27
Number of VT/VF ablations	2.408	1.771
Number of ablation centres (> 10 VT ablations on structural heart diseases)	59	34
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	95	66

Availability of a national registry for interventional electrophysiology		Yes
Official name: NSCA		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No answer
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

National (Russian) Society of Cardiac Arrhythmias (NSCA)

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics - Ministry of Health

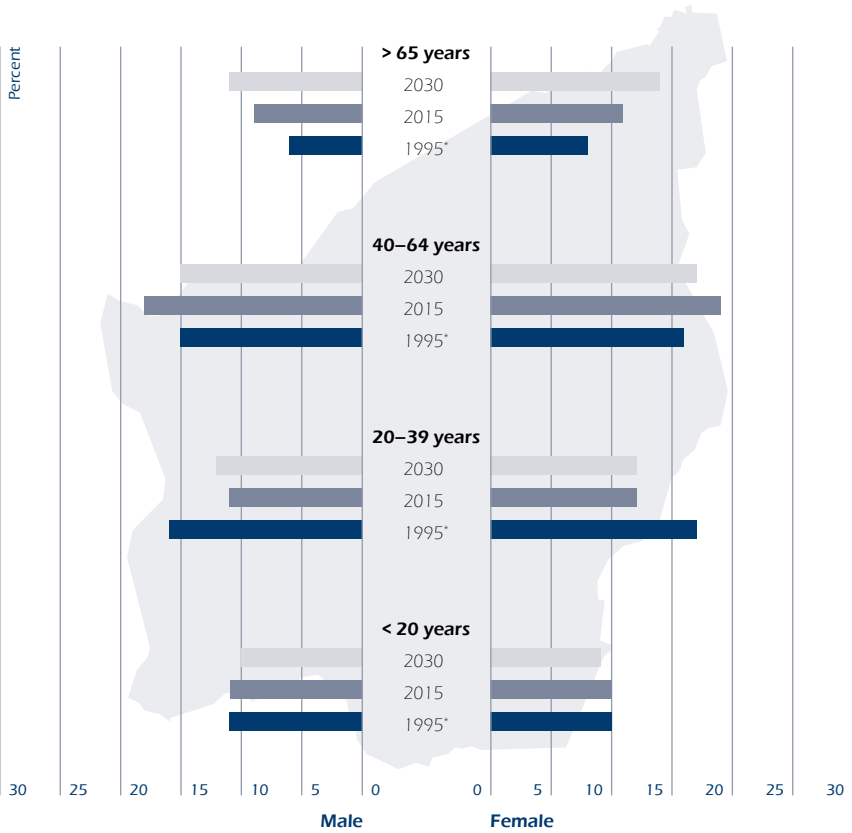
Survey from professional association - NSCA

SAN MARINO



1. Statistics

Age pyramid for San Marino



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,1	2013
Beds (per 100.000 population)	348,7	2013
Density of physicians (per 1.000 population)	5,1	2013
Density of nurses (per 1.000 population)	8,8	2013

Demographic information		Year
Population	33.020	2015
Population annual growth rate (%)	0,9	2015
Life expectancy at birth (in years)	83	2015
Death rate (per 1.000 population)	7,3	2005
Live births (per 1.000 population)	9,9	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	1,54	2015*
Gross domestic product per capita (U.S dollar-units)	49.139,01	2015*
Total expenditure on health as% of GDP	6,5	2013
General government expenditure on health as% of total expenditure on health	87,2	2012
Private expenditure on health as% of total expenditure on health	12,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	28,6 %

3. Healthcare System

National health system provides for total health expenses coverage, for each citizen, from birth to death.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Citizenship and residency in San Marino.

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	not available	100%
Uninsured citizens	not available	0%

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	not available	100%
Private insurance company	not available	0%
Private co-payment	not available	0%

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy		
---	--	--

ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for			Specialist
Catheter ablation	Yes	Cardiologist with experience and proficiency in catheter ablation	
ICD or pacemaker implants	Yes	Cardiologist with experience and proficiency in PM/ICD implants	

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible person for quality control	
National Health Institute	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	
0	
Percentage of academic centres among all practicing EP centres	
0%	
Percentage of academic centres among all practicing implanting devices centres	
0%	

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	1
Total Pacemaker units implanted	not available	11
Thereof, Leadless Pacemaker	not available	0
First implants	not available	7
Replacements	not available	4
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	1
Total CRT units implanted	not available	2
Thereof, CRT pacemaker	not available	0
Thereof, CRT ICD	not available	2
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	1
Total ICD units implanted	not available	8
Thereof, Single chamber	not available	4
Thereof, Dual chamber	not available	3
Thereof, Subcutaneous ICD	not available	1
First implants	not available	5
Replacements	not available	3
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	1
Total loop recorders implanted	not available	2
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	0
Total lead extraction procedures	not available	0

Specialist performing lead extractions		
Cardiologists	Yes	0%
Surgeons	No	0%

Comments: collaboration with foreign hospitals for lead extraction (where trained cardiologists perform the intervention)

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Implementing is underway		

National registry for			Official name
ICD	Yes	State Hospital Registry, belonging to National Health Institute	
Pacing	Yes	State Hospital Registry, belonging to National Health Institute	
Electrophysiology	No		

Availability of a national quality insurance system or complication registry		Yes
Official name: State Hospital Registry, belonging to National Health Institute		

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No
--	--	----



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	not available	0
Number of ablations performed	not available	0
Mean number of ablations per centre	not available	0
Number of AF ablations	not available	0
Number of ablation centres (> 50 AF ablations)	not available	0
Number of VT/VF ablations	not available	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	0
Number of LAA closures	not available	0
Number of centres (LAA closures)	not available	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	0
Number of physicians under training to become independent electrophysiologists	not available	0

Availability of a national registry for interventional electrophysiology	
	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No answer
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Società Sammarinese di Cardiologia

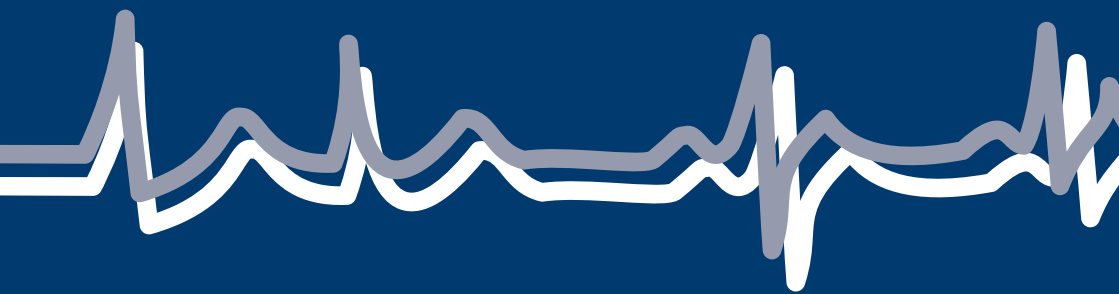
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics - National Health Institute

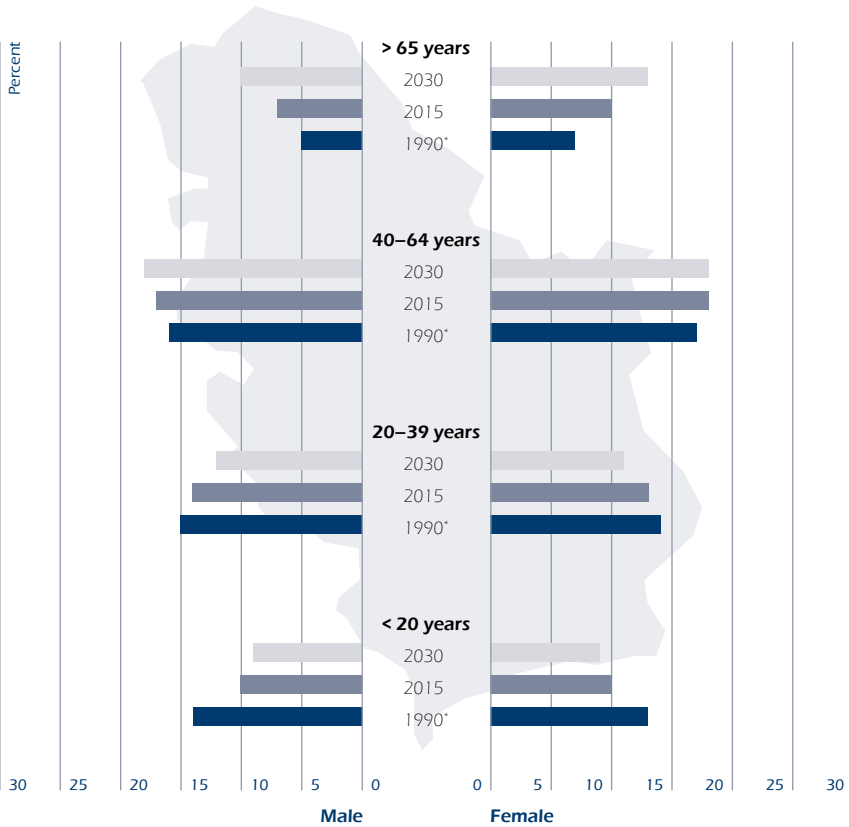
Survey from professional association

SERBIA



1. Statistics

Age pyramid for Serbia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,4	2012
Beds (per 100.000 population)	565,4	2012
Density of physicians (per 1.000 population)	3,1	2012
Density of nurses (per 1.000 population)	6,3	2012

Demographic information		Year
Population	7.176.794	2015
Population annual growth rate (%)	-0,5	2015
Life expectancy at birth (in years)	75	2015
Death rate (per 1.000 population)	14,0	2013
Live births (per 1.000 population)	9,2	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	36,56	2015*
Gross domestic product per capita (U.S dollar-units)	5.102,45	2015*
Total expenditure on health as% of GDP	10,6	2013
General government expenditure on health as% of total expenditure on health	61,2	2012
Private expenditure on health as% of total expenditure on health	38,8	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	56%	56%

3. Healthcare System

National Health System with full insurance for all citizens

Basic insurance availability	Yes
-------------------------------------	------------

Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2014	2015
Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

Comments: Private health insurance is possible, but for now, there is no hospitals that are used for implantation, and electrophysiological procedure.

	Reimbursement availability for physicians and hospitals							
	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: By the decision of the Ministry of Health for all the materials that are permanently implanted in the human body is charged in the amount of 5% of its value, but with defined limited maximum price which the patient can pay.



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	National Reference Centre in consultation with the Ministry of Health
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Serbian Medical Chamber
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	National Reference Centre in consultation with the Ministry of Health

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input checked="" type="checkbox"/>

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist
ICD or pacemaker implants	Yes Cardiologist or cardiovascular surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No answer
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Required period of training to perform implantations	Yes
	1 year
Suggested period of training to perform implantations	Yes
	1 year
National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible person for quality control	
Ministry of Health	
Training centres availability	
Pacemaker	4
ICD implantation	4
CRT implantation	4
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	40%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	17	17
Total Pacemaker units implanted	3.657	3.724
Thereof, Leadless Pacemaker	not available	7
First implants	3.135	3.289
Replacements	522	435
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	6	6
Total CRT units implanted	321	313
Thereof, CRT pacemaker	243	234
Thereof, CRT ICD	78	79
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	10	11
Total ICD units implanted	457	437
Thereof, Single chamber	360	357
Thereof, Dual chamber	97	80
Thereof, Subcutaneous ICD	not available	0
First implants	394	396
Replacements	63	41
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	10	10
Total loop recorders implanted	34	25
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	3
Total lead extraction procedures	62	28

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	Implementation of the pilot phase
Pacing	Yes	Implementation of the pilot phase
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Expert Group within the framework of the Health Insurance Fund		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	2	3
Number of ablations performed	815	700
Mean number of ablations per centre	408	233
Number of AF ablations	236	150
Number of ablation centres (> 50 AF ablations)	2	2
Number of VT/VF ablations	50	75
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2
Number of LAA closures	3	35
Number of centres (LAA closures)	1	20

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	7	11
Number of physicians under training to become independent electrophysiologists	5	1

Availability of a national registry for interventional electrophysiology	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National						Yes
U.S.						Yes
European						Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Cardiology Society of Serbia, Working Group on Cardiac Pacing

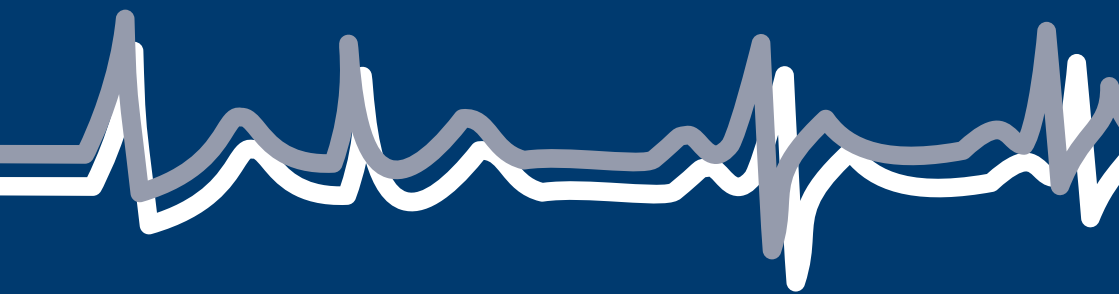
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Survey from professional association - National Referreal Pacemaker Center

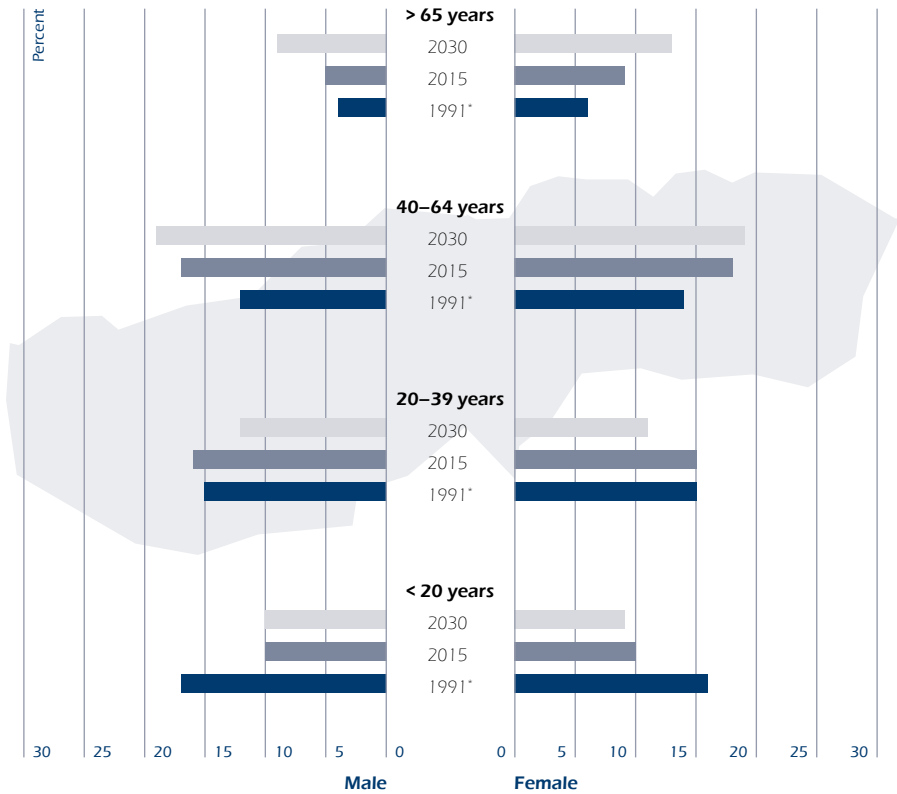
Official statistics - Insitute of Public Health of Serbia, Ministry of Health

SLOVAKIA



1. Statistics

Age pyramid for Slovakia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,5	2013
Beds (per 100.000 population)	580,3	2013
Density of physicians (per 1.000 population)	3,0	2007
Density of nurses (per 1.000 population)	6,1	2013

Demographic information		Year
Population	5.415.949	2015
Population annual growth rate (%)	0,0	2015
Life expectancy at birth (in years)	77	2015
Death rate (per 1.000 population)	9,8	2010
Live births (per 1.000 population)	10,1	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	86,20	2015*
Gross domestic product per capita (U.S dollar-units)	15.892,55	2015*
Total expenditure on health as% of GDP	8,2	2013
General government expenditure on health as% of total expenditure on health	69,7	2012
Private expenditure on health as% of total expenditure on health	30,3	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	47%	45%

3. Healthcare System

National Health System

Basic insurance availability	Yes
-------------------------------------	------------

Percentage of insured and uninsured citizens	2014	2015
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality	2014	2015
Public insurance company	72%	75%
Private insurance company	28%	25%
Private co-payment	0%	0%

Possibility to subscribing to private health insurance plans	No
---	-----------

Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist (training in ablations)
ICD or pacemaker implants	Yes	Cardiologist (training in implantations), cardio surgeon (training in implantations), vascular surgeon (training in implantations)

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible person for quality control	
State Institution for Drug Control	
Training centres availability	
Pacemaker	3
ICD implantation	3
CRT implantation	3
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	75%
Percentage of academic centres among all practicing implanting devices centres	78%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	13	14
Total Pacemaker units implanted	3.326	3.664
Thereof, Leadless Pacemaker	not available	0
First implants	2.634	2.810
Replacements	692	854
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	6	4
Total CRT units implanted	529	588
Thereof, CRT pacemaker	136	209
Thereof, CRT ICD	393	379

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	4	4
Total ICD units implanted	658	665
Thereof, Single chamber	483	513
Thereof, Dual chamber	175	151
Thereof, Subcutaneous ICD	not available	0
First implants	539	514
Replacements	119	151

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	6	12
Total loop recorders implanted	250	120

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	3	3
Total lead extraction procedures	136	119

Specialist performing lead extractions		
Cardiologists	Yes	95%
Surgeons	Yes	5%

10. Device specific

Availability of remote monitoring of devices		Yes
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National registry for		
		Official name
ICD	Yes	
Pacing	Yes	SLOVIMPULZ - Registry of Slovak Heart Rhythm Ass. (SASA)
Electrophysiology	Yes	SLOVABLO - Registry of Slovak Heart Rhythm Ass. (SASA)



Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: State Institute for Drug Control (SUKL)

11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	4	4
Number of ablations performed	1.111	1.204
Mean number of ablations per centre	278	301
Number of AF ablations	129	224
Number of ablation centres (> 50 AF ablations)	2	3
Number of VT/VF ablations	37	106
Number of ablation centres (> 10 VT ablations on structural heart diseases)	3	3
Number of LAA closures	0	not available
Number of centres (LAA closures)	0	not available

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	19	22
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology	Yes
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Official name: SLOVABLO - registry of Slovak Heart Rhythm Ass.

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

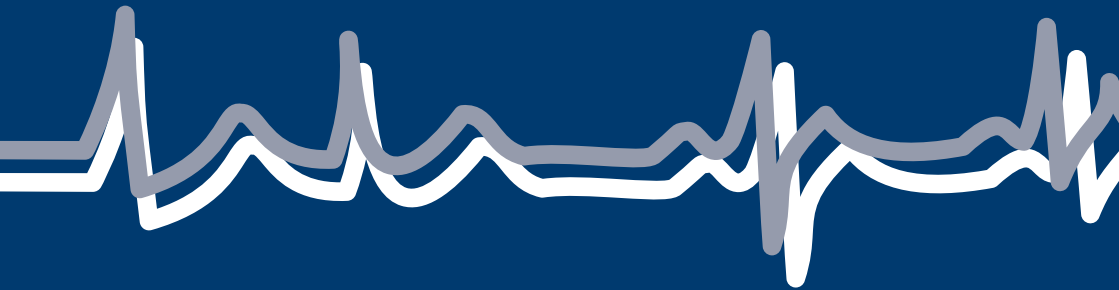
1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Slovak Heart Rhythm Ass. (SASA)

All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Survey from professional association
Sales data
Estimation
Other

SLOVENIA



1. Statistics

Age pyramid for Slovenia



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,4	2014
Beds (per 100.000 population)	455,4	2013
Density of physicians (per 1.000 population)	2,6	2013
Density of nurses (per 1.000 population)	8,3	2013

Demographic information		Year
Population	1.983.412	2015
Population annual growth rate (%)	-0,3	2015
Life expectancy at birth (in years)	78	2015
Death rate (per 1.000 population)	9,1	2010
Live births (per 1.000 population)	10,6	2012

Economic information		Year
Gross domestic product (U.S dollar-billions)	42,74	2015*
Gross domestic product per capita (U.S dollar-units)	20.712,01	2015*
Total expenditure on health as% of GDP	9,2	2013
General government expenditure on health as% of total expenditure on health	71,5	2012
Private expenditure on health as% of total expenditure on health	28,5	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

NHS Fund

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	99%	99%
Uninsured citizens	1%	1%

Distribution of insurance modality		
	2014	2015
Public insurance company	4%	4%
Private insurance company	0%	0%
Private co-payment	96%	96%

Possibility to subscribing to private health insurance plans	No answer
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Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
	Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Specialist	
Catheter ablation	Yes	Internist, cardiologist
ICD or pacemaker implants	Yes	Internist, cardiologist, surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	No
Responsible person for quality control	
Agency of the Republic of Slovenia for Medicines and Medical Devices	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	2
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	22%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	7	9
Total Pacemaker units implanted	1.464	1.235
Thereof, Leadless Pacemaker	not available	0
First implants	1.167	1.015
Replacements	297	220
Specialist performing implants		
Cardiologists	Yes	20%
Surgeons	Yes	80%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	2
Total CRT units implanted	150	164
Thereof, CRT pacemaker	57	47
Thereof, CRT ICD	93	117
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	2	3
Total ICD units implanted	174	228
Thereof, Single chamber	148	177
Thereof, Dual chamber	26	51
Thereof, Subcutaneous ICD	not available	0
First implants	156	204
Replacements	18	24
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	3	3
Total loop recorders implanted	19	40

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	1
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for			Official name
ICD	Yes	Working Group on Arrhythmias, Slovenian Society of Cardiology	
Pacing	Yes	Working Group on Arrhythmias, Slovenian Society of Cardiology	
Electrophysiology	Yes	Working Group on Arrhythmias, Slovenian Society of Cardiology	

Availability of a national quality insurance system or complication registry	Yes
Official name: Agency of the Republic of Slovenia for Medicines and Medical Device	

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
Official name: Agency of the Republic of Slovenia for Medicines and Medical Device	



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	3	3
Number of ablations performed	437	712
Mean number of ablations per centre	146	237
Number of AF ablations	149	214
Number of ablation centres (> 50 AF ablations)	1	2
Number of VT/VF ablations	49	28
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	1
Number of LAA closures	4	17
Number of centres (LAA closures)	not available	1

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	7
Number of physicians under training to become independent electrophysiologists	3	1

Availability of a national registry for interventional electrophysiology		Yes
Official name: Working Group on Arrhythmias, Slovenian Society of Cardiology		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Working Group on Arrhythmias, Slovenian Society of Cardiology

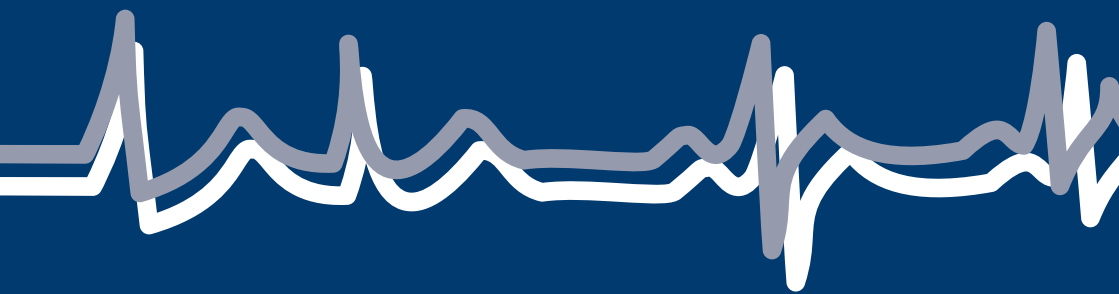
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Survey from professional association

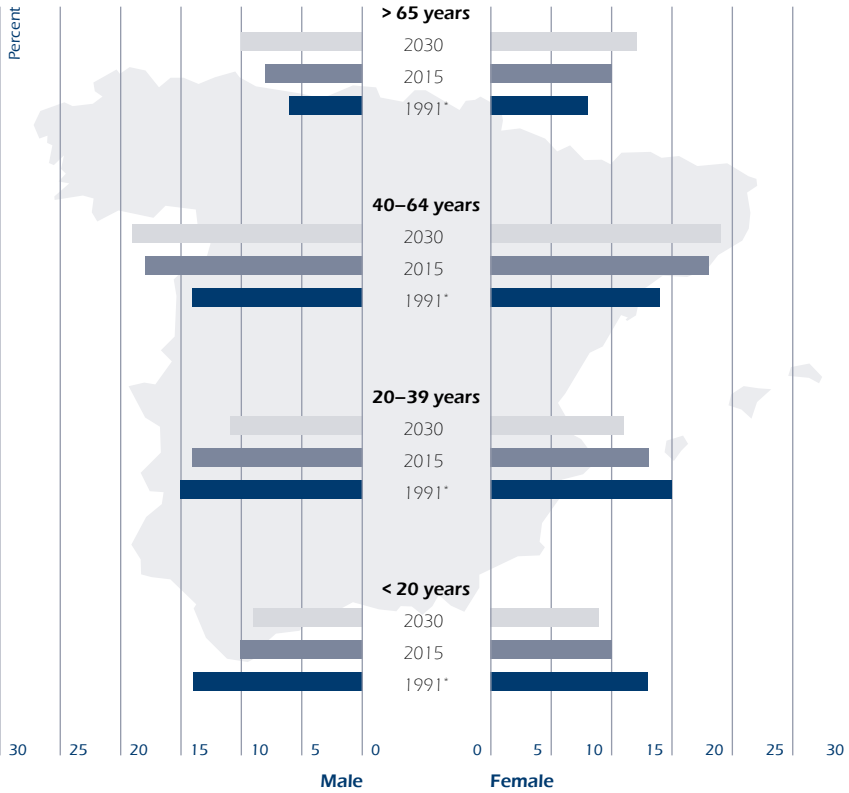
Estimation

SPAIN



1. Statistics

Age pyramid for Spain



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	1,6	2013
Beds (per 100.000 population)	296,5	2013
Density of physicians (per 1.000 population)	3,8	2013
Density of nurses (per 1.000 population)	5,3	2013

Demographic information		Year
Population	48.146.134	2015
Population annual growth rate (%)	0,9	2015
Life expectancy at birth (in years)	82	2015
Death rate (per 1.000 population)	8,4	2013
Live births (per 1.000 population)	9,1	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	1.221,39	2015*
Gross domestic product per capita (U.S dollar-units)	26.326,87	2015*
Total expenditure on health as% of GDP	8,9	2013
General government expenditure on health as% of total expenditure on health	71,7	2012
Private expenditure on health as% of total expenditure on health	28,3	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	33%	30,09%

3. Healthcare System

Spanish healthcare is based on a national health system that covers almost all population. Regional autonomous communities have their own budget and decide how to organize and deliver resources. Private insurance companies offer complementary healthcare coverage.

Basic insurance availability	Yes
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Employed or self-employed persons affiliated (contributors) to the Social Security System • Pensioners of the Social Security System • Unemployed persons receiving unemployment benefits • Unemployed persons who have exhausted unemployment benefits • Persons not previously covered, with incomes less than 100.000€ annually, which are in some of the following situations: • Spanish nationality residing in Spanish territory • Nationals of a Member State of the European Union, the European Economic Area or Switzerland registered in the Central Register of Foreigners. • Nationals of a country other than those mentioned in the preceding paragraphs, or stateless persons, and holders of an authorization to reside in Spanish territory, while it remains in force under the terms provided in their specific legislation. • A person has the status of beneficiary of an insured person when is one of the following situations: Being the spouse of the insured person or living with him/her with a relationship similar to marriage affectivity, forming a partnership. • Be former spouse, or be judicially separated. • Descendant, or person assimilated to it, the insured person or spouse, even if it is legally separated from his former dependent spouse or partner, in both cases by the insured and under 26 year-old or, should be over that age have a disability recognized in an equal or greater than 65% grade.

Percentage of insured and uninsured citizens		
	2014	2015

Insured citizens	95%	99%
Uninsured citizens	5%	1%

Distribution of insurance modality		
	2014	2015

Public insurance company	83%	79%
Private insurance company	15%	5%
Private co-payment	2%	16%

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
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ICD devices	No
Pacemakers	No
Ablation	No

Comments: Yes, only in the private sector



Reimbursement availability for physicians and hospitals

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: In the private sector, the physician/hospital receives per process reimbursement.

Treatment availability

No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cardiac stimulation accreditation (Acreditación en estimulación cardiaca)
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acreditación de formación específica y excelencia para la práctica en Electrofisiología Cardiaca Intervencionista
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acreditación de Centros para la formación en Electrofisiología

National Cardiac Society supporting EHRA certification system		
Yes, the Society demands EHRA certification for practice		<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification		<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification		<input checked="" type="checkbox"/>
No		<input type="checkbox"/>
No answer		<input type="checkbox"/>
Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, cardiac surgeon
Official national competency guidelines for electrophysiological studies or catheter ablation		Yes
Spanish Society of Cardiology		
Required period of training to perform implantations		No
Suggested period of training to perform implantations		Yes
		2 years
National quality control system availability		No
Willingness to install quality control system		Yes
Responsible person for quality control		
Each Centre and Department		
Training centres availability		
Pacemaker		not available
ICD implantation		not available
CRT implantation		not available
Electrophysiological studies and catheter ablation		26
Atrial fibrillation ablation		26
Number of universities (Schools of Medicine)		39
Percentage of academic centres among all practicing EP centres		70%
Percentage of academic centres among all practicing implanting devices centres		35%



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	230	230
Total Pacemaker units implanted	36.322	33.373
Thereof, Leadless Pacemaker	not available	not available
First implants	27.242	25.029
Replacements	9.080	8.344

Specialist performing implants		
Cardiologists	Yes	72%
Surgeons	Yes	24%
Other	Intensive Care specialists	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	130	130
Total CRT units implanted	2.974	2.728
Thereof, CRT pacemaker	949	910
Thereof, CRT ICD	2.025	1.818

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	112	180
Total ICD units implanted	3.869	5.348
Thereof, Single chamber	2.903	not available
Thereof, Dual chamber	966	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	2.813	3.840
Replacements	1.056	1.508

Specialist performing implants		
Cardiologists	Yes	92%
Surgeons	Yes	8%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	145	145
Total loop recorders implanted	2.500	3.008

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	16	35
Total lead extraction procedures	not available	400

Specialist performing lead extractions		
Cardiologists	Yes	30%
Surgeons	Yes	70%



10. Device specific

Availability of remote monitoring of devices	Yes
---	------------

National registry for

		Official name
ICD	Yes	Spanish Implantable Cardioverter-defibrillator Registry. Arrhythmia Working Group. Spanish Society of Cardiology
Pacing	Yes	Spanish Pacemaker Registry. Working Group on Cardiac Pacing. Spanish Society of Cardiology
Electrophysiology	Yes	Spanish Catheter Ablation Registry. Arrhythmia Working Group. Spanish Society of Cardiology

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
---	------------

Official name: Ministry of Health in collaboration with Arrhythmia Working Group and Working Group on Cardiac Pacing, Spanish Society of Cardiology

11. Interventional electrophysiology

Number of ablations performed and number of centres

	2014	2015
Number of ablation centres	85	80
Number of ablations performed	12,871	12,353
Mean number of ablations per centre	151	154
Number of AF ablations	2,498	2,426
Number of ablation centres (> 50 AF ablations)	17	20
Number of VT/VF ablations	711	1,124
Number of ablation centres (> 10 VT ablations on structural heart diseases)	21	8
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists

Number of electrophysiologists performed catheter ablation independently	160	235
Number of physicians under training to become independent electrophysiologists	not available	50

Availability of a national registry for interventional electrophysiology	Yes
---	------------

Official name: Spanish Catheter Ablation Registry. Arrhythmia Working Group. Spanish Society of Cardiology

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Sección de Electrofisiología y Arritmias de la Sociedad Española de Cardiología (Arrhythmia Working Group of the Spanish Society of Cardiology) • Sección de Estimulación Cardíaca de la Sociedad Española de Cardiología (Working Group of Cardiac Pacing of the Spanish Society of Cardiology)

All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Official statistics - Ministry of Health and Ministry of Education
Survey from professional association - Spanish Society of Cardiology Working Groups
Sales data
Estimation
Other - IDIS Foundation

SWEDEN



1. Statistics

Age pyramid for Sweden



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	0,9	2003
Beds (per 100.000 population)	259,4	2013
Density of physicians (per 1.000 population)	4,0	2012
Density of nurses (per 1.000 population)	not available	not available

Demographic information		Year
Population	9.801.616	2015
Population annual growth rate (%)	0,8	2015
Life expectancy at birth (in years)	82	2015
Death rate (per 1.000 population)	9,4	2013
Live births (per 1.000 population)	11,9	2014

Economic information		Year
Gross domestic product (U.S dollar-billions)	483,72	2015*
Gross domestic product per capita (U.S dollar-units)	48.965,95	2015*
Total expenditure on health as% of GDP	9,7	2013
General government expenditure on health as% of total expenditure on health	81,3	2012
Private expenditure on health as% of total expenditure on health	18,7	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	37 %

3. Healthcare System

Basic insurance availability	No answer
-------------------------------------	------------------

Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	100%	not available
Uninsured citizens	0%	not available

Distribution of insurance modality		
	2014	2015
Public insurance company	90%	not available
Private insurance company	0%	not available
Private co-payment	10%	not available

Possibility to subscribing to private health insurance plans	No answer
---	------------------

Co-payment necessary for the following therapy	
ICD devices	No answer
Pacemakers	No answer
Ablation	No answer

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input checked="" type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input checked="" type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	No answer	
ICD or pacemaker implants	No answer	

Official national competency guidelines for electrophysiological studies or catheter ablation	No answer

Required period of training to perform implantations	No answer

Suggested period of training to perform implantations	No answer

National quality control system availability	No answer
Willingness to install quality control system	0
Responsible person for quality control	
No answer	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	9
Atrial fibrillation ablation	9
Number of universities (Schools of Medicine)	
8	
Percentage of academic centres among all practicing EP centres	72%
Percentage of academic centres among all practicing implanting devices centres	22%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	45	44
Total Pacemaker units implanted	9.421	not available
Thereof, Leadless Pacemaker	not available	5
First implants	6.810	6.382
Replacements	2.611	not available
Specialist performing implants		
Cardiologists	Yes	64%
Surgeons	Yes	18%
Other:	Anaesthesiologists	18%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	15	25
Total CRT units implanted	854	1.034
Thereof, CRT pacemaker	308	440
Thereof, CRT ICD	546	594
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available
Other:	Anaesthesiologists	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	35	30
Total ICD units implanted	2.097	not available
Thereof, Single chamber	not available	346
Thereof, Dual chamber	not available	611
Thereof, Subcutaneous ICD	not available	not available
First implants	1.506	870
Replacements	591	not available
Specialist performing implants		
Cardiologists	Yes	81 %
Surgeons	Yes	14 %
	Anaesthesiologists	5 %

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	45	not available
Total loop recorders implanted	753	789

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available
	Anaesthesiologists	not available

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	not available
Total lead extraction procedures	450	not available

Specialist performing lead extractions		
Cardiologists	No	not available
Surgeons	No	not available
Other:	no answer	not available

10. Device specific

Availability of remote monitoring of devices		No answer
National registry for		
		Official name
ICD	No answer	
Pacing	No answer	
Electrophysiology	No answer	
Availability of a national quality insurance system or complication registry		No answer
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No answer



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	10	not available
Number of ablations performed	4.803	not available
Mean number of ablations per centre	480	not available
Number of AF ablations	1.791	not available
Number of ablation centres (> 50 AF ablations)	9	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	51
Number of centres (LAA closures)	not available	5

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	36	not available
Number of physicians under training to become independent electrophysiologists	13	not available

Availability of a national registry for interventional electrophysiology	No answer
0	

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No answer
U.S.	No answer
European	No answer

Obstacles to guideline implementation	Ranking of importance				
	1	2	3	4	5
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Heart Rhythm Group (HRG)

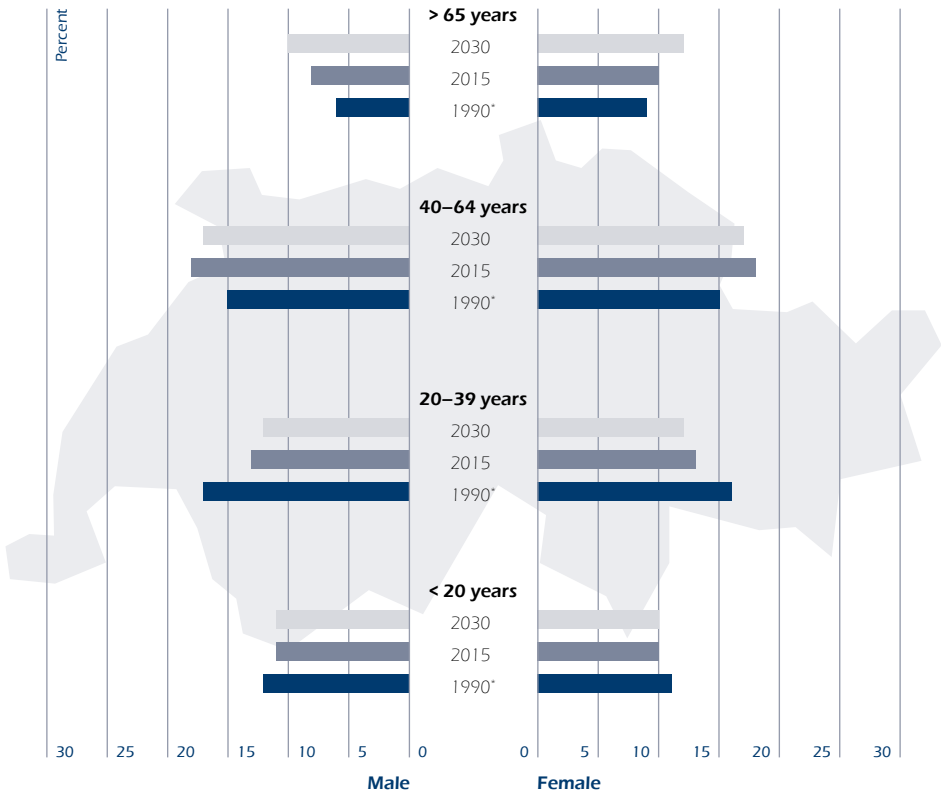
All sources that were used to fill out the questionnaire for the EHRA White Book 2016
EHRA White Book 2015
Official statistics
Sales data
Other

SWITZERLAND



1. Statistics

Age pyramid for Switzerland



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,6	2013
Beds (per 100.000 population)	467,7	2013
Density of physicians (per 1.000 population)	4,0	2013
Density of nurses (per 1.000 population)	17,7	2013

Demographic information		Year
Population	8.121.830	2015
Population annual growth rate (%)	0,8	2015
Life expectancy at birth (in years)	83	2015
Death rate (per 1.000 population)	8,0	2013
Live births (per 1.000 population)	10,2	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	676,98	2015*
Gross domestic product per capita (U.S dollar-units)	82.177,60	2015*
Total expenditure on health as % of GDP	11,5	2013
General government expenditure on health as % of total expenditure on health	65,8	2012
Private expenditure on health as % of total expenditure on health	34,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	35%	not available

3. Healthcare System

National healthcare and private healthcare. Obligatory health insurance to be contracted by all inhabitants.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Inhabitant of the country (declared or not).
The insurance is however not free.

Percentage of insured and uninsured citizens		
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	2014	2015
Insured citizens	100%	not available
Uninsured citizens	0%	not available

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	71%	70%
Private insurance company	0%	30%
Private co-payment	29%	0%

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
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ICD devices	No
Pacemakers	No
Ablation	No

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: Needs to be a cardiologist or cardiovascular surgeon to have reimbursement



Treatment availability	
No restrictions	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EHRA certification
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	According to 2015 Swiss guidelines

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Swiss Working Group on Pacing and Electrophysiology	

Required period of training to perform implantations	Yes
	1 year

Suggested period of training to perform implantations	No
National quality control system availability	
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Cathether ablation	Yes
Responsible person for quality control	
Swiss Working Group on Pacing and Electrophysiology	
Training centres availability	
Pacemaker	6
ICD implantation	6
CRT implantation	6
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	5
Number of universities (Schools of Medicine)	
6	
Percentage of academic centres among all practicing EP centres	
20%	
Percentage of academic centres among all practicing implanting devices centres	
7%	

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	76	71
Total Pacemaker units implanted	6.543	6.401
Thereof, Leadless Pacemaker	not available	not available
First implants	4.983	4.947
Replacements	1.560	1.454
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	48	36
Total CRT units implanted	583	1.133
Thereof, CRT pacemaker	208	395
Thereof, CRT ICD	375	738
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	52	49
Total ICD units implanted	1.341	1.830
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	21
First implants	742	819
Replacements	599	402
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total loop recorders implanted	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	5	6
Total lead extraction procedures	87	not available

Specialist performing lead extractions		
Cardiologists	Yes	80%
Surgeons	Yes	20%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	CHPACEWEB
Pacing	Yes	CHPACEWEB
Electrophysiology	Yes	CHPACEWEB
Availability of a national quality insurance system or complication registry		Yes
Official name: CHPACEWEB		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: CHPACEWEB		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	23	25
Number of ablations performed	5,135	5,709
Mean number of ablations per centre	223	228
Number of AF ablations	1,684	1,991
Number of ablation centres (> 50 AF ablations)	12	13
Number of VT/VF ablations	169	148
Number of ablation centres (> 10 VT ablations on structural heart diseases)	6	7
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	40	not available
Number of physicians under training to become independent electrophysiologists	15	not available

Availability of a national registry for interventional electrophysiology	Yes
Official name: CHPACEWEB	

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	No answer
U.S.	No answer
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Working Group of Pacing and Electrophysiology of the Swiss Society of Cardiology

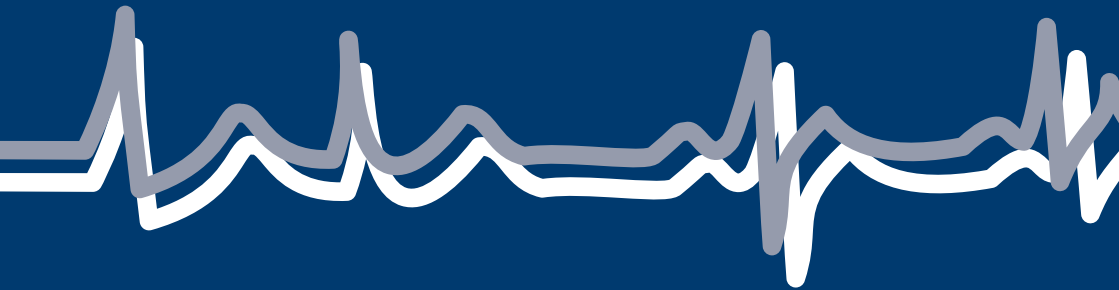
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Survey from professional association

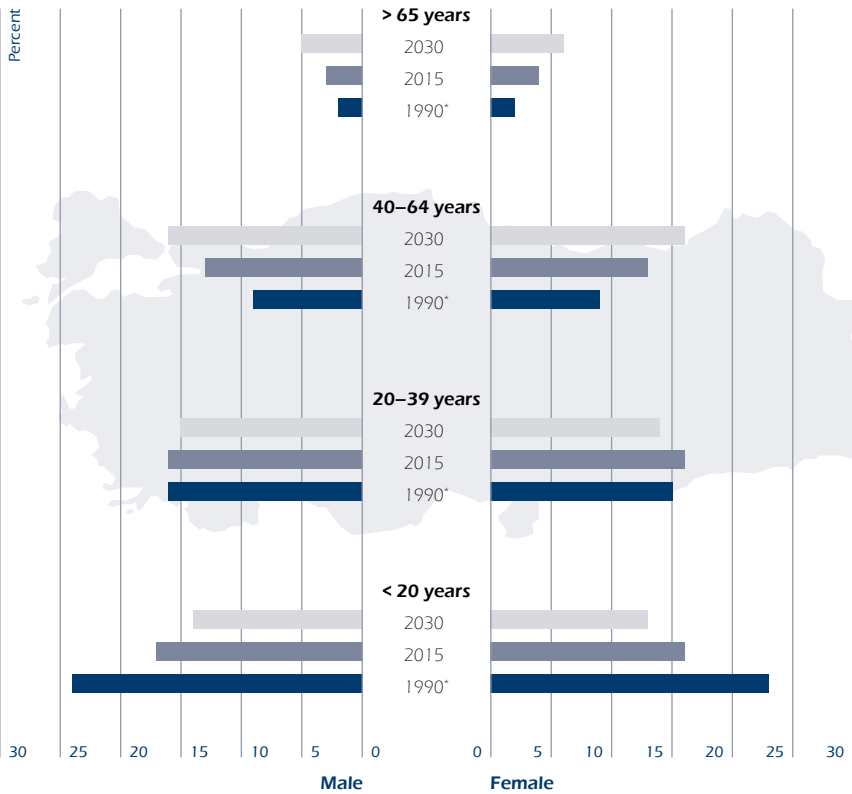
Estimation

TURKEY



1. Statistics

Age pyramid for Turkey



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	2,0	2013
Beds (per 100.000 population)	265,6	2013
Density of physicians (per 1.000 population)	1,8	2013
Density of nurses (per 1.000 population)	2,5	2013

Demographic information		Year
Population	79.414.269	2015
Population annual growth rate (%)	1,3	2015
Life expectancy at birth (in years)	75	2015
Death rate (per 1.000 population)	4,7	2013
Live births (per 1.000 population)	16,9	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	722,22	2015*
Gross domestic product per capita (U.S dollar-units)	9.290,43	2015*
Total expenditure on health as% of GDP	5,6	2013
General government expenditure on health as% of total expenditure on health	76,8	2012
Private expenditure on health as% of total expenditure on health	23,2	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	not available	not available

3. Healthcare System

National Health Care System (Social Security Institution -SSI) covers almost all population. Private insurance companies offer complementary health care.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Working population that has acquired policy and their family, retired population.

Percentage of insured and uninsured citizens		
---	--	--

	2014	2015
Insured citizens	99 %	99 %
Uninsured citizens	1 %	1 %

Distribution of insurance modality		
---	--	--

	2014	2015
Public insurance company	99 %	99 %
Private insurance company	1 %	1 %
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	Yes
---	------------

Co-payment necessary for the following therapy	
---	--

ICD devices	No
Pacemakers	No
Ablation	No

Comments: Yes, only in the private sector

Reimbursement availability for physicians and hospitals									
--	--	--	--	--	--	--	--	--	--

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input checked="" type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Body issuing the guidelines: Health Application Instructions

Comments: Social Security Institution publish a guideline called, 'Health Application Instructions' which reports the indications and the amount of reimbursement for each procedure. Indications follow ESC guidelines.

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for			Specialist
Catheter ablation	Yes		Cardiologist
ICD or pacemaker implants	Yes		Cardiologist, cardiovascular surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No
	<input type="checkbox"/>

Required period of training to perform implantations	No
Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible person for quality control	
None	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	74
Percentage of academic centres among all practicing EP centres	15%
Percentage of academic centres among all practicing implanting devices centres	5%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total Pacemaker units implanted	7.300	9.200
Thereof, Leadless Pacemaker	not available	0
First implants	6.200	6.650
Replacements	1.100	2.250
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total CRT units implanted	2.460	2.810
Thereof, CRT pacemaker	310	230
Thereof, CRT ICD	2.150	2.580

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total ICD units implanted	6.300	6.383
Thereof, Single chamber	2.600	3.340
Thereof, Dual chamber	3.700	1.975
Thereof, Subcutaneous ICD	not available	2
First implants	5.400	5.315
Replacements	900	1.066

Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	not available	not available
Total loop recorders implanted	15	15

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	311	420

Specialist performing lead extractions		
Cardiologists	Yes	75%
Surgeons	Yes	25%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Reimbursement problems		

National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	not available	not available
Number of ablations performed	11.218	13.000
Mean number of ablations per centre	not available	not available
Number of AF ablations	1.208	2.200
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	100	120
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	12	0
Number of centres (LAA closures)	not available	0

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National						Yes
U.S.						Yes
European						Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Turkish Society of Cardiology, Working Group on Arrhythmias

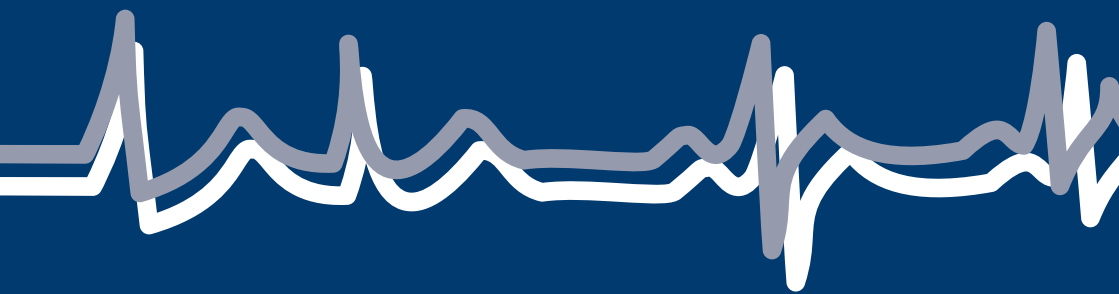
All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

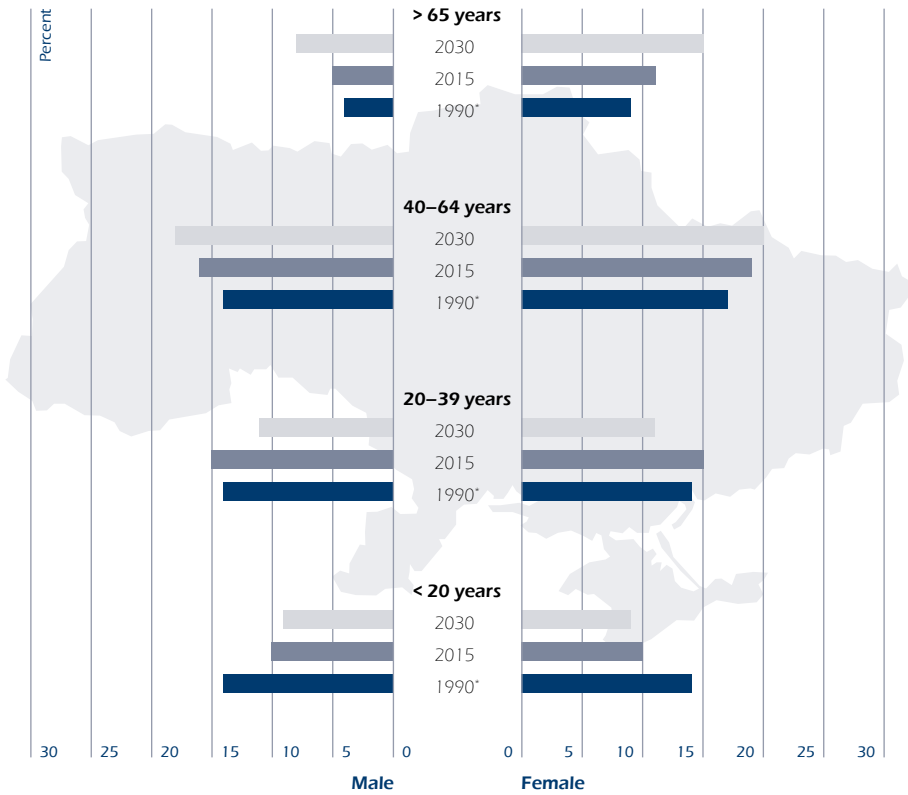
Estimation

UKRAINE



1. Statistics

Age pyramid for Ukraine



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	4,8	2013
Beds (per 100.000 population)	879,8	2013
Density of physicians (per 1.000 population)	3,5	2013
Density of nurses (per 1.000 population)	7,6	2013

Demographic information		Year
Population	44.429.471	2015
Population annual growth rate (%)	-1,2	2015
Life expectancy at birth (in years)	72	2015
Death rate (per 1.000 population)	14,6	2012
Live births (per 1.000 population)	11,1	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	90,14	2015*
Gross domestic product per capita (U.S dollar-units)	2.108,91	2015*
Total expenditure on health as % of GDP	7,8	2013
General government expenditure on health as % of total expenditure on health	55,4	2012
Private expenditure on health as % of total expenditure on health	44,6	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	67,3%	not available

3. Healthcare System

Ministry of Public Health of Ukraine, National Academy of Medical Sciences of Ukraine (National Scientific Centres – 36 in total), profile institutional hospitals (hospital of the Ministry of Internal Affairs, hospital of the Ministry of Defence so on), State sanitary and epidemiological service, State Administration of Ukraine on medical products, State service of Ukraine on HIV/AIDS and other socially dangerous diseases. National health system provides all citizens of Ukraine with the free medical and preventive help in accordance to acting legislation by: emergency, outpatient (ambulatory-polyclinic) help, stationary (general profile and specialized) help.

Basic insurance availability	No
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Percentage of insured and uninsured citizens	2014	2015
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality	2014	2015
Public insurance company	not available	not available
Private insurance company	not available	not available
Private co-payment	not available	not available

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					Official name
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Invasive and non invasive arrhythmology
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Invasive and non invasive arrhythmology
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for		Specialist
Catheter ablation	Yes	Cardiovascular surgeon or cardiologist
ICD or pacemaker implants	Yes	Cardiovascular surgeon or cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
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Рекомендації Асоціації Кардіологів України /Recommendations of Association of Cardiologists of Ukraine/ Рекомендації Асоціації Аритмологів України/ Recommendations of Association of Arrhythmologists of Ukraine

Required period of training to perform implantations	No answer
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Suggested period of training to perform implantations	No answer
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes

Responsible person for quality control	
Ministry of Health of Ukraine, National Academy of Medical Sciences of Ukraine	

Training centres availability	
Pacemaker	4
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	4
Atrial fibrillation ablation	4

Number of universities (Schools of Medicine)	19
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Percentage of academic centres among all practicing EP centres	27,3%
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Percentage of academic centres among all practicing implanting devices centres	8,6%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	36	38
Total Pacemaker units implanted	5.258	4.851
Thereof, Leadless Pacemaker	not available	0
First implants	4,299	4.110
Replacements	959	741

Specialist performing implants		
Cardiologists	Yes	10,3%
Surgeons	Yes	89,7%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	9	10
Total CRT units implanted	85	73
Thereof, CRT pacemaker	72	60
Thereof, CRT ICD	13	13
Specialist performing implants		
Cardiologists	Yes	20%
Surgeons	Yes	80%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	8	14
Total ICD units implanted	57	52
Thereof, Single chamber	33	44
Thereof, Dual chamber	24	8
Thereof, Subcutaneous ICD	not available	0
First implants	47	39
Replacements	10	13
Specialist performing implants		
Cardiologists	Yes	14,3%
Surgeons	Yes	85,7%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	3	2
Total loop recorders implanted	6	2
Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	7	6
Total lead extraction procedures	38	45

Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		No
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	8	11
Number of ablations performed	2,371	2,294
Mean number of ablations per centre	296	208,5
Number of AF ablations	622	634
Number of ablation centres (> 50 AF ablations)	4	5
Number of VT/VF ablations	74	29
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	1
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology	No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

Association of Arrhythmologists of Ukraine

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Association of Arrhythmologists of Ukraine

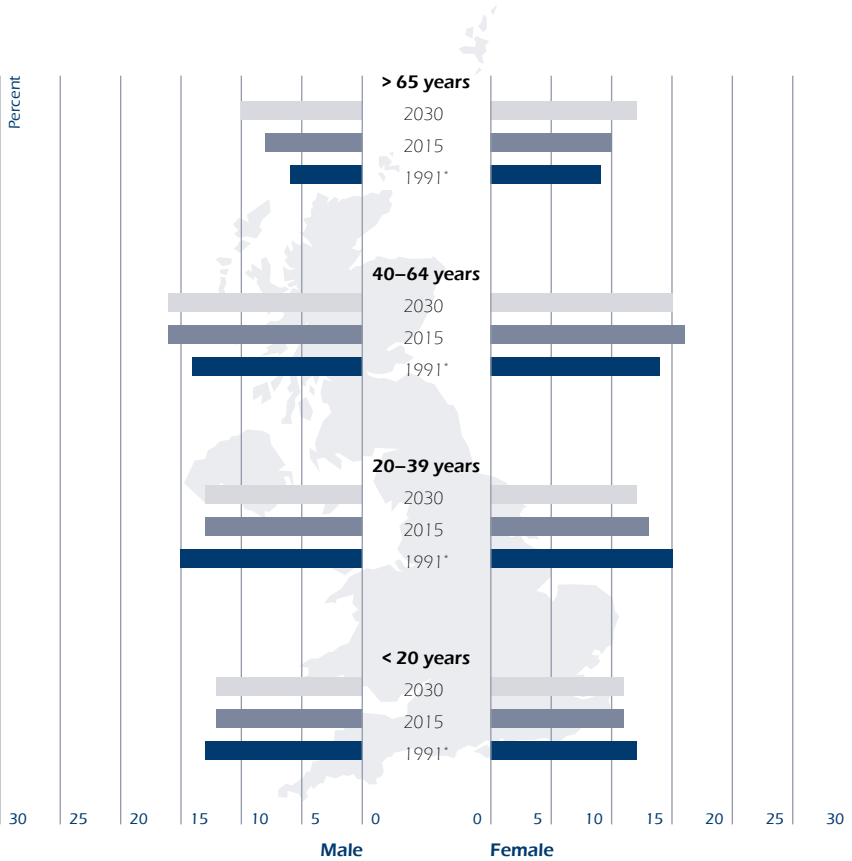
State Statistic Service of Ukraine, Ministry of Public Health of Ukraine

UNITED KINGDOM



1. Statistics

Age pyramid for United Kingdom



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	275,8	2013
Density of physicians (per 1.000 population)	2,8	2014
Density of nurses (per 1.000 population)	8,7	2014

Demographic information		Year
Population	64.088.222	2015
Population annual growth rate (%)	0,5	2015
Life expectancy at birth (in years)	81	2015
Death rate (per 1.000 population)	9,0	2013
Live births (per 1.000 population)	12,2	2013

Economic information		Year
Gross domestic product (U.S dollar-billions)	2.864,90	2015*
Gross domestic product per capita (U.S dollar-units)	44.117,80	2015*
Total expenditure on health as% of GDP	9,1	2013
General government expenditure on health as% of total expenditure on health	84,0	2012
Private expenditure on health as% of total expenditure on health	16,0	2012

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease	2014	2015
	22%	22%

3. Healthcare System

NHS for all citizens. Private healthcare optional.

Basic insurance availability	No
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Percentage of insured and uninsured citizens		
	2014	2015
Insured citizens	100%	5%
Uninsured citizens	0%	95%

Distribution of insurance modality		
	2014	2015
Public insurance company	89%	95%
Private insurance company	11%	0%
Private co-payment	0%	5%

Possibility to subscribing to private health insurance plans	Yes
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Co-payment necessary for the following therapy	
ICD devices	No
Pacemakers	No
Ablation	No

	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
	Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Treatment availability	
No restrictions	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BHRS certification in CIEDs
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BHRS certification in cardiac electrophysiology
Allied professionals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BHRS certification in CIEDs and electrophysiology SCST certification
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>
No answer	<input type="checkbox"/>

Specialist required for	
	Specialist
Catheter ablation	Yes A cardiac electrophysiologist is required for catheter ablation.
ICD or pacemaker implants	Yes A trained cardiologist or cardiac surgeon may undertake device implants.

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
BHRS standards documents in CIEDs and electrophysiology	

Required period of training to perform implantations	Yes
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Cardiology trainees have a 5 year training programme. If they wish to specialise in device implantation, the final 2 years are focussed in this area.

Suggested period of training to perform implantations	No
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National quality control system availability	Yes
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Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes

Responsible person for quality control

BHRS through national audit.

Training centres availability

Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available

Number of universities (Schools of Medicine)	33
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Percentage of academic centres among all practicing EP centres	50%
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Percentage of academic centres among all practicing implanting devices centres	14%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2014	2015
Implanting centres	207	211
Total Pacemaker units implanted	45,131	46,110
Thereof, Leadless Pacemaker	not available	0
First implants	33,893	36,354
Replacements	11,238	9,756
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2014	2015
Implanting centres	129	126
Total CRT units implanted	9,516	10,198
Thereof, CRT pacemaker	4,144	4,160
Thereof, CRT ICD	5,372	6,038
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2014	2015
Implanting centres	126	125
Total ICD units implanted	6,474	6,701
Thereof, Single chamber	2,395	4,021
Thereof, Dual chamber	4,079	2,484
Thereof, Subcutaneous ICD	not available	196
First implants	4,695	5,291
Replacements	1,779	1,410
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2014	2015
Implanting centres	145	129
Total loop recorders implanted	5,792	5,804

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2014	2015
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available

Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices	No answer
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National registry for			Official name
ICD	Yes	National Cardiac Rhythm Management Audit (NICOR)	
Pacing	Yes	National Cardiac Rhythm Management Audit (NICOR)	
Electrophysiology	Yes	National Cardiac Rhythm Management Audit (NICOR)	

Availability of a national quality insurance system or complication registry	Yes
Official name: National Cardiac Rhythm Management Audit (NICOR)	

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
Official name: Medicines and Healthcare Regulatory Authority (MHRA)	



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2014	2015
Number of ablation centres	61	65
Number of ablations performed	17,578	17,622
Mean number of ablations per centre	288	271
Number of AF ablations	6,505	6,390
Number of ablation centres (> 50 AF ablations)	36	32
Number of VT/VF ablations	599	674
Number of ablation centres (> 10 VT ablations on structural heart diseases)	23	23
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available

Availability of a national registry for interventional electrophysiology	Yes
Official name: National cardiac rhythm management audit NICORJ	

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Yes
U.S.	No
European	No

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body

British Heart Rhythm Society

All sources that were used to fill out the questionnaire for the EHRA White Book 2016

EHRA White Book 2015

Official statistics

Estimation

5. Appendix



5. Appendix



EHRA Certification

The EHRA offers the first European certification of professional excellence, in three areas:

- Electrophysiology
- Cardiac Pacing & Device Therapy
- Allied Professionals

The EHRA is pleased to publish the list, starting from 2005, of professionals who are officially fully certified, as well as that of the candidates who have passed the written part of the certification process.

«Join us in congratulating them!»

Candidates successful to the exam need to have their logbook assessed by an EHRA grader to be fully certified. EHRA Certification is valid for 10 years.

Electrophysiology

EHRA EP Certified professionals

ACENA RAMOS	Marta	Spain	2014
ACOU	Willem-Jan	Belgium	2015
ADYAMAN	Ahmet	Netherlands	2014
ALCALDE RODRIGUEZ	Oscar	Spain	2012
ALI	Hussam	Italy	2015
ALZAND	B.	Netherlands	2012
ANDERSON	Mark H.	United Kingdom	2010
ANGUERA CAMOS	Ignacio	Spain	2009
ANNE	Wim	Belgium	2013
ARBELO	Elena	Spain	2009
ARCOCHA TORRES	Maria Fe	Spain	2012
ARIAS PALOMARES	Miguel Angel	Spain	2013
ARMENTA PASTOR	Juan Fernandez	Spain	2012
AVELLA	Andrea	Italy	2009
ÁVILA ALONSO	Pablo	Spain	2013
AYALA PAREDES	Felix	Canada	2009
BALTA	Osman	Germany	2013
BARDYSZEWSKI	Aleksander	Poland	2015
BARRERA CORDERO	Alberto	Spain	2005
BAYRAK	Duhan Fatih	Belgium	2012
BEAUPORT	Joelle	Germany	2013
BELOTTI	Giuseppina	Italy	2008
BENCSEK	Gabor	Hungary	2009
BERRUEZO SANCHEZ	Antonio	Spain	2010
BERTOMEU-GONZALEZ	Vicente	Spain	2012
BISBAL	Felipe	Belgium	2015
BLAAUW	Yuri	Netherlands	2015
BONANNO	Carlo	Italy	2014
BROUZET	Thomas	Spain	2015
BRUGADA	Josep	Spain	2009
BUERKLE	Gerd	Austria	2011
BUN	Sok-Sithikun	France	2012



EHRA EP Certified professionals

BURRI	Haran	Switzerland	2008
CALVO CUERVO	David	Spain	2013
CALVO GALIANO	Naiara	Spain	2012
CANO PEREZ	Oscar	Spain	2011
CASTRO URDA	Victor	Spain	2012
CATANCHIN	Andrei	Australia	2012
CHATTERJEE	Debjit	United Kingdom	2013
CHONG	Daniel	Singapore	2013
CIPOLLETTA	Laura	Italy	2015
CLEMENS	Marcell	Hungary	2015
CORTEZ-DIAS	Nuno	Portugal	2015
COZAR LEON	Rocio	Spain	2012
DATINO	Tomas	Spain	2012
DAVOODI	Gholamreza	Ireland	2008
DE DIEGO	Carlos	Spain	2015
DE FILIPPO	Paolo	Italy	2012
DE GROOT	Joris R.	Netherlands	2012
DE JONG	Jonas	Netherlands	2013
DE MEYER	Grim	Belgium	2014
DE RIVA SILVA	Marta	Spain	2013
DELGADO	Hugo Emilio	Argentina	2014
DEUTSCH	Alexandru	Romania	2012
DI CORI	Andrea	Italy	2015
DJAJADISASTRA	Achmad Iskandar	Germany	2012
DOMINGUEZ MAFE	Eloy	Spain	2014
DURAY	Gabor Zoltan	Germany	2008
DYRDA	Katia	Canada	2012
EISENBERGER	Martin	Czech Republic	2012
EL KADRI	Moutaz	United Kingdom	2013
ELDER	Douglas	United Kingdom	2013
EVERTZ	Reinder	Netherlands	2015
EWERTSEN	Niels Christian	Germany	2014
FERNANDEZ LOZANO	Ignacio	Spain	2005
FERNANDEZ PASTOR	Julia	Spain	2015
FONTENLA	Adolfo	Spain	2012
FORCLAZ	Andrei	Switzerland	2012
FOSCH	Javier	Spain	2015
FRANCK	Harald	Germany	2011
FRANZINI	Christine	Switzerland	2015
GALLARDO LOBO	Rodrigo	Spain	2012
GARCIA MORAN	Emilio	Spain	2005
GAROFALO FORTE	Daniel	Spain	2014
GAWRYSIAK	Marcin	Poland	2013
GLOWNIAK	Andrzej	Poland	2012
GONZALEZ FERRER	Juan Jose	Spain	2015
GONZALEZ VASSEROT	Maria Del Mar	Spain	2009
GONZALEZ-ENRIQUEZ	Susana	Spain	2012
GOPALAMURUGAN	A. B.	United Kingdom	2014
GRECU	Mihaela	Romania	2007
GRUBB	Neil	United Kingdom	2014

EHRA EP Certified professionals

GUGUCHEV	Pavel	United States of America	2010
HEMELS	Martin	Netherlands	2012
HERCZKU	Csaba	Hungary	2012
HERREROS GUILARTE	Benito	Spain	2005
HLIVAK	Peter	Slovakia	2012
HUYBRECHTS	Wim	Belgium	2009
INFUSINO	Tommaso	Italy	2013
JANDA	Igor	Germany	2012
JANSEN	Ward	Netherlands	2010
JASTRZEBSKI	Marek	Poland	2008
JILEK	Clemens	Germany	2012
JIMENEZ JAIMEZ	Juan	Spain	2015
JIMENEZ-DIAZ	Javier	Spain	2015
JOHAR	Sofian	United Kingdom	2012
JONES	David Gareth	United Kingdom	2012
JOST	Colin	Germany	2015
KACZMAREK	Krzysztof	Poland	2013
KARDOS	Attila	Hungary	2012
KEMME	Michiel	The netherlands	2009
KILISZEK	Marek	Poland	2010
KONSTANTINIDOU	Melanie	Germany	2013
KOOPMAN	Pieter	Belgium	2014
KOSTOPOULOU	Anna	Greece	2014
KRISTENSEN	Jens	Denmark	2014
KUHNE	Michael	Switzerland	2012
LANG	Christopher	United Kingdom	2014
LAURENZI	Francesco	Italy	2009
LE POLAIN DE WAROUX	Jean-Benoit	Belgium	2015
LERCHER	Peter	Austria	2012
LETSAS	Konstantinos	Greece	2009
LOUW	Ruan	South Africa	2014
LUBINSKI	Andrzej	Poland	2005
LUEDORFF	Guido	Germany	2012
LUERMANS	Justin	Netherlands	2014
LUQUE	Antonio	Spain	2015
MADRID	Antonio	Spain	2008
MARINI	Massimiliano	Italy	2011
MARTINEK	Martin	Austria	2010
MARTINEZ ALDAY	Jesus Daniel	Spain	2005
MARTINEZ SANDE	Jose Luis	Spain	2012
MATIA FRANCES	Roberto	Spain	2011
MATIELLO	Maria	Spain	2011
MAZUR	Alexander	Israel	2005
MORENO REVIRIEGO	Sara	Spain	2014
MOYA I MITJANS	Angel	Spain	2005
MUELLER	Stephan Andreas	Switzerland	2012
MUNDEL	Markus	Germany	2013
NAGEH-ARMANIOS	Maged	United States of America	2012
NAVARRETE CASAS	Antonio Javier	United States of America	2008
NENTWICH	Karin	Germany	2013



EHRA EP Certified professionals

NOVAK	Jan	United Kingdom	2013
ORMAETXE MERODIO	Jose Miguel	Spain	2005
OSCA ASENSI	Joaquin	Spain	2010
ÖZCAN	Emin Evren	Turkey	2014
PACHON	Marta	Spain	2014
PADFIELD	Gareth	United Kingdom	2015
PAPIASHVILI	Giorgi	Georgia	2009
PASTOR FUENTES	Agustin	Spain	2005
PAURIAH	Maheshwar	United Kingdom	2015
PAVLOVIC	Nikola	Croatia	2014
PEINADO	Rafael	Spain	2005
PELAEZ GONZALEZ	Antonio	Spain	2015
PEREZ ALVAREZ	Luisa	Spain	2014
PEREZ CASTELLANO	Nicasio	Spain	2005
PEREZ DIEZ	Diego	Spain	2012
PEREZ-VILLACASTIN	Julian	Spain	2005
PISON	Laurent	Netherlands	2013
POELSLEER	Robert	Germany	2014
POZZETTI	Daniela	Italy	2007
PRISECARU	Raluca	Belgium	2015
PUCHOL	Alberto	Hungary	2012
RACKAUSKAS	Gediminas	Lithuania	2015
REBELLATO	Luca	Italy	2012
RICCIARDI	Daniilo	Belgium	2013
RIVAS GANDARA	Nuria	Spain	2013
RIVERA	Santiago	Canada	2013
ROCA LUQUE	Ivo	Spain	2014
RODRIGUEZ MANERO	Moises	Belgium	2013
RORDORF	Roberto	Italy	2012
ROSSI	Luca	Italy	2014
ROSSI	Andrea	Italy	2014
ROTEN	Laurent	Switzerland	2009
ROUX	Antoine	France	2013
SABATE DE LA CRUZ	Xavier	Spain	2005
SALGADO ARANDA	Ricardo	Spain	2014
SALGUERO BODES	Rafael	Spain	2009
SAMO AYOU	Romeo	Sweden	2011
SANZO	Antonio	Italy	2015
SAUSE	Armin	Germany	2009
SCHIMPF	Rainer	Germany	2012
SCHOONDERWOERD	Bas	Netherlands	2012
SEBAG	Frederic	France	2014
SEGRETI	Luca	Italy	2013
SEGURA VILLALOBOS	Federico	Spain	2012
SEILER	Jens	Switzerland	2013
SEOW	Swee-Chong	Singapore	2007
SERVATIUS	Helge	Switzerland	2014
SGARITO	Giuseppe	Italy	2014
SIEIRA RODRIGUEZ-MORET	Juan Antonio	Spain	2015
SILISTE	Calin	Italy	2013

EHRA EP Certified professionals

SKENE	Christopher	United Kingdom	2014
SMIT	Jaap Jan	The Netherlands	2009
STANLEY	Anthony	South Africa	2014
STEFFEL	Jan	Switzerland	2012
STOECKEL	Holger	Switzerland	2015
STUEHLINGER	Markus	Austria	2010
SZABO	Albin Arpad	Hungary	2012
SZEPLAKI	Gabor	Hungary	2012
TEJEIRA FERNANDEZ	Elvis	United Kingdom	2012
TER BEKKE	Rachel M.A.	Netherlands	2015
TOMAN	Ondrej	Czech Republic	2013
TOQUERO RAMOS	Jorge	Spain	2005
TORCIVIA	Riccardo	Italy	2015
TRINES	Serge Alexander Ivo Petrus	Netherlands	2008
TRUCCO DE RINAUDO	María Emilce	Spain	2015
TUTDIBI	Osman	Germany	2013
TUTUIANU	Cristina Ioana	Romania	2015
TZEIS	Stylios	Greece	2010
UCER	Ekrem	Germany	2012
VACCARI	Diego	Italy	2013
VALVERDE ANDRE	Irene	Spain	2013
VAN CASTEREN	Lieve	Belgium	2012
VAN DER HEIJDEN	Jeroen	Netherlands	2015
VAN HEUVERSWYN	Frederic	Belgium	2015
VAN OPSTAL	Jurren	Netherlands	2014
VATAESCU	Radu-Gabriel	Romania	2009
VENABLES	Paul	United Kingdom	2013
VILLUENDAS SABATE	Roger	Spain	2013
VITALE	Raffaele	Italy	2012
VOCKE	Wolfgang	Germany	2013
VOSS	Frederik	Germany	2009
VUKAJLOVIC	Dejan	Germany	2010
WETZEL	Renate Ulrike	Germany	2015
WIJCHERS	Sip	Belgium	2015
WINTER	Siegmund	Austria	2012
YEO	Wee Tiong	Singapore	2013
ZELJKO	Hrvojka Marija	Croatia	2013
ZELLERHOFF	Stephan	Germany	2015
ZOPPO	Franco	Italy	2008
ZUCCHELLI	Giulio	Italy	2012

EP Certification candidates who have successfully completed the exam

ABALEA	Jerome	France	2014
ABEDIN	Zainul	United States Of America	2007
ÁBRAHAM	Pál	Hungary	2013
ACENA RAMOS	Marta	Spain	2011
ACOSTA MARTINEZ	Juan	Spain	2014
ACOU	Willem-Jan	Belgium	2013



EP Certification candidates who have successfully completed the exam

ADIYAMAN	Ahmet	Netherlands	2014
AHMED TAHER MAHMOUD	Ahmed	Egypt	2013
AHUMADA	Miguel	Spain	2013
AKERSTROM	Finn	Sweden	2015
AL AMOURA	Alaa	France	2015
AL BUNNI	Muhamad	Italy	2007
ALCALDE RODRIGUEZ	Oscar	Spain	2010
ALGARRA CULLELL	Maria	Spain	2013
ALI	Hussam	Italy	2014
ALIYEV	Farid	Turkey	2010
ALZAND	B.	Netherlands	2012
AMET	Denis	France	2011
ANDERSON	Mark H	United Kingdom	2010
ANGUERA CAMOS	Ignacio	Spain	2008
ANIC	Ante	Croatia	2013
ANNE	Wim	Belgium	2010
ANTOLIC	Bor	Slovenia	2015
ARBELO	Elena	Spain	2007
ARCOCHA TORRES	Maria Fe	Spain	2009
ARGUEDAS-JIMENEZ	Hugo	Spain	2014
ARIAS PALOMARES	Miguel Angel	Spain	2010
ARISHA	Mohamed Mousa	France	2015
ARMENTA PASTOR	Juan Fernandez	Spain	2011
ARND	Christoph	Germany	2014
ATTA	Salah Eldin Sayed	Saudi Arabia	2010
AVELLA	Andrea	Italy	2007
ÁVILA ALONSO	Pablo	Spain	2013
AYALA PAREDES	Felix	Canada	2007
AZEM	Tareq	Germany	2014
BALT	Jippe	Netherlands	2013
BALTA	Osman	Germany	2010
BARDYSZEWSKI	Aleksander	Poland	2014
BARRERA CORDERO	Alberto	Spain	2005
BARRY	James	United Kingdom	2012
BASTANI	Hamid	Sweden	2015
BASTIAN	Dirk	Germany	2014
BAUERNEFEIND	Tamas	Hungary	2013
BAYRAK	Duhan Fatih	Belgium	2011
BEAUPORT	Joelle	Germany	2012
BEDNAREK	Jacek	Poland	2011
BEHAR	Nathalie	France	2014
BELOTTI	Giuseppina	Italy	2006
BENCARDINO	Gianluigi	Italy	2015
BENCsik	Gabor	Hungary	2009
BENEZET MAZUECOS	Juan	Spain	2014
BENITO MARTIN	Eva Maria	Spain	2015
BERRUJEO SANCHEZ	Antonio	Spain	2006
BERTAGNOLLI	Livio	Italy	2013
BERTERO	Giovanni	Italy	2012
BERTOMEU-GONZALEZ	Vicente	Spain	2010

EP Certification candidates who have successfully completed the exam

BIANCHI	Francesca	Italy	2014
BISBAL	Felipe	Belgium	2014
BLAAUW	Yuri	Netherlands	2011
BLANDINO	Alessandro	Italy	2013
BOGDAN	Stefan Nicolae	Romania	2014
BOHORA	Shomu	India	2012
BONANNO	Carlo	Italy	2011
BORDIGNON	Stefano	Italy	2013
BOROV	Stefan	Bulgaria	2015
BORREGO BERNABE	Luis	Spain	2013
BOTROS	Maichel Sobhy Naguib	Egypt	2014
BOULLIN	Julian Paul	United Kingdom	2010
BROCKMEIER	Johannes Paul	Germany	2013
BROUZET	Thomas	Spain	2012
BRUGADA	Josep	Spain	2007
BUCHHOLZ	Jochen	Germany	2013
BUERKLE	Gerd	Austria	2008
BUIATTI	Alessandra	Italy	2015
BUN	Sok-Sithikun	France	2012
BURKHARDT	Dietmar	Germany	2014
BURRI	Haran	Switzerland	2007
CABANAS GRANDIO	Pilar	Spain	2014
CABRERA GOMEZ	Sandra	Spain	2014
CALVANESE	Raimondo	Italy	2014
CALVO CUERVO	David	Spain	2010
CALVO GALIANO	Naiara	Spain	2011
CAMPOS GARCIA	Bieito	Spain	2010
CAÑADAS GODOY	Maria Victoria	Spain	2013
CANO PEREZ	Oscar	Spain	2009
CARBALLEIRA	Lidia	Spain	2015
CASADO ARROYO	Ruben	Spain	2015
CASTAGNO	Davide	Italy	2015
CASTILLO	Jesús	Spain	2013
CASTREJON CASTREJON	Sergio	Spain	2012
CASTRO FIGUEROA	Lena Del Pilar	Spain	2015
CASTRO URDA	Victor	Spain	2009
CATANCHIN	Andrei	Australia	2008
CHALDOUPI	Sevasti-Maria	Netherlands	2015
CHAPURNYKH	Alexander	Russia	2015
CHATTERJEE	Debjit	United Kingdom	2010
CHONG	Daniel	Singapore	2011
CIPOLLETTA	Laura	Italy	2015
CISMARU	Gabriel	Romania	2015
CLEMENS	Marcell	Hungary	2012
CLEMENTY	Nicolas	France	2010
CONTE	Giulio	Italy	2015
CONTI	Sergio	Italy	2015
CORTEZ-DIAS	Nuno	Portugal	2013
COSTA	Alessandro	Italy	2015
COZAR LEON	Rocio	Spain	2011



EP Certification candidates who have successfully completed the exam

DAR	Mehboob	Saudi Arabia	2013
DATINO	Tomas	Spain	2011
DAVOODI	Gholamreza	Ireland	2007
DE DIEGO	Carlos	Spain	2012
DE FILIPPO	Paolo	Italy	2011
DE GROOT	Joris R.	Netherlands	2009
DE JONG	Jonas	Netherlands	2011
DE LUCIA	Raffaele	Italy	2015
DE MEYER	Grim	Belgium	2011
DE RIVA SILVA	Marta	Spain	2011
DEL CASTILLO ARROJO	Silvia	Spain	2006
DELCOUR	Alexandre	Belgium	2015
DELGADO	Hugo Emilio	Argentina	2013
DEUTSCH	Alexandru	Romania	2009
DI CORI	Andrea	Italy	2012
DICHTL	Wolfgang	Austria	2011
DINOV	Borislav	Germany	2012
DJAJADISASTRA	Achmad Iskandar	Germany	2011
DOMINGUEZ MAFE	Eloy	Spain	2012
DURAY	Gabor Zoltan	Germany	2008
DUTHOIT	Guillaume	France	2010
DYRDA	Katia	Canada	2010
EIJSBOUTS	Sabine	Netherlands	2014
EISENBERGER	Martin	Czech Republic	2008
EL KADRI	Moutaz	United Kingdom	2012
EL MAGHAWRY	Mohamed	Egypt	2015
ELDER	Douglas	United Kingdom	2010
ELICES TEJA	Juliana	Spain	2015
ESTRADA	Alejandro	Spain	2013
EVERTZ	Reinder	Netherlands	2014
EWERTSEN	Niels Christian	Germany	2013
EXPOSITO	Victor	Spain	2015
FERNANDEZ LOZANO	Ignacio	Spain	2005
FERNANDEZ PASTOR	Julia	Spain	2012
FICHTNER	Stephanie	Germany	2014
FIGUEROA	Jorge Alejandro	Argentina	2014
FILGUEIRAS RAMA	David	Spain	2012
FONTENLA	Adolfo	Spain	2010
FORCLAZ	Andrei	Switzerland	2009
FOSCH	Javier	Spain	2013
FRANCK	Harald	Germany	2010
FRANCO DIEZ	Eduardo	Spain	2015
FRANZINI	Christine	Switzerland	2014
FUKUNAGA	Masato	Czech Republic	2015
GALLARDO LOBO	Rodrigo	Spain	2009
GANDJBAKHCH	Estelle	France	2013
GARCIA MORAN	Emilio	Spain	2005
GAROFALO FORTE	Daniel	Spain	2013
GAWRYSIK	Marcin	Poland	2009
GLOWNIAK	Andrzej	Poland	2009

EP Certification candidates who have successfully completed the exam

GODA	Sherif	Egypt	2014
GOMEZ	Federico	Spain	2014
GONZALEZ FERRER	Juan Jose	Spain	2012
GONZALEZ VASSEROT	Maria Del Mar	Spain	2007
GONZALEZ-ENRIQUEZ	Susana	Spain	2008
GOPALAMURUGAN	A. B.	United Kingdom	2011
GOURRAUD	Jean Baptiste	France	2014
GRANIER	Mathieu	France	2011
GRECU	Mihaela	Romania	2006
GRIECO	Domenico	Italy	2014
GRUBB	Neil	United Kingdom	2014
GUENANCIA	Charles	France	2015
GUGUCHEV	Pavel	United States Of America	2010
GUY-MOYAT	Benoit	France	2010
HAGGUI	Abdeddayem	Tunisia	2015
HEMELS	Martin	Netherlands	2011
HENDRICKS	Neil	South Africa	2012
HENKENS	Ivo	Netherlands	2015
HERCZKU	Csaba	Hungary	2009
HERREROS GUILARTE	Benito	Spain	2005
HLIVAK	Peter	Slovakia	2010
HOBBS	William Julian	United Kingdom	2007
HOFFMANN	Andrzej	Poland	2012
HOGLUND	Niklas	Sweden	2008
HOOFT VAN HUYSDUYNEN	Bart	Netherlands	2011
HORDYNSKI	Grzegorz	Poland	2012
HUEMER	Martin	Germany	2013
HUYBRECHTS	Wim	Belgium	2008
IATROPOULOS	Dimitrios	Greece	2015
IMNADZE	Guram	Germany	2015
INFUSINO	Tommaso	Italy	2011
IORGULESCU	Corneliu-Nicolae	Romania	2012
JAN	Matevz	Slovenia	2014
JANDA	Igor	Germany	2009
JANSEN	Ward	Netherlands	2009
JARMAN	Julian	United Kingdom	2012
JASTRZEBSKI	Marek	Poland	2007
JAUREGUI ABULARACH	Miguel Eduardo	Spain	2010
JILEK	Clemens	Germany	2011
JIMENEZ JAIMEZ	Juan	Spain	2013
JIMENEZ LOPEZ	Jesús	Spain	2015
JIMENEZ-DIAZ	Javier	Spain	2013
JOHAR	Sofian	United Kingdom	2009
JONES	David Gareth	United Kingdom	2009
JOST	Colin	Germany	2012
JULIA CALVO	Justo	Spain	2015
KACZMAREK	Krzysztof	Poland	2010
KANDIL	Mehmet	Germany	2011
KARDOS	Attila	Hungary	2010
KEMME	Michiel	The Netherlands	2008



EP Certification candidates who have successfully completed the exam

KILISZEK	Marek	Poland	2009
KIRUBAKARAN	Senthil	United Kingdom	2012
KOCH	Lydia	Germany	2012
KONRAD	Torsten	Germany	2014
KONSTANTINIDOU	Melanie	Germany	2011
KONTOGEORGIS	Andrianos	United Kingdom	2015
KOOPMAN	Pieter	Belgium	2011
KOSTOPOULOU	Anna	Greece	2012
KOX	Thomas	Germany	2015
KRISTENSEN	Jens	Denmark	2013
KRIVOLAPOV	Sergey	Russia	2013
KUHNE	Michael	Switzerland	2011
KUMAR	Narendra	Netherlands	2015
KUPICS	Kaspars	Latvia	2015
LALLEMAND	Benedicte	France	2012
LANG	Christopher	United Kingdom	2012
LANGBEIN	Anke	Germany	2014
LAURENZI	Francesco	Italy	2008
LE POLAIN DE WAROUX	Jean-Benoit	Belgium	2012
LERCHER	Peter	Austria	2010
LETSAS	Konstantinos	Greece	2008
LEVENTOPOULOS	Georgios	Greece	2014
LINDE	Antonio	Spain	2013
LOUW	Ruan	South Africa	2014
LUBINSKI	Andrzej	Poland	2005
LUEDORFF	Guido	Germany	2012
LUERMANS	Justin	Netherlands	2013
LUQUE	Antonio	Spain	2014
MADRAZO DELGADO	Ines	Spain	2012
MADRID	Antonio	Spain	2008
MAKOWSKI	Karol	Portugal	2010
MANTZIARI	Aglaia-Angeliki (Lilian)	United Kingdom	2013
MANUSAMA	Randy	Netherlands	2015
MARINI	Massimiliano	Italy	2010
MARTINEK	Martin	Austria	2008
MARTINEZ ALDAY	Jesus Daniel	Spain	2005
MARTINEZ SANDE	Jose Luis	Spain	2009
MASSIN	Francois	France	2009
MATIA FRANCES	Roberto	Spain	2009
MATIELLO	Maria	Spain	2007
MAZUR	Alexander	Israel	2005
MCCREADY	James	United Kingdom	2010
MEJIA	Elena	Spain	2014
MELLOR	Greg	United Kingdom	2013
MEYER	Christian	Germany	2011
MOISEI	Radu Eugen	Romania	2015
MOLATTA	Stephan	Germany	2015
MORENO	Jose	Spain	2013
MORENO REVIRIEGO	Sara	Spain	2011
MOYA I MITJANS	Angel	Spain	2005

EP Certification candidates who have successfully completed the exam

MUELLER	Dirk	Germany	2008
MUELLER	Stephan Andreas	Switzerland	2011
MUNDEL	Markus	Germany	2011
MUNOZ ESPARZA	Carmen	Spain	2015
MUNTEAN	Bogdan	Germany	2013
NAGEH-ARMANIOS	Maged	United States Of America	2010
NAVARRETE CASAS	Antonio Javier	United States Of America	2007
NAVARRO	Javier	Spain	2012
NENTWICH	Karin	Germany	2012
NG	Fu Siong	United Kingdom	2014
NOTI	Fabian	Switzerland	2013
NOVAK	Jan	United Kingdom	2013
OLORIZ SANJUAN	Teresa	Spain	2013
ORMAETXE MERODIO	Jose Miguel	Spain	2005
OSCA ASENSI	Joaquin	Spain	2006
ÖZCAN	Emin Evren	Turkey	2013
PACHON	Marta	Spain	2011
PADFIELD	Gareth	United Kingdom	2013
PAISEY	John	United Kingdom	2008
PANCHETTI	Luca	Italy	2014
PAPIASHVILI	Giorgi	Georgia	2007
PARK	Chan-Il	Switzerland	2014
PASTOR FUENTES	Agustin	Spain	2005
PAURIAH	Maheshwar	United Kingdom	2012
PAVACI	Herribert	Germany	2015
PAVLOVIC	Nikola	Croatia	2014
PAWLIK	Tomasz	Poland	2013
PEINADO	Rafael	Spain	2005
PELAEZ GONZALEZ	Antonio	Spain	2012
PENELA	Diego	Spain	2014
PEREZ	Armando	Spain	2010
PEREZ ALVAREZ	Luisa	Spain	2011
PEREZ CASTELLANO	Nicasio	Spain	2005
PEREZ DIEZ	Diego	Spain	2010
PEREZ-VILLACASTIN	Julian	Spain	2005
PERROTTA	Laura	Italy	2014
PEZAWAS	Thomas	Austria	2015
PIQUERAS	Eric	France	2015
PISON	Laurent	Netherlands	2010
POELSNER	Robert	Germany	2014
POOSAPADDI RAJA	Bhima Shankar	India	2012
POZZETTI	Daniela	Italy	2007
PRISECARU	Raluca	Belgium	2015
PUCHOL	Alberto	Hungary	2009
QURESHI	Norman	United Kingdom	2013
RACKAUSKAS	Gediminas	Lithuania	2015
RAJU	Harihara	United Kingdom	2015
RAMANNA	Hemanth	The Netherlands	2008
REBELLATO	Luca	Italy	2009
REZZULLO	Elvira	Italy	2015



EP Certification candidates who have successfully completed the exam

RIAHI	Leila	Tunisia	2013
RICCIARDI	Daniilo	Belgium	2012
RICCIARDI	Giuseppe	Italy	2015
RISTIC	Velibor	Serbia	2015
RIVAS GANDARA	Nuria	Spain	2010
RIVERA	Santiago	Canada	2013
ROCA LUQUE	Ivo	Spain	2011
ROCHA COSTA	Sergia	Portugal	2015
RODRIGUEZ MANERO	Moises	Belgium	2012
RORDORF	Roberto	Italy	2009
ROSER	Mattias	Germany	2012
ROSSI	Andrea	Italy	2011
ROSSI	Luca	Italy	2012
ROTEN	Laurent	Switzerland	2008
ROUX	Antoine	France	2010
RUBIO	Jose Manuel	Spain	2015
SABATE DE LA CRUZ	Xavier	Spain	2005
SALGADO ARANDA	Ricardo	Spain	2013
SALGUERO BODES	Rafael	Spain	2007
SALMAS	Jozef	Germany	2015
SAMMUT	Mark Adrian	Malta	2012
SAMO AYOU	Romeo	Sweden	2010
SANCHEZ BORQUE	Pepa	Spain	2015
SANCHEZ GOMEZ	Juan Miguel	Spain	2013
SANDILANDS	A.	United Kingdom	2010
SANZO	Antonio	Italy	2014
SARRIAS	Axel	Spain	2013
SAUSE	Armin	Germany	2008
SAYGI	Serkan	Turkey	2015
SCHERR	Daniel	Austria	2013
SCHIMPF	Rainer	Germany	2012
SCHOENBAUER	Robert	Austria	2011
SCHOONDERWOERD	Bas	Netherlands	2008
SEBAG	Frederic	France	2014
SEGRETI	Luca	Italy	2010
SEGURA VILLALOBOS	Federico	Spain	2011
SEILER	Jens	Switzerland	2010
SEOW	Swee-Chong	Singapore	2007
SERVATIUS	Helge	Switzerland	2014
SGARITO	Giuseppe	Italy	2012
SIEIRA RODRIGUEZ-MORET	Juan Antonio	Spain	2014
SIELSKI	Slawomir	Poland	2007
SILBERBAUER	John	United Kingdom	2013
SILISTE	Calin	Italy	2011
SKENE	Christopher	United Kingdom	2013
SKODA	Jan	Czech Republic	2008
SMIT	Jaap Jan	The Netherlands	2008
SOHAL	Manav	United Kingdom	2015
SONNE	Kai	Germany	2015
SORREL	Jeremie	France	2015

EP Certification candidates who have successfully completed the exam

SPADACINI	Gianmario	Italy	2006
STANLEY	Anthony	South Africa	2012
STEC	Sebastian	Poland	2014
STEFFEL	Jan	Switzerland	2012
STOECKEL	Holger	Switzerland	2012
STUEHLINGER	Markus	Austria	2010
SUMAN HORDUNA	Irina	United Kingdom	2008
SZABO	Albin Arpad	Hungary	2010
SZEPLAKI	Gabor	Hungary	2011
SZTANISZLAV	Aron	Hungary	2015
TAHAPARY	Giovanni	Netherlands	2013
TAHIN	Tamas	Hungary	2015
TEJEIRA FERNANDEZ	Elvis	United Kingdom	2012
TEMPLE	Ian	United Kingdom	2013
TER BEKKE	Rachel M.A.	Netherlands	2013
TOMAN	Ondrej	Czech Republic	2012
TOMLINSON	D.	United Kingdom	2008
TONIOLO	Mauro	Italy	2014
TOQUERO RAMOS	Jorge	Spain	2005
TORCIVA	Riccardo	Italy	2012
TRAN	Van Nam	Switzerland	2014
TRAYKOV	Vassil B.	Hungary	2010
TREGUER	Frederic	France	2009
TRINES	Serge Alexander Ivo Petrus	Netherlands	2006
TRUCCO DE RINAUDO	María Emilce	Spain	2013
TSCHOLL	Verena	Germany	2015
TUOHY	Stephen	Ireland	2015
TURRENI	Federico	Italy	2014
TUTDIBI	Osman	Germany	2012
TUTUIANU	Cristina Ioana	Romania	2014
TZEIS	Stylianos	Greece	2009
UCER	Ekrem	Germany	2011
URBAN	Lubos	Slovakia	2009
VACCARI	Diego	Italy	2012
VALVERDE ANDRE	Irene	Spain	2010
VAN ALEM	Anouk	Netherlands	2012
VAN CASTEREN	Lieve	Belgium	2010
VAN DER HEJDEN	Jeroen	Netherlands	2013
VAN DIJK	Vincent	Netherlands	2015
VAN HEUVERSWEYN	Frederic	Belgium	2012
VAN MALDEREN	Sophie	Netherlands	2015
VAN OOSTROM	Antonie	Netherlands	2012
VAN OPSTAL	Jurren	Netherlands	2013
VANDUYNHOFEN	Philippe	Belgium	2015
VATASESCU	Radu-Gabriel	Romania	2007
VEASEY	Rick	United Kingdom	2014
VEGA OLVERA	Mercedes	Spain	2012
VENABLES	Paul	United Kingdom	2010
VERNOOY	Kevin	Netherlands	2014
VILLANUEVA SANCHEZ	José Ginés	Spain	2013



EP Certification candidates who have successfully completed the exam

VILLUENDAS SABATE	Roger	Spain	2010
VITALE	Raffaele	Italy	2009
VITALI SERDOZ	Laura	Italy	2013
VOCKE	Wolfgang	Germany	2010
VOSS	Frederik	Germany	2008
VUKAJLOVIC	Dejan	Germany	2009
WATANABE	Masaya	Netherlands	2014
WEBERNDORFER	Vanessa	Switzerland	2015
WESTRA	Sjoerd	Netherlands	2012
WETZEL	Renate Ulrike	Germany	2013
WIJCHERS	Sip	Belgium	2012
WINTER	Siegmond	Austria	2010
WO	Hung-Ta	Taiwan	2015
WOLF	Michael	Belgium	2015
WYNN	Gareth	United Kingdom	2014
YAMASE	Miki	Italy	2015
YEO	Wee Tiong	Singapore	2013
ZELJKO	Hrvjka Marija	Croatia	2012
ZELLERHOFF	Stephan	Germany	2011
ZHELJAKOV	Eugeniy	Russian Federation	2012
ZOPPO	Franco	Italy	2006
ZUBERI	Zia	United Kingdom	2013
ZUCCHELLI	Giulio	Italy	2008

Cardiac Pacing & Device Therapy

EHRA CP Certified professionals

AARDEMA	Margriet W.	Netherlands	2014
ACENA RAMOS	Marta	Spain	2012
ACOU	Willem-Jan	Belgium	2014
ADYAMAN	Ahmet	Netherlands	2014
AL BUNNI	Muhamad	Italy	2007
ALCALDE RODRIGUEZ	Oscar	Spain	2012
AL-HASHIMI	Hisham	Netherlands	2015
ALZAND	Bakr	Netherlands	2012
ANNE	Wim	Belgium	2011
APOSTOLOPOULOS	Theodoros	Greece	2007
ARBELO	Elena	Spain	2013
ARIAS PALOMARES	Miguel Angel	Spain	2013
AVELLA	Andrea	Italy	2005
AYALA PAREDES	Felix Alejandro	Canada	2009
AZEM	Tareq	Germany	2015
BACCHIONI	Giuseppe	Italy	2012
BAHGAT	Amr Kamal	Egypt	2012
BALT	Jippe	Netherlands	2014
BALTA	Osman	Germany	2013
BAYRAK	Duhan Fatih	Belgium	2012
BELOTTI	Giuseppina	Italy	2005
BENCsik	Gabor	Hungary	2009

EHRA CP Certified professionals

BERTOMEU-GONZALEZ	Vicente	Spain	2012
BIJSTERVELD	Nick	Netherlands	2012
BISSINGER	Andrzej	Poland	2007
BLAAUW	Yuri	Netherlands	2012
BLICHARZ	Jaroslaw	Poland	2015
BOHM	Adam	Hungary	2009
BONANNO	Carlo	Italy	2014
BOOS	Christopher	United Kingdom	2009
BORGER VAN DER BURG	Alida Elisabeth	Netherlands	2009
BORRELLI	Alessio	Italy	2012
BORRELLO	Francesco	Italy	2013
BOUWELS	Leon H.R.	Netherlands	2009
BREULS	Nico	The netherlands	2010
BROERS	Bernard	The netherlands	2010
BUERKLE	Gerd	Austria	2012
BUN	Sok-Sithikun	France	2013
BURRI	Haran	Switzerland	2005
CALVO CUERVO	David	Spain	2013
CALZOLARI	Vittorio	Italy	2007
CANADAS	Victoria	Spain	2013
CARAVATI	Fabrizio	Italy	2012
CASSIDY	Christopher John	United Kingdom	2015
CHATTERJEE	Debjit	United Kingdom	2013
CHONG	Daniel	Singapore	2013
CHONG YU	Eric	Singapore	2013
CHRISTOPHE	Arnd	Germany	2014
CHRISTOU	Apostolos	Greece	2015
CIPOLLETTA	Laura	Italy	2014
CLEMENS	Marcell	Hungary	2015
CROSATO	Martino	Italy	2009
CURNIS	Antonio	Italy	2007
DAVID	Laura-Alice	Romania	2015
DAVOODI	Gholamreza	Iran (Islamic Republic of)	2005
DE DOELDER	Marieke	Netherlands	2012
DE GROOT	Joris R.	Netherlands	2011
DE JONG	Jonas	Netherlands	2012
DE LA FUENTE	Sam	The netherlands	2010
DE MEYER	Grim	Belgium	2013
DE SENSI	Francesco	Italy	2015
DI CORI	Andrea	Italy	2015
DICHTL	Wolfgang	Austria	2012
DIJKMAN	Barbara	Netherlands	2015
DILAVERIS	Polychronis	Greece	2007
DINH	Trang	Netherlands	2013
DOMENICHINI	Giulia	Spain	2014
DORMAN	Reinhart	Netherlands	2013
DULBECCO	Massimo	Italy	2013
DURAY	Gabor Zoltan	Germany	2008
DYRDA	Katia	Canada	2012
EHRlich	Joachim	Germany	2012



EHRA CP Certified professionals

EIJSBOUTS	Sabine	Netherlands	2015
EISENBERGER	Martin	Czech republic	2011
EIVINDSON	Gunvald	Norway	2009
EL KADRI	Moutaz	United Kingdom	2013
ENGBERS	Jos G.	The netherlands	2011
ESCHEN	Ole	Denmark	2012
EVERTZ	Reinder	Spain	2012
FACCHIN	Domenico	Italy	2013
FERNANDEZ PASTOR	Julia	Spain	2012
FERNANDEZ-ARMENTA PASTOR	Juan	Spain	2015
FIROUZI	Mehran	Netherlands	2015
FOLDESI	Csaba Laszlo	Hungary	2012
FOLEY	Paul	United Kingdom	2012
FOLKERINGA	Richard	Netherlands	2009
FONTENLA	Adolfo	Spain	2012
FRANCK	Harald	Germany	2011
FRANCOIS	Bart	Belgium	2012
FRANZINI	Christine	Switzerland	2015
FURNISS	Guy	United Kingdom	2015
GALLARDO LOBO	Rodrigo	Spain	2012
GARCIA BOLAO	Jose Ignacio	Spain	2005
GARWEG	Christophe	Belgium	2014
GERRITSEN	Jean Georges	Netherlands	2013
GHANI	Abdul	Netherlands	2012
GIANNOLA	Gabriele	Italy	2012
GIL	Ricardo	Portugal	2013
GIL ORTEGA	Ignacio	Spain	2013
GJESTVANG	Finn Tore	Norway	2009
GONZALEZ-ENRIQUEZ	Susana	Spain	2013
GRADAUS	Rainer	Germany	2007
GRECU	Mihaela	Romania	2009
GRIECO	Domenico	Italy	2014
HAMEL	John John	Switzerland	2011
HARTOG	Jasper	Netherlands	2015
HASSINK	Rutger	Netherlands	2015
HAUER	Herbert	Netherlands	2012
HAUER	Arnaud	Netherlands	2015
HAYES	Chris	United Kingdom	2012
HAZELEGER	Ronald	Netherlands	2012
HEIB	Klausdieter	Germany	2010
HEMELS	Martin	Netherlands	2012
HERCZKU	Csaba	Hungary	2012
HERREROS GUILARTE	Benito	Spain	2005
HJORTSHOJ	Soren	Denmark	2010
HOBBS	William Julian	United Kingdom	2013
HORDYNSKI	Grzegorz	Poland	2011
HORNSTEN	Jonas	Sweden	2007
HURLIMANN	David	Switzerland	2012
HUYBRECHTS	Wim	Belgium	2010
IONNIDIS	Panagiotis	Greece	2007

EHRA CP Certified professionals

IORGULESCU	Corneliu	Romania	2012
JACON	Peggy	France	2012
JAMALYAN	Smbat	Armenia	2011
JANSEN	Ward	Netherlands	2010
JANSEN	Annemieke	The netherlands	2011
JASTRZEBSKI	Marek	Poland	2007
JILEK	Clemens	Germany	2012
JOHAR	Sofian	United Kingdom	2015
JONES	David Gareth	United Kingdom	2012
KACZMAREK	Krzysztof	Poland	2013
KARABINOS	Ilias K.	Greece	2009
KEMME	Michiel	Netherlands	2009
KETELS	Stefan	Belgium	2009
KLAUSZ	Gergely	Hungary	2015
KLEIN	Gunnar	Germany	2007
KLEIN	Norbert	Germany	2013
KOEPFLI	Pascal	Switzerland	2010
KOEPP	Ulf	Norway	2009
KOOPMAN	Pieter	Belgium	2014
KORANTZOPOULOS	Panagiotis	Greece	2011
KOSTOPOULOU	Anna	Greece	2012
KOULOURLIS	Spyridon	Greece	2010
KOUROUKLIS	Spyridon	Greece	2012
KRAVCHUK	Borys	Ukraine	2012
KRISTENSEN	Jens	Denmark	2013
KRUPA	Wojciech	Poland	2010
LANGERAK	Susan	Netherlands	2013
LERCHER	Peter	Austria	2013
LEWANDOWSKI	Michael	Poland	2015
LEWANDOWSKI	Michael	Poland	2015
LINDE	Antonio	Spain	2015
LIPCHENCA	Igor Ariel	Israel	2009
LIPTON	Jonathan	Netherlands	2015
LITTERFELDT	Ingrid	Sweden	2011
LOUW	Ruan	Belgium	2014
LUBBERTVERBERKMOES	Addy	Netherlands	2013
LUEDORFF	Guido	Germany	2009
LUERMANS	Justin	Netherlands	2014
LUTHJE	Lars	Germany	2013
MAC GILLAVRY	Melvin	The netherlands	2011
MACIAG	Aleksander	Poland	2009
MADEIRA	Joao	Portugal	2012
MARGULESCU	Andrei Dumitru	Romania	2014
MARINI	Massimiliano	Italy	2008
MARTINEK	Martin	Austria	2010
MARTINEZ SANDE	Jose Luis	Spain	2012
MASCIOLI	Giosue	Italy	2007
MASSA	Thomas	Germany	2011
MAXIM	George Razvan	Romania	2015
MEINE	Mathias	Netherlands	2010



EHRA CP Certified professionals

MERKELY	Bela	Hungary	2007
MICHAELSEN	Jochen	Germany	2011
MITKOWSKI	Przemyslaw	Poland	2005
MOLLNAU	Hanke	Germany	2014
MONNINK	Stefan	Netherlands	2012
MORENO	Jose	Spain	2015
MORENO PLANAS	Javier	Spain	2005
MORTSELL	David	Sweden	2013
MUELLER	Stephan Andreas	Switzerland	2014
MUNDEL	Markus	Germany	2011
MUNTINGA	Harm-Jans	Netherlands	2012
NAGEH-ARMANIOS	Maged	United States of America	2015
NENTWICH	Karin	Germany	2013
NEVEN	Kars	Netherlands	2008
NOVAK	Jan	Switzerland	2013
NOVIKOV	Dmitry	Russian Federation	2013
OMAR	Salama	Egypt	2012
OOMEN	Ad	Netherlands	2015
OREZIAK	Artur	Poland	2015
ORSIDA	Daniela	Italy	2014
OSMAN	Faizel	United Kingdom	2007
OSZTHEIMER	István	Hungary	2015
OUSS	Alexandre	Netherlands	2014
PADFIELD	Gareth	United Kingdom	2015
PATWALA	Ashish	United Kingdom	2012
PAULUSSEN	Guido	Netherlands	2007
PENA HERNANDEZ	Jose Luis	Spain	2011
PEREZ ALVAREZ	Luisa	Spain	2013
PEREZ CASTELLANO	Nicasio	Spain	2005
PEREZ DIEZ	Diego	Spain	2012
PERNA	Francesco	Italy	2015
PETRACCI	Barbara	Italy	2012
PETTIT	Stephen	United Kingdom	2013
PINDADO RODRIGUEZ	Javier	Spain	2010
PLUTA	Slawomir	Poland	2012
POELSLEER	Robert	Germany	2013
PORRO	Rosa	Spain	2010
POZZETTI	Daniela	Italy	2007
PREDOVSKI	Milen	Bulgaria	2013
PRISECARU	Raluca	Belgium	2015
PROIETTI	Riccardo	Italy	2014
PRUSKI	Maciej	Poland	2013
PRZYBYLSKI	Andrzej	Poland	2008
PUCHOL	Alberto	Spain	2012
PUGH	Peter	United Kingdom	2009
PYATT	Jason	United Kingdom	2012
RAO	Archana	United Kingdom	2009
RASSIAS	Ioannis	Greece	2014
REBELLATO	Luca	Italy	2012
RESTLE	Christian	Germany	2013

EHRA CP Certified professionals

RICCIARDI	Danilo	Belgium	2013
RIENSTRA	Michiel	Netherlands	2014
RIVAS GANDARA	Nuria	Spain	2013
ROBERT	Jens	Switzerland	2014
ROBLES DE MEDINA	Ramon Mariano	Netherlands	2015
ROCA LUQUE	Ivo	Spain	2015
RODRIGUEZ MANERO	Moises	Belgium	2013
RORDORF	Roberto	Italy	2014
ROSA	Antonio	Switzerland	2013
ROSSI	Andrea	Italy	2014
ROTEN	Laurent	Switzerland	2009
ROUKAS	Kriton-Ioannis	Greece	2012
ROUX	Antoine	France	2013
RUZICKA	Petr	United Kingdom	2013
SAFAK	Erdal	Germany	2014
SALGADO ARANDA	Ricardo	Spain	2014
SCHÄR	Beat Andreas	Switzerland	2013
SCHAUMANN	Anselm	Germany	2012
SCHIEFFER	Michael G.	The netherlands	2011
SCHOONDERWOERD	Bas	Netherlands	2012
SCHREVE-STEENSMA	Ariadne Midori	Netherlands	2014
SEDLACEK	Kamil	Czech Republic	2013
SEGRETI	Luca	Italy	2013
SEGURA VILLALOBOS	Federico	Spain	2012
SEILER	Jens	Switzerland	2013
SEMICHON	Marc	France	2014
SEOW	Swee-Chong	Singapore	2008
SEPSI	Milan	Czech Republic	2014
SGARITO	Giuseppe	Italy	2007
SIMEONIDOU	Eftihia	Greece	2007
SJOBLOM	Johanna	Sweden	2009
SKENE	Chris	United Kingdom	2014
SKIADAS	Ioannis	Greece	2012
SMILDE	Tom	Netherlands	2012
SONESSON	Linus	Sweden	2014
SPIERENBURG	Han	The netherlands	2009
STATESCU	Cristian	Romania	2012
STEEN	Torkel	Norway	2013
STEFAN	Liliana	Czech Republic	2012
STEFAN NICOLEA	Bogdan	Romania	2012
STEFFEL	Jan	Switzerland	2012
STERLINSKI	Marciej	Poland	2009
STOCKBURGER	Martin	Germany	2012
STOECKEL	Holger	Switzerland	2015
STRANDERS	Ischa	Netherlands	2015
STUEHLINGER	Markus	Austria	2012
SZAMLEWSKI	Piotr	Sweden	2011
TAHAPARY	Giovanni	The netherlands	2013
TEJEIRA FERNANDEZ	Elvis	Spain	2014
TER BEKKE	Rachel	The netherlands	2013



EHRA CP Certified professionals

TIELEMAN	Robert	Netherlands	2012
TIMMERS	Liesbeth	Belgium	2015
TIMMERS	Liesbeth	Belgium	2015
TORCIVIA	Riccardo	Italy	2012
TORN	Marieke	The Netherlands	2012
TRAYKOV	Vassil B.	Bulgaria	2011
TRUCCO	Maria Emilce	Spain	2015
TUINENBURG	Anton	Netherlands	2013
TUININGA	Ype	The netherlands	2011
TUREL	Baybars	Turkey	2012
TURK	Ugur Onsel	Turkey	2015
TUTUJANU	Cristina Ioana	Romania	2015
UCER	Ekrem	Germany	2012
VACCARI	Diego	Italy	2007
VALK	Suzanne	Netherlands	2011
VALZANIA	Cinzia	Italy	2010
VAMOS	Mate	Hungary	2014
VAN ALEM	Anouk	Netherlands	2013
VAN CASTEREN	Lieve	Belgium	2011
VAN DEN AKKER-BERMAN	Lily	Netherlands	2015
VAN DEN BOS	Ewoutjan	The netherlands	2011
VAN DEN BRINK	Olivier Wv	Netherlands	2014
VAN DER HEIJDEN	Robert	Netherlands	2011
VAN DER HEIJDEN	Dirk	Netherlands	2011
VAN DER HEIJDEN	Jeroen	Netherlands	2013
VAN DIJK	Vincent	Netherlands	2015
VAN DOORN	Dirk Jan	Netherlands	2015
VAN HEUVERSWIJN	Frederic	Belgium	2015
VAN KRAAIJ	Dave	The netherlands	2010
VAN MALDEREN	Sophie C.H.	Belgium	2015
VAN OOSTROM	Antonie	Netherlands	2012
VAN OPSTAL	Jurren	Netherlands	2009
VAN REIJ	Frank	Netherlands	2012
VAN ROOSMALEN	Radboud	Netherlands	2015
VAN SCHAARDENBURGH	Pepijn	The netherlands	2012
VAN VLIES	Bob	Netherlands	2013
VAN WOERKENS	Leon	Netherlands	2012
VASILOPOULOS	Charalambos	Greece	2007
VATASESCU	Radu- Gabriel	Romania	2007
VENABLES	Paul	United Kingdom	2013
VERGARA	Pasquale	Italy	2010
VERNOOY	Kevin	Netherlands	2013
VET	Thijs	The netherlands	2011
VIERGEVER	Eric Paul	Netherlands	2012
VILLUENDAS SABATE	Roger	Spain	2013
VOLKOV	Dmytro	Ukraine	2015
VOSS	Frederik	Germany	2009
VRAZIC	Hrvoje	Croatia	2014
WESTENDORP	Iris	Netherlands	2009
WESTRA	Sjoerd	Netherlands	2012

EHRA CP Certified professionals

WETZEL	Ulrike Renate	Germany	2015
WIJCHERS	Sip	Belgium	2012
WILLEMS	Albert Richard	Netherlands	2012
WOLF	Michael	Belgium	2015
WOLLMANN	Christian	Austria	2012
YAP	Sing-Chien	Netherlands	2014
YEO	Wee Tiong	Singapore	2014
ZAKY	Hosam	United Arab Emirates	2007
ZALEVSKY	Valery P.	Ukraine	2011
ZELJKO	Hrvojka Marija	Croatia	2015
ZERVOPOULOS	George	Greece	2007
ZIMA	Endre	Hungary	2012
ZOPPO	Franco	Italy	2007
ZUCHELLI	Giulio	Italy	2012

CP Certification candidates who have successfully completed the exam

AARDEMA	Margriet W.	Netherlands	2006
ABRAHAM	Pal	Hungary	2011
ACENA RAMOS	Marta	Spain	2010
ACOU	Willem-Jan	Belgium	2011
ADDONISIO	Luigi	Italy	2012
ADYAMAN	Ahmet	Netherlands	2014
AERTS	Arnaud	The Netherlands	2009
AKERSTROM	Finn	Sweden	2015
AL AMOURA	Alaa	France	2015
AL ANANY	Alaa Allah Mohamed	Egypt	2013
AL BUNNI	Muhamad	Italy	2006
ALBERTSEN	Andi Eie	Denmark	2010
ALCALDE RODRIGUEZ	Oscar	Spain	2010
ALDERGARD	Niklas	Sweden	2007
ALDHOON	Bashar	Czech Republic	2011
ALGALARRONDO	Vincent	France	2009
AL-HASHIMI	Hisham	Netherlands	2011
ALIYEV	Farid	Turkey	2010
ALIZADEH DEHNAVI	Reza	Netherlands	2013
ALMEIDA	Sofia	Portugal	2014
ALZAND	Bakr	Netherlands	2011
AMET	Denis	France	2011
AMMON	Michael	Switzerland	2014
ANDERSON	Mark H	United Kingdom	2012
ANGHEBEN	Carlo	Italy	2015
ANNE	Wim	Belgium	2008
ANSABERGA	Leva	Latvia	2015
APOSTOLOPOULOS	Theodoros	Greece	2006
ARBELO	Elena	Spain	2012
ARGUEDAS-JIMENEZ	Hugo	Spain	2015
ARIAS PALOMARES	Miguel Angel	Spain	2010
ARNOLD	Alfred E. R.	Netherlands	2012



CP Certification candidates who have successfully completed the exam

ARO	Aapo	Finland	2013
ARVANITIS	Panagiotis	Sweden	2015
ASSAAD	Hany	Egypt	2015
ASSELMAN	Maarten	Netherlands	2012
AVELLA	Andrea	Italy	2005
AYALA PAREDES	Felix Alejandro	Canada	2006
AYDIN	Alper	Turkey	2014
AZEM	Tareq	Germany	2013
BACCHIONI	Giuseppe	Italy	2008
BADRAN	Haitham	Egypt	2013
BAHGAT	Amr Kamal	Egypt	2009
BALMER	Christian	Switzerland	2013
BALT	Jippe	Netherlands	2011
BALTA	Osman	Germany	2010
BARBRAUD	Cynthia	Belgium	2015
BARKER	Diane	United Kingdom	2011
BAROUDI	Rabah	France	2014
BARSAMIAN	Sergei	Armenia	2013
BARTHEZ	Olivier	France	2009
BAYRAK	Duhan Fatih	Belgium	2011
BEAUPORT	Joelle	Germany	2012
BEDNAREK	Jacek	Poland	2013
BELOTTI	Giuseppina	Italy	2005
BELVITO	Chiara	Italy	2013
BENCsik	Gabor	Hungary	2008
BENEZET MAZUECOS	Juan	Spain	2014
BENNIK	Jasper	Netherlands	2015
BERENJKOUB	Ehssan	Germany	2015
BERGNER	Michael	Switzerland	2015
BERLI	Reto	Switzerland	2015
BERTE	Benjamin	Belgium	2012
BERTOMEU-GONZALEZ	Vicente	Spain	2010
BEUKEMA	Rypko	Netherlands	2015
BHELEEL	Osama	Libya	2013
BIANCHI	Francesca	Italy	2015
BIANCO	Daniele	Italy	2015
BIJSTERVELD	Nick	Netherlands	2009
BISH	Laurence	Switzerland	2015
BISSINGER	Andrzej	Poland	2006
BLAAUW	Yuri	Netherlands	2009
BLANDINO	Alessandro	Italy	2015
BLICHAZ	Jaroslav	Poland	2011
BLOMGREN	Jan	Sweden	2012
BOHM	Adam	Hungary	2008
BOLOGNESI	Maria Giulia	Italy	2015
BON	Laurens Bastiaan	Netherlands	2015
BONANNO	Carlo	Italy	2012
BONCOMPAGNI	Andrea	Italy	2014
BOOS	Christopher	United Kingdom	2008
BORGER VAN DER BURG	Alida Elisabeth	Netherlands	2007

CP Certification candidates who have successfully completed the exam

BORGHOUTS	Virginie	Netherlands	2014
BORGQUIST	Rasmus	Sweden	2013
BORLEFFS	Jan Willem	Netherlands	2015
BORREGO BERNABE	Luis	Spain	2013
BORRELLI	Alessio	Italy	2009
BORRELLO	Francesco	Italy	2013
BOS	Hans	Netherlands	2012
BOSKER	Hans	Netherlands	2012
BOULE	Stéphane	France	2015
BOUWELS	Leon H.R.	Netherlands	2007
BRAAM	Richard	Netherlands	2010
BREULS	Nico	The Netherlands	2009
BROERS	Bernard	The Netherlands	2009
BRONIS	Konstantinos	United Kingdom	2015
BUERKLE	Gerd	Austria	2008
BUGA	Laszlo	United Kingdom	2012
BULUT	Suat	Netherlands	2010
BUN	Sok-Sithikun	France	2012
BURKART-KUETTNER	Dagmar	Austria	2015
BURRI	Haran	Switzerland	2005
BUSER	Marc	Switzerland	2015
CABANAS GRANDIO	Pilar	Spain	2014
CACKO	Andrzej	Poland	2015
CALVO CUERVO	David	Spain	2010
CALZOLARI	Vittorio	Italy	2006
CAMPOS GARCIA	Bieito	Spain	2010
CANADAS	Victoria	Spain	2010
CANDEIAS	Rui	Portugal	2008
CARAVATI	Fabrizio	Italy	2010
CARBALLEIRA POL	Lidia	Spain	2015
CARROZ	Patrice	Switzerland	2015
CASSIDY	Christopher John	United Kingdom	2014
CASTREJON CASTREJON	Sergio	Spain	2013
CHAMBERS	John	United Kingdom	2013
CHATEL	Marie Pierre	France	2015
CHATTERJEE	Debjit	United Kingdom	2010
CHENEVARD	Remy	Switzerland	2012
CHONG	Daniel	Singapore	2011
CHONG YU	Eric	Singapore	2013
CHRISTOPHE	Arnd	Germany	2011
CHRISTOU	Apostolos	Greece	2014
CIPOLLETTA	Laura	Italy	2014
CLAPPERS	Nick	Netherlands	2014
CLEMENS	Marcell	Hungary	2012
CORTEVILLE	Ben	Belgium	2015
COSER	Alessio	Italy	2011
CROSATO	Martino	Italy	2008
CSONTOS	Pal	Hungary	2009
CURNIS	Antonio	Italy	2006
DAVID	Laura-Alice	Romania	2012



CP Certification candidates who have successfully completed the exam

DAVIDSEN	Ulla	Denmark	2015
DAVIES	Edward	United Kingdom	2015
DAVOODI	Gholamreza	Iran (Islamic Republic Of)	2005
DE CLERCO	An	Netherlands	2013
DE DIEGO RUS	Carlos	Spain	2013
DE DOELDER	Marieke	Netherlands	2010
DE GROOT	Joris R.	Netherlands	2009
DE GROOT	Cornelis Andreas	Netherlands	2012
DE JONG	Jeroen	Netherlands	2006
DE JONG	Richard M.	Netherlands	2007
DE JONG	Jonas	Netherlands	2009
DE LA FUENTE	Sam	The Netherlands	2009
DE LEEUW	Martin	The Netherlands	2008
DE LUCIA	Raffaele	Italy	2014
DE MARIA	Elia	Italy	2012
DE MEYER	Grim	Belgium	2010
DE POOTER	Jan	Belgium	2015
DE POTTER	Tom	Belgium	2008
DE RIVA SILVA	Marta	Spain	2011
DE SENSI	Francesco	Italy	2013
DE TOMMASI	Francesco	Italy	2015
DE WAARD	Daan	Netherlands	2007
DE WEERD	Gerjan	The Netherlands	2009
DEIß	Michael	Germany	2015
DEMONIERE	Fabrice	Martinique	2011
DERNDORFER	Michael	Austria	2013
DI CORI	Andrea	Italy	2012
DI STOLFO	Giuseppe	Italy	2015
DIAB	Ihab Gomaa	United Kingdom	2009
DIAZ BUSCHMANN	Isabel	Spain	2011
DICHTL	Wolfgang	Austria	2010
DIDENKO	Maxim	Roumania	2010
DUKMAN	Barbara	Netherlands	2012
DILAVERIS	Polychronis	Greece	2006
DILLIER	Roger	Switzerland	2015
DINH	Trang	Netherlands	2012
DOMENICHINI	Giulia	Spain	2011
DORMAN	Reinhart	Netherlands	2012
DULBECCO	Massimo	Italy	2010
DUNCKER	David	Germany	2013
DURAY	Gabor Zoltan	Germany	2008
DUSCEAC	Dinu	Sweden	2014
DUTHOIT	Guillaume	France	2010
DYRDA	Katia	Canada	2010
EHL	Niklas Florestan	Switzerland	2014
EHRlich	Joachim	Germany	2011
EJSBOUITS	Sabine	Netherlands	2011
EISENBERGER	Martin	Czech Republic	2008
EIVINDSON	Gunvald	Norway	2008
EL KADIKI	Abdelhadi	Lebanon	2014

CP Certification candidates who have successfully completed the exam

EL KADRI	Moutaz	United Kingdom	2012
ELDER	Douglas	United Kingdom	2010
ELICES TEJA	Juliana	Spain	2013
ENGBERS	Jos G.	The Netherlands	2009
ERCKERT	Martin	Italy	2006
ERIKSEN	Ulrik Hedegaard	Denmark	2011
ERNTELL	Hans	Sweden	2011
ESCHEN	Ole	Denmark	2009
ESMAIL	Shani	United Kingdom	2011
EURLINGS	Luc	Netherlands	2014
EVERTZ	Reinder	Spain	2012
EXPOSITO	Victor	Spain	2013
FACCHIN	Domenico	Italy	2010
FEDORCO	Marian	Czech Republic	2011
FERNANDEZ LOZANO	Juan Antonio	Spain	2013
FERNANDEZ PASTOR	Julia	Spain	2011
FERNANDEZ-ARMENTA PASTOR	Juan	Spain	2014
FIROUZI	Mehran	Netherlands	2011
FLEVARI	Panayota	Greece	2008
FOLDESI	Csaba Laszlo	Hungary	2009
FOLEY	Paul	United Kingdom	2009
FOLKERINGA	Richard	Netherlands	2007
FONTENLA	Adolfo	Spain	2010
FRANCA PEREIRA	Roberto	United States Of America	2007
FRANCK	Harald	Germany	2010
FRANCOIS	Bart	Belgium	2011
FRANZINI	Christine	Switzerland	2014
FREUND	Niclas	Germany	2013
FROMMEYER	Gerrit	Germany	2014
FRYKMANN	Viveka	Sweden	2007
FUNK	Sabine	Switzerland	2010
FURNISS	Guy	United Kingdom	2014
GABRIEL	Mario	Netherlands	2011
GALLARDO LOBO	Rodrigo	Spain	2009
GANDEBAKHCH	Estelle	France	2013
GANIERE	Vincent	Switzerland	2010
GARCIA	Rodrique	France	2014
GARCIA ALMAGRO	Francisco Jose	Spain	2013
GARCIA BOLAO	Jose Ignacio	Spain	2005
GARNIER	Fabien	France	2013
GARWEG	Christophe	Belgium	2011
GEBETSBERGER	Franz	Austria	2008
GERMANS	Tjeerd	Morocco	2013
GERRITSEN	Jean Georges	Netherlands	2011
GHANI	Abdul	Netherlands	2012
GIANNOLA	Gabriele	Italy	2008
GIL	Ricardo	Portugal	2010
GIL ORTEGA	Ignacio	Spain	2011
GIOMI	Andrea	Italy	2015
GIORGI	Davide	Italy	2014



CP Certification candidates who have successfully completed the exam

GJESTVANG	Finn Tore	Norway	2008
GOANTA	Emilia-Violeta	Romania	2015
GONZALEZ FERRER	Juan Jose	Spain	2012
GONZALEZ-ENRIQUEZ	Susana	Spain	2008
GORLO	Adam	Poland	2012
GRABOWSKI	Marcin	Poland	2014
GRADAUS	Rainer	Germany	2006
GRAUSS	Robert Willem	Netherlands	2012
GRECU	Mihaela	Romania	2006
GREYLING	Adele	South Africa	2015
GRIECO	Domenico	Italy	2012
GROSFELD	Marcel	Netherlands	2013
GRUBB	Neil	United Kingdom	2015
GRUBER	Norbert	Germany	2013
GUGUCHEV	Pavel	United States Of America	2010
GUSTEU	Nicolae-Gabriel	Romania	2015
GUTLEBEN	Klaus Juergen	Germany	2011
HAEMERS	Peter	Belgium	2013
HAGGUI	Abdeddayem	Tunisia	2014
HAJKO	Erik	Hungary	2013
HAMEL	John John	Switzerland	2010
HAMRAOUI	Karim	Netherlands	2010
HARTOG	Johannes	Netherlands	2011
HARTOG	Jasper	Netherlands	2014
HASSAN	Ahmed Abdulwadoud	Netherlands	2012
HASSINK	Rutger	Netherlands	2014
HAUER	Herbert	Netherlands	2009
HAUER	Arnaud	Netherlands	2013
HAUGAN	Ketil	Denmark	2014
HAWKINS	Nathaniel Mark	United Kingdom	2012
HAYAT	Sajad	United Kingdom	2012
HAYDOCK	Paul	United Kingdom	2015
HAYES	Chris	United Kingdom	2009
HAZELEGER	Ronald	Netherlands	2010
HEGARD	Terje	Norway	2015
HEGGELUND	Geir	Norway	2013
HEIB	Klausdieter	Germany	2009
HELLIGE	Gerrit	Switzerland	2014
HEMELS	Martin	Netherlands	2009
HENKENS	Ivo	Netherlands	2013
HERCZKU	Csaba	Hungary	2009
HERREROS GUILARTE	Benito	Spain	2005
HERRING	Neil	United Kingdom	2013
HERSBACH	Ferry	Netherlands	2014
HERZOG	Bernhard	Switzerland	2015
HJORTSHOJ	Soren	Denmark	2008
HLIVAK	Peter	Slovak Republic	2013
HOBBS	William Julian	United Kingdom	2010
HOEKSTRA	Eduard Henk	Netherlands	2011
HOFFMANN	Mario	Switzerland	2014

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HOLM	Katja Fiedler	Denmark	2014
HOOF VAN HUYSDUYNEN	Bart	Netherlands	2010
HORDYNSKI	Grzegorz	Poland	2011
HORNSTEN	Jonas	Sweden	2007
HOTTKOWITZ	Christoph	Switzerland	2015
HUANG	Sung-Hao	China	2014
HUEMER	Martin	Germany	2015
HUIJSKES	Raymond	Netherlands	2012
HURLIMANN	David	Switzerland	2009
HUYBRECHTS	Wim	Belgium	2008
IONNIDIS	Panagiotis	Greece	2006
IORGULESCU	Corneliu	Romania	2008
ISAKSEN	Tor Olav	Norway	2014
JACOBSEN	Alexander	United Arab Emirates	2015
JACON	Peggy	France	2010
JAMALYAN	Smbat	Armenia	2010
JANSEN	Annemieke	The Netherlands	2008
JANSEN	Ward	Netherlands	2010
JANSSENS	Cornelis	Netherlands	2006
JARMAN	Julian	United Kingdom	2012
JASTRZEBSKI	Marek	Poland	2006
JAUREGUI ABULARACH	Miguel Eduardo	Spain	2010
JELANI	Anwar D.	Canada	2010
JILEK	Clemens	Germany	2012
JOHANSEN	Mette	Norway	2014
JOHANSSON	Peter	Sweden	2008
JOHAR	Sofian	United Kingdom	2011
JONES	David Gareth	United Kingdom	2009
JONSSON	Jon Erik	Sweden	2010
JUAREZ PRERA	Ruben Alfonso	Spain	2015
KACZMAREK	Krzysztof	Poland	2010
KAHN	Matthew	United Kingdom	2015
KALLIANOS	Christos	Greece	2011
KAMAL	Ziaullah	Norway	2015
KARABINOS	Ilias K.	Greece	2007
KARLSEN	Finn Michael	Denmark	2015
KATARIA	Vikas	India	2014
KATSIKAS	Christos	Greece	2012
KEILEGAVLEN	Håvard	Norway	2015
KEMME	Michiel	Netherlands	2007
KETELS	Stefan	Belgium	2007
KIENCKE	Stephanie	Switzerland	2015
KJELLMAN	Bjorn	Sweden	2007
KLAUSZ	Gergely	Hungary	2013
KLEIN	Gunnar	Germany	2007
KLEIN	Norbert	Germany	2011
KLEIN	Lucas	Netherlands	2013
KNOLL	Mathias	Germany	2015
KNOPS	Reinoud	The Netherlands	2008
KOEPFLI	Pascal	Switzerland	2007



CP Certification candidates who have successfully completed the exam

KOEPP	Ulf	Norway	2008
KOL	Amir	Italy	2013
KOLB	Christophe	Germany	2010
KOLLIAS	Georgios	Greece	2013
KOMANOVA	Erika	Slovak Republic	2011
KOOMEN	Egbert M.	Netherlands	2010
KOOPMAN	Pieter	Belgium	2011
KORANTZOPOULOS	Panagiotis	Greece	2009
KORTZ	Mikael	Netherlands	2010
KOSTOPOULOU	Anna	Greece	2011
KOULOURIS	Spyridon	Greece	2007
KOURGIANNIDIS	Georgios	Greece	2007
KOUROUKLIS	Spyridon	Greece	2011
KOUTSOGEORGIS	Ilias	Greece	2014
KOVACS	Andras	Hungary	2012
KRAAIER	Karin	Netherlands	2015
KRAVCHUK	Borys	Ukraine	2007
KRIJNE	Rudolf	Netherlands	2012
KRISTENSEN	Jens	Denmark	2012
KRONBORG	Mads Brix	Denmark	2011
KRUPA	Wojciech	Poland	2006
KRYZE	Lukas	Czech Republic	2013
KRZYANOWSKI	Krystian	Poland	2014
KUJPER	Aaf	Netherlands	2011
KUJAWSKI	Tomasz	Switzerland	2013
KUMMER	Marco	Switzerland	2015
KUPICS	Kaspars	Latvia	2015
KWASNIEWSKI	Wojciech	Poland	2013
LAN	Rongfang	China	2014
LANGERAK	Susan	Netherlands	2012
LARGAESPADA PEREZ	Gabriel	Spain	2015
LEBEDEVA	Viktoriiia	Russia	2013
LEDEBVRE	Kristof	Netherlands	2015
LENNERZ	Carsten	Germany	2015
LERCHER	Peter	Austria	2010
LERNER	Martin Robert	Sweden	2010
LEVENTOPOULOS	Georgios	Greece	2014
LEWANDOWSKI	Michael	Poland	2012
LIEUW-A-FA	Mariska	The Netherlands	2009
LINDE	Antonio	Spain	2012
LINDELL	Peter	Sweden	2007
LINDGREEN	Ulf	Denmark	2008
LIPCHENCA	Igor Ariel	Israel	2008
LIPOLDOVA	Jolana	Czech Republic	2009
LIPTON	Jonathan	Netherlands	2012
LITTERFELDT	Ingrid	Sweden	2008
LOEPRICH	Bruno	Germany	2015
LOUW	Ruan	Belgium	2013
LUBBERTVERBERKMOES	Addy	Netherlands	2010
LUEDORFF	Guido	Germany	2008

CP Certification candidates who have successfully completed the exam

LUERMANS	Justin	Netherlands	2012
LUNDE	Torbjorn	Norway	2015
LUQUE	Antonio	Spain	2014
LUTHJE	Lars	Germany	2011
LUZI	Mario	Italy	2008
MAASS	Alexander	Netherlands	2007
MAC GILLAVRY	Melvin	The Netherlands	2008
MACIAG	Aleksander	Poland	2007
MADEIRA	Joao	Portugal	2011
MAGNUSSON	Peter	Sweden	2007
MAHFOUD	Mohanad	France	2010
MANENTI	Vladimir	France	2015
MANOLA	Sime	Croatia	2015
MANTZIARI	Lilian	United Kingdom	2015
MANUSAMA	Randy	Netherlands	2011
MARGATO	Renato	Portugal	2013
MARGULESCU	Andrei Dumitru	Romania	2013
MARICONTI	Barbara	Italy	2008
MARINI	Massimiliano	Italy	2007
MARTENS	Eimo	Germany	2013
MARTIN	Alix	France	2013
MARTINEK	Martin	Austria	2008
MARTINEZ SANDE	Jose Luis	Spain	2009
MASCIOLI	Giosue	Italy	2006
MASSA	Thomas	Germany	2008
MATHIEU	Frederic	Belgium	2015
MATTLE	Daniel	Switzerland	2015
MAXIM	George Razvan	Romania	2014
MAZZUCCO	Raffaele	Italy	2009
MEDINA PALOMO	Maria Del Carmen	Spain	2013
MELTZ	Alexandre	Switzerland	2009
MEINARDI	Martin	Netherlands	2015
MEINDERSMA	Esther	Netherlands	2013
MEINE	Mathias	Netherlands	2007
MELANDER	Kjell	Sweden	2008
MELMAN	Paul G.	Netherlands	2011
MENNE	Jochen	Germany	2014
MERKELY	Bela	Hungary	2007
MICHAELSEN	Jochen	Germany	2010
MICHALAK	Marcin	Poland	2015
MIHALCZ	Attila	Austria	2011
MIRANDA	Rita	Portugal	2014
MISOVOULOS	Platon	Switzerland	2015
MITKOWSKI	Przemyslaw	Poland	2005
MJOLSTAD	Ole Christian	Norway	2015
MLCOCHOVA	Hanka	Czech Republic	2009
MOISEI	Radu Eugen	Romania	2015
MOLHOEK	Sander G.	The Netherlands	2008
MOLLNAU	Hanke	Germany	2013
MONDESERT	Blandine	Canada	2014



CP Certification candidates who have successfully completed the exam

MONNARD	Simon	Switzerland	2011
MONNINK	Stefan	Netherlands	2011
MOORE	Philip R.	United Kingdom	2014
MORENO	Jose	Spain	2012
MORENO PLANAS	Javier	Spain	2005
MOROSATO	Martina	Italy	2015
MORTSELL	David	Sweden	2012
MORTTADA	Ayman	Egypt	2012
MUELLER	Dirk	Germany	2008
MUELLER	Stephan Andreas	Switzerland	2011
MUELLER	Iris Irmgard	Germany	2014
MUNDEL	Markus	Germany	2008
MUNTEAN	Bogdan	Germany	2011
MUNTINGA	Harm-Jans	Netherlands	2009
MUTSCHELKNAUSS	Marcus	Switzerland	2013
MUTTER	Michael	Switzerland	2013
NAGARAJAN	Darbhamulla	United Kingdom	2007
NAGEH-ARMANIOS	Maged	United States Of America	2011
NENTWICH	Karin	Germany	2012
NERI	Gianfilippo	Italy	2007
NEVEN	Kars	Netherlands	2007
NG	Sunanto	Netherlands	2011
NG KAM CHUEN	Marie Jennyfer	United Kingdom	2013
NICASTIA	Deborah	The Netherlands	2009
NICOLAIDES	Eleftherios	United Kingdom	2007
NIIRANEN	Jussi	Finland	2015
NOTI	Fabian	Switzerland	2012
NOVAK	Jan	Switzerland	2011
NOVIKOV	Dmitry	Russian Federation	2012
NÜSSLI	Dominique	Switzerland	2013
ODLAND	Hans Henrik	Norway	2009
OIKARINEN	Lasse	Finland	2008
OLORIZ	Teresa	Spain	2015
OMAR	Salama	Egypt	2010
OOMEN	Ad	Netherlands	2011
OREZIAK	Artur	Poland	2011
ORSIDA	Daniela	Italy	2013
OSMAN	Faizel	United Kingdom	2006
OSTROWSKA	Bozena	Sweden	2007
OSZTHEIMER	István	Hungary	2013
OUSS	Alexandre	Netherlands	2012
PACHON IGLESIAS	Marta	Spain	2012
PADFIELD	Gareth	United Kingdom	2013
PAISEY	John	United Kingdom	2008
PAOLTI PERINI	Alessandro	Italy	2015
PAPACHRISTIDIS	Alexandros	United Kingdom	2014
PARAVOLIDAKIS	Konstantinos	Greece	2008
PASCALE	Patrizio	Switzerland	2009
PATWALA	Ashish	United Kingdom	2010
PAULUSSEN	Guido	Netherlands	2006

CP Certification candidates who have successfully completed the exam

PAVACI	Herribert	Albania	2014
PAWLK	Tomasz	Poland	2012
PENA HERNANDEZ	Jose Luis	Spain	2008
PENTEADO	Jose Otavio P.	Brazil	2012
PEREZ ALVAREZ	Luisa	Spain	2010
PEREZ CASTELLANO	Nicasio	Spain	2005
PEREZ DIEZ	Diego	Spain	2009
PERIK	Patrick	Netherlands	2010
PERMENTIER	Lianne	Netherlands	2015
PERNA	Francesco	Italy	2014
PERROTTA	Laura	Italy	2012
PETERS	René	Netherlands	2015
PETKAR	Sanjiv	United Kingdom	2008
PETRACCI	Barbara	Italy	2009
PETRUJ	Jan	Czech Republic	2009
PETTIT	Stephen	United Kingdom	2011
PHILBERT / JENSEN	Berit Thornvig	Denmark	2010
PHILIPS	Thomas	Belgium	2014
PINDADO RODRIGUEZ	Javier	Spain	2009
PIQUERAS	Eric	France	2015
PLASEK	Jiri	Czech Republic	2014
PLUTA	Slawomir	Poland	2010
POELSLEER	Robert	Germany	2013
POGGI	Alessio	Italy	2014
POLGAR	Balazs	Hungary	2015
PORRO	Rosa	Spain	2009
POS	Lambertus	Netherlands	2013
POSTEMA	Pieter	Netherlands	2015
POZZETTI	Daniela	Italy	2006
PRASAD	Rachana	United Kingdom	2013
PREDOVSKI	Milen	Bulgaria	2011
PRENNER	Guenther	Austria	2015
PRISECARU	Raluca	Belgium	2014
PROIETTI	Riccardo	Italy	2013
PRONK	Arjen	Netherlands	2010
PRUSKI	Maciej	Poland	2010
PRZYBYLSKI	Andrzej	Poland	2007
PSYCHARI	Stavroula	Greece	2011
PUCHOL	Alberto	Spain	2009
PUDULIS	Janis	Latvia	2014
PUETZ	Vanessa	Germany	2013
PUGH	Peter	United Kingdom	2008
PYATT	Jason	United Kingdom	2011
RAHEL	Braim M.	Netherlands	2011
RAMANNA	Hemanth	The Netherlands	2008
RAMAZZINA	Carola	Switzerland	2015
RAMCHURN	Hemant	Belgium	2011
RAO	Archana	United Kingdom	2007
RASSIAS	Ioannis	Greece	2013
REBELLATO	Luca	Italy	2009



CP Certification candidates who have successfully completed the exam

REGOLI	François	Switzerland	2015
REICHLIN	Tobias	Switzerland	2015
REIF	Sebastian	Germany	2015
RESTLE	Christyan	Germany	2009
REVERDIN	Stephane	Switzerland	2013
RIAHI	Leila	Tunisia	2014
RICCIARDI	Danilo	Belgium	2012
RICCIARDI	Giuseppe Gilberto	Italy	2013
RIENSTRA	Michiel	Netherlands	2013
RIVAS GANDARA	Nuria	Spain	2010
ROBERT	Jens	Switzerland	2012
ROBERTSON	Alan James	United Kingdom	2014
ROBLES DE MEDINA	Ramon Mariano	Netherlands	2011
ROCA LUQUE	Ivo	Spain	2011
ROCHA	Sérgia	Portugal	2013
RODE	Susanne	Germany	2013
RODRIGUEZ MANERO	Moises	Belgium	2012
ROHNER	Andreas	Switzerland	2014
RORDORF	Roberto	Italy	2013
ROSA	Antonio	Switzerland	2011
ROSSI	Andrea	Italy	2011
ROSSI	Luca	Italy	2012
ROTEN	Laurent	Switzerland	2008
ROUKAS	Kriton-Ioannis	Greece	2011
ROUX	Antoine	France	2010
RUSSI	Ian	Switzerland	2015
RUSSO	Giovanni	Italy	2009
RUZICKA	Petr	United Kingdom	2011
SAFAK	Erdal	Germany	2011
SALAHSHOURI	Pegah	United Kingdom	2011
SALGADO ARANDA	Ricardo	Spain	2013
SALIM	Belgin	Romania	2014
SALMAS	Jozef	Germany	2015
SANCHEZ GARCIA	Manuel	Spain	2015
SANDIN-FUENTES	Maria De Gracia	Spain	2013
SANTOS	Nuno	Portugal	2013
SANTOS CALLE	Francisco José	Spain	2013
SARRIAS	Axel	Spain	2013
SAURER	Georg	Austria	2013
SCHÄR	Beat Andreas	Switzerland	2013
SCHAUMANN	Anselm	Germany	2009
SCHEFFER	Michael G.	The Netherlands	2008
SHELLINGS	Dirk	Netherlands	2015
SCHGOER	Wilfried	Austria	2015
SCHLIEPHAKE	Florian	Switzerland	2015
SCHMUTZ	Mathieu Thomas André Hermann Ghislain	Switzerland	2013
SCHOENBAUER	Robert	Austria	2015
SCHOLZ	Brit	Germany	2011
SCHOONDERWOERD	Bas	Netherlands	2008

CP Certification candidates who have successfully completed the exam

SCHRAGO	Gregoire	Switzerland	2010
SCHREVE-STEENSMA	Ariadne Midori	Netherlands	2012
SCHUKRO	Christoph	Austria	2011
SCHURMANS	Joris	Belgium	2013
SCHWAGTEN	Bruno	Belgium	2008
SCHWERG	Marius	Germany	2014
SCIARAFFIA	Elena	Sweden	2011
SEDLACEK	Kamil	Czech Republic	2010
SEGRETI	Luca	Italy	2010
SEGURA VILLALOBOS	Federico	Spain	2011
SEIFERT	Martin	Germany	2013
SEILER	Jens	Switzerland	2011
SEMICHON	Marc	France	2013
SENOUF	David	Switzerland	2009
SEOW	Swee-Chong	Singapore	2007
SEPSI	Milan	Czech Republic	2011
SERVATIUS	Helge	Switzerland	2014
SGARITO	Giuseppe	Italy	2006
SHCIPPER	Jurjan	Netherlands	2015
SIELSKI	Slawomir	Poland	2005
SILBERBAUER	John	United Kingdom	2013
SIMEONIDOU	Eftihia	Greece	2006
SJOBLOM	Johanna	Sweden	2008
SKENE	Chris	United Kingdom	2013
SKIADAS	Ioannis	Greece	2011
SKRETTEBERG	Per Torger	Norway	2013
SLOOTWEG	Andries	Netherlands	2014
SLOTTE	Fredrik	Finland	2014
SMEELE	Frank	Netherlands	2011
SMEETS	Frans	Netherlands	2011
SMILDE	Tom	Netherlands	2011
SMITS	Jeroen	Netherlands	2012
SOM	Zoltan	Hungary	2014
SONESSON	Linus	Sweden	2013
SORREL	Jeremie	France	2015
SPIERENBURG	Han	The Netherlands	2008
STARTARI	Umberto	Italy	2014
STATESCU	Cristian	Romania	2009
STEEN	Torkel	Norway	2007
STEFAN	Liliana	Czech Republic	2010
STEFAN NICOLEA	Bogdan	Romania	2009
STEFFEL	Jan	Switzerland	2012
STERLINSKI	Marciej	Poland	2006
STEVENHAGEN	Jeroen	The Netherlands	2008
STOCKBURGER	Martin	Germany	2011
STOECKEL	Holger	Switzerland	2012
STRANDERS	Ischa	Netherlands	2011
STRIKWERDA	Sipke	The Netherlands	2009
STUEHLINGER	Markus	Austria	2011
SUN	Qi	China	2014



CP Certification candidates who have successfully completed the exam

SUPRYN	Rafal	Poland	2014
ŠUTER	Yves Martin	Switzerland	2013
SWART	Hp	The Netherlands	2009
SYSKA	Pawel	Poland	2015
SZAMLEWSKI	Piotr	Sweden	2010
SZILAGYI	Szabolcs	Hungary	2013
SZTANISZLAV	Áron	Hungary	2013
TAHAPARY	Giovanni	The Netherlands	2009
TAKENS	Lambertus H.	Netherlands	2014
TAN	Vern Hsen	Singapore	2015
TASIC	Jerneja	Slovenia	2015
TEJEIRA FERNANDEZ	Elvis	Spain	2013
TER BEKKE	Rachel	The Netherlands	2010
TEUBL	Alexander	Austria	2009
THEIB	Söhnke	Germany	2013
TIBITANZL	Jan	United Kingdom	2015
TIELEMAN	Robert	Netherlands	2009
TIMMERS	Liesbeth	Belgium	2011
TOMASI	Luca	Italy	2012
TOMLINSON	D.	United Kingdom	2009
TORCIVIA	Riccardo	Italy	2010
TORN	Marieke	The Netherlands	2009
TOSSEBRO	Morten Shoren	Norway	2009
TRAN	Van Nam	Switzerland	2015
TRAYKOV	Vassil B.	Bulgaria	2010
TREGUER	Frederic	France	2009
TRINES	Serge	The Netherlands	2008
TROFIN	Monica	Germany	2015
TRUCCO	Maria Emilce	Spain	2012
TSCHOLL	Verena	Germany	2015
TUINENBURG	Anton	Netherlands	2011
TUININGA	Ype	The Netherlands	2009
TUREL	Baybars	Turkey	2009
TURK	Ugur Onsel	Turkey	2011
TUTUIANU	Cristina Ioana	Romania	2013
UCER	Ekrem	Germany	2011
UDO	Erik	Netherlands	2015
URBAN	Lubos	Slovakia	2009
VACCARI	Diego	Italy	2006
VALENTE	Bruno	Portugal	2015
VALK	Suzanne	Netherlands	2010
VALZANIA	Cinzia	Italy	2007
VAMOS	Mate	Hungary	2014
VAN ALEM	Anouk	Netherlands	2010
VAN ASSELDONK	Jan	Netherlands	2015
VAN BEMMEL	Marnix	Netherlands	2014
VAN CASTEREN	Lieve	Belgium	2010
VAN DE POLL	Sweder	Netherlands	2013
VAN DEN AKKER-BERMAN	Lily	Netherlands	2011
VAN DEN BERGH	Paulus	Netherlands	2013

CP Certification candidates who have successfully completed the exam

VAN DEN BOS	Ewoutjan	The Netherlands	2009
VAN DEN BRINK	Olivier Wv	Netherlands	2013
VAN DER GALIEN	Albert	Netherlands	2012
VAN DER HEUDEN	Robert	Netherlands	2010
VAN DER HEUDEN	Dirk	Netherlands	2010
VAN DER HEUDEN	Jeroen	Netherlands	2011
VAN DER KLEY	Tim	Netherlands	2011
VAN DER MEER	Peter	Netherlands	2013
VAN DER VEEN	Maurits	Netherlands	2012
VAN DER WAL	Henriette	Netherlands	2010
VAN DER WEERDT	Arno Peter	Netherlands	2007
VAN DEURSEN	Caroline	Netherlands	2012
VAN DIJK	Vincent	Netherlands	2013
VAN DOORN	Dirk Jan	Netherlands	2011
VAN EMPEL	Vanessa	Netherlands	2010
VAN ES	Robert	Netherlands	2011
VAN GASTEL	Henk Christiaan	Netherlands	2010
VAN GENT	Marco	Netherlands	2012
VAN HAELST	Paul	Netherlands	2012
VAN HERENDAEL	Hugo	Belgium	2009
VAN HEUVERSWIJN	Frederic	Belgium	2011
VAN HORSSSEN	Elisabeth Veronica	Netherlands	2013
VAN KRAAUJ	Dave	The Netherlands	2009
VAN MALDEREN	Sophie C.H.	Belgium	2013
VAN NOORD	Trudeke	Netherlands	2007
VAN OFWEGEN-HANEKAMP	Clara Emilia Emese	Netherlands	2013
VAN OOSTROM	Antonie	Netherlands	2009
VAN OPSTAL	Jurren	Netherlands	2007
VAN PETEGHEM	Sylvie	Belgium	2014
VAN POPELE	Nicole	Netherlands	2013
VAN REIJ	Frank	Netherlands	2010
VAN ROOSMALEN	Radboud	Netherlands	2011
VAN SCHAARDENBURGH	Pepijn	The Netherlands	2009
VAN SCHAIVAN DER WIELEN	Marielouise	The Netherlands	2009
VAN VLIES	Bob	Netherlands	2010
VAN WIJK	Leendert M.	Netherlands	2013
VAN WOERKENS	Leon	Netherlands	2011
VANDER	Marianna	Russia	2015
VANDUYNHOFEN	Philippe	Belgium	2014
VASILOPOULOS	Charalambos	Greece	2006
VATAESCU	Radu- Gabriel	Romania	2006
VELTMANN	Christian	Germany	2014
VENABLES	Paul	United Kingdom	2010
VERBUNT	Robert	Netherlands	2011
VERGARA	Pasquale	Italy	2009
VERNOOY	Kevin	Netherlands	2010
VET	Thijs	The Netherlands	2008
VICENTINI	Alessandro	Italy	2009
VIERGEVER	Eric Paul	Netherlands	2010
VIJN	Arie Gerhard	Netherlands	2010



CP Certification candidates who have successfully completed the exam

VILLUENDAS SABATE	Roger	Spain	2010
VISMAN	Roeland	Netherlands	2015
VITALE	Raffaele	Italy	2013
VITALI SERDOZ	Laura	Germany	2015
VOLKOV	Dmytro	Ukraine	2013
VON BARY	Christian	Germany	2011
VOSS	Frederik	Germany	2008
VRAZIC	Hrvoje	Croatia	2011
VRIEND	Joris	Netherlands	2011
WALHOUT	Ronald	Netherlands	2011
WALKER	Alexander Josef	Switzerland	2014
WEBERNDÖRFER	Christina Vanessa	Switzerland	2013
WERETKA	Slawomir	Germany	2011
WESTENBRINK	B. Daan	Netherlands	2015
WESTENDORP	Iris	Netherlands	2006
WESTPHALEN	Alexander	Switzerland	2015
WESTRA	Sjoerd	Netherlands	2009
WETZEL	Ulrike Renate	Germany	2013
WHINNETT	Zachary	United Kingdom	2011
WIDDERSHOVEN	Josef Jos	The Netherlands	2009
WIJCHERS	Sip	Belgium	2009
WIJFFELS DE GROOT	Sofia	Netherlands	2015
WIJNMAALEN	Adrianus	Netherlands	2015
WILLEMS	Albert Richard	Netherlands	2009
WINTER	Siegmund	Austria	2010
WITT	Christoffer Tobias	Denmark	2015
WO	Hung-Ta	Taiwan	2015
WOLF	Michael	Belgium	2014
WOLLMANN	Christian	Austria	2011
WONG	Ka Lam	China	2013
YAP	Sing-Chien	Netherlands	2012
YEO	Wee Tiong	Singapore	2013
YUNG	Arthur	China	2015
ZACA'	Valerio	Italy	2015
ZAGKLI	Fani	Greece	2013
ZAJAC	Dariusz	Poland	2012
ZAKY	Hosam	United Arab Emirates	2007
ZALEVSKY	Valery P.	Ukraine	2007
ZELJKO	Hrvjka Marija	Croatia	2013
ZEMAN	Kamil	Czech Republic	2013
ZERVOPOULOS	George	Greece	2006
ZIMA	Endre	Hungary	2009
ZIZEK	David	Slovenia	2015
ZOPPO	Franco	Italy	2006
ZUCHELLI	Giulio	Italy	2008
ZYCINSKI	Pawel	Poland	2014

Allied Professionals

Certified Allied Professionals

AMAZINE	Natja	Netherlands	2015
AMIRANDA	Giuseppe	Italy	2015
ANSELMI	Vittorio	Italy	2015
ANTENBRINK	Johannes Fredericus	Netherlands	2011
ARNDSELL	Dianne	Netherlands	2015
ARTS	Germaine	Netherlands	2011
ARUMUGAM	Paul Ayyappan	United Kingdom	2014
BAKKER	Emiel	Netherlands	2015
BATSIKAS	Kimon	Greece	2013
BENEDUCE	Roberta	Italy	2015
BERGERVOET	Jan	Netherlands	2015
BERNARDES	Ana	Portugal	2015
BERTOLI	Fabrizio	Switzerland	2013
BESTEN DEN	Truus	Netherlands	2013
BETTEN	Jort	Netherlands	2015
BIJL	Jeroen	Netherlands	2015
BIJVOET	Eleonora	Netherlands	2011
BOWEN	Daniel	United Kingdom	2015
BRAAM	Nort	Netherlands	2014
BRANTS	Ruud	Netherlands	2014
BROENINK	Ingrid	Netherlands	2014
BRUEGGEMANN	Thomas	Germany	2013
BURGOS	Jesús	Spain	2013
BURKHARDT	Dr.Dietmar	Germany	2015
BUSKES	Marjo	Netherlands	2014
CARCONI	Marco	Italy	2015
CARRERO	David	Spain	2014
CHAISING	Rismy	Netherlands	2015
DE BLAAUW	Mariska	Netherlands	2014
DE CLERCO	Katrien	Belgium	2014
DE GRAAF	Hendrik	Netherlands	2014
DE KEYZER-VAN MUIJLWIJK	Klara	Netherlands	2012
DE KONING	Rens	Netherlands	2015
DE LA VIEJA ALARCON	Juan José	Spain	2015
DE MELKER	Robert	Netherlands	2012
DE ROVER	Vincent	Netherlands	2013
DE RUITER	Wouter Arie	Netherlands	2015
DE VRIES - VAN DER MOLEN	Carla	Netherlands	2014
DE WINTER	Peter	Netherlands	2014
DEBIE	Luuk	Netherlands	2013
DELLEA	Alessandro	Italy	2015
DEMOZZI	Marilena	Italy	2015
DEJUNK	Gerhard	Netherlands	2015
DIJKERS-SICCAMA	Maria Martina	Netherlands	2015
EBES	F.J.	Netherlands	2015
EDENS	Joran	Netherlands	2011
ENGELAER	Paulus Johannes Maria	Germany	2013
FABRIZI	Agnese	Italy	2015
FERSINI	Gabriele	Italy	2015
FOCARDI	Alessandro	Italy	2015
FOGH JONNASSON	Pernille	Denmark	2014
GERCAMA	Ale	Netherlands	2012



Certified Allied Professionals

GEURS	Paul	Netherlands	2015
GIACOPELLI	Daniele	Italy	2015
GOMEZ LLAUGER	Albert	Spain	2015
GOPINATH	Binoob	United Kingdom	2013
GOUGH	Jacqueline	Netherlands	2012
GRASDIJK	Michel	Netherlands	2013
GRASSINI	Diego	Italy	2015
GRAUENKAMP	Caspar	Netherlands	2012
GRESSONI	Sara	Italy	2015
GRIFFITHS	Jon	United Kingdom	2014
GRIMBERG	Arenda	Netherlands	2013
GROEN	Henk	Netherlands	2014
GROVE	Ulrik	Denmark	2014
HAAS DE	Oudshoorn	Netherlands	2013
HAMOEN	Marinus	Netherlands	2014
HAUGDAL	Martin Aar	Denmark	2013
HENDRIKS	Thijs	Netherlands	2013
HOFSTEDE	Jan	Netherlands	2013
HOJGAARD	Susanne	Denmark	2014
HOP	Henri Marco	Netherlands	2011
HULSKOTTE	J.H.N.	Netherlands	2015
HUSKENS	Paul	Netherlands	2013
IGLESIAS BRAVO	Jose Antonio	Spain	2014
JANSSEN	Michel	Netherlands	2013
JOSEPH	Marielle	Netherlands	2014
KAMMEIJER	Willem	Netherlands	2013
KEIJZER	Rens	Netherlands	2012
KEUKEN	Johannes	Netherlands	2014
KINCH WESTERDAHL	Annika	Sweden	2013
KNOPS	Paul	Netherlands	2013
KOFLER	Ruth	Austria	2012
KUUR VAN DER	Erwin Ronald	Netherlands	2014
LA GRAND	Reinalda	Netherlands	2011
LAST	Tim	Netherlands	2012
LAU	Tsan Fung	China	2014
LAURETTI	Maurelio Domenico	Italy	2015
LEGGIERO	Angelo	Italy	2015
LEWIS	Peter	United Kingdom	2015
LINSSSEN-ABEN	Maria Helena Hendrica	Netherlands	2011
LO GIUDICE	Vincenzo	Italy	2015
LUJTEN	Kees	Netherlands	2014
MAARSE	Albert	Netherlands	2013
MAAT-POOT	Barbara Maria	Netherlands	2014
MARCHANT	Isabelle	Netherlands	2014
MAWHOOD	Sue	United Kingdom	2014
MEIJER	Kim	Netherlands	2014
MEIJER	Karin Maria	Netherlands	2013
MIEDEMA	Pieter	Netherlands	2014
MINTJENS	Martin	Netherlands	2015
MOL	Daniel	Netherlands	2013
MOORE	Chris	United Kingdom	2015
MORINI	Filippo	Italy	2015

Certified Allied Professionals

MUNOZ	Julio	Spain	2011
NASTA	Gianluca	Italy	2015
NATHOE	Mohamed Djabbaar	Netherlands	2014
NEVE	Eric	Netherlands	2014
NIJKAMP	Dennis	Netherlands	2015
OLIVEIRA	Joao Rodrigo	Portugal	2014
OOSTERWEGHEL	Jeannette	Netherlands	2012
OSKAM	Aart	Netherlands	2013
OVEREEM	Bartjan	Netherlands	2012
PAIANO	Salvatore	Italy	2015
PALETTA	Alessandro	Italy	2015
PALUMBO	Annalisa	Italy	2015
PASMAN	Harrold	Netherlands	2014
PASTORE	Cosimo	Netherlands	2013
PATTERSON-ROTTGERING	Wendy	Netherlands	2012
PEARSON	Theodore	United Kingdom	2015
PEREIRA	Helder	United Kingdom	2012
PILAGE	Robert	Netherlands	2014
PIMENTA	Ricardo	Portugal	2012
PISCEDDA	Valerio	Belgium	2011
PISCITELLI	Gioacchino	Italy	2015
PRATAS DA SILVA	Francisco Emanuel	United Kingdom	2014
PURCHASE	Nicole	United Kingdom	2014
QVARNSTRÖM	Eva	Sweden	2013
RAMSOEKH	Wandana	Netherlands	2015
RAVERS	Henry	Netherlands	2013
REK	Anita	Netherlands	2014
REKKER	Kees	Netherlands	2013
RESCIGNO	Stefania	Italy	2015
RICH	Caroline	United Kingdom	2014
RIERA	Marta	Spain	2015
RIETRAE	Rachel	Netherlands	2015
RUIJSWIJK	Nathalia Hillegonda	Netherlands	2014
RITZEN	John	Netherlands	2014
RODRIGUES DA SILVA ANDRADE	Jose Tomas	United Kingdom	2014
RUSSELL	Mark	Ireland	2015
RUSSO	Gerardo	Italy	2015
SANCHEZ HUETE	Gonzalo	Spain	2015
SANTOS CALLE	Francisco José	Spain	2013
SCHAIBLE	Bernd	Germany	2015
SCHERER	Brenda	Netherlands	2014
SCHROEMGES	Johannes	Netherlands	2014
SCHUMM	Steven	Netherlands	2012
SCHUURMAN	Bert	Netherlands	2013
SCHUURMAN-VAN DER ZWAAN	Marielle	Netherlands	2014
SEFFINGA	Kees	Netherlands	2012
SIEBERT	Sijmon	Netherlands	2015
SILVA	Ines	United Kingdom	2015
SLIJKERMAN	Myrna	Netherlands	2012
SMITS	Xavier	Netherlands	2015
SMITS-GELISSEN	Marloes	Netherlands	2015
SOARES	Filipe	Germany	2011



Certified Allied Professionals

SOESBERGEN	Joop	Netherlands	2013
SOUGIANNIS	Dimitrios	Greece	2012
SPRINGORUM	Bob	Netherlands	2014
STEUJAERT	Patrick	Netherlands	2014
STEL	Erik	Netherlands	2013
STOFFELS	Kim	Netherlands	2015
STOLL	Eric	Netherlands	2012
STORM	Margaretha	Netherlands	2013
STUART	Jonas	Denmark	2014
SULLIVAN	Siobháin	United Kingdom	2015
SVENSSON	Emma	Sweden	2011
TER AVEST- ROELINK	Leonie	Netherlands	2013
TERBURG	Bonnie	Netherlands	2014
THERON	Adam	United Kingdom	2015
THUSSEN	Robert Vincent Matthias	Netherlands	2014
TIDDENS	Ronaldus	Netherlands	2015
TRİYASUT	Grisana	Netherlands	2013
UGEN	Ad	Netherlands	2011
UITERWAAL	Hans	Netherlands	2011
VAN CRUIJSEN	Marc	Netherlands	2013
VAN DER DRIFT	Mireille	Netherlands	2011
VAN DER KEMP	Peter	Netherlands	2011
VAN DER NAGEL	Roel	Netherlands	2015
VAN DER SALM	K.	Netherlands	2014
VAN DER SMAN	Yoeri Walter	Netherlands	2011
VAN DIJK	Frederik	Netherlands	2013
VAN DOORN	Arjan	Netherlands	2011
VAN ELS - RUITEN	Anna	Netherlands	2012
VAN ELSACKER	Andreas	Netherlands	2015
VAN GOOL	Stephan	Netherlands	2015
VAN KOOTEN	Andre	Netherlands	2014
VAN OORT	Geeske	Netherlands	2013
VAN VELDHUIZEN	Erny	Netherlands	2013
VASCONCELOS	Hugo Morujo	Portugal	2013
VENANCIO GALVAO	Julia Maria	Netherlands	2012
VERSTEEG	Astrid	Netherlands	2014
VILLADEAMIGO	Juan Manuel	Spain	2012
VISSCHER-HARINK	Sabine	Netherlands	2015
VOS	Jeroen	Netherlands	2015
WALRAVEN	Jacintha	Netherlands	2015
WALSH	Andrea	Ireland	2015
WASSEN	Jeroen	Netherlands	2014
WHITAKER	Lynne	United Kingdom	2014
WILS	Alexandra	Netherlands	2013
WOLTING	Roelof John	Netherlands	2012
XAVIER	Ana	Portugal	2012
ZANELLA	Michela	Italy	2015
ZERIKIOTIS	Evangelos	Greece	2013
ZUMBRINK	Jacobus Johannes Maria	Netherlands	2013