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The EHRA White Book 2014

**The Current Status of Cardiac Electrophysiology
in ESC Member Countries**

**K.-H. Kuck, G. Hindricks, L. Padeletti,
P. Raatikainen, D.O. Arnar**



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Preface – The EHRA White Book 2014: seventh edition

The White Book of the European Heart Rhythm Association (EHRA) has become a key reference for those seeking information about electrophysiological procedures and implantation of cardiac implantable electronic devices (CIEDs) in Europe. No other publication provides such a comprehensive collection of data from 49 of the 56 member countries of the European Society of Cardiology (ESC). Moreover, the EHRA White Book contains valuable up-to-date demographic information about each participating country, key national healthcare statistics along with training and educational requirements for those who are involved in the care of arrhythmia patients. Additionally, there is an attempt to identify possible obstacles to ESC Guidelines implementation in each country.

Since its founding, the spirit and methodology of the project has remained unchanged, although the questionnaire and the data collected has been revised and refined each year.

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 yearly status of treatment of arrhythmia in ESC countries as well as to assess its dynamics and progressive harmonisation in access to healthcare and specifically, arrhythmia treatment over the years.

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 ESC countries, well established centralised databases of both CIEDs and catheter ablation procedures do exist. The databases are in most cases created and maintained by each National Working Group on arrhythmias and electrophysiology and/or National Cardiac Societies. 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. EHRA is very grateful to all National Working Groups for their continuous support and contribution to the White Book.

As in the past, this edition not only contains last year's data but also an update of last year's information following a process of continuous refinement and improvement. This year's edition includes data from 49 countries.

The EHRA White Book has been made possible thanks to the efforts of several key contributors. Prof. Christian Wolpert and Prof. Panos Vardas deserve special mention as the founding fathers of the EHRA White Book, the chairs and co-chairs of national Working Groups / National Cardiac Societies of the 56 ESC countries, the EHRA staff at the European Heart House, and last but not least the project sponsor, BIOTRONIK SE & Co. KG company and in particular Robert Wüstenberg and Anja Thümen. 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 2014 is the seventh 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.

Like in the past most of them have provided 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
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

The 2014 EHRA White Book edition follows similar methodology as the previous editions from 2008-2013.

The data were 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.

All data were collected in the period from March 2014 to May 2014 and was the most recent available, at the time of the publication. Unfortunately, some countries did not have available data for all of the sections of the book.

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)

URL: <http://www.census.gov/ipc/www/idb/informationGateway.php>

March 12-13, 2014

Healthcare data

- Hospitals (per 100 000 population)
European health for all database (HFA-DB)
URL: <http://data.euro.who.int/hfadb/>
March 17, 2014
- Beds (per 100 000 population)
European health for all database (HFA-DB)
URL: <http://data.euro.who.int/hfadb/>
March 17, 2014
- Density of physicians (per 1000 population)
European health for all database (HFA-DB)
URL: <http://data.euro.who.int/hfadb/>
March 17, 2014
- Density of nurses (per 1000 population)
European health for all database (HFA-DB)
URL: <http://data.euro.who.int/hfadb/>
March 17, 2014

Demographic information

- Population
United States Census Bureau (Homepage)
URL: <http://www.census.gov/ipc/www/idb/informationGateway.php>
March 12, 2014
- Population annual growth rate [%]
United States Census Bureau (Homepage)
URL: <http://www.census.gov/ipc/www/idb/informationGateway.php>
March 12, 2014
- Life expectancy at birth (in years)
United States Census Bureau (Homepage)
URL: <http://www.census.gov/ipc/www/idb/informationGateway.php>
March 12, 2014

- Death rate (per 1000 population)
European health for all database (HFA-DB)
URL: <http://data.euro.who.int/hfadb/>
March 17, 2014
- Live births (per 1000 population)
European health for all database (HFA-DB)
URL: <http://data.euro.who.int/hfadb/>
March 17, 2014

Economic information

- Gross domestic product (U.S dollar-billions)
International Monetary Fund (IMF)
URL: <http://www.imf.org/external/ns/cs.aspx?id=28>
March 17, 2014
- Gross domestic product per capita (U.S dollar-units)
International Monetary Fund (IMF)
URL: <http://www.imf.org/external/ns/cs.aspx?id=28>
March 17, 2014
- Total expenditure on health as % of GDP
European health for all database (HFA-DB)
URL: <http://data.euro.who.int/hfadb/>
March 17, 2014
- General government expenditure on health as % of total expenditure on health
WHO -World Health Statistics Report 2013; Section 7;
March 12, 2014
- Private expenditure on health as % of total expenditure on health
WHO -World Health Statistics Report 2013; Section 7;
March 12, 2014

4. ESC Countries Overview





ALBANIA

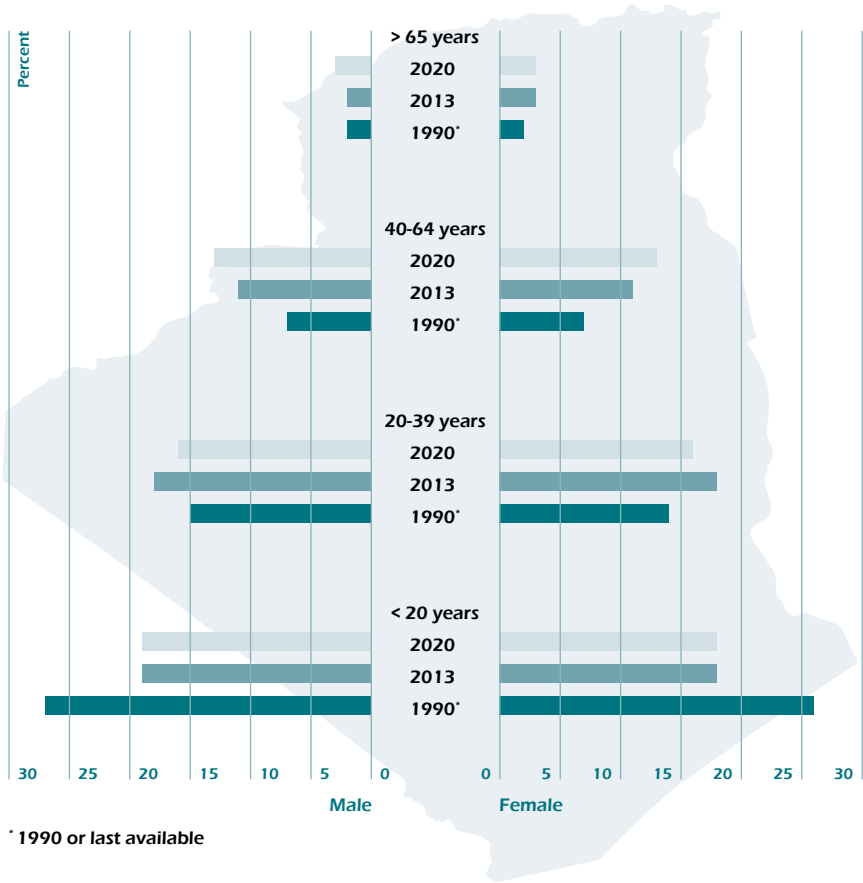
Data not submitted.

ALGERIA



1. Statistics

Age pyramid for Algeria



Healthcare data		
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		
Population	38.087.812	2013
Population annual growth rate (%)	1,9	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available

Economic information		
Gross domestic product (U.S dollar-billions)	215,72	2013*
Gross domestic product per capita (U.S dollar-units)	5.668,36	2013*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	79,9	2010
Private expenditure on health as % of total expenditure on health	20,1	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

3. Healthcare System

Mainly National Health System, private offices and clinics available.

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

Requirements. social security for public or private jobs.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	70%
Uninsured citizens	not available	30%

Distribution of insurance modality		
	2012	2013
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
--	-----

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

Comments: All available in the public sector.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Comments: Physicians receive salaries as these techniques are provided by public hospitals. Hospitals providing these techniques pay by themselves according to their resources.

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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	Yes	1 year
--	------------	---------------

Training centres availability	
Pacemaker	11
ICD implantation	7
CRT implantation	2
Electrophysiological studies and catheter ablation	1
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	90%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	19
Total Pacemaker units implanted	not available	2.480
Thereof, New implants	not available	2.050
Thereof, Replacements	not available	430

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	8
Total CRT units implanted	not available	64
Thereof, CRT pacemaker	not available	31
Thereof, CRT ICD	not available	33

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		8
Total ICD units implanted	not available		38
Thereof, Single chamber	not available		23
Thereof, Dual chamber	not available		15
First implants	not available		30
Replacements	not available		8

Specialist performing implants			
Cardiologists		Yes	100%
Surgeons		No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		2
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			
	2012		2013
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 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		
	2012	2013
Number of ablation centres	not available	1
Number of ablations performed	not available	230
Mean number of ablations per centre	not available	230
Number of AF ablations	not available	0
Number of ablation centres (> 50 AF ablations)	not available	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	0

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

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants	
National	Not available
U.S.	Not available
European	Yes

Obstacles to guideline implementation	Ranking of importance*					
	1	2	3	4	5	
Lack of centres	☐	☒	☐	☐	☐	2
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	3
Lack of referral	☐	☒	☐	☐	☐	5
Lack of trained personnel	☐	☐	☐	☒	☐	4
Low awareness of guidelines	☐	☒	☐	☐	☐	6
Lack of operators	☐	☐	☐	☒	☐	1
	1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
Not available

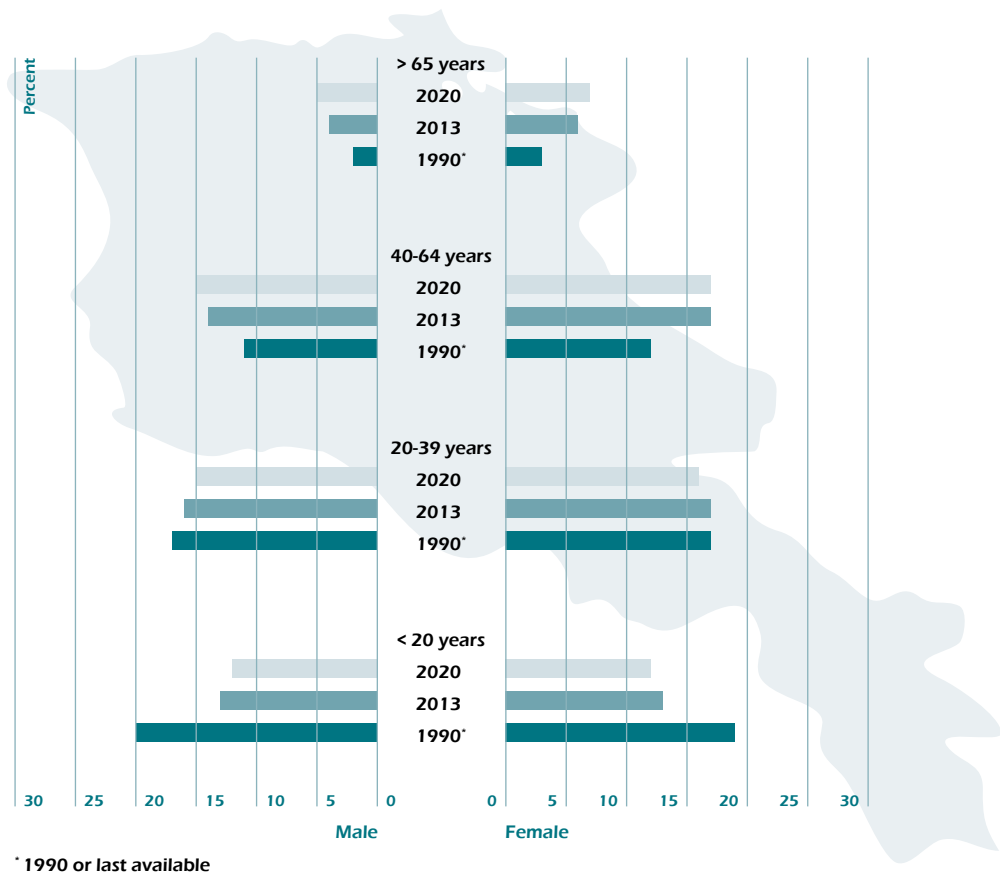
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• Sample short survey • Estimation • Official statistics

ARMENIA



1. Statistics

Age pyramid for Armenia



Healthcare data		
Hospitals (per 100.000 population)	4,1	2012
Beds (per 100.000 population)	394,0	2012
Density of physicians (per 1.000 population)	2,7	2012
Density of nurses (per 1.000 population)	4,9	2012

Demographic information		
Population	3.064.267	2013
Population annual growth rate (%)	-0,1	2013
Life expectancy at birth	74	2013
Death rate (per 1.000 population)	8,6	2011
Live births (per 1.000 population)	13,3	2011

Economic information		
Gross domestic product (U.S dollar-billions)	10,44	2013*
Gross domestic product per capita (U.S dollar-units)	3.176,28	2013*
Total expenditure on health as % of GDP	4,3	2011
General government expenditure on health as % of total expenditure on health	40,5	2010
Private expenditure on health as % of total expenditure on health	59,5	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	49%	47%

3. Healthcare System

National Health System; Health Insurance System; Private Health System.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	25%	35%
Uninsured citizens	75%	65%

Distribution of insurance modality		
	2012	2013
Public insurance company	0%	0%
Private insurance company	100%	70%
Private co-payment	0%	30%

Possibility to subscribing to private health insurance plans	Not available
--	---------------

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☐	☒	☐	☐	☐	☒
ICD primary prevention	☐	☐	☐	☒	☐	☐	☐	☒
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☐	☐	☐	☒	☐	☐	☐	☒
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☒	☐	☐	
Training centres	☒	☐	☐	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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
--	-----------

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)	1
---	----------

Percentage of academic centres among all practicing EP centres	0%
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Percentage of academic centres among all practicing implanting devices centres	0%
---	-----------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	3	2
Total Pacemaker units implanted	221	94
Thereof, New implants	192	59
Thereof, Replacements	29	35

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	3	2
Total CRT units implanted	18	10
Thereof, CRT pacemaker	16	0
Thereof, CRT ICD	2	10

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	3		2
Total ICD units implanted	not available		28
Thereof, Single chamber	33		2
Thereof, Dual chamber	0		26
First implants	30		16
Replacements	2		12

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		2
Total loop recorders implanted	not available		6

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions			
	2012		2013
Hospitals performed lead extractions	0		1
Total lead extraction procedures	0		3



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

10. Device specific

Availability of remote monitoring of devices	Not available
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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		
	2012	2013
Number of ablation centres	3	2
Number of ablations performed	67	140
Mean number of ablations per centre	11	70
Number of AF ablations	8	8
Number of ablation centres (> 50 AF ablations)	0	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☐	☒	☐	☐	☐
Low awareness of guidelines	☐	☐	☐	☒	☐
Lack of operators	☐	☒	☐	☐	☐

1 = no obstacle 5 = great obstacle * (1 = top; 6 = lowest)

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
• Arrhythmological Working Group of Armenia • Cardiac Pacing and Electrophysiology Working Group

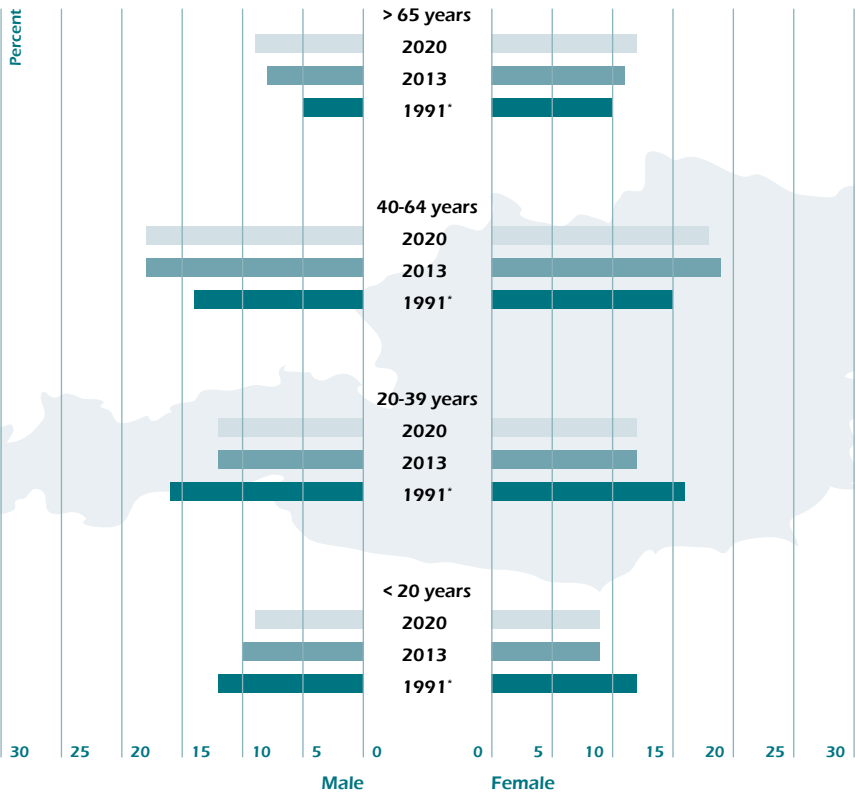
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • Health Ministry of Armenia • Arrhythmological Working Group of Armenia • Cardiac Pacing and Electrophysiology Working Group

AUSTRIA



1. Statistics

Age pyramid for Austria



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	3,2	2011
Beds (per 100.000 population)	765,0	2011
Density of physicians (per 1.000 population)	4,8	2011
Density of nurses (per 1.000 population)	7,9	2011

Demographic information		
Population	8.221.646	2013
Population annual growth rate (%)	0,0	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	9,1	2011
Live births (per 1.000 population)	9,3	2011

Economic information		
Gross domestic product (U.S dollar-billions)	417,90	2013*
Gross domestic product per capita (U.S dollar-units)	49.255,61	2013*
Total expenditure on health as % of GDP	10,6	2011
General government expenditure on health as % of total expenditure on health	76,2	2010
Private expenditure on health as % of total expenditure on health	23,8	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	43%	43%

3. Healthcare System

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
Requirements: All citizens of our country with a minimum salary of 300€ pay for the social security and therefore qualify for public insurance.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	99,3%	98,2%
Uninsured citizens	0,7%	1,8%

Distribution of insurance modality		
	2012	2013
Public insurance company	70%	85%
Private insurance company	30%	not available
Private co-payment	not available	15%

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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability	
No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist
ICD or pacemaker implants	Yes Cardiologist, surgeon or cardiac 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
---	----

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)	4
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Percentage of academic centres among all practicing EP centres	22%
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Percentage of academic centres among all practicing implanting devices centres	7%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	25		57
Total Pacemaker units implanted	7.870		7.950
Thereof, New implants	5.709		5.814
Thereof, Replacements	2.161		2.136

Specialist performing implants			
Cardiologists	Yes		50%
Surgeons	Yes		50%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	18		18
Total CRT units implanted	879		1.178
Thereof, CRT pacemaker	258		281
Thereof, CRT ICD	621		897

Specialist performing implants			
Cardiologists	Yes		50%
Surgeons	Yes		50%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	21		21
Total ICD units implanted	1.195		1.296
Thereof, Single chamber	not available		not available
Thereof, Dual chamber	not available		not available
First implants	919		974
Replacements	276		322

Specialist performing implants			
Cardiologists		Yes	10%
Surgeons		Yes	90%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	25		25
Total loop recorders implanted	454		504

Specialist performing implants			
Cardiologists		Yes	80%
Surgeons		Yes	20%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions			
	2012		2013
Hospitals performed lead extractions	4		5
Total lead extraction procedures	220		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	Austrian Pacemaker, ICD and Loop Recorder Registry (GOEG)
Pacing	Yes	Austrian Pacemaker, ICD and Loop Recorder Registry (GOEG)
Electrophysiology	Yes	Ablation Registry of the Austrian 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
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Official name: Austrian Pacemaker, ICD and Loop Recorder Registry (GOEG)

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	14	17
Number of ablations performed	2.790	2.421
Mean number of ablations per centre	199	142
Number of AF ablations	1.000	771
Number of ablation centres (> 50 AF ablations)	7	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2

Availability of a national registry for interventional electrophysiology	Yes
Official name: Questionnaire of the Austrian Society of Cardiology (1 center not reporting)	

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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	1
Lack of referral	☐	☒	☐	☐	☐	2
Lack of trained personnel	☐	☒	☐	☐	☐	3
Low awareness of guidelines	☐	☒	☐	☐	☐	4
Lack of operators	☐	☒	☐	☐	☐	5
	1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

13. Sources

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

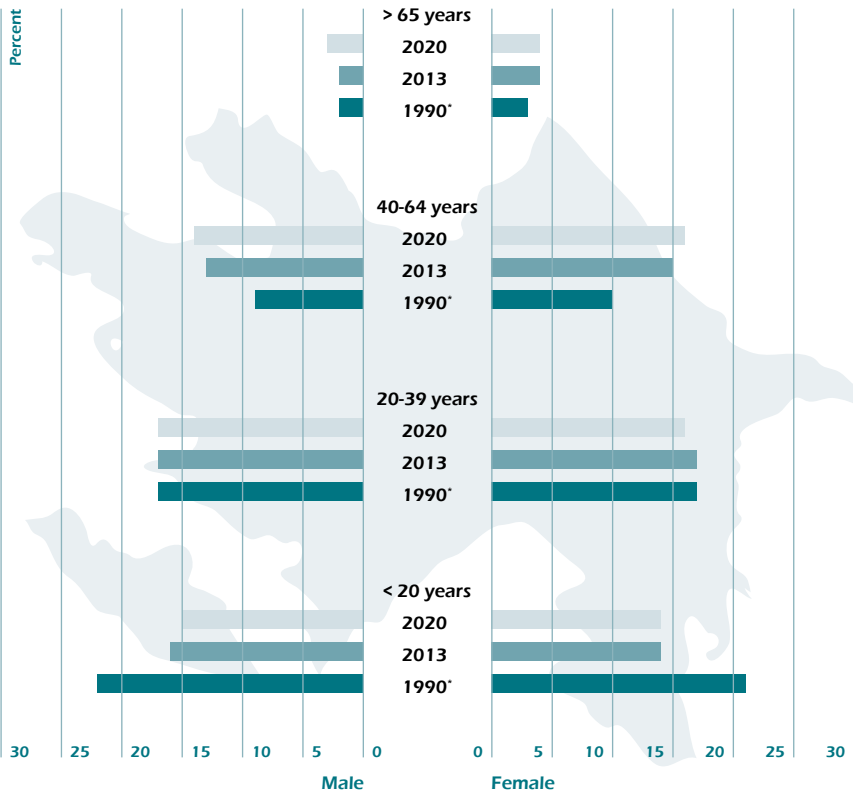
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Austrian Ministry of Health · GOEG (Gesundheit Österreich GmbH) · Working Group of Rhythmology · Austrian Society of Cardiology · Questionnaire of the Austrian Society of Cardiology · Statistics of the Austrian Social Security

AZERBAIJAN



1. Statistics

Age pyramid for Azerbaijan



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	5,8	2012
Beds (per 100.000 population)	467,8	2012
Density of physicians (per 1.000 population)	3,5	2012
Density of nurses (per 1.000 population)	6,8	2012

Demographic information		
Population	9.590.159	2013
Population annual growth rate (%)	1,0	2013
Life expectancy at birth	72	2013
Death rate (per 1.000 population)	5,9	2007
Live births (per 1.000 population)	18,3	2010

Economic information		
Gross domestic product (U.S dollar-billions)	76,01	2013*
Gross domestic product per capita (U.S dollar-units)	8.165,12	2013*
Total expenditure on health as % of GDP	5,2	2011
General government expenditure on health as % of total expenditure on health	21,9	2010
Private expenditure on health as % of total expenditure on health	78,1	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	33%

3. Healthcare System

Healthcare system is considered to be free for every citizen. But most of cardiovascular procedures are not covered. The only one hospital in our country offers cardiovascular procedures free of charge (including some implants).

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	100%
Uninsured citizens	not available	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	not available	70%
Private insurance company	not available	10%
Private co-payment	not available	20%

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

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☒
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☒	☐	☐	☐	Ministry of Health certification exam
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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	Not available
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Suggested period of training to perform implantations	No
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Training centres availability	
Pacemaker	5
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	1

Number of universities (Schools of Medicine)	1
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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	66%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	6
Total Pacemaker units implanted	not available	131
Thereof, New implants	not available	22
Thereof, Replacements	not available	109

Specialist performing implants		
Cardiologists	Yes	52%
Surgeons	Yes	48%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	2
Total CRT units implanted	not available	17
Thereof, CRT pacemaker	not available	0
Thereof, CRT ICD	not available	17

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		2
Total ICD units implanted	not available		13
Thereof, Single chamber	not available		4
Thereof, Dual chamber	not available		9
First implants	not available		13
Replacements	not available		0

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		2
Total loop recorders implanted	not available		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			
	2012		2013
Hospitals performed lead extractions	not available		1
Total lead extraction procedures	not available		10



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: because of economic reasons

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		
	2012	2013
Number of ablation centres	not available	2
Number of ablations performed	not available	232
Mean number of ablations per centre	not available	116
Number of AF ablations	not available	4
Number of ablation centres (> 50 AF ablations)	not available	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	1

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	☐	☒	☐	☐	☐	4
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☐	☐	☐	☒	☐	2
Lack of trained personnel	☐	☒	☐	☐	☐	5
Low awareness of guidelines	☐	☐	☒	☐	☐	3
Lack of operators	☐	☒	☐	☐	☐	6

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

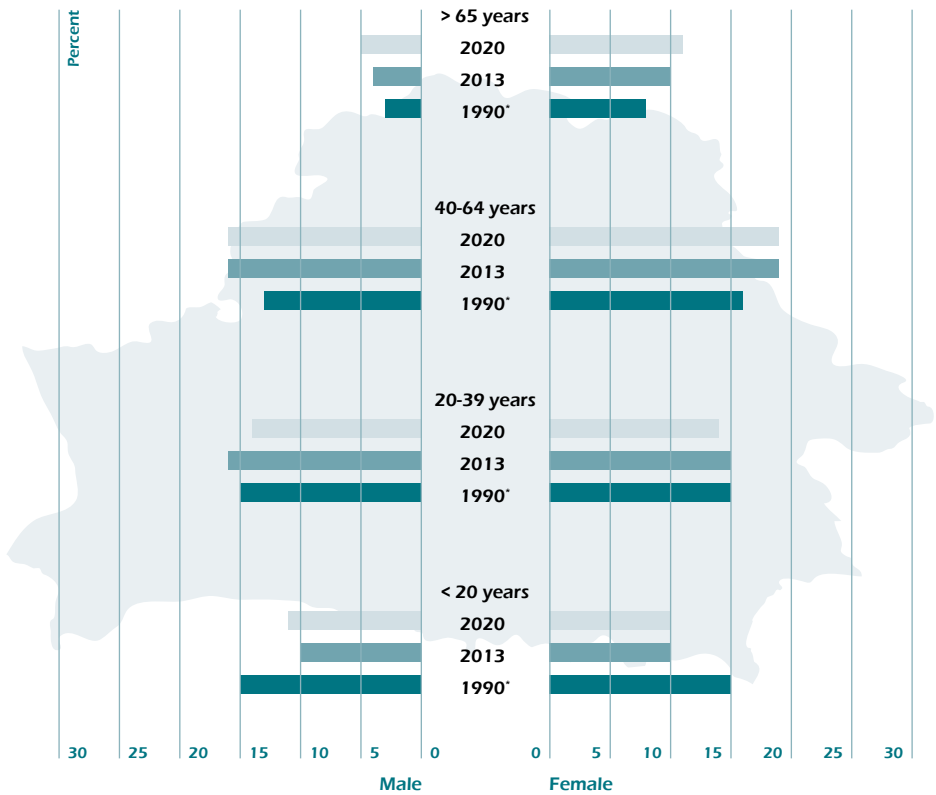
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· Society data
· Azerbaijan Society of Cardiology

BELARUS



1. Statistics

Age pyramid for Belarus



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	6,9	2011
Beds (per 100.000 population)	1.125,1	2011
Density of physicians (per 1.000 population)	3,8	2011
Density of nurses (per 1.000 population)	10,6	2011

Demographic information		
Population	9.625.888	2013
Population annual growth rate (%)	-0,2	2013
Life expectancy at birth	72	2013
Death rate (per 1.000 population)	14,0	2009
Live births (per 1.000 population)	11,5	2011

Economic information		
Gross domestic product (U.S dollar-billions)	69,24	2013*
Gross domestic product per capita (U.S dollar-units)	7.413,84	2013*
Total expenditure on health as % of GDP	5,3	2011
General government expenditure on health as % of total expenditure on health	77,7	2010
Private expenditure on health as % of total expenditure on health	22,3	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	52,4%	52,7%

3. Healthcare System

National Health System.

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☒	☐	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☒	☐	☐	☐	☐	☒	☐
CRT devices	☐	☒	☐	☐	☐	☐	☒	☐
Ablation	☐	☒	☐	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	
Invasive electrophysiology	☒	☐	☐	☐	
Allied professionals	☒	☐	☐	☐	
Training centres	☒	☐	☐	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for		
	Specialist	
Catheter ablation	Yes	Roentgen-endovascular surgeons
ICD or pacemaker implants	Yes	Roentgen-endovascular surgeons

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes	4 months
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Suggested period of training to perform implantations	Yes	1 year
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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
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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	80%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	10	10
Total Pacemaker units implanted	2.651	2.813
Thereof, New implants	2.329	2.430
Thereof, Replacements	322	383

Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	5
Total CRT units implanted	38	54
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		
	2012	2013
Implanting centres	7	10
Total ICD units implanted	114	2.813
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
First implants	not available	2.430
Replacements	not available	383

Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	41	22

Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	1	10
Total lead extraction procedures	40	not available



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	
Pacing	Yes	
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		
	2012	2013
Number of ablation centres	6	6
Number of ablations performed	524	736
Mean number of ablations per centre	87,3	123
Number of AF ablations	54	70
Number of ablation centres (> 50 AF ablations)	1	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	1

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	☐	☒	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐
Lack of referral	☐	☐	☐	☒	☐
Lack of trained personnel	☐	☐	☒	☐	☐
Low awareness of guidelines	☐	☐	☒	☐	☐
Lack of operators	☐	☐	☒	☐	☐

1 = no obstacle 5 = great obstacle * (1 = top; 6 = lowest)

13. Sources

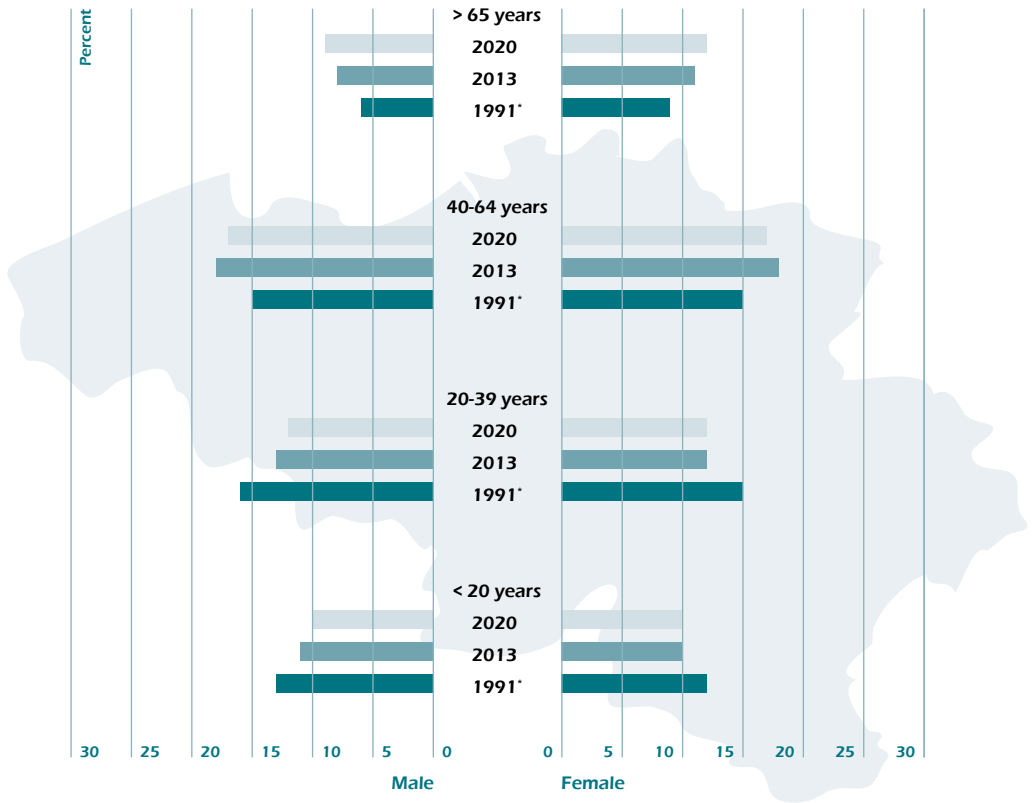
Name of National Cardiac Society, National Working Group or arrhythmia body
· Belarusian Scientific Society of Cardiologists, Belarusian Heart Rhythm Association
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Official statistics

BELGIUM



1. Statistics

Age pyramid for Belgium



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	1,8	2012
Beds (per 100.000 population)	650,2	2012
Density of physicians (per 1.000 population)	3,0	2011
Density of nurses (per 1.000 population)	15,8	2010

Demographic information		
Population	10.444.268	2013
Population annual growth rate (%)	0,1	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	9,6	2009
Live births (per 1.000 population)	11,8	2009

Economic information		
Gross domestic product (U.S dollar-billions)	507,42	2013*
Gross domestic product per capita (U.S dollar-units)	45.537,46	2013*
Total expenditure on health as % of GDP	10,6	2011
General government expenditure on health as % of total expenditure on health	75,6	2010
Private expenditure on health as % of total expenditure on health	24,4	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	31,4%	not available

3. Healthcare System

Obligatory national health system: INAMI = Institut national d'assurance maladie invalidité.

Basic insurance availability		Yes
Requirements: all citizens.		

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	99%	99%
Uninsured citizens	1%	1%

Distribution of insurance modality		
	2012	2013
Public insurance company	78%	not available
Private insurance company	2%	not available
Private co-payment	20%	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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☒	☐	☐	☐	☒	☐	☐	☐
ICD primary prevention	☒	☐	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☒	☐	☐	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐
Comments: INAMI-RIZIV	

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	
Invasive electrophysiology	☒	☐	☐	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

Comments: Pacemakers only allowed in centres with „P agreements“ (given by regional health authorities). ICDs only available in conventinoned centres (agreed by national health system)
Ablations only allowed in centres with „E agreements“ (given by regional authorities).

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
http://www.behra.eu/wp-content/uploads/Guidelines-in-cardiac-electrophysiology-and-ablation1.pdf	

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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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
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Percentage of academic centres among all practicing EP centres	20%
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Percentage of academic centres among all practicing implanting devices centres	7%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	103		105
Total Pacemaker units implanted	12.817		12.725
Thereof, New implants	8.840		8.945
Thereof, Replacements	3.682		3.780

Specialist performing implants			
Cardiologists	Yes		not available
Surgeons	Yes		not available

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	37		35
Total CRT units implanted	858		1.221
Thereof, CRT pacemaker	349		397
Thereof, CRT ICD	507		824

Specialist performing implants			
Cardiologists	Yes		not available
Surgeons	Yes		not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	23	23
Total ICD units implanted	2.197	1.704
Thereof, Single chamber	875	1.047
Thereof, Dual chamber	648	657
First implants	1.524	1.136
Replacements	673	568

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	38	45
Total loop recorders implanted	259	317

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		
	2012	2013
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	Yes	QERMID database
Pacing	Yes	QERMID database
Electrophysiology	Yes	BeHRA database

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: FAGG

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	37	44
Number of ablations performed	5.886	6.056
Mean number of ablations per centre	160	138
Number of AF ablations	2.339	2.352
Number of ablation centres (> 50 AF ablations)	16	16
Number of ablation centres (> 10 VT ablations on structural heart diseases)	13	7

Availability of a national registry for interventional electrophysiology	Yes
Official name: BeHRA database	

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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	1
Lack of referral	☒	☐	☐	☐	☐	4
Lack of trained personnel	☒	☐	☐	☐	☐	2
Low awareness of guidelines	☒	☐	☐	☐	☐	3
Lack of operators	☒	☐	☐	☐	☐	5
1 = no obstacle		5 = great obstacle			* (1 = top; 6 = lowest)	

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
• BeHRA = Belgian Heart Rhythm Association – www.behra.be

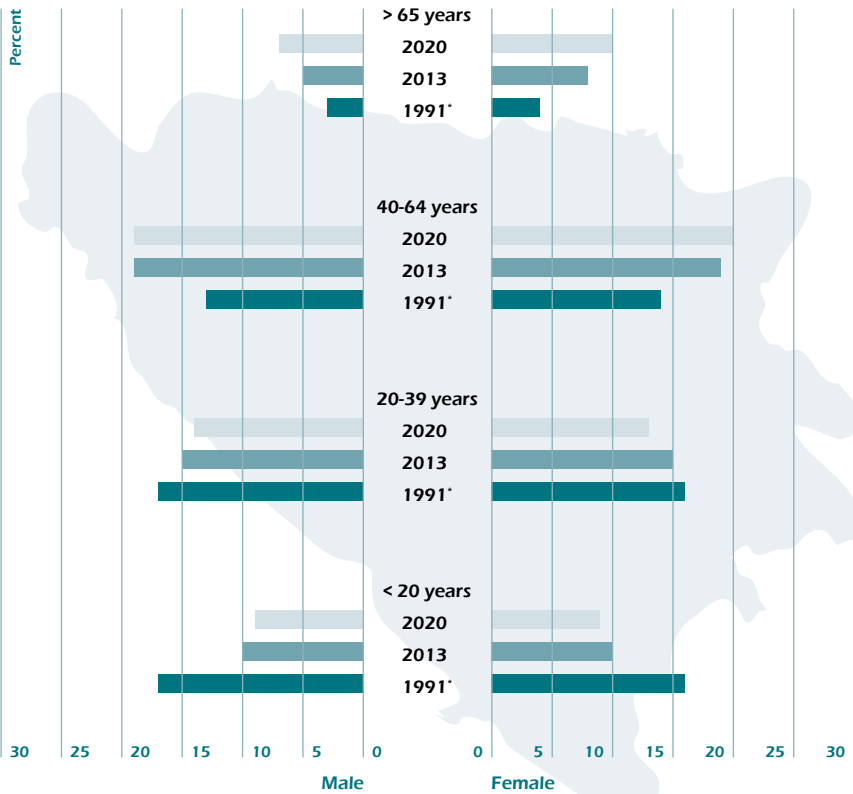
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • RIZIV • Belgian pacemaker database analysed by BeHRA • BeHRA database • BeHRA registry6056 • Estimation

BOSNIA & HERZEGOVINA



1. Statistics

Age pyramid for Bosnia & Herzegovina



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	1,0	2010
Beds (per 100.000 population)	345,1	2010
Density of physicians (per 1.000 population)	1,7	2010
Density of nurses (per 1.000 population)	5,3	2010

Demographic information		
Population	3.875.723	2013
Population annual growth rate (%)	-0,1	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	9,1	2011
Live births (per 1.000 population)	8,3	2011

Economic information		
Gross domestic product (U.S dollar-billions)	18,87	2013*
Gross domestic product per capita (U.S dollar-units)	4.865,57	2013*
Total expenditure on health as % of GDP	10,2	2011
General government expenditure on health as % of total expenditure on health	68,1	2010
Private expenditure on health as % of total expenditure on health	31,9	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	54%	52%

3. Healthcare System

The National healthcare system in Bosnia and Herzegovina 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 and specialized institutions are providing services. A few private healthcares are incorporated to the healthcare system.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	74%	75%
Uninsured citizens	26%	25%

Distribution of insurance modality		
	2012	2013
Public insurance company	74%	75%
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	Not available
Pacemakers	Not available
Ablation	Not available

Comments: Our healthcare system is decentralized. We have twelve Cantonal and Republic Ministry of Health. In one Canton co-payment is necessary (20-100%) and in the other co-payment is not necessary.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, internist, 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
--	-----------

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
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Percentage of academic centres among all practicing EP centres	20%
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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		
	2012	2013
Implanting centres	6	6
Total Pacemaker units implanted	909	868
Thereof, New implants	909	826
Thereof, Replacements	not available	42

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	35%
Other: Internists	Yes	15%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total CRT units implanted	21	25
Thereof, CRT pacemaker	15	16
Thereof, CRT ICD	6	9

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	4	5
Total ICD units implanted	53	65
Thereof, Single chamber	47	56
Thereof, Dual chamber	6	9
First implants	53	61
Replacements	not available	4

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	8	8

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	not available	0
Total lead extraction procedures	not available	0

Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	No	0%
Comments: No lead extraction.		

10. Device specific

Availability of remote monitoring of devices	No
Reason: Budget	

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
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11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	1	0
Number of ablations performed	3	0
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 ablation centres (> 10 VT ablations on structural heart diseases)	not available	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.	Not available
European	Yes

Obstacles to guideline implementation	Ranking of importance*				
	1	2	3	4	5
Lack of centres	☐	☒	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☐	☐	☐	☒	☐
Low awareness of guidelines	☐	☐	☐	☒	☐
Lack of operators	☐	☐	☐	☐	☒

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 in Bosnia and Herzegovina, Working Group for Cardiac Pacing

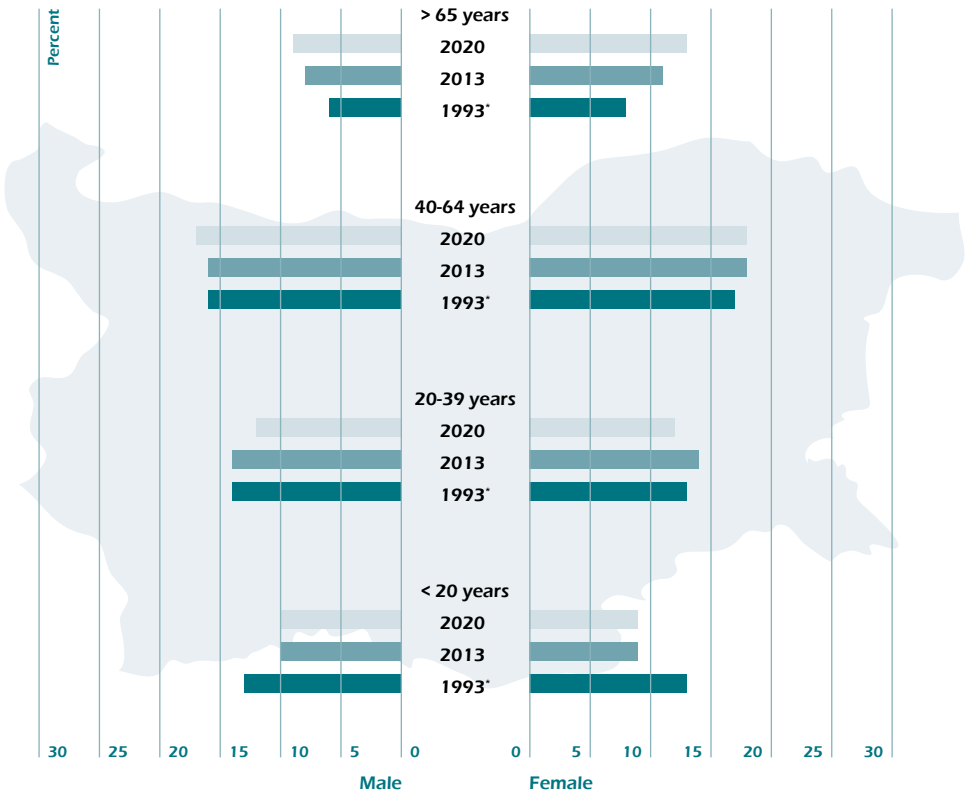
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Estimation
· Official statistics
· Survey from professional association

BULGARIA



1. Statistics

Age pyramid for Bulgaria



* 1990 or last available



Healthcare data		
Hospitals (per 100.000 population)	4,7	2011
Beds (per 100.000 population)	644,9	2011
Density of physicians (per 1.000 population)	3,9	2011
Density of nurses (per 1.000 population)	4,7	2011

Demographic information		
Population	6.981.642	2013
Population annual growth rate (%)	-0,8	2013
Life expectancy at birth	74	2013
Death rate (per 1.000 population)	14,7	2011
Live births (per 1.000 population)	9,6	2011

Economic information		
Gross domestic product (U.S dollar-billions)	53,70	2013*
Gross domestic product per capita (U.S dollar-units)	7.411,15	2013*
Total expenditure on health as % of GDP	7,3	2011
General government expenditure on health as % of total expenditure on health	55,7	2010
Private expenditure on health as % of total expenditure on health	44,3	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	63%	60%

3. Healthcare System

The National Health system includes National Health System Fund and private eighteen insurance funds.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	80%	80%
Uninsured citizens	20%	20%

Distribution of insurance modality		
	2012	2013
Public insurance company	75%	75%
Private insurance company	1%	1%
Private co-payment	24%	24%

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

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

Comments: Co-payment is necessary for ICDs, CRT-D and for ablation for atrial fibrillation.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

Comments: There is limited reimbursement for ICD, CRT-D and CRT devices and the patient has to co-pay.

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	A national program for training and certification.
Invasive electrophysiology	☒	☐	☐	☐	A national program for training and certification.
Allied professionals	☒	☐	☐	☐	A national program for training and certification. Established by the Professional Association for pacemakers and electrophysiology
Training centres	☒	☐	☐	☐	A national program for training and certification. Established by the Professional Association for pacemakers and electrophysiology

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes	2 years
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Suggested period of training to perform implantations	No
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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)	5
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Percentage of academic centres among all practicing EP centres	36%
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Percentage of academic centres among all practicing implanting devices centres	36%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	17	17
Total Pacemaker units implanted	3.153	3.511
Thereof, New implants	2.451	3.011
Thereof, Replacements	702	500

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	4	8
Total CRT units implanted	198	260
Thereof, CRT pacemaker	181	232
Thereof, CRT ICD	17	28

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	4	8
Total ICD units implanted	47	32
Thereof, Single chamber	28	19
Thereof, Dual chamber	19	13
First implants	42	30
Replacements	5	2

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	5	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		
	2012	2013
Hospitals performed lead extractions	0	1
Total lead extraction procedures	not available	11



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	National Register – „BG PACE“
Pacing	Yes	National Register – „BG PACE“
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		
	2012	2013
Number of ablation centres	2	3
Number of ablations performed	422	378
Mean number of ablations per centre	not available	126
Number of AF ablations	49	47
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒
Lack of referral	☐	☐	☐	☒	☐
Lack of trained personnel	☐	☒	☐	☐	☐
Low awareness of guidelines	☒	☐	☐	☐	☐
Lack of operators	☒	☐	☐	☐	☐

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 of pacemakers and electrophysiology

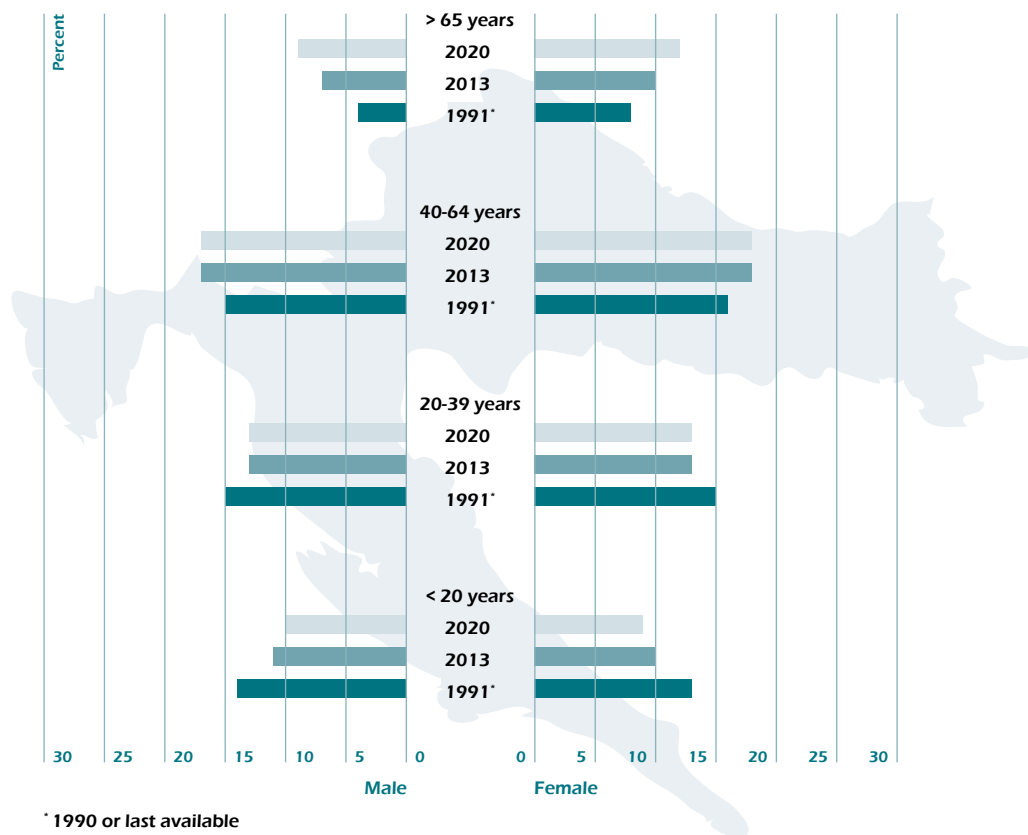
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Bulgarian Society of Cardiology
· National Register – „BG PACE“

CROATIA



1. Statistics

Age pyramid for Croatia



Healthcare data		
Hospitals (per 100.000 population)	1,3	2011
Beds (per 100.000 population)	578,9	2011
Density of physicians (per 1.000 population)	2,8	2011
Density of nurses (per 1.000 population)	5,8	2011

Demographic information		
Population	4.475.611	2013
Population annual growth rate (%)	-0,1	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	11,6	2011
Live births (per 1.000 population)	9,4	2011

Economic information		
Gross domestic product (U.S dollar-billions)	58,60	2013*
Gross domestic product per capita (U.S dollar-units)	13.312,35	2013*
Total expenditure on health as % of GDP	7,8	2011
General government expenditure on health as % of total expenditure on health	84,8	2010
Private expenditure on health as % of total expenditure on health	15,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	49%	49%

3. Healthcare System

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

Basic insurance availability	Yes
Requirements: This is guaranteed by constitution.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	90%	90%
Uninsured citizens	10%	10%

Distribution of insurance modality		
	2012	2013
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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☐	☒	
Invasive electrophysiology	☐	☐	☐	☒	
Allied professionals	☐	☐	☐	☒	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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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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
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Percentage of academic centres among all practicing EP centres	80%
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Percentage of academic centres among all practicing implanting devices centres	58%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	17	18
Total Pacemaker units implanted	2.515	2.418
Thereof, New implants	2.191	2.075
Thereof, Replacements	324	343

Specialist performing implants		
Cardiologists	Yes	88%
Surgeons	Yes	12%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	10	7
Total CRT units implanted	58	81
Thereof, CRT pacemaker	37	60
Thereof, CRT ICD	21	21

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	12	12
Total ICD units implanted	118	156
Thereof, Single chamber	73	88
Thereof, Dual chamber	29	68
First implants	102	not available
Replacements	16	not available

Specialist performing implants		
Cardiologists	Yes	65%
Surgeons	Yes	35%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	5	7
Total loop recorders implanted	7	28

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	Yes	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	3	3
Total lead extraction procedures	7	0



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

10. Device specific

Availability of remote monitoring of devices	No
--	----

National registry for		
		Official name
ICD	not available	
Pacing	not available	
Electrophysiology	not available	

Availability of a national quality insurance system or complication registry	Not available
--	---------------

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Not available
--	---------------

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	5	5
Number of ablations performed	593	817
Mean number of ablations per centre	100	163
Number of AF ablations	79	172
Number of ablation centres (> 50 AF ablations)	0	2
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	3

Availability of a national registry for interventional electrophysiology	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒
Lack of referral	☐	☒	☐	☐	☐
Lack of trained personnel	☐	☐	☒	☐	☐
Low awareness of guidelines	☐	☐	☒	☐	☐
Lack of operators	☐	☒	☐	☐	☐
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 for Arrhythmias and Cardiac Pacing

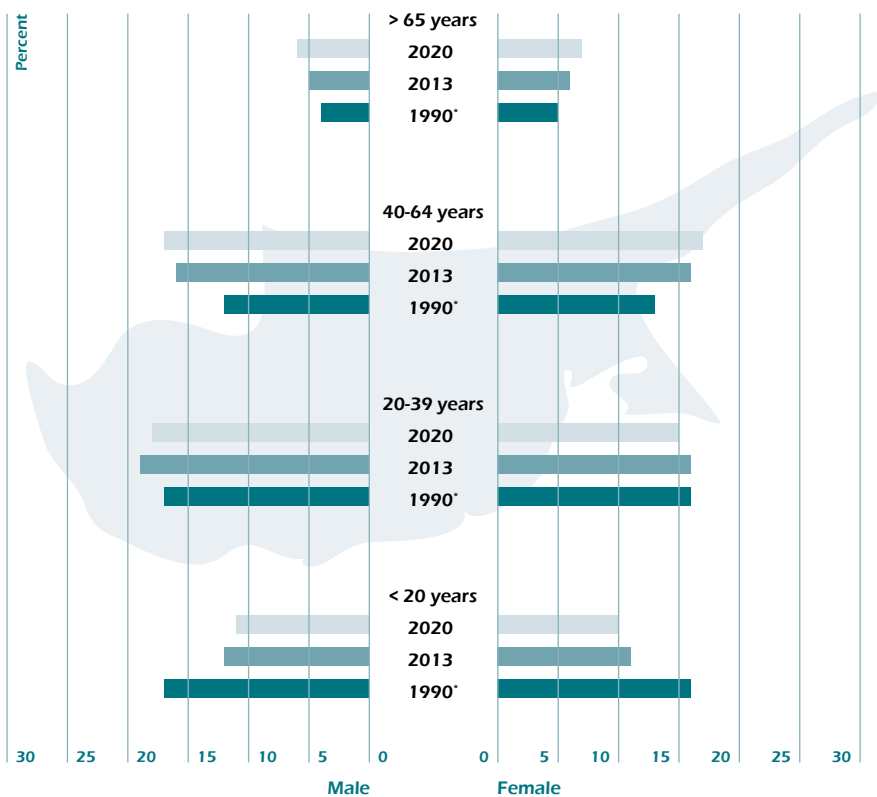
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Croatian Cardiac Society · Working Group for Arrhythmias and Cardiac Pacing · Croatian Institute for Public Health · Croatian Institute for Health Insurance

CYPRUS



1. Statistics

Age pyramid for Cyprus



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	10,2	2011
Beds (per 100.000 population)	346,6	2011
Density of physicians (per 1.000 population)	3,0	2011
Density of nurses (per 1.000 population)	4,4	2004

Demographic information		
Population	1.155.403	2013
Population annual growth rate (%)	1,5	2013
Life expectancy at birth	78	2013
Death rate (per 1.000 population)	6,3	2011
Live births (per 1.000 population)	11,2	2011

Economic information		
Gross domestic product (U.S dollar-billions)	21,78	2013*
Gross domestic product per capita (U.S dollar-units)	24.705,94	2013*
Total expenditure on health as % of GDP	7,4	2011
General government expenditure on health as % of total expenditure on health	43,3	2010
Private expenditure on health as % of total expenditure on health	56,7	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	30%	30%

3. Healthcare System

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

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	85%	85%
Uninsured citizens	15%	15%

Distribution of insurance modality		
	2012	2013
Public insurance company	85%	85%
Private insurance company	15%	15%
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

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	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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
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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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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%
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Percentage of academic centres among all practicing implanting devices centres	20%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	5		5
Total Pacemaker units implanted	240		250
Thereof, New implants	not available		not available
Thereof, 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			
	2012		2013
Implanting centres	3		3
Total CRT units implanted	28		25
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			
	2012		2013
Implanting centres	3		3
Total ICD units implanted	52		60
Thereof, Single chamber	not available		not available
Thereof, Dual chamber	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			
	2012		2013
Implanting centres	3		3
Total loop recorders implanted	12		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			
	2012		2013
Hospitals performed lead extractions	0		1
Total lead extraction procedures	0		2

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

10. Device specific

Availability of remote monitoring of devices	No
--	----

Reasons: Short distances render it unnecessary.

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		
	2012	2013
Number of ablation centres	3	3
Number of ablations performed	40	45
Mean number of ablations per centre	not available	15
Number of AF ablations	6	6
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐	1
Lack of referral	☐	☒	☐	☐	☐	5
Lack of trained personnel	☐	☒	☐	☐	☐	3
Low awareness of guidelines	☐	☐	☒	☐	☐	4
Lack of operators	☐	☐	☒	☐	☐	2
	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 of the Cyprus Society of Cardiology

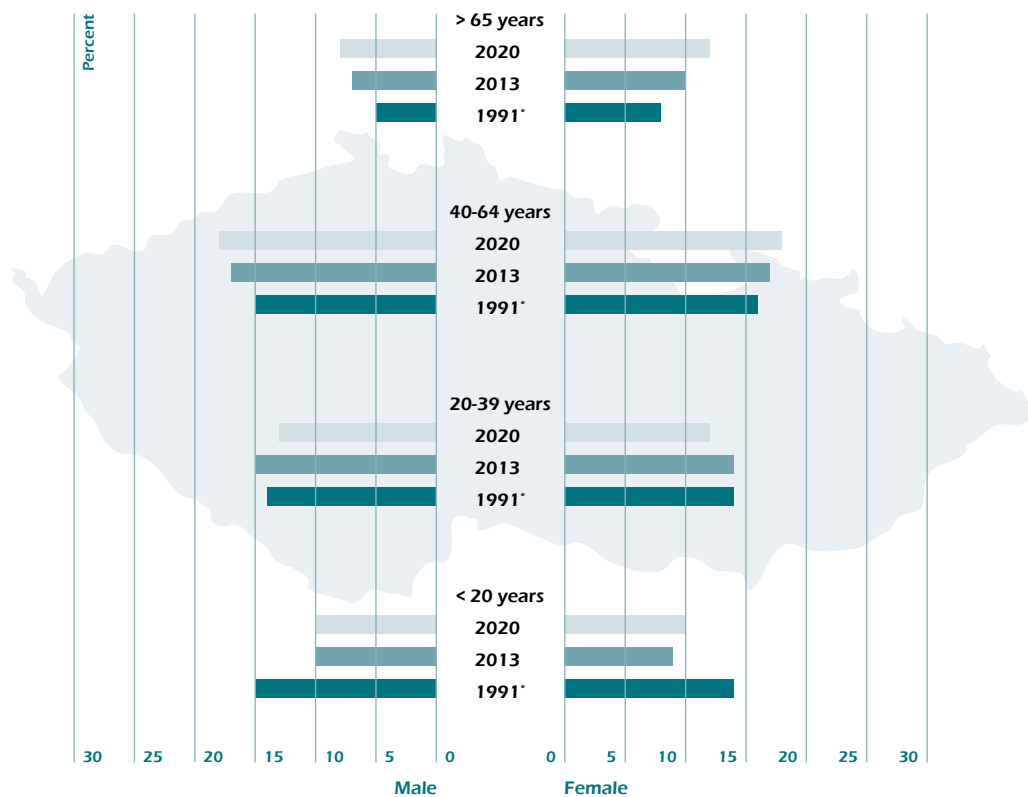
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • Official statistics • Survey from professional association • Sample short survey • Sales data • Estimation • Other: Personal communication with implanting and EP centres

CZECH REPUBLIC



1. Statistics

Age pyramid for Czech Republic



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	2,4	2011
Beds (per 100.000 population)	683,6	2011
Density of physicians (per 1.000 population)	3,6	2011
Density of nurses (per 1.000 population)	8,5	2011

Demographic information		
Population	10.609.762	2013
Population annual growth rate (%)	0,2	2013
Life expectancy at birth	78	2013
Death rate (per 1.000 population)	10,2	2011
Live births (per 1.000 population)	10,4	2011

Economic information		
Gross domestic product (U.S dollar-billions)	198,63	2013*
Gross domestic product per capita (U.S dollar-units)	18.848,35	2013*
Total expenditure on health as % of GDP	7,4	2011
General government expenditure on health as % of total expenditure on health	83,8	2010
Private expenditure on health as % of total expenditure on health	16,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

3. Healthcare System

National Health System.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	99,9%	99,9%
Uninsured citizens	0,1%	0,1%

Distribution of insurance modality		
	2012	2013
Public insurance company	99,9%	99,9%
Private insurance company	0,1%	0,1%
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	

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☒	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☒	☐	☐
CRT devices	☐	☐	☒	☐	☐	☒	☐	☐
Ablation	☐	☐	☒	☐	☐	☒	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	ICD and Pacemaker Accreditation
Invasive electrophysiology	☒	☐	☐	☐	EP Accreditation
Allied professionals	☒	☐	☐	☐	NA
Training centres	☒	☐	☐	☐	Accreditation for Device Implantation Training, Accreditation for EP Training

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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
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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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Training centres availability	
Pacemaker	37
ICD implantation	17
CRT implantation	17
Electrophysiological studies and catheter ablation	20
Atrial fibrillation ablation	11

Number of universities (Schools of Medicine)	7
---	----------

Percentage of academic centres among all practicing EP centres	not available
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Percentage of academic centres among all practicing implanting devices centres	not available
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	37	37
Total Pacemaker units implanted	9.150	9.416
Thereof, New implants	6.410	6.615
Thereof, Replacements	2.740	2.801

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	19	17
Total CRT units implanted	1.289	1.716
Thereof, CRT pacemaker	370	435
Thereof, CRT ICD	919	1.281

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	17	17
Total ICD units implanted	2.824	3.196
Thereof, Single chamber	949	1.342
Thereof, Dual chamber	333	573
First implants	1.282	2.435
Replacements	623	761

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	not available
Total loop recorders implanted	250	520

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	not available	5
Total lead extraction procedures	300	320

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

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		
		Official name
ICD	Yes	ICD on-line registry
Pacing	Yes	Pacemaker on-line registry
Electrophysiology	Yes	Catheter ablation on-line 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	Yes
--	-----

Official name: State institute for drug control

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	20	20
Number of ablations performed	4.822	5.116
Mean number of ablations per centre	241	256
Number of AF ablations	1.800	2.082
Number of ablation centres (> 50 AF ablations)	9	11
Number of ablation centres (> 10 VT ablations on structural heart diseases)	8	6

Availability of a national registry for interventional electrophysiology	Yes
Official name: Catheter ablation 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*					
	1	2	3	4	5	
Lack of centres	☒	☐	☐	☐	☐	5
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐	1
Lack of referral	☐	☒	☐	☐	☐	4
Lack of trained personnel	☐	☒	☐	☐	☐	3
Low awareness of guidelines	☒	☐	☐	☐	☐	6
Lack of operators	☐	☒	☐	☐	☐	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; Working Group on Arrhythmias and Cardiac Pacing

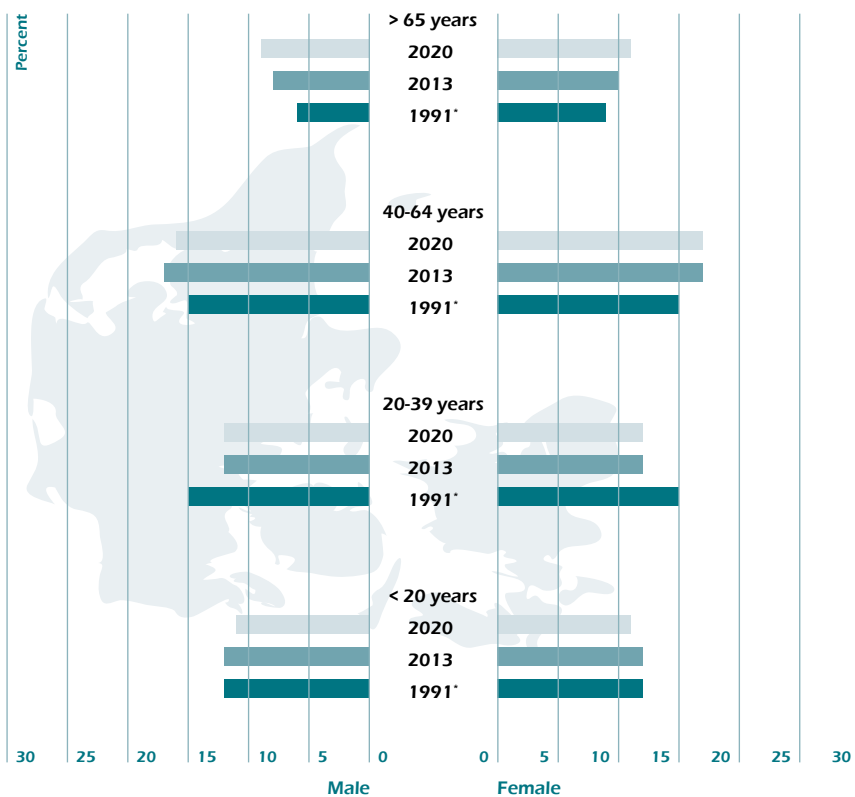
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Registries
• Sales data
• Estimation

DENMARK



1. Statistics

Age pyramid for Denmark



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	349,6	2010
Density of physicians (per 1.000 population)	3,5	2009
Density of nurses (per 1.000 population)	15,7	2009

Demographic information		
Population	5.556.452	2013
Population annual growth rate (%)	0,2	2013
Life expectancy at birth	79	2013
Death rate (per 1.000 population)	9,4	2011
Live births (per 1.000 population)	11,2	2011

Economic information		
Gross domestic product (U.S dollar-billions)	324,29	2013*
Gross domestic product per capita (U.S dollar-units)	57.998,67	2013*
Total expenditure on health as % of GDP	11,2	2011
General government expenditure on health as % of total expenditure on health	85,1	2010
Private expenditure on health as % of total expenditure on health	14,9	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	25%*

* data from 2012

3. Healthcare System

National Health System.

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

Requirements: none

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
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
--	-----

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiac Electrophysiologist (Cardiologist)
ICD or pacemaker implants	Yes	Cardiologist with specialized training in device implantations – often an electrophysiologist

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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Training centres availability	
Pacemaker	11
ICD implantation	6
CRT implantation	5
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	6

Number of universities (Schools of Medicine)	4
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Percentage of academic centres among all practicing EP centres	83%
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Percentage of academic centres among all practicing implanting devices centres	45%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	9	11
Total Pacemaker units implanted	4.663	4.725
Thereof, New implants	3.516	3.543
Thereof, Replacements	1.157	1.182

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	6	5
Total CRT units implanted	941	1.001
Thereof, CRT pacemaker	337	405
Thereof, CRT ICD	604	596

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	6	6
Total ICD units implanted	1.207	1.285
Thereof, Single chamber	825	982
Thereof, Dual chamber	382	303
First implants	896	890
Replacements	311	395

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	9	11
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		
	2012	2013
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
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National registry for		
		Official name
ICD	Yes	The Danish Pacemaker and ICD register
Pacing	Yes	The Danish Pacemaker and ICD register
Electrophysiology	Yes	Ablation.dk

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

Official name: National Board of Health

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		
	2012	2013
Number of ablation centres	7	6
Number of ablations performed	3.271	3.622
Mean number of ablations per centre	467	604
Number of AF ablations	1.450	1.609
Number of ablation centres (> 50 AF ablations)	6	6
Number of ablation centres (> 10 VT ablations on structural heart diseases)	5	5

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.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance*				
	1	2	3	4	5
Lack of centres	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐
Lack of referral	☒	☐	☐	☐	☐
Lack of trained personnel	☒	☐	☐	☐	☐
Low awareness of guidelines	☒	☐	☐	☐	☐
Lack of operators	☒	☐	☐	☐	☐
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

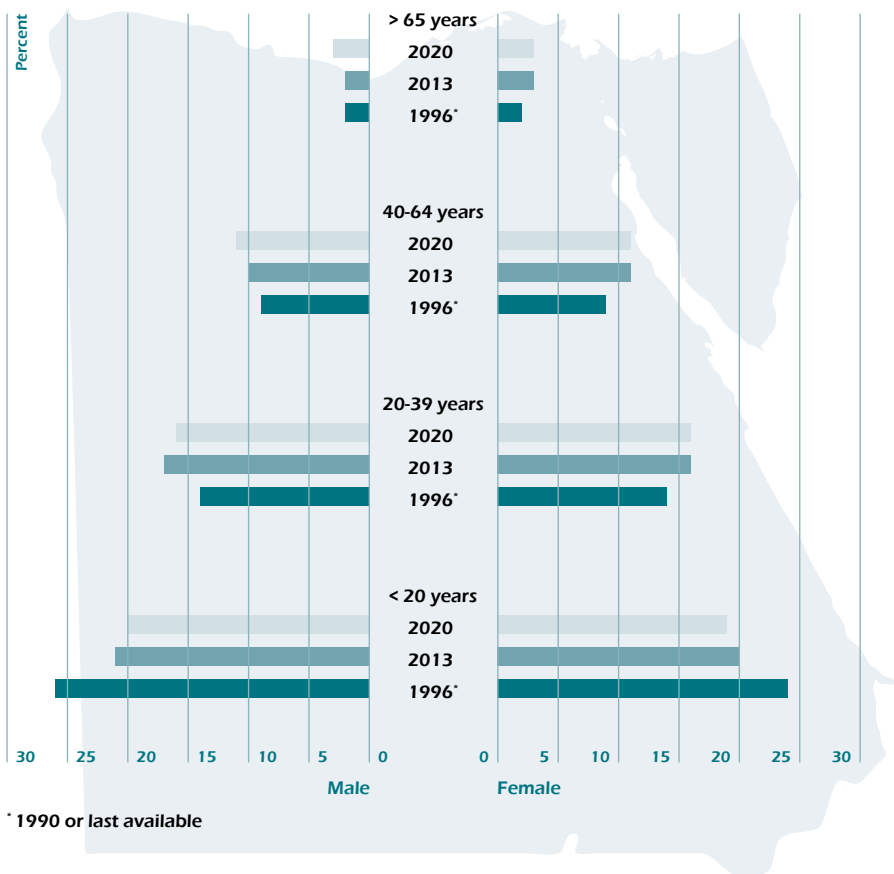
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Danish Pacemaker and ICD registry
· Ablation.dk

EGYPT



1. Statistics

Age pyramid for Egypt



Healthcare data		
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		
Population	85.294.388	2013
Population annual growth rate (%)	1,9	2013
Life expectancy at birth	73	2013
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available

Economic information		
Gross domestic product (U.S dollar-billions)	262,03	2013*
Gross domestic product per capita (U.S dollar-units)	3.113,84	2013*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	39,2	2010
Private expenditure on health as % of total expenditure on health	60,8	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

3. Healthcare System

Egypt has a segmented health system. There are different public and private providers and financing agents. The main agents are: the government sector, public sector (known as Health Insurance Organization, the Curative Care Organization (CCO) and private organizations. Governmental healthcare sector include the Ministry of Health, University and teaching Hospitals, Military and Police Hospitals.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	75%	65%
Uninsured citizens	25%	35%

Distribution of insurance modality		
	2012	2013
Public insurance company	60%	64%
Private insurance company	10%	1%
Private co-payment	5%	30-40%*

* No defined pricing for co-payment. It represents an undefined component in each category representing between 30-40%. It is better defined in private insurance companies depending on the coverage agreement and personal payments.

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

Co-payment necessary for the following therapy

ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

Comments: Private Insurance companies pay all devices and procedures up to CRT-D and 3D mapping/ablation procedures, however this covers only 1% of the general population.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☒	☐	☐	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Comments: For the Public Insurance it is insufficient and not related to the complexity or duration of the procedure.

For the Public Insurance it is insufficient and not related to the complexity or duration of the procedure.

Treatment availability

No restrictions	☒
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

Comments: Guidelines usually followed include ESC/AHA/ACC. However, these are not prerequisites for performing or payment for procedures.

4. Education

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	EPS Diploma of the ECRA
Invasive electrophysiology	☐	☒	☐	☐	EPS Diploma of the ECRA
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologists, Electrophysiologists. There is one exception only in one department (Critical Care Department in Cairo University). Critical Care physicians are allowed to train in and perform EP procedures and device therapy.
ICD or pacemaker implants	Yes	Cardiologists, not necessarily electrophysiologists. There is one exception only in one department (Critical Care Department in Cairo University). Critical Care physicians are allowed to train in and perform EP procedures and device therapy after training.

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes	3 years
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Suggested period of training to perform implantations	Yes	3 years
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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%
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Percentage of academic centres among all practicing implanting devices centres	28%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	28		28
Total Pacemaker units implanted	2.500		2.850
Thereof, New implants	not available		not available
Thereof, Replacements	not available		not available

Specialist performing implants			
Cardiologists		Yes	60%
Surgeons		Yes	10%
Other: Critical Care Physicians (Cairo University)		Yes	30%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	11		13
Total CRT units implanted	354		414
Thereof, CRT pacemaker	284		339
Thereof, CRT ICD	70		75

Specialist performing implants			
Cardiologists		Yes	65%
Surgeons		No	0%
Other: Critical Care Physicians		Yes	35%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	11	13
Total ICD units implanted	151	178
Thereof, Single chamber	138	142
Thereof, Dual chamber	13	36
First implants	not available	0
Replacements	not available	not available

Specialist performing implants		
Cardiologists	Yes	65%
Surgeons	No	0%
Other: Critical Care Physicians	Yes	35%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	3	2
Total loop recorders implanted	5	3

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	No	0%
Other: Critical Care Physicians	Yes	10%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	2	2
Total lead extraction procedures	26	15

Specialist performing lead extractions		
Cardiologists	Yes	80%
Surgeons	No	0%
Other: Critical Care Physicians	Yes	20%

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
--	----

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	11	13
Number of ablations performed	887	1.064
Mean number of ablations per centre	not available	82
Number of AF ablations	24	35
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	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 answer
European	Yes

Obstacles to guideline implementation	Ranking of importance*					
	1	2	3	4	5	
Lack of centres	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☐	☐	☒	☐	☐	2
Lack of trained personnel	☐	☒	☐	☐	☐	4
Low awareness of guidelines	☐	☒	☐	☐	☐	3
Lack of operators	☐	☒	☐	☐	☐	5
	1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

13. Sources

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

All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Survey from professional association · Sample short survey · Sales data · Estimation: Egyptian Cardiac Rhythm Association · Hospital Statistics

ESTONIA



1. Statistics

Age pyramid for Estonia



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	4,1	2011
Beds (per 100.000 population)	530,9	2011
Density of physicians (per 1.000 population)	3,3	2011
Density of nurses (per 1.000 population)	6,5	2011

Demographic information		
Population	1.266.375	2013
Population annual growth rate (%)	-0,7	2013
Life expectancy at birth	74	2013
Death rate (per 1.000 population)	11,4	2011
Live births (per 1.000 population)	11,0	2011

Economic information		
Gross domestic product (U.S dollar-billions)	24,28	2013*
Gross domestic product per capita (U.S dollar-units)	18.127,25	2013*
Total expenditure on health as % of GDP	6,0	2011
General government expenditure on health as % of total expenditure on health	78,9	2010
Private expenditure on health as % of total expenditure on health	20,3	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	54%	54%

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
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Requirements: 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		
	2012	2013
Insured citizens	95%	not available
Uninsured citizens	5%	not available

Distribution of insurance modality		
	2012	2013
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	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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability	
No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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	Yes	100 implantations
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Suggested period of training to perform implantations	No
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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
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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	30%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	5	5
Total Pacemaker units implanted	954	1.155
Thereof, New implants	854	1.001
Thereof, Replacements	91	154

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total CRT units implanted	68	70
Thereof, CRT pacemaker	42	41
Thereof, CRT ICD	26	29

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total ICD units implanted	101	104
Thereof, Single chamber	22	26
Thereof, Dual chamber	79	78
First implants	94	98
Replacements	7	6

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total loop recorders implanted	3	10

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
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	No	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
--	----

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		
	2012	2013
Number of ablation centres	2	2
Number of ablations performed	332	382
Mean number of ablations per centre	166	191
Number of AF ablations	34	71
Number of ablation centres (> 50 AF ablations)	0	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒
Lack of referral	☐	☐	☐	☒	☐
Lack of trained personnel	☒	☐	☐	☐	☐
Low awareness of guidelines	☐	☐	☒	☐	☐
Lack of operators	☒	☐	☐	☐	☐
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

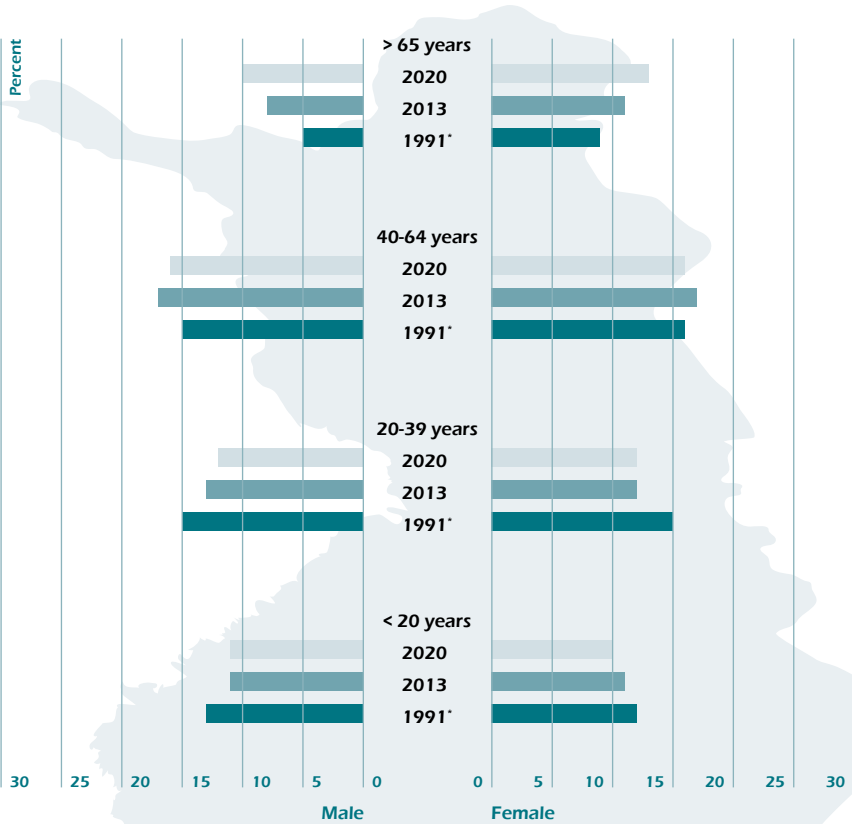
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· National Institute for Health Development - Data for 2012. No data for 2013
· Estonian Health Insurance Fund
· Estonian Society of Cardiology

FINLAND



1. Statistics

Age pyramid for Finland



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	5,1	2011
Beds (per 100.000 population)	552,2	2011
Density of physicians (per 1.000 population)	2,7	2008
Density of nurses (per 1.000 population)	10,7	2010

Demographic information		
Population	5.266.114	2013
Population annual growth rate (%)	0,1	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	9,4	2011
Live births (per 1.000 population)	11,1	2011

Economic information		
Gross domestic product (U.S dollar-billions)	259,63	2013*
Gross domestic product per capita (U.S dollar-units)	47.625,45	2013*
Total expenditure on health as % of GDP	8,9	2011
General government expenditure on health as % of total expenditure on health	74,5	2010
Private expenditure on health as % of total expenditure on health	25,5	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	39,9%*	39%

* 2012 data have been updated

3. Healthcare System

Finland has a compulsory healthcare 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		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	75%	75,2%
Private insurance company	2%	3%
Private co-payment	23%	21,8%

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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐
Comments: The physician do not receive any additional reimbursement for any procedures in the public healthcare.					The hospitals 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	☒
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for	
	Specialist
Catheter ablation	No
ICD or pacemaker implants	No
Comments: There is no official specialty requirement, but in practice it is performed only by cardiologist or pediatric cardiologist.	

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
--	------------

Training centres availability	
Pacemaker	20
ICD implantation	19
CRT implantation	14
Electrophysiological studies and catheter ablation	7
Atrial fibrillation ablation	5

Number of universities (Schools of Medicine)	5
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Percentage of academic centres among all practicing EP centres	71%
---	------------

Percentage of academic centres among all practicing implanting devices centres	25%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	20		20
Total Pacemaker units implanted	5.208*		5.369
Thereof, New implants	3.956		4.184
Thereof, Replacements	1.252*		1.185

* 2012 data have been updated.

Specialist performing implants			
Cardiologists	Yes		95%
Surgeons	Yes		5%*
Other: Internal medicine	Yes		<1%

* only replacements

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	12		14
Total CRT units implanted	380		437
Thereof, CRT pacemaker	140*		158
Thereof, CRT ICD	240*		279

* 2012 data have been updated

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	19		19
Total ICD units implanted	874*		1.020
Thereof, Single chamber	not available		not available
Thereof, Dual chamber	not available		not available
First implants	655*		734
Replacements	219*		286

* 2012 data have been updated

Specialist performing implants			
Cardiologists		Yes	100%
Surgeons		No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		16
Total loop recorders implanted	not available		321

Specialist performing implants			
Cardiologists		Yes	100%
Surgeons		No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions			
	2012		2013
Hospitals performed lead extractions	5		5
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	Yes
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Official name; Finnish Medicines Agency

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

Official name; Finnish Medicines Agency

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	7	8
Number of ablations performed	2.183	2.203
Mean number of ablations per centre	312*	275
Number of AF ablations	577	654
Number of ablation centres (> 50 AF ablations)	4	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	3*	4

* 2012 data have been updated

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	☒	☐	☐	☐	☐	5
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐	6
Lack of referral	☐	☐	☐	☒	☐	1
Lack of trained personnel	☒	☐	☐	☐	☐	3
Low awareness of guidelines	☐	☐	☒	☐	☐	2
Lack of operators	☒	☐	☐	☐	☐	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 on Cardiac Arrhythmias and Pacing

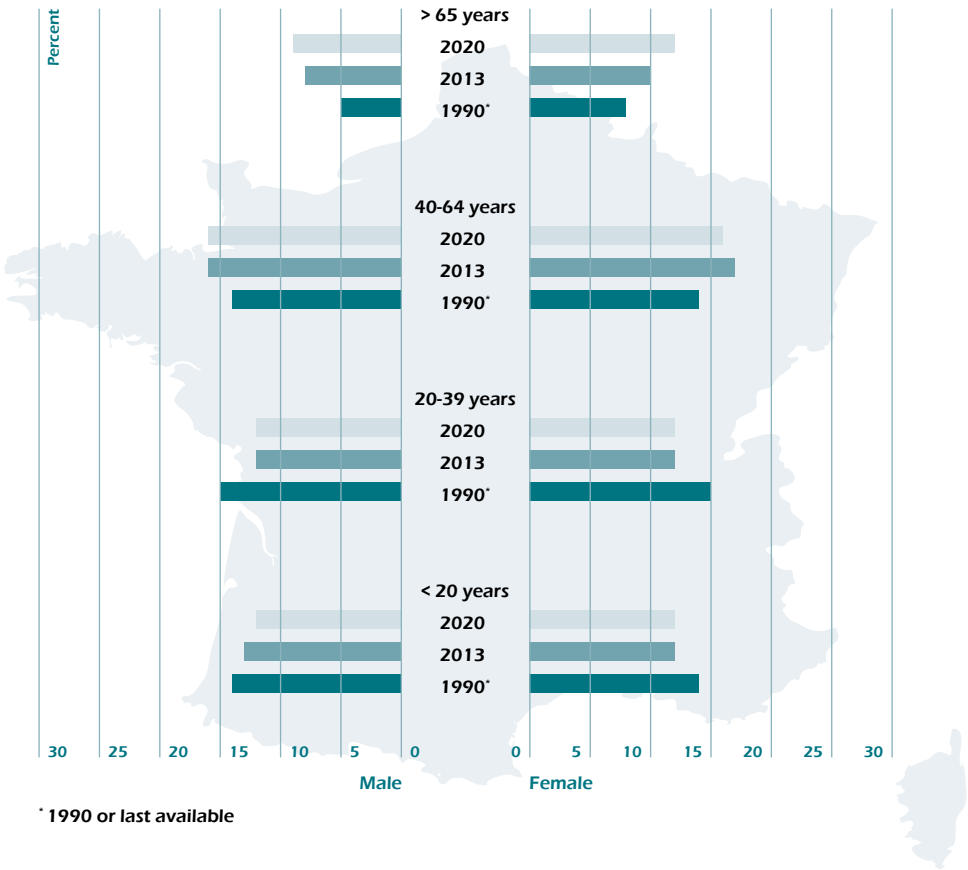
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • Statistics Finland • Ministry of Social Affairs and Health • Finnish Cardiac Society survey • Finnish Cardiac Society annual survey • Sales data • Estimation

FRANCE



1. Statistics

Age pyramid for France



Healthcare data		
Hospitals (per 100.000 population)	4,1	2011
Beds (per 100.000 population)	637,7	2011
Density of physicians (per 1.000 population)	3,2	2012
Density of nurses (per 1.000 population)	9,7	2012

Demographic information		
Population	65.951.611	2013
Population annual growth rate (%)	0,5	2013
Life expectancy at birth	82	2013
Death rate (per 1.000 population)	8,6	2009
Live births (per 1.000 population)	12,7	2009

Economic information		
Gross domestic product (U.S dollar-billions)	2.738,68	2013*
Gross domestic product per capita (U.S dollar-units)	42.990,85	2013*
Total expenditure on health as % of GDP	11,6	2011
General government expenditure on health as % of total expenditure on health	76,9	2010
Private expenditure on health as % of total expenditure on health	23,1	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	26%	not available

3. Healthcare System

National health system: public health system, completed by private insurances.

Basic insurance availability	Yes
Requirements: less than 3 months of residency.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	100%	55%
Private insurance company	0%	0%
Private co-payment	0%	45%

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☒	☐	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☒	☐	☐	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	Diplôme Interuniversitaire de Rythmologie et de Stimulation Cardiaque
Invasive electrophysiology	☒	☐	☐	☐	Diplôme Interuniversitaire de Rythmologie et de Stimulation Cardiaque
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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
Piot O, Anselme F, Bovéda S, Chauvin M, Daubert JC, Defaye P, Deharo JC, Gras D, Hermida JS, Kacet S, Klug D, Leenhardt A, le Heuzey JY, Mabo P, Pisapia A, Sadoul N, Salvador-Mazenq M, Cazeau S; on behalf of the Cardiac Rhythm and Pacing Group. Guidelines issued by the French Society of Cardiology concerning the competence, performance and environment required in the practice of diagnostic and interventional cardiac electrophysiology. Arch Cardiovasc Dis. 2011 Nov;104:586-590.	

Required period of training to perform implantations	Yes	2 years
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Suggested period of training to perform implantations	No
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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
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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	50%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	474	500
Total Pacemaker units implanted	62.846	60.000
Thereof, New implants	50.277	50.000
Thereof, Replacements	12.569	10.000

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	159	159
Total CRT units implanted	8.605	not available
Thereof, CRT pacemaker	3.103	not available
Thereof, CRT ICD	5.502	not available

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	148		148
Total ICD units implanted	6.986		not available
Thereof, Single chamber	3.714		not available
Thereof, Dual chamber	3.272		not available
First implants	5.589		not available
Replacements	1.397		not available

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	260		260
Total loop recorders implanted	1.600		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			
	2012		2013
Hospitals performed lead extractions	42		50
Total lead extraction procedures	2.000		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	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	Yes
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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		
	2012	2013
Number of ablation centres	195	not available
Number of ablations performed	31.000	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	8.500	not available
Number of ablation centres (> 50 AF ablations)	8.500	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	39	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐
Lack of referral	☒	☐	☐	☐	☐
Lack of trained personnel	☒	☐	☐	☐	☐
Low awareness of guidelines	☐	☐	☐	☒	☐
Lack of operators	☐	☒	☐	☐	☐
1 = no obstacle 5 = great obstacle * (1 = top; 6 = lowest)					

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
· Groupe de Rythmologie et de Stimulation de la Société Française de Cardiologie

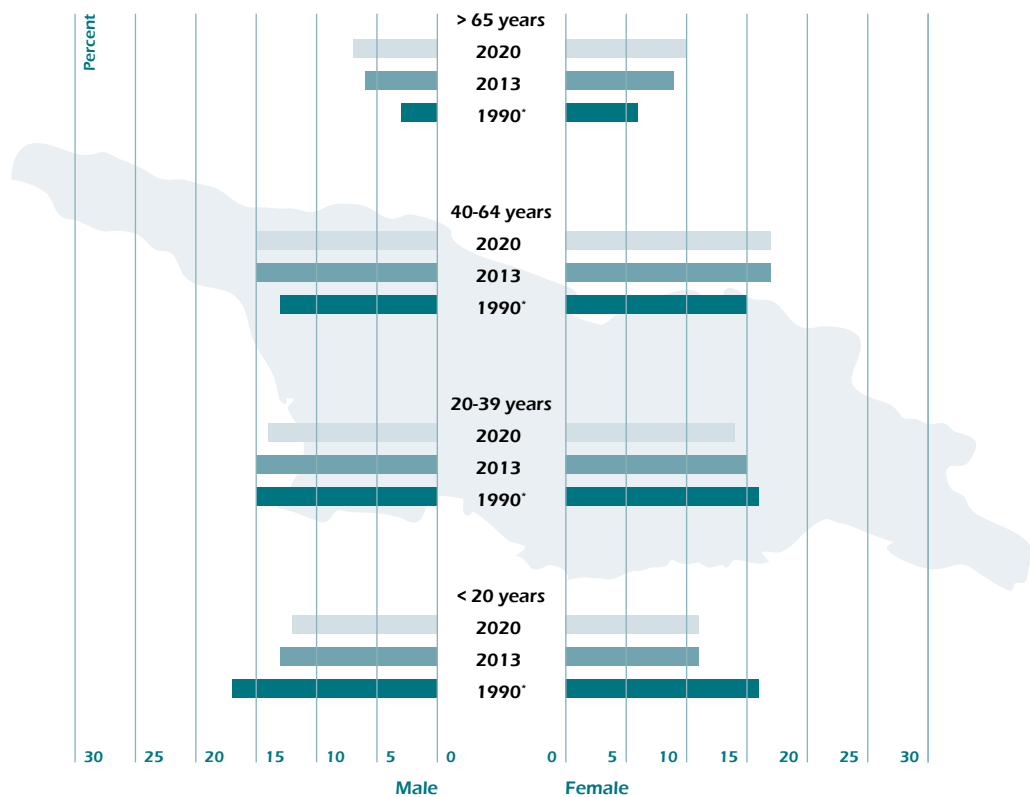
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Official statistics · Survey from professional association · Estimation

GEORGIA



1. Statistics

Age pyramid for Georgia



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	5,1	2012
Beds (per 100.000 population)	263,6	2012
Density of physicians (per 1.000 population)	4,2	2012
Density of nurses (per 1.000 population)	3,3	2012

Demographic information		
Population	4.942.157	2013
Population annual growth rate (%)	-0,2	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	10,7	2010
Live births (per 1.000 population)	12,9	2011

Economic information		
Gross domestic product (U.S dollar-billions)	15,95	2013*
Gross domestic product per capita (U.S dollar-units)	3.557,98	2013*
Total expenditure on health as % of GDP	9,4	2011
General government expenditure on health as % of total expenditure on health	23,6	2010
Private expenditure on health as % of total expenditure on health	76,4	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

3. Healthcare System

National health system and private insurance companies.

Basic insurance availability	Yes
Requirements: Not being insured with private insurance company.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	45%	not available
Uninsured citizens	55%	not available

Distribution of insurance modality		
	2012	2013
Public insurance company	25%	not available
Private insurance company	60%	not available
Private co-payment	15%	not available

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

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	Cardiology subspecialty (cardiac electrophysiology and management of heart rhythm disorders)
Invasive electrophysiology	☒	☐	☐	☐	Cardiology subspecialty (cardiac electrophysiology and management of heart rhythm disorders)
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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

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)	3
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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	50%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	9	9
Total Pacemaker units implanted	467	620
Thereof, New implants	398	not available
Thereof, Replacements	69	not available

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	6	6
Total CRT units implanted	33	40
Thereof, CRT pacemaker	6	6
Thereof, CRT ICD	27	34

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	7	7
Total ICD units implanted	53	59
Thereof, Single chamber	47	51
Thereof, Dual chamber	6	8
First implants	52	55
Replacements	1	4

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	2	5
Total loop recorders implanted	2	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		
	2012	2013
Hospitals performed lead extractions	not available	0
Total lead extraction procedures	not available	0



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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Reasons: Additional costs which are not funded.

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		
	2012	2013
Number of ablation centres	6	7
Number of ablations performed	344	269
Mean number of ablations per centre	57	38
Number of AF ablations	49	35
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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 answer
U.S.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance*					
	1	2	3	4	5	
Lack of centres	☐	☐	☐	☒	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☐	☐	☐	☐	☒	4
Lack of trained personnel	☐	☐	☐	☐	☒	3
Low awareness of guidelines	☐	☐	☐	☐	☒	2
Lack of operators	☐	☐	☐	☒	☐	5
	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

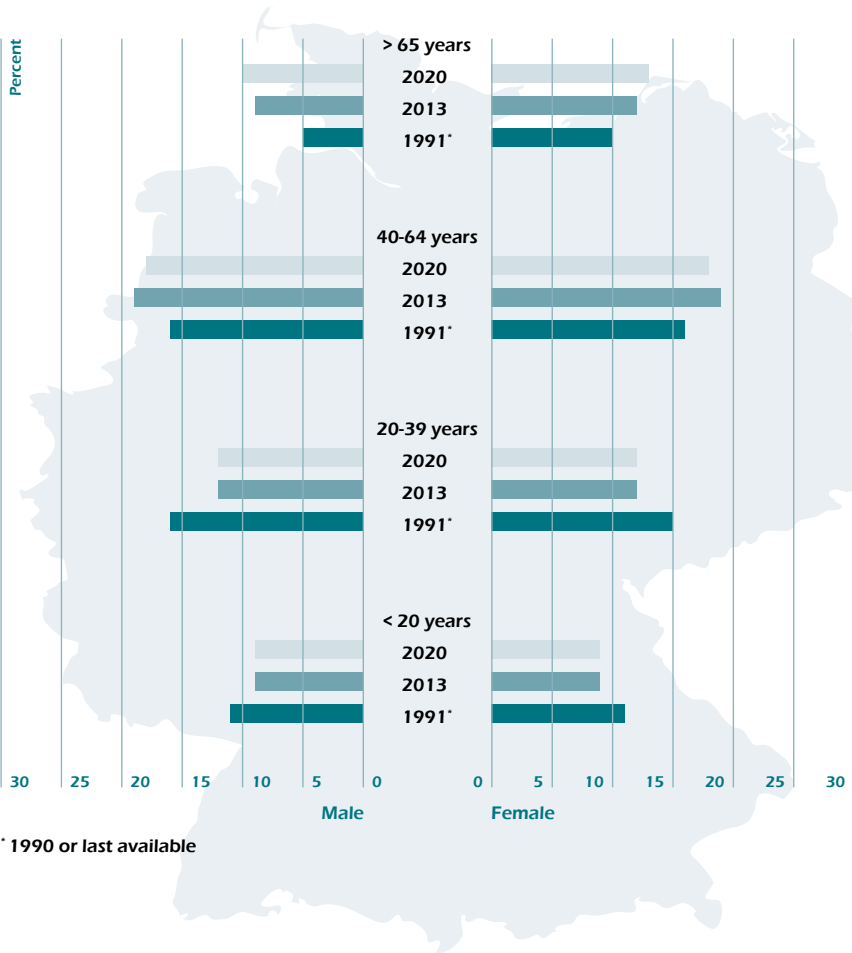
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Georgian Heart Rhythm Association
· Estimation

GERMANY



1. Statistics

Age pyramid for Germany



Healthcare data		
Hospitals (per 100.000 population)	4,0	2011
Beds (per 100.000 population)	822,4	2011
Density of physicians (per 1.000 population)	3,8	2011
Density of nurses (per 1.000 population)	11,5	2011

Demographic information		
Population	81.147.265	2013
Population annual growth rate (%)	-0,2	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	10,4	2011
Live births (per 1.000 population)	8,3	2010

Economic information		
Gross domestic product (U.S dollar-billions)	3.593,24	2013*
Gross domestic product per capita (U.S dollar-units)	43.952,01	2013*
Total expenditure on health as % of GDP	11,6	2011
General government expenditure on health as % of total expenditure on health	76,8	2010
Private expenditure on health as % of total expenditure on health	23,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	40%	not available

3. Healthcare System

Public and private insurances.

Basic insurance availability	No
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Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	98%
Uninsured citizens	not available	2%

Distribution of insurance modality		
	2012	2013
Public insurance company	not available	75%
Private insurance company	25%	10%
Private co-payment	25%	15%

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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☒	☐	☐	☒	☐	☐	☐
ICD primary prevention	☐	☒	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☒	☐	☐	☒	☐	☐	☐
CRT devices	☐	☒	☐	☐	☒	☐	☐	☐
Ablation	☐	☒	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	Zusatzqualifikation und Sachkunde Herzschrittmacher und Defibrillatoren; Zusatzqualifikation und Sachkunde Elektrophysiologie und Ablation; Ausbildungsstätte für Herzschrittmacher und Defibrillatoren; Ausbildungsstätte für Elektrophysiologie und Ablation
Invasive electrophysiology	☐	☒	☐	☐	Zusatzqualifikation und Sachkunde Elektrophysiologie und Ablation
Allied professionals	☐	☐	☐	☒	
Training centres	☐	☒	☐	☐	Ausbildungsstätte für Herzschrittmacher und Defibrillatoren; Ausbildungsstätte für Elektrophysiologie und Ablation

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist with additional qualification Zusatzqualifikation Elektrophysiologie und Ablation)
ICD or pacemaker implants	Yes Cardiologist or surgeon (Zusatzqualifikation und Sachkunde Herzschrittmacher und Defibrillatoren)

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
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Required period of training to perform implantations	Yes	15 months
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Suggested period of training to perform implantations	Yes	15 months
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Training centres availability	
Pacemaker	62
ICD implantation	62
CRT implantation	62
Electrophysiological studies and catheter ablation	52
Atrial fibrillation ablation	52

Number of universities (Schools of Medicine)	37
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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	50%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	1.048		1.010
Total Pacemaker units implanted	106.567		93.520
Thereof, New implants	not available		76.282
Thereof, Replacements	not available		17.238

Specialist performing implants			
Cardiologists	Yes		70%
Surgeons	Yes		20%
Other	Yes		10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	490		465
Total CRT units implanted	17.949		8.859
Thereof, CRT pacemaker	2.224		not available
Thereof, CRT ICD	15.725		8.859

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	670	654
Total ICD units implanted	26.536	27.241
Thereof, Single chamber	15.319	12.070
Thereof, Dual chamber	11.217	8.105
First implants	not available	20.175
Replacements	not available	7.066

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	20%
Other: Internal medicine	Yes	10%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	560	not available
Total loop recorders implanted	7.000	0

Specialist performing implants		
Cardiologists	Yes	80%
Surgeons	Yes	20%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	57	not available
Total lead extraction procedures	800	0



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

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
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Official name: Aqua institute

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: BEFARM

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	230	122
Number of ablations performed	38.000	33.420
Mean number of ablations per centre	250	274
Number of AF ablations	14.000	11.697
Number of ablation centres (> 50 AF ablations)	not available	99
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	81

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
European	Yes

Obstacles to guideline implementation	Ranking of importance*				
	1	2	3	4	5
Lack of centres	☐	☐	☐	☐	☒
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒
Lack of referral	☒	☐	☐	☐	☐
Lack of trained personnel	☐	☐	☒	☐	☐
Low awareness of guidelines	☐	☐	☐	☒	☐
Lack of operators	☐	☒	☐	☐	☐

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 Rhythmology of German Society of Cardiology

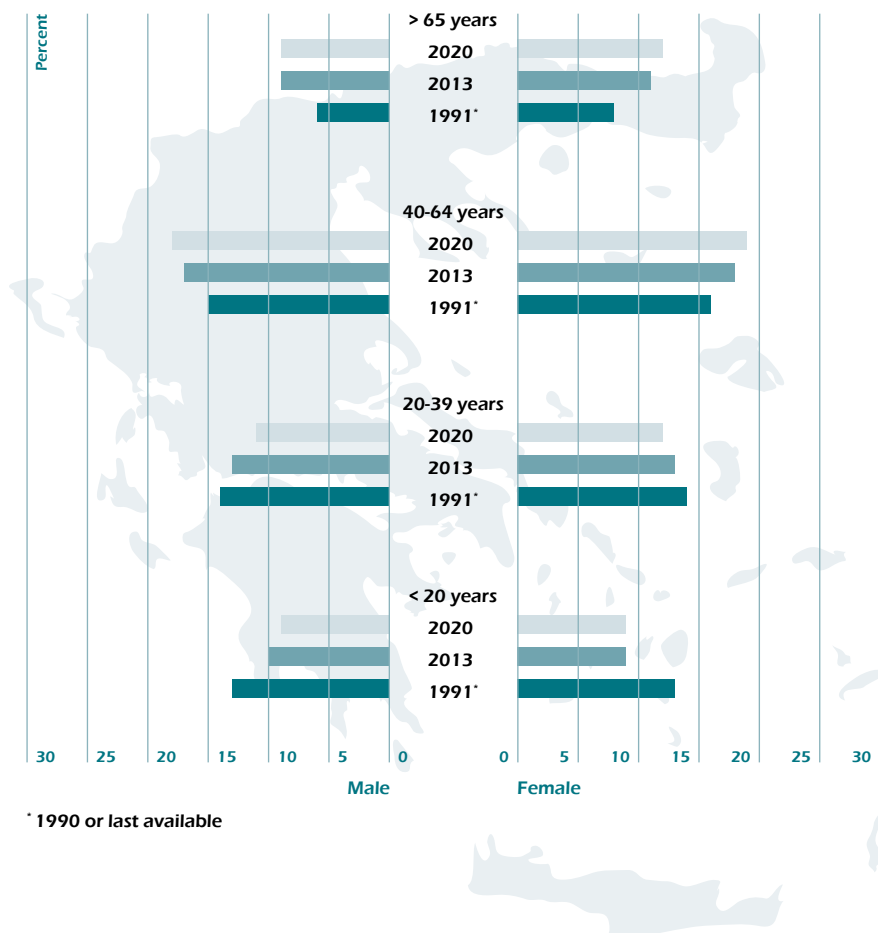
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Official statistics · Survey from professional association · Sample short survey · Estimation

GREECE



1. Statistics

Age pyramid for Greece



Healthcare data		
Hospitals (per 100.000 population)	2,8	2009
Beds (per 100.000 population)	484,9	2009
Density of physicians (per 1.000 population)	6,1	2011
Density of nurses (per 1.000 population)	3,5	2009

Demographic information		
Population	10.772.967	2013
Population annual growth rate (%)	0,1	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	9,8	2011
Live births (per 1.000 population)	9,4	2011

Economic information		
Gross domestic product (U.S dollar-billions)	243,33	2013*
Gross domestic product per capita (U.S dollar-units)	21.617,40	2013*
Total expenditure on health as % of GDP	9,0	2011
General government expenditure on health as % of total expenditure on health	61,5	2010
Private expenditure on health as % of total expenditure on health	38,5	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	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. (WHO 2004).

Basic insurance availability	Yes
Requirements: Citizens have to pay every year their contribution to the public insurance system.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	90%	85%
Uninsured citizens	10%	15%

Distribution of insurance modality		
	2012	2013
Public insurance company	89%	89%
Private insurance company	10%	10%
Private co-payment	1%	1%

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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	National accreditation for pacemaker and ICD therapy. It is required a minimum of one year of training at an implanting center.
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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	Yes	1 year
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Suggested period of training to perform implantations	Yes	1 year
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Training centres availability	
Pacemaker	15
ICD implantation	6
CRT implantation	8
Electrophysiological studies and catheter ablation	8
Atrial fibrillation ablation	6

Number of universities (Schools of Medicine)	7
---	----------

Percentage of academic centres among all practicing EP centres	25%
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Percentage of academic centres among all practicing implanting devices centres	12%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	56	56
Total Pacemaker units implanted	7.440	7.800
Thereof, New implants	5.505	5.750
Thereof, Replacements	1.934	2.050

Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	16	16
Total CRT units implanted	487	500
Thereof, CRT pacemaker	25	50
Thereof, CRT ICD	462	450

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	24	24
Total ICD units implanted	938	1,050
Thereof, Single chamber	168	210
Thereof, Dual chamber	770	840
First implants	751	815
Replacements	187	235

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	16	16
Total loop recorders implanted	105	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		
	2012	2013
Hospitals performed lead extractions	8	4
Total lead extraction procedures	25	30



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

10. Device specific

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

National registry for		
	Official name	
ICD	No	
Pacing	No	
Electrophysiology	Yes	There is a national registry of ablations

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		
	2012	2013
Number of ablation centres	29	29
Number of ablations performed	1.410	1.440
Mean number of ablations per centre	not available	50
Number of AF ablations	395	430
Number of ablation centres (> 50 AF ablations)	6	6
Number of ablation centres (> 10 VT ablations on structural heart diseases)	6	6

Availability of a national registry for interventional electrophysiology	Yes
Comments: There is a national registry of ablations.	

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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐
Lack of referral	☐	☒	☐	☐	☐
Lack of trained personnel	☒	☐	☐	☐	☐
Low awareness of guidelines	☐	☒	☐	☐	☐
Lack of operators	☐	☒	☐	☐	☐
1 = no obstacle 5 = great obstacle * (1 = top; 6 = lowest)					

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
• Greek National Working Group of Electrophysiology and Pacing

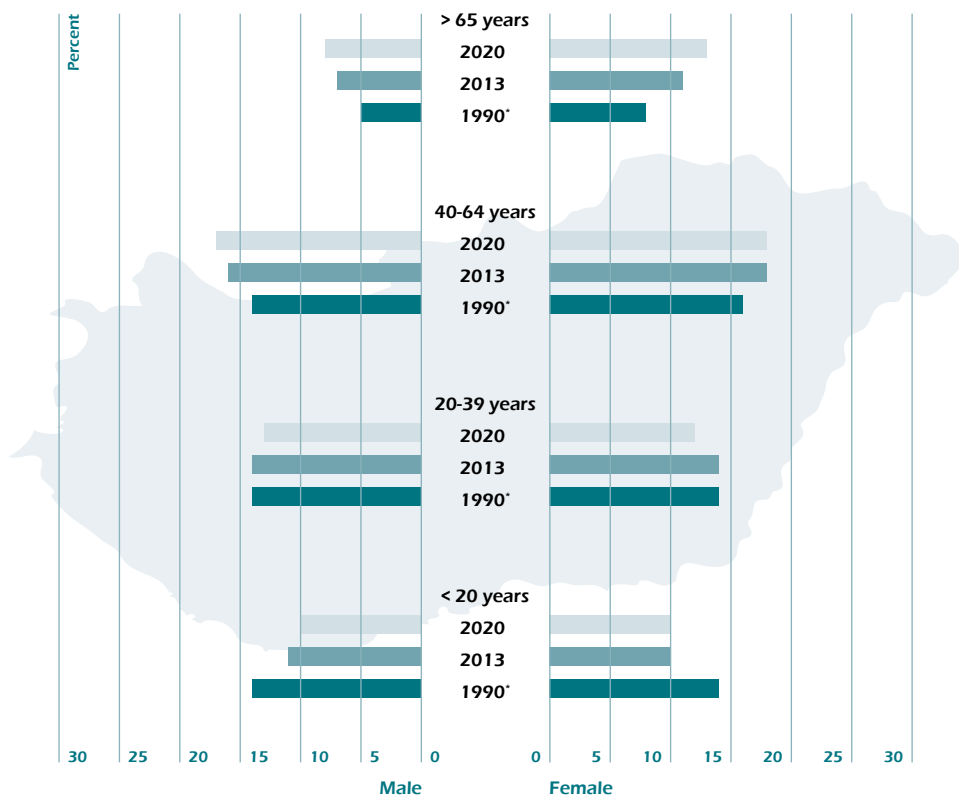
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • National Statistical Service of Greece • Hellenic Working Group of Cardiac Pacing and Electrophysiology • Sales data: Pacemaker Companies • Estimation

HUNGARY



1. Statistics

Age pyramid for Hungary



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	1,7	2011
Beds (per 100.000 population)	718,7	2011
Density of physicians (per 1.000 population)	3,0	2011
Density of nurses (per 1.000 population)	6,4	2011

Demographic information		
Population	9.939.470	2013
Population annual growth rate (%)	-0,2	2013
Life expectancy at birth	75	2013
Death rate (per 1.000 population)	12,9	2011
Live births (per 1.000 population)	8,8	2011

Economic information		
Gross domestic product (U.S dollar-billions)	130,56	2013*
Gross domestic product per capita (U.S dollar-units)	13.171,99	2013*
Total expenditure on health as % of GDP	7,8	2011
General government expenditure on health as % of total expenditure on health	64,8	2010
Private expenditure on health as % of total expenditure on health	35,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

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: Age under 18 or retired, or valid job contract, or regular payment of the insurance fee.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	98%	98%
Uninsured citizens	2%	2%

Distribution of insurance modality		
	2012	2013
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	Arrhythmologist Licence for Pacemaker/ICD/CRT (Device Therapy)
Invasive electrophysiology	☐	☒	☐	☐	Arrhythmologist Licence for Cardiac Electrophysiology and Ablation
Allied professionals	☐	☒	☐	☐	Arrhythmologist Licence for Pacemaker/ICD/CRT (Device Therapy) for allies professionals, Arrhythmologist Licence for Cardiac Electrophysiology and Ablation for allied professionals
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

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
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Suggested period of training to perform implantations	Yes	2 years
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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%
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Percentage of academic centres among all practicing implanting devices centres	25%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	16	17
Total Pacemaker units implanted	6.046	6.143
Thereof, New implants	4.742	4.733
Thereof, Replacements	1.304	1.410

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	5%
Other: Anaesthesiologist	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	13	13
Total CRT units implanted	884	984
Thereof, CRT pacemaker	497	483
Thereof, CRT ICD	387	501

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	2%
Other: Anaesthesiologist	Yes	3%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	13	14
Total ICD units implanted	844	940
Thereof, Single chamber	603	497
Thereof, Dual chamber	241	443
First implants	604	710
Replacements	240	230

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	5%
Other: Anaesthesiologist	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	0	11
Total loop recorders implanted	0	77

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	7	7
Total lead extraction procedures	73	126

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	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 centres.

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: National Health Insurance Fund

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	10	11
Number of ablations performed	3.129	3.356
Mean number of ablations per centre	313	305
Number of AF ablations	742	859
Number of ablation centres (> 50 AF ablations)	5	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	1

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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	3
Lack of referral	☐	☐	☐	☒	☐	1
Lack of trained personnel	☐	☒	☐	☐	☐	4
Low awareness of guidelines	☐	☐	☒	☐	☐	2
Lack of operators	☐	☒	☐	☐	☐	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

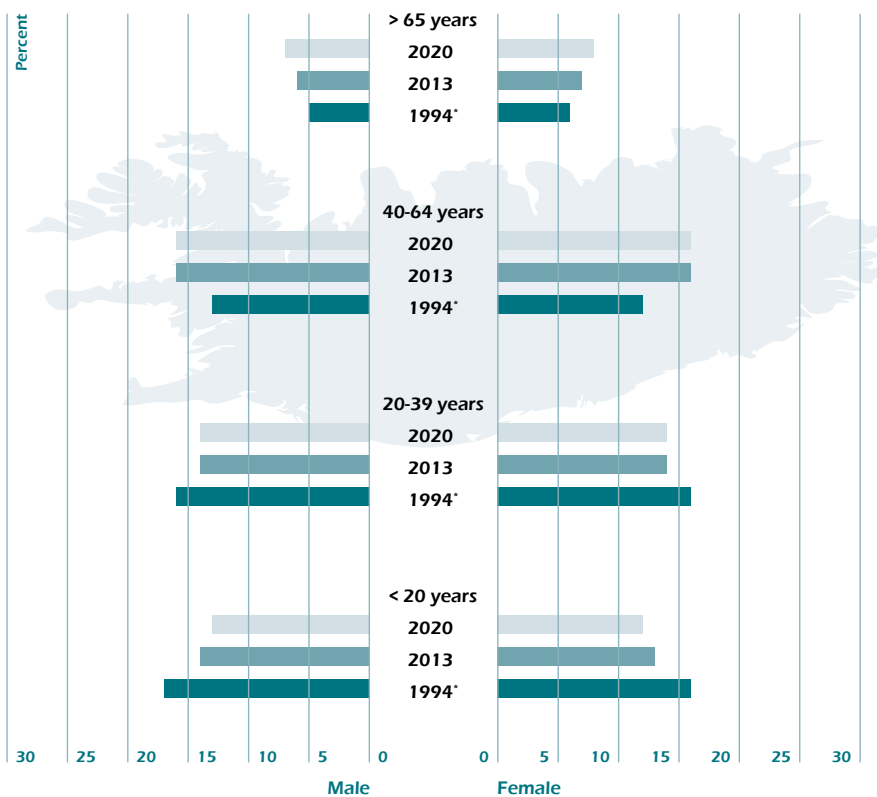
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· National Health Insurance Fund
· Working Group on Cardiac Arrhythmias and Pacing, Hungarian Society of Cardiology
· Estimation

ICELAND



1. Statistics

Age pyramid for Iceland



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	2,4	2012
Beds (per 100.000 population)	320,3	2012
Density of physicians (per 1.000 population)	3,5	2012
Density of nurses (per 1.000 population)	15,6	2012

Demographic information		
Population	315.281	2013
Population annual growth rate (%)	0,7	2013
Life expectancy at birth	81	2013
Death rate (per 1.000 population)	6,3	2009
Live births (per 1.000 population)	14,1	2011

Economic information		
Gross domestic product (U.S dollar-billions)	14,59	2013*
Gross domestic product per capita (U.S dollar-units)	45.314,89	2013*
Total expenditure on health as % of GDP	9,1	2011
General government expenditure on health as % of total expenditure on health	80,4	2010
Private expenditure on health as % of total expenditure on health	19,6	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	36%	45%

3. Healthcare System

Iceland has a public funded health care system with universal access for all citizens.

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

Requirements: All citizens who have lived in the country for a minimum of 6 months qualify.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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	No
--	-----------

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
Comments: All Icelandic physicians need to get their cardiology training outside of Iceland.	

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		
	2012	2013
Implanting centres	1	2
Total Pacemaker units implanted	303	314
Thereof, New implants	161	259
Thereof, Replacements	42	55

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total CRT units implanted	10	14
Thereof, CRT pacemaker	7	8
Thereof, CRT ICD	3	6

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	Yes	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total ICD units implanted	42	54
Thereof, Single chamber	25	29
Thereof, Dual chamber	17	25
First implants	33	31
Replacements	9	23

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	8	6

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	Yes	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
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	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		
	2012	2013
Number of ablation centres	1	1
Number of ablations performed	75	80
Mean number of ablations per centre	75	80
Number of AF ablations	24	23
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☐	☒	☐	☐	☐	5
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☐	☐	☒	☐	☐	6
Lack of trained personnel	☐	☐	☒	☐	☐	2
Low awareness of guidelines	☐	☐	☒	☐	☐	4
Lack of operators	☐	☒	☐	☐	☐	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 Icelandic Cardiac Society

All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Official statistics
• University Hospital data & statistics 2013
• Estimation

IRELAND



1. Statistics

Age pyramid for Ireland



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	2,1	2012
Beds (per 100.000 population)	294,8	2011
Density of physicians (per 1.000 population)	2,7	2012
Density of nurses (per 1.000 population)	12,2	2011

Demographic information		
Population	4.775.982	2013
Population annual growth rate (%)	1,1	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	6,1	2010
Live births (per 1.000 population)	16,3	2011

Economic information		
Gross domestic product (U.S dollar-billions)	220,89	2013*
Gross domestic product per capita (U.S dollar-units)	47.881,66	2013*
Total expenditure on health as % of GDP	9,4	2011
General government expenditure on health as % of total expenditure on health	69,2	2010
Private expenditure on health as % of total expenditure on health	30,8	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	33%	not available

3. Healthcare System

National Health system and Private Healthcare.

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

Requirements: All citizens entitled to national health service.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	48%	48%
Uninsured citizens	52%	52%

Distribution of insurance modality		
	2012	2013
Public insurance company	48%	48%
Private insurance company	52%	52%
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐
Comments: Above answers apply to the national health service where physicians are salaried. In the private healthcare system physicians are reimbursed per procedure.					Above answers apply to the national health service which operate under a fixed budget. In the private healthcare system the private hospitals are reimbursed per procedure.			

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	Majority are trained in USA in accredited programs
Invasive electrophysiology	☐	☒	☐	☐	Majority are trained in USA in accredited programs
Allied professionals	☐	☒	☐	☐	HRS exam is encouraged
Training centres	☐	☒	☐	☐	RCPI

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☒

Specialist required for		
	Specialist	
Catheter ablation	Yes	Majority are trained in USA in accredited programs
ICD or pacemaker implants	Yes	Majority are trained in USA in accredited programs

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Comments: Majority are trained in USA in accredited programs - accredited by ACC - HRS. There is not a separate accreditation process for the subspeciality of cardiac electrophysiology in Ireland as majority are trained in USA.	

Required period of training to perform implantations	Yes	6 years
Comments: Cardiology training program		

Suggested period of training to perform implantations	Yes	6 years
Comments: Cardiology training program		

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
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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	63%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	17		17
Total Pacemaker units implanted	2.129		2.288
Thereof, New implants	2.129		not available
Thereof, 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			
	2012		2013
Implanting centres	17		17
Total CRT units implanted	286		378
Thereof, CRT pacemaker	51		67
Thereof, CRT ICD	235		311

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	17	17
Total ICD units implanted	682	732
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	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		
	2012	2013
Implanting centres	17	17
Total loop recorders implanted	343	505

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
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
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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		
	2012	2013
Number of ablation centres	12	12
Number of ablations performed	1.000	1.000
Mean number of ablations per centre	83	83
Number of AF ablations	450	450
Number of ablation centres (> 50 AF ablations)	2	2
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐
Lack of referral	☒	☐	☐	☐	☐
Lack of trained personnel	☒	☐	☐	☐	☐
Low awareness of guidelines	☒	☐	☐	☐	☐
Lack of operators	☒	☐	☐	☐	☐

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

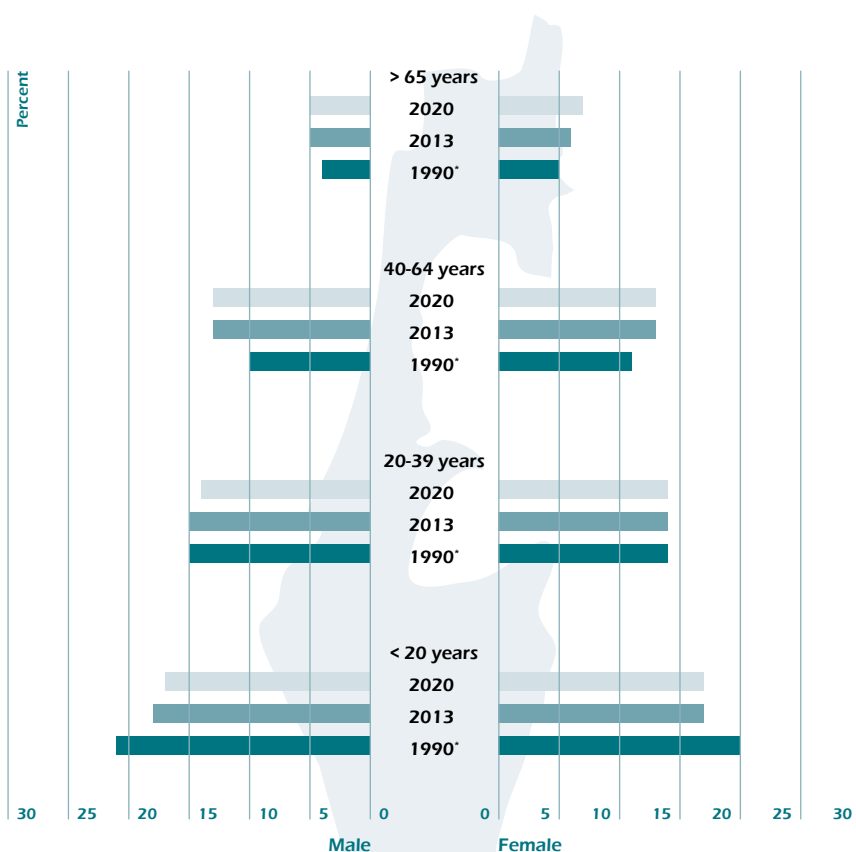
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Central Statistics Office, Health Insurance Authority Report
• Department of Health, Department of Finance
• Industry

ISRAEL



1. Statistics

Age pyramid for Israel



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	1,2	2012
Beds (per 100.000 population)	334,6	2012
Density of physicians (per 1.000 population)	3,3	2011
Density of nurses (per 1.000 population)	5,0	2011

Demographic information		
Population	7.707.042	2013
Population annual growth rate (%)	1,5	2013
Life expectancy at birth	81	2013
Death rate (per 1.000 population)	5,2	2010
Live births (per 1.000 population)	21,3	2011

Economic information		
Gross domestic product (U.S dollar-billions)	272,74	2013*
Gross domestic product per capita (U.S dollar-units)	34.651,38	2013*
Total expenditure on health as % of GDP	7,7	2011
General government expenditure on health as % of total expenditure on health	61,7	2010
Private expenditure on health as % of total expenditure on health	34,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	17%	not available

3. Healthcare System

National Health Care system; National Insurance; Private sector supplements.

Basic insurance availability	Yes
Requirements: None	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	80%	100%
Private insurance company	20%	0%
Private co-payment	0%	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

Comments: Yes, only in the private sector.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☒
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

Comments: Ministry of Health with Professional organizations.

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☒	☐	☐	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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
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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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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)	6
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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		
	2012	2013
Implanting centres	18	20
Total Pacemaker units implanted	4.236	3.966
Thereof, New implants	3.000	not available
Thereof, Replacements	1.236	not available

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	21	20
Total CRT units implanted	898	1.216
Thereof, CRT pacemaker	172	219
Thereof, CRT ICD	726	997

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	21	20
Total ICD units implanted	1.038	1.277
Thereof, Single chamber	417	544
Thereof, Dual chamber	621	733
First implants	677	not available
Replacements	361	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	21	20
Total loop recorders implanted	not available	240

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	5	5
Total lead extraction procedures	1	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	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		
	2012	2013
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	not available	not available
Number of ablation centres (> 50 AF ablations)	2	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	4	4

Availability of a national registry for interventional electrophysiology	No answer
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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	☒	☐	☐	☐	☐	2
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☐	☐	☐	☒	☐	4
Lack of trained personnel	☐	☐	☐	☒	☐	6
Low awareness of guidelines	☐	☐	☐	☒	☐	5
Lack of operators	☐	☒	☐	☐	☐	3

1 = no obstacle

5 = great obstacle

* (1 = top; 6 = lowest)

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
· Israeli Working Group for Pacing and Electrophysiology

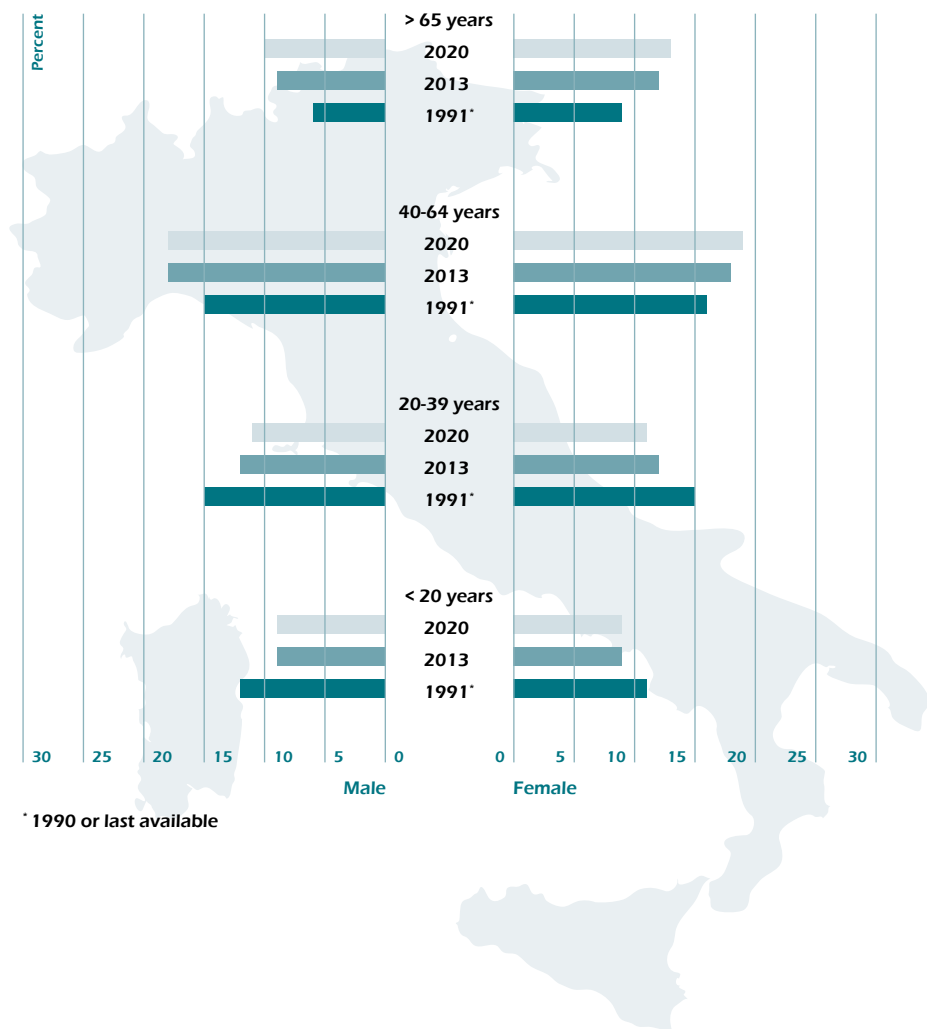
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Sales data · Estimation · Other

ITALY



1. Statistics

Age pyramid for Italy



Healthcare data		
Hospitals (per 100.000 population)	2,0	2011
Beds (per 100.000 population)	342,7	2011
Density of physicians (per 1.000 population)	4,1	2011
Density of nurses (per 1.000 population)	6,6	2011

Demographic information		
Population	61.482.297	2013
Population annual growth rate (%)	0,4	2013
Life expectancy at birth	82	2013
Death rate (per 1.000 population)	9,7	2010
Live births (per 1.000 population)	9,2	2010

Economic information		
Gross domestic product (U.S dollar-billions)	2.068,37	2013*
Gross domestic product per capita (U.S dollar-units)	33.909,12	2013*
Total expenditure on health as % of GDP	9,5	2011
General government expenditure on health as % of total expenditure on health	77,6	2010
Private expenditure on health as % of total expenditure on health	22,4	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	0,375%	not available

3. Healthcare System

National Healthcare System with the possibility of private insurance.

Basic insurance availability	Yes
Requirements: to be Italian citizen.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☒
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	AIAC (Italian Rhythmology and Cardiac Pacing Association) Certification
Invasive electrophysiology	☐	☒	☐	☐	AIAC (Italian Rhythmology and Cardiac Pacing Association) Certification
Allied professionals	☐	☒	☐	☐	AIAC (Italian Rhythmology and Cardiac Pacing Association) Certification
Training centres	☐	☒	☐	☐	AIAC (Italian Rhythmology and Cardiac Pacing Association) Certification

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

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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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)	35
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Percentage of academic centres among all practicing EP centres	7%
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Percentage of academic centres among all practicing implanting devices centres	10%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	400		420
Total Pacemaker units implanted	61.300		62.198
Thereof, New implants	44.700		34.831
Thereof, Replacements	16.600		27.367

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	350		361
Total CRT units implanted	11.900		12.148
Thereof, CRT pacemaker	1.900		2.010
Thereof, CRT ICD	10.000		10.138

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	360	365
Total ICD units implanted	12.000	12.556
Thereof, Single chamber	5.000	5.396
Thereof, Dual chamber	7.000	7.160
First implants	8.160	8.538
Replacements	3.840	4.018

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	350	365
Total loop recorders implanted	2.500	3.700

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
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
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National registry for		
		Official name
ICD	Yes	AIAC (Italian Rhythmology and Cardiac Pacing Association) RIP & RID
Pacing	Yes	AIAC (Italian Rhythmology and Cardiac Pacing Association) RIP & RID
Electrophysiology	Yes	AIAC (Italian Rhythmology and Cardiac Pacing Association) EPS 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	Yes
--	-----

Official name: Italian Ministry of Health

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
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 ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available

Availability of a national registry for interventional electrophysiology	Yes
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Official name; AIAC (Italian Rhythmology and Cardiac Pacing Association) Registry on EPS

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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐	1
Lack of referral	☐	☒	☐	☐	☐	3
Lack of trained personnel	☒	☐	☐	☐	☐	4
Low awareness of guidelines	☐	☐	☒	☐	☐	2
Lack of operators	☒	☐	☐	☐	☐	5
	1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
• A.I.A.C. - Associazione Italiana Aritmologia e Cardioritmo (Italian Rhythmology and Cardiac Pacing Association)

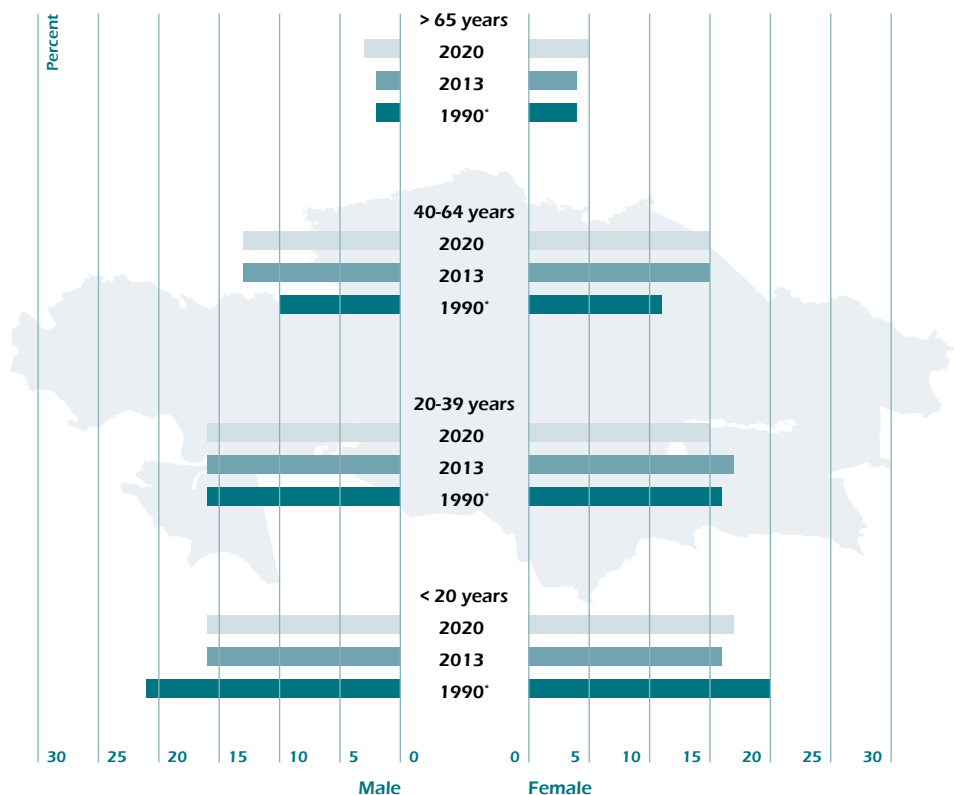
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • Ministry of Education • AIAC (Italian Rhythmology and Cardiac Pacing Association) Survey • Eucomed 2012-2013 • Registry

KAZAKHSTAN



1. Statistics

Age pyramid for Kazakhstan



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	5,7	2012
Beds (per 100.000 population)	717,1	2012
Density of physicians (per 1.000 population)	3,6	2012
Density of nurses (per 1.000 population)	8,2	2012

Demographic information		
Population	17.736.896	2013
Population annual growth rate (%)	1,2	2013
Life expectancy at birth	70	2013
Death rate (per 1.000 population)	8,9	2010
Live births (per 1.000 population)	22,5	2011

Economic information		
Gross domestic product (U.S dollar-billions)	224,86	2013*
Gross domestic product per capita (U.S dollar-units)	13.048,37	2013*
Total expenditure on health as % of GDP	3,9	2011
General government expenditure on health as % of total expenditure on health	59,1	2010
Private expenditure on health as % of total expenditure on health	40,9	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	29,9%	27%

3. Healthcare System

National Health System and there are private medical centres and private insurance companies.

Basic insurance availability	No
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Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality		
	2012	2013
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
--	-----

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	Licence
Invasive electrophysiology	☒	☐	☐	☐	Licence
Allied professionals	☒	☐	☐	☐	Licence
Training centres	☒	☐	☐	☐	Licence

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

Specialist required for		
		Specialist
Catheter ablation	Yes	Interventional arrhythmologist and clinical electrophysiologist
ICD or pacemaker implants	Yes	Interventional arrhythmologist and clinical electrophysiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes	1 year
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Suggested period of training to perform implantations	Yes	1 year
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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)	7
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Percentage of academic centres among all practicing EP centres	not available
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Percentage of academic centres among all practicing implanting devices centres	not available
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	22	27
Total Pacemaker units implanted	1.227	1.489
Thereof, New implants	1.174	1.396
Thereof, Replacements	113	93

Specialist performing implants		
Cardiologists	Yes	53%
Surgeons	Yes	47%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	6	9
Total CRT units implanted	153	209
Thereof, CRT pacemaker	42	26
Thereof, CRT ICD	111	183

Specialist performing implants		
Cardiologists	Yes	53%
Surgeons	Yes	47%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	5	12
Total ICD units implanted	116	221
Thereof, Single chamber	31	52
Thereof, Dual chamber	85	169
First implants	116	198
Replacements	0	23

Specialist performing implants		
Cardiologists	Yes	55%
Surgeons	Yes	45%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	4	6
Total loop recorders implanted	27	42

Specialist performing implants		
Cardiologists	Yes	47%
Surgeons	Yes	53%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	2	2
Total lead extraction procedures	2	not available

Specialist performing lead extractions		
Cardiologists	Yes	43%
Surgeons	Yes	57%

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		
	2012	2013
Number of ablation centres	7	7
Number of ablations performed	1.006	1.470
Mean number of ablations per centre	143,7	210
Number of AF ablations	195	268
Number of ablation centres (> 50 AF ablations)	2	2
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	14

Availability of a national registry for interventional electrophysiology	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☐	☐	☐	☒	☐
Low awareness of guidelines	☐	☐	☒	☐	☐
Lack of operators	☐	☒	☐	☐	☐

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

All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Official statistics
· Data from the Medical Centers



KOSOVO

Data not submitted.



KYRGYZSTAN

Data not submitted.



LATVIA



1. Statistics

Age pyramid for Latvia



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	3,4	2011
Beds (per 100.000 population)	588,4	2011
Density of physicians (per 1.000 population)	3,1	2011
Density of nurses (per 1.000 population)	5,2	2011

Demographic information		
Population	2.178.443	2013
Population annual growth rate (%)	-0,6	2013
Life expectancy at birth	73	2013
Death rate (per 1.000 population)	13,4	2010
Live births (per 1.000 population)	9,0	2011

Economic information		
Gross domestic product (U.S dollar-billions)	30,38	2013*
Gross domestic product per capita (U.S dollar-units)	14.923,99	2013*
Total expenditure on health as % of GDP	6,2	2011
General government expenditure on health as % of total expenditure on health	60,9	2010
Private expenditure on health as % of total expenditure on health	39,1	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	53,8%	53,2%

3. Healthcare System

National Health System. The Ministry of Healthcare and municipalities.

Basic insurance availability	Yes
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Requirements: National Health register system, Healthcare Economy Center sources.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	90%	88%
Private insurance company	10%	12%
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	No

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☒	☐	☐	☐	☒	☐	☐	☐
ICD primary prevention	☒	☐	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☒	☐	☐	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☒
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

Comments: ESC Guidelines, National Society of Cardiology Guidelines, Task Forces

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	National Society of Cardiology
Invasive electrophysiology	☒	☐	☐	☐	National Society of Cardiology
Allied professionals	☒	☐	☐	☐	National Society of Cardiology
Training centres	☒	☐	☐	☐	National Society of Cardiology

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐
Comments: National Society of Cardiology	

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
Official name: National Society of Cardiology	

Required period of training to perform implantations	Yes	1 year
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Suggested period of training to perform implantations	Yes	1 year
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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
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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		
	2012	2013
Implanting centres	3	3
Total Pacemaker units implanted	1.201	1.288
Thereof, New implants	947	996
Thereof, Replacements	254	292

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total CRT units implanted	76	63
Thereof, CRT pacemaker	25	17
Thereof, CRT ICD	51	46

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total ICD units implanted	70	88
Thereof, Single chamber	26	34
Thereof, Dual chamber	44	54
First implants	64	78
Replacements	6	10

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	2	3
Total loop recorders implanted	18	18

Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	1	1
Total lead extraction procedures	6	8

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

10. Device specific

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

National registry for		
	Official name	
ICD	Yes	
Pacing	Yes	
Electrophysiology	Yes	

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

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		
	2012	2013
Number of ablation centres	2	2
Number of ablations performed	589	518
Mean number of ablations per centre	not available	259
Number of AF ablations	58	64
Number of ablation centres (> 50 AF ablations)	1	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	1

Availability of a national registry for interventional electrophysiology	Yes
--	-----

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	☒	☐	☐	☐	☐	2
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☐	☐	☒	☐	☐	5
Lack of trained personnel	☐	☒	☐	☐	☐	3
Low awareness of guidelines	☒	☐	☐	☐	☐	6
Lack of operators	☐	☒	☐	☐	☐	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, Working Group of Arrhythmology

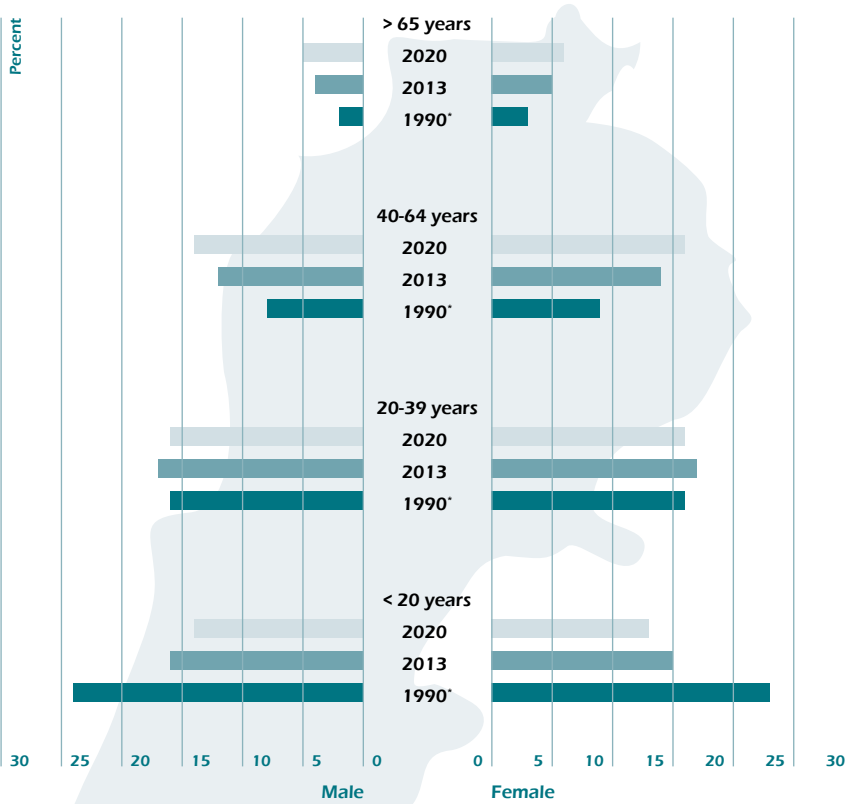
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · The Ministry of Healthcare · National Society of Cardiology · Working Group of Arrhythmology · National Health register system · Healthcare Economy Center sources

LEBANON



1. Statistics

Age pyramid for Lebanon



* 1990 or last available

Healthcare data		
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		
Population	4.131.583	2013
Population annual growth rate (%)	-0,2	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available

Economic information		
Gross domestic product (U.S dollar-billions)	43,49	2013*
Gross domestic product per capita (U.S dollar-units)	10.707,67	2013*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	27,0	2010
Private expenditure on health as % of total expenditure on health	73,0	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

3. Healthcare System

Most healthcare system is private, nearly 90% of hospitals are private. Governmental facilities are less likely to be equipped with advanced diagnostic and therapeutic medical tools.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	60%
Uninsured citizens	not available	40%

Distribution of insurance modality		
	2012	2013
Public insurance company	not available	25%
Private insurance company	not available	25%
Private co-payment	not available	10%

Possibility to subscribing to private health insurance plans	Not available
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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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☒	☐	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist, Electrophysiologist
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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Training centres availability	
Pacemaker	5
ICD implantation	5
CRT implantation	5
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	1

Number of universities (Schools of Medicine)	7
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Percentage of academic centres among all practicing EP centres	80%
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Percentage of academic centres among all practicing implanting devices centres	80%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	15
Total Pacemaker units implanted	not available	900
Thereof, New implants	not available	600
Thereof, Replacements	not available	300

Specialist performing implants		
Cardiologists	Yes	75%
Surgeons	Yes	20%
Other	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	5
Total CRT units implanted	not available	100
Thereof, CRT pacemaker	not available	10
Thereof, CRT ICD	not available	90

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	5%
Other	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	10
Total ICD units implanted	not available	300
Thereof, Single chamber	not available	150
Thereof, Dual chamber	not available	150
First implants	not available	200
Replacements	not available	100

Specialist performing implants		
Cardiologists	Yes	75%
Surgeons	Yes	20%
Other	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	3
Total loop recorders implanted	not available	6

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		
	2012	2013
Hospitals performed lead extractions	not available	5
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
--	----

Reasons: Network structure not available.

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		
	2012	2013
Number of ablation centres	not available	5
Number of ablations performed	not available	100
Mean number of ablations per centre	not available	20
Number of AF ablations	not available	not available
Number of ablation centres (> 50 AF ablations)	not available	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	0

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

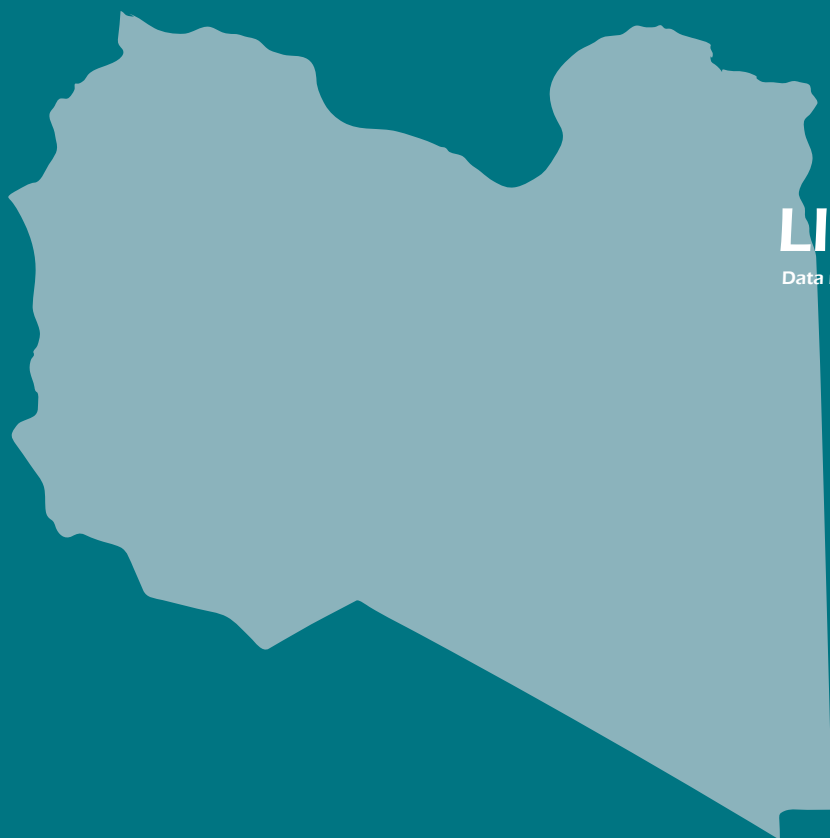
Obstacles to guideline implementation	Ranking of importance*				
	1	2	3	4	5
Lack of centres	☐	☐	☒	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☐	☐	☒	☐	☐
Low awareness of guidelines	☐	☐	☒	☐	☐
Lack of operators	☐	☐	☒	☐	☐

1 = no obstacle 5 = great obstacle * (1 = top; 6 = lowest)

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
· Lebanese Society of Cardiology (LSC), Arrhythmia Working Group (AW/G-LSC)

All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· Sample short survey · Sales data · Estimation



LIBYA

Data not submitted.

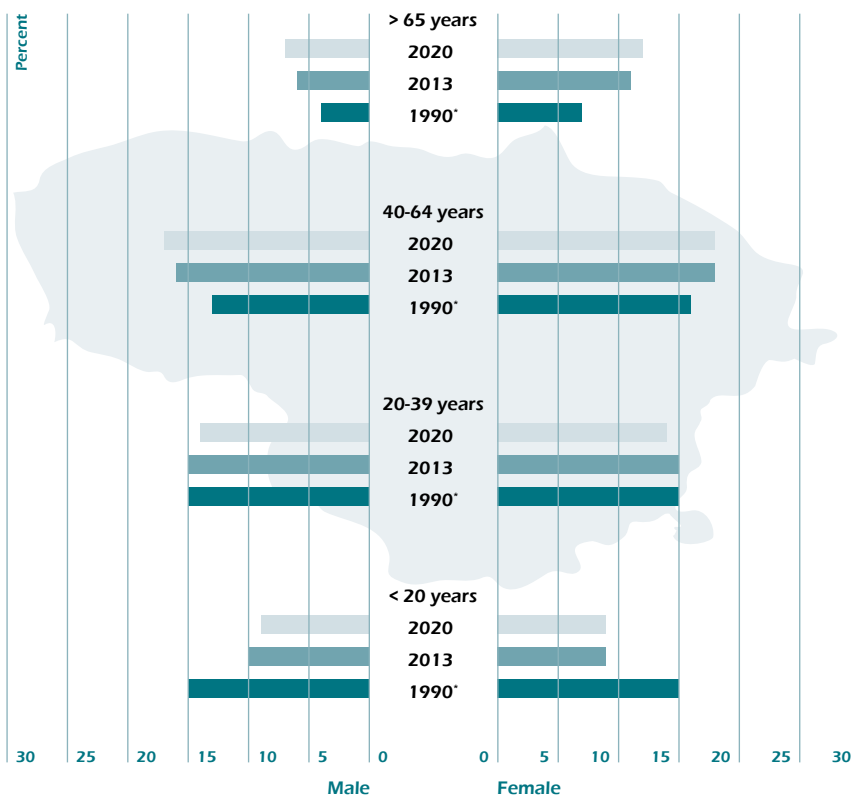


LITHUANIA



1. Statistics

Age pyramid for Lithuania



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	3,3	2011
Beds (per 100.000 population)	699,8	2011
Density of physicians (per 1.000 population)	3,9	2011
Density of nurses (per 1.000 population)	7,4	2011

Demographic information		
Population	3.515.858	2013
Population annual growth rate (%)	-0,3	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	12,8	2010
Live births (per 1.000 population)	10,7	2011

Economic information		
Gross domestic product (U.S dollar-billions)	46,71	2013*
Gross domestic product per capita (U.S dollar-units)	15.632,64	2013*
Total expenditure on health as % of GDP	6,6	2011
General government expenditure on health as % of total expenditure on health	72,9	2010
Private expenditure on health as % of total expenditure on health	27,1	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

3. Healthcare System

Medical expenses are paid by State Patient Fund.

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	98%	100%
Uninsured citizens	2%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	100%	98%
Private insurance company	0%	2%
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: Co-payment only for MRI-compliant pacemaker.



Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☐	☒
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist, no specific certificate necessary
ICD or pacemaker implants	Yes	Cardiologist or cardiac surgeon (for PM), no specific certificate necessary

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
--	-----------

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%
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Percentage of academic centres among all practicing implanting devices centres	50%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	4	4
Total Pacemaker units implanted	2.666	2.716
Thereof, New implants	2.245	2.302
Thereof, Replacements	421	414

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	3	3
Total CRT units implanted	139	165
Thereof, CRT pacemaker	111	134
Thereof, CRT ICD	28	31

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	3	3
Total ICD units implanted	149	124
Thereof, Single chamber	24	38
Thereof, Dual chamber	96	86
First implants	132	102
Replacements	17	22

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total loop recorders implanted	19	10

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	2	2
Total lead extraction procedures	10	11

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

10. Device specific

Availability of remote monitoring of devices	No
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Reasons: No reimbursement.

National registry for		
	Official name	
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	Yes
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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		
	2012	2013
Number of ablation centres	3	3
Number of ablations performed	856	840
Mean number of ablations per centre	285	280
Number of AF ablations	28	30
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☐	☐	☐	☒	☐	2
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	5
Lack of referral	☐	☐	☒	☐	☐	4
Lack of trained personnel	☐	☐	☒	☐	☐	3
Low awareness of guidelines	☐	☒	☐	☐	☐	6
Lack of operators	☐	☐	☐	☒	☐	1
	1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

13. Sources

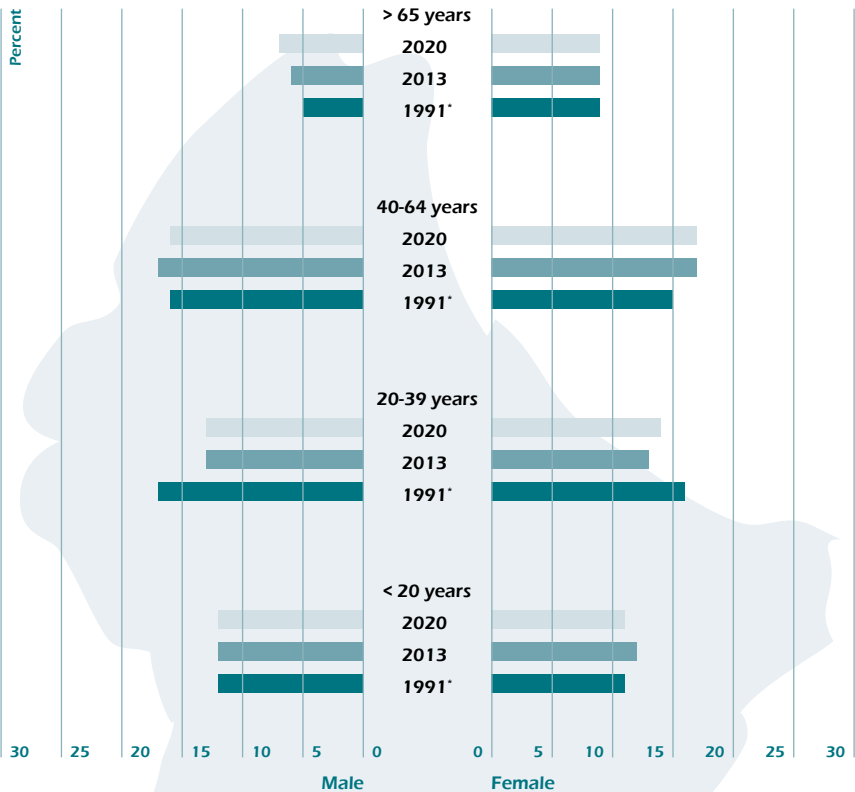
Name of National Cardiac Society, National Working Group or arrhythmia body
· Lithuanian Society of Cardiology, Working Group on Cardiac Pacing and Arrhythmias
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Survey from centre representatives

LUXEMBOURG



1. Statistics

Age pyramid for Luxembourg



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	2,3	2012
Beds (per 100.000 population)	536,7	2010
Density of physicians (per 1.000 population)	2,8	2012
Density of nurses (per 1.000 population)	12,3	2012

Demographic information		
Population	514.862	2013
Population annual growth rate (%)	1,1	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	7,2	2011
Live births (per 1.000 population)	10,9	2011

Economic information		
Gross domestic product (U.S dollar-billions)	60,54	2013*
Gross domestic product per capita (U.S dollar-units)	110.573,00	2013*
Total expenditure on health as % of GDP	7,7	2011
General government expenditure on health as % of total expenditure on health	84,3	2010
Private expenditure on health as % of total expenditure on health	15,7	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	34%	not available

3. Healthcare System

National health system.

Basic insurance availability	Yes
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Requirements: Paid 1/2 by yourself and 1/2 by your employer.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	100%	100%
Private insurance company	60%	not available
Private co-payment	60%	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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☒	☐	☐	☐	☐	☒	☐	☐
ICD primary prevention	☒	☐	☐	☐	☐	☒	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☐	☒	☐	☐
CRT devices	☒	☐	☐	☐	☐	☒	☐	☐
Ablation	☒	☐	☐	☐	☐	☒	☐	☐

Treatment availability

No restrictions	☒
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

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
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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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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
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Percentage of academic centres among all practicing EP centres	0%
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Percentage of academic centres among all practicing implanting devices centres	0%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	5	5
Total Pacemaker units implanted	316	188
Thereof, New implants	218	125
Thereof, Replacements	98	63

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total CRT units implanted	30	22
Thereof, CRT pacemaker	6	7
Thereof, CRT ICD	24	15

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total ICD units implanted	76	71
Thereof, Single chamber	34	41
Thereof, Dual chamber	18	15
First implants	62	58
Replacements	14	13

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	1	17

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	1	1
Total lead extraction procedures	9	not available

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 la Chirurgie cardiaque et Cardiologie Invasive)
Pacing	No	
Electrophysiology	Yes	INCCI (Institut National de la Chirurgie cardiaque et Cardiologie Invasive)

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

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	1	1
Number of ablations performed	153	129
Mean number of ablations per centre	153	129
Number of AF ablations	31	31
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0

Availability of a national registry for interventional electrophysiology	Yes
Official name: INCCI (Institut National de la Chirurgie cardiaque et Cardiologie Invasive)	

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	☐	☒	☐	☐	☐
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☒	☐	☐	☐	☐
Low awareness of guidelines	☐	☒	☐	☐	☐
Lack of operators	☐	☒	☐	☐	☐
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

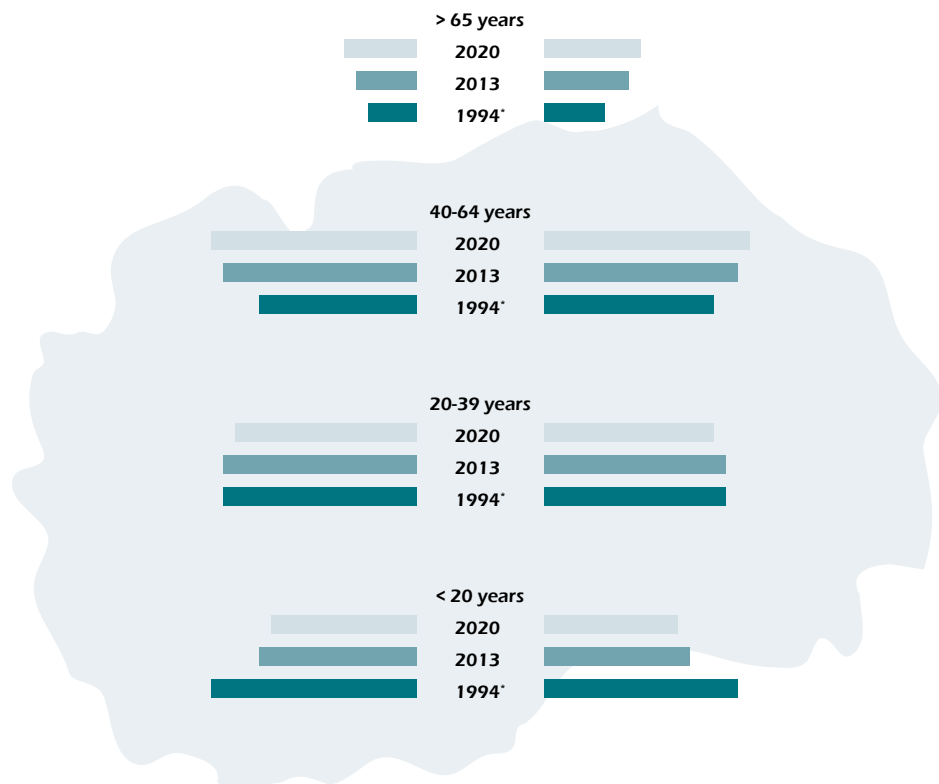
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· INCCI (Institut National de la Chirurgie cardiaque et Cardiologie Invasive), Ministry of Health
· Estimation

MACEDONIA FYR



1. Statistics

Age pyramid for Macedonia FYR



Healthcare data		
Hospitals (per 100.000 population)	3,2	2011
Beds (per 100.000 population)	449,6	2011
Density of physicians (per 1.000 population)	2,7	2011
Density of nurses (per 1.000 population)	4,2	2011

Demographic information		
Population	2.087.171	2013
Population annual growth rate (%)	0,2	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	9,3	2010
Live births (per 1.000 population)	11,8	2010

Economic information		
Gross domestic product (U.S dollar-billions)	10,51	2013*
Gross domestic product per capita (U.S dollar-units)	5.073,33	2013*
Total expenditure on health as % of GDP	6,6	2011
General government expenditure on health as % of total expenditure on health	61,8	2010
Private expenditure on health as % of total expenditure on health	38,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	52%	52%

3. Healthcare System

National Health System.

Basic insurance availability	Yes
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Requirements: Employment, social welfare, unemployment benefits, international health coverage for foreigners.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	90%	90%
Uninsured citizens	10%	10%

Distribution of insurance modality		
	2012	2013
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	No
Pacemakers	No
Ablation	No

Comments: Co-payment is not required in public hospitals, co-payment is required in private hospitals.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Comments: In private hospital physicians receive per process reimbursement.

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

Comments: No restrictions in private hospitals, but indications follow ESC guidelines.

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☒

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	Yes
Comments: Until proficiency and independent work is achieved.	

Suggested period of training to perform implantations	No
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Training centres availability	
Pacemaker	3
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	0

Number of universities (Schools of Medicine)	3
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Percentage of academic centres among all practicing EP centres	33,3%
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Percentage of academic centres among all practicing implanting devices centres	33,3%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	3	2
Total Pacemaker units implanted	345	322
Thereof, New implants	276	240
Thereof, Replacements	69	82

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total CRT units implanted	11	16
Thereof, CRT pacemaker	8	11
Thereof, CRT ICD	3	5

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total ICD units implanted	15	12
Thereof, Single chamber	9	8
Thereof, Dual chamber	4	4
First implants	13	8
Replacements	2	4

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total loop recorders implanted	2	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		
	2012	2013
Hospitals performed lead extractions	3	2
Total lead extraction procedures	6	0

Specialist performing lead extractions		
Cardiologists	Yes	33%
Surgeons	Yes	67%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		
		Official name
ICD	Yes	National society registry
Pacing	Yes	National society registry
Electrophysiology	Yes	National society 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
--	----

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	2	3
Number of ablations performed	62	80
Mean number of ablations per centre	31	27
Number of AF ablations	0	0
Number of ablation centres (> 50 AF ablations)	0	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☐	☒	☐	☐	☐
Low awareness of guidelines	☐	☐	☒	☐	☐
Lack of operators	☐	☒	☐	☐	☐

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 of Cardiology

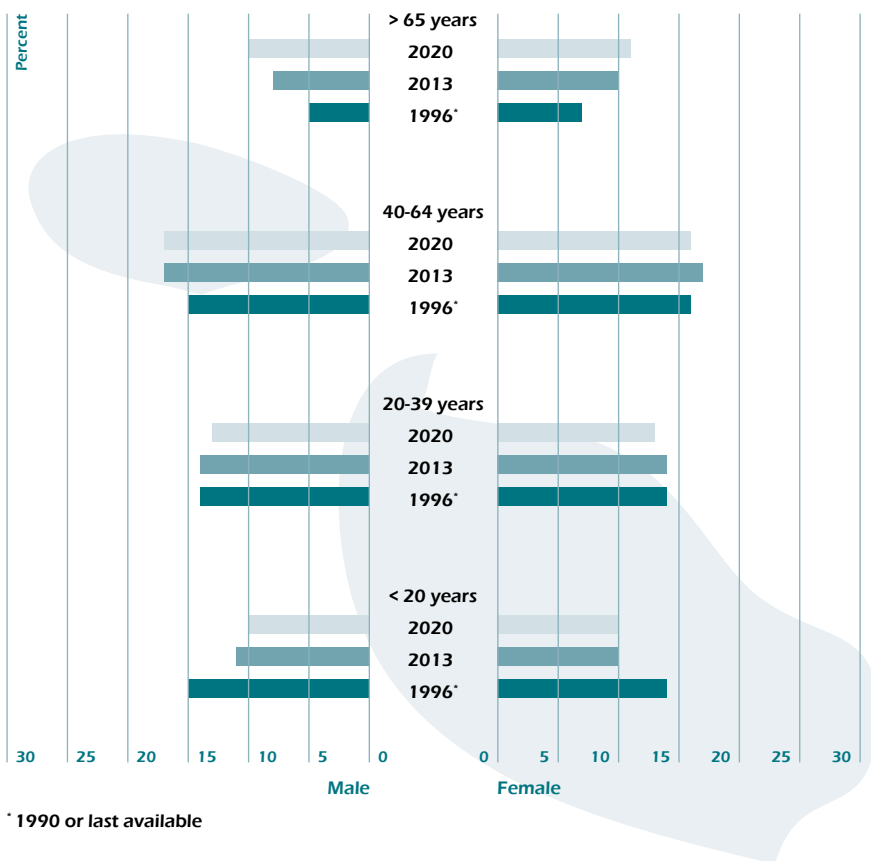
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Estimation
• Professional information
• Professional sources

MALTA



1. Statistics

Age pyramid for Malta



Healthcare data		
Hospitals (per 100.000 population)	1,9	2012
Beds (per 100.000 population)	478,5	2012
Density of physicians (per 1.000 population)	3,5	2012
Density of nurses (per 1.000 population)	7,1	2012

Demographic information		
Population	411.277	2013
Population annual growth rate (%)	0,4	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	7,9	2011
Live births (per 1.000 population)	10,3	2011

Economic information		
Gross domestic product (U.S dollar-billions)	9,32	2013*
Gross domestic product per capita (U.S dollar-units)	22.322,85	2013*
Total expenditure on health as % of GDP	8,7	2011
General government expenditure on health as % of total expenditure on health	64,2	2010
Private expenditure on health as % of total expenditure on health	33,3	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	35%	34%

3. Healthcare System

National Health System.

Basic insurance availability	Yes
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Requirements: National insurance contributions.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	100%	100%
Private insurance company	0%	0%
Private co-payment	0%	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

Comments: Yes only in the private sector.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☒
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐
Comments: National Guidelines, ESC, NICE, AHA.	

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☒	☐	☐	☐	Cardiology Accreditation
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Maltese National Society adopts ESC Guidelines.	

Required period of training to perform implantations	Yes	5 years
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Suggested period of training to perform implantations	Yes	2 years
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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
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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		
	2012	2013
Implanting centres	2	2
Total Pacemaker units implanted	264	227
Thereof, New implants	212	143
Thereof, Replacements	52	84

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total CRT units implanted	34	16
Thereof, CRT pacemaker	1	1
Thereof, CRT ICD	33	15

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total ICD units implanted	54	67
Thereof, Single chamber	0	11
Thereof, Dual chamber	17	56
First implants	17	47
Replacements	20	20

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	4	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		
	2012	2013
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	Yes
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National registry for		
		Official name
ICD	Yes	Maltese National Registry
Pacing	Yes	Maltese National Registry
Electrophysiology	Yes	Maltese National 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
--	----

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	1	1
Number of ablations performed	10	12
Mean number of ablations per centre	10	12
Number of AF ablations	0	1
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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.	Yes
European	Yes

Obstacles to guideline implementation	Ranking of importance*					
	1	2	3	4	5	
Lack of centres	☒	☐	☐	☐	☐	5
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	2
Lack of referral	☒	☐	☐	☐	☐	1
Lack of trained personnel	☒	☐	☐	☐	☐	4
Low awareness of guidelines	☒	☐	☐	☐	☐	6
Lack of operators	☒	☐	☐	☐	☐	3
	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

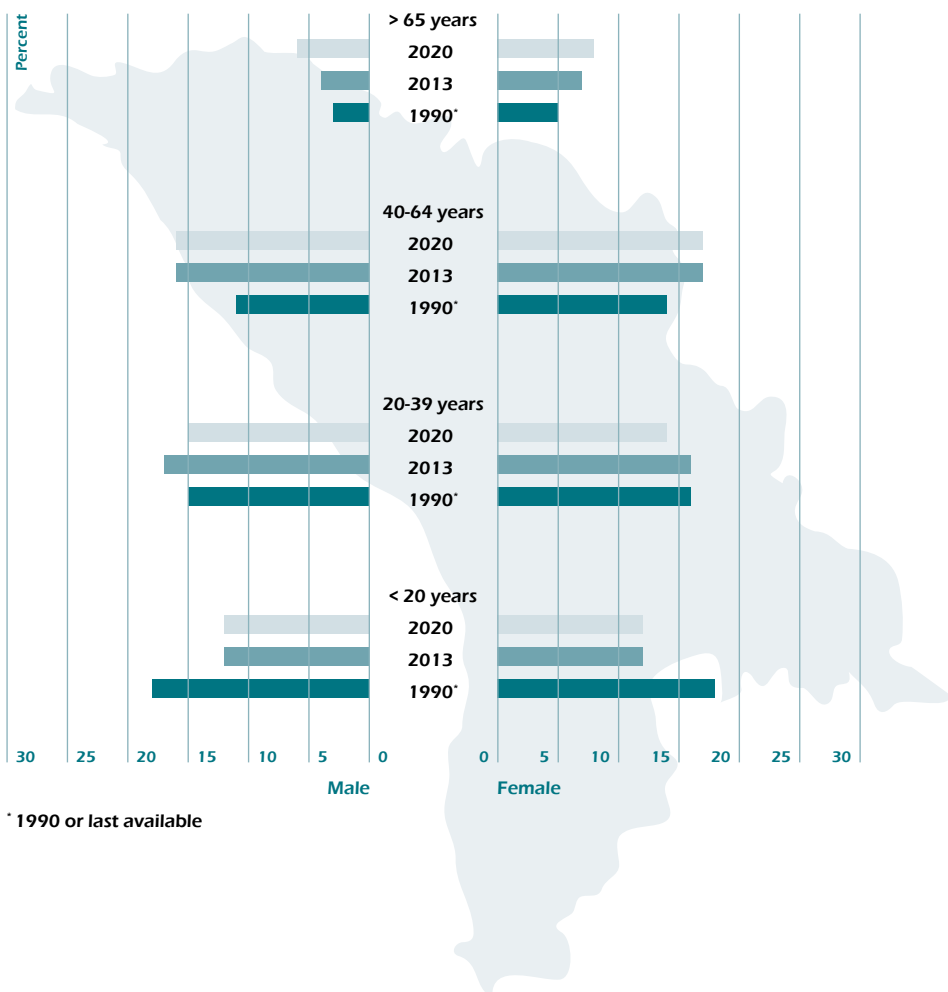
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· National Statistics

MOLDOVA



1. Statistics

Age pyramid for Moldova



Healthcare data		
Hospitals (per 100.000 population)	2,4	2012
Beds (per 100.000 population)	622,6	2012
Density of physicians (per 1.000 population)	2,8	2012
Density of nurses (per 1.000 population)	6,4	2012

Demographic information		
Population	3.619.925	2013
Population annual growth rate (%)	-1,0	2013
Life expectancy at birth	70	2013
Death rate (per 1.000 population)	11,1	2012
Live births (per 1.000 population)	11,1	2012

Economic information		
Gross domestic product (U.S dollar-billions)	7,88	2013*
Gross domestic product per capita (U.S dollar-units)	2.214,49	2013*
Total expenditure on health as % of GDP	11,4	2011
General government expenditure on health as % of total expenditure on health	45,8	2010
Private expenditure on health as % of total expenditure on health	54,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	58,2%

3. Healthcare System

National Healthcare System that includes primary medical assistance, hospital assistance, ambulance, mother and child care, preventive medicine, pharmaceutical assistance and forensic medicine dpt.

Basic insurance availability		Yes
Requirements: all population that has assurance (working population that has acquired policy, retired, students, children, handicapped).		

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	80%
Uninsured citizens	not available	19,9%

Distribution of insurance modality		
	2012	2013
Public insurance company	not available	99,95%
Private insurance company	not available	0,05%
Private co-payment	not available	0%

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

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☐	☒	☐	☐	☐	☒
ICD primary prevention	☐	☐	☐	☒	☐	☐	☐	☒
ICD secondary prevention	☐	☐	☐	☒	☐	☐	☐	☒
CRT devices	☐	☐	☐	☒	☐	☐	☐	☒
Ablation	☐	☐	☐	☒	☐	☐	☐	☒

Comments: Yet, in our country does not exist reimbursement system. ICD, CRT, IL, Ablation procedures not performed.

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

Comments: The number of procedures is limited due to financing from National Insurance Company.

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☒	☐	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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	Yes	1 year
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Suggested period of training to perform implantations	Yes	1 year
--	------------	---------------

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
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Percentage of academic centres among all practicing EP centres	0%
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Percentage of academic centres among all practicing implanting devices centres	not available
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Comments: A single institution provides implanting of pacemakers (Institute of Cardiology).

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	1
Total Pacemaker units implanted	not available	287
Thereof, New implants	not available	198
Thereof, Replacements	not available	89

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	0
Total CRT units implanted	not available	0
Thereof, CRT pacemaker	not available	0
Thereof, CRT ICD	not available	0

Specialist performing implants		
Cardiologists	No	0%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	0
Total ICD units implanted	not available	0
Thereof, Single chamber	not available	0
Thereof, Dual chamber	not available	0
First implants	not available	0
Replacements	not available	0

Specialist performing implants		
Cardiologists	No	0%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
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		
	2012	2013
Hospitals performed lead extractions	not available	1
Total lead extraction procedures	not available	2

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

10. Device specific

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

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

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		
	2012	2013
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 ablation centres (> 10 VT ablations on structural heart diseases)	not available	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	☐	☒	☐	☐	☐	2
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☒	☐	☐	☐	☐	
Lack of trained personnel	☒	☐	☐	☐	☐	
Low awareness of guidelines	☒	☐	☐	☐	☐	
Lack of operators	☒	☐	☐	☐	☐	

1 = no obstacle

5 = great obstacle

* (1 = top; 6 = lowest)

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
· Moldavian Society of Cardiology

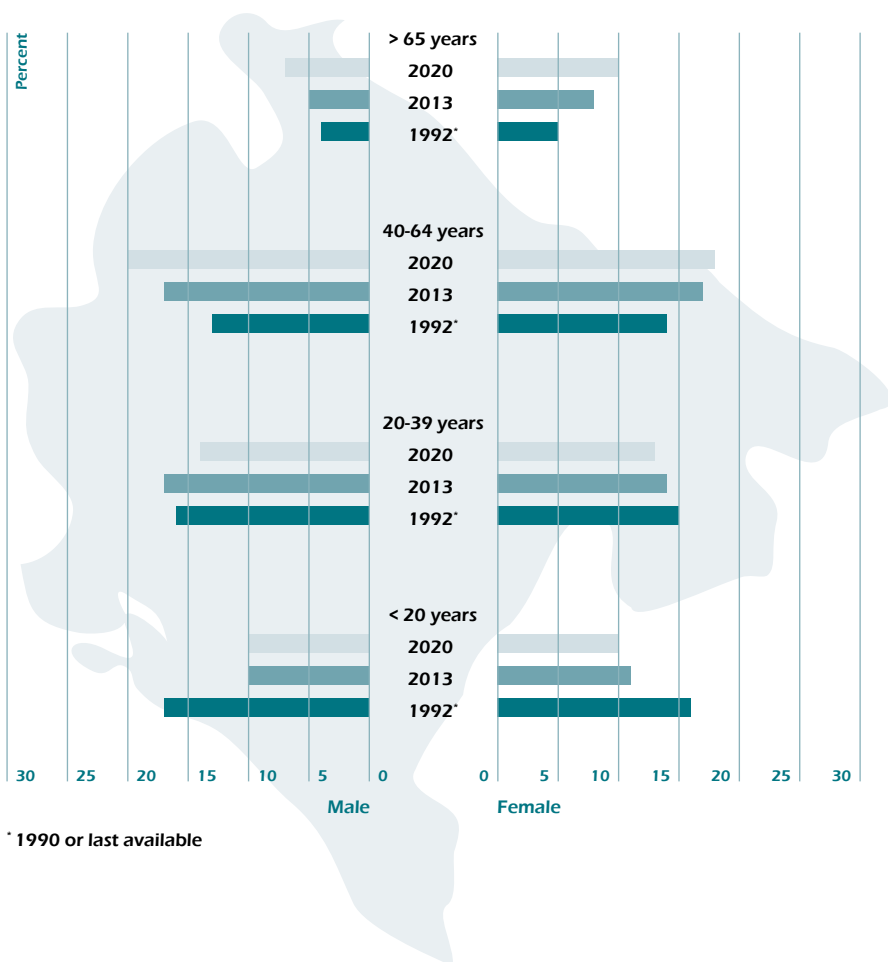
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· Official statistics
· Survey from professional association
· Sales data
· Estimation

MONTENEGRO



1. Statistics

Age pyramid for Montenegro



Healthcare data		
Hospitals (per 100.000 population)	1,8	2011
Beds (per 100.000 population)	397,4	2011
Density of physicians (per 1.000 population)	2,0	2011
Density of nurses (per 1.000 population)	5,3	2011

Demographic information		
Population	653.474	2013
Population annual growth rate (%)	-0,6	2013
Life expectancy at birth	78	2013
Death rate (per 1.000 population)	9,3	2009
Live births (per 1.000 population)	11,6	2011

Economic information		
Gross domestic product (U.S dollar-billions)	4,52	2013*
Gross domestic product per capita (U.S dollar-units)	7.252,31	2013*
Total expenditure on health as % of GDP	9,3	2011
General government expenditure on health as % of total expenditure on health	66,5	2010
Private expenditure on health as % of total expenditure on health	33,5	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	52%	54%

3. Healthcare System

All treatment charged by the National Insurance Fund.

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

Requirements: to be paid general health insurance.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	99%	not available
Uninsured citizens	1%	not available

Distribution of insurance modality		
	2012	2013
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐
Comments: Unfair division recognized and begun a project hazard kind of work and work-place.					Unfair division recognized and begun a project hazard kind of work and work-place.			

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐
Comments: We have a restricted budget so the waiting lists are too long.	

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	Education lasting 6 months in Pace maker Center in Belgrade, Serbia or in Center for pacemaker and electrophysiology Dedinje, Serbia.
Invasive electrophysiology	☒	☐	☐	☐	The Center for pacemaker and electrophysiology Dedinje, Belgrade, Serbia.
Allied professionals	☒	☐	☐	☐	They have to have a license practices given by the Medical Association of Montenegro.
Training centres	☐	☐	☐	☒	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Comments: We have two young cardiologists which performed procedures with collaboration and under supervision with allied professionalist.

Specialist required for		Specialist
Catheter ablation	Yes	We have two young cardiologists which performed procedures with collaboration and under supervision with allied professionalist.
ICD or pacemaker implants	Yes	Vascular surgeons and cardiologists perform ICD or pacemaker implantations.

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes	6 months
---	------------	-----------------

Suggested period of training to perform implantations	No
--	-----------

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		
	2012	2013
Implanting centres	1	1
Total Pacemaker units implanted	143	204
Thereof, New implants	119	194
Thereof, Replacements	24	10

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total CRT units implanted	19	10
Thereof, CRT pacemaker	10	5
Thereof, CRT ICD	9	5

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total ICD units implanted	29	38
Thereof, Single chamber	19	30
Thereof, Dual chamber	10	8
First implants	25	30
Replacements	4	8

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	2	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		
	2012	2013
Hospitals performed lead extractions	0	0
Total lead extraction procedures	0	0

Specialist performing lead extractions		
Cardiologists	Yes	50%
Surgeons	Yes	50%
Comments: we sent our patients abroad.		

10. Device specific

Availability of remote monitoring of devices	No
Comments: It is more expensive. We try for once but it does not function with the Central abroad.	

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		
	2012	2013
Number of ablation centres	1	1
Number of ablations performed	98	45
Mean number of ablations per centre	98	45
Number of AF ablations	0	0
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	4
Lack of referral	☐	☐	☒	☐	☐	3
Lack of trained personnel	☐	☐	☒	☐	☐	2
Low awareness of guidelines	☒	☐	☐	☐	☐	5
Lack of operators	☐	☒	☐	☐	☐	1

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 pacemakers and electrophysiology

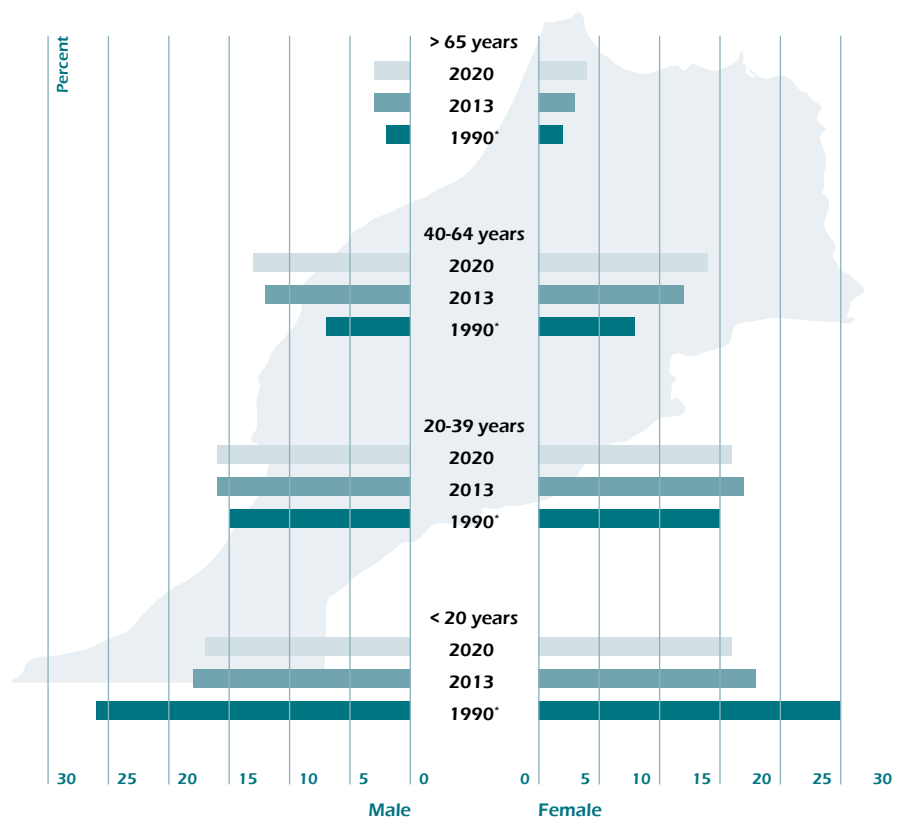
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Insitute of Public Health
· Ministry of Education
· Ministry of Health

MOROCCO



1. Statistics

Age pyramid for Morocco



* 1990 or last available

Healthcare data		
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		
Population	32.649.130	2013
Population annual growth rate (%)	1,1	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available

Economic information		
Gross domestic product (U.S dollar-billions)	104,80	2013*
Gross domestic product per capita (U.S dollar-units)	3.189,93	2013*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	29,8	2010
Private expenditure on health as % of total expenditure on health	70,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	23%	40%

3. Healthcare System

National health system and non governmental organizations.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	62%	65%
Uninsured citizens	38%	35%

Distribution of insurance modality		
	2012	2013
Public insurance company	70%	70%
Private insurance company	20%	25%
Private co-payment	10%	5%

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

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

Comments: 10% of the total cost are copayment.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☐	☒	☐	☐	☐	☒
ICD primary prevention	☒	☐	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☒	☐	☐	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Comments: Those are applicable to physician working in private and public hospital. in private hospital.

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

Comments: restrictions for primary prevention.

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	DEU of cardiac pacing
Invasive electrophysiology	☒	☐	☐	☐	DEU of electrophysiology
Allied professionals	☒	☐	☐	☐	Certificate of nursing
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐
Comments: most of electrophysiologists have European DEU.	

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	Yes	1 year
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Suggested period of training to perform implantations	Yes	1-2 years
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Comments: 1 year for pm; 2 years for ICD and CRT.

Training centres availability	
Pacemaker	11
ICD implantation	7
CRT implantation	6
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	1

Number of universities (Schools of Medicine)	5
---	---

Percentage of academic centres among all practicing EP centres	40%
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Percentage of academic centres among all practicing implanting devices centres	36%
--	-----

5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	11		11
Total Pacemaker units implanted	1.231		1.109
Thereof, New implants	1.200		1.069
Thereof, Replacements	31		40

Specialist performing implants			
Cardiologists	Yes		99%
Surgeons	Yes		1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	7		5
Total CRT units implanted	57		75
Thereof, CRT pacemaker	42		41
Thereof, CRT ICD	15		34

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	7	5
Total ICD units implanted	21	34
Thereof, Single chamber	12	8
Thereof, Dual chamber	9	26
First implants	21	not available
Replacements	0	not available

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	not available
Total loop recorders implanted	2	not available

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		
	2012	2013
Hospitals performed lead extractions	2	2
Total lead extraction procedures	10	10



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

10. Device specific

Availability of remote monitoring of devices	No answer
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National registry for		
		Official name
ICD	Yes	Registry of SMC (Moroccan cardiology society)
Pacing	Yes	Registry of SMC
Electrophysiology	Yes	Registry of SMC

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		
	2012	2013
Number of ablation centres	5	4
Number of ablations performed	216	150
Mean number of ablations per centre	20	38
Number of AF ablations	5	not available
Number of ablation centres (> 50 AF ablations)	0	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	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	☐	☐	☐	☒	☐
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☐	☒	☐	☐	☐
Low awareness of guidelines	☐	☒	☐	☐	☐
Lack of operators	☐	☐	☐	☐	☒
1 = no obstacle 5 = great obstacle * (1 = top; 6 = lowest)					

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
· SOCITE MAROCAINE DE CARDIOLOGIE : SMC FILIALE DE RYTHMOLOGIE

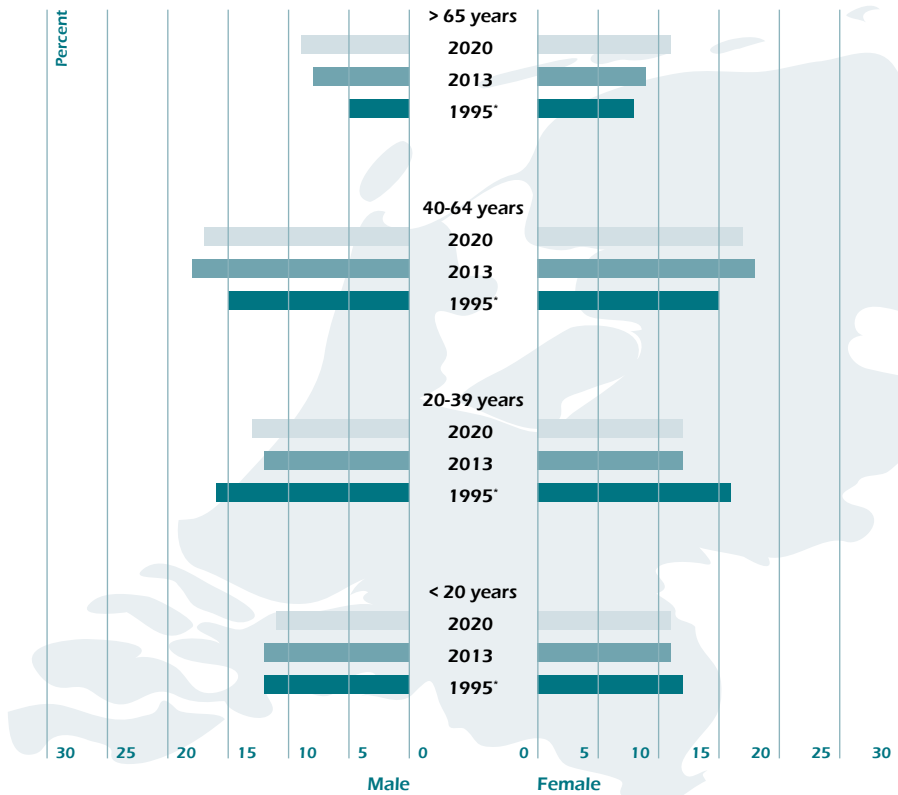
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Health ministry · National data · Estimation

NETHERLANDS



1. Statistics

Age pyramid for Netherlands



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	1,6	2011
Beds (per 100.000 population)	465,7	2009
Density of physicians (per 1.000 population)	3,0	2010
Density of nurses (per 1.000 population)	8,6	2008

Demographic information		
Population	16.805.037	2013
Population annual growth rate (%)	0,4	2013
Life expectancy at birth	81	2013
Death rate (per 1.000 population)	8,1	2011
Live births (per 1.000 population)	11,1	2010

Economic information		
Gross domestic product (U.S dollar-billions)	800,54	2013*
Gross domestic product per capita (U.S dollar-units)	47.650,90	2013*
Total expenditure on health as % of GDP	12,0	2011
General government expenditure on health as % of total expenditure on health	84,8	2010
Private expenditure on health as % of total expenditure on health	14,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	28%	25%

3. Healthcare System

Basic Health Insurance for all citizens.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	99,2%	100%
Uninsured citizens	0,8%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	0%	0%
Private insurance company	100%	100%
Private co-payment	0%	0%

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

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☒	☐	☐	☐	☒	☐	☐	☐
ICD primary prevention	☒	☐	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☒	☐	☐	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	EHRA or IBHRE certification
Invasive electrophysiology	☒	☐	☐	☐	EHRA certification
Allied professionals	☒	☐	☐	☐	EHRA or IBHRE certification
Training centres	☒	☐	☐	☐	NVVC practice guidelines for ICD centra and NHRA educational document for invasive electrophysiology.

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☒
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Official name: NHRA (Netherlands Heart Rhythm Association)	

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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Training centres availability	
Pacemaker	17
ICD implantation	12
CRT implantation	12
Electrophysiological studies and catheter ablation	12
Atrial fibrillation ablation	12

Number of universities (Schools of Medicine)	8
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Percentage of academic centres among all practicing EP centres	47%
---	------------

Percentage of academic centres among all practicing implanting devices centres	9%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	90	90
Total Pacemaker units implanted	9.370	10.174
Thereof, New implants	7.031	7.463
Thereof, Replacements	2.339	2.711

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	5%
Other: Allied Professionals	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	28	57
Total CRT units implanted	2.076	2.069
Thereof, CRT pacemaker	462	463
Thereof, CRT ICD	1.614	1.606

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	No	0%
Other: Allied Professionals	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	28		31
Total ICD units implanted	2.669		4.096
Thereof, Single chamber	not available		not available
Thereof, Dual chamber	not available		not available
First implants	2.040		2.724
Replacements	629		1.372

Specialist performing implants			
Cardiologists		Yes	90%
Surgeons		Yes	5%
Other: Allied Professionals		Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		90
Total loop recorders implanted	not available		1.095

Specialist performing implants			
Cardiologists		Yes	80%
Surgeons		No	0%
Other: Allied Professionals		Yes	20%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions			
	2012		2013
Hospitals performed lead extractions	not available		12
Total lead extraction procedures	not available		405

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) and DIPR (Dutch ICD and Pacemaker Registry)
Pacing	Yes	NCDR (National Cardiovascular Data Registry) and DIPR (Dutch ICD and Pacemaker Registry)
Electrophysiology	Yes	NCDR (National Cardiovascular Data Registry) and NHRA

Availability of a national quality insurance system or complication registry	Yes
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Official name: NCDR (National Cardiovascular Data Registry)

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: Device committee of the NHRA

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	16	16
Number of ablations performed	6.386	not available
Mean number of ablations per centre	425	not available
Number of AF ablations	2.611	not available
Number of ablation centres (> 50 AF ablations)	13	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	12	not available

Availability of a national registry for interventional electrophysiology	Yes
Official name: NHRA	

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	☒	☐	☐	☐	☐	1
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	5
Lack of referral	☒	☐	☐	☐	☐	3
Lack of trained personnel	☐	☐	☒	☐	☐	6
Low awareness of guidelines	☒	☐	☐	☐	☐	2
Lack of operators	☒	☐	☐	☐	☐	4
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

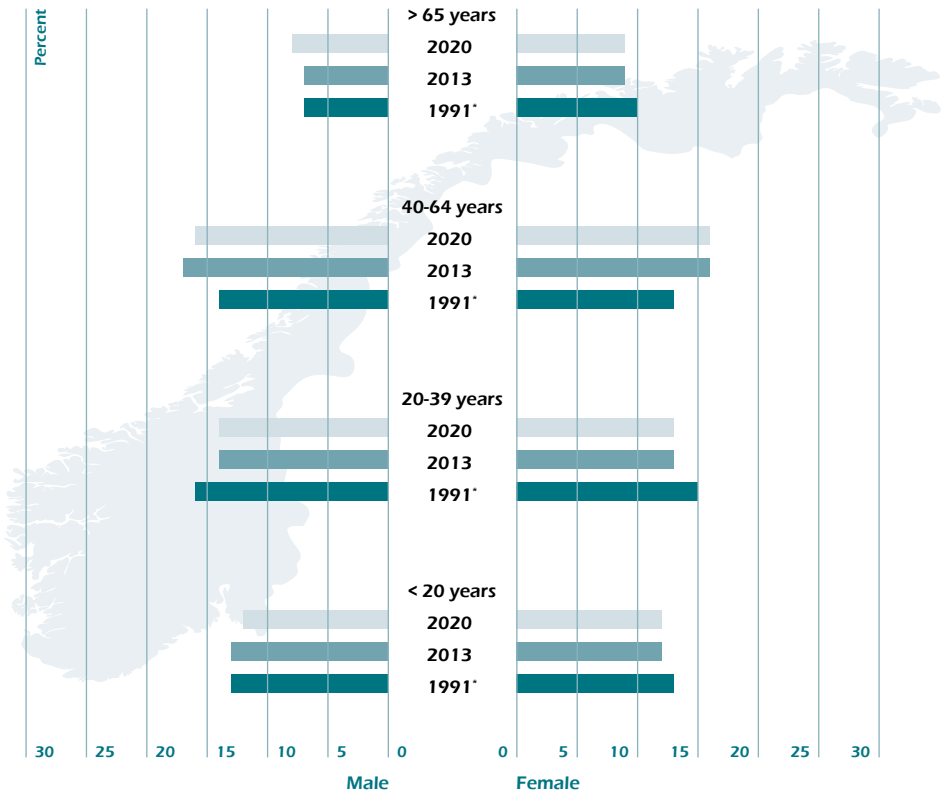
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • Dutch Heart Foundation • NHRA (Netherlands Heart Rhythm Association) • NCDR and Dutch ICD and Pacemaker Registry

NORWAY



1. Statistics

Age pyramid for Norway



* 1990 or last available



Healthcare data		
Hospitals (per 100.000 population)	1,3	2011
Beds (per 100.000 population)	331,6	2011
Density of physicians (per 1.000 population)	3,7	2011
Density of nurses (per 1.000 population)	13,3	2011

Demographic information		
Population	5.085.582	2013
Population annual growth rate (%)	1,3	2013
Life expectancy at birth	82	2013
Death rate (per 1.000 population)	8,3	2011
Live births (per 1.000 population)	12,2	2011

Economic information		
Gross domestic product (U.S dollar-billions)	515,83	2013*
Gross domestic product per capita (U.S dollar-units)	101.271,40	2013*
Total expenditure on health as % of GDP	9,1	2011
General government expenditure on health as % of total expenditure on health	85,5	2010
Private expenditure on health as % of total expenditure on health	14,5	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	31%	32%

3. Healthcare System

National Health System.

Basic insurance availability	Yes
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Requirements: Free basic services to all citizens and those registered as residents or working in Norway.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	100%	97%
Private insurance company	0%	not available
Private co-payment	3%	3%

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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☒
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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	No
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Training centres availability	
Pacemaker	5
ICD implantation	5
CRT implantation	4
Electrophysiological studies and catheter ablation	4
Atrial fibrillation ablation	3

Number of universities (Schools of Medicine)	4
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Percentage of academic centres among all practicing EP centres	84%
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Percentage of academic centres among all practicing implanting devices centres	22%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	23	23
Total Pacemaker units implanted	3.456	3.459
Thereof, New implants	2.678	2.610
Thereof, Replacements	778	849

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	9	9
Total CRT units implanted	383	426
Thereof, CRT pacemaker	145	150
Thereof, CRT ICD	238	276

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	11	11
Total ICD units implanted	994	1.089
Thereof, Single chamber	153	165
Thereof, Dual chamber	537	530
First implants	748	779
Replacements	246	310

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	not available	not available
Total loop recorders implanted	194	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		
	2012	2013
Hospitals performed lead extractions	3	3
Total lead extraction procedures	179	214

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	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
--	----

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		
	2012	2013
Number of ablation centres	5	5
Number of ablations performed	2.648	2.578
Mean number of ablations per centre	not available	516
Number of AF ablations	1.244	1.227
Number of ablation centres (> 50 AF ablations)	4	4
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	3

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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐	5
Lack of referral	☐	☐	☒	☐	☐	1
Lack of trained personnel	☐	☐	☒	☐	☐	3
Low awareness of guidelines	☐	☐	☒	☐	☐	2
Lack of operators	☐	☒	☐	☐	☐	4

1 = no obstacle

5 = great obstacle

* (1 = top; 6 = lowest)

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
• Norwegian Cardiac Society, Norwegian Working Group of Arrhythmias

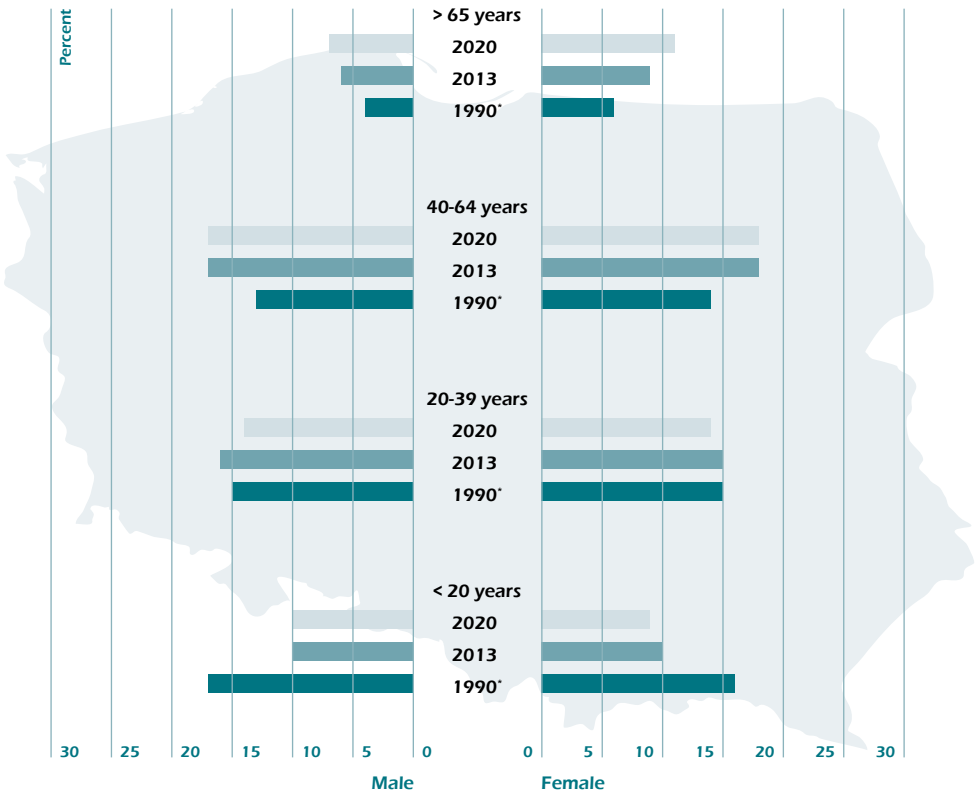
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Norwegian Pacemaker and ICD registry
• Norwegian Society of Cardiology
• Official statistics

POLAND



1. Statistics

Age pyramid for Poland



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	2,5	2011
Beds (per 100.000 population)	654,8	2011
Density of physicians (per 1.000 population)	2,2	2011
Density of nurses (per 1.000 population)	5,8	2011

Demographic information		
Population	38.383.809	2013
Population annual growth rate (%)	-0,1	2013
Life expectancy at birth	77	2013
Death rate (per 1.000 population)	9,8	2010
Live births (per 1.000 population)	10,1	2011

Economic information		
Gross domestic product (U.S dollar-billions)	513,93	2013*
Gross domestic product per capita (U.S dollar-units)	13.333,63	2013*
Total expenditure on health as % of GDP	6,7	2011
General government expenditure on health as % of total expenditure on health	71,7	2010
Private expenditure on health as % of total expenditure on health	27,8	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	45%	45%

3. Healthcare System

National Health Fund.

Basic insurance availability	Yes
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Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	95%	95%
Uninsured citizens	5%	5%

Distribution of insurance modality		
	2012	2013
Public insurance company	71%	90%
Private insurance company	1%	5%
Private co-payment	28%	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



Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☒	☐	☐	☐	☒	☐	☐	☐
ICD secondary prevention	☒	☐	☐	☐	☒	☐	☐	☐
CRT devices	☒	☐	☐	☐	☒	☐	☐	☐
Ablation	☒	☐	☐	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	Certification of Heart Rhythm Section of Polish Cardiac Society
Invasive electrophysiology	☒	☐	☐	☐	Certification of Heart Rhythm Section of Polish Cardiac Society
Allied professionals	☒	☐	☐	☐	Certification of Heart Rhythm Section of Polish Cardiac Society
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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

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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Training centres availability	
Pacemaker	40
ICD implantation	25
CRT implantation	12
Electrophysiological studies and catheter ablation	10
Atrial fibrillation ablation	5

Number of universities (Schools of Medicine)	12
---	-----------

Percentage of academic centres among all practicing EP centres	16%
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Percentage of academic centres among all practicing implanting devices centres	8%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	132		145
Total Pacemaker units implanted	27.498		27.500
Thereof, New implants	21.978		22.000
Thereof, Replacements	5.520		5.500

Specialist performing implants			
Cardiologists	Yes		99%
Surgeons	Yes		1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	21		25
Total CRT units implanted	2.788		3.000
Thereof, CRT pacemaker	388		400
Thereof, CRT ICD	2.400		2.600

Specialist performing implants			
Cardiologists	Yes		100%
Surgeons	No		0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	111	115
Total ICD units implanted	7.006	9.500
Thereof, Single chamber	4.484	not available
Thereof, Dual chamber	2.522	not available
First implants	6.095	7.500
Replacements	911	2.000

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	9	15
Total loop recorders implanted	25	200

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	10	7
Total lead extraction procedures	520	450



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	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	Yes
--	-----

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	73	75
Number of ablations performed	8.806	9.500
Mean number of ablations per centre	not available	127
Number of AF ablations	1.700	1.900
Number of ablation centres (> 50 AF ablations)	15	16
Number of ablation centres (> 10 VT ablations on structural heart diseases)	8	9

Availability of a national registry for interventional electrophysiology	Not available
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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	☒	☐	☐	☐	☐	5
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	1
Lack of referral	☒	☐	☐	☐	☐	4
Lack of trained personnel	☐	☒	☐	☐	☐	2
Low awareness of guidelines	☒	☐	☐	☐	☐	6
Lack of operators	☐	☒	☐	☐	☐	3
	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 2014
• EHRA White Book 2013
• Ministry of Health
• National Health Fund
• National Consultant

PORTUGAL



1. Statistics

Age pyramid for Portugal



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	2,1	2011
Beds (per 100.000 population)	337,9	2011
Density of physicians (per 1.000 population)	4,0	2011
Density of nurses (per 1.000 population)	6,3	2011

Demographic information		
Population	10.799.270	2013
Population annual growth rate (%)	0,2	2013
Life expectancy at birth	79	2013
Death rate (per 1.000 population)	9,8	2011
Live births (per 1.000 population)	9,2	2011

Economic information		
Gross domestic product (U.S dollar-billions)	219,29	2013*
Gross domestic product per capita (U.S dollar-units)	20.663,23	2013*
Total expenditure on health as % of GDP	10,4	2011
General government expenditure on health as % of total expenditure on health	65,8	2010
Private expenditure on health as % of total expenditure on health	34,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	31%	not available

3. Healthcare System

National health Service covers everyone that has no private insurance.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	80%	100%
Private insurance company	0%	0%
Private co-payment	20%	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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☒	☐	☐	Ordem dos Médicos – Portuguese Medical Association
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologist with subspeciality in Cardiac Electrophysiology
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	Yes
---	------------

Suggested period of training to perform implantations	No answer
--	------------------

Training centres availability	
Pacemaker	12
ICD implantation	5
CRT implantation	5
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	3

Number of universities (Schools of Medicine)	not available
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Percentage of academic centres among all practicing EP centres	not available
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Percentage of academic centres among all practicing implanting devices centres	not available
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	42	40
Total Pacemaker units implanted	8.890	8.790
Thereof, New implants	6.792	7.124
Thereof, Replacements	2.098	1.666

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	27	26
Total CRT units implanted	564	not available
Thereof, CRT pacemaker	189	not available
Thereof, CRT ICD	375	427

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	24		27
Total ICD units implanted	990		not available
Thereof, Single chamber	not available		not available
Thereof, Dual chamber	not available		not available
First implants	669		1.138
Replacements	321		not available

Specialist performing implants			
Cardiologists		Yes	100%
Surgeons		No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	23		not available
Total loop recorders implanted	182		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			
	2012		2013
Hospitals performed lead extractions	7		5
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	APAPE: Portuguese Association of Arrhythmology, Pacing and EP
Pacing	Yes	APAPE: Portuguese Association of Arrhythmology, Pacing and EP
Electrophysiology	Yes	APAPE: Portuguese Association of Arrhythmology, Pacing and EP

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		
	2012	2013
Number of ablation centres	18	16
Number of ablations performed	2.010	2.062
Mean number of ablations per centre	112	129
Number of AF ablations	523	556
Number of ablation centres (> 50 AF ablations)	3	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	not available

Availability of a national registry for interventional electrophysiology	Yes
Official name: APAPE: Portuguese Association of Arrhythmology, Pacing and EP	

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	☑	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☑	☐	☐	2
Lack of referral	☐	☐	☐	☑	☐	1
Lack of trained personnel	☐	☑	☐	☐	☐	4
Low awareness of guidelines	☐	☐	☑	☐	☐	3
Lack of operators	☐	☑	☐	☐	☐	5
1 = no obstacle 5 = great obstacle * (1 = top; 6 = lowest)						

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
• APAPE: Portuguese Association of Arrhythmology, Pacing and EP

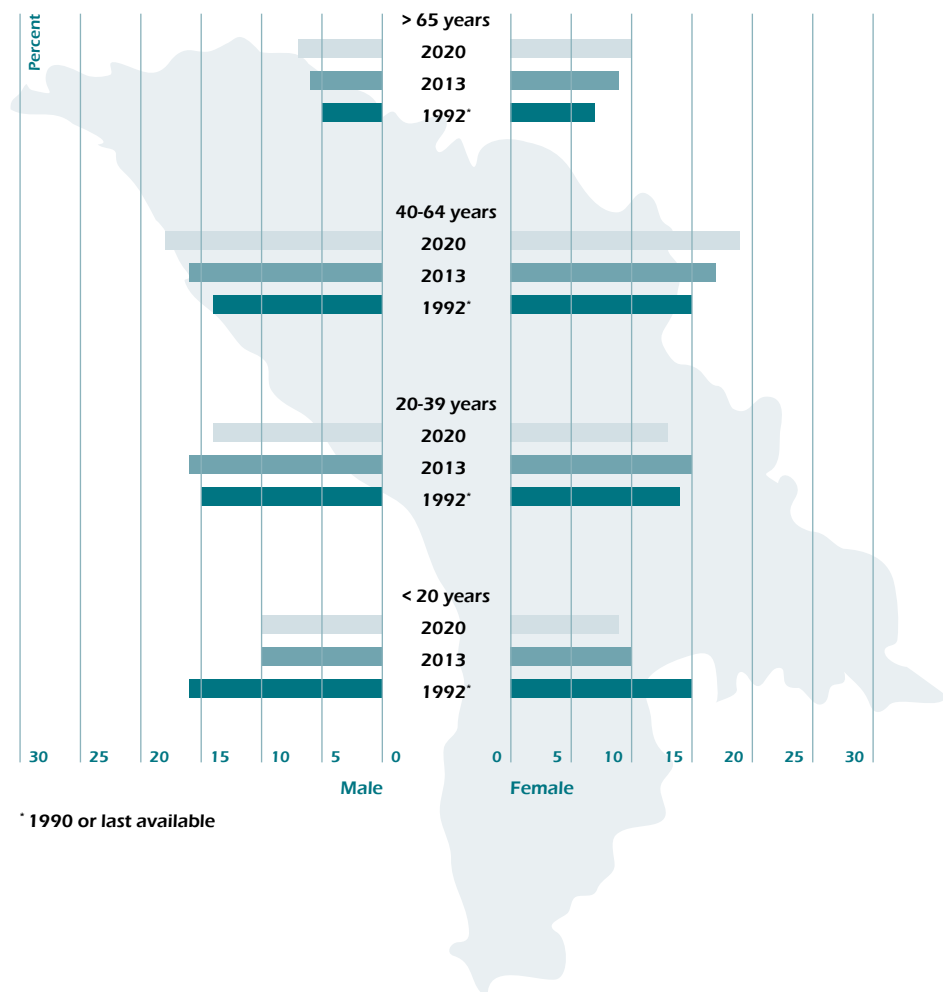
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Official statistics
• Survey from professional association
• Estimation

ROMANIA



1. Statistics

Age pyramid for Romania



Healthcare data		
Hospitals (per 100.000 population)	2,3	2011
Beds (per 100.000 population)	610,7	2011
Density of physicians (per 1.000 population)	2,4	2011
Density of nurses (per 1.000 population)	5,5	2011

Demographic information		
Population	21.790.479	2013
Population annual growth rate (%)	-0,3	2013
Life expectancy at birth	75	2013
Death rate (per 1.000 population)	12,1	2010
Live births (per 1.000 population)	9,9	2010

Economic information		
Gross domestic product (U.S dollar-billions)	183,79	2013*
Gross domestic product per capita (U.S dollar-units)	8.630,19	2013*
Total expenditure on health as % of GDP	5,8	2011
General government expenditure on health as % of total expenditure on health	80,3	2010
Private expenditure on health as % of total expenditure on health	19,6	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	50%

3. Healthcare System

NHS

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality		
	2012	2013
Public insurance company	96%	98%
Private insurance company	2%	0%
Private co-payment	2%	2%

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

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



Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☐	☒
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☐	☒
CRT devices	☐	☐	☒	☐	☐	☐	☐	☒
Ablation	☐	☐	☒	☐	☐	☐	☐	☒

Comments:

A limited number of procedures are reimbursed.

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☐	☒	
Invasive electrophysiology	☐	☐	☐	☒	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☐	☒	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist
ICD or pacemaker implants	Yes Cardiologist, rarely 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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Training centres availability	
Pacemaker	10
ICD implantation	10
CRT implantation	10
Electrophysiological studies and catheter ablation	7
Atrial fibrillation ablation	1

Number of universities (Schools of Medicine)	10
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Percentage of academic centres among all practicing EP centres	100%
---	-------------

Percentage of academic centres among all practicing implanting devices centres	90%
---	------------



5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	21	22
Total Pacemaker units implanted	3.150	2.400
Thereof, New implants	3.100	2.000
Thereof, Replacements	500	400

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	15	17
Total CRT units implanted	163	200
Thereof, CRT pacemaker	15	130
Thereof, CRT ICD	15	70

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	17	17
Total ICD units implanted	178	200
Thereof, Single chamber	17	190
Thereof, Dual chamber	16	10
First implants	150	150
Replacements	28	50

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	3	5
Total loop recorders implanted	15	10

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	1	2
Total lead extraction procedures	5	10



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

10. Device specific

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

National registry for		
	Official name	
ICD	Yes	
Pacing	Yes	
Electrophysiology	Yes	

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		
	2012	2013
Number of ablation centres	13	14
Number of ablations performed	1.100	1.300
Mean number of ablations per centre	85	108
Number of AF ablations	83	120
Number of ablation centres (> 50 AF ablations)	0	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	1

Availability of a national registry for interventional electrophysiology	Yes
--	-----

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	☐	☒	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒
Lack of referral	☐	☐	☒	☐	☐
Lack of trained personnel	☐	☒	☐	☐	☐
Low awareness of guidelines	☐	☐	☐	☒	☐
Lack of operators	☐	☒	☐	☐	☐

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 Arrhythmia, Romanian Society of Cardiology

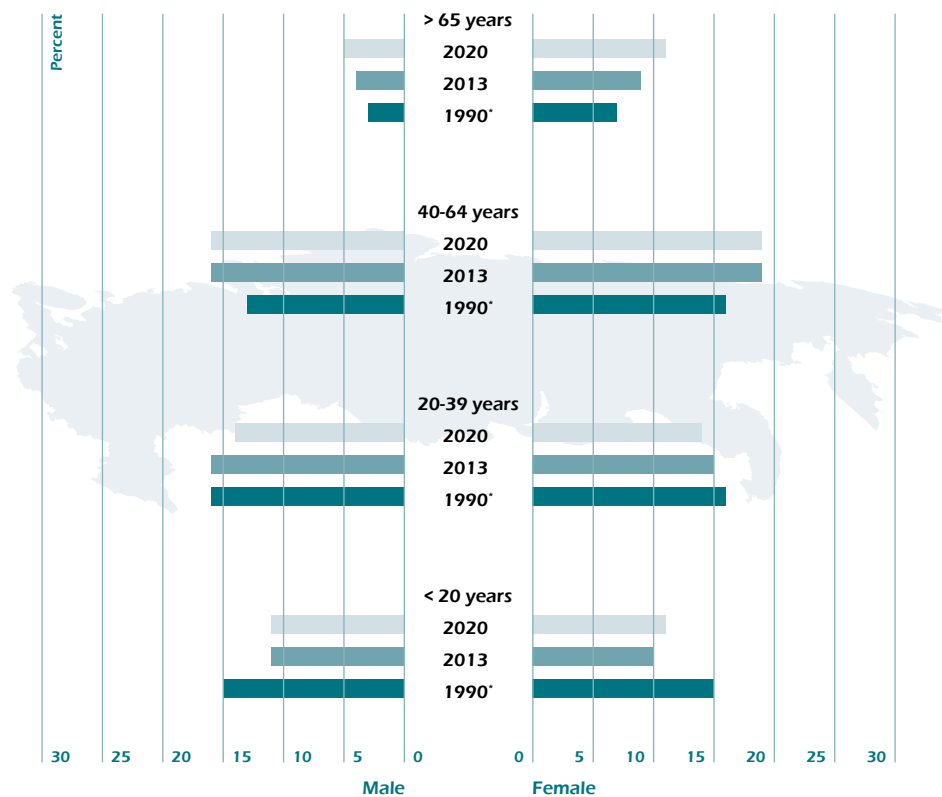
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • Official statistics • Survey from professional association • Sample short survey • Sales data • Estimation

RUSSIAN FEDERATION



1. Statistics

Age pyramid for Russian Federation



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	4,5	2006
Beds (per 100.000 population)	965,9	2006
Density of physicians (per 1.000 population)	4,3	2006
Density of nurses (per 1.000 population)	8,5	2006

Demographic information		
Population	142.500.482	2013
Population annual growth rate (%)	0,0	2013
Life expectancy at birth	70	2013
Death rate (per 1.000 population)	14,2	2010
Live births (per 1.000 population)	12,3	2010

Economic information		
Gross domestic product (U.S dollar-billions)	2.117,83	2013*
Gross domestic product per capita (U.S dollar-units)	14.973,48	2013*
Total expenditure on health as % of GDP	6,2	2011
General government expenditure on health as % of total expenditure on health	58,7	2010
Private expenditure on health as % of total expenditure on health	41,3	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	55,5%	55%

3. Healthcare System

National Health System.

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

Requirements: all citizens

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality		
	2012	2013
Public insurance company	85%	85%
Private insurance company	10%	10%
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	Yes
Ablation	No

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☐	☒
ICD primary prevention	☐	☐	☒	☐	☐	☐	☐	☒
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☐	☒
CRT devices	☐	☐	☒	☐	☐	☐	☐	☒
Ablation	☐	☐	☒	☐	☐	☐	☐	☒

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☒
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐
Comments: Ministry of Health	

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	
Invasive electrophysiology	☒	☐	☐	☐	
Allied professionals	☒	☐	☐	☐	
Training centres	☒	☐	☐	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

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
Official name: Russian Society of Arrhythmology	

Required period of training to perform implantations	Yes	3 years
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Suggested period of training to perform implantations	Yes	3 years
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Training centres availability	
Pacemaker	10
ICD implantation	7
CRT implantation	7
Electrophysiological studies and catheter ablation	11
Atrial fibrillation ablation	5

Number of universities (Schools of Medicine)	not available
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Percentage of academic centres among all practicing EP centres	not available
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Percentage of academic centres among all practicing implanting devices centres	not available
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	140		140
Total Pacemaker units implanted	30.218		34.758
Thereof, New implants	25.526		28.930
Thereof, Replacements	4.692		5.828

Specialist performing implants			
Cardiologists	Yes		70%
Surgeons	Yes		30%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	42		42
Total CRT units implanted	911		1.012
Thereof, CRT pacemaker	370		382
Thereof, CRT ICD	541		630

Specialist performing implants			
Cardiologists	Yes		50%
Surgeons	Yes		50%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	57	57
Total ICD units implanted	1.580	1.870
Thereof, Single chamber	434	457
Thereof, Dual chamber	558	1.413
First implants	1.326	1.644
Replacements	254	226

Specialist performing implants		
Cardiologists	Yes	60%
Surgeons	Yes	40%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
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 and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	not available	not available
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
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National registry for		
		Official name
ICD	Yes	Russian Society of Arrhythmology
Pacing	Yes	Russian Society of Arrhythmology
Electrophysiology	Yes	Russian Society of Arrhythmology

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: Federal center for Interventional and Surgical Arrhythmology

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	71	81
Number of ablations performed	17.130	21.185
Mean number of ablations per centre	240	262
Number of AF ablations	3.905	5.858
Number of ablation centres (> 50 AF ablations)	50	53
Number of ablation centres (> 10 VT ablations on structural heart diseases)	52	55

Availability of a national registry for interventional electrophysiology	Yes
Official name: Russian Society of Arrhythmology	

12. Guidelines

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

Obstacles to guideline implementation	Ranking of importance*				
	1	2	3	4	5
Lack of centres	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐
Lack of referral	☐	☒	☐	☐	☐
Lack of trained personnel	☐	☐	☒	☐	☐
Low awareness of guidelines	☒	☐	☐	☐	☐
Lack of operators	☐	☒	☐	☐	☐
1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
· Russian Society of Arrhythmology (RSCA)

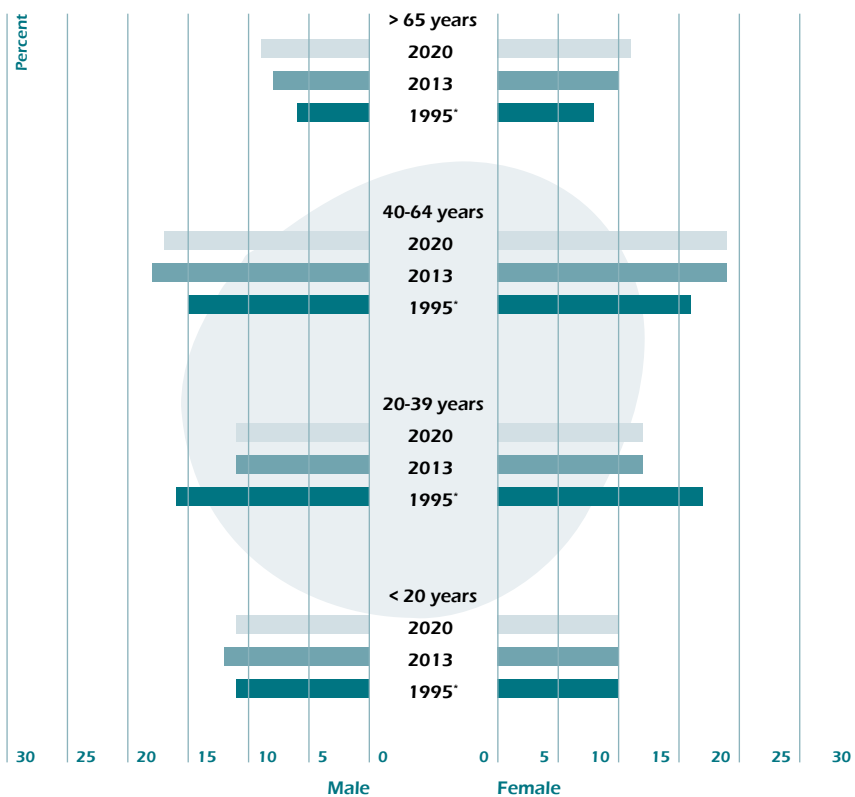
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013
· Russian Society of Arrhythmology (RSCA)
· Ministry of Health

SAN MARINO



1. Statistics

Age pyramid for San Marino



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	3,4	2012
Beds (per 100.000 population)	383,2	2012
Density of physicians (per 1.000 population)	5,6	2012
Density of nurses (per 1.000 population)	9,6	2012

Demographic information		
Population	32.448	2013
Population annual growth rate (%)	1,0	2013
Life expectancy at birth	83	2013
Death rate (per 1.000 population)	7,3	2005
Live births (per 1.000 population)	10,2	2011

Economic information		
Gross domestic product (U.S dollar-billions)	1,87	2013*
Gross domestic product per capita (U.S dollar-units)	not available	not available
Total expenditure on health as % of GDP	7,2	2011
General government expenditure on health as % of total expenditure on health	84,7	2010
Private expenditure on health as % of total expenditure on health	15,3	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	35%	31%

3. Healthcare System

NHS: every resident citizen is supplied with NHS and has gratuiti for all the cure supplied by NHS.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	0%	not available
Uninsured citizens	100%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	100%	100%
Private insurance company	0%	not available
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☒
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologist (electrophysiologist)
ICD or pacemaker implants	Yes	Cardiologist (electrophysiologist)

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes	5 years
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Suggested period of training to perform implantations	Yes	5 years
--	------------	----------------

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
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Percentage of academic centres among all practicing EP centres	0%
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Percentage of academic centres among all practicing implanting devices centres	0%
---	-----------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total Pacemaker units implanted	26	14
Thereof, New implants	15	8
Thereof, Replacements	11	6

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total CRT units implanted	2	0
Thereof, CRT pacemaker	1	0
Thereof, CRT ICD	1	0

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total ICD units implanted	13	20
Thereof, Single chamber	1	8
Thereof, Dual chamber	4	12
First implants	5	11
Replacements	8	9

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	1	1
Total loop recorders implanted	0	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		
	2012	2013
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	Yes
--	-----

National registry for		
		Official name
ICD	Yes	ICD data base
Pacing	Yes	Pace Maker data base
Electrophysiology	Yes	SEF data base

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		
	2012	2013
Number of ablation centres	0	0
Number of ablations performed	0	0
Mean number of ablations per centre	0	0
Number of AF ablations	0	0
Number of ablation centres (> 50 AF ablations)	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	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	☐	☐	☐	☐	☒	1
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐	4
Lack of referral	☒	☐	☐	☐	☐	5
Lack of trained personnel	☐	☐	☐	☐	☒	2
Low awareness of guidelines	☒	☐	☐	☐	☐	6
Lack of operators	☐	☐	☒	☐	☐	3

1 = no obstacle

5 = great obstacle

* (1 = top; 6 = lowest)

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
• San Marino Society of Cardiology

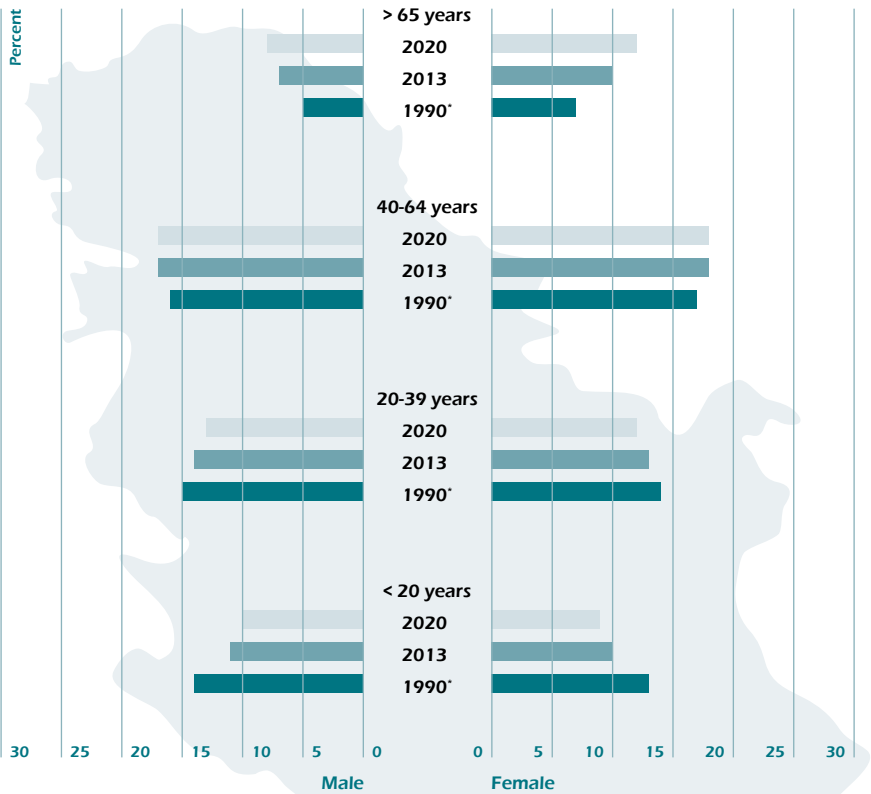
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Official statistic
• Pace Maker data base
• ICD data base

SERBIA



1. Statistics

Age pyramid for Serbia



* 1990 or last available

Healthcare data		
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)	3,1	2012
Density of nurses (per 1.000 population)	6,3	2012

Demographic information		
Population	7.243.007	2013
Population annual growth rate (%)	-0,5	2013
Life expectancy at birth	75	2013
Death rate (per 1.000 population)	14,2	2011
Live births (per 1.000 population)	9,0	2011

Economic information		
Gross domestic product (U.S dollar-billions)	43,68	2013*
Gross domestic product per capita (U.S dollar-units)	6.017,13	2013*
Total expenditure on health as % of GDP	10,4	2011
General government expenditure on health as % of total expenditure on health	61,9	2010
Private expenditure on health as % of total expenditure on health	38,1	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	56%	56%

3. Healthcare System

Network of health centres and health stations (primary care)...

General hospitals, university clinical centres and specialized institutions provide secondary and tertiary care... Private healthcare not incorporated into national healthcare system.

Basic insurance availability	Yes
Requirements: Permanent and temporary job, unemployed members of family, persons on pension, invalid persons, fund for unemployed persons for 12 months.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	95%
Uninsured citizens	0%	5%

Distribution of insurance modality		
	2012	2013
Public insurance company	100%	90%
Private insurance company	0%	5%
Private co-payment	0%	5%

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, in the private sector.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Comments: Reimbursement for patients who are not Serbian citizens.

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

Comments: ESC guidelines but budget limited number of procedures.

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	Referral National Pacemaker center, Clinical center of Serbia
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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	Yes	6 months
---	------------	-----------------

Suggested period of training to perform implantations	Not available
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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)	4
---	----------

Percentage of academic centres among all practicing EP centres	100%
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Percentage of academic centres among all practicing implanting devices centres	25%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	17	18
Total Pacemaker units implanted	3.139	3.958
Thereof, New implants	2.926	3.664
Thereof, Replacements	213	294

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	6	6
Total CRT units implanted	303	329
Thereof, CRT pacemaker	238	282
Thereof, CRT ICD	65	47

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	10	8
Total ICD units implanted	277	448
Thereof, Single chamber	222	381
Thereof, Dual chamber	55	67
First implants	270	not available
Replacements	7	not available

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	11	11
Total loop recorders implanted	16	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		
	2012	2013
Hospitals performed lead extractions	5	3
Total lead extraction procedures	53	34

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

10. Device specific

Availability of remote monitoring of devices	No
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Reasons: Not regular and reimbursed by Insurance fund, but exists for scientific reason.

National registry for		
		Official name
ICD	Yes	Referral National Pacemaker center data base
Pacing	Yes	Referral National Pacemaker center data base
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
--	-----

Official name: Referral National Pacemaker center

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	3	3
Number of ablations performed	965	1.010
Mean number of ablations per centre	300	337
Number of AF ablations	105	120
Number of ablation centres (> 50 AF ablations)	1	2
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒	1
Lack of referral	☐	☐	☒	☐	☐	3
Lack of trained personnel	☐	☒	☐	☐	☐	4
Low awareness of guidelines	☐	☐	☒	☐	☐	2
Lack of operators	☒	☐	☐	☐	☐	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 Pacing and Resynchronization, Serbian Cardiology Society

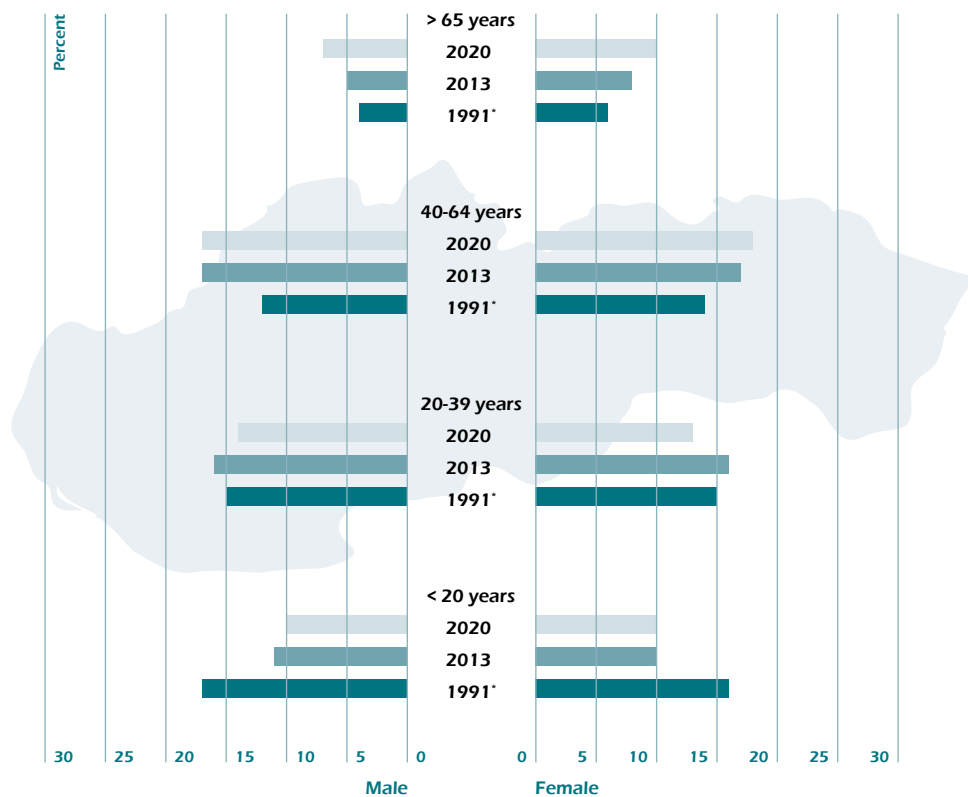
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Working Group on Cardiac Pacing, Serbian Cardiology Society
• National statistics
• Referral National Pacemaker center data base
• Estimation

SLOVAKIA



1. Statistics

Age pyramid for Slovakia



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	2,6	2011
Beds (per 100.000 population)	597,5	2011
Density of physicians (per 1.000 population)	3,0	2007
Density of nurses (per 1.000 population)	6,2	2011

Demographic information		
Population	5.488.339	2013
Population annual growth rate (%)	0,1	2013
Life expectancy at birth	76	2013
Death rate (per 1.000 population)	9,8	2010
Live births (per 1.000 population)	11,1	2011

Economic information		
Gross domestic product (U.S dollar-billions)	96,96	2013*
Gross domestic product per capita (U.S dollar-units)	17.929,23	2013*
Total expenditure on health as % of GDP	8,7	2011
General government expenditure on health as % of total expenditure on health	64,5	2010
Private expenditure on health as % of total expenditure on health	35,5	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	53%	47%

3. Healthcare System

National health system with universal health insurance coverage, major hospitals (incl. university hospitals) owned and operated by government, regional hospitals mostly non-profit organizations or privately owned. General practitioners and most specialists work in private offices (on the basis of agreements with insurance companies, no (or very little) cash contribution from the patients for medical services. There is no patient financial contribution for arrhythmia devices or interventions. However, significant co-payments for most cardiovascular drugs.

Basic insurance availability	Yes
Requirements: citizenship or permanent residence, no further requirements, health insurance coverage is mandatory, for the unemployed population the coverage is guaranteed by the constitution and paid by the government.	

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	72%	72%
Private insurance company	28%	28%
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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability	
No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	Certified activity for implanting cardiac impulse generators (Ministry of Health)
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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
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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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Training centres availability	
Pacemaker	3
ICD implantation	3
CRT implantation	3
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	1

Number of universities (Schools of Medicine)	4
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Percentage of academic centres among all practicing EP centres	66%
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Percentage of academic centres among all practicing implanting devices centres	50%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	13	14
Total Pacemaker units implanted	3.111	3.456
Thereof, New implants	2.579	2.837
Thereof, Replacements	532	619

Specialist performing implants		
Cardiologists	Yes	65%
Surgeons	Yes	35%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	4	5
Total CRT units implanted	332	452
Thereof, CRT pacemaker	70	110
Thereof, CRT ICD	262	342

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	4	4
Total ICD units implanted	577	591
Thereof, Single chamber	455	434
Thereof, Dual chamber	122	157
First implants	500	470
Replacements	77	121

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	6	5
Total loop recorders implanted	89	101

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	3	3
Total lead extraction procedures	136	108



Specialist performing lead extractions		
Cardiologists	Yes	98%
Surgeons	Yes	2%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		
		Official name
ICD	Yes	SLOVIMPULZ
Pacing	Yes	SLOVIMPULZ
Electrophysiology	Yes	SLOVABLO

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		
	2012	2013
Number of ablation centres	3	4
Number of ablations performed	922	1.071
Mean number of ablations per centre	307	268
Number of AF ablations	101	150
Number of ablation centres (> 50 AF ablations)	1	2
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	2

Availability of a national registry for interventional electrophysiology	Yes
Official name: SLOVABLO	

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	☐	☐	☒	☐	☐	4
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	3
Lack of referral	☐	☒	☐	☐	☐	6
Lack of trained personnel	☐	☐	☐	☒	☐	2
Low awareness of guidelines	☐	☒	☐	☐	☐	5
Lack of operators	☐	☐	☐	☒	☐	1
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 Association (Slovenska asociacia srdcovych arytmií)

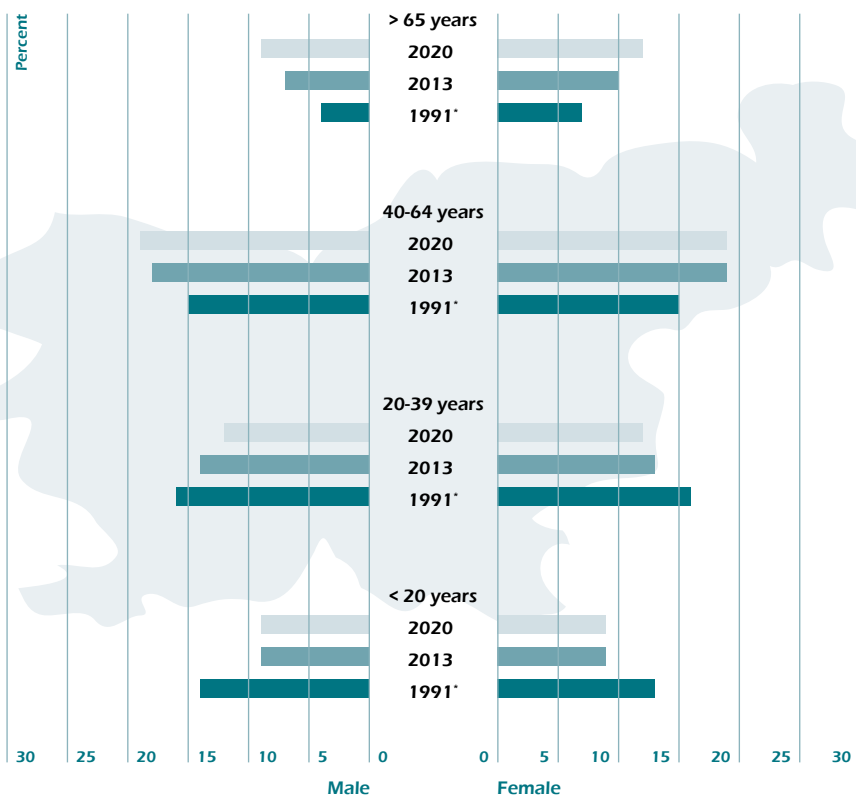
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013 • National Health Information Center • National Registry SLOVIMPULZ • National electronic registries SLOVIMPULZ and SLOVABLO operated by the Slovak Heart Rhythm Association • Sales data

SLOVENIA



1. Statistics

Age pyramid for Slovenia



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	1,4	2012
Beds (per 100.000 population)	462,5	2011
Density of physicians (per 1.000 population)	2,5	2011
Density of nurses (per 1.000 population)	8,4	2011

Demographic information		
Population	1.992.690	2013
Population annual growth rate (%)	-0,2	2013
Life expectancy at birth	78	2013
Death rate (per 1.000 population)	9,1	2010
Live births (per 1.000 population)	10,6	2011

Economic information		
Gross domestic product (U.S dollar-billions)	46,82	2013*
Gross domestic product per capita (U.S dollar-units)	22.718,63	2013*
Total expenditure on health as % of GDP	9,1	2011
General government expenditure on health as % of total expenditure on health	72,8	2010
Private expenditure on health as % of total expenditure on health	27,2	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	not available	not available

3. Healthcare System

NHS Fund

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	99%	99%
Uninsured citizens	1%	1%

Distribution of insurance modality		
	2012	2013
Public insurance company	85%	4%
Private insurance company	13%	0%
Private co-payment	2%	96%

Possibility to subscribing to private health insurance plans	Not available
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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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☒
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☐	☒	☐	
Invasive electrophysiology	☐	☐	☒	☐	
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes	1 year
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Suggested period of training to perform implantations	Yes	1 year
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Training centres availability	
Pacemaker	8
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	2%
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Percentage of academic centres among all practicing implanting devices centres	25%
---	------------

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	6	8
Total Pacemaker units implanted	1.333	1.287
Thereof, New implants	1.030	1.089
Thereof, Replacements	303	198

Specialist performing implants		
Cardiologists	Yes	10%
Surgeons	Yes	90%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	2	2
Total CRT units implanted	139	131
Thereof, CRT pacemaker	63	55
Thereof, CRT ICD	76	76

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	3	2
Total ICD units implanted	122	142
Thereof, Single chamber	103	113
Thereof, Dual chamber	19	29
First implants	0	135
Replacements	0	7

Specialist performing implants		
Cardiologists	Yes	5%
Surgeons	Yes	95%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	4	not available
Total loop recorders implanted	26	not available

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extraction	2	1
Total lead extraction procedures	not available	not available



Specialist performing lead extractions		
Cardiologists	No	0%
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	WG on arrhythmias, Slovenian Society of Cardiology
Pacing	Yes	WG on arrhythmias, Slovenian Society of Cardiology
Electrophysiology	Yes	WG on arrhythmias, Slovenian 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	No
--	----

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	2	2
Number of ablations performed	272	279
Mean number of ablations per centre	136	139
Number of AF ablations	109	165
Number of ablation centres (> 50 AF ablations)	1	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	1

Availability of a national registry for interventional electrophysiology	Yes
Official name: WG 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	☒	☐	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐
Lack of referral	☐	☒	☐	☐	☐
Lack of trained personnel	☒	☐	☐	☐	☐
Low awareness of guidelines	☒	☐	☐	☐	☐
Lack of operators	☒	☐	☐	☐	☐
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

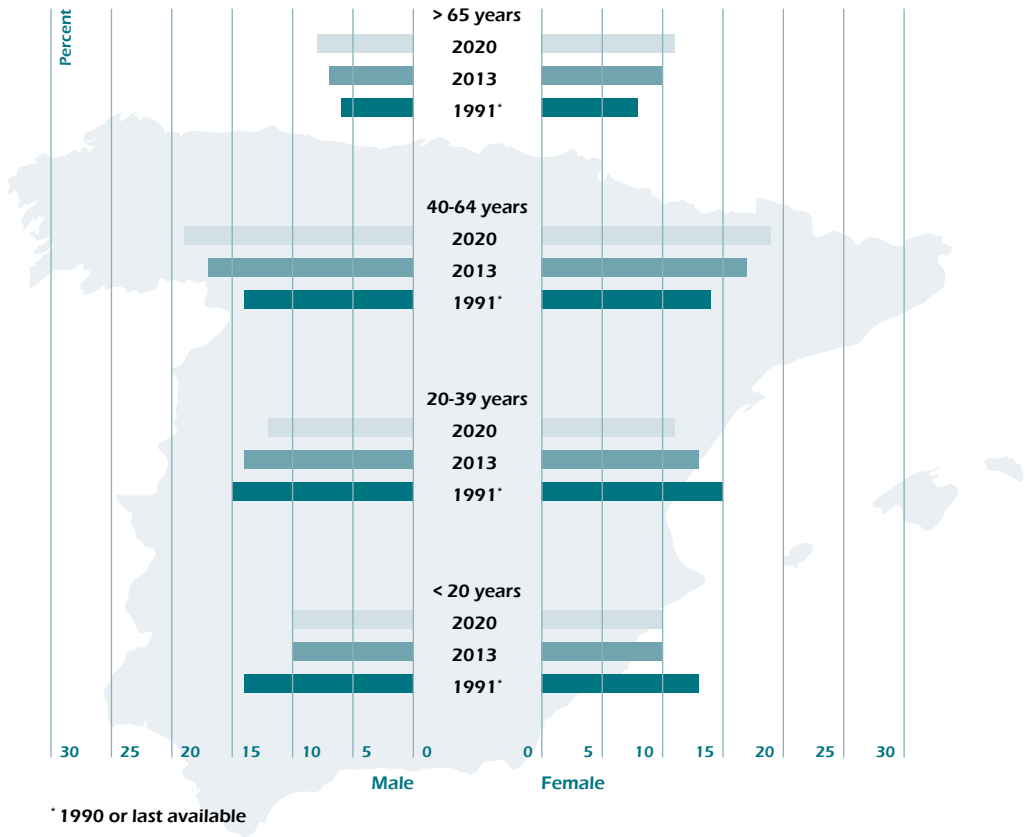
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
• EHRA White Book 2013
• Official statistics
• Survey from professional association
• Estimation

SPAIN



1. Statistics

Age pyramid for Spain



Healthcare data		
Hospitals (per 100.000 population)	1,7	2011
Beds (per 100.000 population)	309,2	2011
Density of physicians (per 1.000 population)	3,7	2012
Density of nurses (per 1.000 population)	5,5	2011

Demographic information		
Population	47.370.542	2013
Population annual growth rate (%)	0,7	2013
Life expectancy at birth	81	2013
Death rate (per 1.000 population)	8,4	2011
Live births (per 1.000 population)	10,2	2011

Economic information		
Gross domestic product (U.S dollar-billions)	1.355,66	2013*
Gross domestic product per capita (U.S dollar-units)	29.408,93	2013*
Total expenditure on health as % of GDP	9,4	2011
General government expenditure on health as % of total expenditure on health	74,2	2010
Private expenditure on health as % of total expenditure on health	25,8	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	37,3%	32%

3. Healthcare System

SystemSpanish healthcare system is based on a national health system that covers almost all population. Regional autonomous communities have their own budget and decide how to organise and deliver resources. Private insurance companies offer complementary healthcare coverage.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	99%	95%
Uninsured citizens	1%	5%

Distribution of insurance modality		
	2012	2013
Public insurance company	99%	75%
Private insurance company	15%	10%
Private co-payment	not available	15%

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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	Cardiac stimulation accreditation (Acreditacion en estimulación cardiaca)
Invasive electrophysiology	☐	☒	☐	☐	Acreditacion de formación específica t excelencia para la practica en Electrofisiología Cardiaca Intervencionista
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☒	☐	☐	Acreditacion de centros para la formacion en Electrofisiología

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☒
No	☐
No answer	☐

Specialist required for		
		Specialist
Catheter ablation	Yes	Cardiologists
ICD or pacemaker implants	Yes	Cardiologists, cardiac surgeons

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Official name: Spanish Society of Cardiology	

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	Yes	2 years
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Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	22
Atrial fibrillation ablation	22

Number of universities (Schools of Medicine)	28
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Percentage of academic centres among all practicing EP centres	70%
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Percentage of academic centres among all practicing implanting devices centres	30%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	220		230
Total Pacemaker units implanted	34.710		35.500
Thereof, New implants	25.339		not available
Thereof, Replacements	9.371		not available

Specialist performing implants			
Cardiologists	Yes		70%
Surgeons	Yes		25%
Other: Intensive care specialists	Yes		5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	125		130
Total CRT units implanted	2.490		2.545
Thereof, CRT pacemaker	709		857
Thereof, CRT ICD	1.781		1.688

Specialist performing implants			
Cardiologists	Yes		90%
Surgeons	Yes		10%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	161	153
Total ICD units implanted	3.434	3.885
Thereof, Single chamber	2.424	2.920
Thereof, Dual chamber	1.011	965
First implants	2.619	2.673
Replacements	815	1.212
Specialist performing implants		
Cardiologists	Yes	81%
Surgeons	Yes	14%
Other: Intensive care specialists	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	140	140
Total loop recorders implanted	1.724	2.063
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	No	not available

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	16	16
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	Yes	15%
Surgeons	Yes	85%

10. Device specific

Availability of remote monitoring of devices	Yes
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National registry for		
		Official name
ICD	Yes	Spanish implantable cardioverter defibrillator Registry. Official report of the Spanish Society of Cardiology Working Group on Implantable Cardioverter defibrillator. Javier Alzueta, José María Fernández; Rev Esp Cardiol. 2013;66:881-93
Pacing	Yes	Spanish Pacemaker Registry. Tenth Official Report of the Spanish Society of Cardiology Working Group on Cardiac Pacing. Raúl Coma Samartín, Francisco Ruiz Mateas, María Luisa Fidalgo Andrés, Juan Leal del Ojo González, Luisa Perez Álvarez; Rev Esp Cardiol. 2013;66:959-72
Electrophysiology	Yes	Spanish Catheter ablation. 12th Official Report of the Spanish Society of Cardiology Working Group on Electrophysiology and Arrhythmias Ángel Ferrero de Loma-Orsorio, Ernesto Díaz-Infante, Alfonso Macías Gallego, en representación de los colaboradores del Registro Español de Ablación con Catéter; Rev Esp Cardiol. 2013;66:983-92

Availability of a national quality insurance system or complication registry	Yes
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YesComments: Spanish Catheter ablation. 12th Official Report of the Spanish Society of Cardiology Working Group on Electrophysiology and Arrhythmias Ángel Ferrero de Loma-Orsorio, Ernesto Díaz-Infante, Alfonso Macías Gallego, en representación de los colaboradores del Registro Español de Ablación con Catéter; Rev Esp Cardiol. 2013;66:983-92

Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: Agencia Española del Medicamento y Productos Sanitarios

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	74	80
Number of ablations performed	9.662	11.987
Mean number of ablations per centre	146	150
Number of AF ablations	1.535	2.201
Number of ablation centres (> 50 AF ablations)	8	16
Number of ablation centres (> 10 VT ablations on structural heart diseases)	20	20

Availability of a national registry for interventional electrophysiology	Yes
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Official name: Spanish Catheter ablation. 12th Official Report of the Spanish Society of Cardiology Working Group on Electrophysiology and Arrhythmias (1021) Ángel Ferrero de Loma-Orsorio, Ernesto Díaz-Infante, Alfonso Macías Gallego, en representación de los colaboradores del Registro Español de Ablación con Catéter; Rev Esp Cardiol. 2013;66:983-92

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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☐	☒	☐	1
Lack of referral	☐	☐	☐	☒	☐	2
Lack of trained personnel	☐	☒	☐	☐	☐	4
Low awareness of guidelines	☐	☐	☒	☐	☐	3
Lack of operators	☐	☒	☐	☐	☐	5
	1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

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 de la Sociedad Española de Cardiología. (Pacing Working Group of the Spanish Society of Cardiology)

All sources that were used to fill out the questionnaire for the EHRA White Book 2014

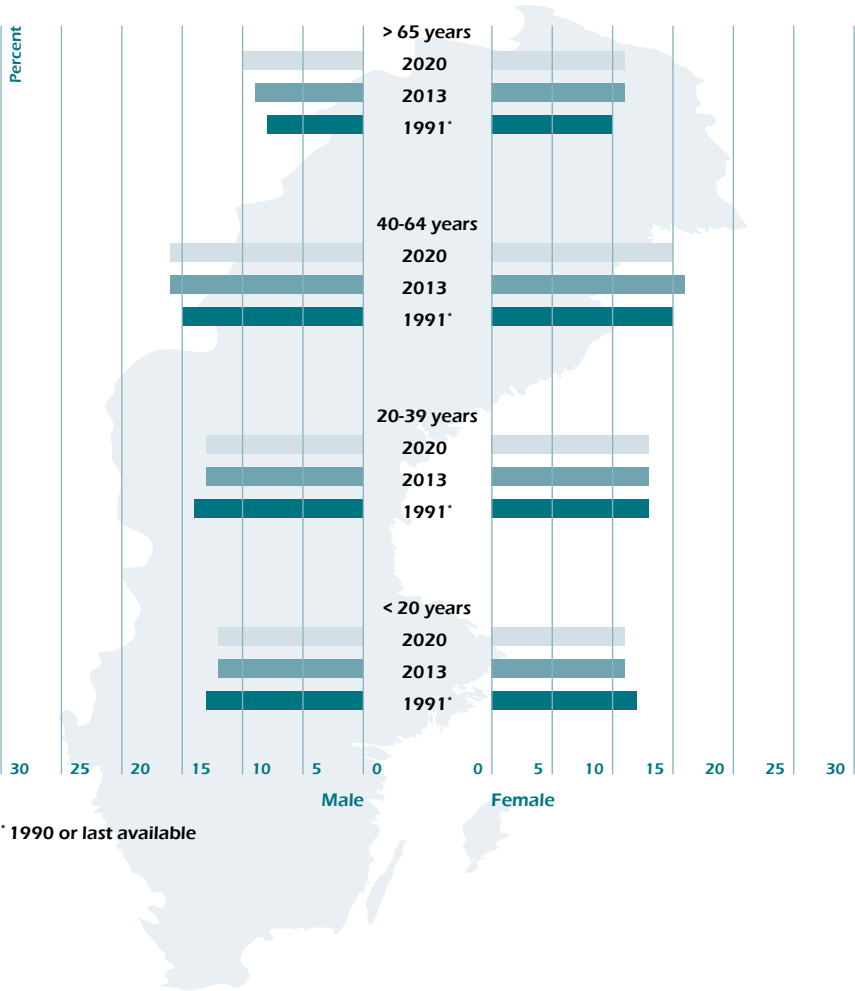
- EHRA White Book 2013
- National registry
- Ministry education
- National Working Group
- Working Group of Arrhythmias
- Sales data
- Estimation

SWEDEN



1. Statistics

Age pyramid for Sweden



Healthcare data		
Hospitals (per 100.000 population)	0,9	2003
Beds (per 100.000 population)	270,6	2011
Density of physicians (per 1.000 population)	2,8	1994
Density of nurses (per 1.000 population)	not available	not available

Demographic information		
Population	9.647.386	2013
Population annual growth rate (%)	0,8	2013
Life expectancy at birth	82	2013
Death rate (per 1.000 population)	9,7	2010
Live births (per 1.000 population)	11,8	2011

Economic information		
Gross domestic product (U.S dollar-billions)	552,04	2013*
Gross domestic product per capita (U.S dollar-units)	57.297,29	2013*
Total expenditure on health as % of GDP	9,4	2011
General government expenditure on health as % of total expenditure on health	81,0	2010
Private expenditure on health as % of total expenditure on health	19,0	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	39%	not available

3. Healthcare System

National Health System.

Basic insurance availability	Yes
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Requirements: Permit of residency.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	95%	not available
Private insurance company	0%	not available
Private co-payment	5%	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



Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☒
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	EHRA, IBHRE
Invasive electrophysiology	☐	☒	☐	☐	EHRA, IBHRE
Allied professionals	☐	☒	☐	☐	EHRA, IBHRE
Training centres	☐	☐	☒	☐	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☒

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
--	-----------

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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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)	7
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Percentage of academic centres among all practicing EP centres	70%
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Percentage of academic centres among all practicing implanting devices centres	17,5%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	43	42
Total Pacemaker units implanted	9.476	9.602
Thereof, New implants	6.687	6.854
Thereof, Replacements	2.789	2.748

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available
Other: Anaesthesiologists	Yes	not available

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	33	not available
Total CRT units implanted	443	967
Thereof, CRT pacemaker	214	431
Thereof, CRT ICD	229	536

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available
Other: Anaesthesiologists	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	35	29
Total ICD units implanted	1.758	1.911
Thereof, Single chamber	348	380
Thereof, Dual chamber	1.410	1.531
First implants	1.301	1.323
Replacements	457	588

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available
Other: Anaesthesiologists	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	45	not available
Total loop recorders implanted	649	605

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available
Other: Anaesthesiologists	Yes	not available

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	3	4
Total lead extraction procedures	198	491

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	Swedish ICD and pacemaker register
Pacing	Yes	Swedish ICD and pacemaker register
Electrophysiology	Yes	Swedish ICD and pacemaker register

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
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11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	10	10
Number of ablations performed	4.351	4.483
Mean number of ablations per centre	435	448
Number of AF ablations	1.617	1.727
Number of ablation centres (> 50 AF ablations)	9	9
Number of ablation centres (> 10 VT ablations on structural heart diseases)	7	5

Availability of a national registry for interventional electrophysiology	Yes
--	-----

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	☑	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☑	☐	☐	☐	☐	5
Lack of referral	☐	☐	☐	☑	☐	1
Lack of trained personnel	☐	☐	☑	☐	☐	2
Low awareness of guidelines	☐	☑	☐	☐	☐	3
Lack of operators	☐	☐	☑	☐	☐	4
	1 = no obstacle		5 = great obstacle		* (1 = top; 6 = lowest)	

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
· Swedish Society of Cardiology, Swedish Society of Cardiology's HeartRhythmGroup - HRG

All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Swedish ICD and pacemaker register · Swedish catheter ablation registry · personal knowledge · EHRA guidelines

SWITZERLAND



1. Statistics

Age pyramid for Switzerland



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	3,9	2011
Beds (per 100.000 population)	500,8	2011
Density of physicians (per 1.000 population)	3,9	2011
Density of nurses (per 1.000 population)	17,4	2011

Demographic information		
Population	7.996.026	2013
Population annual growth rate (%)	0,9	2013
Life expectancy at birth	82	2013
Death rate (per 1.000 population)	8,0	2010
Live births (per 1.000 population)	10,3	2010

Economic information		
Gross domestic product (U.S dollar-billions)	646,20	2013*
Gross domestic product per capita (U.S dollar-units)	80.275,78	2013*
Total expenditure on health as % of GDP	10,9	2011
General government expenditure on health as % of total expenditure on health	65,2	2010
Private expenditure on health as % of total expenditure on health	34,8	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	35%	35%

3. Healthcare System

Compulsory general healthcare insurance for all citizens. Complementary private insurances exist for the in-hospital treatment. High financial contribution of the individual compared to other healthcare systems.

Basic insurance availability	Yes
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Requirements: Basic insurance coverage is mandatory. The system is run on a per capita insurance system. Citizens, whose income are below a certain limit or who are unemployed, can apply for subsidies for themselves and their families on a municipal level.

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2012	2013
Public insurance company	70%	70%
Private insurance company	0%	0%
Private co-payment	30%	30%

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: Every patient pays 10% of the costs up to a maximum of 700 CHF annually.

Reimbursement availability for physicians and hospitals

	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐

Treatment availability

No restrictions	☒
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	As of 2011 physicians have to follow the Guidelines of the Swiss Society of Cardiology (which includes passing the EHRA exam on Cardiac pacing and ICD). Richtlinien 2011 zur Herzschrittmacher und Defibrillatortherapie und perkutanen Katheterablation
Invasive electrophysiology	☐	☒	☐	☐	Richtlinien 2011 zur Herzschrittmacher und Defibrillatortherapie und perkutanen Katheterablation
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☒	☐	☐	Richtlinien 2011 zur Herzschrittmacher und Defibrillatortherapie und perkutanen Katheterablation

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☒
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

Comments: Richtlinien 2011 zur Herzschrittmacher und Defibrillatortherapie und perkutanen Katheterablation.

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Swiss Society of Cardiology	

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	Yes	1 year
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Training centres availability	
Pacemaker	15
ICD implantation	10
CRT implantation	8
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	5

Number of universities (Schools of Medicine)	5
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Percentage of academic centres among all practicing EP centres	22%
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Percentage of academic centres among all practicing implanting devices centres	7%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	74	76
Total Pacemaker units implanted	5.965	6.097
Thereof, New implants	4.417	4.614
Thereof, Replacements	1.548	1.483

Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	34	31
Total CRT units implanted	520	477
Thereof, CRT pacemaker	160	157
Thereof, CRT ICD	360	320

Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2012	2013
Implanting centres	41	46
Total ICD units implanted	1.549	1.604
Thereof, Single chamber	397	582
Thereof, Dual chamber	358	427
First implants	1.115	1.025
Replacements	434	579

Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2012	2013
Implanting centres	74	not available
Total loop recorders implanted	327	not available

Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	No	not available

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2012	2013
Hospitals performed lead extractions	10	8
Total lead extraction procedures	not available	90

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	www.arrhythmia.ch [CHPACE WEB] Annual reports published on www.pacemaker.ch
Pacing	Yes	www.arrhythmia.ch [CHPACE WEB] Annual reports published on www.pacemaker.ch
Electrophysiology	Yes	www.arrhythmia.ch [CHPACE WEB] Annual reports published on www.pacemaker.ch

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		
	2012	2013
Number of ablation centres	21	22
Number of ablations performed	4.743	4.527
Mean number of ablations per centre	190	206
Number of AF ablations	1.532	1.469
Number of ablation centres (> 50 AF ablations)	10	11
Number of ablation centres (> 10 VT ablations on structural heart diseases)	11	3

Availability of a national registry for interventional electrophysiology	Yes
Official name: CHPACE WEB Registry	

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	☒	☐	☐	☐	☐	6
Lack of reimbursement, limited financial resources	☒	☐	☐	☐	☐	5
Lack of referral	☒	☐	☐	☐	☐	1
Lack of trained personnel	☒	☐	☐	☐	☐	2
Low awareness of guidelines	☒	☐	☐	☐	☐	3
Lack of operators	☒	☐	☐	☐	☐	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 „Cardiac Pacing and Electrophysiology“ of the Swiss Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · Gesundheitsstatistik 2013, Bundesamt für Statistik · www.pacemaker.ch · CHPACE WEB online registry of the Swiss Working Group · Estimation



SYRIA

Data not submitted.





TUNISIA

Data not submitted.



TURKEY

Data not submitted.

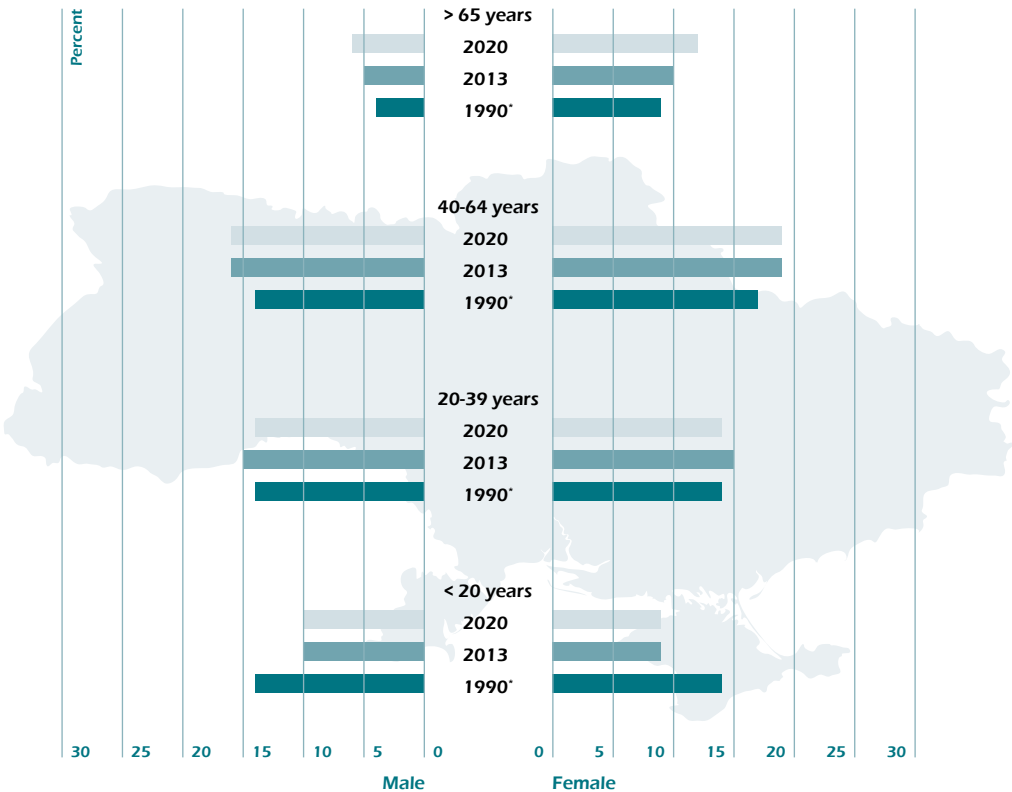


UKRAINE



1. Statistics

Age pyramid for Ukraine



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	5,3	2012
Beds (per 100.000 population)	899,0	2012
Density of physicians (per 1.000 population)	3,5	2012
Density of nurses (per 1.000 population)	7,6	2012

Demographic information		
Population	44.573.205	2013
Population annual growth rate (%)	-0,6	2013
Life expectancy at birth	69	2013
Death rate (per 1.000 population)	14,6	2011
Live births (per 1.000 population)	11,0	2011

Economic information		
Gross domestic product (U.S dollar-billions)	175,53	2013*
Gross domestic product per capita (U.S dollar-units)	3.861,70	2013*
Total expenditure on health as % of GDP	7,3	2011
General government expenditure on health as % of total expenditure on health	56,6	2010
Private expenditure on health as % of total expenditure on health	43,4	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	65,8%	66,5%

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-policlinic) help, stationary (general profile and specialized) help.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality		
	2012	2013
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

Comments: Co-payment is not necessary when NHS funds are available in a hospital. In any other case, patient must cover all expenses from own budget.

Reimbursement availability for physicians and hospitals								
	Physician receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☐	☐	☒	☐
ICD primary prevention	☐	☐	☒	☐	☐	☐	☒	☐
ICD secondary prevention	☐	☐	☒	☐	☐	☐	☒	☐
CRT devices	☐	☐	☒	☐	☐	☐	☒	☐
Ablation	☐	☐	☒	☐	☐	☐	☒	☐

Treatment availability	
No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☐
Restricted to certain number of treatments/budget	☒
Not funded	☐
No answer	☐

4. Education

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☐	☒	☐	☐	Curriculum: Invasive and non invasive arrhythmology
Invasive electrophysiology	☐	☒	☐	☐	Curriculum: Invasive and non invasive arrhythmology
Allied professionals	☐	☐	☒	☐	
Training centres	☐	☐	☐	☒	

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☒
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☐
No answer	☐

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
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	Not available
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Suggested period of training to perform implantations	Not available
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Training centres availability	
Pacemaker	6
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	3

Number of universities (Schools of Medicine)	19
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Percentage of academic centres among all practicing EP centres	11,4%
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Percentage of academic centres among all practicing implanting devices centres	11,4%
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5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2012	2013
Implanting centres	36	36
Total Pacemaker units implanted	5.491	6.579
Thereof, New implants	4.630	5.523
Thereof, Replacements	861	1.056

Specialist performing implants		
Cardiologists	Yes	10,26%
Surgeons	Yes	89,74%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2012	2013
Implanting centres	11	13
Total CRT units implanted	57	89
Thereof, CRT pacemaker	39	67
Thereof, CRT ICD	18	22

Specialist performing implants		
Cardiologists	Yes	17,65%
Surgeons	Yes	82,35%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	9		17
Total ICD units implanted	52		85
Thereof, Single chamber	not available		not available
Thereof, Dual chamber	not available		not available
First implants	47		71
Replacements	5		14

Specialist performing implants			
Cardiologists	Yes		17,65%
Surgeons	Yes		82,35%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	3		2
Total loop recorders implanted	8		11

Specialist performing implants			
Cardiologists	Yes		50%
Surgeons	Yes		50%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions			
	2012		2013
Hospitals performed lead extractions	9		7
Total lead extraction procedures	30		55

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

10. Device specific

Availability of remote monitoring of devices	No
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Reasons: This is available only in a few private centres due to restricted budget.

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		
	2012	2013
Number of ablation centres	13	13
Number of ablations performed	2.489	2.672
Mean number of ablations per centre	153,2	206
Number of AF ablations	614	680
Number of ablation centres (> 50 AF ablations)	5	6
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2

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	☐	☒	☐	☐	☐
Lack of reimbursement, limited financial resources	☐	☐	☐	☐	☒
Lack of referral	☐	☐	☐	☒	☐
Lack of trained personnel	☐	☐	☐	☒	☐
Low awareness of guidelines	☐	☐	☒	☐	☐
Lack of operators	☐	☐	☐	☒	☐

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

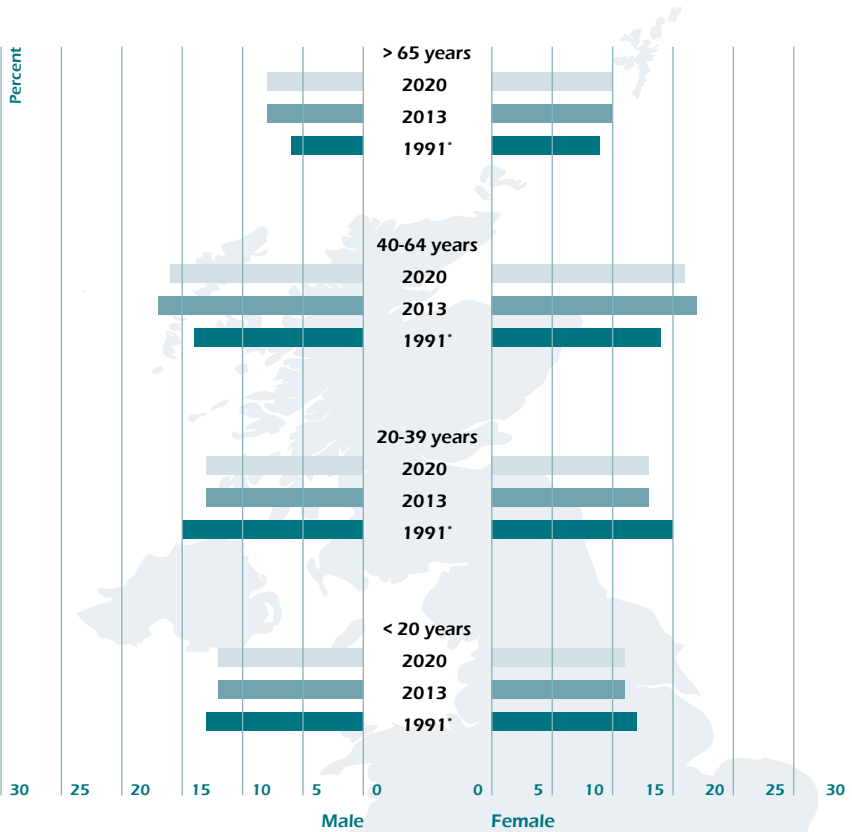
All sources that were used to fill out the questionnaire for the EHRA White Book 2014
· EHRA White Book 2013 · State Statistics Service of Ukraine: http://www.ukrstat.gov.ua/ · Association of Arrhythmologists of Ukraine · Official site of Ministry of Health of Ukraine: http://www.moz.gov.ua/ua/portal/mtbr_eduinsti-tutions/

UNITED KINGDOM



1. Statistics

Age pyramid for United Kingdom



* 1990 or last available

Healthcare data		
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	291,7	2011
Density of physicians (per 1.000 population)	2,8	2012
Density of nurses (per 1.000 population)	8,8	2012

Demographic information		
Population	63.395.574	2013
Population annual growth rate (%)	0,6	2013
Life expectancy at birth	80	2013
Death rate (per 1.000 population)	9,0	2010
Live births (per 1.000 population)	13,0	2010

Economic information		
Gross domestic product (U.S dollar-billions)	2.489,67	2013*
Gross domestic product per capita (U.S dollar-units)	39.048,66	2013*
Total expenditure on health as % of GDP	9,3	2011
General government expenditure on health as % of total expenditure on health	83,2	2010
Private expenditure on health as % of total expenditure on health	16,8	2010

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2012	2013
	40,9%	28,4%

3. Healthcare System

National Health Service provided for all citizens. Private healthcare optionally available.

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

Percentage of insured and uninsured citizens		
	2012	2013
Insured citizens	11,7%	10%
Uninsured citizens	88,3%	90%

Distribution of insurance modality		
	2012	2013
Public insurance company	88,3%*	90%
Private insurance company	11,7%*	10%
Private co-payment	0%	0%

* 2012 data have accidentally been transposed in EHRA White Book 2013.

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 receives per process reimbursement	Physician does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician does not receive reimbursement neither incentive	No answer	Hospital receives per process reimbursement	Hospital does not receive reimbursement, but incentives (e.g. more budget on the following year)	Hospital does not receive reimbursement neither incentive	No answer
Internal loop recorders	☐	☐	☒	☐	☒	☐	☐	☐
ICD primary prevention	☐	☐	☒	☐	☒	☐	☐	☐
ICD secondary prevention	☐	☐	☒	☐	☒	☐	☐	☐
CRT devices	☐	☐	☒	☐	☒	☐	☐	☐
Ablation	☐	☐	☒	☐	☒	☐	☐	☐
Comments:	Physician reimbursement is only for procedures performed in the private sector. All NHS work is with a fixed salary, with no reimbursement or incentive.				All procedures have a set tariff, which is the amount the hospital receives.			

Treatment availability

No restrictions	☐
No restrictions, but the indications have to follow the ESC guidelines	☐
No restrictions, but the indications have to follow the National guidelines	☒
Restricted to certain number of treatments/budget	☐
Not funded	☐
No answer	☐

Comments: NICE (for example sets indications for ICD implantation that are determined by both clinical efficacy and cost-effectiveness).

4. Education

National certification availability

	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	☒	☐	☐	☐	Certificate of Completion of Specialist Training (with subspecialty training in Device/EP) issued by Joint Royal Colleges of Physicians Training Board is mandatory; Accreditation by British Heart Rhythm Society/HRs/EHRA is encouraged but not mandatory
Invasive electrophysiology	☒	☐	☐	☐	Certificate of Completion of Specialist Training (with subspecialty training in Device/EP) issued by Joint Royal Colleges of Physicians Training Board is mandatory; Accreditation by British Heart Rhythm Society/HRs/EHRA is encouraged but not mandatory
Allied professionals	☒	☐	☐	☐	Society for Cardiological Science and Technology
Training centres	☐	☒	☐	☐	British Heart Rhythm Society has guidelines for training centres for device management (basic, advanced) and EP (basic, advanced) but these are not mandatory

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	☐
Yes, the Society advises EHRA certification and homologates national certification	☐
Yes, the Society advises EHRA certification, but it does not homologate national certification	☐
No	☒
No answer	☐

Specialist required for		
	Specialist	
Catheter ablation	Yes	Certificate of Completion of Specialist Training (with subspecialty training in Device/EP) issued by Joint Royal Colleges of Physicians Training Board is mandatory; Accreditation by British Heart Rhythm Society/HRS/EHRA is encouraged but not mandatory
ICD or pacemaker implants	Yes	Certificate of Completion of Specialist Training (with subspecialty training in Device/EP) issued by Joint Royal Colleges of Physicians Training Board is mandatory; Accreditation by British Heart Rhythm Society/HRS/EHRA is encouraged but not mandatory

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
---	-----

Official name; British Heart Rhythm Society publishes guidelines for competency, ongoing competency, and for centres.

Required period of training to perform implantations	Yes	2 years
--	-----	---------

Comments: 2 years of subspecialty training (after 3 years of basic training including pacing implantation).

Suggested period of training to perform implantations	Yes	2 years
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Comments: 2 years of subspecialty training (after 3 years of basic training including pacing implantation).

Training centres availability	
Pacemaker	50
ICD implantation	50
CRT implantation	50
Electrophysiological studies and catheter ablation	40
Atrial fibrillation ablation	40

Number of universities (Schools of Medicine)	33
--	----

Percentage of academic centres among all practicing EP centres	50%
--	-----

Percentage of academic centres among all practicing implanting devices centres	14%
--	-----

5. Pacemakers

Pacemaker units implanted and number of implanting centres			
	2012		2013
Implanting centres	205		227
Total Pacemaker units implanted	38.770		44.503
Thereof, New implants	32.120		32.567
Thereof, Replacements	6.650		11.936

Specialist performing implants			
Cardiologists	Yes		98%
Surgeons	Yes		2%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres			
	2012		2013
Implanting centres	114		109
Total CRT units implanted	6.965		7.762
Thereof, CRT pacemaker	4.015		3.792
Thereof, CRT ICD	2.950		3.970

Specialist performing implants			
Cardiologists	Yes		98%
Surgeons	Yes		2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres			
	2012		2013
Implanting centres	114		106
Total ICD units implanted	5.762		5.809
Thereof, Single chamber	1.310		1.806
Thereof, Dual chamber	4.452		4.003
First implants	4.788		3.988
Replacements	974		1.821

Specialist performing implants			
Cardiologists		Yes	98%
Surgeons		Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres			
	2012		2013
Implanting centres	not available		120
Total loop recorders implanted	not available		4.104

Specialist performing implants			
Cardiologists		Yes	100%
Surgeons		No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions			
	2012		2013
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	National CRM Database (NICOR)
Pacing	Yes	National CRM Database (NICOR)
Electrophysiology	Yes	National CRM Database (NICOR)

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

Official name: National CRM Database (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

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2012	2013
Number of ablation centres	48	54
Number of ablations performed	16.030	15.903
Mean number of ablations per centre	308	295
Number of AF ablations	5.064	5.408
Number of ablation centres (> 50 AF ablations)	26	30
Number of ablation centres (> 10 VT ablations on structural heart diseases)	24	22

Availability of a national registry for interventional electrophysiology	Yes
Official name: National CRM Database (NICOR)	

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	☐	☐	☒	☐	☐	6
Lack of reimbursement, limited financial resources	☐	☐	☒	☐	☐	4
Lack of referral	☐	☒	☐	☐	☐	1
Lack of trained personnel	☐	☒	☐	☐	☐	2
Low awareness of guidelines	☐	☐	☒	☐	☐	3
Lack of operators	☐	☐	☒	☐	☐	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 2014
• EHRA White Book 2013 • www.medschools.ac.uk • National EP Ablation Database (NICOR) • National Cardiac Rhythm Management Device Database (NICOR) • National database (NICOR) • 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 2006, 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

ALCALDE RODRIGUEZ	Oscar	Spain	2012
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
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
BONANNO	Carlo	Italy	2014
BRUGADA	Josep	Spain	2009

EHRA EP Certified professionals

BUERKLE	Gerd	Austria	2011
BUN	Sok-Sithikun	France	2012
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
COZAR LEON	Rocio	Spain	2012
DATINO	Tomas	Spain	2012
DAVOODI	Gholamreza	Ireland	2008
DE FILIPPO	Paolo	Italy	2012
DE GROOT	Joris R.	Netherlands	2012
DE JONG	Jonas	Netherlands	2013
DE RIVA SILVA	Marta	Spain	2013
DELGADO	Hugo Emilio	Argentina	2014
DEUTSCH	Alexandru	Romania	2012
DJAJADISASTRA	Achmad Iskandar	Germany	2012
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
FONTENLA	Adolfo	Spain	2012
FORCLAZ	Andrei	Switzerland	2012
FRANCK	Harald	Germany	2011
GALLARDO LOBO	Rodrigo	Spain	2012
GAWRYSIAK	Marcin	Poland	2013
GLOWNIAK	Andrzej	Poland	2012
GONZALEZ VASSEROT	Maria del Mar	Spain	2009
GONZALEZ-ENRIQUEZ	Susana	Spain	2012
GRECU	Mihaela	Romania	2007
GUGUCHEV	Pavel	United States of America	2010

5. Appendix

EHRA Certification

Electrophysiology

EHRA EP Certified professionals

HEMELS	Martin	Netherlands	2012
HERCZKU	Csaba	Hungary	2012
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
JOHAR	Sofian	United Kingdom	2012
JONES	David Gareth	United Kingdom	2012
KACZMAREK	Krzysztof	Poland	2013
KARDOS	Attila	Hungary	2012
KEMME	Michiel	Netherlands	2009
KILISZEK	Marek	Poland	2010
KONSTANTINIDOU	Melanie	Germany	2013
KOSTOPOULOU	Anna	Greece	2014
KUHNE	Michael	Switzerland	2012
LANG	Christopher	United Kingdom	2014
LAURENZI	Francesco	Italy	2009
LERCHER	Peter	Austria	2012
LETSAS	Konstantinos	Greece	2009
LUEDORFF	Guido	Germany	2012
MADRID	Antonio	Spain	2008
MARINI	Massimiliano	Italy	2011
MARTINEK	Martin	Austria	2010
MARTINEZ SANDE	Jose Luis	Spain	2012
MATIA FRANCES	Roberto	Spain	2011
MATIELLO	Maria	Spain	2011
MUELLER	Stephan Andreas	Switzerland	2012
MUNDEL	Markus	Germany	2013
NAGEH-ARMANIOS	Maged	United States of America	2012
NAVARRERE CASAS	Antonio Javier	United States of America	2008
NENTWICH	Karin	Germany	2013
NOVAK	Jan	United Kingdom	2013

EHRA EP Certified professionals

OSCA ASENSI	Joaquin	Spain	2010
ÖZCAN	Emin Evren	Turkey	2014
PAPIASHVILI	Giorgi	Georgia	2009
PEREZ DIEZ	Diego	Spain	2012
PISON	Laurent	Netherlands	2013
POZZETTI	Daniela	Italy	2007
PUCHOL	Alberto	Hungary	2012
REBELLATO	Luca	Italy	2012
RICCIARDI	Danilo	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
ROTEN	Laurent	Switzerland	2009
ROUX	Antoine	France	2013
SALGUERO BODES	Rafael	Spain	2009
SAMO AYOU	Romeo	Sweden	2011
SAUSE	Armin	Germany	2009
SCHIMPF	Rainer	Germany	2012
SCHOONDERWOERD	Bas	Netherlands	2012
SEGRETI	Luca	Italy	2013
SEGURA VILLALOBOS	Federico	Spain	2012
SEILER	Jens	Switzerland	2013
SEOW	Swee-Chong	Singapore	2007
SILISTE	Calin	Italy	2013
SKENE	Christopher	United Kingdom	2014
SMIT	Jaap Jan	Netherlands	2009
STANLEY	Anthony	South Africa	2014
STEFFEL	Jan	Switzerland	2012
STUEHLINGER	Markus	Austria	2010
SZABO	Albin Arpad	Hungary	2012
SZEPLAKI	Gabor	Hungary	2012
TEJEIRA FERNANDEZ	Elvis	United Kingdom	2012
TOMAN	Ondrej	Czech Republic	2013

5. Appendix

EHRA Certification



Electrophysiology

EHRA EP Certified professionals

TRINES	Serge Alexander Ivo Petrus	Netherlands	2008
TUTDIBI	Osman	Germany	2013
TZEIS	Stylianios	Greece	2010
UCER	Ekrem	Germany	2012
VACCARI	Diego	Italy	2013
VALVERDE ANDRE	Irene	Spain	2013
VAN CASTEREN	Lieve	Belgium	2012
VATASESCU	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
WINTER	Siegmund	Austria	2012
YEO	Wee Tiong	Singapore	2013
ZELJKO	Hrvojka Marija	Croatia	2013
ZOPPO	Franco	Italy	2008
ZUCCHELLI	Giulio	Italy	2012

EP Certification candidates who have successfully completed the exam

ABEDIN	Zainul	United States of America	2007
ÁBRAHAM	Pál	Hungary	2013
ACENA RAMOS	Marta	Spain	2011
ACOU	Willem-Jan	Belgium	2013
AHMED TAHER MAHMOUD	Ahmed	Egypt	2013
AHUMADA	MIGUEL	Spain	2013
AL BUNNI	Muhamad	Italy	2007
ALCALDE RODRIGUEZ	Oscar	Spain	2010
ALGARRA CULLELL	Maria	Spain	2013
ALIYEV	Farid	Turkey	2010
ALZAND	B.	Netherlands	2012
AMET	Denis	France	2011
ANDERSON	Mark H.	United Kingdom	2010

EP Certification candidates who have successfully completed the exam

ANGUERA CAMOS	Ignacio	Spain	2008
ANIC	Ante	Croatia	2013
ANNE	Wim	Belgium	2010
ARBELO	Elena	Spain	2007
ARCOCHA TORRES	Maria Fe	Spain	2009
ARIAS PALOMARES	Miguel Angel	Spain	2010
ARMENTA PASTOR	Juan Fernandez	Spain	2011
ATTA	Salah Eldin Sayed	Saudi Arabia	2010
AVELLA	Andrea	Italy	2007
ÁVILA ALONSO	Pablo	Spain	2013
AYALA PAREDES	Felix	Canada	2007
BALT	Jippe	Netherlands	2013
BALTA	Osman	Germany	2010
BARRY	James	United Kingdom	2012
BAUERNFEIND	Tamas	Hungary	2013
BAYRAK	Duhan Fatih	Belgium	2011
BEAUPORT	Joelle	Germany	2012
BEDNAREK	Jacek	Poland	2011
BELOTTI	Giuseppina	Italy	2006
BENCSEK	Gabor	Hungary	2009
BERRUEZO SANCHEZ	Antonio	Spain	2006
BERTAGNOLLI	Livio	Italy	2013
BERTERO	Giovanni	Italy	2012
BERTOMEU-GONZALEZ	Vicente	Spain	2010
BLAAUW	Yuri	Netherlands	2011
BLANDINO	Alessandro	Italy	2013
BOHORA	Shomu	India	2012
BONANNO	Carlo	Italy	2011
BORDIGNON	Stefano	Italy	2013
BORREGO BERNABE	Luis	Spain	2013
BOULLIN	Julian Paul	United Kingdom	2010
BROCKMEIER	Johannes Paul	Germany	2013
BROUZET	thomas	Spain	2012
BRUGADA	Josep	Spain	2007
BUCHHOLZ	Jochen	Germany	2013

5. Appendix

Electrophysiology

EP Certification candidates who have successfully completed the exam

BUERKLE	Gerd	Austria	2008
BUN	Sok-Sithikun	France	2012
BURRI	Haran	Switzerland	2007
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
CASTILLO	Jesús	Spain	2013
CASTREJON CASTREJON	Sergio	Spain	2012
CASTRO URDA	Victor	Spain	2009
CATANCHIN	Andrei	Australia	2008
CHATTERJEE	Debjit	United Kingdom	2010
CHONG	Daniel	Singapore	2011
CLEMENS	Marcell	Hungary	2012
CLEMENTY	Nicolas	France	2010
CORTEZ-DIAS	Nuno	Portugal	2013
COZAR LEON	Rocio	Spain	2011
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 MEYER	Grim	Belgium	2011
DE RIVA SILVA	Marta	Spain	2011
DEL CASTILLO ARROJO	Silvia	Spain	2006
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

EP Certification candidates who have successfully completed the exam

DURAY	Gabor Zoltan	Germany	2008
DUTHOIT	Guillaume	France	2010
DYRDA	Katia	Canada	2010
EISENBERGER	Martin	Czech Republic	2008
EIZMENDI GOICOECHEA	Maria de Iciar	Spain	2011
EL KADRI	Moutaz	United Kingdom	2012
ELDER	Douglas	United Kingdom	2010
ESTRADA	Alejandro	Spain	2013
EWERTSEN	Niels Christian	Germany	2013
FERNANDEZ PASTOR	Julia	Spain	2012
FILGUEIRAS RAMA	David	Spain	2012
FONTENLA	Adolfo	Spain	2010
FORCLAZ	Andrei	Switzerland	2009
FOSCH	Javier	Spain	2013
FRANCK	Harald	Germany	2010
GALLARDO LOBO	Rodrigo	Spain	2009
GANDJBAKHCH	Estelle	France	2013
GAROFALO FORTE	Daniel	Spain	2013
GAWRYSIAK	Marcin	Poland	2009
GLOWNIAK	Andrzej	Poland	2009
GONZALEZ FERRER	Juan Jose	Spain	2012
GONZALEZ VASSEROT	Maria del Mar	Spain	2007
GONZALEZ-ENRIQUEZ	Susana	Spain	2008
GOPALAMURUGAN	A. B.	United Kingdom	2011
GRANIER	Mathieu	France	2011
GRECU	Mihaela	Romania	2006
GUGUCHEV	Pavel	United States of America	2010
GUY-MOYAT	Benoit	France	2010
HEMELS	Martin	Netherlands	2011
HENDRICKS	Neil	South Africa	2012
HERCZKU	Csaba	Hungary	2009
HLIVAK	Peter	Slovakia	2010
HOBBS	William Julian	United Kingdom	2007
HOFFMANN	Andrzej	Poland	2012
HOGLUND	Niklas	Sweden	2008

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EHRA Certification



Electrophysiology

EP Certification candidates who have successfully completed the exam

HOOFT VAN HUYSDUYNEN	Bart	Netherlands	2011
HORDYNSKI	Grzegorz	Poland	2012
HUEMER	Martin	Germany	2013
HUYBRECHTS	Wim	Belgium	2008
INFUSINO	Tommaso	Italy	2011
IORGULESCU	Corneliu-Nicolae	Romania	2012
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-DIAZ	Javier	Spain	2013
JOHAR	Sofian	United Kingdom	2009
JONES	David Gareth	United Kingdom	2009
JOST	Colin	Germany	2012
KACZMAREK	Krzysztof	Poland	2010
KANDIL	Mehmet	Germany	2011
KARDOS	Attila	Hungary	2010
KEMME	Michiel	Netherlands	2008
KILISZEK	Marek	Poland	2009
KIRUBAKARAN	Senthil	United Kingdom	2012
KOCH	Lydia	Germany	2012
KONSTANTINIDOU	Melanie	Germany	2011
KOOPMAN	Pieter	Belgium	2011
KOSTOPOULOU	Anna	Greece	2012
KRISTENSEN	Jens	Denmark	2013
KRIVOLAPOV	Sergey	Russia	2013
KUHNE	Michael	Switzerland	2011
LALLEMAND	Benedicte	France	2012
LANG	Christopher	United Kingdom	2012
LAURENZI	Francesco	Italy	2008
LE POLAIN DE WAROUX	Jean-Benoit	Belgium	2012
LERCHER	Peter	Austria	2010

EP Certification candidates who have successfully completed the exam

LETSAS	Konstantinos	Greece	2008
LINDE	Antonio	Spain	2013
LUEDORFF	Guido	Germany	2012
LUERMANS	Justin	Netherlands	2013
MADRAZO DELGADO	Ines	Spain	2012
MADRID	Antonio	Spain	2008
MAKOWSKI	Karol	Portugal	2010
MANTZIARI	Aglaia-Angeliki (lilian)	United Kingdom	2013
MARINI	Massimiliano	Italy	2010
MARTINEK	Martin	Austria	2008
MARTINEZ SANDE	Jose Luis	Spain	2009
MASSIN	Francois	France	2009
MATIA FRANCES	Roberto	Spain	2009
MATIELLO	Maria	Spain	2007
MCCREADY	James	United Kingdom	2010
MELLOR	Greg	United Kingdom	2013
MEYER	Christian	Germany	2011
MORENO	Jose	Spain	2013
MORENO REVIRIEGO	Sara	Spain	2011
MUELLER	Dirk	Germany	2008
MUELLER	Stephan Andreas	Switzerland	2011
MUNDEL	Markus	Germany	2011
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
NOTI	Fabian	Switzerland	2013
NOVAK	Jan	United Kingdom	2013
OLORIZ SANJUAN	Teresa	Spain	2013
OSCA ASENSI	Joaquin	Spain	2006
ÖZCAN	Emin Evren	Turkey	2013
PACHON	Marta	Spain	2011
PADFIELD	Gareth	United Kingdom	2013
PAISEY	John	United Kingdom	2008

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Electrophysiology

EP Certification candidates who have successfully completed the exam

PAPIASHVILI	Giorgi	Georgia	2007
PAURIAH	Maheshwar	United Kingdom	2012
PAWLIK	Tomasz	Poland	2013
PELAEZ GONZALEZ	Antonio	Spain	2012
PEREZ	Armando	Spain	2010
PEREZ ALVAREZ	Luisa	Spain	2011
PEREZ DIEZ	Diego	Spain	2010
PISON	Laurent	Netherlands	2010
POOSAPADDI RAJA	Bhima Shankar	India	2012
POZZETTI	Daniela	Italy	2007
PUCHOL	Alberto	Hungary	2009
QURESHI	Norman	United Kingdom	2013
RAMANNA	Hemanth	Netherlands	2008
REBELLATO	Luca	Italy	2009
RIAH	Leila	Tunisia	2013
RICCIARDI	Danilo	Belgium	2012
RIVAS GANDARA	Nuria	Spain	2010
RIVERA	Santiago	Canada	2013
ROCA LUQUE	Ivo	Spain	2011
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
SALGADO ARANDA	Ricardo	Spain	2013
SALGUERO BODES	Rafael	Spain	2007
SAMMUT	Mark Adrian	Malta	2012
SAMO AYOU	Romeo	Sweden	2010
SANCHEZ GOMEZ	Juan Miguel	Spain	2013
SANDILANDS	A.	United Kingdom	2010
SARRIAS	Axel	Spain	2013
SAUSE	Armin	Germany	2008
SCHERR	Daniel	Austria	2013

EP Certification candidates who have successfully completed the exam

SCHIMPF	Rainer	Germany	2012
SCHOENBAUER	Robert	Austria	2011
SCHOONDERWOERD	Bas	Netherlands	2008
SEGRETI	Luca	Italy	2010
SEGURA VILLALOBOS	Federico	Spain	2011
SEILER	Jens	Switzerland	2010
SEOW	Swee-Chong	Singapore	2007
SGARITO	Giuseppe	Italy	2012
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	Netherlands	2008
SPADACINI	Gianmario	Italy	2006
STANLEY	Anthony	South Africa	2012
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
TAHAPARY	Giovanni	Netherlands	2013
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
TORCIVIA	Riccardo	Italy	2012
TRAYKOV	Vassil B	Hungary	2010
TREGUER	Frederic	France	2009
TRINES	Serge Alexander Ivo Petrus	Netherlands	2006
TRUCCO DE RINAUDO	Maria Emilce	Spain	2013
TUTDIBI	Osman	Germany	2012
TZEIS	Stylianios	Greece	2009

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Electrophysiology

EP Certification candidates who have successfully completed the exam

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 HEIJDEN	Jeroen	Netherlands	2013
VAN HEUVERSWYN	Frederic	Belgium	2012
VAN OOSTROM	Antonie	Netherlands	2012
VAN OPSTAL	Jurren	Netherlands	2013
VATASESCU	Radu-Gabriel	Romania	2007
VEGA OLVERA	Mercedes	Spain	2012
VENABLES	Paul	United Kingdom	2010
VILLANUEVA SANCHEZ	José Ginés	Spain	2013
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
WESTRA	Sjoerd	Netherlands	2012
WETZEL	Renate Ulrike	Germany	2013
WIJCHERS	Sip	Belgium	2012
WINTER	Siegmund	Austria	2010
YEO	Wee Tiong	Singapore	2013
ZELJKO	Hrvojka Marija	Croatia	2012
ZELLERHOFF	Stephan	Germany	2011
ZHELYAKOV	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
AL BUNNI	Muhamad	Italy	2007
ALCALDE RODRIGUEZ	Oscar	Spain	2012
ALZAND	Bakr	Netherlands	2012
ANNE	Wim	Belgium	2011
APOSTOLOPOULOS	Theodoros	Greece	2007
ARBELO	Elena	Spain	2013
ARIAS PALOMARES	Miguel Angel	Spain	2013
AYALA PAREDES	Felix Alejandro	Canada	2009
BACCHIONI	Giuseppe	Italy	2012
BAHGAT	Amr Kamal	Egypt	2012
BALTA	Osman	Germany	2013
BAYRAK	Duhan Fatih	Belgium	2012
BENCSIK	Gabor	Hungary	2009
BERTOMEU-GONZALEZ	Vicente	Spain	2012
BIJSTERVELD	Nick	Netherlands	2012
BISSINGER	Andrzej	Poland	2007
BLAAUW	Yuri	Netherlands	2012
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	Netherlands	2010
BROERS	Bernard	Netherlands	2010
BUERKLE	Gerd	Austria	2012
BUN	Sok-Sithikun	France	2013
CALVO CUERVO	David	Spain	2013
CALZOLARI	Vittorio	Italy	2007
CANADAS	Victoria	Spain	2013
CARAVATI	Fabrizio	Italy	2012
CHATTERJEE	Debjit	United Kingdom	2013

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Cardiac Pacing & Device Therapy

EHRA CP Certified professionals

CHONG	Daniel	Singapore	2013
CHONG YU	Eric	Singapore	2013
CROSATO	Martino	Italy	2009
CURNIS	Antonio	Italy	2007
DE DOELDER	Marieke	Netherlands	2012
DE GROOT	Joris R.	Netherlands	2011
DE JONG	Jonas	Netherlands	2012
DE LA FUENTE	Sam	Netherlands	2010
DE MEYER	Grim	Belgium	2013
DICHTL	Wolfgang	Austria	2012
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
EISENBERGER	Martin	Czech republic	2011
EIVINDSON	Gunvald	Norway	2009
EL KADRI	Moutaz	United Kingdom	2013
ENGBERS	Jos G.	Netherlands	2011
ESCHEN	Ole	Denmark	2012
EVERTZ	Reinder	Spain	2012
FACCHIN	Domenico	Italy	2013
FERNANDEZ PASTOR	Julia	Spain	2012
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
GALLARDO LOBO	Rodrigo	Spain	2012
GERRITSEN	Jean Georges	Netherlands	2013
GHANI	Abdul	Netherlands	2012

EHRA CP Certified professionals

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
HAMEL	John John	Switzerland	2011
HAUER	Herbert	Netherlands	2012
HAYES	Chris	United Kingdom	2012
HAZELEGER	Ronald	Netherlands	2012
HEIB	KlausDieter	Germany	2010
HEMELS	Martin	Netherlands	2012
HERCZKU	Csaba	Hungary	2012
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
IORGULESCU	Corneliu	Romania	2012
JACON	Peggy	France	2012
JAMALYAN	Smbat	Armenia	2011
JANSEN	Ward	Netherlands	2010
JANSEN	Annemieke	Netherlands	2011
JASTRZEBSKI	Marek	Poland	2007
JILEK	Clemens	Germany	2012
JONES	David Gareth	United Kingdom	2012
KACZMAREK	Krzysztof	Poland	2013
KARABINOS	Ilias K.	Greece	2009
KEMME	Michiel	Netherlands	2009
KETELS	Stefan	Belgium	2009
KLEIN	Gunnar	Germany	2007
KLEIN	Norbert	Germany	2013

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Cardiac Pacing & Device Therapy

EHRA CP Certified professionals

KOEPFLI	Pascal	Switzerland	2010
KOEPP	Ulf	Norway	2009
KORANTZOPOULOS	Panagiotis	Greece	2011
KOSTOPOULOU	Anna	Greece	2012
KOULOURIS	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
LIPCHENCA	Igor Ariel	Israel	2009
LITTERFELDT	Ingrid	Sweden	2011
LUBBERTVERBERKMOES	Addy	Netherlands	2013
LUEDORFF	Guido	Germany	2009
LUERMANS	Justin	Netherlands	2014
LUTHJE	Lars	Germany	2013
MAC GILLAVRY	Melvin	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
MEINE	Mathias	Netherlands	2010
MERKELY	Bela	Hungary	2007
MICHAELSEN	Jochen	Germany	2011
MONNINK	Stefan	Netherlands	2012
MORTSELL	David	Sweden	2013
MUNDEL	Markus	Germany	2011
MUNTINGA	Harm-Jans	Netherlands	2012
NENTWICH	Karin	Germany	2013
NEVEN	Kars	Netherlands	2008

EHRA CP Certified professionals

NOVAK	Jan	Switzerland	2013
NOVIKOV	Dmitry	Russian Federation	2013
OMAR	Salama	Egypt	2012
ORSIDA	Daniela	Italy	2014
OSMAN	Faizel	United Kingdom	2007
OUSS	Alexandre	Netherlands	2014
PATWALA	Ashish	United Kingdom	2012
PAULUSSEN	Guido	Netherlands	2007
PENA HERNANDEZ	Jose Luis	Spain	2011
PEREZ ALVAREZ	Luisa	Spain	2013
PEREZ DIEZ	Diego	Spain	2012
PETRACCI	Barbara	Italy	2012
PETTIT	Stephen	United Kingdom	2013
PINDADO RODRIGUEZ	Javier	Spain	2010
PLUTA	Slawomir	Poland	2012
POELSLER	Robert	Germany	2013
PORRO	Rosa	Spain	2010
POZZETTI	Daniela	Italy	2007
PREDOVSKI	Milen	Bulgaria	2013
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
REBELLATO	Luca	Italy	2012
RESTLE	Christian	Germany	2013
RICCIARDI	Danilo	Belgium	2013
RIENSTRA	Michiel	Netherlands	2014
RIVAS GANDARA	Nuria	Spain	2013
RODRIGUEZ MANERO	Moises	Belgium	2013
ROSA	Antonio	Switzerland	2013
ROTEN	Laurent	Switzerland	2009
ROUKAS	Kriton-Ioannis	Greece	2012
ROUX	Antoine	France	2013

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EHRA CP Certified professionals

RUZICKA	Petr	United Kingdom	2013
SCHÄR	Beat Andreas	Switzerland	2013
SCHAUMANN	Anselm	Germany	2012
SCHEFFER	Michael G.	Netherlands	2011
SCHOONDERWOERD	Bas	Netherlands	2012
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
SGARITO	Giuseppe	Italy	2007
SIMEONIDOU	Eftihia	Greece	2007
SJOBLOM	Johanna	Sweden	2009
SKIADAS	Ioannis	Greece	2012
SMILDE	Tom	Netherlands	2012
SPIERENBURG	Han	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
STUEHLINGER	Markus	Austria	2012
SZAMLEWSKI	Piotr	Sweden	2011
TAHAPARY	Giovanni	Netherlands	2013
TER BEKKE	Rachel	Netherlands	2013
TIELEMAN	Robert	Netherlands	2012
TORCIVIA	Riccardo	Italy	2012
TORN	Marieke	Netherlands	2012
TRAYKOV	Vassil B.	Bulgaria	2011
TUINENBURG	Anton	Netherlands	2013
TUININGA	Ype	Netherlands	2011
TUREL	Baybars	Turkey	2012

EHRA CP Certified professionals

UCER	Ekrem	Germany	2012
VACCARI	Diego	Italy	2007
VALK	Suzanne	Netherlands	2011
VALZANIA	Cinzia	Italy	2010
VAN ALEM	Anouk	Netherlands	2013
VAN CASTEREN	Lieve	Belgium	2011
VAN DEN BOS	EwoutJan	Netherlands	2011
VAN DER HEIJDEN	Robert	Netherlands	2011
VAN DER HEIJDEN	Dirk	Netherlands	2011
VAN DER HEIJDEN	Jeroen	Netherlands	2013
VAN KRAAIJ	Dave	Netherlands	2010
VAN OOSTROM	Antonie	Netherlands	2012
VAN OPSTAL	Jurren	Netherlands	2009
VAN REIJ	Frank	Netherlands	2012
VAN SCHAARDENBURGH	Pepijn	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	Netherlands	2011
VIERGEVER	Eric Paul	Netherlands	2012
VILLUENDAS SABATE	Roger	Spain	2013
VOSS	Frederik	Germany	2009
WESTENDORP	Iris	Netherlands	2009
WESTRA	Sjoerd	Netherlands	2012
WIJCHERS	Sip	Belgium	2012
WILLEMS	Albert Richard	Netherlands	2012
WOLLMANN	Christian	Austria	2012
ZAKY	Hosam	United Arab Emirates	2007
ZALEVSKY	Valery P.	Ukraine	2011
ZERVOPOULOS	George	Greece	2007
ZIMA	Endre	Hungary	2012

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Cardiac Pacing & Device Therapy

EHRA CP Certified professionals

ZOPPO	Franco	Italy	2007
ZUCCHELLI	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
AERTS	Arnaud	Netherlands	2009
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
ALZAND	Bakr	Netherlands	2011
AMET	Denis	France	2011
ANDERSON	Mark H.	United Kingdom	2012
ANNE	Wim	Belgium	2008
APOSTOLOPOULOS	Theodoros	Greece	2006
ARBELO	Elena	Spain	2012
ARIAS PALOMARES	Miguel Angel	Spain	2010
ARNOLD	Alfred E. R.	Netherlands	2012
ARO	Aapo	Finland	2013
ASSELMAN	Maarten	Netherlands	2012
AYALA PAREDES	Felix Alejandro	Canada	2006
AZEM	Tareq	Germany	2013
BACCHIONI	Giuseppe	Italy	2008
BADRAN	Haitham	Egypt	2013

CP Certification candidates who have successfully completed the exam

BAHGAT	Amr Kamal	Egypt	2009
BALMER	Christian	Switzerland	2013
BALT	Jippe	Netherlands	2011
BALTA	Osman	Germany	2010
BARKER	Diane	United Kingdom	2011
BARSAMIAN	Sergei	Armenia	2013
BARTHEZ	Olivier	France	2009
BAYRAK	Duhan Fatih	Belgium	2011
BEAUPORT	Joelle	Germany	2012
BEDNAREK	Jacek	Poland	2013
BELVITO	chiara	Italy	2013
BENCSEK	Gabor	Hungary	2008
BERTE	Benjamin	Belgium	2012
BERTOMEU-GONZALEZ	Vicente	Spain	2010
BHELEEL	Osama	Libya	2013
BIJSTERVELD	Nick	Netherlands	2009
BISSINGER	Andrzej	Poland	2006
BLAAUW	Yuri	Netherlands	2009
BLICHARZ	Jaroslav	Poland	2011
BLOMGREN	Jan	Sweden	2012
BOHM	Adam	Hungary	2008
BONANNO	Carlo	Italy	2012
BOOS	Christopher	United Kingdom	2008
BORGER VAN DER BURG	Alida Elisabeth	Netherlands	2007
BORGQUIST	Rasmus	Sweden	2013
BORREGO BERNABE	Luis	Spain	2013
BORRELLI	Alessio	Italy	2009
BORRELLO	Francesco	Italy	2013
BOS	Hans	Netherlands	2012
BOSKER	Hans	Netherlands	2012
BOUWELS	Leon H. R.	Netherlands	2007
BRAAM	Richard	Netherlands	2010
BREULS	Nico	Netherlands	2009
BROERS	Bernard	Netherlands	2009
BUERKLE	Gerd	Austria	2008

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Cardiac Pacing & Device Therapy

CP Certification candidates who have successfully completed the exam

BUGA	Laszlo	United Kingdom	2012
BULUT	Suat	Netherlands	2010
BUN	Sok-Sithikun	France	2012
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
CASTREJON CASTREJON	Sergio	Spain	2013
CHAMBERS	John	United Kingdom	2013
CHATTERJEE	Debjit	United Kingdom	2010
CHENEVARD	Remy	Switzerland	2012
CHONG	Daniel	Singapore	2011
CHONG YU	Eric	Singapore	2013
CHRISTOPHE	Arnd	Germany	2011
CLEMENS	Marcell	Hungary	2012
COSER	Alessio	Italy	2011
CROSATO	Martino	Italy	2008
CSONTOS	Pal	Hungary	2009
CURNIS	Antonio	Italy	2006
DAVID	Laura-Alice	Romania	2012
DE CLERCQ	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	Netherlands	2009
DE LEEUW	Martin	Netherlands	2008
DE MARIA	Elia	Italy	2012
DE MEYER	Grim	Belgium	2010
DE POTTER	Tom	Belgium	2008

CP Certification candidates who have successfully completed the exam

DE RIVA SILVA	Marta	Spain	2011
DE SENSI	Francesco	Italy	2013
DE WAARD	Daan	Netherlands	2007
DE WEERD	Gerjan	Netherlands	2009
DEMONIERE	Fabrice	Martinique	2011
DERNDORFER	Michael	Austria	2013
DI CORI	Andrea	Italy	2012
DIAB	Ihab Gomaa	United Kingdom	2009
DIAZ BUSCHMANN	Isabel	Spain	2011
DICHTL	Wolfgang	Austria	2010
DIDENKO	Maxim	Roumania	2010
DIJKMAN	Barbara	Netherlands	2012
DILAVERIS	Polychronis	Greece	2006
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
DUTHOIT	Guillaume	France	2010
DYRDA	Katia	Canada	2010
EHRLICH	Joachim	Germany	2011
EIJSBOUTS	Sabine	Netherlands	2011
EISENBERGER	Martin	Czech republic	2008
EIVINDSON	Gunvald	Norway	2008
EL KADRI	Moutaz	United Kingdom	2012
ELDER	Douglas	United Kingdom	2010
ELICES TEJA	Juliana	Spain	2013
ENGBERS	Jos G.	Netherlands	2009
ERCKERT	Martin	Italy	2006
ERIKSEN	Ulrik Hedegaard	Denmark	2011
ERNTELL	Hans	Sweden	2011
ESCHEN	Ole	Denmark	2009
ESMAIL	Shani	United Kingdom	2011
EVERTZ	Reinder	Spain	2012

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CP Certification candidates who have successfully completed the exam

EXPOSITO	Victor	Spain	2013
FACCHIN	Domenico	Italy	2010
FEDORCO	Marian	Czech Republic	2011
FERNANDEZ LOZANO	Juan Antonio	Spain	2013
FERNANDEZ PASTOR	Julia	Spain	2011
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
FREUND	Niclas	Germany	2013
FRYKMANN	Viveka	Sweden	2007
FUNK	Sabine	Switzerland	2010
GABRIEL	Mario	Netherlands	2011
GALLARDO LOBO	Rodrigo	Spain	2009
GANDJBAKHCH	Estelle	France	2013
GANIERE	Vincent	Switzerland	2010
GARCIA ALMAGRO	Francisco Jose	Spain	2013
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
GJESTVANG	Finn Tore	Norway	2008
GONZALEZ FERRER	Juan Jose	Spain	2012
GONZALEZ-ENRIQUEZ	Susana	Spain	2008
GORLO	Adam	Poland	2012

CP Certification candidates who have successfully completed the exam

GRADAUS	Rainer	Germany	2006
GRAUSS	Robert Willem	Netherlands	2012
GRECU	Mihaela	Romania	2006
GRIECO	Domenico	Italy	2012
GROSFELD	Marcel	Netherlands	2013
GRUBER	Norbert	Germany	2013
GUGUCHEV	Pavel	United States of America	2010
GUTLEBEN	Klaus Juergen	Germany	2011
HAEMERS	Peter	Belgium	2013
HAJKO	Erik	Hungary	2013
HAMEL	John John	Switzerland	2010
HAMRAOUI	Karim	Netherlands	2010
HARTOG	Johannes	Netherlands	2011
HASSAN	Ahmed Abdulwadoud	Netherlands	2012
HAUER	Herbert	Netherlands	2009
HAUER	Arnaud	Netherlands	2013
HAWKINS	Nathaniel Mark	United Kingdom	2012
HAYAT	Sajad	United Kingdom	2012
HAYES	Chris	United Kingdom	2009
HAZELEGER	Ronald	Netherlands	2010
HEGGELUND	Geir	Norway	2013
HEIB	KlausDieter	Germany	2009
HEMELS	Martin	Netherlands	2009
HENKENS	Ivo	Netherlands	2013
HERCZKU	Csaba	Hungary	2009
HERRING	Neil	United Kingdom	2013
HJORTSHOJ	Soren	Denmark	2008
HLIVAK	Peter	Slovakia	2013
HOBBS	William Julian	United Kingdom	2010
HOEKSTRA	Eduard Henk	Netherlands	2011
HOOFT VAN HUYSDUYNEN	Bart	Netherlands	2010
HORDYNSKI	Grzegorz	Poland	2011
HORNSTEN	Jonas	Sweden	2007
HUIJSKES	Raymond	Netherlands	2012
HURLIMANN	David	Switzerland	2009

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Cardiac Pacing & Device Therapy

CP Certification candidates who have successfully completed the exam

HUYBRECHTS	Wim	Belgium	2008
IONNIDIS	Panagiotis	Greece	2006
IORGULESCU	Corneliu	Romania	2008
JACON	Peggy	France	2010
JAMALYAN	Smbat	Armenia	2010
JANSEN	Annemieke	Netherlands	2008
JANSEN	Ward	Netherlands	2010
JANSENS	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
JOHANSSON	Peter	Sweden	2008
JOHAR	Sofian	United Kingdom	2011
JONES	David Gareth	United Kingdom	2009
JONSSON	Jon Erik	Sweden	2010
KACZMAREK	Krzysztof	Poland	2010
KALLIANOS	Christos	Greece	2011
KARABINOS	Ilias K.	Greece	2007
KATSIKAS	Christos	Greece	2012
KEMME	Michiel	Netherlands	2007
KETELS	Stefan	Belgium	2007
KJELLMAN	Bjorn	Sweden	2007
KLAUSZ	Gergely	Hungary	2013
KLEIN	Gunnar	Germany	2007
KLEIN	Norbert	Germany	2011
KLEIN	Lucas	Netherlands	2013
KNOPS	Reinoud	Netherlands	2008
KOEPFLI	Pascal	Switzerland	2007
KOEPP	Ulf	Norway	2008
KOL	Amir	Italy	2013
KOLB	Christophe	Germany	2010
KOLLIAS	Georgios	Greece	2013
KOMANOVA	Erika	Slovakia	2011

CP Certification candidates who have successfully completed the exam

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
KOVACS	Andras	Hungary	2012
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
KUIJPER	Aaf	Netherlands	2011
KUJAWSKI	Tomasz	Switzerland	2013
KWASNIEWSKI	Wojciech	Poland	2013
LANGERAK	Susan	Netherlands	2012
LEBEDEVA	Viktoriia	Russia	2013
LERCHER	Peter	Austria	2010
LERNER	Martin Robert	Sweden	2010
LEWANDOWSKI	Michael	Poland	2012
LIEUW-A-FA	Mariska	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
LOUW	Ruan	Belgium	2013
LUBBERTVERBERKMOES	Addy	Netherlands	2010
LUEDORFF	Guido	Germany	2008
LUERMANS	Justin	Netherlands	2012

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CP Certification candidates who have successfully completed the exam

LUTHJE	Lars	Germany	2011
LUZI	Mario	Italy	2008
MAASS	Alexander	Netherlands	2007
MAC GILLAVRY	Melvin	Netherlands	2008
MACIAG	Aleksander	Poland	2007
MADEIRA	Joao	Portugal	2011
MAGNUSSON	Peter	Sweden	2007
MAHFOUD	Mohanad	France	2010
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
MAZZUCCO	Raffaele	Italy	2009
MEDINA PALOMO	Maria Del Carmen	Spain	2013
MEILTZ	Alexandre	Switzerland	2009
MEINDERSMA	Esther	Netherlands	2013
MEINE	Mathias	Netherlands	2007
MELANDER	Kjell	Sweden	2008
MELMAN	Paul G.	Netherlands	2011
MERKELY	Bela	Hungary	2007
MICHAELSEN	Jochen	Germany	2010
MIHALCZ	Attila	Austria	2011
MLCOCHOVA	Hanka	Czech Republic	2009
MOLHOEK	Sander G.	Netherlands	2008
MOLLNAU	Hanke	Germany	2013
MONNARD	Simon	Switzerland	2011
MONNINK	Stefan	Netherlands	2011
MORENO	Jose	Spain	2012

CP Certification candidates who have successfully completed the exam

MORTSELL	David	Sweden	2012
MORTTADA	Ayman	Egypt	2012
MUELLER	Dirk	Germany	2008
MUELLER	Stephan Andreas	Switzerland	2011
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	Netherlands	2009
NICOLAIDES	Eleftherios	United Kingdom	2007
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
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

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Cardiac Pacing & Device Therapy

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PARAVOLIDAKIS	Konstantinos	Greece	2008
PASCALE	Patrizio	Switzerland	2009
PATWALA	Ashish	United Kingdom	2010
PAULUSSEN	Guido	Netherlands	2006
PAWLIK	Tomasz	Poland	2012
PENA HERNANDEZ	Jose Luis	Spain	2008
PENTEADO	Jose Otavio P.	Brazil	2012
PEREZ ALVAREZ	Luisa	Spain	2010
PEREZ DIEZ	Diego	Spain	2009
PERIK	Patrick	Netherlands	2010
PERROTTA	Laura	Italy	2012
PETKAR	Sanjiv	United Kingdom	2008
PETRACCI	Barbara	Italy	2009
PETRU	Jan	Czech Republic	2009
PETTIT	Stephen	United Kingdom	2011
PHILBERT / JENSEN	Berit Thornvig	Denmark	2010
PINDADO RODRIGUEZ	Javier	Spain	2009
PLUTA	Slawomir	Poland	2010
POELSLER	Robert	Germany	2013
PORRO	Rosa	Spain	2009
POS	Lambertus	Netherlands	2013
POZZETTI	Daniela	Italy	2006
PRASAD	Rachana	United Kingdom	2013
PREDOVSKI	Milen	Bulgaria	2011
PROIETTI	Riccardo	Italy	2013
PRONK	Arjen	Netherlands	2010
PRUSKI	Maciej	Poland	2010
PRZYBYLSKI	Andrzej	Poland	2007
PSYCHARI	Stavroula	Greece	2011
PUCHOL	Alberto	Spain	2009
PUETZ	Vanessa	Germany	2013
PUGH	Peter	United Kingdom	2008
PYATT	Jason	United Kingdom	2011
RAHEL	Braim M.	Netherlands	2011
RAMANNA	Hemanth	Netherlands	2008

CP Certification candidates who have successfully completed the exam

RAMCHURN	Hemant	Belgium	2011
RAO	Archana	United Kingdom	2007
RASSIAS	Ioannis	Greece	2013
REBELLATO	Luca	Italy	2009
RESTLE	Christian	Germany	2009
REVERDIN	Stephane	Switzerland	2013
RICCIARDI	Danilo	Belgium	2012
RICCIARDI	Giuseppe Gilberto	Italy	2013
RIENSTRA	Michiel	Netherlands	2013
RIVAS GANDARA	Nuria	Spain	2010
ROBERT	Jens	Switzerland	2012
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
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
RUSSO	Giovanni	Italy	2009
RUZICKA	Petr	United Kingdom	2011
SAFAK	Erdal	Germany	2011
SALAHSHOURI	Pegah	United Kingdom	2011
SALGADO ARANDA	Ricardo	Spain	2013
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

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SCHEFFER	Michael G.	Netherlands	2008
SCHMUTZ	Mathieu Thomas André Hermann Ghislain	Switzerland	2013
SCHOLZ	Brit	Germany	2011
SCHOONDERWOERD	Bas	Netherlands	2008
SCHRAGO	Gregoire	Switzerland	2010
SCHREVE-STEENSMA	Ariadne Midori	Netherlands	2012
SCHUKRO	Christoph	Austria	2011
SCHURMANS	Joris	Belgium	2013
SCHWAGTEN	Bruno	Belgium	2008
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
SGARITO	Giuseppe	Italy	2006
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 Skretteberg	Norway	2013
SMEELE	Frank	Netherlands	2011
SMEETS	Frans	Netherlands	2011
SMILDE	Tom	Netherlands	2011
SMITS	Jeroen	Netherlands	2012
SONESSON	Linus	Sweden	2013
SPIERENBURG	Han	Netherlands	2008
STATESCU	Cristian	Romania	2009
STEEN	Torkel	Norway	2007

CP Certification candidates who have successfully completed the exam

STEFAN	Liliana	Czech Republic	2010
STEFAN NICOLEA	Bogdan	Romania	2009
STEFFEL	Jan	Switzerland	2012
STERLINSKI	Marciej	Poland	2006
STEVENHAGEN	Jeroen	Netherlands	2008
STOCKBURGER	Martin	Germany	2011
STOECKEL	Holger	Switzerland	2012
STRANDERS	Ischa	Netherlands	2011
STRIKWERDA	Sipke	Netherlands	2009
STUEHLINGER	Markus	Austria	2011
SUTER	Yves Martin	Switzerland	2013
SWART	Hp	Netherlands	2009
SZAMLEWSKI	Piotr	Sweden	2010
SZILAGYI	Szabolcs	Hungary	2013
SZTANISZLAV	Áron	Hungary	2013
TAHAPARY	Giovanni	Netherlands	2009
TEJEIRA FERNANDEZ	Elvis	Spain	2013
TER BEKKE	Rachel	Netherlands	2010
TEUBL	Alexander	Austria	2009
THEIß	Söhnke	Germany	2013
TIELEMAN	Robert	Netherlands	2009
TIMMERS	Liesbeth	Belgium	2011
TOMASI	Luca	Italy	2012
TOMLINSON	D.	United Kingdom	2009
TORCIVIA	Riccardo	Italy	2010
TORN	Marieke	Netherlands	2009
TOSSEBRO	Morten Shoren	Norway	2009
TRAYKOV	Vassil B.	Bulgaria	2010
TREGUER	Frederic	France	2009
TRINES	Serge	Netherlands	2008
TRUCCO	Maria Emilce	Spain	2012
TUINENBURG	Anton	Netherlands	2011
TUININGA	Ype	Netherlands	2009
TUREL	Baybars	Turkey	2009
TURK	Ugur Onsel	Turkey	2011

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TUTUIANU	Cristina Ioana	Romania	2013
UCER	Ekrem	Germany	2011
URBAN	Lubos	Slovakia	2009
VACCARI	Diego	Italy	2006
VALK	Suzanne	Netherlands	2010
VALZANIA	Cinzia	Italy	2007
VAN ALEM	Anouk	Netherlands	2010
VAN CASTEREN	Lieve	Belgium	2010
VAN DE POLL	Sweder	Netherlands	2013
VAN DEN AKKER-BERMAN	Lily	Netherlands	2011
VAN DEN BERGH	Paulus	Netherlands	2013
VAN DEN BOS	Ewout Jan	Netherlands	2009
VAN DEN BRINK	Olivier W. V.	Netherlands	2013
VAN DER GALIEN	Albert	Netherlands	2012
VAN DER HEIJDEN	Robert	Netherlands	2010
VAN DER HEIJDEN	Dirk	Netherlands	2010
VAN DER HEIJDEN	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 HAELEST	Paul	Netherlands	2012
VAN HERENDAEL	Hugo	Belgium	2009
VAN HEUVERSWIJN	Frederic	Belgium	2011
VAN HORSSSEN	Elisabeth Veronica	Netherlands	2013
VAN KRAAIJ	Dave	Netherlands	2009
VAN MALDEREN	Sophie C. H.	Belgium	2013

CP Certification candidates who have successfully completed the exam

VAN NOORD	Trudeke	Netherlands	2007
VAN OFWEGEN-HANEKAMP	Clara Emilia Emese	Netherlands	2013
VAN OOSTROM	Antonie	Netherlands	2009
VAN OPSTAL	Jurren	Netherlands	2007
VAN POPELE	Nicole	Netherlands	2013
VAN REIJ	Frank	Netherlands	2010
VAN ROOSMALEN	Radboud	Netherlands	2011
VAN SCHAARDENBURGH	Pepijn	Netherlands	2009
VAN SCHAIKVAN DER WIELEN	MarieLouise	Netherlands	2009
VAN VLIES	Bob	Netherlands	2010
VAN WIJK	Leendert M.	Netherlands	2013
VAN WOERKENS	Leon	Netherlands	2011
VASILOPOULOS	Charalambos	Greece	2006
VATASESCU	Radu- Gabriel	Romania	2006
VENABLES	Paul	United Kingdom	2010
VERBUNT	Robert	Netherlands	2011
VERGARA	Pasquale	Italy	2009
VERNOOY	Kevin	Netherlands	2010
VET	Thijs	Netherlands	2008
VICENTINI	Alessandro	Italy	2009
VIERGEVER	Eric Paul	Netherlands	2010
VIJN	Arie Gerhard	Netherlands	2010
VILLUENDAS SABATE	Roger	Spain	2010
VITALE	Raffaele	Italy	2013
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
WEBERNDÖRFER	Christina Vanessa	Switzerland	2013
WERETKA	Slawomir	Germany	2011
WESTENDORP	Iris	Netherlands	2006
WESTRA	Sjoerd	Netherlands	2009
WETZEL	Ulrike Renate	Germany	2013

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WHINNETT	Zachary	United Kingdom	2011
WIDDERSHOVEN	Josef Jos	Netherlands	2009
WIJCHERS	Sip	Belgium	2009
WILLEMS	Albert Richard	Netherlands	2009
WINTER	Siegmund	Austria	2010
WOLLMANN	Christian	Austria	2011
WONG	Ka Lam	China	2013
YAP	Sing-Chien	Netherlands	2012
YEO	Wee Tiong	Singapore	2013
ZAGKLI	FANI	Greece	2013
ZAJAC	Dariusz	Poland	2012
ZAKY	Hosam	United Arab Emirates	2007
ZALEVSKY	Valery P.	Ukraine	2007
ZELJKO	Hrvojka Marija	Croatia	2013
ZEMAN	Kamil	Czech Republic	2013
ZERVOPOULOS	George	Greece	2006
ZIMA	Endre	Hungary	2009
ZOPPO	Franco	Italy	2006
ZUCCHELLI	Giulio	Italy	2008

Allied Professionals

Certified Allied Professionals

ANTENBRINK	Johannes Fredericus	Netherlands	2011
ARTS	Germaine	Netherlands	2011
BATSIKAS	Kimon	Greece	2013
BERTOLI	Fabrizio	Switzerland	2013
BESTEN DEN	Truus	Netherlands	2013
BIJVOET	Eleonora	Netherlands	2011
BRUEGGEMANN	Thomas	Germany	2013
BURGOS	Jesús	Spain	2013
DE KEYZER-VAN MUJLWIJK	Klara	Netherlands	2012
DE MELKER	Robert	Netherlands	2012
DE ROVER	Vincent	Netherlands	2013

Certified Allied Professionals

DEBIE	Luuk	Netherlands	2013
EDENS	Joran	Netherlands	2011
EIZMENDI GOICOECHEA	Maria De Iciar	Spain	2011
ENGELAER	Paulus Johannes Maria	Germany	2013
GERCAMA	Ale	Netherlands	2012
GOPINATH	Binoob	United Kingdom	2013
GOUGH	Jacqueline	Netherlands	2012
GRASDIJK	Michel	Netherlands	2013
GRAUENKAMP	Caspar	Netherlands	2012
GRIMBERG	Arenda	Netherlands	2013
HAAS DE	Oudshoorn	Netherlands	2013
HAUGDAL	Martin Aar	Denmark	2013
HENDRIKS	Thijs	Netherlands	2013
HOFSTEDE	Jan	Netherlands	2013
HOP	Henri Marco	Netherlands	2011
HUSKENS	Paul	Netherlands	2013
JANSSEN	Michel	Netherlands	2013
KAMMEIJER	Willem	Netherlands	2013
KEIJZER	Rens	Netherlands	2012
KINCH WESTERDAHL	Annika	Sweden	2013
KNOPS	Paul	Netherlands	2013
KOFLER	Ruth	Austria	2012
LA GRAND	Reinalda	Netherlands	2011
LAST	Tim	Netherlands	2012
LINSSEN-ABEN	Maria Helena Hendrica	Netherlands	2011
MAARSE	Albert	Netherlands	2013
MEIJER	Karin Maria	Netherlands	2013
MOL	Daniel	Netherlands	2013
MUNOZ	Julio	Spain	2011
OOSTERWEGHEL	Jeannette	Netherlands	2012
OSKAM	Aart	Netherlands	2013
OVEREEM	Bartjan	Netherlands	2012
PASTORE	Cosimo	Netherlands	2013
PATTERSON-ROTTGERING	Wendy	Netherlands	2012
PEREIRA	Helder	United Kingdom	2012

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Allied Professionals

Certified Allied Professionals

PIMENTA	Ricardo	Portugal	2012
PISCEDDA	Valerio	Belgium	2011
QVARNSTRÖM	Eva	Sweden	2013
RAVERS	Henry	Netherlands	2013
REKKER	Kees	Netherlands	2013
SANTOS CALLE	Francisco José	Spain	2013
SCHUMM	Steven	Netherlands	2012
SCHURMAN	Bert	Netherlands	2013
SEFFINGA	Kees	Netherlands	2012
SLIJKERMAN	Myrna	Netherlands	2012
SOARES	Filipe	Germany	2011
SOESBERGEN	Joop	Netherlands	2013
SOUGIANNIS	Dimitrios	Greece	2012
STEL	Erik	Netherlands	2013
STOLL	Eric	Netherlands	2012
STORM	Margaretha	Netherlands	2013
SVENSSON	Emma	Sweden	2011
TER AVEST- ROELINK	Leonie	Netherlands	2013
TRIYASUT	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 SMAN	Yoei Walter	Netherlands	2011
VAN DIJK	Frederik	Netherlands	2013
VAN DOORN	Arjan	Netherlands	2011
VAN ELS - RUTTEN	Anna	Netherlands	2012
VAN OORT	Geeske	Netherlands	2013
VAN VELDHIJZEN	Erny	Netherlands	2013
VASCONCELOS	Hugo Morujo	Portugal	2013
VENANCIO GALVAO	Julia Maria	Netherlands	2012
VILLADEAMIGO	Juan Manuel	Spain	2012
WILS	Alexandra	Netherlands	2013
WOLTING	Roelof John	Netherlands	2012

EHRA Certification

Certified Allied Professionals

XAVIER	Ana	Portugal	2012
ZERIKIOTIS	Evangelos	Greece	2013
ZUMBRINK	Jacobus Johannes Maria	Netherlands	2013



European Heart Rhythm Association

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