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The EHRA White Book 2017

The Current Status of Cardiac Electrophysiology
in ESC Member Countries

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



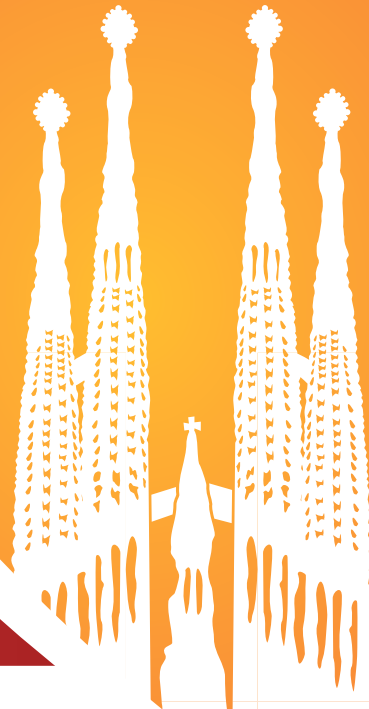
Tenth Edition

EHRA 2018

THE ANNUAL CONGRESS
OF THE EUROPEAN HEART
RHYTHM ASSOCIATION

BARCELONA
SPAIN

18 / 20
MARCH
2018



www.escardio.org/EHRA



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Acknowledgements

The EHRA White Book 2017 is supported by BIOTRONIK SE & Co. KG in the form of an educational grant.

Preface – The EHRA White Book 2017

The tenth edition of the European Heart Rhythm Association (EHRA) White Book provides comprehensive data on electrophysiological procedures and implantation of cardiac implantable electronic devices (CIEDs) in the European Society of Cardiology (ESC) area. Over the last 10 years the White Book has become a key reference for those seeking information about invasive arrhythmia therapies. No other publication provides up-to-date information on the procedure numbers and educational requirements along with key demographic information and national healthcare statistics.

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

The data collection is mostly the result of voluntary participation from each National Working Group on Arrhythmias and Electrophysiology and/or the National Cardiac Societies. In the vast majority of the 56 ESC member countries, well established centralised databases of both CIEDs and catheter ablation procedures do exist. The databases are often created and maintained by the National Working Group on Arrhythmias and

Electrophysiology and/or the National Cardiac Society. However, in some ESC member 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 enabling comparison on a year to year basis. This year's edition includes data from 53 countries out of the 56 ESC member countries.

Unfortunately, despite their good will, 3 countries were unable to submit their data. Indeed, the difficult situation these countries have been facing in the recent years makes data collection and the production of reliable statistics impossible.

The EHRA White Book has been made possible thanks to the efforts of several key contributors. EHRA is grateful to the chairs and co-chairs of the National Working Groups on Arrhythmias and Electrophysiology and/or the National Cardiac Societies for their continuous support and contribution to the EHRA White Book. The EHRA staff at the European Heart House and last but not least, the project sponsor, BIOTRONIK SE & Co. KG company and in particular Anja Thümen and Robert Wüstenberg.

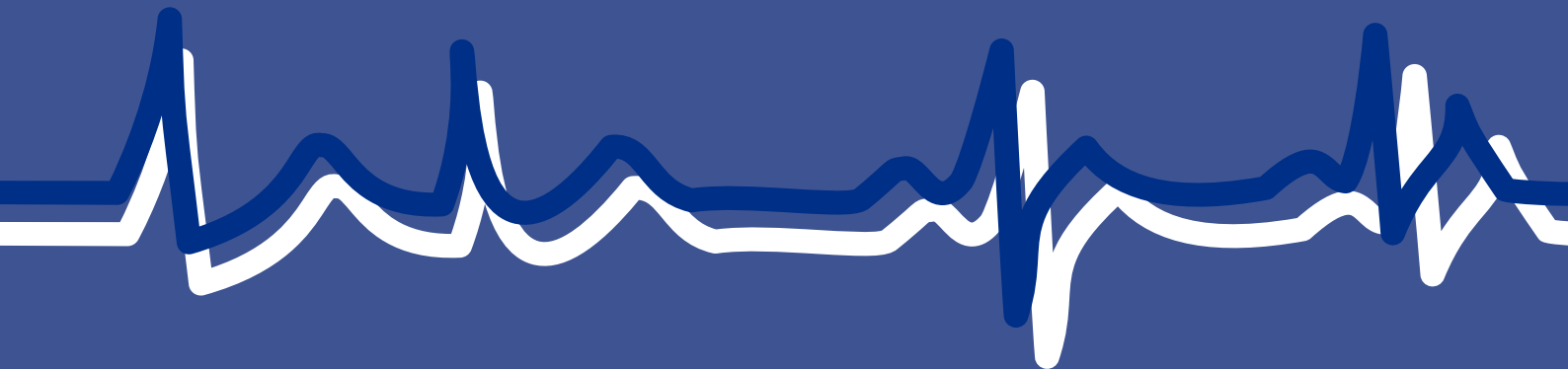
To all of them, we extend our deepest gratitude and appreciation.

- Prof. Gerhard Hindricks, EHRA President (2015-2017)
- Prof. John Camm, EHRA President Elect (2015-2017)
- Prof. Béla Merkely, EHRA National Cardiac Society Committee Chair (2015-2017)
- Prof. Pekka Raatikainen, EHRA White Book 2017 Sub-Committee Chair, Member of the EHRA National Cardiac Society Committee (2015-2017)
- Prof. David O. Arnar, EHRA White Book 2017 Sub-Committee Co-Chair, Member of the EHRA National Cardiac Society Committee (2015-2017)

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1. List of Authors



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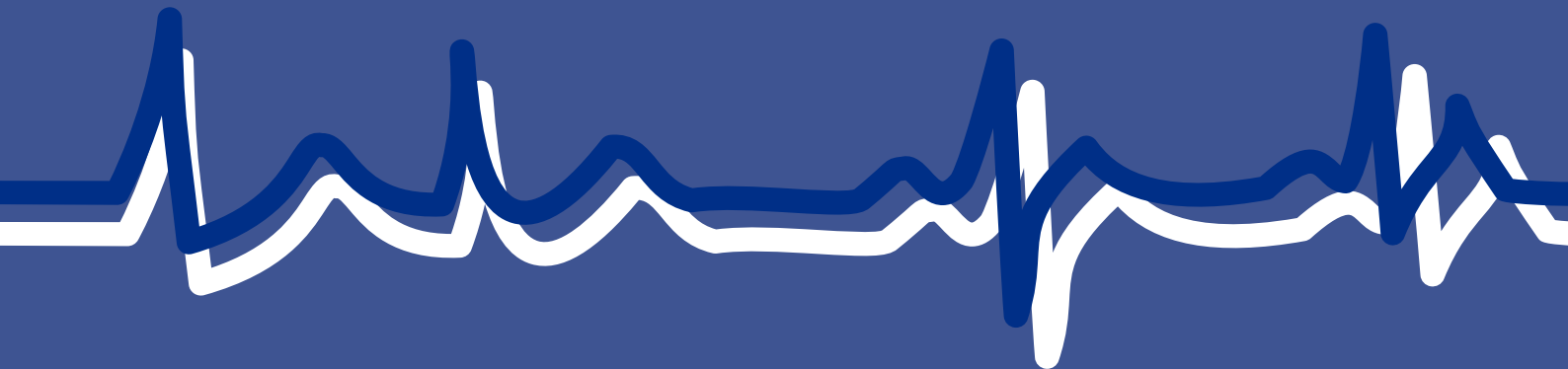
The EHRA would like to express a sincere thank you to those below who went to the efforts to collect, research and compile valuable information on the current status of arrhythmias in their country. They should be considered as co-authors of this book:

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Algeria	Prof. M. Tayeb Chentir, Assoc. Prof. Seddik Ait Messaoudene, Assoc. Prof. Yazid Aoudia with special thanks to: HM Ali-Lahmar, N. Boudoucha, Y. Benchaaba, N. Nemmar
Armenia	Prof. Svetlana Grigoryan
Austria	Prof. Daniel Scherr
Azerbaijan	Assoc. Prof. Farid Aliyev, Dr. Elnur Isayev
Belarus	Alexander Chasnoits
Belgium	Dr. Yves Vandekerckhove
Bosnia & Herzegovina	Assist. Prof. Boris Goronja, Assist. Prof. Elnur Tahirovic, Assist. Prof. Ivica Markota with special thanks to: Assist. Prof. Dragan Uncanin, Prof. Elmir Jahic, Prof. Veljko Maric, Dr. Samed Djedovic
Bulgaria	Dr. Vassil Traykov, Assoc. Prof. Tchavdar Shalганov with special thanks to: Assoc. Prof. Toshо Balabanski, Dr. Svetoslav lovev, Dr. Mihail Protich, Dr. Milen Predovski
Croatia	Dr. Šime Manola
Cyprus	Dr. Panayiotis Avraamides, Dr. Pantelis Kourtellaris, Dr. Evagoras Economides with special thanks to: Dr. Eleftherios Nicolaides (Nicosia General Hospital)
Czech Republic	Dr. Robert Cihak, Dr. Miloš Taborsky, Dr. Petr Neuzil
Denmark	Dr. Michael Vinther, Assoc. Prof. Axel Brandes
Egypt	Cardiology & EP associate consultant Secretary of the ECRA Dr. Azza Katta Cardiology & EP consultant and president of ECRA Prof. Gamal Shaban Professor of cardiology & EP consultant Vice President of ECRA Prof. Mervat Aboelmaaty with special thanks to: Dr. Tamer Fahmy former secretary of the ECRA
Estonia	Dr. Jüri Voitk, Dr. Indrek Roose
Finland	Prof. Pekka Raatikainen with special thanks to: Research Nurse Outi Raatikainen

France	Dr. Nicolas Sadoul, Dr. Serge Boveda, Dr. Christian De Chillou with special thanks to: C. Durand, D. Henquet, V. Peters, M. Mainardis, G. Waque
Georgia Republic of	Dr. Giorgi Papiashvili
Germany	Prof. Thomas Deneke, Dr. Christopher Piorkowski
Greece	Dr. Antonios Sideris, Dr. Michalis Efremidis, Dr. Sotirios Xydonas with special thanks to: Dr. Kostas Vlahos, Dr. Stamatis Georgopoulos
Hungary	Dr. Marcell Clemens, Assist. Prof. László Sághy
Iceland	Dr. Sigfus Gizurarson, Dr. Kristjan Gudmundsson, Prof. David O. Arnar
Ireland	Dr. David Keane
Israel	Dr. Roy Beinart
Italy	Prof. Giuseppe Boriani with special thanks to: Dr. Alessandro Proclemer, Dr. Giuseppe Stabile
Kazakhstan	Prof. Salim Berkinbayev, Dr. Roin Rekvava, Dr. Ayan Abdrakhmanov
Kosovo	Prof. Gani Bajraktari, Dr. Artan Ahmeti
Kyrgyzstan	Dr. Alina Kerimkulova, Prof. Erkin Mirrakhimov
Latvia	Prof. Oskars Kalejs, Assist. Prof. Kristine Jubele, Dr. Aldis Strelnieks with special thanks to: Dr. Baiba Lurina, Dr. Irina Pupkevica
Lithuania	Prof. Germanas Marinskas, Prof. Aras Puodziukynas, Dr. Ausrius Poviliunas
Luxembourg	Dr. Carlo Dimmer, Dr. Laurent Groben
Macedonia, FYR	Dr. Nikola Gjorgov, Dr. Lidija Poposka Dr. Oliver Busljetic
Malta	Dr. Mark Adrian Sammut with special thanks to: Mr. Joe Debono
Moldova	Dr. Mihail Popovici with special thanks to: Dr. Mihail Rizov
Montenegro	Prof. Ljilja Music, Dr. Mihailo Vukmirovic, VMS Enes Vatic

Morocco	Prof. Salima Abdelali Dr. Siham Essadki, Najat Bourhim
Netherlands	Dr. Gerardus Kimman, Dr. Mike Scheffer
Norway	Dr. Erik Kongsgaard, Dr. Torkel Steen
Poland	Dr. Oskar Kowalski, Prof. Jarosław Kaźmierczak
Portugal	Dr. Pedro Cunha, Dr. Pedro Marques, Dr. Helena Gonçalves with special thanks to: Dr. Hipólito Reis, Santo António Hospital
Romania	Dr. Alexandru Deutsch with special thanks to: the representatives of centres who responded to the survey
Russian Federation	Prof. Amiran Revishvili with special thanks to: Dr. Vladislav Kuptsov. Secretary of the RSSA
San Marino	Dr. Marina Foscoli, Dr. Marco Zavatta
Serbia	Prof. Goran Milasinovic, Dr. Bratislav Kircanski, Assoc. Prof. Nebojsa Mujovic, Dr. Milosav Tomovic with special thanks to: Dr. Sinisa U. Pavlovic
Slovakia	Dr. Gabriela Kaliska, Dr. Silvia Misikova
Slovenia	Prof. Peter Rakovec
Spain	Dr. Jose M. Guerra Ramos, Dr. Nicasio Perez-Castellano with special thanks to: Dr. Oscar Cano, Dr. Ernesto Diaz-Infante, Dr. Ignacio Fernández-Lozano
Sweden	Prof. Carina Blomström Lundqvist, Assoc. Prof. Fredrik Holmqvist, Assoc. Prof. Fredrik Gadler with special thanks to: Helena Malmborg, Left atrial appendage occluder, Anita Fredenson
Switzerland	Prof. Haran Burri with special thanks to: Dr. Sc Nat Istvan Babotai and Dr. Juerg Fuhrer, both heading the national registry (CHPACEWEB)
Tunisia	Dr. Rafik Chettaoui, Dr. Sana Ouali, Dr. Afef Ben Halima
Turkey	Assoc. Prof. Emin Evren Özcan, Prof. Dursun Aras, Prof. Bülent Görenek
Ukraine	Prof. Oleg Sychov, Dr. Artem Borodai with special thanks to: Biskub I., Bugaev M., Burkovskii S., Gritsay A., Doronin O., Burdeinyi I., Kachan O., Karpenko Y., Klantsa A., Komiaty V., Lisohub S., Matlah A., Malyarchuk R., Melnitchuk M., Nikitan S., Notova G., Oleinik V., Pohilko S., Popov S., Posudevskii S., Pravosudovich S., Protsik V., Puziryov G., Sarazhin K., Volkov D., Zubenko K.
United Kingdom	Dr. Nick Linker, Dr. Francis Murgatroyd, Dr. David Cunningham

2. SCOPE AND METHODOLOGY



2. Scope and Methodology

The EHRA White Book 2017 is the 10th edition of a project that was launched in an attempt to understand the national realities with regards to the treatment of cardiac arrhythmias.

Every year, the EHRA invites all the National Working Groups on Arrhythmias and Electrophysiology and/or the National Cardiac Societies, members of the European Society of Cardiology, to participate in this project. This year, the data were collected in the period from March 2017 to May 2017. Like in the past, most of the ESC member countries provided up-to-date data for this year's edition.

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

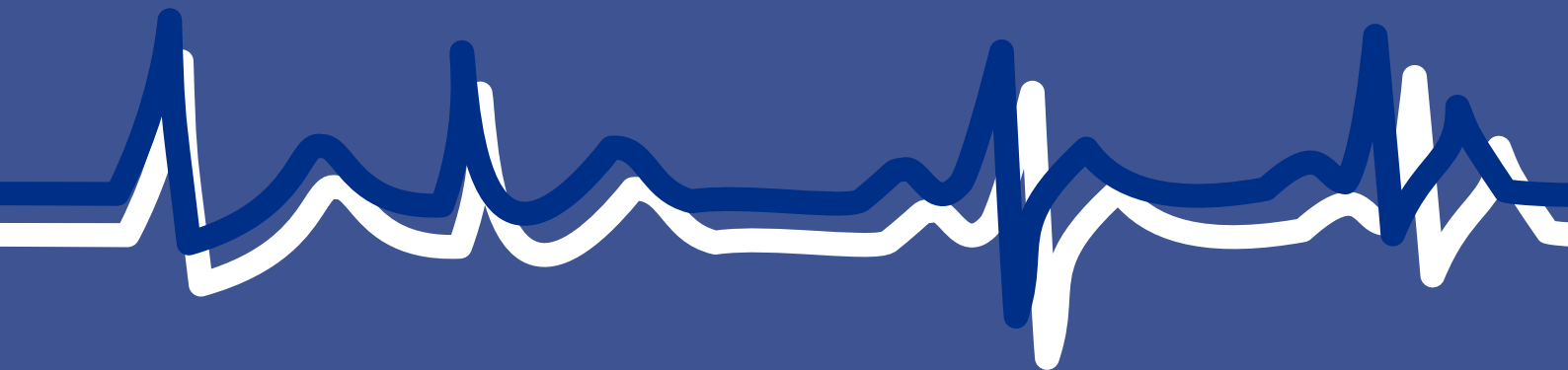
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9. Lead extractions
10. Device specific information
11. Interventional electrophysiology
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13. Sources

Since the beginning of the project in 2008 the data for the EHRA White Book have been collected by surveying National Cardiac Societies and National Working Groups on Arrhythmias and Electrophysiology in each ESC member country.

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

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

3. SOURCES FOR DEMOGRAPHIC INFORMATION



3. Sources for demographic information

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

Age pyramid

United States Census Bureau (Homepage)	http://www.census.gov/ipc/www/idb/informationGateway.php	March 6, 2017
--	---	---------------

Healthcare data

Hospitals (per 100 000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	February 6, 2017
Beds (per 100 000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	February 6, 2017
Density of physicians (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	February 6, 2017
Density of nurses (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	February 6, 2017

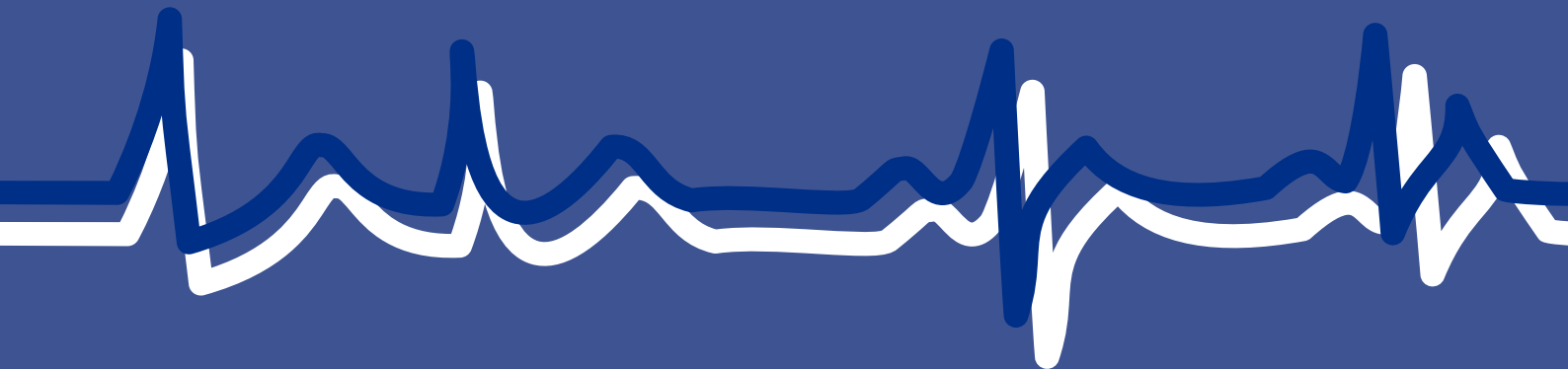
Demographic information

Population	United States Census Bureau (Homepage) http://www.census.gov/ipc/www/idb/informationGateway.php	March 6, 2017
Population annual growth rate (%)	United States Census Bureau (Homepage) http://www.census.gov/ipc/www/idb/informationGateway.php	March 6, 2017
Life expectancy at birth (in years)	United States Census Bureau (Homepage) http://www.census.gov/ipc/www/idb/informationGateway.php	March 6, 2017
Death rate (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	March 6, 2017
Live births (per 1000 population)	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	March 6, 2017

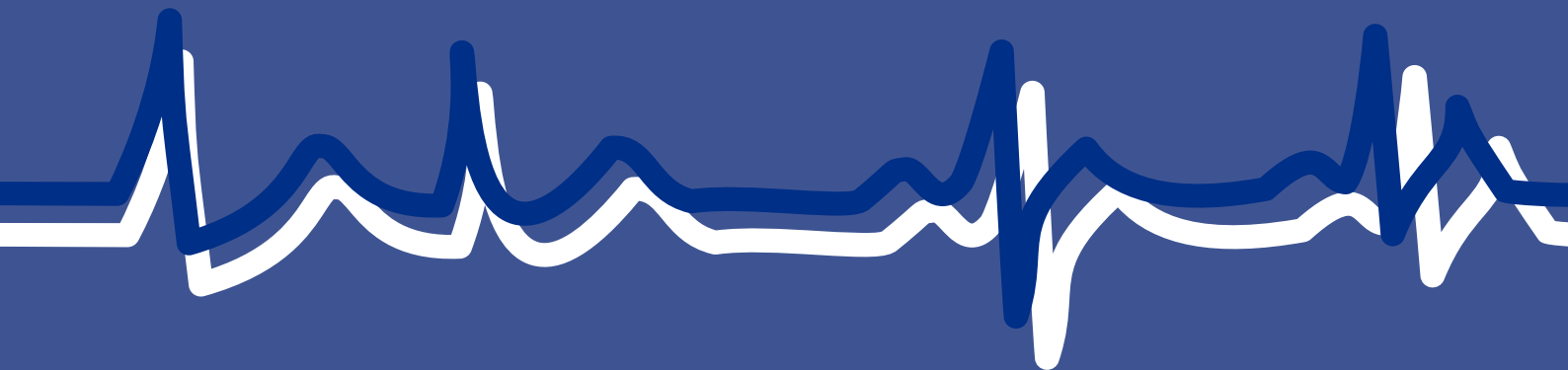
Economic information

Gross domestic product (U.S. dollar-billions)	International Monetary Fund (IMF) http://www.imf.org/external/ns/cs.aspx?id=28	March 6, 2017
Gross domestic product per capita (U.S. dollar-units)	International Monetary Fund (IMF) http://www.imf.org/external/ns/cs.aspx?id=28	March 6, 2017
Total expenditure on health as % of GDP	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	March 6, 2017
General government expenditure on health as % of total expenditure on health	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	March 6, 2017
Private expenditure on health as % of total expenditure on health	European health for all database (HFA-DB) http://data.euro.who.int/hfadb/	March 6, 2017

4. ESC COUNTRIES OVERVIEW

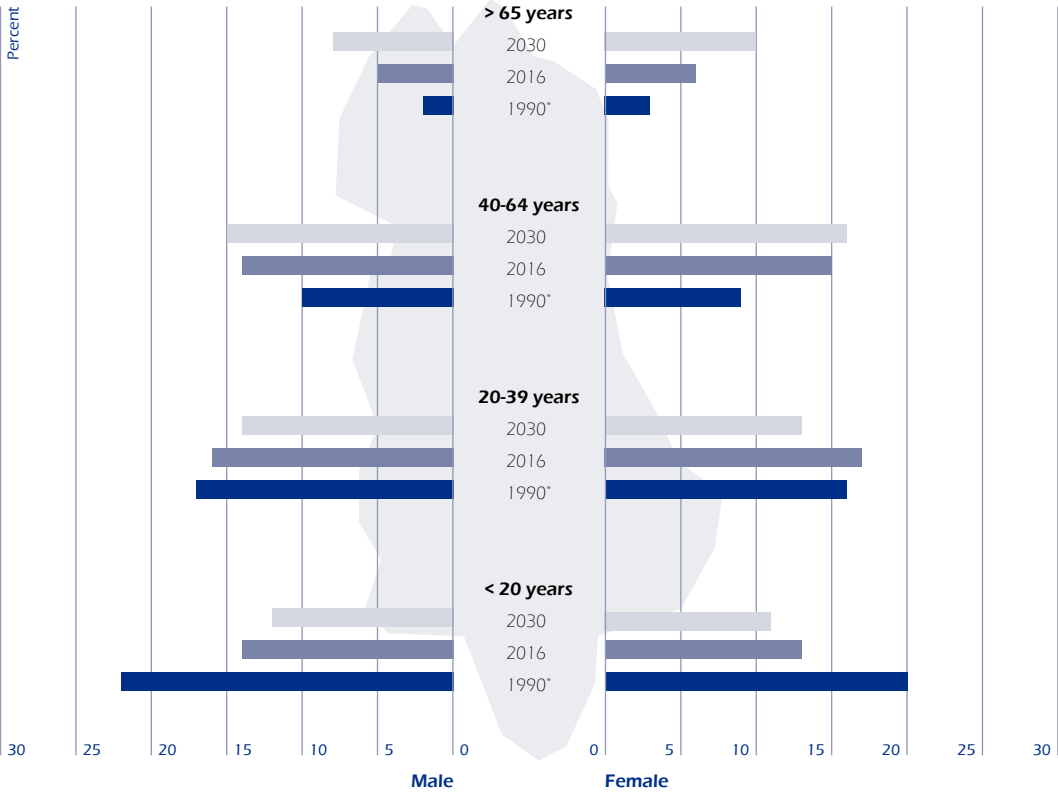


ALBANIA



1. Statistics

Age pyramid for Albania



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,5	2013
Beds (per 100.000 population)	288,8	2013
Density of physicians (per 1.000 population)	1,3	2013
Density of nurses (per 1.000 population)	5,1	1994
Demographic information		Year
Population	3.038.594	2016
Population annual growth rate (%)	0,3	2016
Life expectancy at birth (in years)	78	2016
Death rate (per 1.000 population)	5,4	2009
Live births (per 1.000 population)	11,3	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	12,14	2016*
Gross domestic product per capita (U.S dollar-units)	4.209,87	2016*
Total expenditure on health as % of GDP	5,9	2014
General government expenditure on health as % of total expenditure on health	49,9	2014
Private expenditure on health as % of total expenditure on health	50,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	52%

3. Healthcare System

Public healthcare system, under the Mandatory Insurance Fund of Health Care (<http://www.fsdksh.com.al/en/>), available for EVERY citizen. Monetary limitations on some expensive procedures (mostly EP / ablations), unavailability of some „high end“ procedures (TAVR, some hybrid cardiac procedures). Collaboration between the Mandatory Insurance Fund and private structures on coverage of some procedures (however priority is given to public centers). Private insurance also does exist, BUT there is no formal contract / clause of co-funding on procedures between private and public insurance (a patient can NOT benefit from two different insurances on the same procedure).

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

Requirements for citizens to qualify for public insurance: ID or proof of citizenship. Does cover even those who aren't active contributors (for example the unemployed) to the public insurance scheme. However, limitations on the type of the procedures / illnesses covered by this insurance.

Percentage of insured and uninsured citizens	2015	2016
--	------	------

Insured citizens	not available	100%
Uninsured citizens	not available	0%

Distribution of insurance modality	2015	2016
------------------------------------	------	------

Public insurance company	not available	100%
Private insurance company	not available	not available
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	Yes

Comments:

ICD: Full coverage on the public sector / limited number of ICD implanted / not covered on private centers.

PM: Full coverage on both public and private sector, some limitation on the diversity of devices.

RF ablation: Not covered by the Fund, only available on a private (by the patient) payment basis.

Reimbursement availability for physicians and hospitals

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

Comments: Physician: Internal Loop Recorders / Subcutaneous ICD / Leadless Pacing: Not available (NA) in Albania (yet). No reimbursement, neither incentives for physicians working on the public sector, percentage payment (fee) for those on the private sector (regulated by the internal rules of every private center). Hospital: Through the Mandatory Insurance Fund of Health Care to the Hospital.

Treatment availability

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

Comments: Restrictions mainly on the budget limitations.



4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Validation of the Specialist Diploma through the Ministry of Health, however it requires proof of being a Cardiologist ONLY !!! Non-specific updates (not necessarily related to a specific sub-specialty within Cardiology) are required through CME / Congresses / other scientific (or similar) updates by the National Center of Continuing Education (http://www.qkev.gov.al/en/home-1) for the Certification / Re-Certification process.
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Validation of the Specialist Diploma through the Ministry of Health, however it requires proof of being a Cardiologist ONLY !!! Non-specific updates (not necessarily related to a specific sub-specialty within Cardiology) are required through CME / Congresses / other scientific (or similar) updates by the National Center of Continuing Education (http://www.qkev.gov.al/en/home-1) for the Certification / Re-Certification process.
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Validation of the Specific Diploma through the Ministry of Health. Non-specific updates (not necessarily related to a specific sub-specialty within Cardiology) are required through CME / Congresses / other scientific (or similar) updates by the National Center of Continuing Education (http://www.qkev.gov.al/en/home-1) for the Certification / Re-Certification process.
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Updates for the senior trainers (in Cardiology) are required through CME / Congresses / other scientific (or similar) updates by the National Center of Continuing Education (http://www.qkev.gov.al/en/home-1) for the Certification / Re-Certification process.

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
Required period of training to perform implantations	No
Suggested period of training to perform implantations	Yes 1 year

National quality control system availability	No
Willingness to install quality control system	Yes

Responsible for quality control
Universitary Hospital „Mother Teresa“, Department of Cardiovascular Diseases.

Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	
	2
Percentage of academic centres among all practicing EP centres	
	not available
Percentage of academic centres among all practicing implanting devices centres	
	17%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	6
Total Pacemaker units implanted	not available	440
Thereof, Leadless Pacemaker	not available	0
First implants	not available	360
Replacements	not available	80
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	4
Total CRT units implanted	not available	22
Thereof, CRT pacemaker	not available	18
Thereof, CRT ICD	not available	4

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	4
Total ICD units implanted	not available	16
Thereof, Single chamber	not available	16
Thereof, Dual chamber	not available	0
Thereof, Subcutaneous ICD	not available	0
First implants	not available	16
Replacements	not available	0

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	0
Total loop recorders implanted	not available	0

Specialist performing implants		
Cardiologists	No	0%
Surgeons	No	0%

Comments: No loop recorders implanted in Albania.

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	2
Total lead extraction procedures	not available	4
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Not yet started as a project / monetary limitations.		
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		
	2015	2016
Number of ablation centres	not available	2
Number of ablations performed	not available	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	not available	not available
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	3
Number of physicians under training to become independent electrophysiologists	not available	0
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

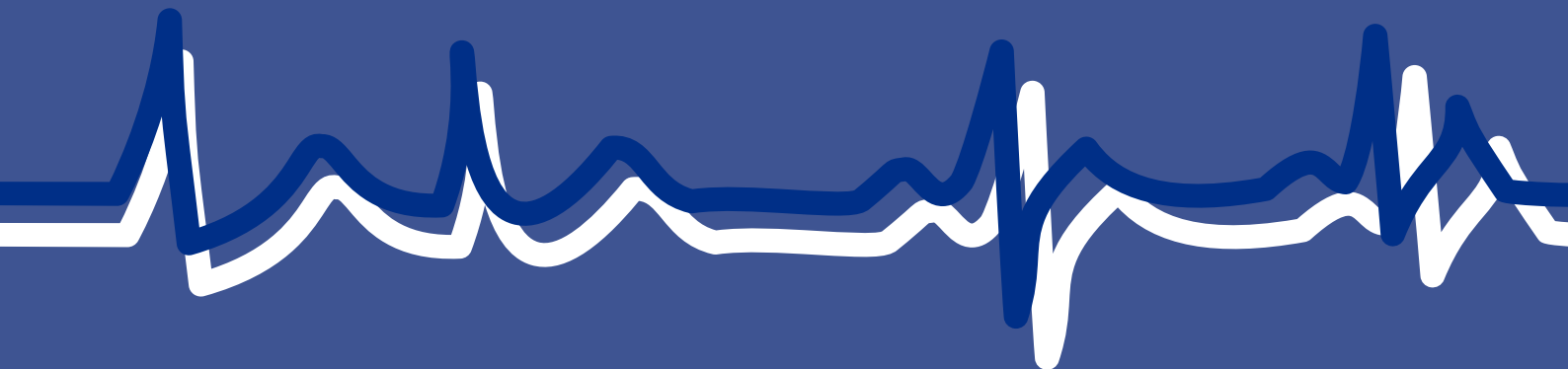
Guidelines adhered to ICD implants and pacemaker implants						
National	No answer					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation					Ranking of importance	
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle
1 = top, 6 = lowest

13. Sources

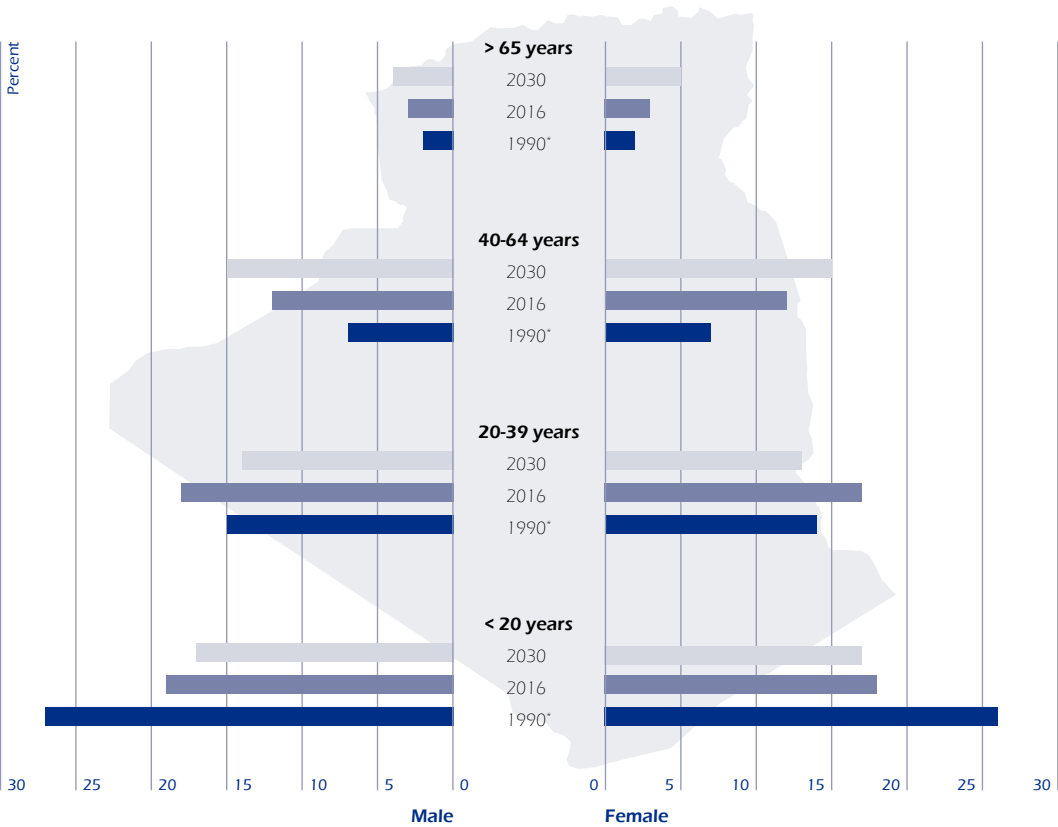
Name of National Cardiac Society, National Working Group or arrhythmia body
<ul style="list-style-type: none"> · Albanian Society of Cardiology. · National Working Group on Arrhythmia
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
<ul style="list-style-type: none"> · EHRA White Book 2016 · Official statistics · Estimation · Other

ALGERIA



1. Statistics

Age pyramid for Algeria



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available
Demographic information		Year
Population	40.263.711	2016
Population annual growth rate (%)	1,8	2016
Life expectancy at birth (in years)	77	2016
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available
Economic information		Year
Gross domestic product (U.S dollar-billions)	168,32	2016*
Gross domestic product per capita (U.S dollar-units)	4.129,27	2016*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	not available	2014
Private expenditure on health as % of total expenditure on health	not available	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

Public facilities and some small to middle sized private clinics.

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

Requirements for citizens to qualify for public insurance: To provide vaccinations,coverage of communicable diseases and the main chronic diseases(Diabètes,HTN...)

Percentage of insured and uninsured citizens	2015	2016
--	------	------

Insured citizens	70%	70%
Uninsured citizens	30%	30%

Distribution of insurance modality	2015	2016
------------------------------------	------	------

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
--	-----

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

ICD devices	No
Pacemakers	Yes
Ablation	No

Comments: ICD and Ablation only in public structures so far. Pacemakers also available in private structures with co-payment.

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

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

Comments:

Physicians: Only salaries in public structures; Hospitals: Devices are paid by implanting centers according to their own Financial capabilities.

Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input checked="" type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>
Body issuing: Consensus between groups to refer to ESC Guidelines	
Comments: Consensus between groups to refer to ESC Guidelines	

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
---	----

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



Suggested period of training to perform implantations	Yes
	1 year
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
	To be defined.
Training centres availability	
Pacemaker	11
ICD implantation	7
CRT implantation	3
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	1
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	85%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	19	19
Total Pacemaker units implanted	2.915	3.248
Thereof, Leadless Pacemaker	0	0
First implants	2.303	2.166
Replacements	612	1.082
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	8	8
Total CRT units implanted	108	89
Thereof, CRT pacemaker	53	62
Thereof, CRT ICD	55	27
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	9	9
Total ICD units implanted	91	67
Thereof, Single chamber	76	11
Thereof, Dual chamber	15	56
Thereof, Subcutaneous ICD	0	0
First implants	85	60
Replacements	6	7
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total loop recorders implanted	15	15
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	3	3
Total lead extraction procedures	41	23
Specialist performing lead extractions		
Cardiologists	Yes	60%
Surgeons	Yes	40%

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		
	2015	2016
Number of ablation centres	3	3
Number of ablations performed	303	374
Mean number of ablations per centre	101	125
Number of AF ablations	0	10
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	8	20
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	1
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	5	6
Number of physicians under training to become independent electrophysiologists	4	4
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

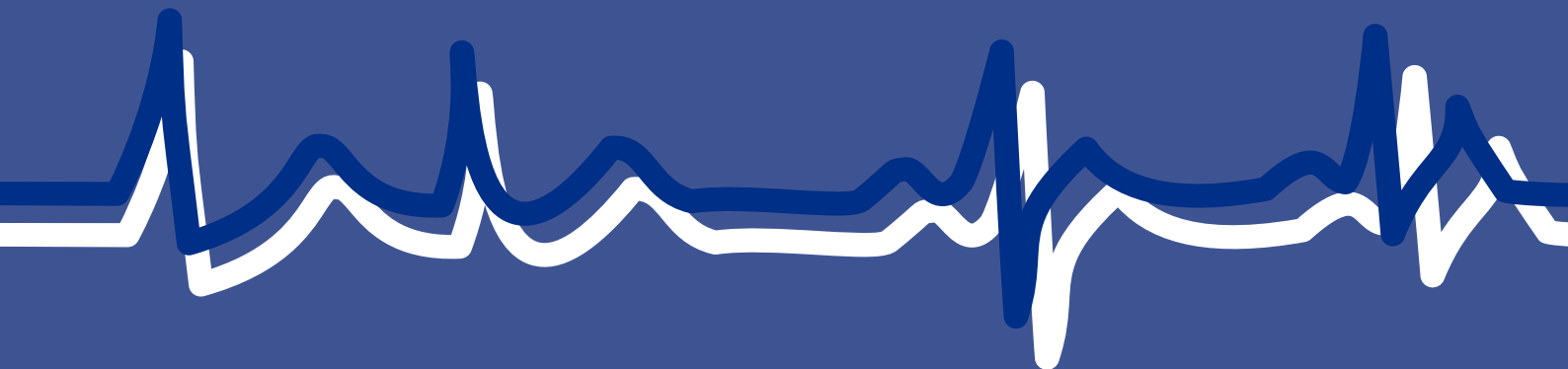
Name of National Cardiac Society, National Working Group or arrhythmia body

- Working Group („Algerythme“) of the Algerian Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

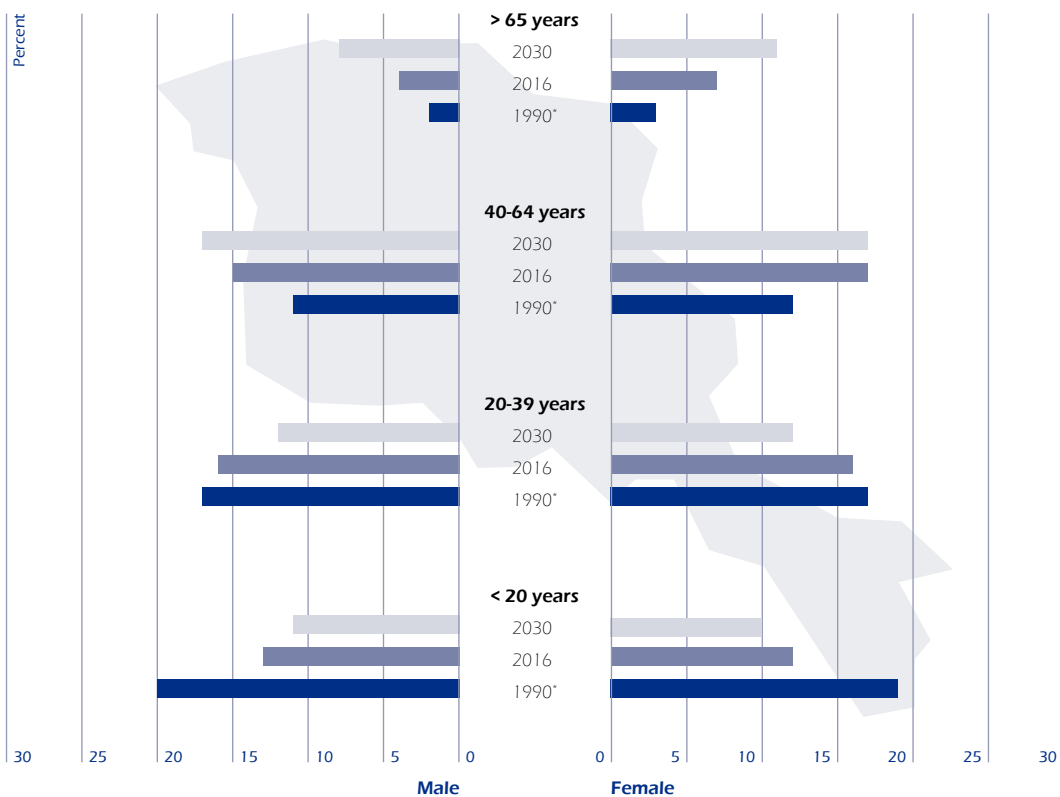
- EHRA White Book 2016
- Survey from professional association
- Estimation
- Other

ARMENIA



1. Statistics

Age pyramid for Armenia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	4,3	2014
Beds (per 100.000 population)	415,2	2014
Density of physicians (per 1.000 population)	2,8	2014
Density of nurses (per 1.000 population)	5,0	2014
Demographic information		Year
Population	3.051.250	2016
Population annual growth rate (%)	-0,2	2016
Life expectancy at birth (in years)	75	2016
Death rate (per 1.000 population)	9,2	2014
Live births (per 1.000 population)	14,3	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	10,75	2016*
Gross domestic product per capita (U.S dollar-units)	3.595,87	2016*
Total expenditure on health as % of GDP	4,5	2014
General government expenditure on health as % of total expenditure on health	43,0	2014
Private expenditure on health as % of total expenditure on health	57,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	48%	48%

3. Healthcare System

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

Basic insurance availability			No					
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	33%	32%						
Uninsured citizens	67%	68%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	0%	33%						
Private insurance company	100%	64%						
Private co-payment	0%	3%						
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/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
---	----

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

Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Perhaps the Armenian Arrhythmological Association	
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	50%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	3
Total Pacemaker units implanted	117	188
Thereof, Leadless Pacemaker	0	0
First implants	107	99
Replacements	10	89
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	3
Total CRT units implanted	10	20
Thereof, CRT pacemaker	1	10
Thereof, CRT ICD	9	10
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total ICD units implanted	21	37
Thereof, Single chamber	5	7
Thereof, Dual chamber	16	30
Thereof, Subcutaneous ICD	0	0
First implants	17	33
Replacements	4	4
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	3
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		
	2015	2016
Hospitals performed lead extractions	0	3
Total lead extraction procedures	0	0
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
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		
	2015	2016
Number of ablation centres	3	3
Number of ablations performed	48	52
Mean number of ablations per centre	16	17
Number of AF ablations	1	3
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	2	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	4	5
Number of physicians under training to become independent electrophysiologists	2	2
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

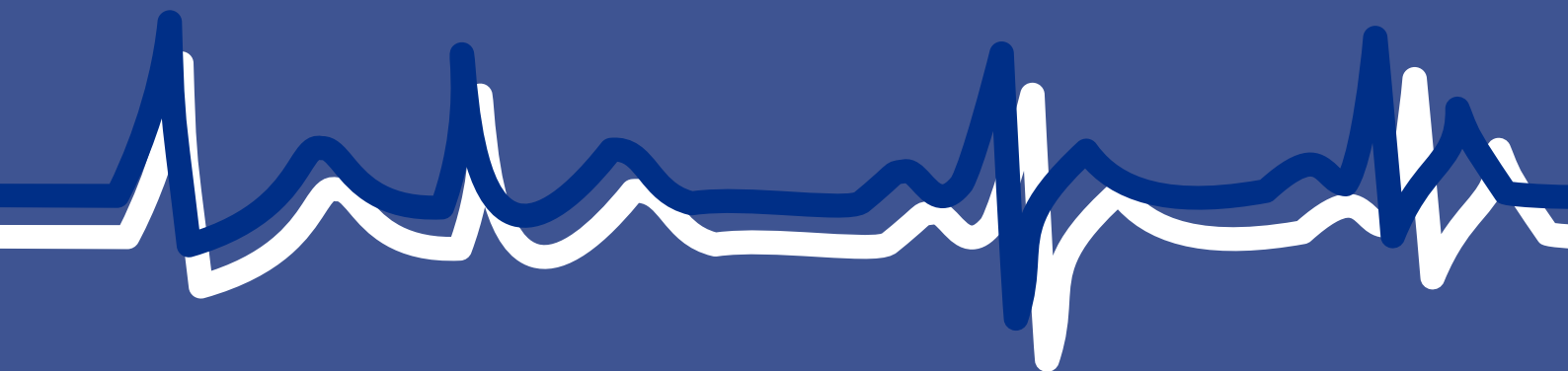
Name of National Cardiac Society, National Working Group or arrhythmia body

- | |
|---|
| <ul style="list-style-type: none">· Armenian Arrhythmological Association |
|---|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

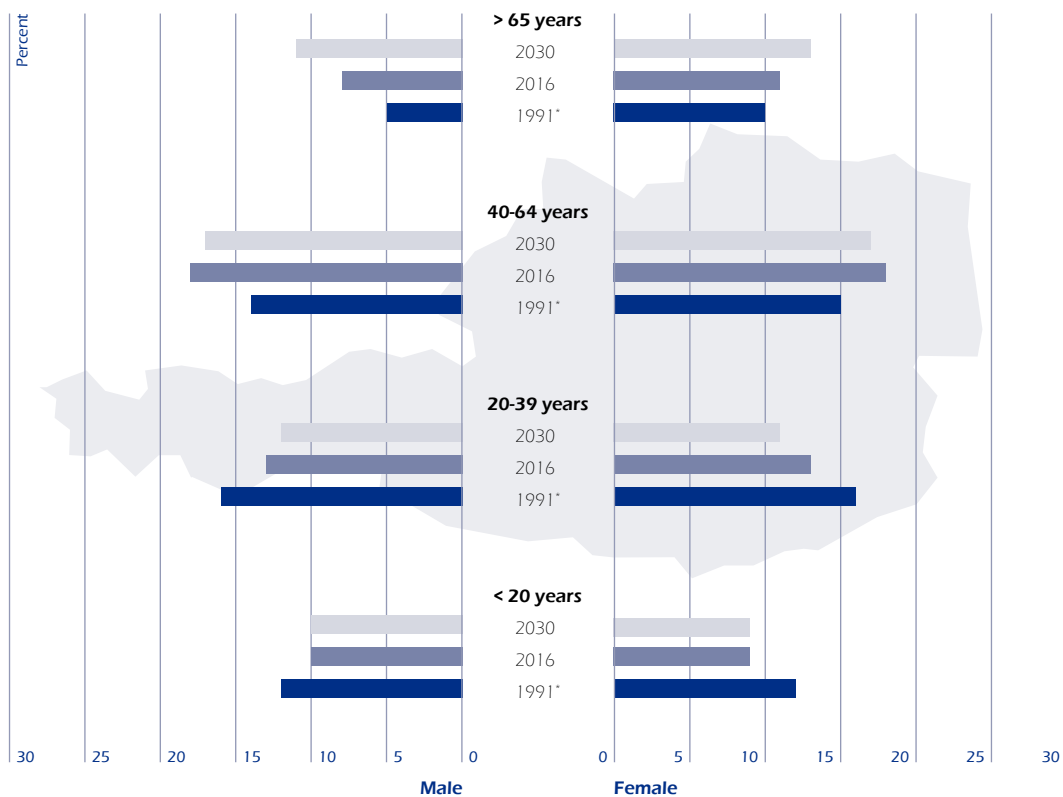
- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Ministry of Health |
|---|

AUSTRIA



1. Statistics

Age pyramid for Austria



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	3,3	2014
Beds (per 100.000 population)	758,6	2014
Density of physicians (per 1.000 population)	5,1	2015
Density of nurses (per 1.000 population)	8,2	2014
Demographic information		Year
Population	8.711.770	2016
Population annual growth rate (%)	0,5	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	9,2	2014
Live births (per 1.000 population)	9,6	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	387,30	2016*
Gross domestic product per capita (U.S dollar-units)	44.561,31	2016*
Total expenditure on health as % of GDP	11,2	2014
General government expenditure on health as % of total expenditure on health	77,9	2014
Private expenditure on health as % of total expenditure on health	22,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	42%	43%

3. Healthcare System

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

Basic insurance availability		Yes
Requirements for citizens to qualify for public insurance: All citizens with a minimum salary / payment of 416€/month qualify for public healthcare insurance.		
Percentage of insured and uninsured citizens		
	2015	2016
Insured citizens	98%	99%
Uninsured citizens	2%	1%
Distribution of insurance modality		
	2015	2016
Public insurance company	99%	70%
Private insurance company	0%	0%
Private co-payment	0%	30%
Possibility to subscribing to private health insurance plans		Yes
Co-payment necessary for the following therapy		
ICD devices		No
Pacemakers		No
Ablation		No

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

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

4. Education and Quality Control

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

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

Comments: EHRA certification and EHRA Center certification.

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
Suggested period of training to perform implantations		No
National quality control system availability		No
Willingness to install quality control system		Yes
Responsible for quality control		
Austrian Medical Association		
Training centres availability		
Pacemaker		72
ICD implantation		38
CRT implantation		36
Electrophysiological studies and catheter ablation		19
Atrial fibrillation ablation		14
Number of universities (Schools of Medicine)		4
Percentage of academic centres among all practicing EP centres		21%
Percentage of academic centres among all practicing implanting devices centres		6%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	57	72
Total Pacemaker units implanted	7.905	7.567
Thereof, Leadless Pacemaker	not available	91
First implants	5.711	5.502
Replacements	2.194	2.065

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	18	36
Total CRT units implanted	1.364	1.270
Thereof, CRT pacemaker	470	400
Thereof, CRT ICD	894	870

Specialist performing implants		
Cardiologists	Yes	66%
Surgeons	Yes	33%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	21	38
Total ICD units implanted	1.393	1.457
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	100
First implants	1.045	1.057
Replacements	348	400

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%



8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	25	64
Total loop recorders implanted	893	1.111
Specialist performing implants		
Cardiologists	Yes	80%
Surgeons	Yes	20%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	5	6
Total lead extraction procedures	250	300
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		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	19	19
Number of ablations performed	2.777	3.342
Mean number of ablations per centre	146	176
Number of AF ablations	966	1.209
Number of ablation centres (> 50 AF ablations)	8	9
Number of VT/VF ablations	95	145
Number of ablation centres (> 10 VT ablations on structural heart diseases)	4	4
Number of LAA closures	50	65
Number of centres (LAA closures)	10	8
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	46	41
Number of physicians under training to become independent electrophysiologists	17	20
Availability of a national registry for interventional electrophysiology		Yes
Official name: Registry of the EP Working Group / Austrian Society of Cardiology		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

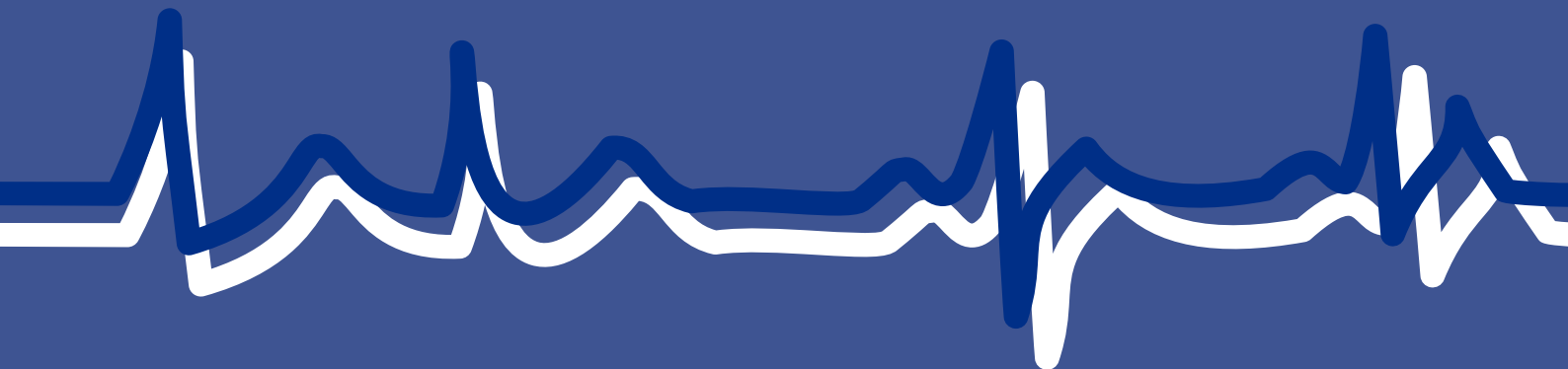
Name of National Cardiac Society, National Working Group or arrhythmia body

- EP Working Group
- Austrian Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

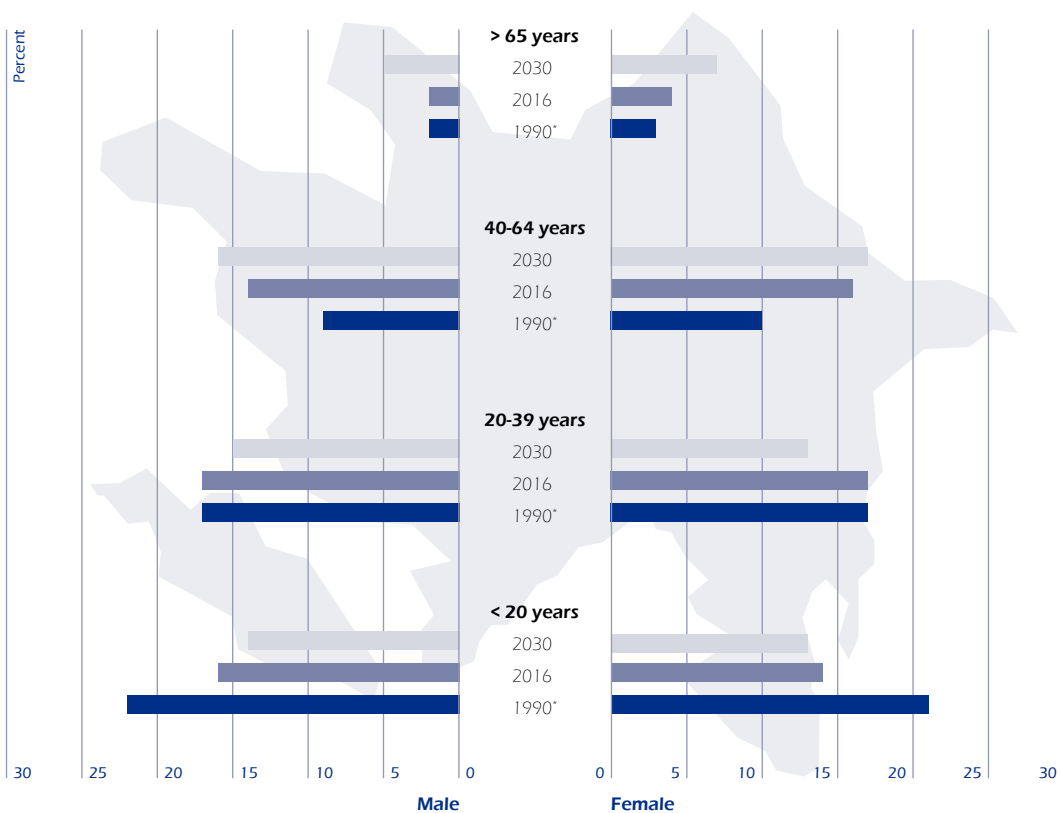
- EHRA White Book 2016
- Official statistics
- Survey from professional association
- Estimation

AZERBAIJAN



1. Statistics

Age pyramid for Azerbaijan



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	5,9	2014
Beds (per 100.000 population)	487,0	2014
Density of physicians (per 1.000 population)	3,4	2014
Density of nurses (per 1.000 population)	6,4	2014
Demographic information		Year
Population	9.872.765	2016
Population annual growth rate (%)	0,9	2016
Life expectancy at birth (in years)	73	2016
Death rate (per 1.000 population)	5,9	2007
Live births (per 1.000 population)	17,2	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	35,69	2016*
Gross domestic product per capita (U.S dollar-units)	3.759,47	2016*
Total expenditure on health as % of GDP	6,0	2014
General government expenditure on health as % of total expenditure on health	20,4	2014
Private expenditure on health as % of total expenditure on health	79,6	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	50%	not available

3. Healthcare System

Until last year only general insurance was available. This general insurance did not covered device implantations and ablation procedures. From 2017 governmental mandatory insurance company was established and started in two regions as a pilot program. This new insurance covering EP procedures for patients living in this two regions. Within next years all people living in Azerbaijan are expected to become insured.

Basic insurance availability		Yes
Percentage of insured and uninsured citizens		
	2015	2016
Insured citizens	100%	not available
Uninsured citizens	0%	not available
Distribution of insurance modality		
	2015	2016
Public insurance company	80%	not available
Private insurance company	10%	not available
Private co-payment	10%	not available
Possibility to subscribing to private health insurance plans		Yes
Co-payment necessary for the following therapy		
ICD devices		Yes
Pacemakers		Yes
Ablation		Yes

Comments: Co-payment is necessary in private hospitals for pacemakers, ICDs and ablation. Pacemaker are covered in free governmental hospitals, but these hospitals do not perform ablation and ICD implantations.

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

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Ministry of Health	
Training centres availability	
Pacemaker	3
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	20%
Percentage of academic centres among all practicing implanting devices centres	20%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	8	6
Total Pacemaker units implanted	395	452
Thereof, Leadless Pacemaker	0	0
First implants	352	347
Replacements	43	105
Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	5
Total CRT units implanted	24	65
Thereof, CRT pacemaker	0	2
Thereof, CRT ICD	24	63
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	7	5
Total ICD units implanted	21	29
Thereof, Single chamber	8	11
Thereof, Dual chamber	13	18
Thereof, Subcutaneous ICD	0	0
First implants	not available	20
Replacements	not available	9
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total loop recorders implanted	1	1
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	1	1
Total lead extraction procedures	5	3
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		No
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	5	5
Number of ablations performed	398	742
Mean number of ablations per centre	80	148
Number of AF ablations	6	10
Number of ablation centres (> 50 AF ablations)	not available	0
Number of VT/VF ablations	not available	252
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	2	3
Number of physicians under training to become independent electrophysiologists	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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

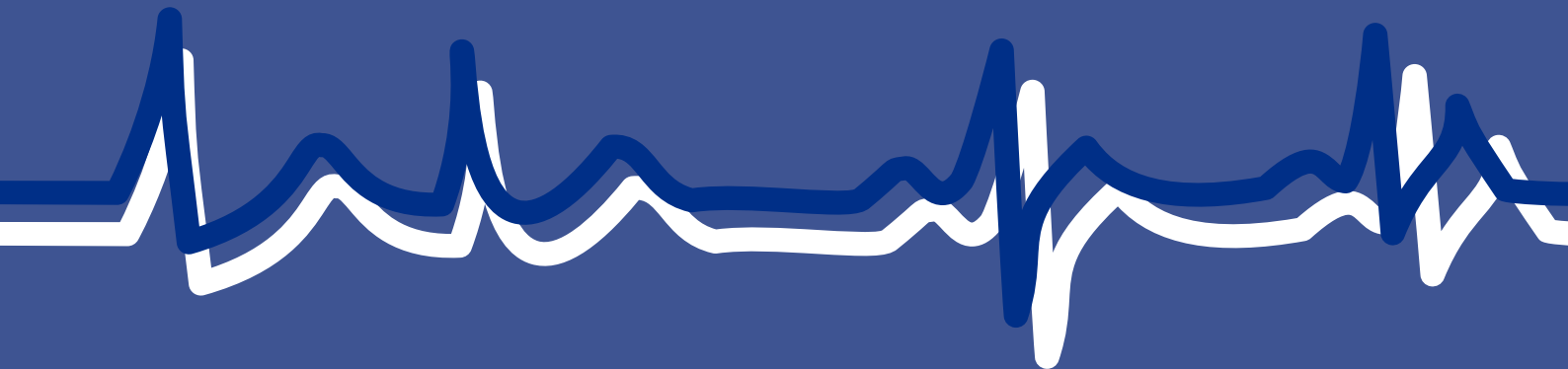
- | |
|--|
| <ul style="list-style-type: none">· Azerbaijan Society of Cardiology |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Survey from professional association |
|---|

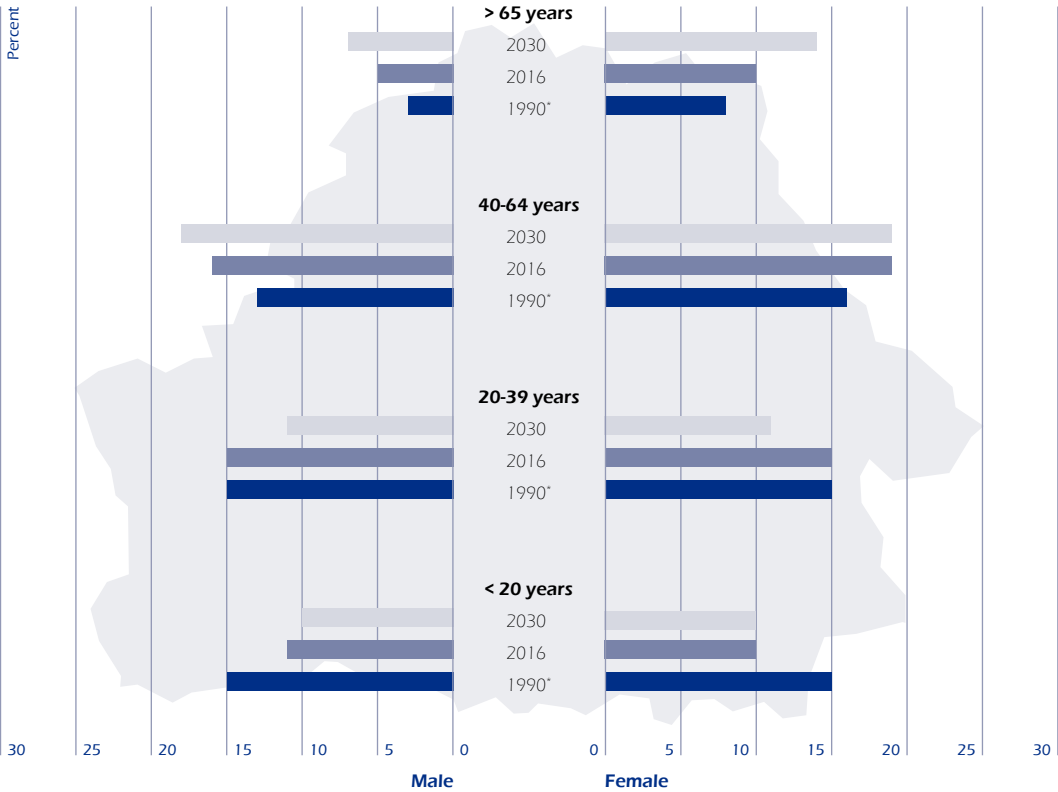


BELARUS



1. Statistics

Age pyramid for Belarus



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	6,8	2014
Beds (per 100.000 population)	1.086,3	2014
Density of physicians (per 1.000 population)	2,2	2014
Density of nurses (per 1.000 population)	6,2	2014
Demographic information		Year
Population	9.570.376	2016
Population annual growth rate (%)	-0,2	2016
Life expectancy at birth (in years)	73	2016
Death rate (per 1.000 population)	12,8	2014
Live births (per 1.000 population)	12,5	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	48,13	2016*
Gross domestic product per capita (U.S dollar-units)	5.092,04	2016*
Total expenditure on health as % of GDP	5,7	2014
General government expenditure on health as % of total expenditure on health	65,8	2014
Private expenditure on health as % of total expenditure on health	34,2	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	55,15%	55,2%

3. Healthcare System

National Health System.

Basic insurance availability			Yes					
Percentage of insured and uninsured citizens								
			2015	2016				
Insured citizens			100%	100%				
Uninsured citizens			0%	0%				
Distribution of insurance modality								
			2015	2016				
Public insurance company			100%	100%				
Private insurance company			not available	not available				
Private co-payment			not available	not available				
Possibility to subscribing to private health insurance plans			Yes					
Co-payment necessary for the following therapy								
ICD devices				No				
Pacemakers				No				
Ablation				No				
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive	No answer			
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

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

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

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

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

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

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	10	10
Total Pacemaker units implanted	3.149	3.005
Thereof, Leadless Pacemaker	not available	not available
First implants	2.607	2.537
Replacements	542	468
Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	6
Total CRT units implanted	100	60
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		
	2015	2016
Implanting centres	10	10
Total ICD units implanted	133	136
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total loop recorders implanted	57	44
Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	3	4
Total lead extraction procedures	11	59
Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
	Official name	
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	7	7
Number of ablations performed	993	1 138
Mean number of ablations per centre	142	163
Number of AF ablations	106	175
Number of ablation centres (> 50 AF ablations)	2	1
Number of VT/VF ablations	5	53
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	1
Number of LAA closures	12	12
Number of centres (LAA closures)	2	2
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	0	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

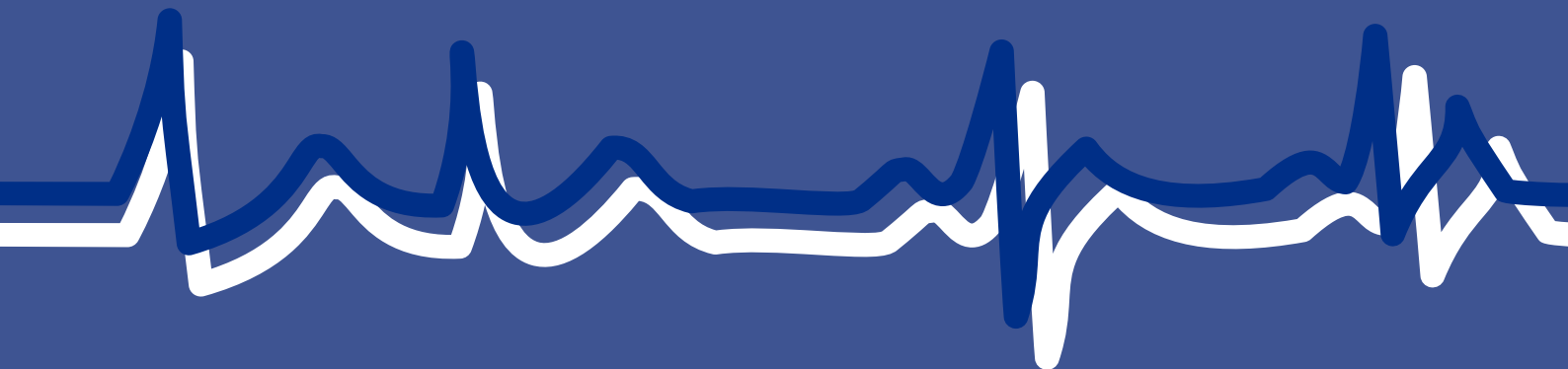
Name of National Cardiac Society, National Working Group or arrhythmia body

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| · Belorussian Heart Rhythm Association a branch of Belorussian Scientific Society of Cardiologists |
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All sources that were used to fill out the questionnaire for the EHRA White Book 2017

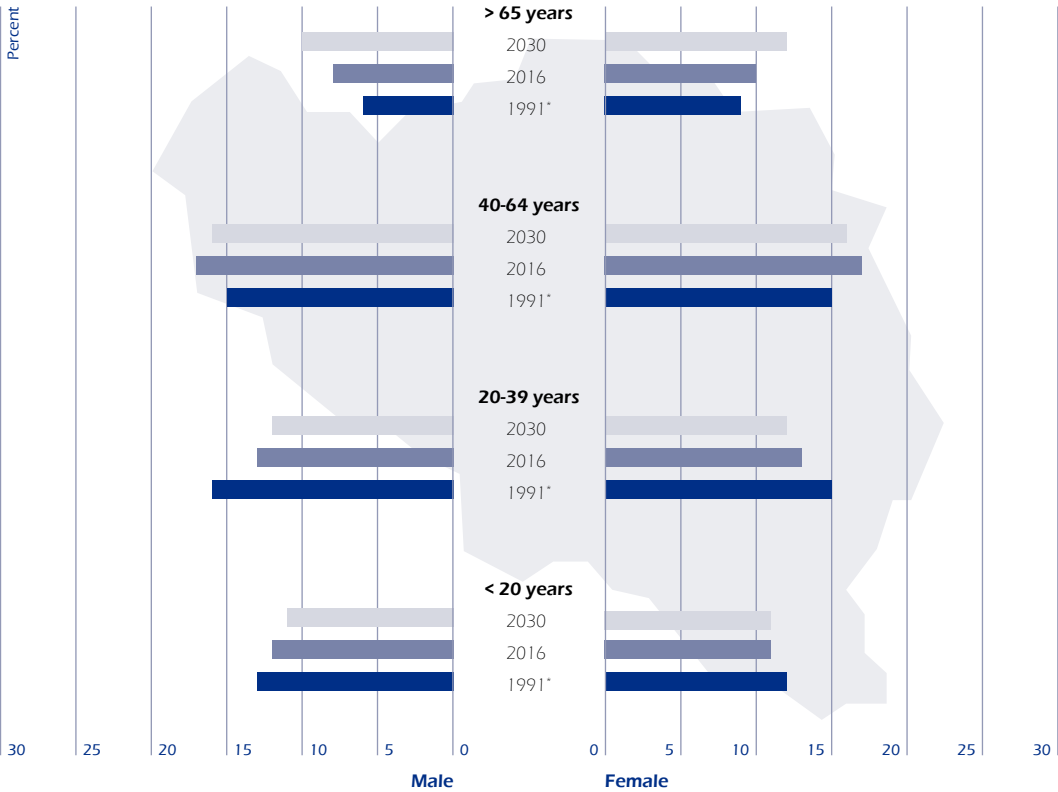
- | |
|------------------------|
| · EHRA White Book 2016 |
| · Official statistics |

BELGIUM



1. Statistics

Age pyramid for Belgium



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,7	2014
Beds (per 100.000 population)	619,0	2015
Density of physicians (per 1.000 population)	3,0	2014
Density of nurses (per 1.000 population)	10,2	2010
Demographic information		Year
Population	11.409.077	2016
Population annual growth rate (%)	0,8	2016
Life expectancy at birth (in years)	81	2016
Death rate (per 1.000 population)	9,8	2013
Live births (per 1.000 population)	10,9	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	470,18	2016*
Gross domestic product per capita (U.S dollar-units)	41.491,12	2016*
Total expenditure on health as % of GDP	10,6	2014
General government expenditure on health as % of total expenditure on health	77,9	2014
Private expenditure on health as % of total expenditure on health	22,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available



3. Healthcare System

National and obligatory for everybody.

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: citizenship								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	99%	99%						
Uninsured citizens	1%	1%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	90%	90%						
Private insurance company	0%	0%						
Private co-payment	10%	10%						
Possibility to subscribing to private health insurance plans				Yes				
Co-payment necessary for the following therapy								
ICD devices				No				
Pacemakers				No				
Ablation				Yes				
Reimbursement availability for physicians and hospitals								
	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

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

4. Education and Quality Control

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

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

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

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

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
PM and ICD: Ministry Healthcare; Ablation: Working Group (BeHRA)	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	7
Percentage of academic centres among all practicing EP centres	20%
Percentage of academic centres among all practicing implanting devices centres	7%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	104	104
Total Pacemaker units implanted	13.073	not available
Thereof, Leadless Pacemaker	0	not available
First implants	9.094	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	40	40
Total CRT units implanted	1.485	not available
Thereof, CRT pacemaker	528	not available
Thereof, CRT ICD	957	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	23	23
Total ICD units implanted	1.531	not available
Thereof, Single chamber	907	not available
Thereof, Dual chamber	542	not available
Thereof, Subcutaneous ICD	82	not available
First implants	1.081	not available
Replacements	450	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total loop recorders implanted	400	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		
	2015	2016
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	Yes	not available
Surgeons	Yes	not available

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	QERMID@DEFIBRILLATORS
Pacing	Yes	QERMID@PACEMAKERS
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	not available	not available
Number of ablations performed	7.091	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	3.273	not available
Number of ablation centres (> 50 AF ablations)	16	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		Yes
Official name: BEHRA national ablation database		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

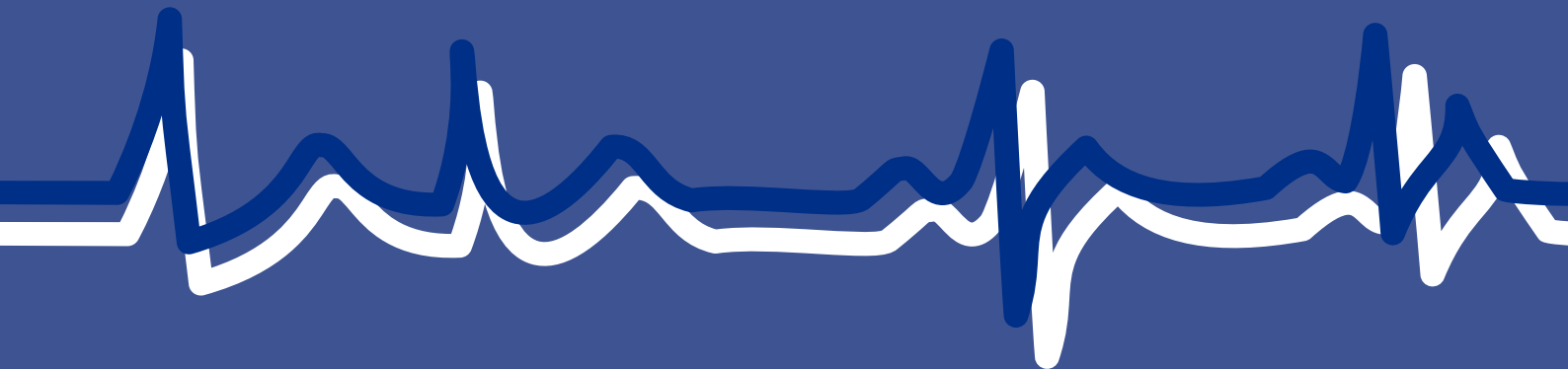
Name of National Cardiac Society, National Working Group or arrhythmia body

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| <ul style="list-style-type: none">· BeHRA |
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All sources that were used to fill out the questionnaire for the EHRA White Book 2017

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|--|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association· Estimation |
|--|

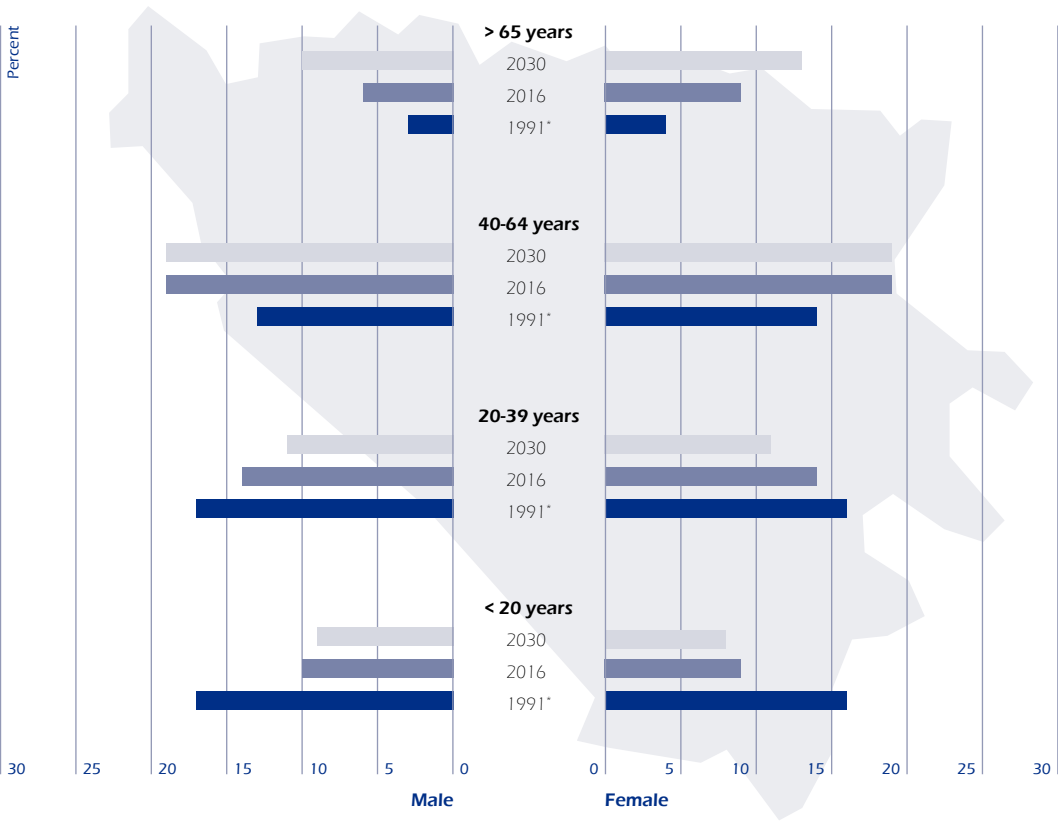
BOSNIA & HERZEGOVINA





1. Statistics

Age pyramid for Bosnia & Herzegovina



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,0	2013
Beds (per 100.000 population)	348,4	2014
Density of physicians (per 1.000 population)	1,9	2013
Density of nurses (per 1.000 population)	5,6	2014
Demographic information		Year
Population	3.861.912	2016
Population annual growth rate (%)	-0,1	2016
Life expectancy at birth (in years)	77	2016
Death rate (per 1.000 population)	9,4	2014
Live births (per 1.000 population)	7,9	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	16,53	2016*
Gross domestic product per capita (U.S dollar-units)	4.289,32	2016*
Total expenditure on health as % of GDP	9,6	2014
General government expenditure on health as % of total expenditure on health	71,2	2014
Private expenditure on health as % of total expenditure on health	28,8	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	52%	48%

3. Healthcare System

The National Healthcare System in B&H is provided through an established network of health centers of Family Medicine (Primary Care). As a secondary and tertiary care General Hospitals, University Clinical Centers, University hospitals and special institution are provided services. A few private healthcares are incorporated in healthcare system.

Basic insurance availability		No						
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	75%	75%						
Uninsured citizens	25%	25%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	75%	75%						
Private insurance company	not available	not available						
Private co-payment	25%	25%						
Possibility to subscribing to private health insurance plans		No						
Co-payment necessary for the following therapy								
ICD devices		Yes						
Pacemakers		Yes						
Ablation		No answer						
Comments: 100% in the private sector. It is mandatory the payment of 20% of all implant costs for patients under 65 years old.								
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No answer
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Required period of training to perform implantations	No answer
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Suggested period of training to perform implantations	No answer
National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible for quality control	
Ministry of Health	
Training centres availability	
Pacemaker	2
ICD implantation	0
CRT implantation	0
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	50%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	6
Total Pacemaker units implanted	854	1.008
Thereof, Leadless Pacemaker	0	not available
First implants	793	896
Replacements	61	112
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	3
Total CRT units implanted	17	17
Thereof, CRT pacemaker	11	8
Thereof, CRT ICD	6	9
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	6
Total ICD units implanted	87	56
Thereof, Single chamber	78	53
Thereof, Dual chamber	9	3
Thereof, Subcutaneous ICD	0	not available
First implants	81	48
Replacements	6	8
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	1	2
Total loop recorders implanted	5	4
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	0	not available
Total lead extraction procedures	0	not available
Specialist performing lead extractions		
Cardiologists	Yes	not available
Surgeons	No	not available

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: 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		
	2015	2016
Number of ablation centres	1	1
Number of ablations performed	not available	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	0	not available
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	0	not available
Number of physicians under training to become independent electrophysiologists	2	2
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

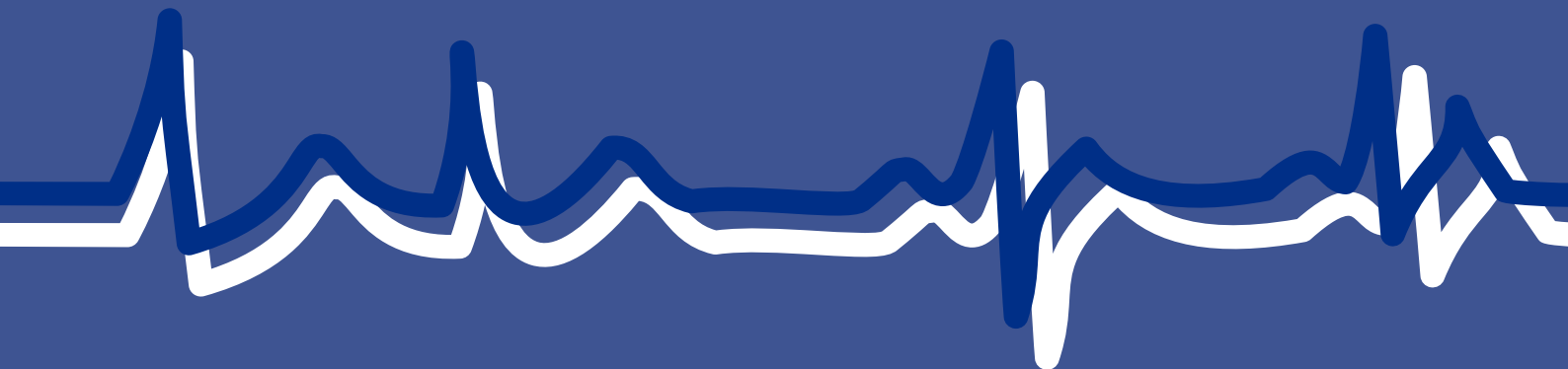
- | |
|---|
| <ul style="list-style-type: none">· Working Group for Cardiac Pacing / Association of Cardiologist in Bosnia and Herzegovina· Working Group for Cardiac Pacing / Cardiac Society of Republic of Srpska |
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All sources that were used to fill out the questionnaire for the EHRA White Book 2017

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|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association |
|---|

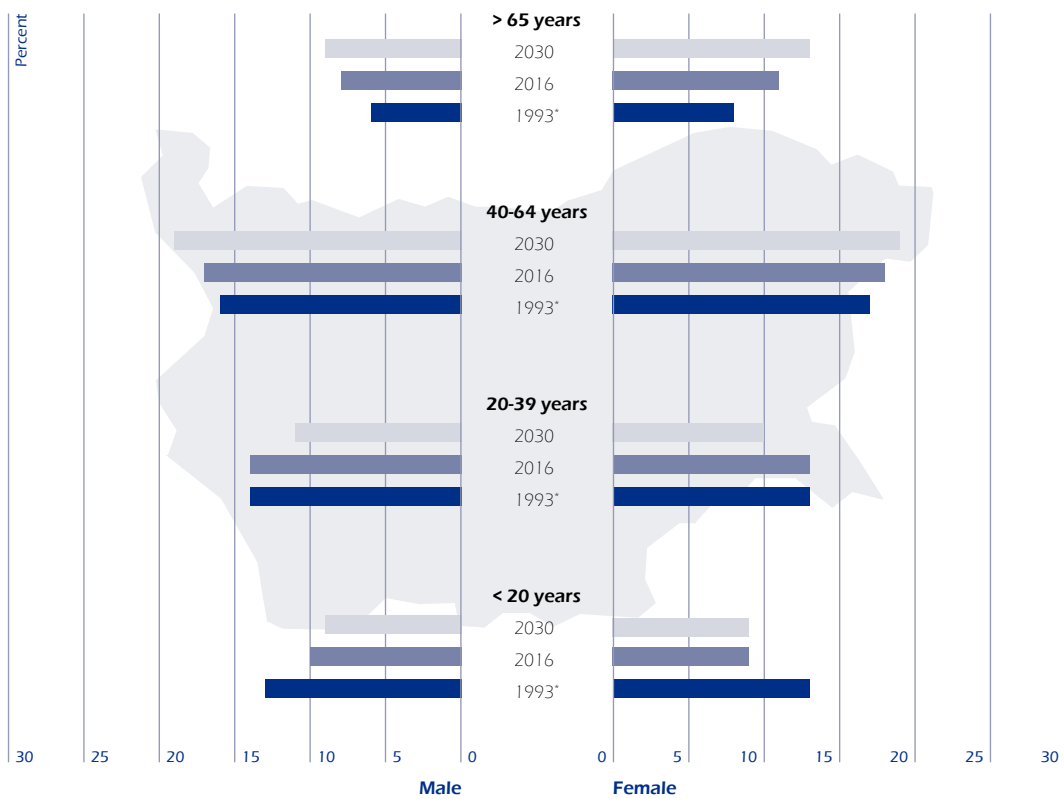


BULGARIA



1. Statistics

Age pyramid for Bulgaria



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	4,8	2014
Beds (per 100.000 population)	713,0	2014
Density of physicians (per 1.000 population)	4,0	2014
Density of nurses (per 1.000 population)	4,8	2014
Demographic information		Year
Population	7.144.653	2016
Population annual growth rate (%)	-0,6	2016
Life expectancy at birth (in years)	75	2016
Death rate (per 1.000 population)	14,4	2013
Live births (per 1.000 population)	9,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	50,45	2016*
Gross domestic product per capita (U.S dollar-units)	7.091,32	2016*
Total expenditure on health as % of GDP	8,4	2014
General government expenditure on health as % of total expenditure on health	54,6	2014
Private expenditure on health as % of total expenditure on health	45,4	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	65%	65,4%

3. Healthcare System

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

Basic insurance availability		Yes							
Requirements for citizens to qualify for public insurance: all citizens qualify for public insurance. Citizens in working age (aged 18 until retirement) are insured if the installments are paid regularly by the employer (for the employed) or by themselves (for the self-employed). Children, minors and the retired are insured by the state.									
Percentage of insured and uninsured citizens									
	2015	2016							
Insured citizens	80%	82,3%							
Uninsured citizens	20%	17,7%							
Distribution of insurance modality									
	2015	2016							
Public insurance company	75%	80,78%							
Private insurance company	1%	not available							
Private co-payment	24%	0,72%							
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 for some complex ablations requiring 3D mapping was necessary occasionally at some private hospitals.									
Reimbursement availability for physicians and hospitals									
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer		
Physician		Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital	
Internal loop recorders		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments: Physician/Hospital: Leadless pacing and subcutaneous ICD are not available in Bulgaria.									



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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
The National Standard for Cardiology	

Required period of training to perform implantations	Yes
	2 years



Suggested period of training to perform implantations	Yes
	2 years
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Responsible person for quality control: There is nobody specifically responsible for quality control in the field of EP and devices.	
Training centres availability	
Pacemaker	4
ICD implantation	4
CRT implantation	4
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	75%
Percentage of academic centres among all practicing implanting devices centres	37%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	19	20
Total Pacemaker units implanted	3.953	3.816
Thereof, Leadless Pacemaker	0	0
First implants	3.269	3.258
Replacements	605	558
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	9	10
Total CRT units implanted	296	371
Thereof, CRT pacemaker	253	325
Thereof, CRT ICD	43	46

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	10	10
Total ICD units implanted	51	73
Thereof, Single chamber	35	48
Thereof, Dual chamber	16	25
Thereof, Subcutaneous ICD	0	0
First implants	36	54
Replacements	15	19

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	2
Total loop recorders implanted	not available	5

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	1
Total lead extraction procedures	not available	14
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	Professional National Registry – “BGPace”
Pacing	Yes	Professional National Registry – “BGPace”
Electrophysiology	Yes	Professional National Registry – “BGEphy”
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		
	2015	2016
Number of ablation centres	5	4
Number of ablations performed	961	1 136
Mean number of ablations per centre	192	284
Number of AF ablations	147	248
Number of ablation centres (> 50 AF ablations)	1	2
Number of VT/VF ablations	6	22
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	not available	2
Number of centres (LAA closures)	not available	1
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	10	10
Number of physicians under training to become independent electrophysiologists	5	6
Availability of a national registry for interventional electrophysiology		Yes
Official name: Professional National Registry "BGEphy"		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

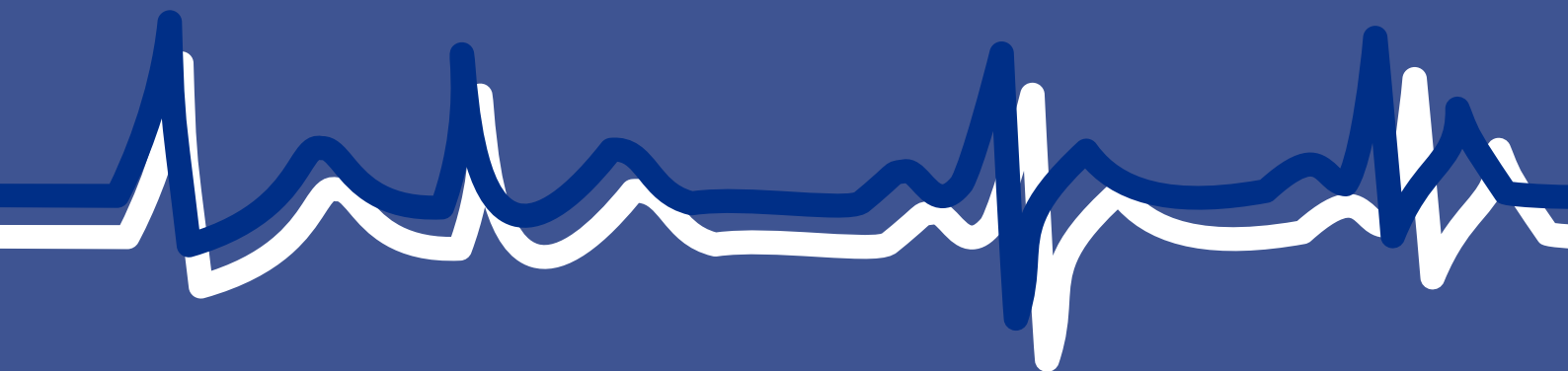
Name of National Cardiac Society, National Working Group or arrhythmia body

- Professional Association of Electrophysiology and Cardiac Pacing

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

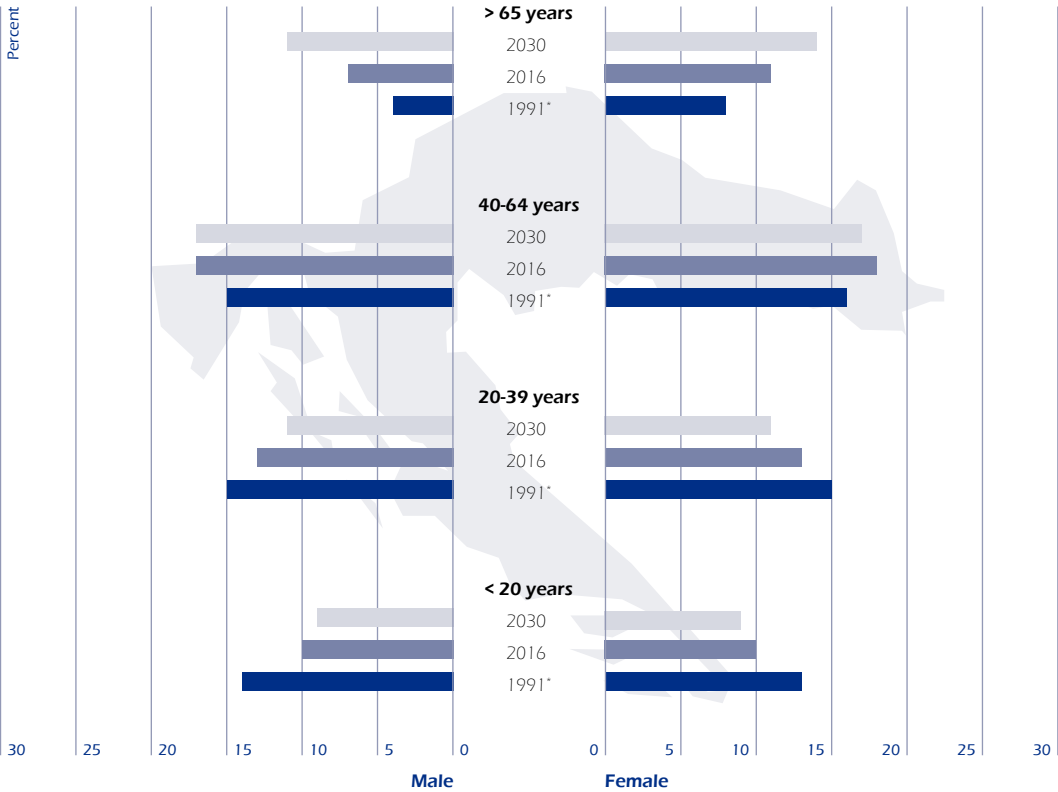
- EHRA White Book 2016
- Ministry of Health - National Center of Public Health and Analyses
- National Statistical Institute
- World Health Organization
- Survey from professional association
- Professional National Registry for Device Implants “BGPace”
- Professional National Registry for EP Studies and Ablations “BGEphy”

CROATIA



1. Statistics

Age pyramid for Croatia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,5	2014
Beds (per 100.000 population)	590,7	2014
Density of physicians (per 1.000 population)	3,1	2014
Density of nurses (per 1.000 population)	6,2	2014
Demographic information		Year
Population	4.313.707	2016
Population annual growth rate (%)	-0,5	2016
Life expectancy at birth (in years)	76	2016
Death rate (per 1.000 population)	12,0	2014
Live births (per 1.000 population)	9,3	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	49,86	2016*
Gross domestic product per capita (U.S dollar-units)	11.858,47	2016*
Total expenditure on health as % of GDP	7,8	2014
General government expenditure on health as % of total expenditure on health	81,9	2014
Private expenditure on health as % of total expenditure on health	18,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	49%	49%

3. Healthcare System

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

Basic insurance availability		Yes						
Requirements for citizens to qualify for public insurance: 0								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	90%	90%						
Uninsured citizens	10%	10%						
Distribution of insurance modality								
	2015	2016						
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/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes <input type="checkbox"/> Cardiologist
ICD or pacemaker implants	Yes <input type="checkbox"/> Cardiologist or Surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No <input type="checkbox"/>
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Required period of training to perform implantations	No <input type="checkbox"/>
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Croatian Cardiac Society, Working Group on Arrhythmias and Cardiac Pacing	
Training centres availability	
Pacemaker	5
ICD implantation	5
CRT implantation	5
Electrophysiological studies and catheter ablation	4
Atrial fibrillation ablation	4
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	50%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	17	17
Total Pacemaker units implanted	2.855	2.740
Thereof, Leadless Pacemaker	not available	0
First implants	2.416	2.324
Replacements	439	416
Specialist performing implants		
Cardiologists	Yes	93%
Surgeons	Yes	7%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	8	11
Total CRT units implanted	261	277
Thereof, CRT pacemaker	125	132
Thereof, CRT ICD	136	145
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	11	14
Total ICD units implanted	388	412
Thereof, Single chamber	344	370
Thereof, Dual chamber	44	42
Thereof, Subcutaneous ICD	0	0
First implants	348	376
Replacements	40	36
Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	6	7
Total loop recorders implanted	24	27
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	5	3
Total lead extraction procedures	49	53
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	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		
	2015	2016
Number of ablation centres	6	6
Number of ablations performed	1.348	1.810
Mean number of ablations per centre	225	302
Number of AF ablations	385	551
Number of ablation centres (> 50 AF ablations)	3	4
Number of VT/VF ablations	40	71
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	3
Number of LAA closures	2	24
Number of centres (LAA closures)	1	2
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	10	10
Number of physicians under training to become independent electrophysiologists	7	10
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	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

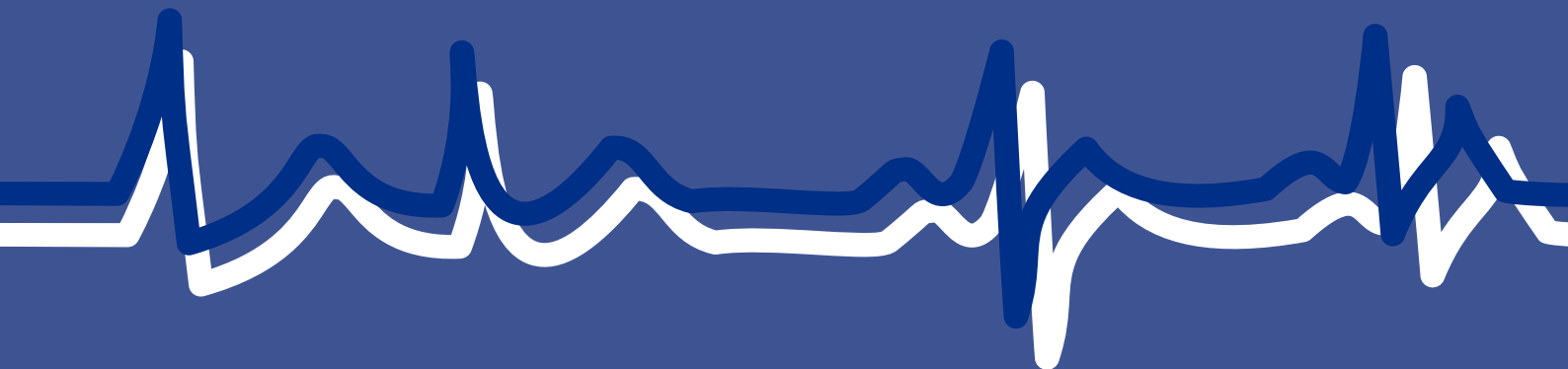
Name of National Cardiac Society, National Working Group or arrhythmia body

- Croatian Cardiac Society
- Working Group on Arrhythmias and Cardiac Pacing

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

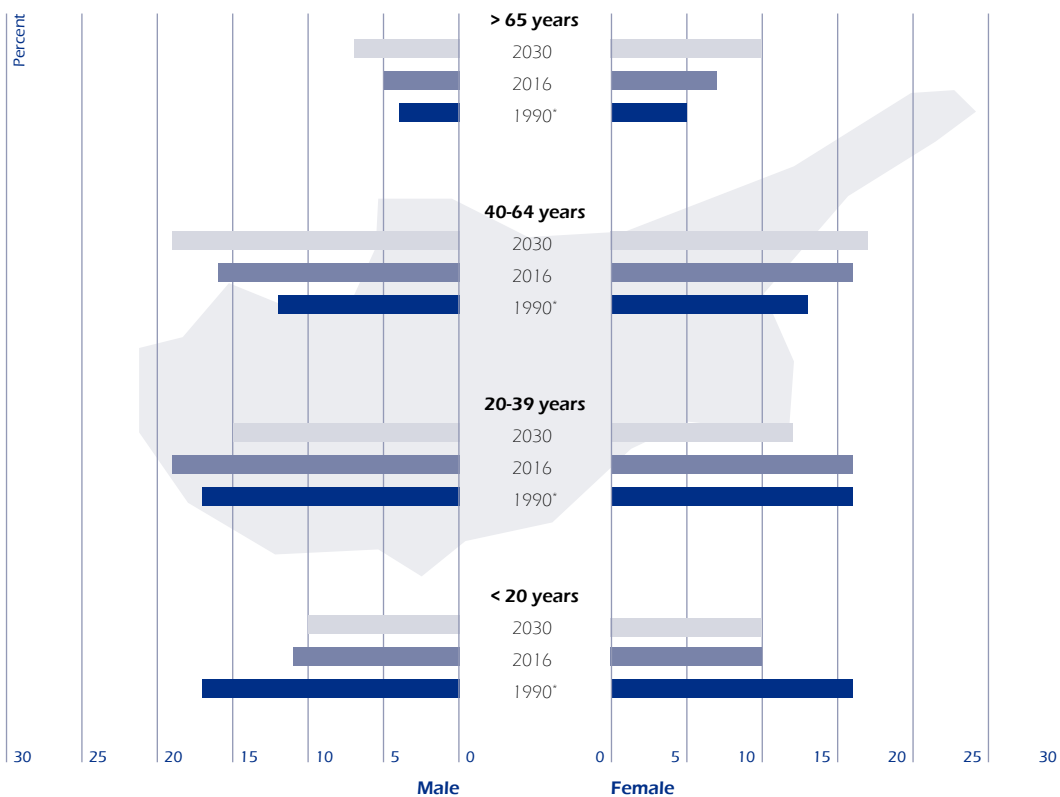
- EHRA White Book 2016
- Official statistics
- Survey from professional association

CYPRUS



1. Statistics

Age pyramid for Cyprus



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	9,9	2014
Beds (per 100.000 population)	341,3	2014
Density of physicians (per 1.000 population)	3,4	2014
Density of nurses (per 1.000 population)	5,3	2014
Demographic information		Year
Population	1.205.575	2016
Population annual growth rate (%)	1,4	2016
Life expectancy at birth (in years)	79	2016
Death rate (per 1.000 population)	6,1	2013
Live births (per 1.000 population)	10,9	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	19,93	2016*
Gross domestic product per capita (U.S dollar-units)	23.424,93	2016*
Total expenditure on health as % of GDP	7,4	2014
General government expenditure on health as % of total expenditure on health	45,2	2014
Private expenditure on health as % of total expenditure on health	54,8	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	30%	30%

3. Healthcare System

Free health service is provided by government hospitals and health centres according to income criteria; in addition all government employees are eligible for free health care.

Basic insurance availability		No						
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	85%	85%						
Uninsured citizens	15%	15%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	85%	85%						
Private insurance company	15%	15%						
Private co-payment	0%	0%						
Possibility to subscribing to private health insurance plans		Yes						
Co-payment necessary for the following therapy								
ICD devices		No						
Pacemakers		No						
Ablation		No						
Comments: free in the public sector only.								
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: Physicians: in state hospitals the funding is directly from the ministry of health; the physicians are paid a flat salary irrespective of numbers of interventions in private medical centres the patient pays from his pocket or by a private health insurance leadless pacing and subcutaneous ICD have not been implanted as yet; Hospitals: The devices and interventions are paid for by the ministry of health in state hospitals ; In private medical centres the payment is either direct from the patient or via a private health insurance.

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	No answer
Responsible for quality control	
Each medical center has their own quality control.	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	1
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	25%
Percentage of academic centres among all practicing implanting devices centres	17%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	5	6
Total Pacemaker units implanted	280	290
Thereof, Leadless Pacemaker	0	0
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	4	4
Total CRT units implanted	30	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		
	2015	2016
Implanting centres	4	5
Total ICD units implanted	75	80
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	0	0
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	5	5
Total loop recorders implanted	15	12
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	2	2
Total lead extraction procedures	4	3
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: due to the short distances and close relationships between patients and doctors remote monitoring is not used.		
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		
	2015	2016
Number of ablation centres	3	4
Number of ablations performed	60	78
Mean number of ablations per centre	20	20
Number of AF ablations	10	22
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	5	6
Number of physicians under training to become independent electrophysiologists	0	0
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

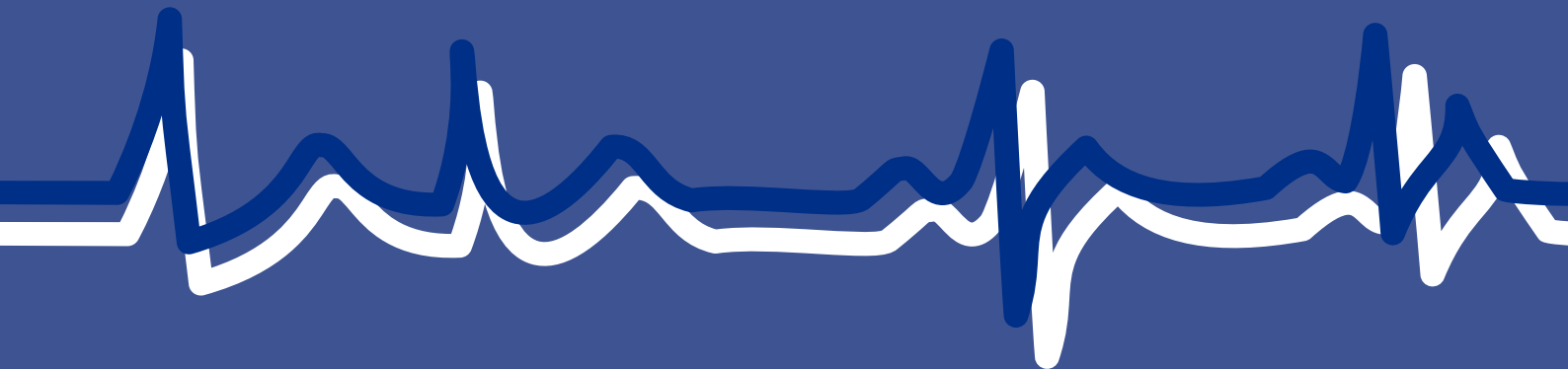
Name of National Cardiac Society, National Working Group or arrhythmia body

- Cyprus Society of Cardiology
- Working Group on Cardiac Arrhythmias Pacing and Electrophysiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

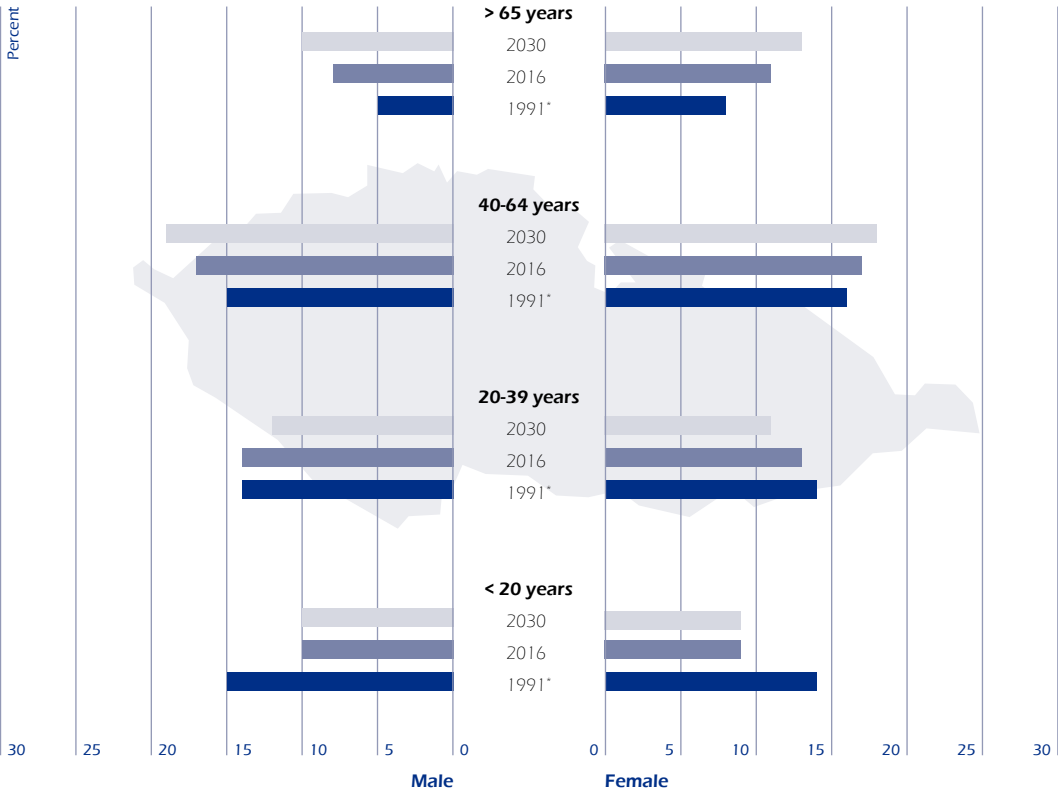
- EHRA White Book 2016
- Official statistics
- Survey from professional association
- Sample short survey
- Estimation
- Other

CZECH REPUBLIC



1. Statistics

Age pyramid for Czech Republic



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,4	2014
Beds (per 100.000 population)	645,5	2014
Density of physicians (per 1.000 population)	3,7	2013
Density of nurses (per 1.000 population)	8,3	2014
Demographic information		Year
Population	10.660.932	2016
Population annual growth rate (%)	0,2	2016
Life expectancy at birth (in years)	79	2016
Death rate (per 1.000 population)	10,0	2014
Live births (per 1.000 population)	10,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	193,54	2016*
Gross domestic product per capita (U.S dollar-units)	18.325,89	2016*
Total expenditure on health as % of GDP	7,4	2014
General government expenditure on health as % of total expenditure on health	84,5	2014
Private expenditure on health as % of total expenditure on health	15,5	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

National Health System

Basic insurance availability		Yes					
Requirements for citizens to qualify for public insurance: Czech citizenship							
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	99,9%	99,9%					
Uninsured citizens	0,1%	0,1%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	99,8%	99%					
Private insurance company	0,1%	1%					
Private co-payment	0,1%	0%					
Possibility to subscribing to private health insurance plans			No				
Co-payment necessary for the following therapy							
ICD devices			No				
Pacemakers			No				
Ablation			No				
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician/Hospital does not receive reimbursement neither incentive	No answer			
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist, licence for EP ablations
ICD or pacemaker implants	Yes Cardiologist, Surgeon, licence for device implantations

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

Required period of training to perform implantations	Yes
--	-----

Suggested period of training to perform implantations	No answer
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
State Institute for Drug Control	
Training centres availability	
Pacemaker	37
ICD implantation	19
CRT implantation	19
Electrophysiological studies and catheter ablation	23
Atrial fibrillation ablation	18
Number of universities (Schools of Medicine)	7
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	37	37
Total Pacemaker units implanted	8.969	9.311
Thereof, Leadless Pacemaker	not available	20
First implants	6.377	6.795
Replacements	2.592	2.516
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	18	19
Total CRT units implanted	1.952	2.093
Thereof, CRT pacemaker	465	450
Thereof, CRT ICD	1.487	1.643
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	18	19
Total ICD units implanted	2.039	2.362
Thereof, Single chamber	1.475	1.682
Thereof, Dual chamber	564	624
Thereof, Subcutaneous ICD	not available	56
First implants	1.627	1.809
Replacements	412	553
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total loop recorders implanted	280	268
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	6	5
Total lead extraction procedures	300	350
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	Czech ICD on line registry
Pacing	Yes	Czech PM on line registry
Electrophysiology	Yes	Czech catheter ablation on line registry
Availability of a national quality insurance system or complication registry		Yes
Official name: State Institute for Drug Control		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	23	23
Number of ablations performed	6.158	6.577
Mean number of ablations per centre	268	286
Number of AF ablations	2.537	2.884
Number of ablation centres (> 50 AF ablations)	12	13
Number of VT/VF ablations	297	299
Number of ablation centres (> 10 VT ablations on structural heart diseases)	7	6
Number of LAA closures	94	144
Number of centres (LAA closures)	7	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		Yes
Official name: Catheter ablation on line registry		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

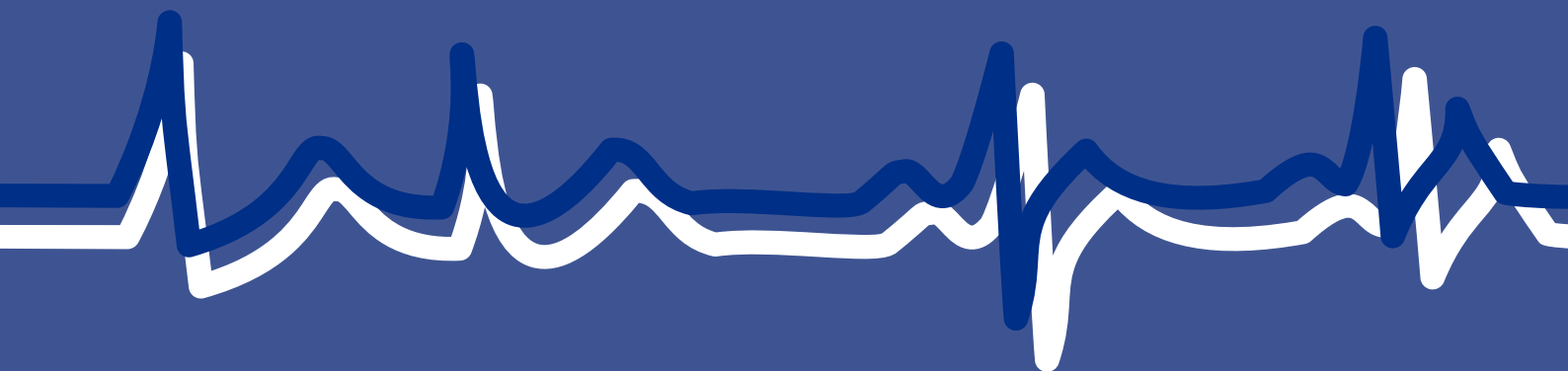
- | |
|--|
| <ul style="list-style-type: none">· Czech Heart Rhythm Association· Czech Society of Cardiology |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|--|
| <ul style="list-style-type: none">· EHRA White Book 2016· Sample short survey· Sales data· Estimation· National registries |
|--|



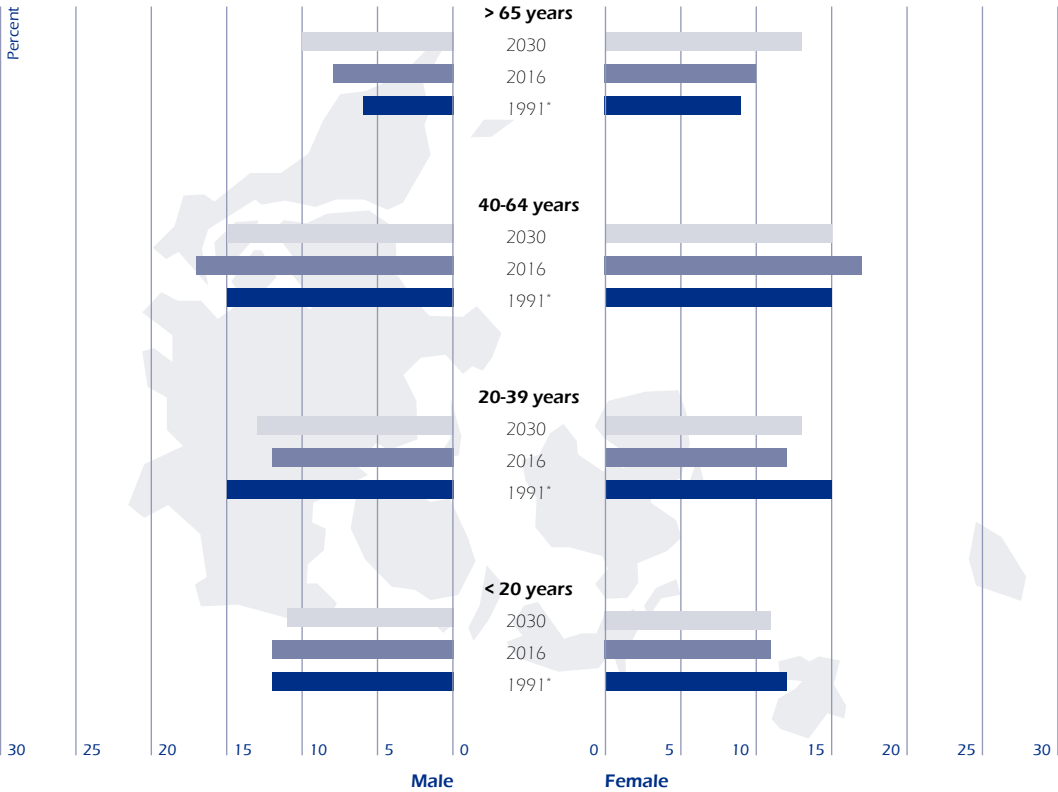
DENMARK





1. Statistics

Age pyramid for Denmark



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	253,2	2015
Density of physicians (per 1.000 population)	3,7	2013
Density of nurses (per 1.000 population)	16,9	2013
Demographic information		Year
Population	5.593.785	2016
Population annual growth rate (%)	0,2	2016
Life expectancy at birth (in years)	79	2016
Death rate (per 1.000 population)	9,3	2012
Live births (per 1.000 population)	10,3	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	302,57	2016*
Gross domestic product per capita (U.S dollar-units)	53.242,91	2016*
Total expenditure on health as % of GDP	10,8	2014
General government expenditure on health as % of total expenditure on health	84,8	2014
Private expenditure on health as % of total expenditure on health	15,2	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	21%	21%



3. Healthcare System

National Health System.

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: none for citizens.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	100%	100%						
Uninsured citizens	0%	0%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	100%	100%						
Private insurance company	0%	0%						
Private co-payment	0%	0%						
Possibility to subscribing to private health insurance plans				Yes				
Co-payment necessary for the following therapy								
ICD devices				No				
Pacemakers				No				
Ablation				No				
Reimbursement availability for physicians and hospitals								
	Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Ablations are done by an electrophysiologist (cardiologist) and in addition surgeons do ablation for atrial fibrillation (PVI) if deemed necessary in conjunction with open heart surgery.
ICD or pacemaker implants	Yes Cardiologists do the implantations. In addition cardiology fellows can do implantation supervised by a 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
	1 year
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
Danish Health Authority	
Training centres availability	
Pacemaker	13
ICD implantation	6
CRT implantation	5
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	6
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	83%
Percentage of academic centres among all practicing implanting devices centres	45%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	15	15
Total Pacemaker units implanted	4.818	4.899
Thereof, Leadless Pacemaker	3	52
First implants	3.805	3.972
Replacements	1.013	927
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	5	5
Total CRT units implanted	985	1.129
Thereof, CRT pacemaker	441	500
Thereof, CRT ICD	544	629
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	6
Total ICD units implanted	1.208	1.262
Thereof, Single chamber	918	996
Thereof, Dual chamber	275	256
Thereof, Subcutaneous ICD	15	10
First implants	887	874
Replacements	321	388
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	13	15
Total loop recorders implanted	not available	900
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	4	4
Total lead extraction procedures	not available	not available
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	Danish pacemaker and ICD registry
Pacing	Yes	Danish pacemaker and ICD registry
Electrophysiology	Yes	Danish Ablation Registry
Availability of a national quality insurance system or complication registry		Yes
Official name: Danish Health Authority. Complications are also registered in the Danish pacemaker and ICD registry and the ablation registry.		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: No state institution but device recalls are handled by the Danish pacemaker and ICD registry.		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	6	6
Number of ablations performed	3.925	4.125
Mean number of ablations per centre	654	688
Number of AF ablations	1.882	1.988
Number of ablation centres (> 50 AF ablations)	6	6
Number of VT/VF ablations	145	156
Number of ablation centres (> 10 VT ablations on structural heart diseases)	5	5
Number of LAA closures	not available	not available
Number of centres (LAA closures)	4	4
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	27	25
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		Yes
Official name: Danish Ablation Registry		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

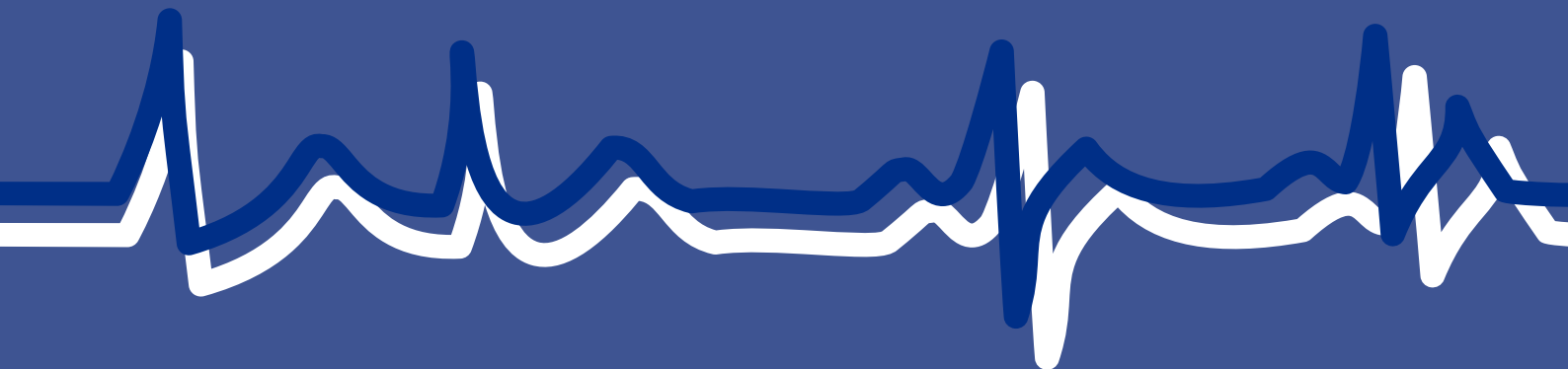
Name of National Cardiac Society, National Working Group or arrhythmia body

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

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

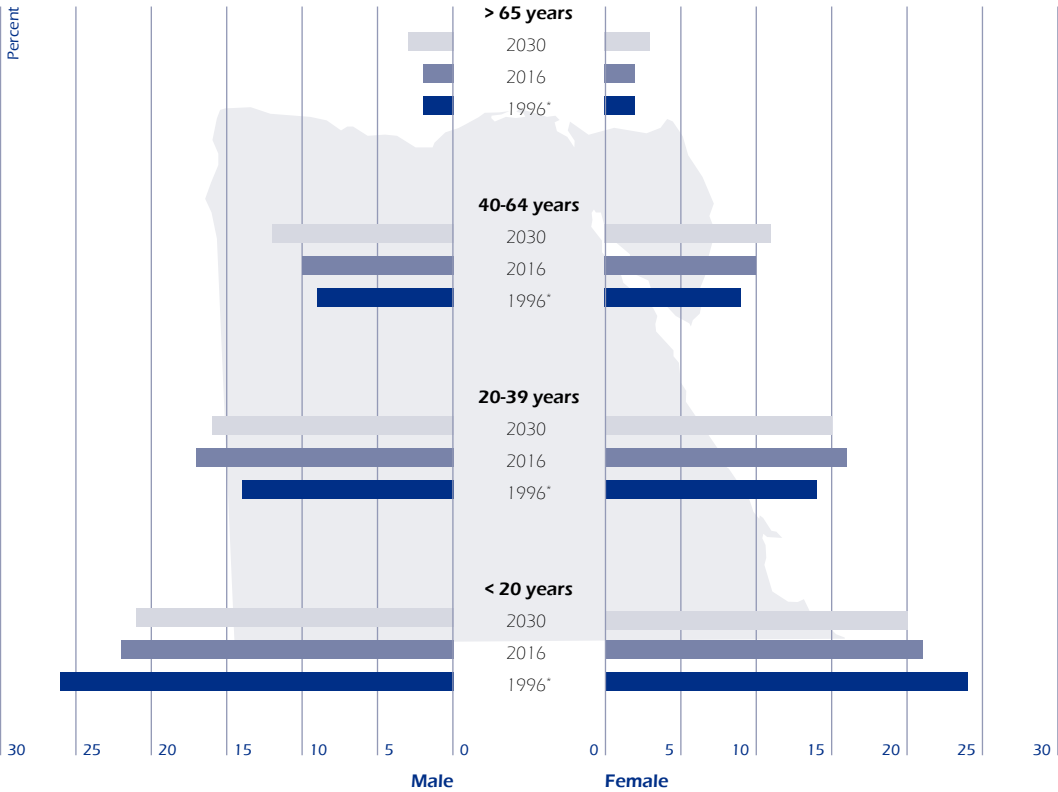
- EHRA White Book 2016
- Official statistics
- Danish Ablation Registry, Danish Pacemaker and ICD Registry

EGYPT



1. Statistics

Age pyramid for Egypt



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available
Demographic information		Year
Population	94.666.993	2016
Population annual growth rate (%)	2,5	2016
Life expectancy at birth (in years)	73	2016
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available
Economic information		Year
Gross domestic product (U.S dollar-billions)	not available	not available
Gross domestic product per capita (U.S dollar-units)	not available	not available
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	not available	not available
Private expenditure on health as % of total expenditure on health	not available	not available

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

- Health care system is divided into several categories:
- a. Governmental sector including ministry of health institutes, university and teaching hospitals
 - b. Health insurance hospitals for the public sector
 - c. military and police hospitals
 - d. Private sector.

Basic insurance availability			No					
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	65%	65%						
Uninsured citizens	35%	35%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	64%	64%						
Private insurance company	1%	1%						
Private co-payment	35%	35%						
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/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: Physicians: though the physician receives reimbursement for the cases supplied by the governmental and the public insurance; it is quite insufficient.; Hospitals: However the hospital reimbursements is quite insufficient.

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

Comments: We follow the ESC guidelines. However, providing the full medical treatment in electrophysiology department is markedly limited by the available budget especially with the citizens not provided by any type of insurance and who cannot afford out of pocket.

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist with special training in ablation procedures. With the exception of one centre -critical care centre- where critical care specialists are allowed and trained to perform EP and device implantation procedures
ICD or pacemaker implants	Yes Cardiologist with special training in ablation procedures. With the exception of one centre -critical care centre- where critical care specialists are allowed and trained to perform EP and device implantation procedures

Official national competency guidelines for electrophysiological studies or catheter ablation	No
---	----

Required period of training to perform implantations	Yes
	3 years
Suggested period of training to perform implantations	Yes
	3 years
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Egyptian cardiac rhythm association together with the people working for the quality system in Egypt.	
Training centres availability	
Pacemaker	28
ICD implantation	13
CRT implantation	13
Electrophysiological studies and catheter ablation	11
Atrial fibrillation ablation	4
Number of universities (Schools of Medicine)	22
Percentage of academic centres among all practicing EP centres	60%
Percentage of academic centres among all practicing implanting devices centres	70%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	33	33
Total Pacemaker units implanted	3.552	4.428
Thereof, Leadless Pacemaker	not available	0
First implants	3.222	4.048
Replacements	330	380
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	No	0%
Other: Critical care physicians cairo university	Yes	30%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	17	0
Total CRT units implanted	545	626
Thereof, CRT pacemaker	429	600
Thereof, CRT ICD	116	26
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	No	0%
Other: Critical care physicians	Yes	30%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	17	not available
Total ICD units implanted	253	278
Thereof, Single chamber	201	170
Thereof, Dual chamber	52	108
Thereof, Subcutaneous ICD	0	0
First implants	224	not available
Replacements	29	not available
Specialist performing implants		
Cardiologists	Yes	80%
Surgeons	No	0%
Other: Critical care physicians	Yes	20%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	0	not available
Total loop recorders implanted	0	4



Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	No	0%
Other: Critical care physicians	Yes	50%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	3	2
Total lead extraction procedures	20	30

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
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11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	15	16
Number of ablations performed	1,448	1,592
Mean number of ablations per centre	97	100
Number of AF ablations	65	168
Number of ablation centres (> 50 AF ablations)	0	3
Number of VT/VF ablations	13	45
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	3
Number of LAA closures	not available	5
Number of centres (LAA closures)	not available	2
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	22	50
Number of physicians under training to become independent electrophysiologists	4	30
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	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

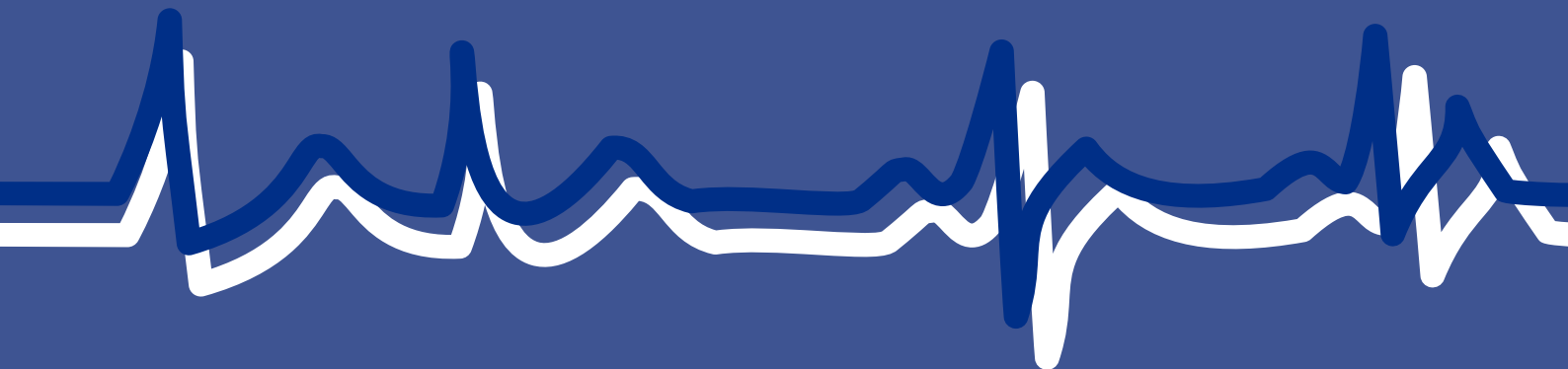
Name of National Cardiac Society, National Working Group or arrhythmia body

- Egyptian Cardiac Rhythm Association (ECRA)

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

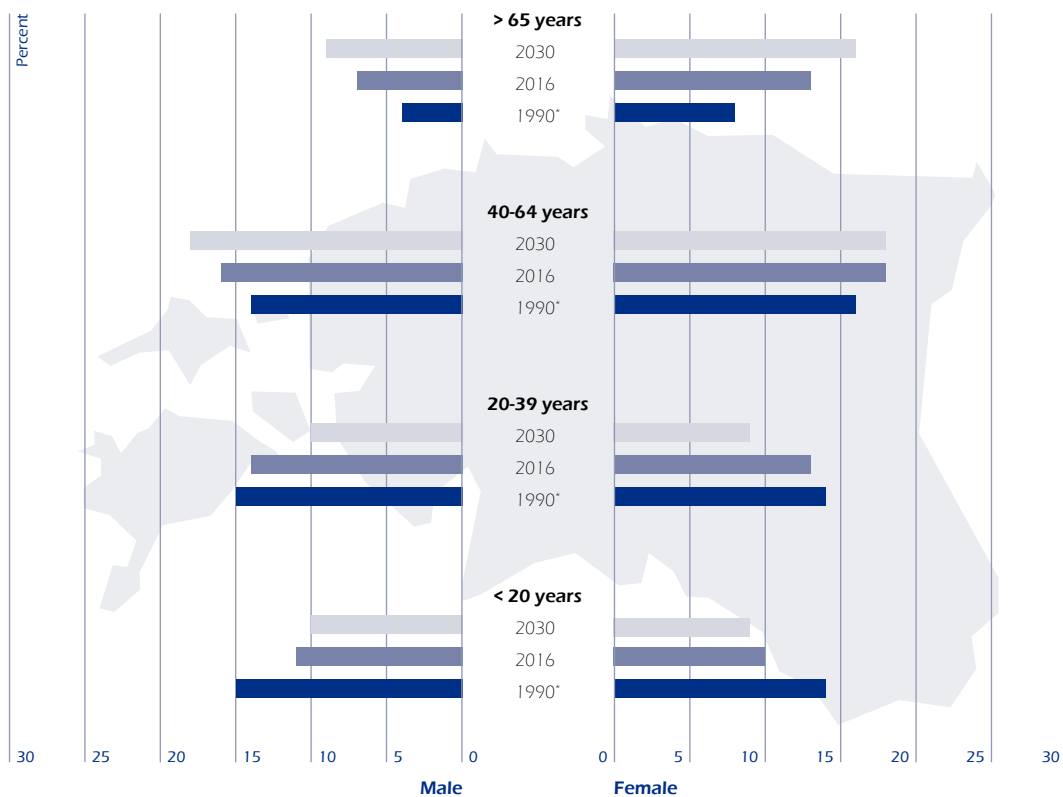
- EHRA White Book 2016
- Official statistics
- Survey from professional association
- Sample short survey
- Sales data
- Estimation

ESTONIA



1. Statistics

Age pyramid for Estonia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,3	2014
Beds (per 100.000 population)	500,9	2014
Density of physicians (per 1.000 population)	3,3	2014
Density of nurses (per 1.000 population)	6,0	2014
Demographic information		Year
Population	1.258.545	2016
Population annual growth rate (%)	-0,5	2016
Life expectancy at birth (in years)	77	2016
Death rate (per 1.000 population)	11,8	2014
Live births (per 1.000 population)	10,3	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	23,48	2016*
Gross domestic product per capita (U.S dollar-units)	17.896,47	2016*
Total expenditure on health as % of GDP	6,4	2014
General government expenditure on health as % of total expenditure on health	78,8	2014
Private expenditure on health as % of total expenditure on health	21,2	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	53,9%



3. Healthcare System

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

Basic insurance availability		Yes
Requirements for citizens to qualify for public insurance: An insured person is a permanent resident of the Republic of Estonia or a person living in Estonia by virtue of a temporary residence permit or by the right of permanent residence, who pays the social tax for himself/herself or for whom the payer of social tax is required to pay social tax. Insured persons are: a person working on the basis of an employment contract; a public servant; a member of the management or supervisory board of a legal entity; a person employed on the basis of a contract under the law of obligations; a person registered at Estonian Unemployment Insurance Fund; a person, who participated in the elimination of the consequences of a nuclear disaster, a conscript, the non-working spouse of a diplomat or a public servant, the curator of a disabled person; a person receiving child care allowance, a dependant spouse, for whom the government pays social tax, a person receiving social allowance. According to the Health Insurance Act persons for whom no social tax is paid are considered as having equal status to the insured person. The persons having equal status are: a pregnant woman, a person under 19 years of age, a person receiving state pension granted in Estonia, an insured person's dependent spouse, who is no more than 5 years away from attaining the age limit for old-age pension, pupils (there are age limits), a student, who is permanent resident.		
Percentage of insured and uninsured citizens		
	2015	2016
Insured citizens	not available	95%
Uninsured citizens	not available	5%
Distribution of insurance modality		
	2015	2016
Public insurance company	not available	not available
Private insurance company	not available	not available
Private co-payment	not available	not available
Possibility to subscribing to private health insurance plans		No answer
Co-payment necessary for the following therapy		
ICD devices		No
Pacemakers		No
Ablation		No

Reimbursement availability for physicians and hospitals

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

Comments: Hospital: Limited budget for ICD/CRT therapy.

Treatment availability

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

4. Education and Quality Control

National certification availability

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

National Cardiac Society supporting EHRA certification system

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



Specialist required for	
	Specialist
Catheter ablation	Yes Electrophysiologist
ICD or pacemaker implants	Yes Cardiologist
Official national competency guidelines for electrophysiological studies or catheter ablation	
	No
Required period of training to perform implantations	
	Yes 100 implantations
Suggested period of training to perform implantations	
	Yes 100 implantations
National quality control system availability	
	No
Willingness to install quality control system	
	No
Responsible for quality control	
In Estonia we have 5 centers and 8 implanters. Responsible are head of department and implanter.	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	
	1
Percentage of academic centres among all practicing EP centres	
	50%
Percentage of academic centres among all practicing implanting devices centres	
	20%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	5	5
Total Pacemaker units implanted	1.085	1.006
Thereof, Leadless Pacemaker	0	0
First implants	954	863
Replacements	131	143
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total CRT units implanted	73	44
Thereof, CRT pacemaker	49	23
Thereof, CRT ICD	24	21
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total ICD units implanted	91	73
Thereof, Single chamber	22	16
Thereof, Dual chamber	69	57
Thereof, Subcutaneous ICD	0	0
First implants	85	55
Replacements	6	18



Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total loop recorders implanted	3	4

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	2
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	No	
Pacing	No	
Electrophysiology	No	



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

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	2	2
Number of ablations performed	426	459
Mean number of ablations per centre	213	230
Number of AF ablations	110	121
Number of ablation centres (> 50 AF ablations)	1	1
Number of VT/VF ablations	13	10
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	0
Number of LAA closures	not available	0
Number of centres (LAA closures)	not available	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	5	4
Number of physicians under training to become independent electrophysiologists	0	0
Availability of a national registry for interventional electrophysiology	No	

12. Guidelines

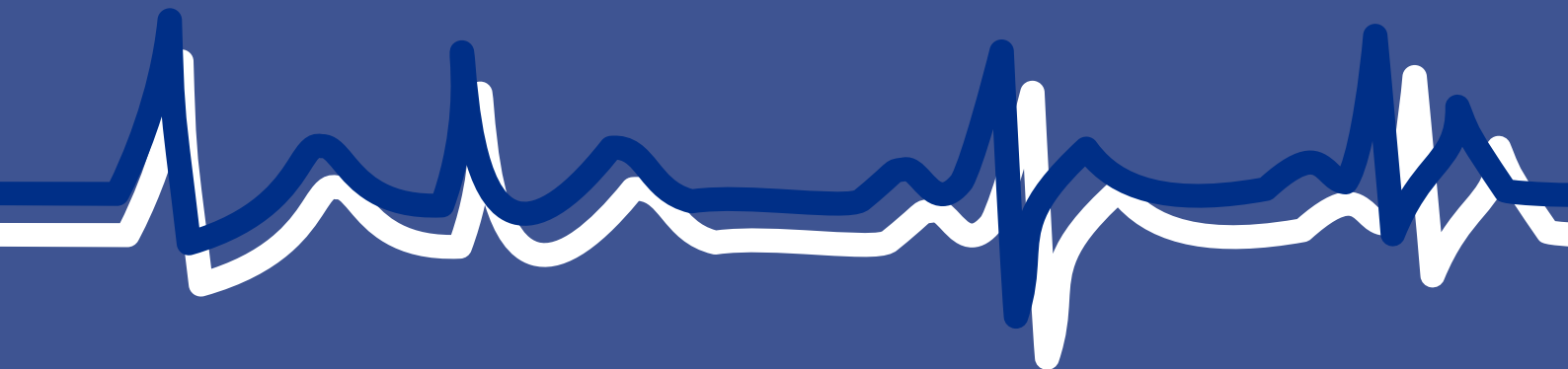
Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1 = no obstacle, 5 = great obstacle						1 = top, 6 = lowest

13. Sources

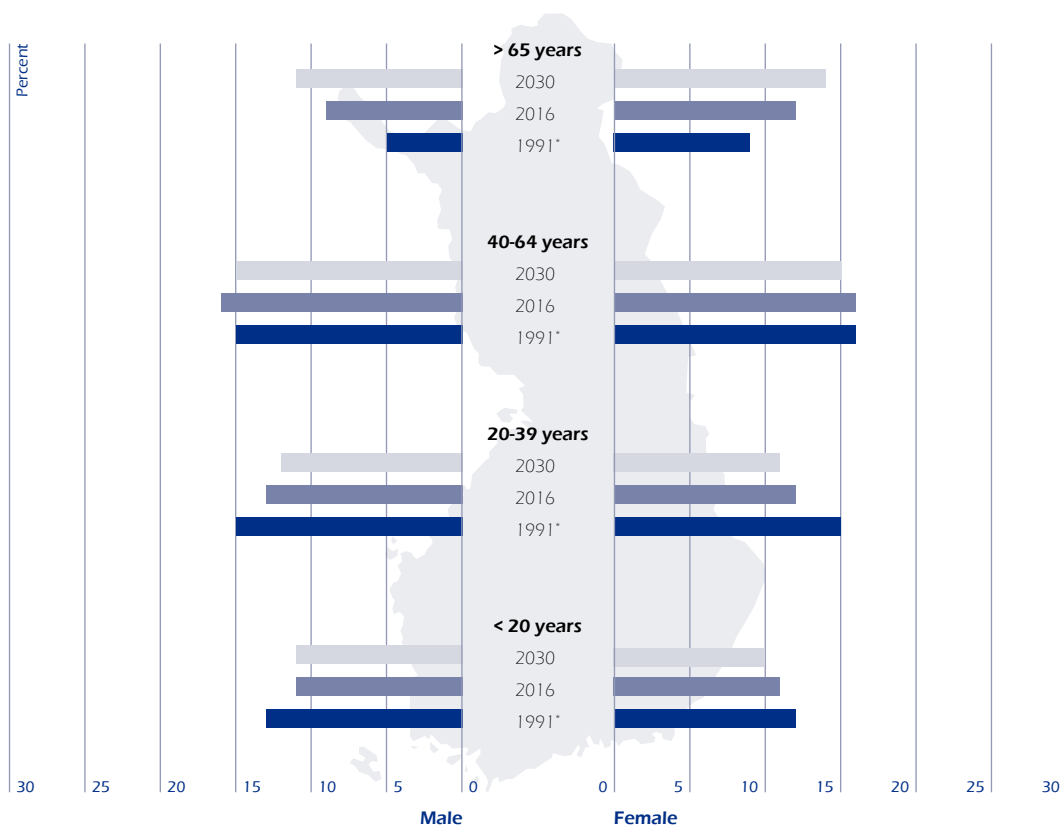
Name of National Cardiac Society, National Working Group or arrhythmia body
· Estonian Society of Cardiology, Working Group of Arrhythmias
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
· EHRA White Book 2016 · Official statistics: The National Institute for Health Development, Estonian Health Insurance Fund · Survey from professional association: Estonian Society of Cardiology

FINLAND



1. Statistics

Age pyramid for Finland



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	4,7	2014
Beds (per 100.000 population)	453,0	2014
Density of physicians (per 1.000 population)	3,0	2013
Density of nurses (per 1.000 population)	14,5	2012
Demographic information		Year
Population	5.498.211	2016
Population annual growth rate (%)	0,4	2016
Life expectancy at birth (in years)	81	2016
Death rate (per 1.000 population)	9,6	2014
Live births (per 1.000 population)	10,5	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	239,19	2016*
Gross domestic product per capita (U.S dollar-units)	43.492,07	2016*
Total expenditure on health as % of GDP	9,7	2014
General government expenditure on health as % of total expenditure on health	75,3	2014
Private expenditure on health as % of total expenditure on health	24,7	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	23%	23%

3. Healthcare System

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

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: Permanent residence in Finland.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	100%	100%						
Uninsured citizens	0%	0%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	75,6%	75,6%						
Private insurance company	3%	3%						
Private co-payment	21,4%	21,4%						
Possibility to subscribing to private health insurance plans				Yes				
Co-payment necessary for the following therapy								
ICD devices				No				
Pacemakers				No				
Ablation				No				
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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



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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
National Supervisory Authority for Welfare and Health	
Training centres availability	
Pacemaker	20
ICD implantation	19
CRT implantation	15
Electrophysiological studies and catheter ablation	9
Atrial fibrillation ablation	8
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	56%
Percentage of academic centres among all practicing implanting devices centres	25%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	20	20
Total Pacemaker units implanted	5.821	6.180
Thereof, Leadless Pacemaker	not available	37
First implants	4.578	4.859
Replacements	1.243	1.321
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	5%
Other: Internal medicine	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	15	15
Total CRT units implanted	527	578
Thereof, CRT pacemaker	184	212
Thereof, CRT ICD	343	366
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	18	19
Total ICD units implanted	1.198	1.303
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	16	23
First implants	887	947
Replacements	311	356
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	19	not available
Total loop recorders implanted	368	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		
	2015	2016
Hospitals performed lead extractions	5	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		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		Yes
Official name: National Supervisory Authority for Welfare and Health (Valvira)		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No answer

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	9	9
Number of ablations performed	2.550	2.957
Mean number of ablations per centre	283	329
Number of AF ablations	926	1.006
Number of ablation centres (> 50 AF ablations)	6	6
Number of VT/VF ablations	162	101
Number of ablation centres (> 10 VT ablations on structural heart diseases)	4	5
Number of LAA closures	123	133
Number of centres (LAA closures)	5	5
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	21	21
Number of physicians under training to become independent electrophysiologists	7	7
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

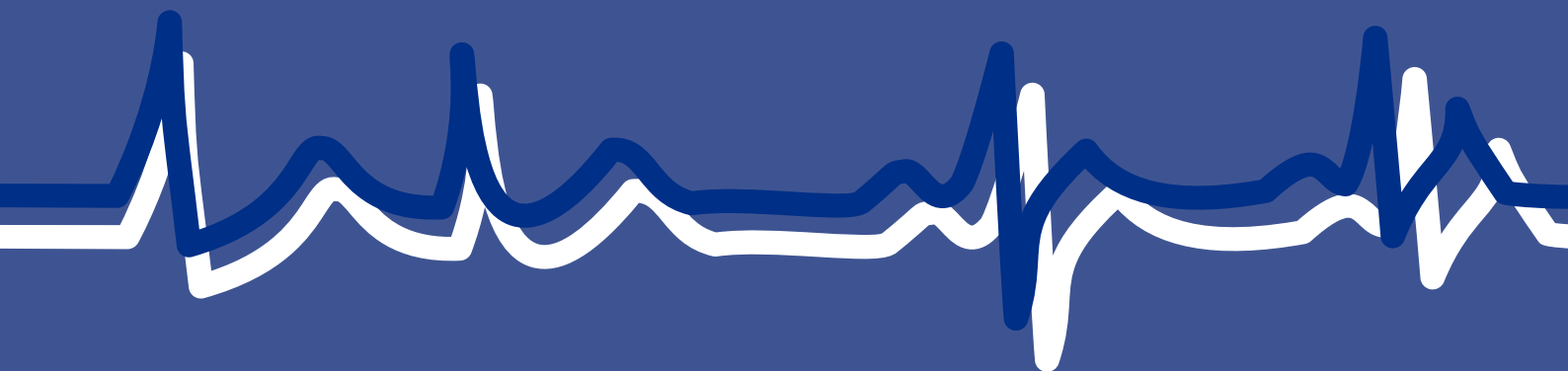
Name of National Cardiac Society, National Working Group or arrhythmia body

- | |
|--|
| <ul style="list-style-type: none">· The Finnish Cardiac Society· Working Group for Arrhythmias and Pacing |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

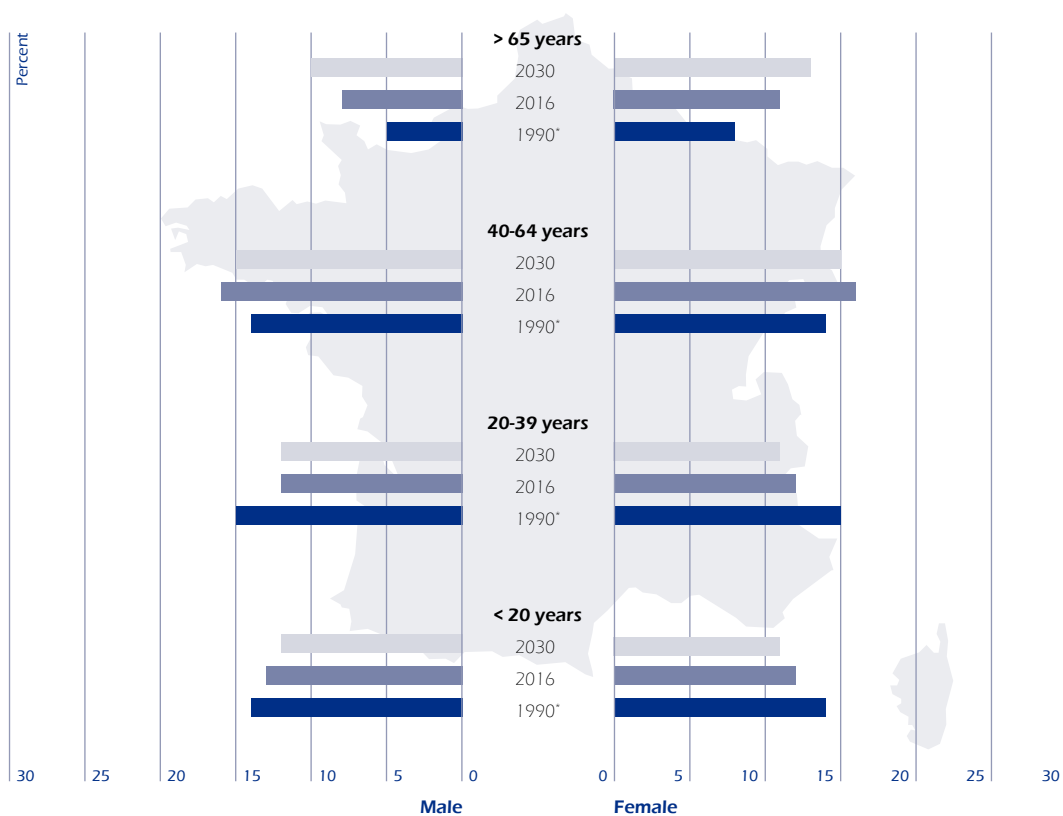
- | |
|--|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association· Estimation |
|--|

FRANCE



1. Statistics

Age pyramid for France



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	4,9	2014
Beds (per 100.000 population)	640,9	2014
Density of physicians (per 1.000 population)	3,2	2015
Density of nurses (per 1.000 population)	10,6	2015
Demographic information		Year
Population	66.836.154	2016
Population annual growth rate (%)	0,4	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	8,7	2013
Live births (per 1.000 population)	12,2	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	2.488,28	2016*
Gross domestic product per capita (U.S dollar-units)	38.536,71	2016*
Total expenditure on health as % of GDP	11,5	2014
General government expenditure on health as % of total expenditure on health	78,2	2014
Private expenditure on health as % of total expenditure on health	21,8	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	22,6%	not available

3. Healthcare System

French National Health System is called the „Sécurité sociale“ Each French Citizen is covered by the Health system.

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: None except being a French citizen.								
Percentage of insured and uninsured citizens								
	2015		2016					
Insured citizens	100%		100%					
Uninsured citizens	0%		0%					
Distribution of insurance modality								
	2015		2016					
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								
No								
Co-payment necessary for the following therapy								
ICD devices								
Pacemakers								
Ablation								
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

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

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

Required period of training to perform implantations	Yes
	2 years

Suggested period of training to perform implantations	Yes
	2 years
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
The HAS (Haute Autorité de Santé) agency	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	47
Percentage of academic centres among all practicing EP centres	55%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	453	453
Total Pacemaker units implanted	63.946	69.042
Thereof, Leadless Pacemaker	124	100
First implants	not available	45.100
Replacements	not available	13.942
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	174	180
Total CRT units implanted	10.432	10.732
Thereof, CRT pacemaker	3.888	4.046
Thereof, CRT ICD	6.544	6.686
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	161	164
Total ICD units implanted	7.825	8.174
Thereof, Single chamber	not available	3.756
Thereof, Dual chamber	not available	3.598
Thereof, Subcutaneous ICD	not available	820
First implants	not available	6.539
Replacements	not available	1.635
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	310
Total loop recorders implanted	3.600	4.300
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	30	40
Total lead extraction procedures	3.000	2.800
Specialist performing lead extractions		
Cardiologists	Yes	95%
Surgeons	Yes	5%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		Yes
Official name: 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		
	2015	2016
Number of ablation centres	196	135
Number of ablations performed	43.414	38.855
Mean number of ablations per centre	222	288
Number of AF ablations	13.890	16.116
Number of ablation centres (> 50 AF ablations)	57	72
Number of VT/VF ablations	741	1.103
Number of ablation centres (> 10 VT ablations on structural heart diseases)	23	50*
Number of LAA closures	700	900
Number of centres (LAA closures)	47	56

* approximately

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

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

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

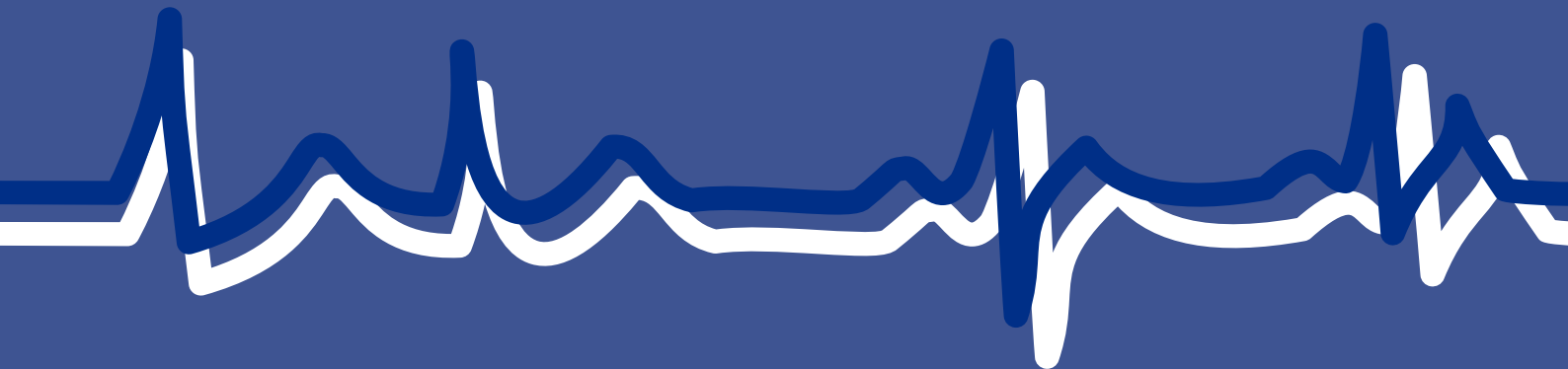
Name of National Cardiac Society, National Working Group or arrhythmia body

- | |
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| <ul style="list-style-type: none">· 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 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association· Sample short survey· Sales data· Estimation |
|---|

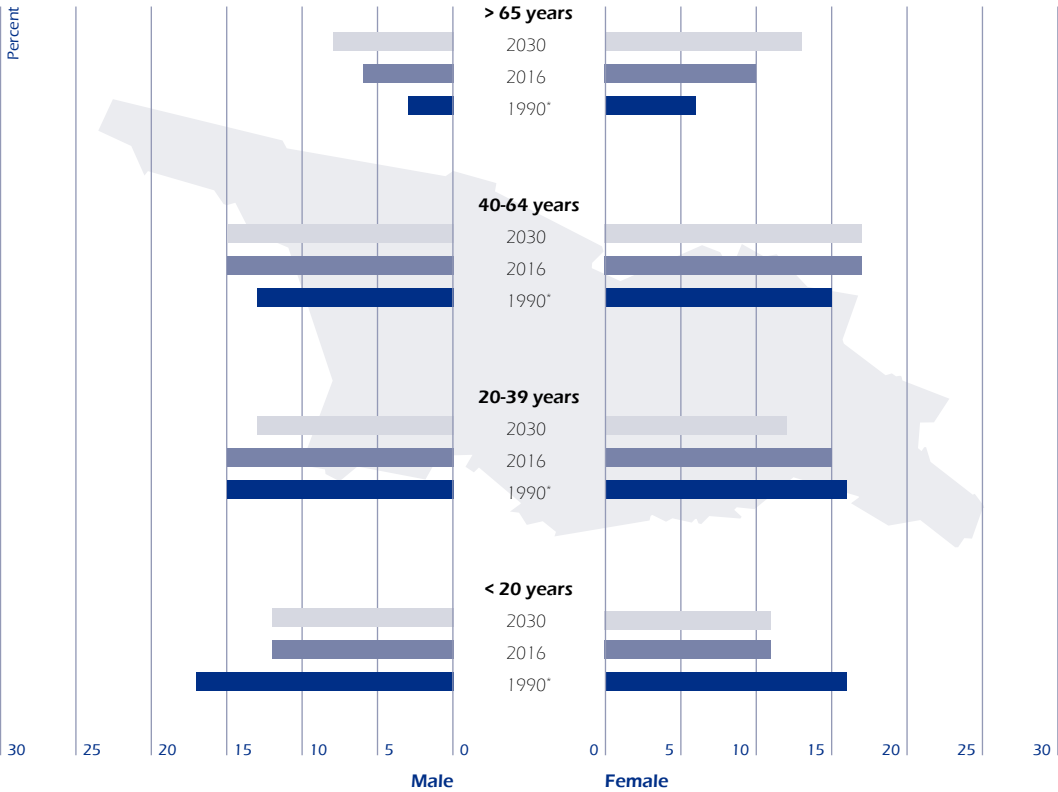
GEORGIA REPUBLIC OF





1. Statistics

Age pyramid for Georgia Republic of



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	7,0	2014
Beds (per 100.000 population)	313,3	2014
Density of physicians (per 1.000 population)	5,2	2014
Density of nurses (per 1.000 population)	4,1	2014

Demographic information		Year
Population	4.928.052	2016
Population annual growth rate (%)	-0,1	2016
Life expectancy at birth (in years)	76	2016
Death rate (per 1.000 population)	13,2	2014
Live births (per 1.000 population)	16,3	2014

Economic information		Year
Gross domestic product (U.S dollar-billions)	14,46	2016*
Gross domestic product per capita (U.S dollar-units)	3.907,60	2016*
Total expenditure on health as % of GDP	7,4	2014
General government expenditure on health as % of total expenditure on health	20,9	2014
Private expenditure on health as % of total expenditure on health	79,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available



3. Healthcare System

National health system and private insurance.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: Not be privately insured.

Percentage of insured and uninsured citizens	2015	2016
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Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality	2015	2016
------------------------------------	------	------

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	Yes
--	-----

ICD devices	Yes
Pacemakers	Yes
Ablation	Yes

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

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



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

4. Education and Quality Control

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

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

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

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	15	15
Total Pacemaker units implanted	817	849
Thereof, Leadless Pacemaker	not available	0
First implants	not available	789
Replacements	not available	60
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	10	10
Total CRT units implanted	62	112
Thereof, CRT pacemaker	10	13
Thereof, CRT ICD	52	99
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	12	12
Total ICD units implanted	140	182
Thereof, Single chamber	118	135
Thereof, Dual chamber	22	46
Thereof, Subcutaneous ICD	0	1
First implants	135	172
Replacements	5	10

Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
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		
	2015	2016
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	4

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	
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		
	2015	2016
Number of ablation centres	8	8
Number of ablations performed	403	464
Mean number of ablations per centre	50	58
Number of AF ablations	64	63
Number of ablation centres (> 50 AF ablations)	0	3
Number of VT/VF ablations	not available	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	0
Number of LAA closures	not available	0
Number of centres (LAA closures)	not available	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	8	8
Number of physicians under training to become independent electrophysiologists	not available	2
Availability of a national registry for interventional electrophysiology	No	

12. Guidelines

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



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

1 = no obstacle, 5 = great obstacle

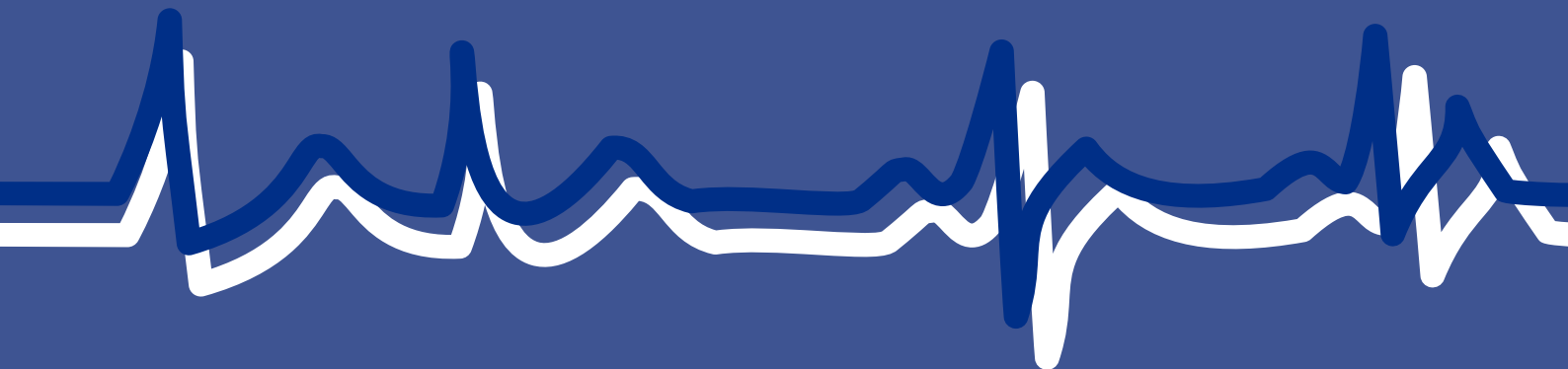
1 = top, 6 = lowest

Other obstacles to guideline implementation
Lack of reimbursement is the major obstacle. Cardiac electrophysiology procedures such as ICD, CRT implants or catheter ablations are not reimbursed at all for most of the patients. For unexplained reasons these procedures are not covered at all by national health system except for specific groups such as elderly or persons living in poverty.

13. Sources

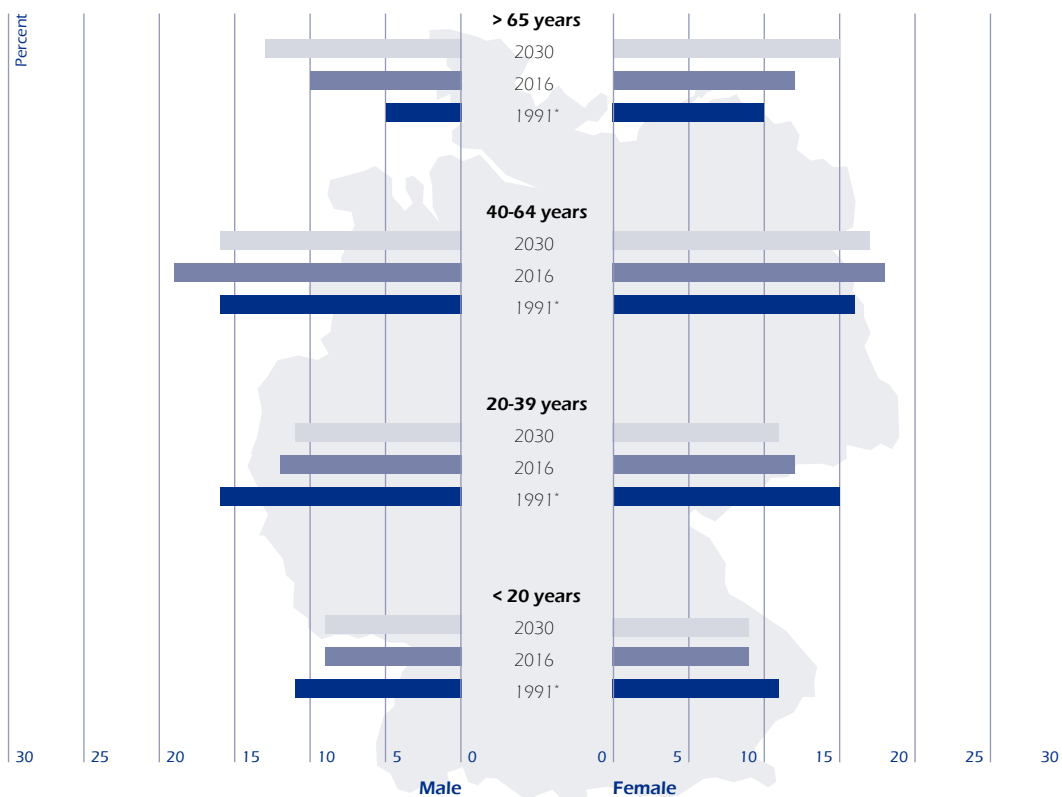
Name of National Cardiac Society, National Working Group or arrhythmia body
· Georgian Heart Rhythm Association
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
· EHRA White Book 2016 · Official statistics · Survey from professional association

GERMANY



1. Statistics

Age pyramid for Germany



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	3,9	2014
Beds (per 100.000 population)	822,8	2014
Density of physicians (per 1.000 population)	4,1	2014
Density of nurses (per 1.000 population)	13,4	2014
Demographic information		Year
Population	80.722.792	2016
Population annual growth rate (%)	-0,2	2016
Life expectancy at birth (in years)	81	2016
Death rate (per 1.000 population)	10,7	2014
Live births (per 1.000 population)	8,8	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	3'494,90	2016*
Gross domestic product per capita (U.S dollar-units)	42.326,03	2016*
Total expenditure on health as % of GDP	11,3	2014
General government expenditure on health as % of total expenditure on health	77,0	2014
Private expenditure on health as % of total expenditure on health	23,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	44,7%	39%

3. Healthcare System

National Health System and private insurance companies may apply for some but General health insurance for all citizens.

Basic insurance availability		Yes					
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	99%	99%					
Uninsured citizens	1%	1%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	87%	87%					
Private insurance company	13%	11%					
Private co-payment	not available	2%					
Possibility to subscribing to private health insurance plans		Yes					
Co-payment necessary for the following therapy							
ICD devices		No					
Pacemakers		No					
Ablation		No					
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curriculum Device Therapy certified by German Cardiac Society
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curriculum Catheter Ablation certified by German Cardiac Society
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curriculum Electrophysiology/Device Therapy of the German Cardiac Society

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Curriculum Device Therapy certified by German Cardiac Society	

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



Suggested period of training to perform implantations	Yes
Curriculum Device Therapy certified by German Cardiac Society	
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	No
CRT implantation	No
Catheter ablation	No
Responsible for quality control	
For Device therapy official Institute but not for interventional EP	
Training centres availability	
Pacemaker	137
ICD implantation	137
CRT implantation	137
Electrophysiological studies and catheter ablation	109
Atrial fibrillation ablation	109
Number of universities (Schools of Medicine)	37
Percentage of academic centres among all practicing EP centres	20%
Percentage of academic centres among all practicing implanting devices centres	10%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	1.135	1.200
Total Pacemaker units implanted	106.700	110.100
Thereof, Leadless Pacemaker	not available	not available
First implants	81.092	82.000
Replacements	25.608	28.100
Specialist performing implants		
Cardiologists	Yes	68%
Surgeons	Yes	20%
Other: Internal medicine	Yes	12%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	250	750
Total CRT units implanted	21.139	21.550
Thereof, CRT pacemaker	3.305	3.700
Thereof, CRT ICD	17.834	17.850
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	745	780
Total ICD units implanted	28.914	27.000
Thereof, Single chamber	18.241	17.000
Thereof, Dual chamber	10.673	10.000
Thereof, Subcutaneous ICD	0	not available
First implants	18.805	18.000
Replacements	10.109	9.000
Specialist performing implants		
Cardiologists	Yes	67%
Surgeons	Yes	21%
Other: Internal medicine	Yes	12%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	843	900
Total loop recorders implanted	16.900	20.000
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available
Other: Neurologist, internal medicine	Yes	not available



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	126	126
Total lead extraction procedures	2.357	2.451
Specialist performing lead extractions		
Cardiologists	Yes	18%
Surgeons	Yes	82%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	Yes	German Pacemaker Registry
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		Yes
Official name: Only for Pacemaker Implants, not for interventional EP		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: Bfarm		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	346	293
Number of ablations performed	63.790	80.661
Mean number of ablations per centre	184	275
Number of AF ablations	33.628	40.884
Number of ablation centres (> 50 AF ablations)	156	190
Number of VT/VF ablations	6.686	9.500
Number of ablation centres (> 10 VT ablations on structural heart diseases)	138	186
Number of LAA closures	4.428	5.100
Number of centres (LAA closures)	212	235
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

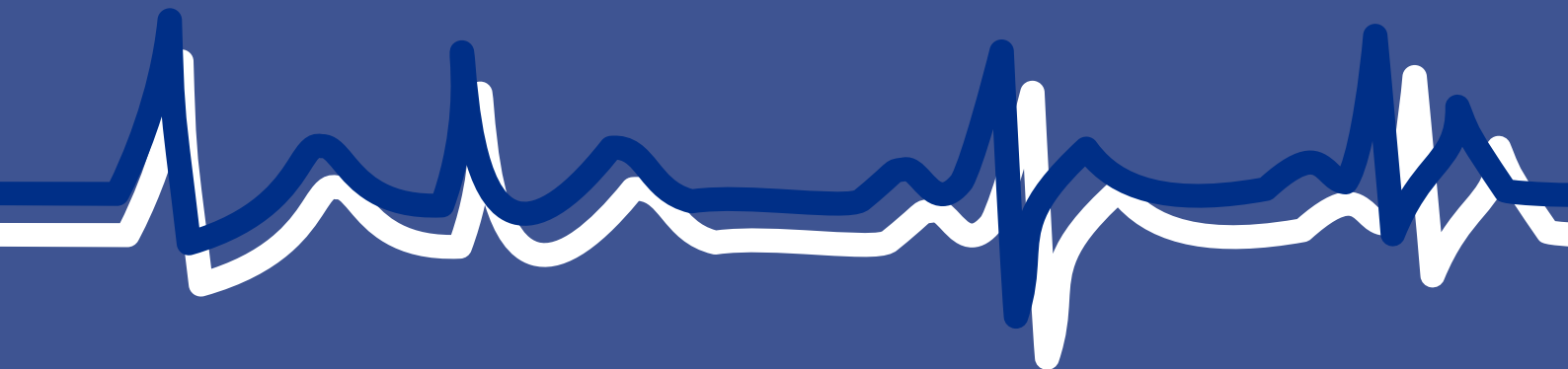
Name of National Cardiac Society, National Working Group or arrhythmia body

- Working Group on Arrhythmias
- German Cardiac Society

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

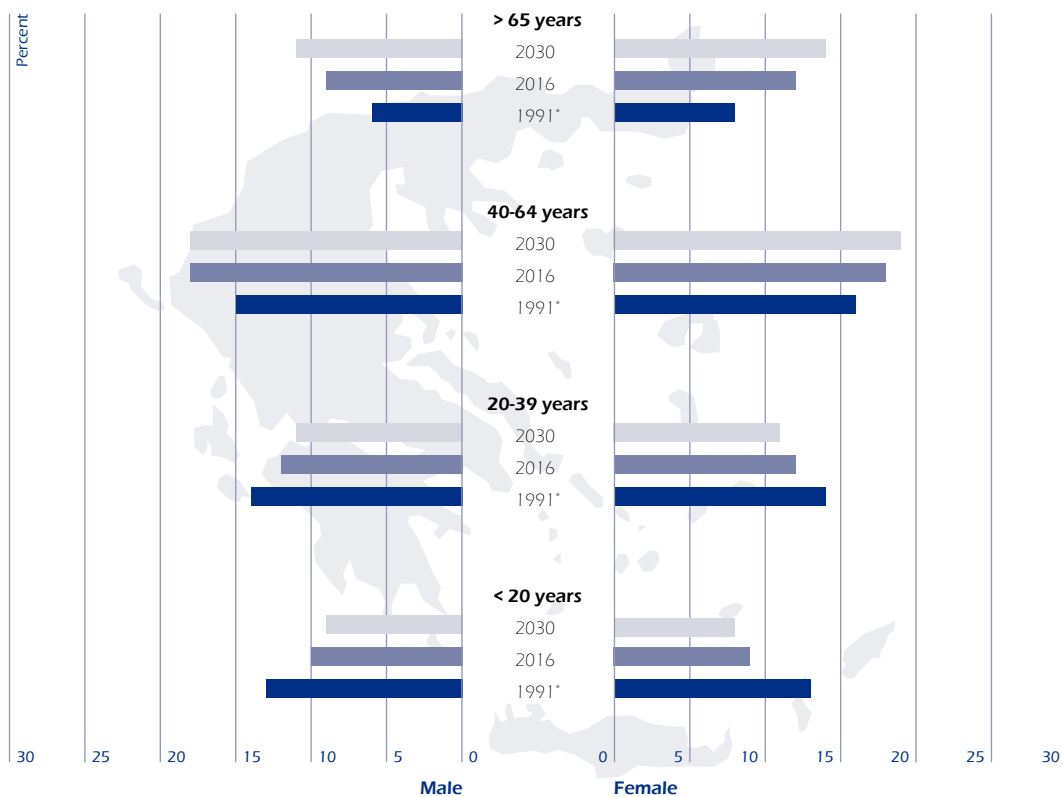
- EHRA White Book 2016
- Official statistics
- Survey from professional association
- Sales data
- Estimation

GREECE



1. Statistics

Age pyramid for Greece



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,6	2014
Beds (per 100.000 population)	419,6	2014
Density of physicians (per 1.000 population)	6,3	2014
Density of nurses (per 1.000 population)	3,4	2014
Demographic information		Year
Population	10.773.253	2016
Population annual growth rate (%)	0,0	2016
Life expectancy at birth (in years)	81	2016
Death rate (per 1.000 population)	10,5	2012
Live births (per 1.000 population)	8,6	2013
Economic information		Year
Gross domestic product (U.S dollar-billions)	195,88	2016*
Gross domestic product per capita (U.S dollar-units)	18.077,64	2016*
Total expenditure on health as % of GDP	8,1	2014
General government expenditure on health as % of total expenditure on health	61,7	2014
Private expenditure on health as % of total expenditure on health	38,3	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

Coexistence of National Healthcare system, 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.

Basic insurance availability		Yes						
Requirements for citizens to qualify for public insurance:: Employment.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	75%	70%						
Uninsured citizens	25%	30%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	90%	85%						
Private insurance company	10%	10%						
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					
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

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

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

Suggested period of training to perform implantations	Yes
	1 year
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Ministry of Health	
Training centres availability	
Pacemaker	17
ICD implantation	8
CRT implantation	8
Electrophysiological studies and catheter ablation	8
Atrial fibrillation ablation	8
Number of universities (Schools of Medicine)	7
Percentage of academic centres among all practicing EP centres	25%
Percentage of academic centres among all practicing implanting devices centres	12%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	56	56
Total Pacemaker units implanted	8.800	9.400
Thereof, Leadless Pacemaker	0	30
First implants	6.490	6.985
Replacements	2.310	2.415
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	16	16
Total CRT units implanted	726	750
Thereof, CRT pacemaker	88	650
Thereof, CRT ICD	638	100
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	24	24
Total ICD units implanted	1.188	1.685
Thereof, Single chamber	275	350
Thereof, Dual chamber	913	1.300
Thereof, Subcutaneous ICD	0	35
First implants	899	1.250
Replacements	289	435
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	16	16
Total loop recorders implanted	165	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		
	2015	2016
Hospitals performed lead extractions	4	5
Total lead extraction procedures	55	70
Specialist performing lead extractions		
Cardiologists	Yes	90%
Surgeons	Yes	10%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Cost		
National registry for		
	Official name	
ICD	Yes	Working Group of Electrophysiology and Pacing of Hellenic Society of Cardiology Registry
Pacing	Yes	Working Group of Electrophysiology and Pacing of Hellenic Society of Cardiology Registry
Electrophysiology	Yes	Working Group of Electrophysiology and Pacing of Hellenic Society of Cardiology Registry
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		
	2015	2016
Number of ablation centres	29	29
Number of ablations performed	1.710	1.950
Mean number of ablations per centre	59	67
Number of AF ablations	650	780
Number of ablation centres (> 50 AF ablations)	6	6
Number of VT/VF ablations	185	220
Number of ablation centres (> 10 VT ablations on structural heart diseases)	6	6
Number of LAA closures	8	not available
Number of centres (LAA closures)	2	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	76	80
Number of physicians under training to become independent electrophysiologists	8	15
Availability of a national registry for interventional electrophysiology		Yes
Official name: Working Group of Electrophysiology and Pacing of Hellenic Society of Cardiology Registry		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

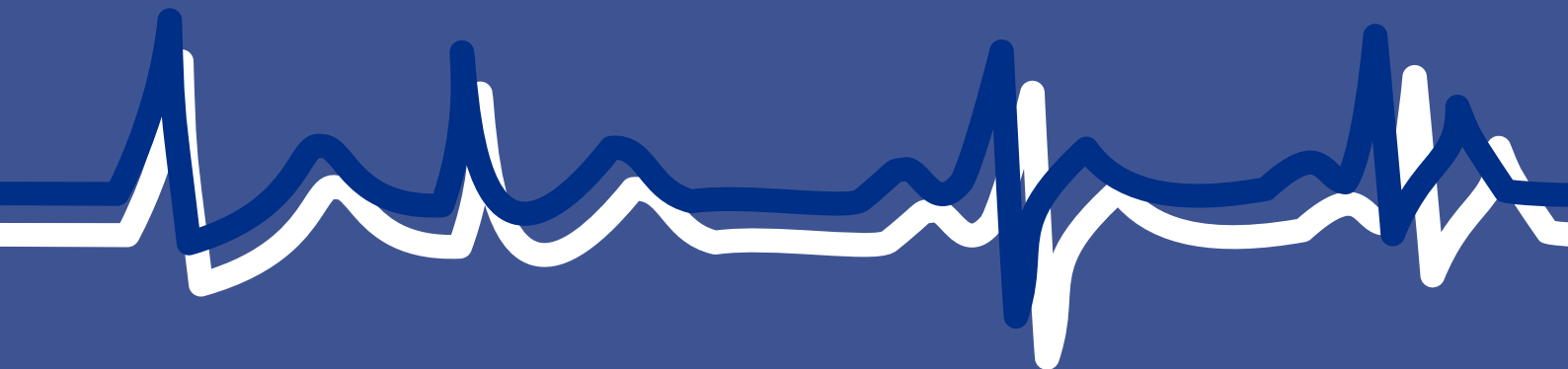
Name of National Cardiac Society, National Working Group or arrhythmia body

- Hellenic Society of Cardiology
- Working Group of Electrophysiology and Pacing

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- EHRA White Book 2016
- Survey from professional association
- Sample short survey
- Sales data
- Estimation

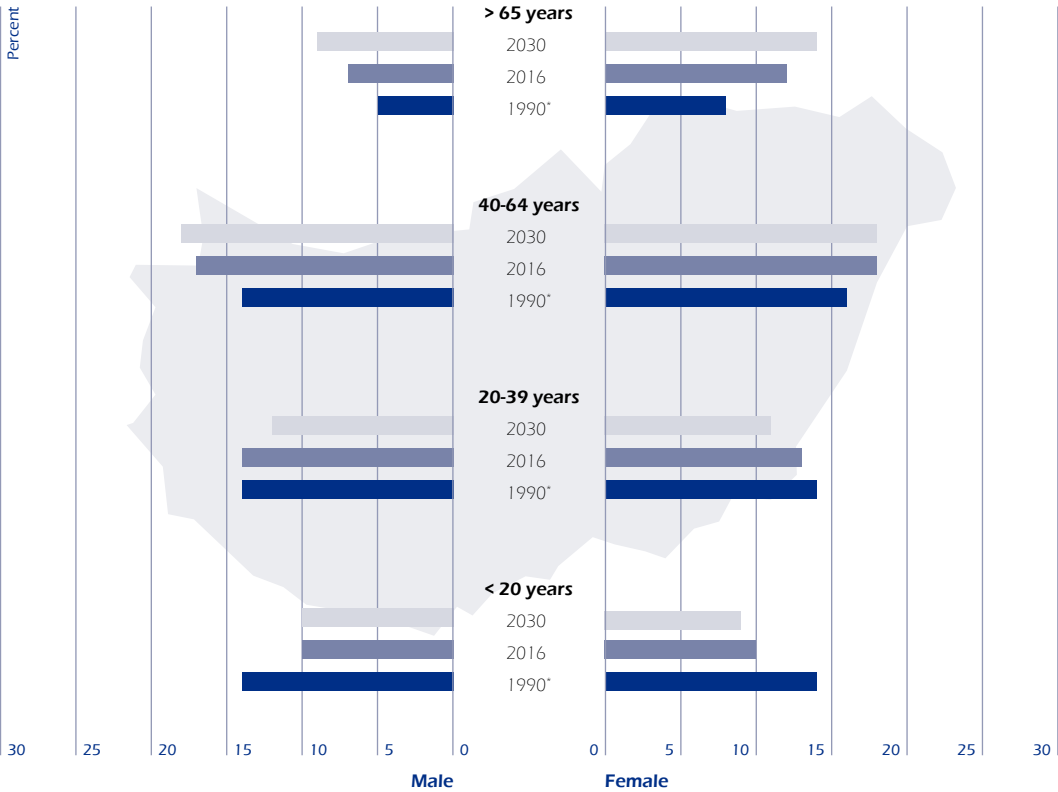
HUNGARY





1. Statistics

Age pyramid for Hungary



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,8	2014
Beds (per 100.000 population)	698,4	2014
Density of physicians (per 1.000 population)	3,3	2014
Density of nurses (per 1.000 population)	6,6	2014
Demographic information		Year
Population	9.874.784	2016
Population annual growth rate (%)	-0,2	2016
Life expectancy at birth (in years)	76	2016
Death rate (per 1.000 population)	12,8	2014
Live births (per 1.000 population)	9,3	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	117,07	2016*
Gross domestic product per capita (U.S dollar-units)	11.902,79	2016*
Total expenditure on health as % of GDP	7,4	2014
General government expenditure on health as % of total expenditure on health	66,0	2014
Private expenditure on health as % of total expenditure on health	34,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	46%	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 for citizens to qualify for public insurance: Age under 18 or retired; or valid job contract; or regular payment of the insurance fee.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	98%	99%						
Uninsured citizens	2%	1%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	99%	99%						
Private insurance company	1%	1%						
Private co-payment	0%	0%						
Possibility to subscribing to private health insurance plans		Yes						
Co-payment necessary for the following therapy								
ICD devices		No						
Pacemakers		No						
Ablation		No						
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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

4. Education and Quality Control

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

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

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

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
National quality control system availability	No
Willingness to install quality control system	No answer
Training centres availability	
Pacemaker	6
ICD implantation	6
CRT implantation	6
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	6
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	36%
Percentage of academic centres among all practicing implanting devices centres	22%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	18	18
Total Pacemaker units implanted	6.432	6.424
Thereof, Leadless Pacemaker	24	3
First implants	4.893	4.746
Replacements	1.539	1.678
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	14	14
Total CRT units implanted	1.091	1.107
Thereof, CRT pacemaker	496	471
Thereof, CRT ICD	595	636
Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	13	13
Total ICD units implanted	986	958
Thereof, Single chamber	689	627
Thereof, Dual chamber	294	326
Thereof, Subcutaneous ICD	3	5
First implants	835	825
Replacements	151	133
Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	12	12
Total loop recorders implanted	169	160
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	8	8
Total lead extraction procedures	105	145
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	Yes	Hungarian Online Pacemaker Registry
Pacing	Yes	Hungarian Online Pacemaker Registry
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		Yes
Official name: Hungarian Online Pacemaker Registry and individual paper based data collection from centers.		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: National Health Insurance Fund		



11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	11	11
Number of ablations performed	3.723	3.769
Mean number of ablations per centre	338	343
Number of AF ablations	1.204	1.236
Number of ablation centres (> 50 AF ablations)	7	7
Number of VT/VF ablations	87	88
Number of ablation centres (> 10 VT ablations on structural heart diseases)	3	4
Number of LAA closures	33	27
Number of centres (LAA closures)	5	4
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	25	25
Number of physicians under training to become independent electrophysiologists	not available	15
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

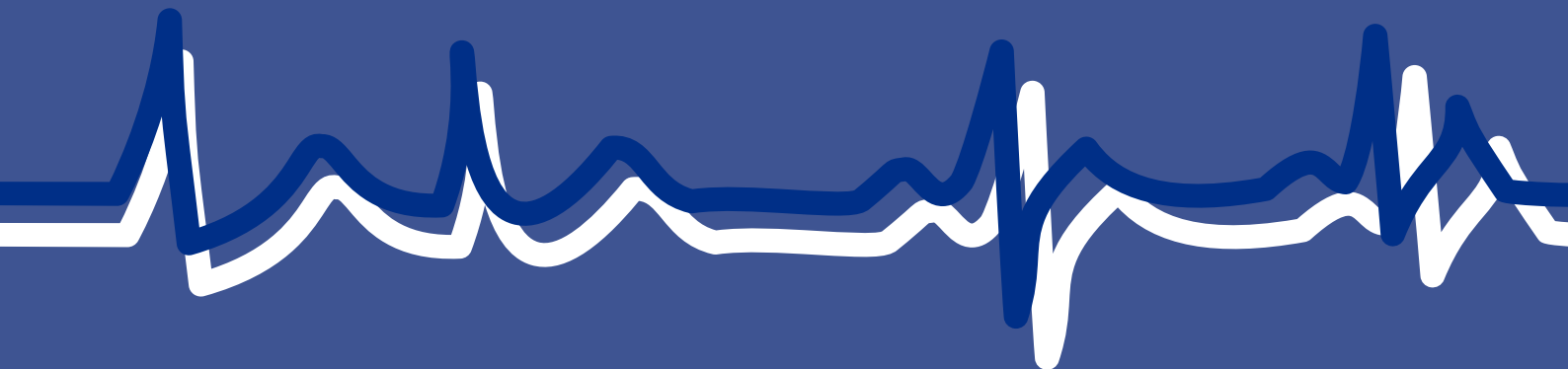
Name of National Cardiac Society, National Working Group or arrhythmia body

- 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 2017

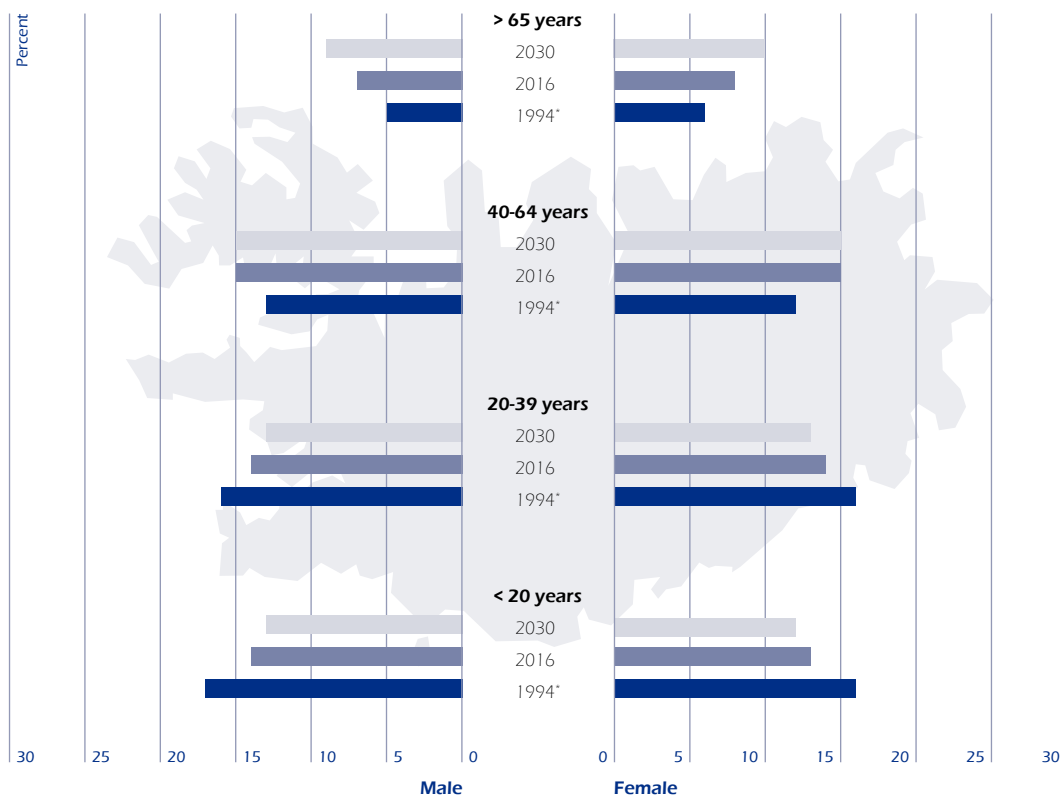
- EHRA White Book 2016
- National Health Insurance Fund
- Working Group on Cardiac Arrhythmias and Pacing, Hungarian Society of Cardiology

ICELAND



1. Statistics

Age pyramid for Iceland



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,4	2015
Beds (per 100.000 population)	314,1	2015
Density of physicians (per 1.000 population)	3,8	2015
Density of nurses (per 1.000 population)	16,3	2015
Demographic information		Year
Population	335.878	2016
Population annual growth rate (%)	1,2	2016
Life expectancy at birth (in years)	83	2016
Death rate (per 1.000 population)	6,3	2009
Live births (per 1.000 population)	13,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	19,44	2016*
Gross domestic product per capita (U.S dollar-units)	57.888,65	2016*
Total expenditure on health as % of GDP	8,9	2014
General government expenditure on health as % of total expenditure on health	81,0	2014
Private expenditure on health as % of total expenditure on health	19,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	36%	36%

3. Healthcare System

All citizens are insured by the government. Patients may be charged some minimal co-payment.

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: None.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	100%	100%						
Uninsured citizens	0%	0%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	100%	100%						
Private insurance company	0%	0%						
Private co-payment	0%	0%						
Possibility to subscribing to private health insurance plans			No					
Co-payment necessary for the following therapy								
ICD devices			No					
Pacemakers			No					
Ablation			No					
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for		
	Specialist	
Catheter ablation	Yes	Specialist in electrophysiology
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	No
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
The University Hospital/Surgeon General	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	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		
	2015	2016
Implanting centres	2	2
Total Pacemaker units implanted	308	322
Thereof, Leadless Pacemaker	0	8
First implants	263	250
Replacements	45	72
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total CRT units implanted	21	19
Thereof, CRT pacemaker	13	11
Thereof, CRT ICD	8	8
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total ICD units implanted	59	50
Thereof, Single chamber	25	23
Thereof, Dual chamber	34	27
Thereof, Subcutaneous ICD	0	0
First implants	40	29
Replacements	19	21
Specialist performing implants		
Cardiologists	Yes	60%
Surgeons	Yes	40%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total loop recorders implanted	14	11
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	0	0
Total lead extraction procedures	0	0
Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	No	0%
Comments: None done 2016		

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		
	2015	2016
Number of ablation centres	1	1
Number of ablations performed	78	173
Mean number of ablations per centre	78	173
Number of AF ablations	36	45
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	5	7
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	3	2
Number of physicians under training to become independent electrophysiologists	0	0
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

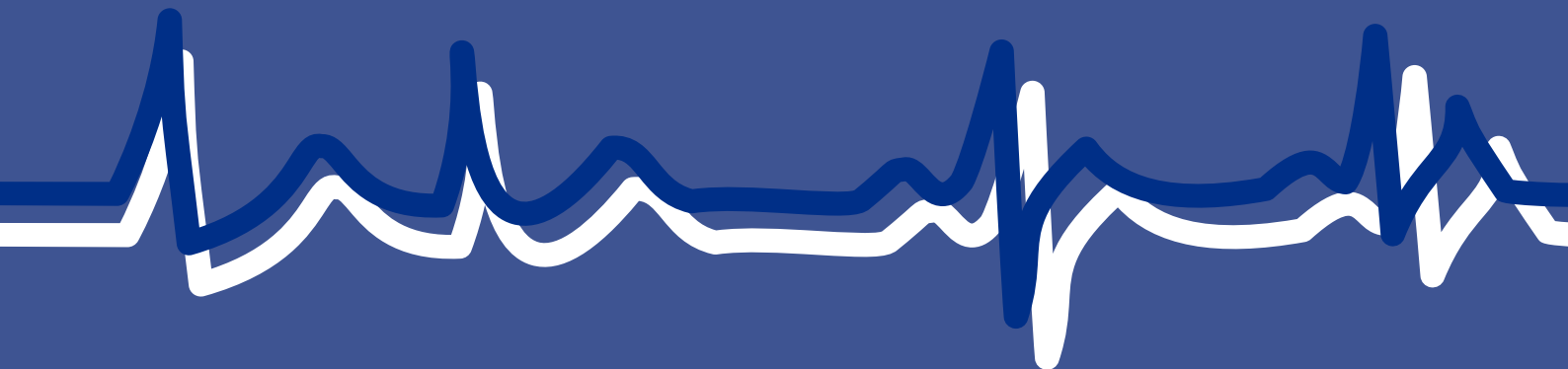
Name of National Cardiac Society, National Working Group or arrhythmia body

- Icelandic Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

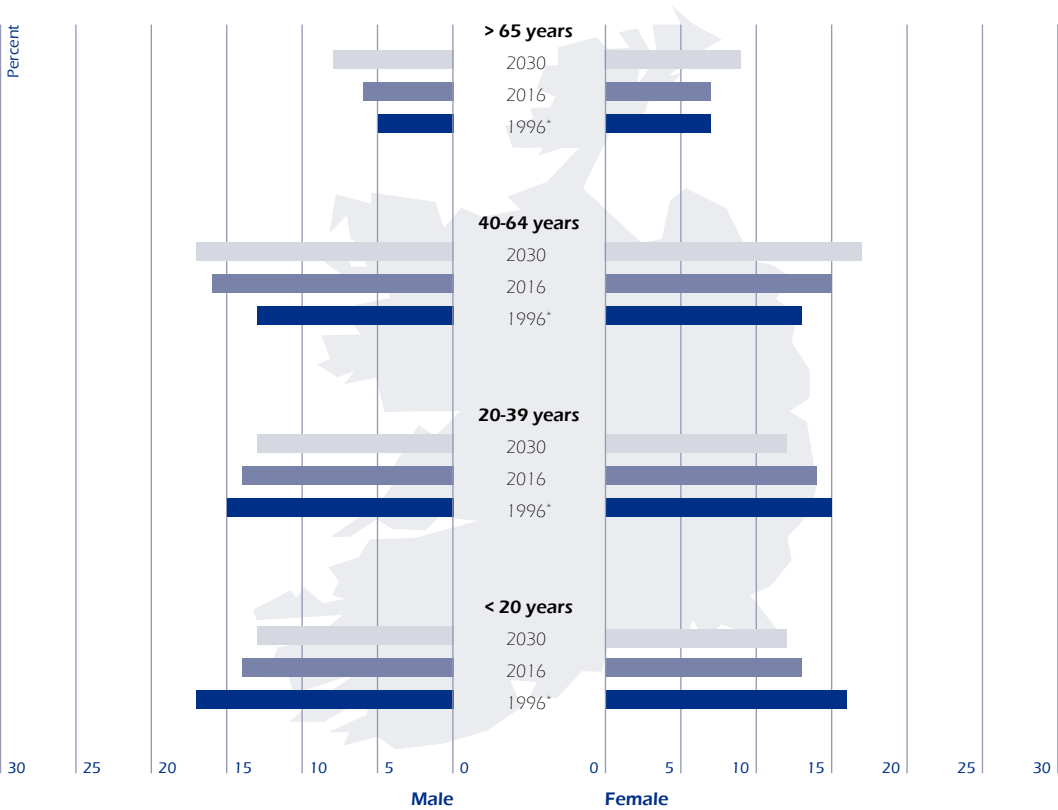
- EHRA White Book 2016
- Official statistics
- Estimation

IRELAND



1. Statistics

Age pyramid for Ireland



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,1	2012
Beds (per 100.000 population)	260,1	2014
Density of physicians (per 1.000 population)	2,8	2015
Density of nurses (per 1.000 population)	12,6	2011
Demographic information		Year
Population	4.952.473	2016
Population annual growth rate (%)	1,2	2016
Life expectancy at birth (in years)	81	2016
Death rate (per 1.000 population)	6,4	2013
Live births (per 1.000 population)	14,6	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	307,92	2016*
Gross domestic product per capita (U.S dollar-units)	65.870,83	2016*
Total expenditure on health as % of GDP	7,8	2014
General government expenditure on health as % of total expenditure on health	66,1	2014
Private expenditure on health as % of total expenditure on health	33,9	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	0,19%	not available

3. Healthcare System

National Health Service Executive. 100% public health insurance coverage at public hospitals available to all citizens in addition to an optional supplemental private insurance - over 40% of the population have additional private insurance for treatment at private hospitals.

Basic insurance availability		Yes					
Requirements for citizens to qualify for public insurance: National or EU citizenship.							
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	100%	100%					
Uninsured citizens	0%	0%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	100%	54%					
Private insurance company	46%	46%					
Private co-payment	46%	0%					
Possibility to subscribing to private health insurance plans		Yes					
Co-payment necessary for the following therapy							
ICD devices		No					
Pacemakers		No					
Ablation		No					
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: Physician: The above answers of physician reimbursement apply to the public health service. In the private hospitals for patients with private insurance, the physician is reimbursed for all approved device implants (this does not yet include leadless pacing in the private system which is included in the public service).; Hospital: „the above answers of hospital reimbursement apply to the public hospitals. Each public hospital budget (from the Health Service Executive) which is fixed for the year does not reimburse per procedures / implant but is based on estimates in advance and budget considerations. In the private hospitals for patients with private insurance, the hospital is reimbursed by private insurance companies for all approved device implants (this does not yet include leadless pacing in the private system which is included in the public service).



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

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HRS exam
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EP fellowship (majority of EP docs in Ireland trained in the US)
Allied professionals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HRS exams
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiac Electrophysiologist who has completed EP fellowship in the US (majority) or other international program
ICD or pacemaker implants	Yes Cardiologist (majority of ICD and PPM now implanted by cardiologists who are cardiac electrophysiologists)

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	Yes
All cardiologists in Ireland will have completed a six year training program (SpR) (including a period at a subspecialty international training program e.g. in the US).	

Suggested period of training to perform implantations	Yes
All cardiologists in Ireland will have completed a six year training program (SpR) (including a period at a subspecialty international training program e.g. in the US).	
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Royal College of Physicians of Ireland (RCPI) and HIOA	
Training centres availability	
Pacemaker	10
ICD implantation	10
CRT implantation	10
Electrophysiological studies and catheter ablation	6
Atrial fibrillation ablation	6
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	75%
Percentage of academic centres among all practicing implanting devices centres	75%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	17	17
Total Pacemaker units implanted	2,277	2,290
Thereof, Leadless Pacemaker	not available	4
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	17	17
Total CRT units implanted	319	330
Thereof, CRT pacemaker	88	90
Thereof, CRT ICD	231	240
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	17	17
Total ICD units implanted	740	761
Thereof, Single chamber	403	420
Thereof, Dual chamber	337	340
Thereof, Subcutaneous ICD	not available	1
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		
	2015	2016
Implanting centres	17	17
Total loop recorders implanted	760	800
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	2	4
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	Yes	40%
Surgeons	Yes	60%

10. Device specific

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

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	12	12
Number of ablations performed	not available	2.300
Mean number of ablations per centre	not available	192
Number of AF ablations	650	950
Number of ablation centres (> 50 AF ablations)	not available	6
Number of VT/VF ablations	110	150
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	6
Number of LAA closures	not available	40
Number of centres (LAA closures)	not available	4
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	12
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

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

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

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

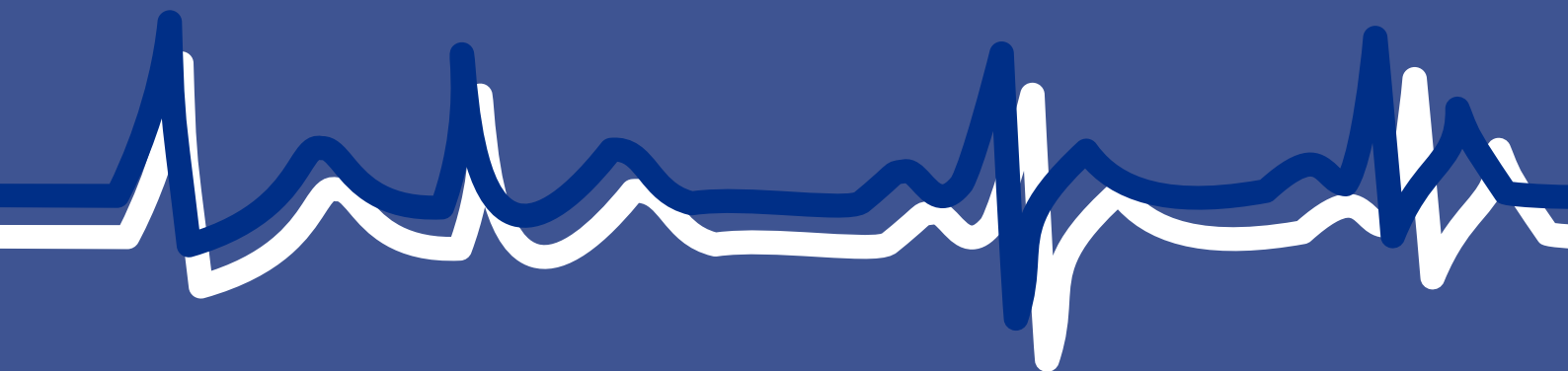
- | |
|---|
| <ul style="list-style-type: none">· Irish Cardiac Society - EP Subgroup |
|---|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|--|
| <ul style="list-style-type: none">· EHRA White Book 2016· Sales data· Estimation· Other |
|--|



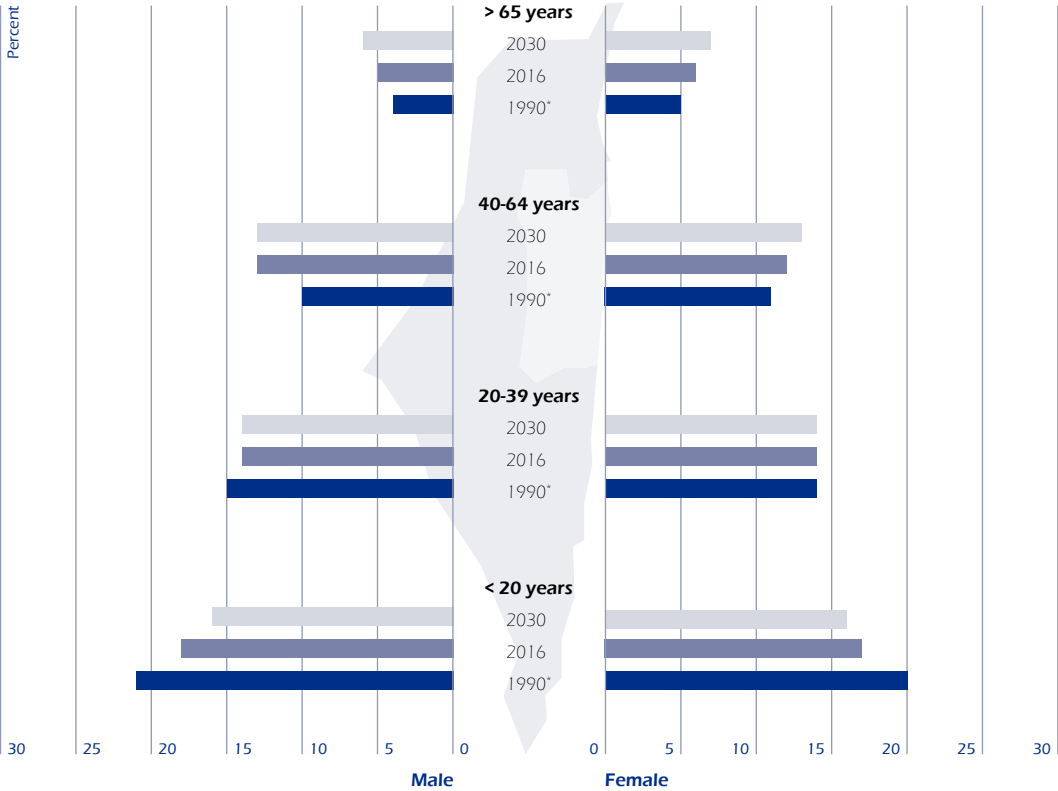
ISRAEL





1. Statistics

Age pyramid for Israel



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,0	2015
Beds (per 100.000 population)	314,4	2015
Density of physicians (per 1.000 population)	3,5	2014
Density of nurses (per 1.000 population)	5,1	2014
Demographic information		Year
Population	8.174.527	2016
Population annual growth rate (%)	1,5	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	5,2	2013
Live births (per 1.000 population)	21,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	311,74	2016*
Gross domestic product per capita (U.S dollar-units)	36.556,92	2016*
Total expenditure on health as % of GDP	7,8	2014
General government expenditure on health as % of total expenditure on health	60,9	2014
Private expenditure on health as % of total expenditure on health	39,2	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	17%	not available

3. Healthcare System

National Health System.

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: No requirements.

Percentage of insured and uninsured citizens		
	2015	2016
Insured citizens	100%	100%
Uninsured citizens	0%	0%

Distribution of insurance modality		
	2015	2016
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	Yes

Comments: Ablation yes, only in the private sector.

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

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

4. Education and Quality Control

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

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

Specialist required for		
	Specialist	
Catheter ablation	Yes	Electrophysiologist
ICD or pacemaker implants	Yes	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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National quality control system availability	No
Willingness to install quality control system	No answer
Responsible for quality control	
The ministry of health	
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)	6
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	20	20
Total Pacemaker units implanted	3,946	4,200
Thereof, Leadless Pacemaker	10	60
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	20	20
Total CRT units implanted	1.452	1.435
Thereof, CRT pacemaker	115	239
Thereof, CRT ICD	1.337	1.196
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	20	20
Total ICD units implanted	1.300	1.026
Thereof, Single chamber	700	297
Thereof, Dual chamber	600	723
Thereof, Subcutaneous ICD	0	6
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		
	2015	2016
Implanting centres	20	20
Total loop recorders implanted	310	469
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	5	5
Total lead extraction procedures	80	90
Specialist performing lead extractions		
Cardiologists	Yes	98%
Surgeons	Yes	2%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	Israel ICD registry
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
Official name: National society – EP and pacing working group		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
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)	4	4
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	4	4
Number of LAA closures	not available	not available
Number of centres (LAA closures)	7	7
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	35	not available
Number of physicians under training to become independent electrophysiologists	2	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	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

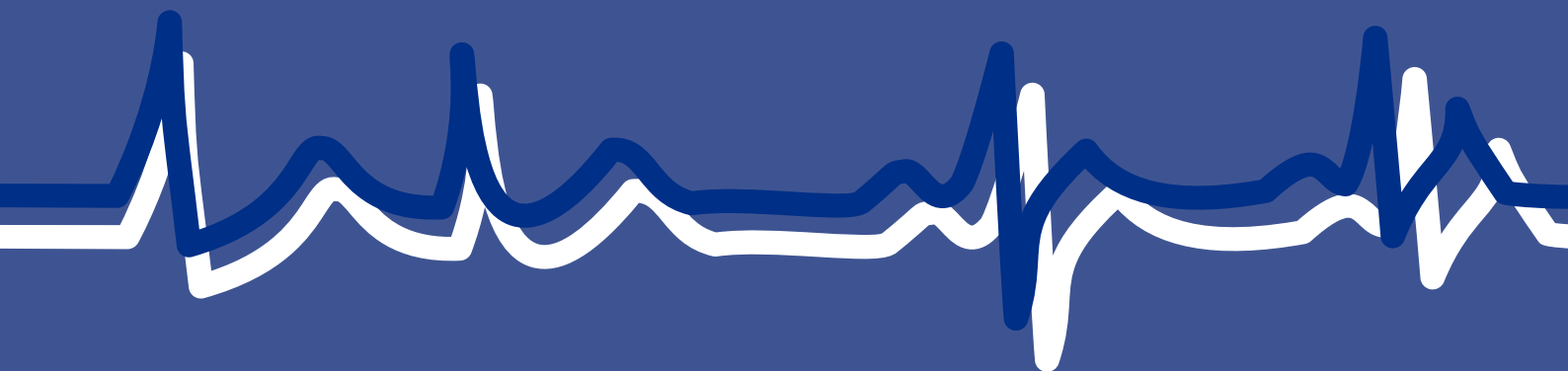
1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

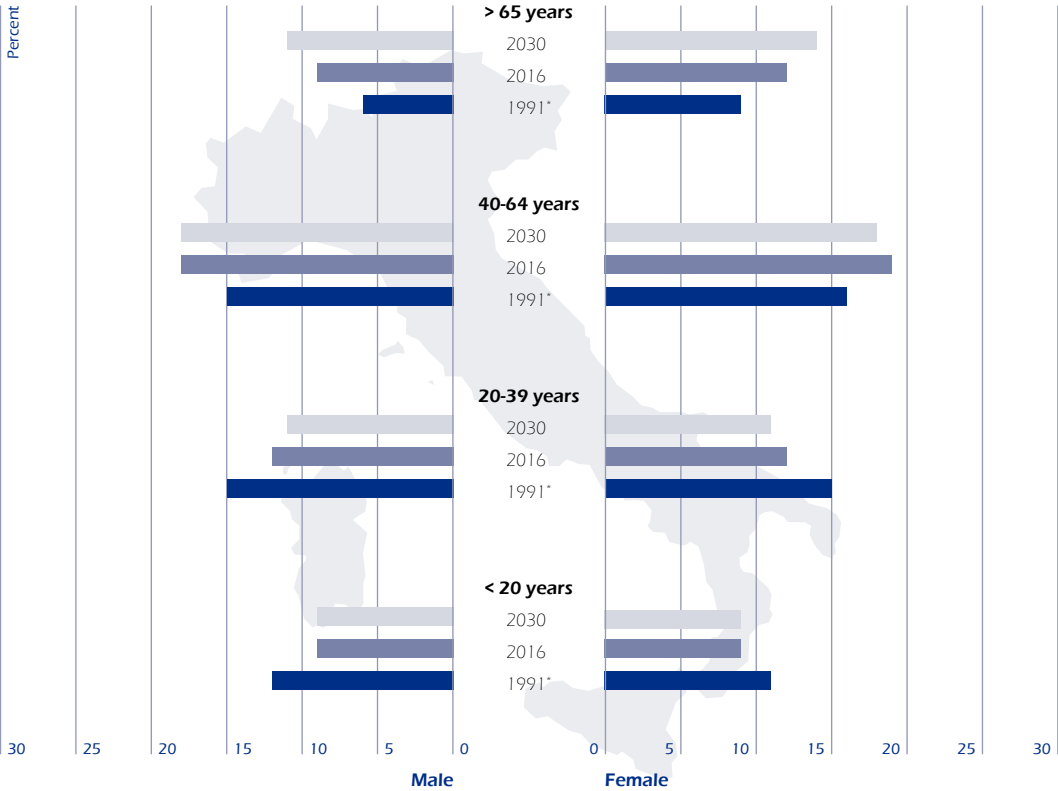
Name of National Cardiac Society, National Working Group or arrhythmia body
· The Israeli Working Group on Pacing and Electrophysiology, Israeli Heart Society
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
· EHRA White Book 2016
· Official statistics
· Sales data
· Estimation

ITALY



1. Statistics

Age pyramid for Italy



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,9	2013
Beds (per 100.000 population)	331,2	2013
Density of physicians (per 1.000 population)	3,9	2014
Density of nurses (per 1.000 population)	6,4	2014
Demographic information		Year
Population	62.007.540	2016
Population annual growth rate (%)	0,3	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	10,3	2012
Live births (per 1.000 population)	8,1	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	1.852,50	2016*
Gross domestic product per capita (U.S dollar-units)	30.294,08	2016*
Total expenditure on health as % of GDP	9,3	2014
General government expenditure on health as % of total expenditure on health	75,6	2014
Private expenditure on health as % of total expenditure on health	24,4	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

National Health System in charge of regional authorities.

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: to be Italian citizen.								
Percentage of insured and uninsured citizens								
	2015		2016					
Insured citizens	100%		100%					
Uninsured citizens	0%		0%					
Distribution of insurance modality								
	2015		2016					
Public insurance company	100%		100%					
Private insurance company	0%		0%					
Private co-payment	0%		0%					
Possibility to subscribing to private health insurance plans						Yes		
Co-payment necessary for the following therapy								
ICD devices							No	
Pacemakers							No	
Ablation							No	
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Regional authorities	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	35
Percentage of academic centres among all practicing EP centres	8%
Percentage of academic centres among all practicing implanting devices centres	10%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	435	434
Total Pacemaker units implanted	65.234	65.100
Thereof, Leadless Pacemaker	not available	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	380	378
Total CRT units implanted	12.815	13.100
Thereof, CRT pacemaker	2.153	2.300
Thereof, CRT ICD	10.662	10.800
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	396	396
Total ICD units implanted	14.709	14.500
Thereof, Single chamber	6.584	not available
Thereof, Dual chamber	7.574	not available
Thereof, Subcutaneous ICD	551	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		
	2015	2016
Implanting centres	400	400
Total loop recorders implanted	4.000	4.010
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	No	not available
Surgeons	No	not available

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	RIP and RID
Pacing	Yes	RIP and RID
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: Minister of Health, Italian Association of Arrhythmia and Cardiac Stimulation		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	not available	not available
Number of ablations performed	26.044	26.982
Mean number of ablations per centre	not available	not available
Number of AF ablations	8.200	8.900
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

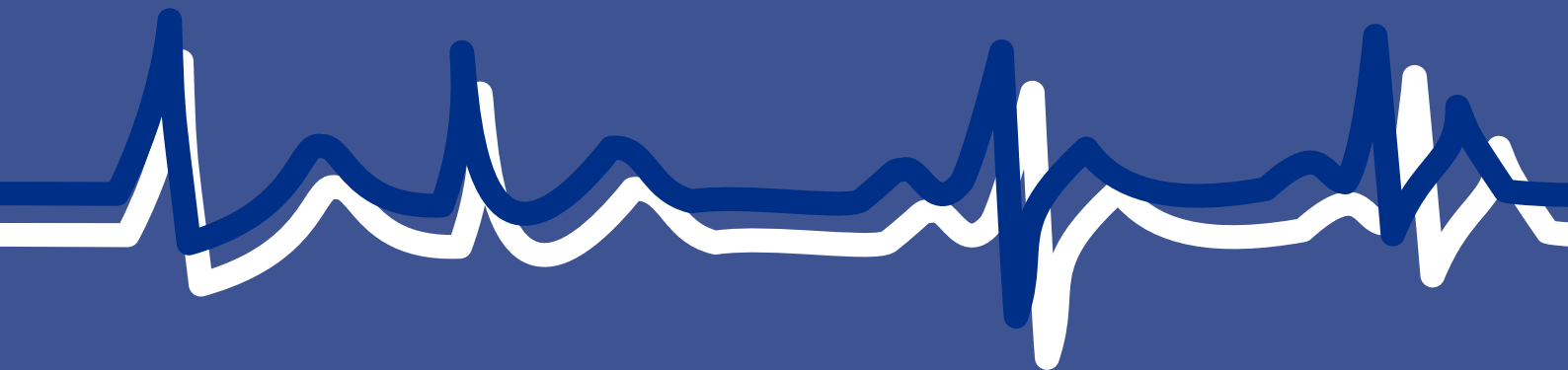
1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

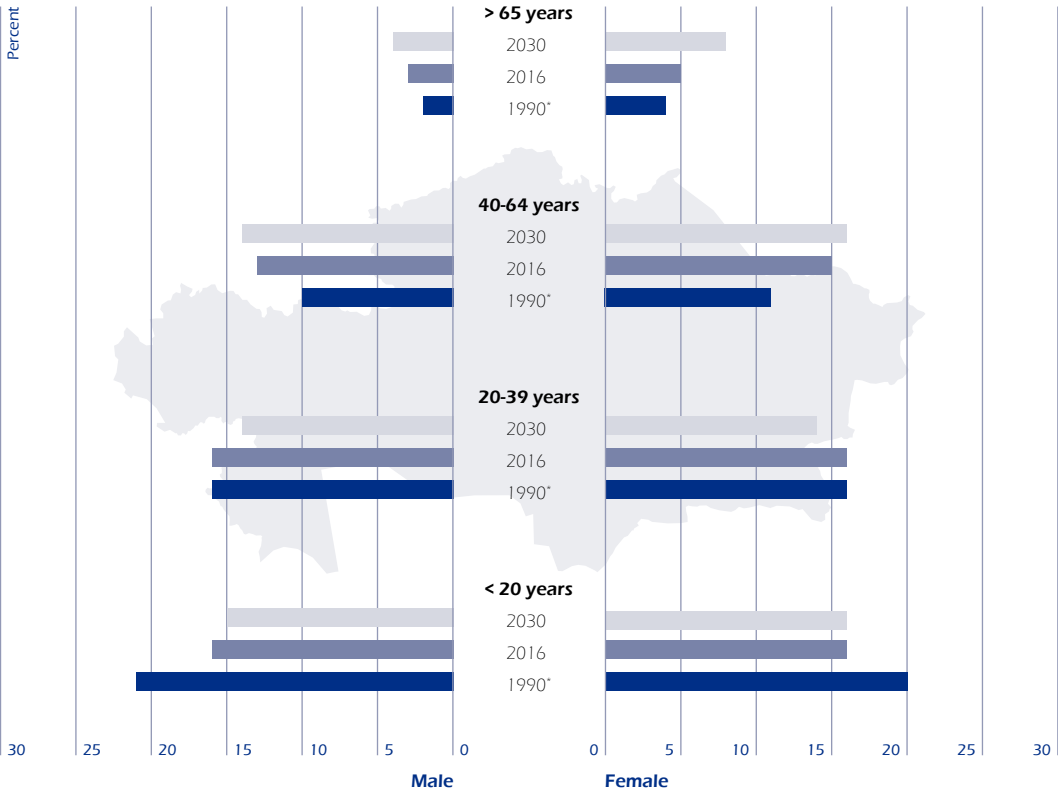
Name of National Cardiac Society, National Working Group or arrhythmia body
<div><div></div><div>· AIAC (Italian Association of Arrhythmia and Cardiac Stimulation)</div></div>
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
<div><div></div><div>· EHRA White Book 2016</div><div>· Estimation</div></div>

KAZAKHSTAN



1. Statistics

Age pyramid for Kazakhstan



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	5,3	2014
Beds (per 100.000 population)	608,6	2014
Density of physicians (per 1.000 population)	3,3	2014
Density of nurses (per 1.000 population)	8,0	2013
Demographic information		Year
Population	18.360.353	2016
Population annual growth rate (%)	1,1	2016
Life expectancy at birth (in years)	71	2016
Death rate (per 1.000 population)	7,5	2015
Live births (per 1.000 population)	22,7	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	128,11	2016*
Gross domestic product per capita (U.S dollar-units)	7.138,09	2016*
Total expenditure on health as % of GDP	4,4	2014
General government expenditure on health as % of total expenditure on health	54,4	2014
Private expenditure on health as % of total expenditure on health	45,6	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	26%	not available

3. Healthcare System

In our country there is a National Health System which allows to cover cost-free medical treatment for all citizens of Republic of Kazakhstan.

Basic insurance availability		No					
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	not available	not available					
Uninsured citizens	not available	not available					
Distribution of insurance modality							
	2015	2016					
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/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician/Hospital does not receive reimbursement neither incentive	No answer			
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologist, surgeon
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	Yes
	2 years

Suggested period of training to perform implantations	Yes
	2 years

National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
Ministry of healthcare system	
Training centres availability	
Pacemaker	4
ICD implantation	4
CRT implantation	4
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	7
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	25	28
Total Pacemaker units implanted	1.801	1.964
Thereof, Leadless Pacemaker	not available	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	18	23
Total CRT units implanted	314	414
Thereof, CRT pacemaker	0	not available
Thereof, CRT ICD	314	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	19	25
Total ICD units implanted	527	791
Thereof, Single chamber	23	not available
Thereof, Dual chamber	504	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	5
Total loop recorders implanted	19	35
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		
	2015	2016
Hospitals performed lead extractions	1	3
Total lead extraction procedures	16	32
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	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		
	2015	2016
Number of ablation centres	13	12
Number of ablations performed	2.461	3.089
Mean number of ablations per centre	189	257
Number of AF ablations	762	1.059
Number of ablation centres (> 50 AF ablations)	4	4
Number of VT/VF ablations	not available	40
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	2
Number of LAA closures	81	70
Number of centres (LAA closures)	3	5
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

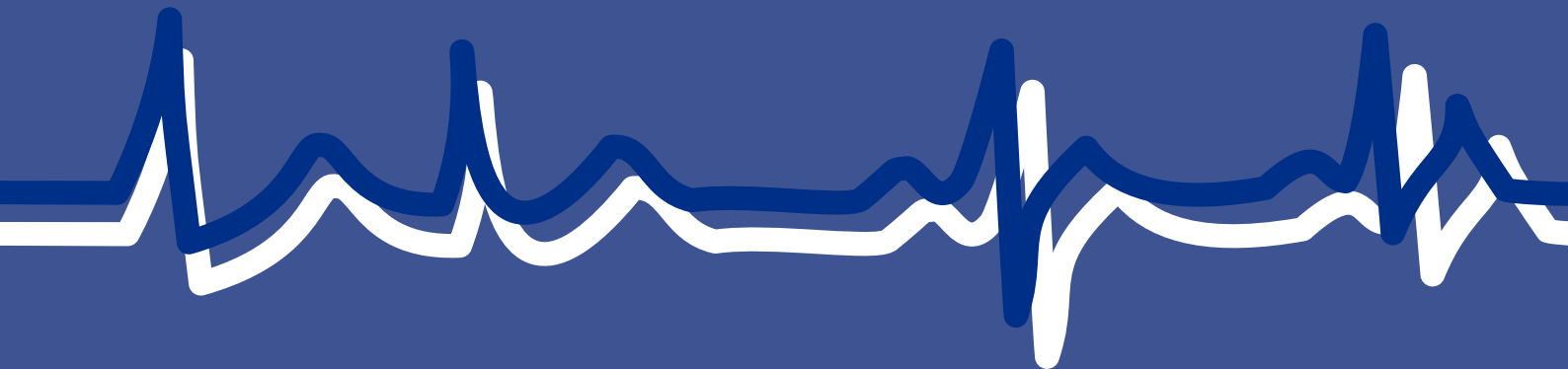
Name of National Cardiac Society, National Working Group or arrhythmia body

- Association of cardiologists of Kazakhstan

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

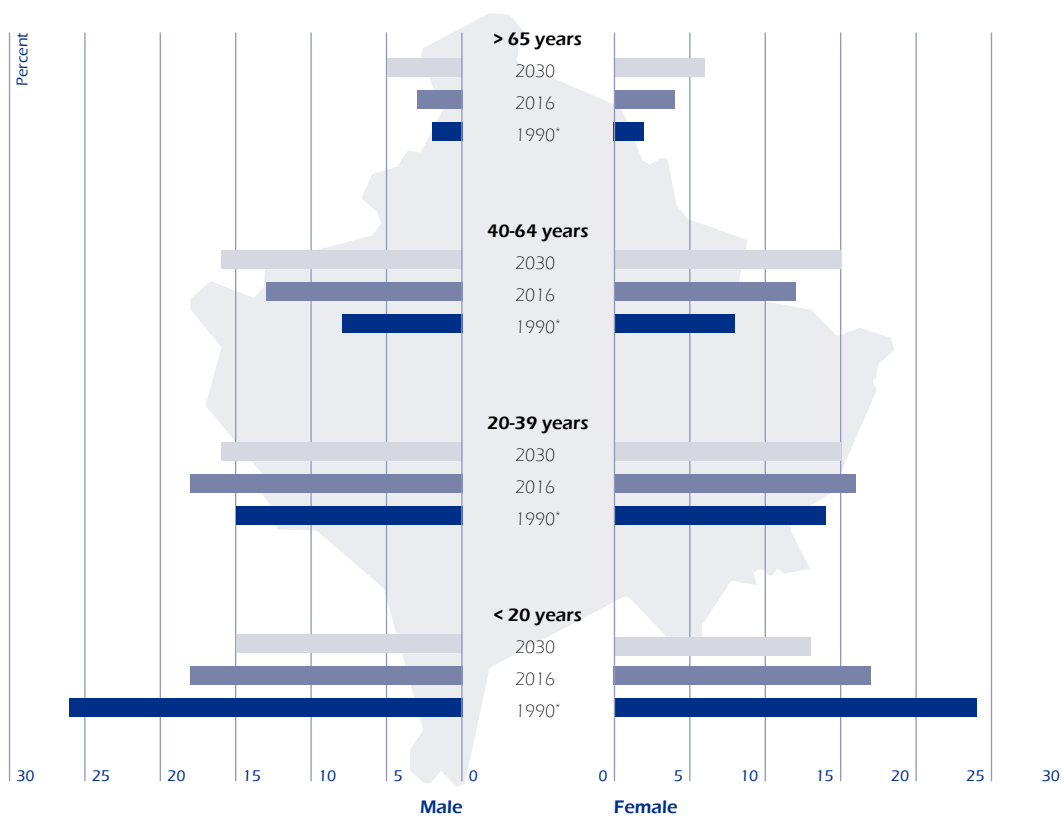
- EHRA White Book 2016
- Survey from professional association
- Sample short survey
- Estimation

KOSOVO



1. Statistics

Age pyramid for Kosovo



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available
Demographic information		Year
Population	1.883.018	2016
Population annual growth rate (%)	0,6	2016
Life expectancy at birth (in years)	72	2016
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available
Economic information		Year
Gross domestic product (U.S dollar-billions)	6,56	2016*
Gross domestic product per capita (U.S dollar-units)	not available	not available
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	not available	not available
Private expenditure on health as % of total expenditure on health	not available	not available

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

National Health System

Basic insurance availability		No					
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	not available	not available					
Uninsured citizens	not available	not available					
Distribution of insurance modality							
	2015	2016					
Public insurance company	not available	not available					
Private insurance company	not available	not available					
Private co-payment	not available	not available					
Possibility to subscribing to private health insurance plans			No				
Co-payment necessary for the following therapy							
ICD devices			Yes				
Pacemakers			Yes				
Ablation			No answer				
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: There is no public health insurance in Kosovo.

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No answer
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Required period of training to perform implantations	No answer
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Suggested period of training to perform implantations	No answer
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National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible for quality control	
Chief of arrhythmogenic department	
Training centres availability	
Pacemaker	3
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	1
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total Pacemaker units implanted	122	46
Thereof, Leadless Pacemaker	not available	not available
First implants	116	39
Replacements	6	7
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total CRT units implanted	4	not available
Thereof, CRT pacemaker	not available	not available
Thereof, CRT ICD	4	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total ICD units implanted	12	3
Thereof, Single chamber	9	3
Thereof, Dual chamber	3	0
Thereof, Subcutaneous ICD	not available	0
First implants	12	not available
Replacements	not available	3
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total loop recorders implanted	not available	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		
	2015	2016
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		No answer
National registry for		
		Official name
ICD	No answer	
Pacing	No answer	
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 answer

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	not available	not available
Number of ablations performed	not available	not available
Mean number of ablations per centre	not available	not available
Number of AF ablations	not available	not available
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

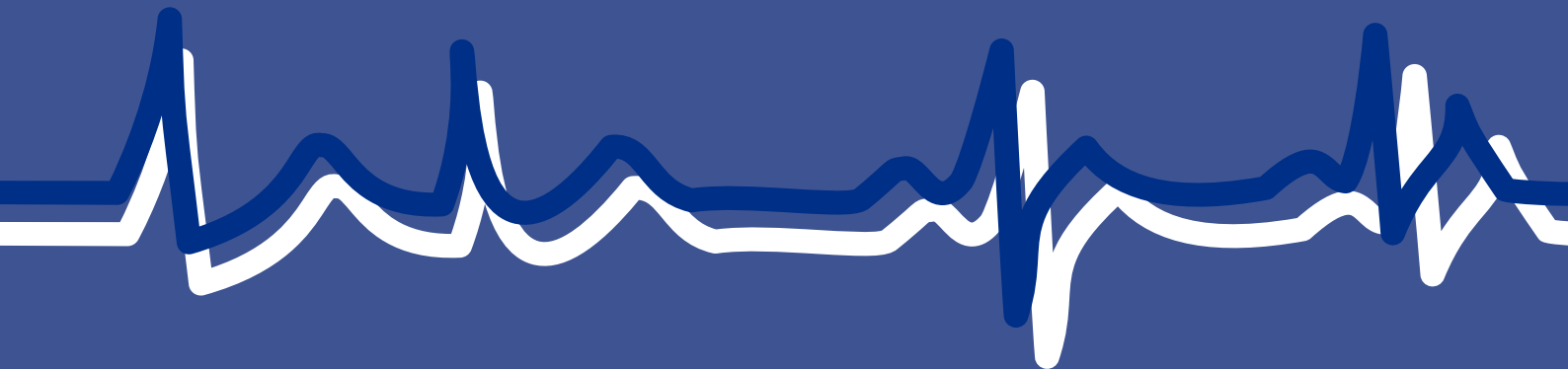
Name of National Cardiac Society, National Working Group or arrhythmia body

- Kosovo Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

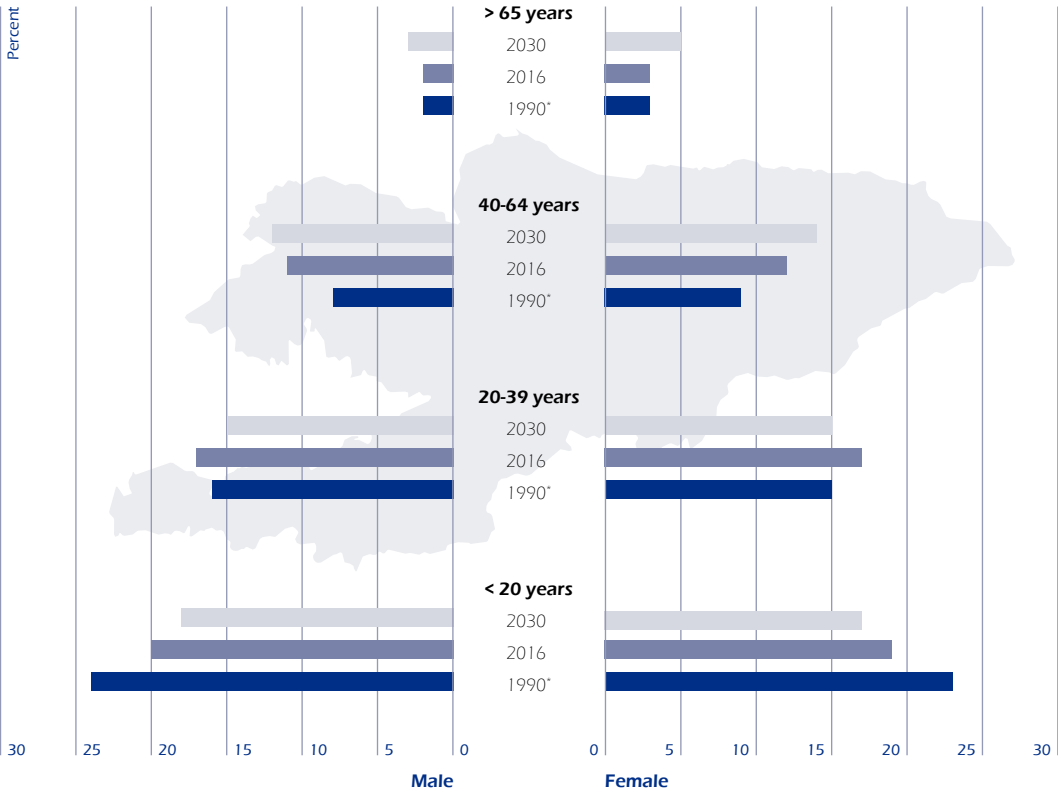
- EHRA White Book 2016

KYRGYZSTAN



1. Statistics

Age pyramid for Kyrgyzstan



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,3	2015
Beds (per 100.000 population)	424,0	2015
Density of physicians (per 1.000 population)	1,8	2015
Density of nurses (per 1.000 population)	5,5	2015
Demographic information		Year
Population	5.957.300	2015
Population annual growth rate (%)	1,1	2016
Life expectancy at birth (in years)	71	2016
Death rate (per 1.000 population)	5,8	2015
Live births (per 1.000 population)	27,4	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	5,79	2016*
Gross domestic product per capita (U.S dollar-units)	956,27	2016*
Total expenditure on health as % of GDP	6,5	2014
General government expenditure on health as % of total expenditure on health	56,1	2014
Private expenditure on health as % of total expenditure on health	43,9	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	50%	50,8%

3. Healthcare System

National Health System

Basic insurance availability		Yes						
Requirements for citizens to qualify for public insurance:								
– pensioners at age 70 years and older								
– labouring people								
– children at age 5 years and less								
– invalids at 2nd and 1st groups								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	not available	not available						
Uninsured citizens	not available	not available						
Distribution of insurance modality								
	2015	2016						
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			Yes					
Pacemakers			Yes					
Ablation			Yes					
Comments: Yes, in the private sector and in public hospitals too.								
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No answer
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Required period of training to perform implantations	No answer
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	No answer
Responsible for quality control	
Healthcare Ministry	
Training centres availability	
Pacemaker	3
ICD implantation	3
CRT implantation	2
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	0%
Percentage of academic centres among all practicing implanting devices centres	0%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	3
Total Pacemaker units implanted	126	not available
Thereof, Leadless Pacemaker	0	not available
First implants	0	0
Replacements	not available	not available
Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	2
Total CRT units implanted	not available	not available
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		
	2015	2016
Implanting centres	2	3
Total ICD units implanted	not available	0
Thereof, Single chamber	not available	0
Thereof, Dual chamber	not available	0
Thereof, Subcutaneous ICD	not available	0
First implants	not available	0
Replacements	not available	0
Specialist performing implants		
Cardiologists	No	not available
Surgeons	Yes	not available

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	3
Total loop recorders implanted	not available	0
Specialist performing implants		
Cardiologists	No	0%
Surgeons	Yes	100%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	3
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: there are three reasons: a). lack of devices in medical market; b). lack of specialists; c). high price of such devices (they are not covered by governmental insurance).		
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		
	2015	2016
Number of ablation centres	2	1
Number of ablations performed	59	21
Mean number of ablations per centre	30	21
Number of AF ablations	not available	0
Number of ablation centres (> 50 AF ablations)	not available	0
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	1
Number of LAA closures	not available	0
Number of centres (LAA closures)	not available	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No answer					
U.S.	No answer					
European	No answer					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

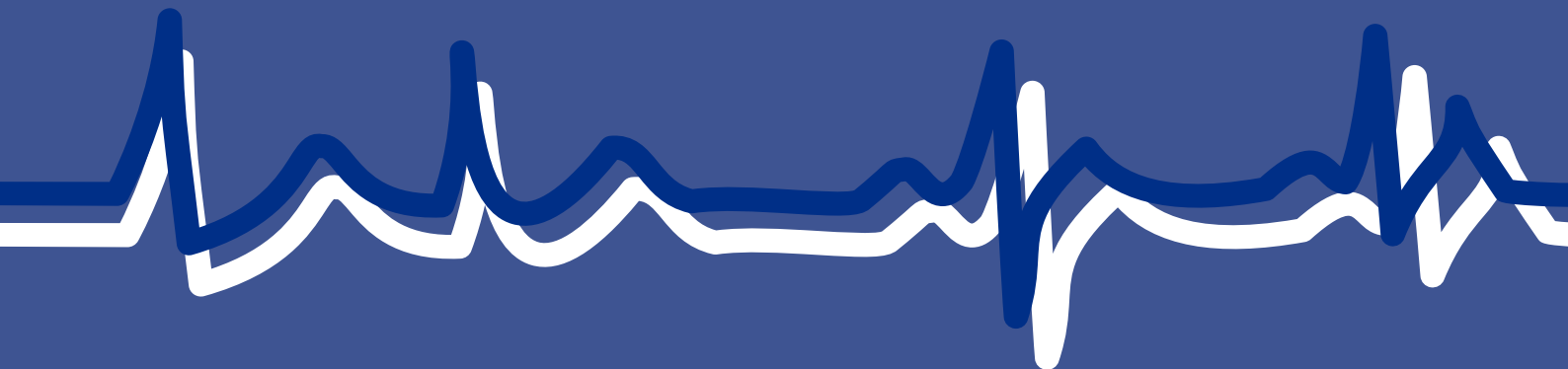
- | |
|--|
| <ul style="list-style-type: none">· Kyrgyz Society of Cardiology |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association |
|---|

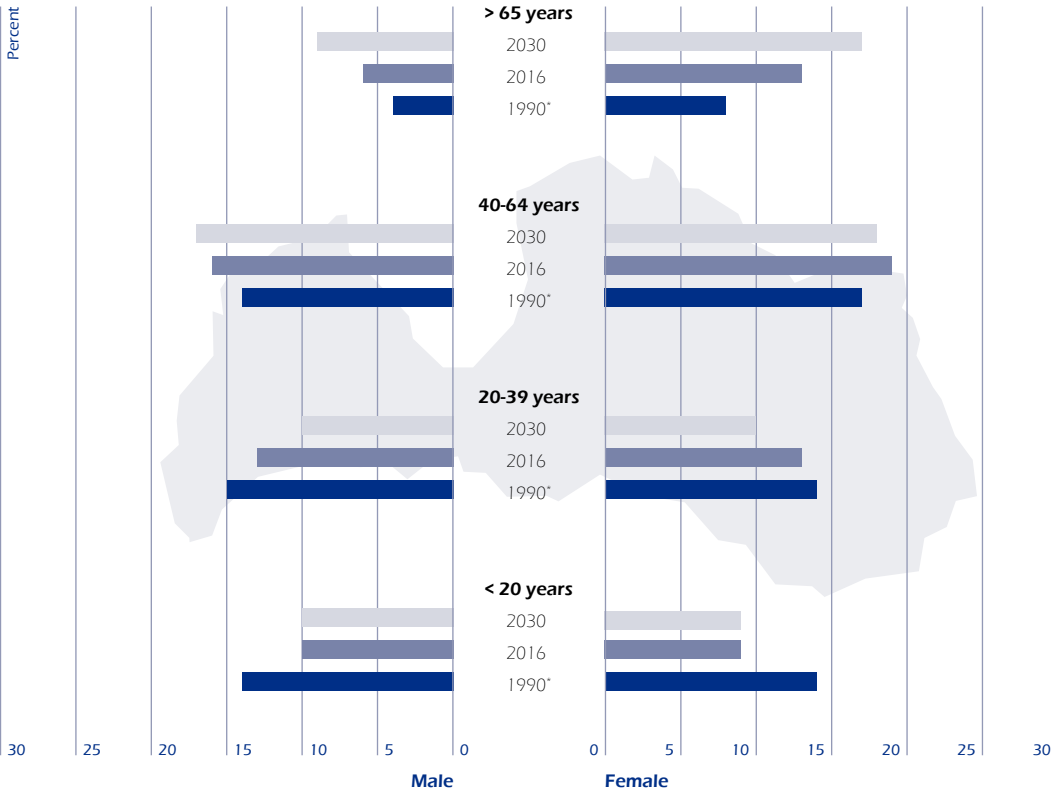


LATVIA



1. Statistics

Age pyramid for Latvia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	3,2	2014
Beds (per 100.000 population)	565,7	2014
Density of physicians (per 1.000 population)	3,2	2014
Density of nurses (per 1.000 population)	5,0	2014
Demographic information		Year
Population	1.965.686	2016
Population annual growth rate (%)	-1,1	2016
Life expectancy at birth (in years)	75	2016
Death rate (per 1.000 population)	14,1	2014
Live births (per 1.000 population)	10,9	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	27,95	2016*
Gross domestic product per capita (U.S dollar-units)	14.140,93	2016*
Total expenditure on health as % of GDP	5,9	2014
General government expenditure on health as % of total expenditure on health	63,2	2014
Private expenditure on health as % of total expenditure on health	36,8	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	53,1%	54%

3. Healthcare System

National Health System

Basic insurance availability		Yes						
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	100%	99%						
Uninsured citizens	0%	1%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	81%	80%						
Private insurance company	19%	12%						
Private co-payment	not available	8%						
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/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Latvian National Society of Cardiology	

Required period of training to perform implantations	Yes
1 year	

Suggested period of training to perform implantations	Yes
1 year	

National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
National Healthcare System	
Training centres availability	
Pacemaker	1
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	1
Atrial fibrillation ablation	1
Number of universities (Schools of Medicine)	2
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	100%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total Pacemaker units implanted	1.400	1.228
Thereof, Leadless Pacemaker	0	3
First implants	1.160	945
Replacements	240	283
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total CRT units implanted	107	111
Thereof, CRT pacemaker	22	26
Thereof, CRT ICD	85	85
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total ICD units implanted	90	150
Thereof, Single chamber	25	56
Thereof, Dual chamber	62	91
Thereof, Subcutaneous ICD	3	3
First implants	82	139
Replacements	8	11
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total loop recorders implanted	44	52
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	1	1
Total lead extraction procedures	19	22
Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	National Register of Implantable Devices and EP procedures. National WG of Arrhythmology
Pacing	Yes	National Register of Implantable Devices and EP procedures. National WG of Arrhythmology
Electrophysiology	Yes	National Register of Implantable Devices and EP procedures. National WG of Arrhythmology
Availability of a national quality insurance system or complication registry		Yes
Official name: National Healthcare system in collaboration with National Society of Cardiology		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: National Healthcare system in collaboration with National Society of Cardiology		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	2	2
Number of ablations performed	726	697
Mean number of ablations per centre	363	349
Number of AF ablations	88	127
Number of ablation centres (> 50 AF ablations)	1	1
Number of VT/VF ablations	36	44
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	1
Number of LAA closures	28	31
Number of centres (LAA closures)	21	1
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	5	5
Number of physicians under training to become independent electrophysiologists	2	3
Availability of a national registry for interventional electrophysiology		Yes
Official name: National Register of Implantable Devices and EP procedures		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle 1 = top, 6 = lowest

13. Sources

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

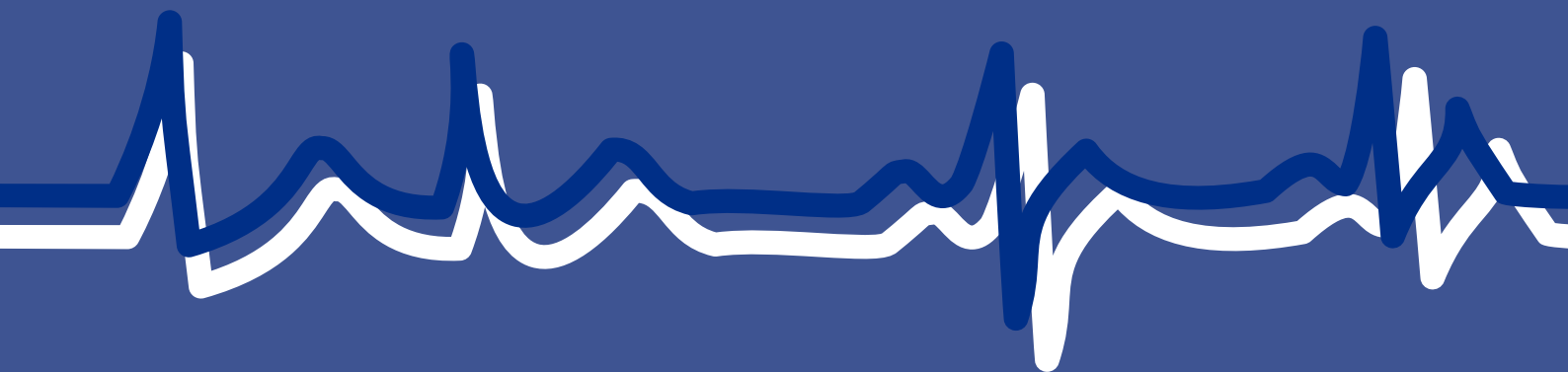
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| <ul style="list-style-type: none">· Latvian National Society of Cardiology, National WG of Arrhythmology |
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All sources that were used to fill out the questionnaire for the EHRA White Book 2017

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|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association· Sample short survey |
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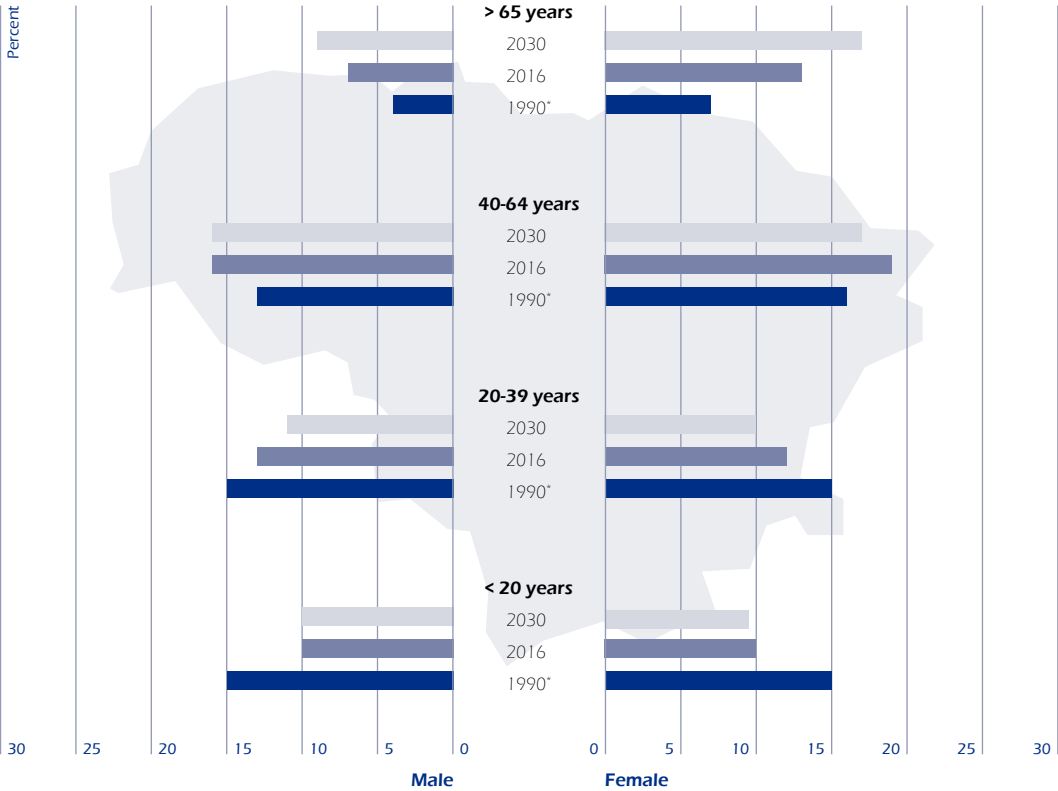


LITHUANIA



1. Statistics

Age pyramid for Lithuania



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	3,2	2014
Beds (per 100.000 population)	722,2	2014
Density of physicians (per 1.000 population)	4,3	2014
Density of nurses (per 1.000 population)	7,9	2014
Demographic information		Year
Population	2.854.235	2016
Population annual growth rate (%)	-1,1	2016
Life expectancy at birth (in years)	75	2016
Death rate (per 1.000 population)	13,7	2014
Live births (per 1.000 population)	10,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	42,78	2016*
Gross domestic product per capita (U.S dollar-units)	14.899,37	2016*
Total expenditure on health as % of GDP	6,6	2014
General government expenditure on health as % of total expenditure on health	67,9	2014
Private expenditure on health as % of total expenditure on health	32,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

Provision of health services is regulated by National Health Insurance Fund under the Ministry of Health.

Basic insurance availability		Yes					
Requirements for citizens to qualify for public insurance: Permanent residents and officially employed, non-permanent residents have basic insurance.							
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	100%	100%					
Uninsured citizens	0%	0%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	98%	98%					
Private insurance company	2%	0%					
Private co-payment	0%	2%					
Possibility to subscribing to private health insurance plans		Yes					
Co-payment necessary for the following therapy							
ICD devices		No					
Pacemakers		No					
Ablation		No					
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologist
ICD or pacemaker implants	Yes Cardiologist, 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
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
State Healthcare Accreditation Agency	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	2
Percentage of academic centres among all practicing EP centres	67%
Percentage of academic centres among all practicing implanting devices centres	40%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	5	5
Total Pacemaker units implanted	2.583	2.588
Thereof, Leadless Pacemaker	0	0
First implants	2.350	2.342
Replacements	233	246
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total CRT units implanted	195	181
Thereof, CRT pacemaker	150	140
Thereof, CRT ICD	45	41
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total ICD units implanted	123	149
Thereof, Single chamber	26	45
Thereof, Dual chamber	97	104
Thereof, Subcutaneous ICD	0	0
First implants	84	93
Replacements	39	56
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total loop recorders implanted	7	9
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	2	2
Total lead extraction procedures	19	18
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		Yes
Official name: State Healthcare Accreditation Agency		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: State Healthcare Accreditation Agency		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	3	3
Number of ablations performed	1.078	1.061
Mean number of ablations per centre	359	354
Number of AF ablations	81	113
Number of ablation centres (> 50 AF ablations)	1	1
Number of VT/VF ablations	8	8
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	15	15
Number of physicians under training to become independent electrophysiologists	1	2
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

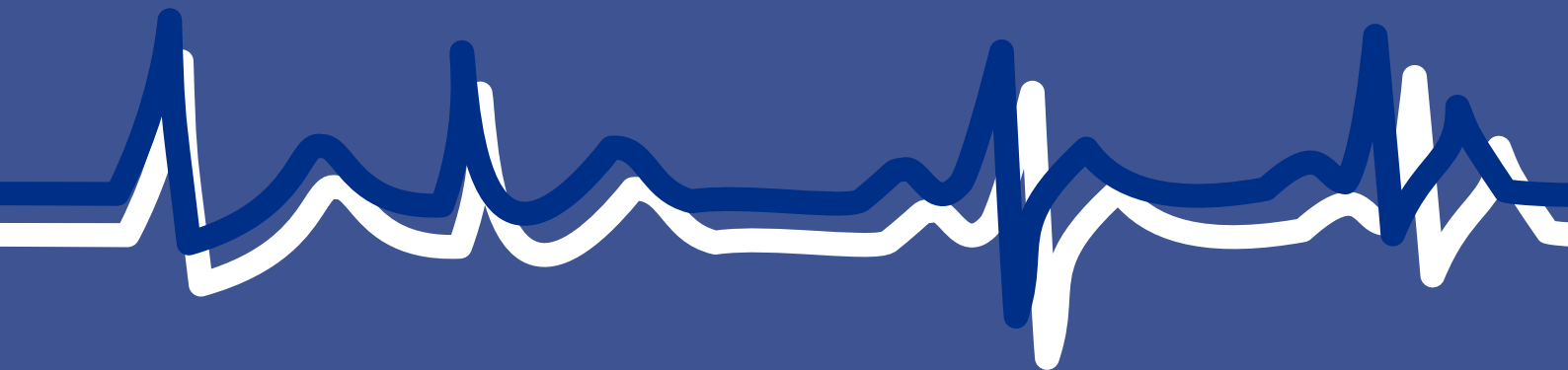
Name of National Cardiac Society, National Working Group or arrhythmia body

- Lithuanian Society of Cardiology
- Working Group on Pacing and Electrophysiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

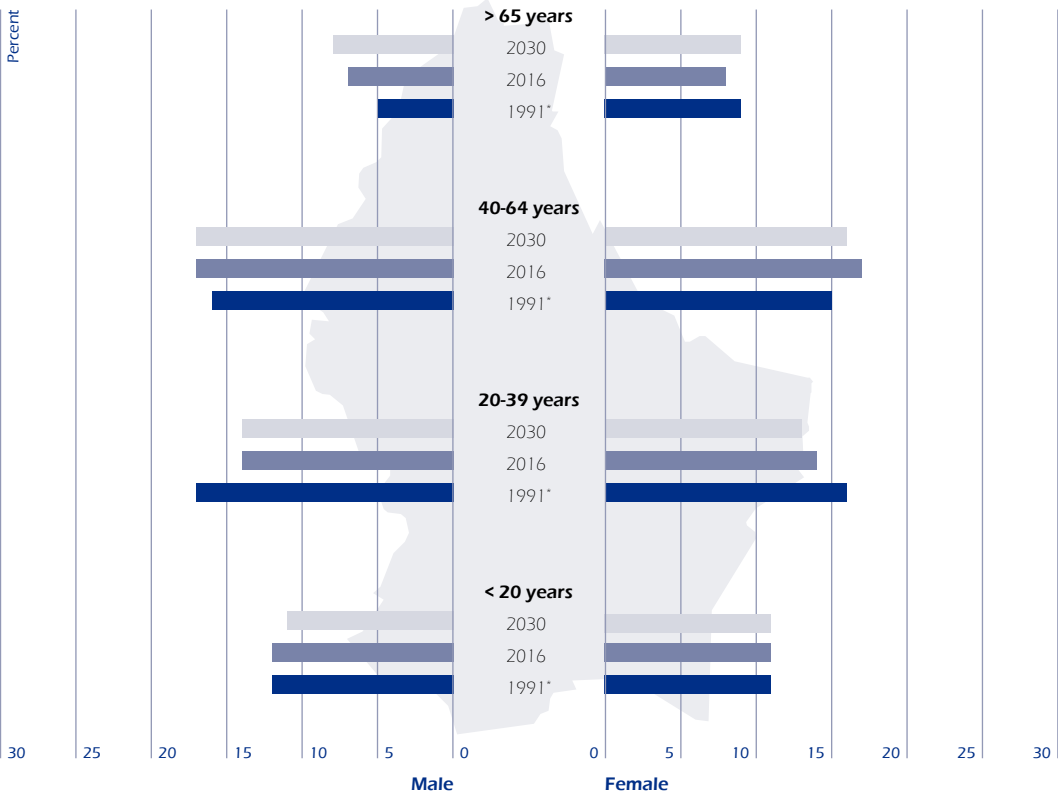
- EHRA White Book 2016
- Official statistics
- Survey from professional association

LUXEMBOURG



1. Statistics

Age pyramid for Luxembourg



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,1	2015
Beds (per 100.000 population)	484,2	2015
Density of physicians (per 1.000 population)	2,9	2015
Density of nurses (per 1.000 population)	12,3	2015
Demographic information		Year
Population	582.291	2016
Population annual growth rate (%)	2,1	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	6,7	2014
Live births (per 1.000 population)	10,8	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	60,98	2016*
Gross domestic product per capita (U.S dollar-units)	105.829,05	2016*
Total expenditure on health as % of GDP	6,9	2014
General government expenditure on health as % of total expenditure on health	83,9	2014
Private expenditure on health as % of total expenditure on health	16,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

General state health care insurance.

Basic insurance availability				Yes					
Requirements for citizens to qualify for public insurance: Mandatory participation for all residents and non-residents working in Luxembourg. Persons with an other status (unemployed, retired, refugees...) also covered. Possibility of voluntary insurance for persons without working or alternative status.									
Percentage of insured and uninsured citizens									
				2015		2016			
Insured citizens				100%		100%			
Uninsured citizens				0%		0%			
Distribution of insurance modality									
				2015		2016			
Public insurance company				100%		100%			
Private insurance company				not available		not available			
Private co-payment				not available		not available			
Possibility to subscribing to private health insurance plans								Yes	
Co-payment necessary for the following therapy									
ICD devices								No	
Pacemakers								No	
Ablation								No	
Reimbursement availability for physicians and hospitals									
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer		
Physician		Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital	
Internal loop recorders		☑	☑	☐	☐	☐	☐	☐	☐
ICD primary prevention		☑	☑	☐	☐	☐	☐	☐	☐
ICD secondary prevention		☑	☑	☐	☐	☐	☐	☐	☐
CRT devices		☑	☑	☐	☐	☐	☐	☐	☐
Ablation		☑	☑	☐	☐	☐	☐	☐	☐
Leadless Pacing		☐	☐	☐	☐	☐	☐	☑	☑
Subcutaneous ICD		☑	☑	☐	☐	☐	☐	☐	☐

Comments: Physicians: Reimbursement for the implantation (physician). The devices are included in a global budget (health insurance and reimbursed to the hospital); Hospitals: The devices are included in a global budget (health insurance and reimbursed to the hospital).



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

Comments: There are restrictions, only one center in the country has reimbursement of ICD, CRT-D and ablation therapies.

4. Education and Quality Control

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

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

Specialist required for		
	Specialist	
Catheter ablation	Yes	Certified electrophysiologist (in foreign centers)
ICD or pacemaker implants	Yes/No	Yes for ICD , CRT. No for pacemaker implantation; certified electrophysiologist, cardiologist, vascular/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 answer
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
National center of invasive cardiology and cardiac surgery. Hospital pharmacy in case of recalls.	
Training centres availability	
Pacemaker	2
ICD implantation	1
CRT implantation	1
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	0
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	25%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	4
Total Pacemaker units implanted	393	404
Thereof, Leadless Pacemaker	not available	0
First implants	281	278
Replacements	112	126
Specialist performing implants		
Cardiologists	Yes	90%
Surgeons	Yes	10%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total CRT units implanted	34	36
Thereof, CRT pacemaker	8	11
Thereof, CRT ICD	26	25
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total ICD units implanted	65	94
Thereof, Single chamber	50	70
Thereof, Dual chamber	15	22
Thereof, Subcutaneous ICD	0	2
First implants	47	64
Replacements	18	30
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total loop recorders implanted	22	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		
	2015	2016
Hospitals performed lead extractions	1	1
Total lead extraction procedures	6	10
Specialist performing lead extractions		
Cardiologists	Yes	10%
Surgeons	Yes	90%

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		
	2015	2016
Number of ablation centres	1	1
Number of ablations performed	145	185
Mean number of ablations per centre	145	185
Number of AF ablations	48	54
Number of ablation centres (> 50 AF ablations)	0	1
Number of VT/VF ablations	6	5
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	2	3
Number of centres (LAA closures)	1	1
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	3	2
Number of physicians under training to become independent electrophysiologists	0	0
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No answer					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

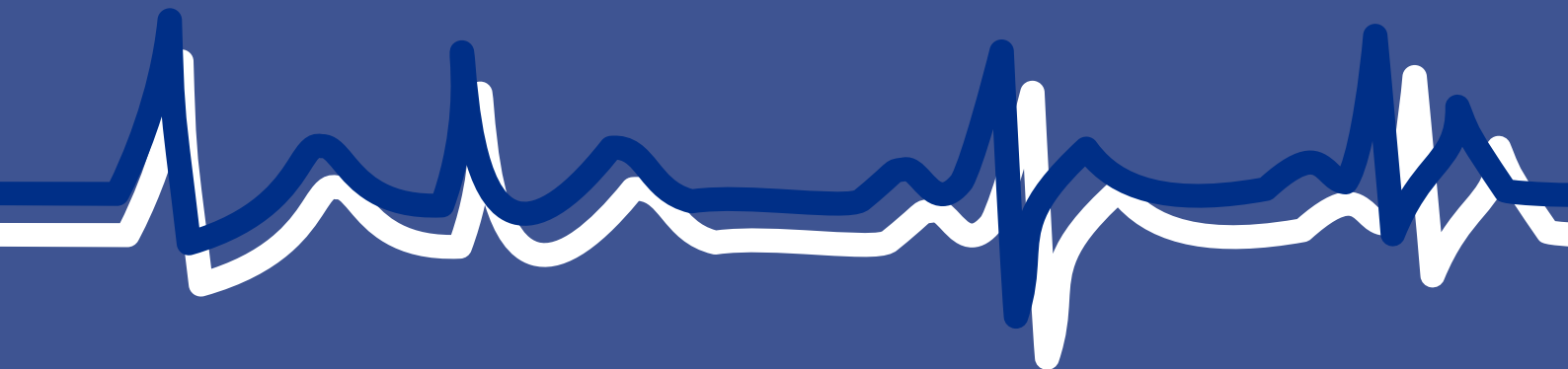
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| <ul style="list-style-type: none">· Société luxembourgeoise de cardiologie |
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All sources that were used to fill out the questionnaire for the EHRA White Book 2017

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| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Estimation· Other |
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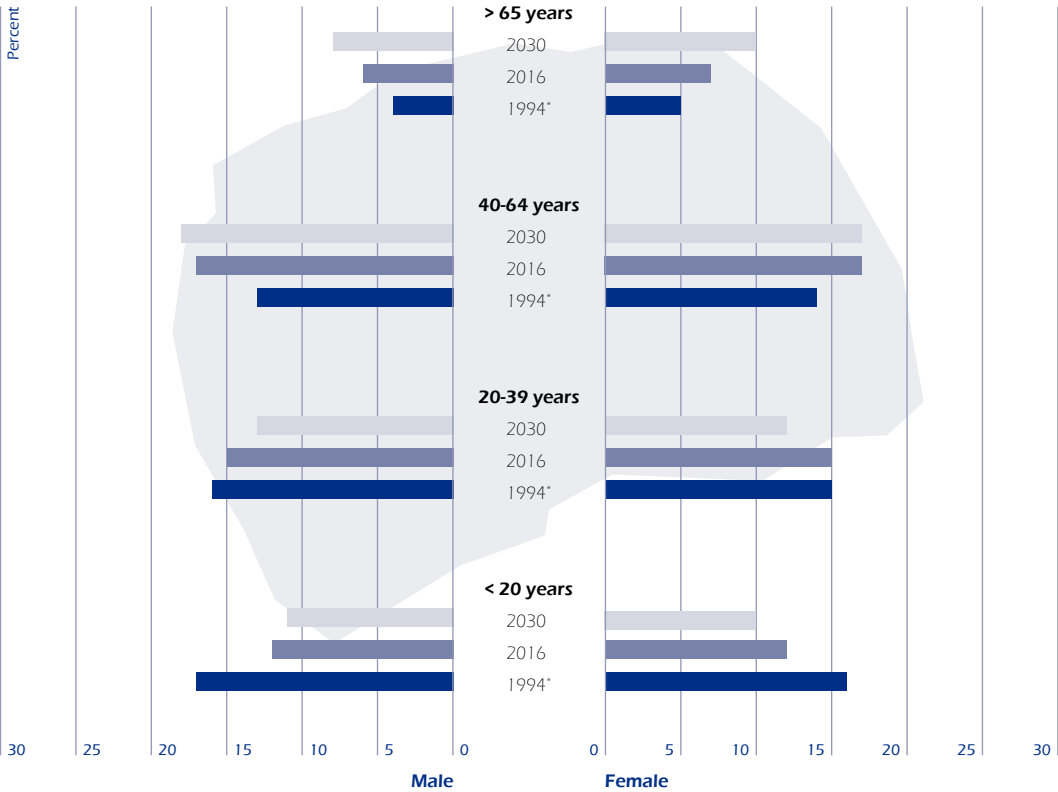
MACEDONIA, FYR





1. Statistics

Age pyramid for Macedonia, FYR



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	3,2	2013
Beds (per 100.000 population)	442,8	2013
Density of physicians (per 1.000 population)	2,8	2013
Density of nurses (per 1.000 population)	4,2	2013
Demographic information		Year
Population	2.100.025	2016
Population annual growth rate (%)	0,2	2016
Life expectancy at birth (in years)	76	2016
Death rate (per 1.000 population)	9,3	2010
Live births (per 1.000 population)	11,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	10,49	2016*
Gross domestic product per capita (U.S dollar-units)	5.060,19	2016*
Total expenditure on health as % of GDP	6,5	2014
General government expenditure on health as % of total expenditure on health	63,3	2014
Private expenditure on health as % of total expenditure on health	36,7	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	58%	51%

3. Healthcare System

National Healthcare system, and Private Healthcare system.

Basic insurance availability			No					
Requirements for citizens to qualify for public insurance: Employment, or personal subscription to the Healthcare system.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	90%	90%						
Uninsured citizens	10%	10%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	90%	80%						
Private insurance company	10%	10%						
Private co-payment	not available	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: Only in Private sector								
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Univ. St Kliment Ohridski, School of Nursing, Bitola, Macedonia, http://www.vmsb.uklo.edu.mk/
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	
No answer	
Responsible for quality control	
Institution where the procedures are performed	
Training centres availability	
Pacemaker	3
ICD implantation	3
CRT implantation	3
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	3
Percentage of academic centres among all practicing EP centres	33%
Percentage of academic centres among all practicing implanting devices centres	67%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total Pacemaker units implanted	470	403
Thereof, Leadless Pacemaker	not available	not available
First implants	387	337
Replacements	83	66
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total CRT units implanted	38	56
Thereof, CRT pacemaker	26	47
Thereof, CRT ICD	12	9
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total ICD units implanted	29	21
Thereof, Single chamber	14	8
Thereof, Dual chamber	15	13
Thereof, Subcutaneous ICD	not available	not available
First implants	20	13
Replacements	9	8
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	3	3
Total loop recorders implanted	not available	2
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	2	3
Total lead extraction procedures	1	1
Specialist performing lead extractions		
Cardiologists	Yes	50%
Surgeons	Yes	50%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
	Official name	
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
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		
	2015	2016
Number of ablation centres	2	2
Number of ablations performed	166	158
Mean number of ablations per centre	83	79
Number of AF ablations	not available	not available
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	4	4
Number of physicians under training to become independent electrophysiologists	1	1
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
1 = no obstacle, 5 = great obstacle 1 = top, 6 = lowest						
Other obstacles to guideline implementation						
Financial obstacles						

13. Sources

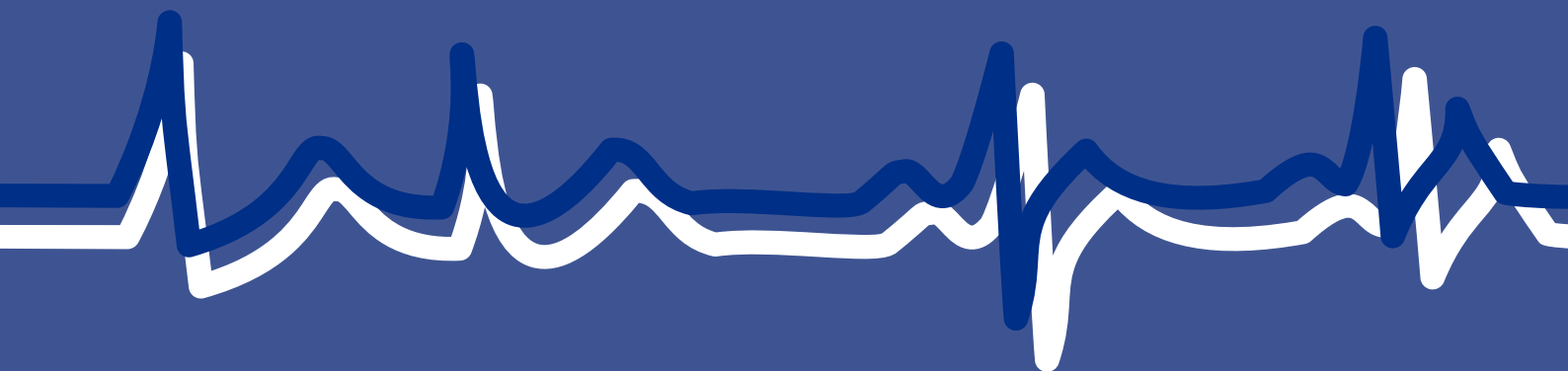
Name of National Cardiac Society, National Working Group or arrhythmia body

- Macedonian Society for Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

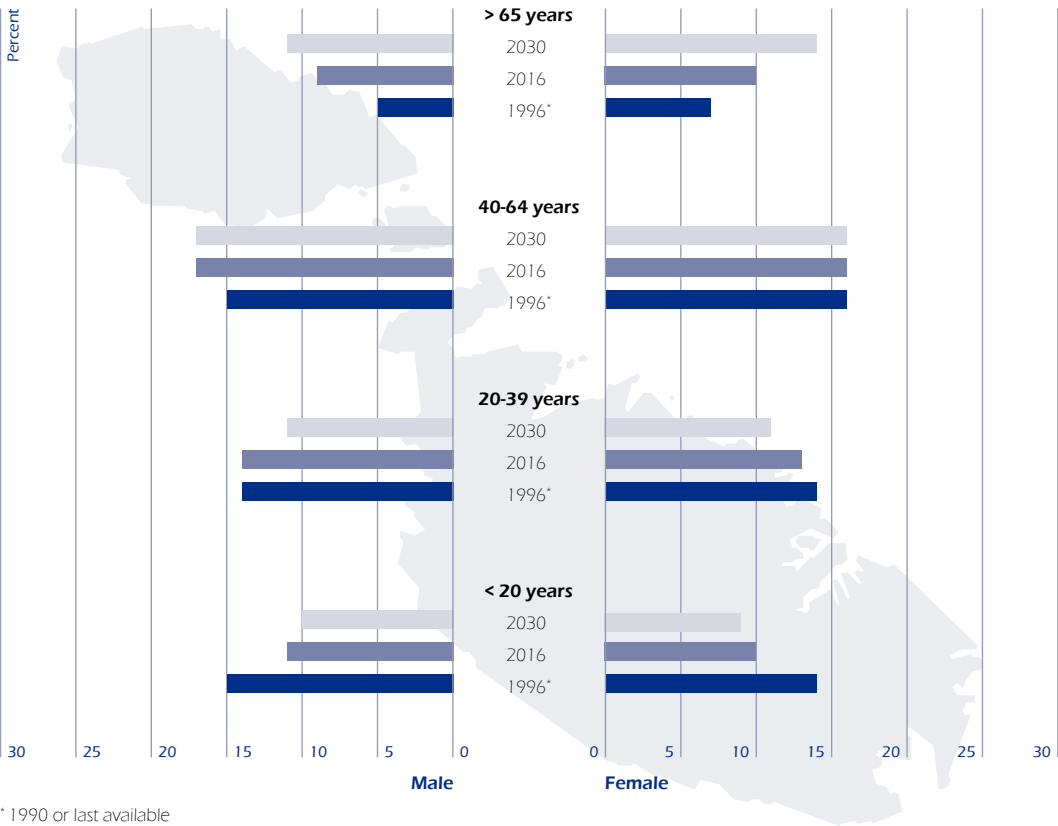
- EHRA White Book 2016
- Official statistics
- Survey from professional association
- Estimation
- Other

MALTA



1. Statistics

Age pyramid for Malta



Healthcare data		Year
Hospitals (per 100.000 population)	2,2	2015
Beds (per 100.000 population)	487,5	2015
Density of physicians (per 1.000 population)	3,9	2015
Density of nurses (per 1.000 population)	8,7	2015
Demographic information		Year
Population	415.196	2016
Population annual growth rate (%)	0,3	2016
Life expectancy at birth (in years)	80	2016
Death rate (per 1.000 population)	7,7	2014
Live births (per 1.000 population)	9,8	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	10,46	2016*
Gross domestic product per capita (U.S dollar-units)	24.297,67	2016*
Total expenditure on health as % of GDP	9,8	2014
General government expenditure on health as % of total expenditure on health	69,2	2014
Private expenditure on health as % of total expenditure on health	30,8	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	23%

3. Healthcare System

National health system with every Maltese resident being covered by a national health insurance. Optional non-government funded private health insurance also available.

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: Tax-paying Maltese resident.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	100%	100%						
Uninsured citizens	0%	0%						
Distribution of insurance modality								
	2015	2016						
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/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)	Physician/Hospital does not receive reimbursement neither incentive		No answer		
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Electrophysiologist
ICD or pacemaker implants	Yes Electrophysiologist for CRT and ICD implants. Cardiologist for brady-pacing devices.

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	Yes 2 years
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National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Department of Cardiology	
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		
	2015	2016
Implanting centres	1	1
Total Pacemaker units implanted	400	427
Thereof, Leadless Pacemaker	0	0
First implants	266	288
Replacements	134	139
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total CRT units implanted	41	39
Thereof, CRT pacemaker	10	8
Thereof, CRT ICD	31	31
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total ICD units implanted	35	42
Thereof, Single chamber	1	3
Thereof, Dual chamber	34	39
Thereof, Subcutaneous ICD	0	0
First implants	26	34
Replacements	9	8
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total loop recorders implanted	13	27
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	1	1
Total lead extraction procedures	9	9
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	1	1
Number of ablations performed	32	37
Mean number of ablations per centre	32	37
Number of AF ablations	0	9
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	0	1
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	5	5
Number of centres (LAA closures)	1	1
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	2	2
Number of physicians under training to become independent electrophysiologists	1	1
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No answer					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

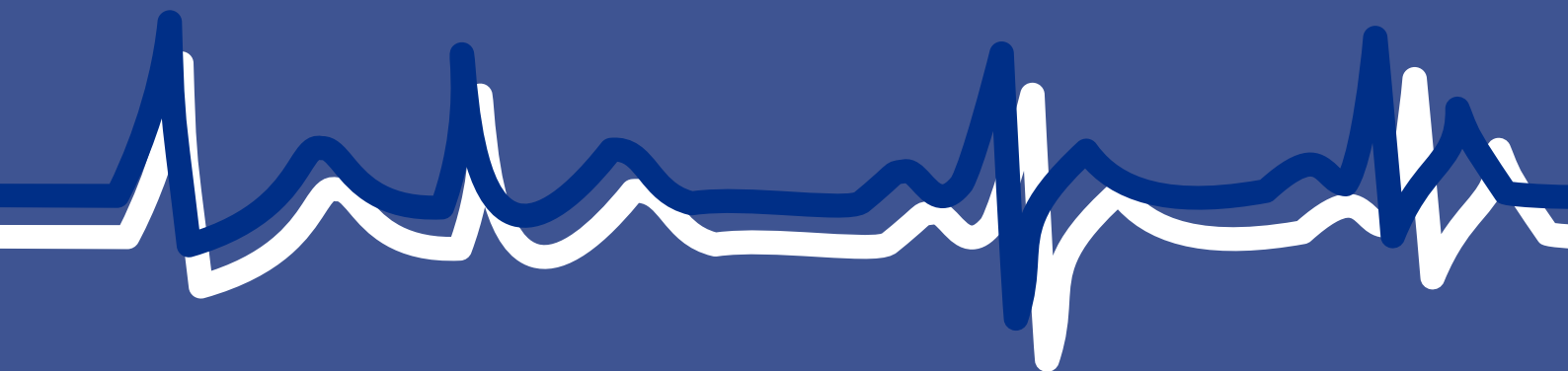
Name of National Cardiac Society, National Working Group or arrhythmia body

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| <ul style="list-style-type: none">· Maltese National Cardiac Society |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

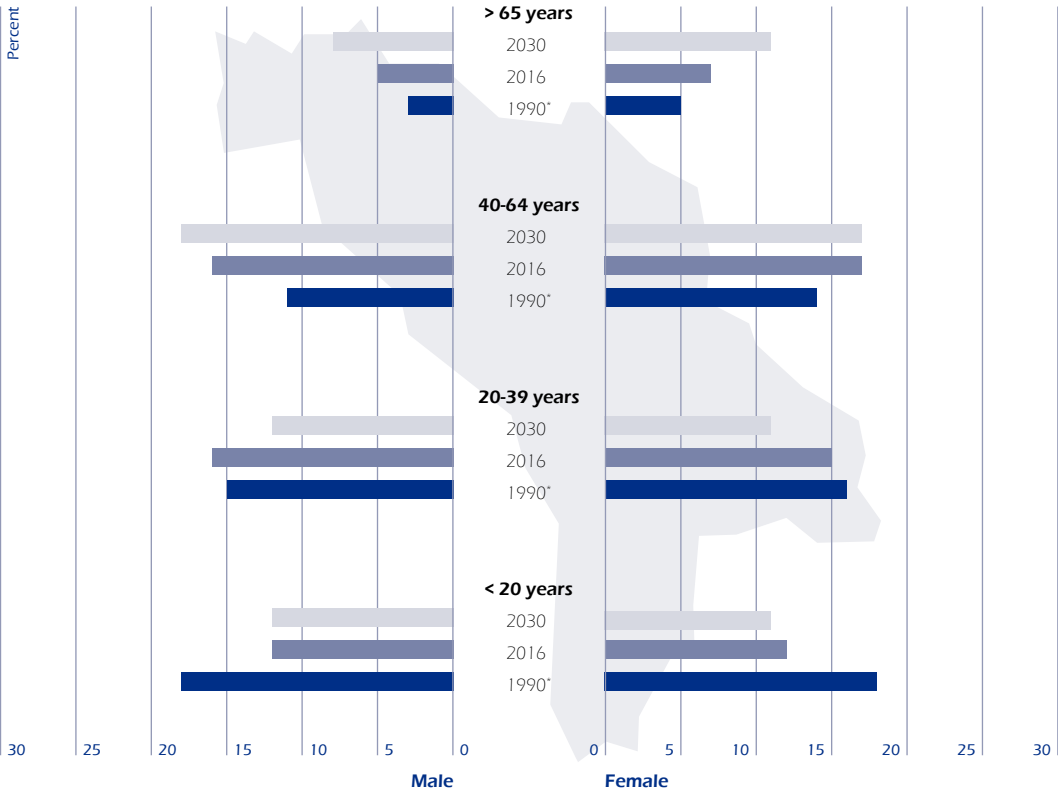
- | |
|--|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics |
|--|

MOLDOVA



1. Statistics

Age pyramid for Moldova



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,5	2014
Beds (per 100.000 population)	566,1	2014
Density of physicians (per 1.000 population)	2,9	2014
Density of nurses (per 1.000 population)	6,1	2014
Demographic information		Year
Population	3.510.485	2016
Population annual growth rate (%)	-1,0	2016
Life expectancy at birth (in years)	71	2016
Death rate (per 1.000 population)	11,1	2014
Live births (per 1.000 population)	10,9	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	6,65	2016*
Gross domestic product per capita (U.S dollar-units)	1.871,50	2016*
Total expenditure on health as % of GDP	10,3	2014
General government expenditure on health as % of total expenditure on health	51,4	2014
Private expenditure on health as % of total expenditure on health	48,6	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	57%

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 for citizens to qualify for public insurance: Working citizens, students, children, handicapped							
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	not available	95%					
Uninsured citizens	not available	5%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	not available	98%					
Private insurance company	not available	1,1%					
Private co-payment	not available	0,9%					
Possibility to subscribing to private health insurance plans				Yes			
Co-payment necessary for the following therapy							
ICD devices				No			
Pacemakers				No			
Ablation				No			
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

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

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

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

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



National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
1) a) Cardiologist/Implanter; b) Cardiologist/electrophysiologist 2) Chief of Department of Cardiology 3) Representatives (Chief) of ambulance clinic	
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)	1
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	2
Total Pacemaker units implanted	not available	317
Thereof, Leadless Pacemaker	not available	not available
First implants	not available	261
Replacements	not available	56
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total CRT units implanted	not available	not available
Thereof, CRT pacemaker	not available	not available
Thereof, CRT ICD	not available	not available
Specialist performing implants		
Cardiologists	No	not available
Surgeons	No	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	1
Total ICD units implanted	not available	8
Thereof, Single chamber	not available	8
Thereof, Dual chamber	not available	0
Thereof, Subcutaneous ICD	not available	0
First implants	not available	5
Replacements	not available	3
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total loop recorders implanted	not available	not available
Specialist performing implants		
Cardiologists	No	not available
Surgeons	No	not available



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	No	not available
Surgeons	No	not available

10. Device specific

Availability of remote monitoring of devices		No
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		
	2015	2016
Number of ablation centres	not available	1
Number of ablations performed	not available	45
Mean number of ablations per centre	not available	45
Number of AF ablations	not available	7
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	1
Number of physicians under training to become independent electrophysiologists	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	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

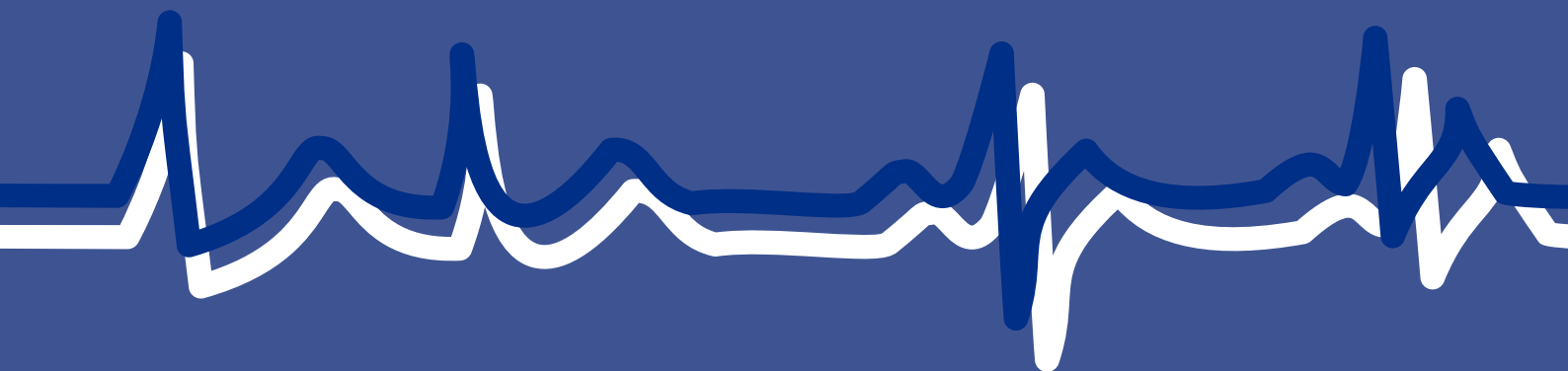
· National Cardiology Society

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

· EHRA White Book 2016
· Official Statistics

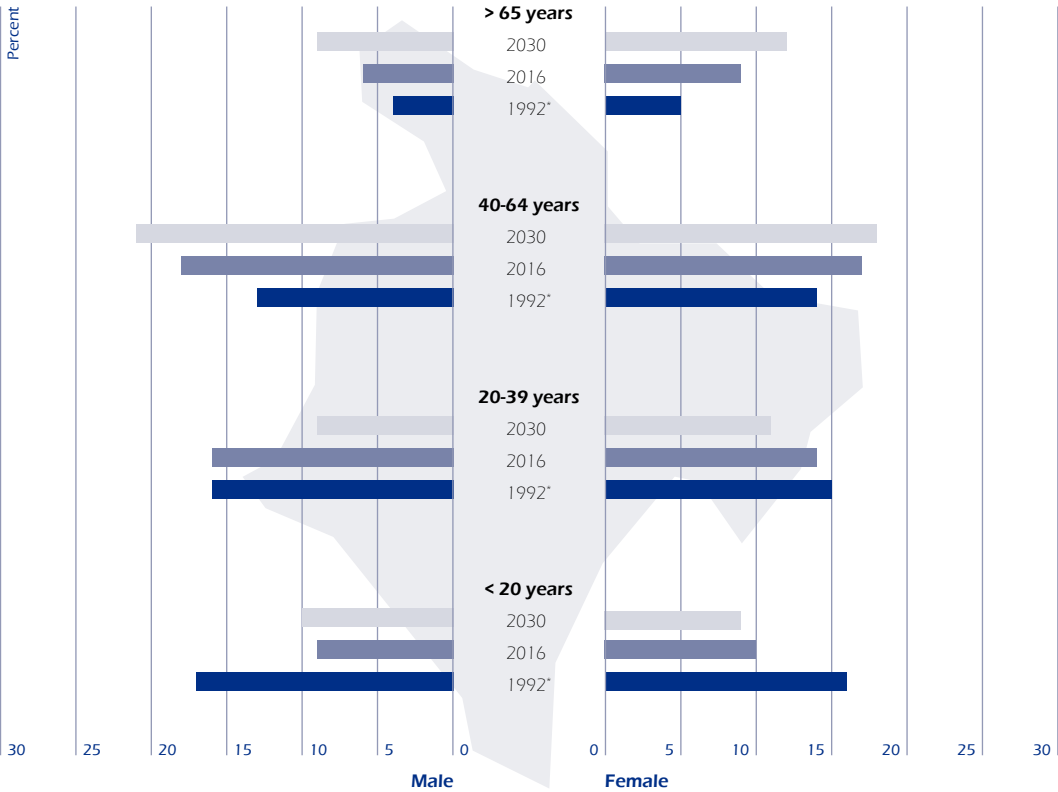


MONTENEGRO



1. Statistics

Age pyramid for Montenegro



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,8	2015
Beds (per 100.000 population)	393,4	2014
Density of physicians (per 1.000 population)	2,3	2015
Density of nurses (per 1.000 population)	5,3	2015
Demographic information		Year
Population	644.578	2016
Population annual growth rate (%)	-0,4	2016
Life expectancy at birth (in years)	79	2016
Death rate (per 1.000 population)	9,3	2009
Live births (per 1.000 population)	12,1	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	4,24	2016*
Gross domestic product per capita (U.S dollar-units)	6.809,23	2016*
Total expenditure on health as % of GDP	6,4	2014
General government expenditure on health as % of total expenditure on health	57,2	2014
Private expenditure on health as % of total expenditure on health	42,8	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	54%	51%

3. Healthcare System

National Health System covered all services. It is organized through Houses of Health (primary health care), secondary health care (general hospitals) and tertiary system (Clinical Center of Montenegro).

Basic insurance availability Yes

Requirements for citizens to qualify for public insurance: All citizens which are registered like some kind of employee and the others who are registered like unemployed at Bureau of unemployed are qualify for public insurance.

Percentage of insured and uninsured citizens

	2015	2016
Insured citizens	99%	100%
Uninsured citizens	1%	0%

Distribution of insurance modality

	2015	2016
Public insurance company	not available	95%
Private insurance company	not available	2%
Private co-payment	not available	3%

Possibility to subscribing to private health insurance plans Yes

Co-payment necessary for the following therapy

ICD devices	No
Pacemakers	No
Ablation	No

Comments: Co-payment does not exist necessary to receive one of the following therapies in 2016.

Reimbursement availability for physicians and hospitals

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

Comments:

Physicians: There is an initiative to do a risk assessment of the workplace and difficulties of procedures and accordingly increase the salaries. Hospitals: There are activities increases in the budget of the hospital, depending on the planned needs for the coming year.



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

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	It is general certification from Institution for device therapy but it's not required for practice.
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	It is general certification from Institution for invasive electrophysiology but it's not required for practice.
Allied professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	It is necessary for allied professional to have certification from Institution for certain issues and it is required for practice.
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	It is general certification from special training center for certain issues but it's not required for practice.

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

Specialist required for		
		Specialist
Catheter ablation	Yes	First of all the physician has to be general cardiologist and after that some of them training to perform catheter ablation.
ICD or pacemaker implants	Yes	First of all the physician has to be general cardiologist and after that some of them training to perform ICD implantation.
Official national competency guidelines for electrophysiological studies or catheter ablation		No
Required period of training to perform implantations		No
Suggested period of training to perform implantations		Yes
		6 months to one year
National quality control system availability		No
Willingness to install quality control system		Yes
Responsible for quality control		
The National commission for quality control		
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		
	2015	2016
Implanting centres	1	1
Total Pacemaker units implanted	247	320
Thereof, Leadless Pacemaker	0	0
First implants	197	265
Replacements	50	55
Specialist performing implants		
Cardiologists	Yes	67%
Surgeons	Yes	33%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total CRT units implanted	19	31
Thereof, CRT pacemaker	14	15
Thereof, CRT ICD	5	16
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total ICD units implanted	53	59
Thereof, Single chamber	31	47
Thereof, Dual chamber	22	12
Thereof, Subcutaneous ICD	0	0
First implants	46	46
Replacements	7	13



Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	1	1
Total loop recorders implanted	0	1

Specialist performing implants		
Cardiologists	Yes	50%
Surgeons	Yes	50%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	0	0
Total lead extraction procedures	0	0

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

Comments: We send some patients in center abroad.

10. Device specific

Availability of remote monitoring of devices	No
Reasons why remote monitoring is not available: High price offers by industry	

National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	

Availability of a national quality insurance system or complication registry	No
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Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions	Yes
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Official name: National Agency for Drugs and Medical Devices

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	1	1
Number of ablations performed	83	80
Mean number of ablations per centre	83	80
Number of AF ablations	18	32
Number of ablation centres (> 50 AF ablations)	0	0
Number of VT/VF ablations	7	10
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	0
Number of centres (LAA closures)	0	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	1	2
Number of physicians under training to become independent electrophysiologists	2	2
Availability of a national registry for interventional electrophysiology	No	

12. Guidelines

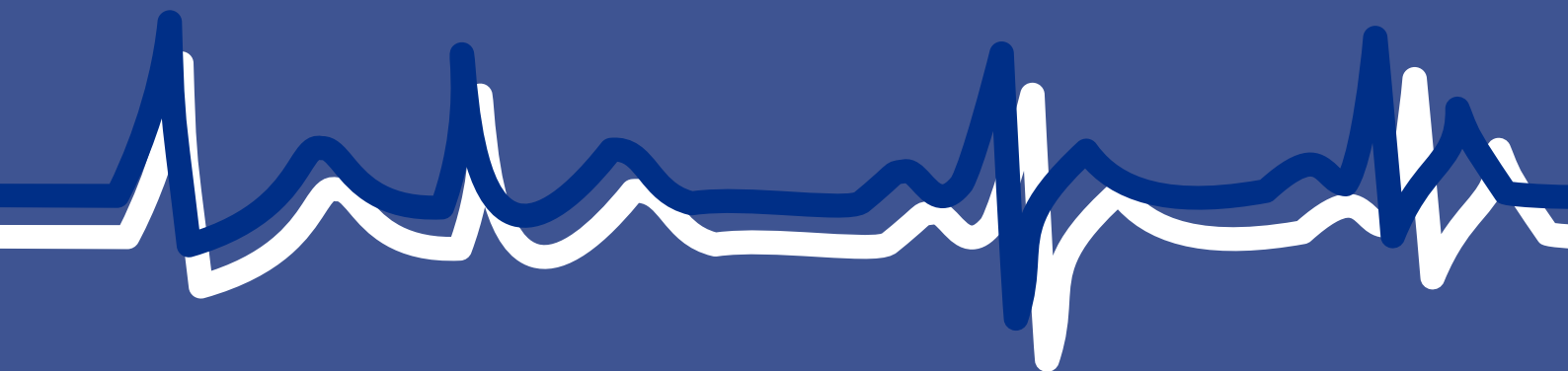
Guidelines adhered to ICD implants and pacemaker implants	
National	No
U.S.	No
European	Yes

Obstacles to guideline implementation	Ranking of importance					
	1	2	3	4	5	
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
1 = no obstacle, 5 = great obstacle					1 = top, 6 = lowest	

13. Sources

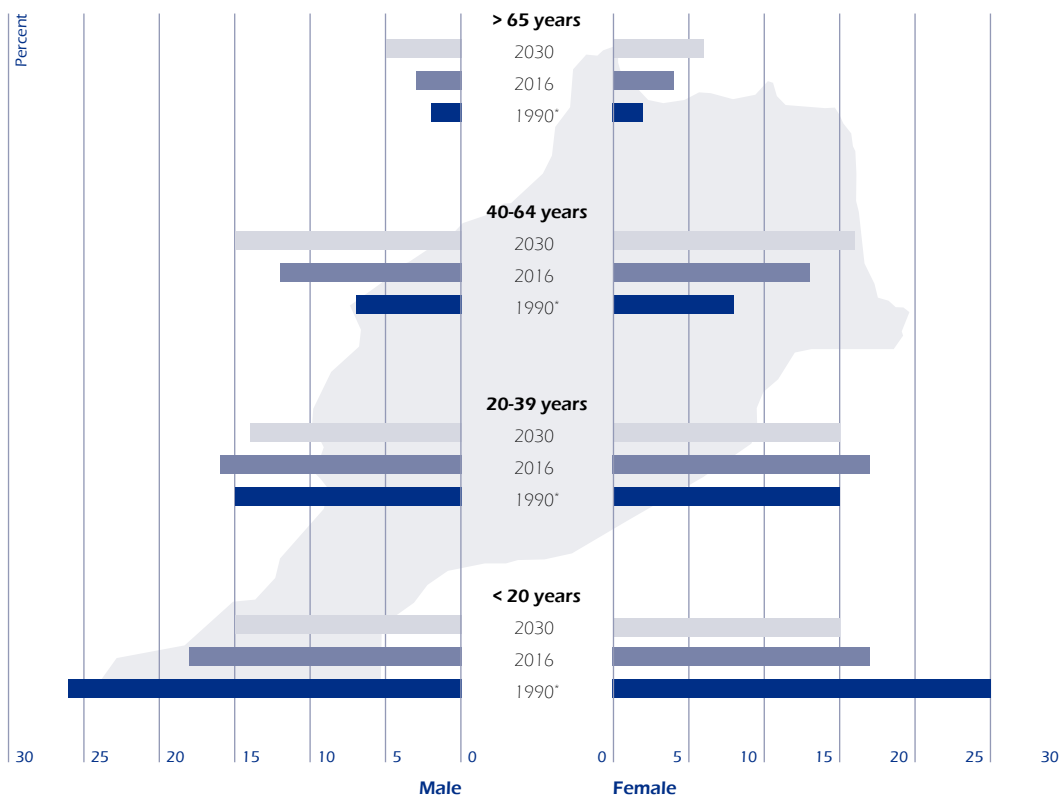
Name of National Cardiac Society, National Working Group or arrhythmia body
· Society of Cardiology of Montenegro
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
· EHRA White Book 2016
· Official statistics
· Survey from professional association

MOROCCO



1. Statistics

Age pyramid for Morocco



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available
Demographic information		Year
Population	33.655.786	2016
Population annual growth rate (%)	1,0	2016
Life expectancy at birth (in years)	77	2016
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	23,4	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	104,91	2016*
Gross domestic product per capita (U.S dollar-units)	3.101,31	2016*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	not available	2014
Private expenditure on health as % of total expenditure on health	not available	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	37,6%	41%

3. Healthcare System

L'Agence nationale de l'assurance maladie (ANAM).

Basic insurance availability			No				
Percentage of insured and uninsured citizens							
	2015		2016				
Insured citizens	75%		60%				
Uninsured citizens	25%		40%				
Distribution of insurance modality							
	2015		2016				
Public insurance company	80%		80%				
Private insurance company	15%		19%				
Private co-payment	5%		1%				
Possibility to subscribing to private health insurance plans			Yes				
Co-payment necessary for the following therapy							
ICD devices			No answer				
Pacemakers			No				
Ablation			No				
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: Physician reimbursement only in private medical activity. Hospital: Actually no leadless and nor subcutaneous ICD performed in Morocco.

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No answer
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Required period of training to perform implantations	No answer
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Suggested period of training to perform implantations	Yes
1 year for PM and 2 years for CRT	



National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible for quality control	
No answer	
Training centres availability	
Pacemaker	13
ICD implantation	not available
CRT implantation	3
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	6
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	33%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	11	12
Total Pacemaker units implanted	1.801	1.823
Thereof, Leadless Pacemaker	0	not available
First implants	1.801	not available
Replacements	0	not available
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	3
Total CRT units implanted	84	81
Thereof, CRT pacemaker	42	38
Thereof, CRT ICD	42	43
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	5
Total ICD units implanted	57	36
Thereof, Single chamber	13	12
Thereof, Dual chamber	44	24
Thereof, Subcutaneous ICD	0	not available
First implants	not available	not available
Replacements	not available	not available
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	0	not available
Total loop recorders implanted	0	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		
	2015	2016
Hospitals performed lead extractions	3	2
Total lead extraction procedures	10	5
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: not yet.		
National registry for		
		Official name
ICD	No answer	
Pacing	No answer	
Electrophysiology	No answer	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No answer

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	5	5
Number of ablations performed	60	200
Mean number of ablations per centre	12	40
Number of AF ablations	not available	15
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	7	13
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No answer

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
1 = no obstacle, 5 = great obstacle						
1 = top, 6 = lowest						
Other obstacles to guideline implementation						
We need our own guidelines according to our conditions.						



13. Sources

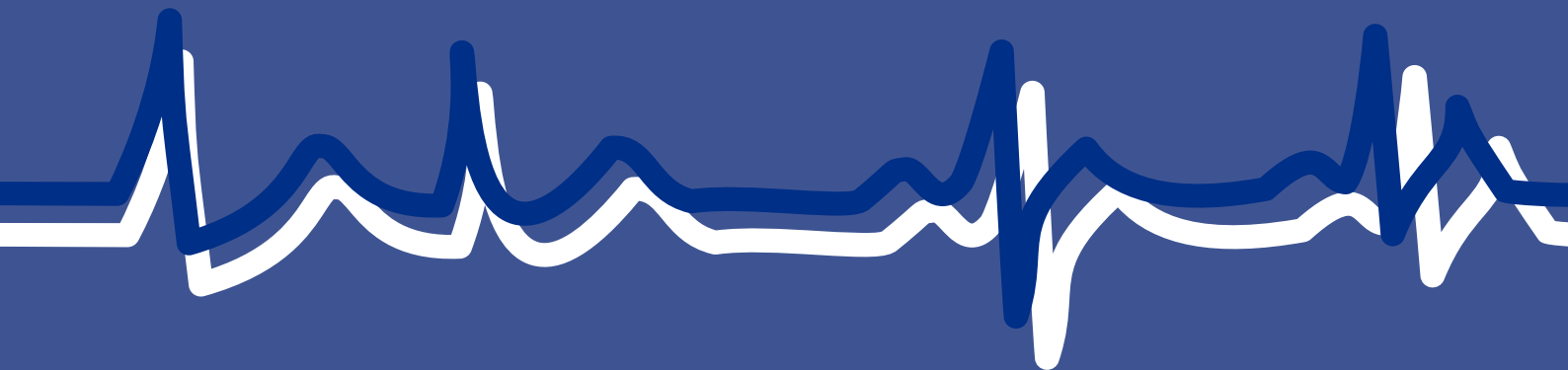
Name of National Cardiac Society, National Working Group or arrhythmia body

- SMC FILIALE DE RYTHMOLOGIE

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

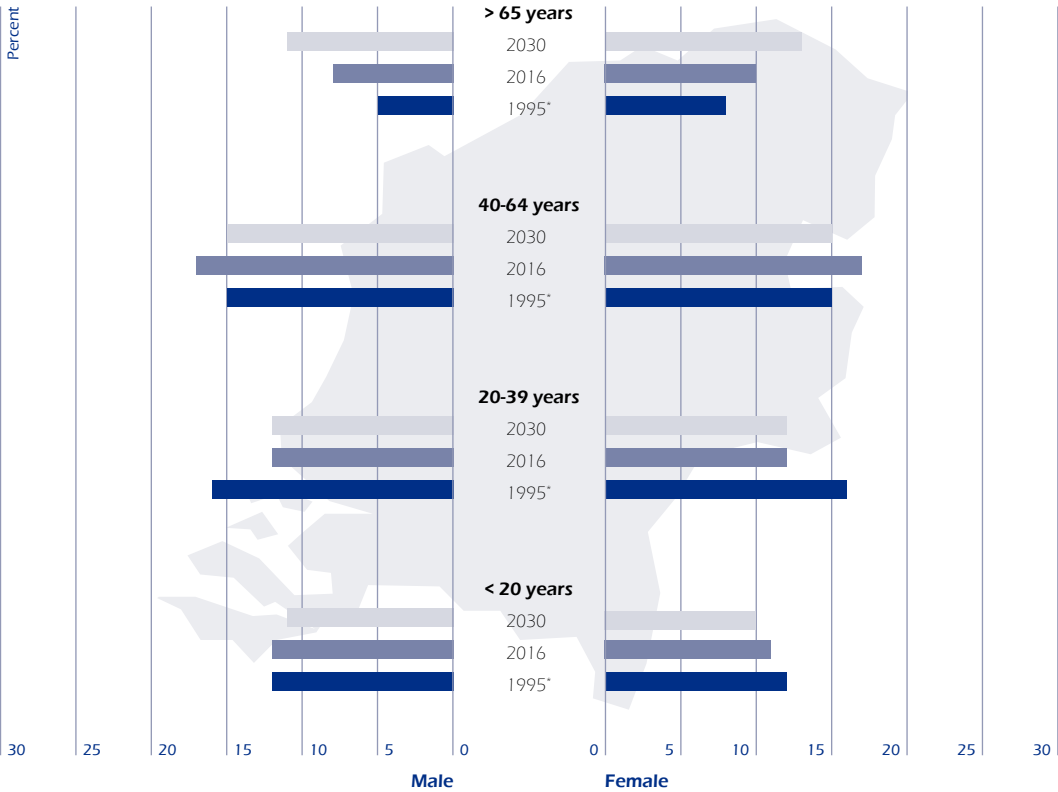
- EHRA White Book 2016
- Official statistics
- Sample short survey
- Sales data

NETHERLANDS



1. Statistics

Age pyramid for Netherlands



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,6	2014
Beds (per 100.000 population)	465,7	2009
Density of physicians (per 1.000 population)	3,4	2014
Density of nurses (per 1.000 population)	8,6	2008
Demographic information		Year
Population	17.016.967	2016
Population annual growth rate (%)	0,4	2016
Life expectancy at birth (in years)	81	2016
Death rate (per 1.000 population)	8,4	2013
Live births (per 1.000 population)	10,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	769,93	2016*
Gross domestic product per capita (U.S dollar-units)	45.210,24	2016*
Total expenditure on health as % of GDP	10,9	2014
General government expenditure on health as % of total expenditure on health	87,0	2014
Private expenditure on health as % of total expenditure on health	13,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	28%	27%

3. Healthcare System

There is a system of obligatory health Insurance with private Insurance companies. These Insurance companies are obliged to provide a package with a defined set of insured treatments.

Basic insurance availability			Yes					
Requirements for citizens to qualify for public insurance: Resident in the Netherlands.								
Percentage of insured and uninsured citizens								
	2015		2016					
Insured citizens	100%		100%					
Uninsured citizens	0%		0%					
Distribution of insurance modality								
	2015		2016					
Public insurance company	0%		0%					
Private insurance company	100%		100%					
Private co-payment	0%		0%					
Possibility to subscribing to private health insurance plans					Yes			
Co-payment necessary for the following therapy								
ICD devices					No			
Pacemakers					No			
Ablation					No			
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input checked="" type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>
Comments: in some cases the Dutch guidelines are somewhat different from the ESC guidelines.	

4. Education and Quality Control

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

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

Specialist required for		
	Yes	Specialist
Catheter ablation	Yes	Cardiologists named in the NHRA (Netherlands Heart Rhythm Association) documents
ICD or pacemaker implants	Yes	Cardiologists named in the NHRA (Netherlands Heart Rhythm Association) documents

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
NHRA	

Required period of training to perform implantations	Yes
Cardiologists named in the NHRA (Netherlands Heart Rhythm Association) documents	



Suggested period of training to perform implantations	Yes
	at least 1 year
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
NCDR: National Cardiovascular Data Registry	
Training centres availability	
Pacemaker	27
ICD implantation	16
CRT implantation	16
Electrophysiological studies and catheter ablation	16
Atrial fibrillation ablation	16
Number of universities (Schools of Medicine)	8
Percentage of academic centres among all practicing EP centres	47%
Percentage of academic centres among all practicing implanting devices centres	9%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	85	85
Total Pacemaker units implanted	10.000	10.000
Thereof, Leadless Pacemaker	50	150
First implants	7.650	7.550
Replacements	2.350	2.450
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	2%
Other: Allied professionals	Yes	3%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	29	29
Total CRT units implanted	2.000	2.100
Thereof, CRT pacemaker	400	450
Thereof, CRT ICD	1.600	1.650
Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	29	29
Total ICD units implanted	3.500	3.500
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	150	300
First implants	2.450	2.450
Replacements	1.050	1.050
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	3%
Other: Allied professionals	Yes	2%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	85	85
Total loop recorders implanted	300	not available
Specialist performing implants		
Cardiologists	Yes	85%
Surgeons	Yes	5%
Other: Allied professionals	Yes	10%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	12	12
Total lead extraction procedures	120	400
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	NCDR
Pacing	Yes	NCDR
Electrophysiology	Yes	NCDR
Availability of a national quality insurance system or complication registry		Yes
Official name: NCDR		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: NCDR		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	16	16
Number of ablations performed	8.500	8.750
Mean number of ablations per centre	531	547
Number of AF ablations	3.600	4.000
Number of ablation centres (> 50 AF ablations)	16	16
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	16	16
Number of LAA closures	not available	not available
Number of centres (LAA closures)	5	4
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	52	60
Number of physicians under training to become independent electrophysiologists	10	10
Availability of a national registry for interventional electrophysiology		Yes
Official name: NCDR		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

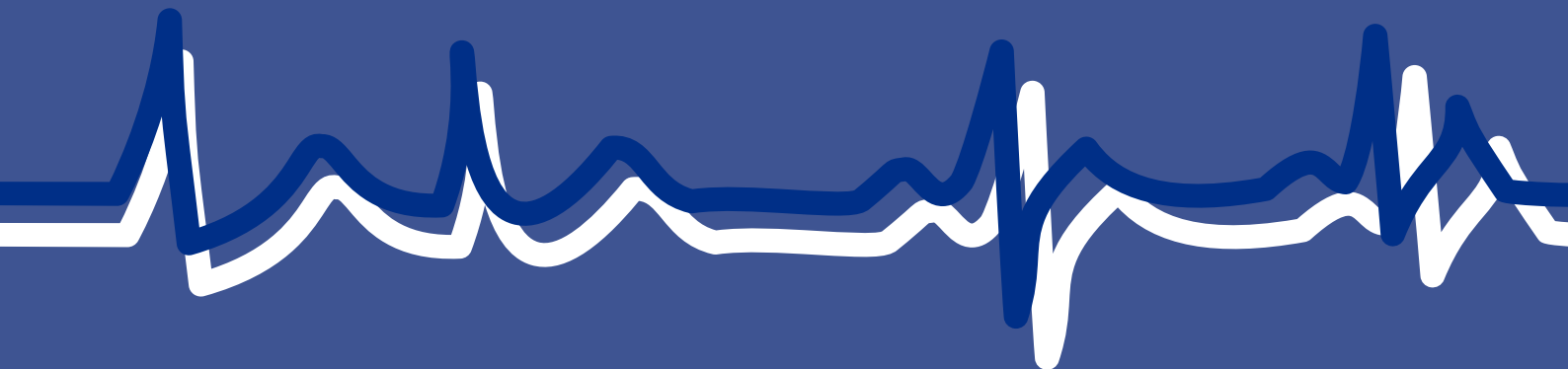
1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
<div><div></div><div><div>· Nederlandse Vereniging voor Cardiologie (NVVC)</div><div>· Netherlands Heart Rhythm Association (NHRA)</div></div></div>
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
<div><div></div><div><div>· EHRA White Book 2016</div><div>· Official statistics</div><div>· Survey from professional association</div><div>· Estimation</div><div>· NHRA/NCDR</div></div></div>

NORWAY



1. Statistics

Age pyramid for Norway



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	384,5	2014
Density of physicians (per 1.000 population)	4,4	2014
Density of nurses (per 1.000 population)	17,4	2014
Demographic information		Year
Population	5.265.158	2016
Population annual growth rate (%)	1,1	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	7,9	2014
Live births (per 1.000 population)	11,3	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	376,27	2016*
Gross domestic product per capita (U.S dollar-units)	71.497,29	2016*
Total expenditure on health as % of GDP	9,7	2014
General government expenditure on health as % of total expenditure on health	85,5	2014
Private expenditure on health as % of total expenditure on health	14,5	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	28,5%	not available

3. Healthcare System

National Health System.

Basic insurance availability			Yes					
Percentage of insured and uninsured citizens								
			2015	2016				
Insured citizens			100%	100%				
Uninsured citizens			0%	0%				
Distribution of insurance modality								
			2015	2016				
Public insurance company			99%	99%				
Private insurance company			0%	0%				
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			
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
The hospital	
Training centres availability	
Pacemaker	4
ICD implantation	4
CRT implantation	4
Electrophysiological studies and catheter ablation	4
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	80%
Percentage of academic centres among all practicing implanting devices centres	32%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	23	22
Total Pacemaker units implanted	4,121	3,908
Thereof, Leadless Pacemaker	5	23
First implants	3,217	3,042
Replacements	904	866
Specialist performing implants		
Cardiologists	Yes	99,6%
Surgeons	Yes	0,4%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	9	9
Total CRT units implanted	562	520
Thereof, CRT pacemaker	214	179
Thereof, CRT ICD	348	341
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	11	11
Total ICD units implanted	1,214	915
Thereof, Single chamber	222*	335
Thereof, Dual chamber	669*	578
Thereof, Subcutaneous ICD	0	2
First implants	891	618
Replacements	323	297
* First implants only		
Specialist performing implants		
Cardiologists	Yes	99,6%
Surgeons	Yes	0,4%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	11
Total loop recorders implanted	not available	476
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	3	3
Total lead extraction procedures	194	200
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	The Norwegian PM and ICD Registry
Pacing	Yes	The Norwegian PM 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		
	2015	2016
Number of ablation centres	5	5
Number of ablations performed	3.067	3.307
Mean number of ablations per centre	613	661
Number of AF ablations	1.460	1.677
Number of ablation centres (> 50 AF ablations)	5	5
Number of VT/VF ablations	not available	68
Number of ablation centres (> 10 VT ablations on structural heart diseases)	3	3
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	3
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	15	16
Number of physicians under training to become independent electrophysiologists	2	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	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

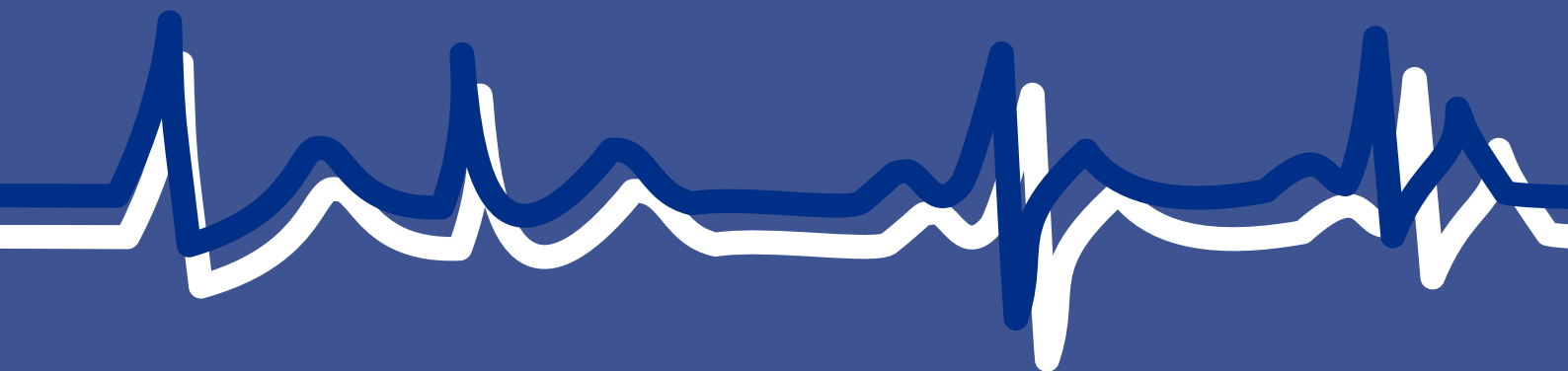
Name of National Cardiac Society, National Working Group or arrhythmia body

- | |
|--|
| <ul style="list-style-type: none">· Norwegian Cardiac Society· Norwegian Working Group of Arrhythmias |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|--|
| <ul style="list-style-type: none">· EHRA White Book 2016· Survey from professional association· Sales data· The Norwegian PM and ICD registry |
|--|

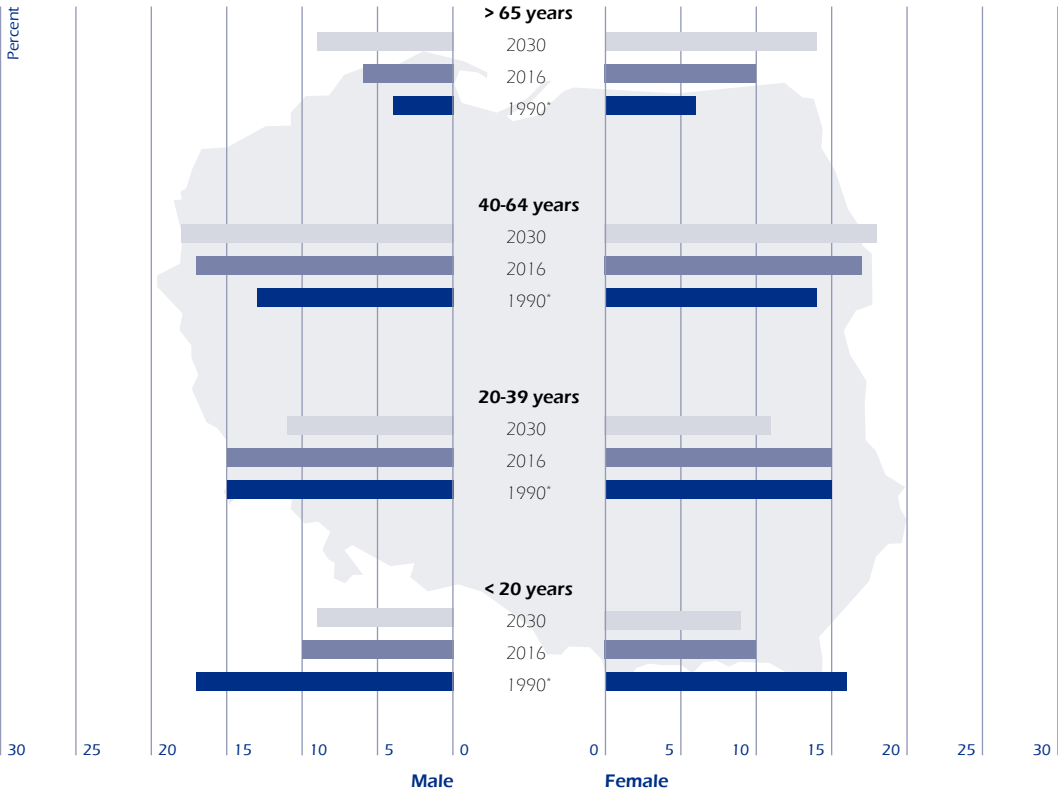
POLAND





1. Statistics

Age pyramid for Poland



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,9	2014
Beds (per 100.000 population)	662,8	2014
Density of physicians (per 1.000 population)	2,3	2014
Density of nurses (per 1.000 population)	5,8	2014
Demographic information		Year
Population	38.523.261	2016
Population annual growth rate (%)	-0,1	2016
Life expectancy at birth (in years)	78	2016
Death rate (per 1.000 population)	9,9	2014
Live births (per 1.000 population)	9,9	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	467,35	2016*
Gross domestic product per capita (U.S dollar-units)	12.309,30	2016*
Total expenditure on health as % of GDP	6,4	2014
General government expenditure on health as % of total expenditure on health	71,0	2014
Private expenditure on health as % of total expenditure on health	29,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	45%	not available



3. Healthcare System

National Health System for all citizens.

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

Requirements for citizens to qualify for public insurance: Monthly health care contribution.

Percentage of insured and uninsured citizens	2015	2016
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality	2015	2016
Public insurance company	90%	not available
Private insurance company	0%	not available
Private co-payment	10%	not available

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

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

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

Comments: Hospital: In the case of reimbursement for IRL, leadless pacemaker and S-ICD implantation decision may be taken individually by the NHS at the request of the hospital.

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Cardiologist	

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

Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
Ministry of Health	
Training centres availability	
Pacemaker	41
ICD implantation	26
CRT implantation	12
Electrophysiological studies and catheter ablation	10
Atrial fibrillation ablation	5
Number of universities (Schools of Medicine)	13
Percentage of academic centres among all practicing EP centres	14,3%
Percentage of academic centres among all practicing implanting devices centres	8,8%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	145	147
Total Pacemaker units implanted	30.494	30.295
Thereof, Leadless Pacemaker	not available	not available
First implants	21.542	21.151
Replacements	8.952	9.144
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%



6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total CRT units implanted	3.964	4.164
Thereof, CRT pacemaker	645	691
Thereof, CRT ICD	3.319	3.473
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	122	133
Total ICD units implanted	8.526	8.467
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	not available
First implants	6.711	6.366
Replacements	1.815	2.101
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total loop recorders implanted	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	30	22
Total lead extraction procedures	1.050	1.272
Specialist performing lead extractions		
Cardiologists	Yes	99%
Surgeons	Yes	1%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: In terms of legal use telemonitoring is possible, but the NHS does not refund it. Therefore, the number of patients using telemonitoring is limited.		
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		
	2015	2016
Number of ablation centres	85	91
Number of ablations performed	10.795	12.439
Mean number of ablations per centre	127	137
Number of AF ablations	3.253	3.512
Number of ablation centres (> 50 AF ablations)	21	not available
Number of VT/VF ablations	693	810
Number of ablation centres (> 10 VT ablations on structural heart diseases)	19	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

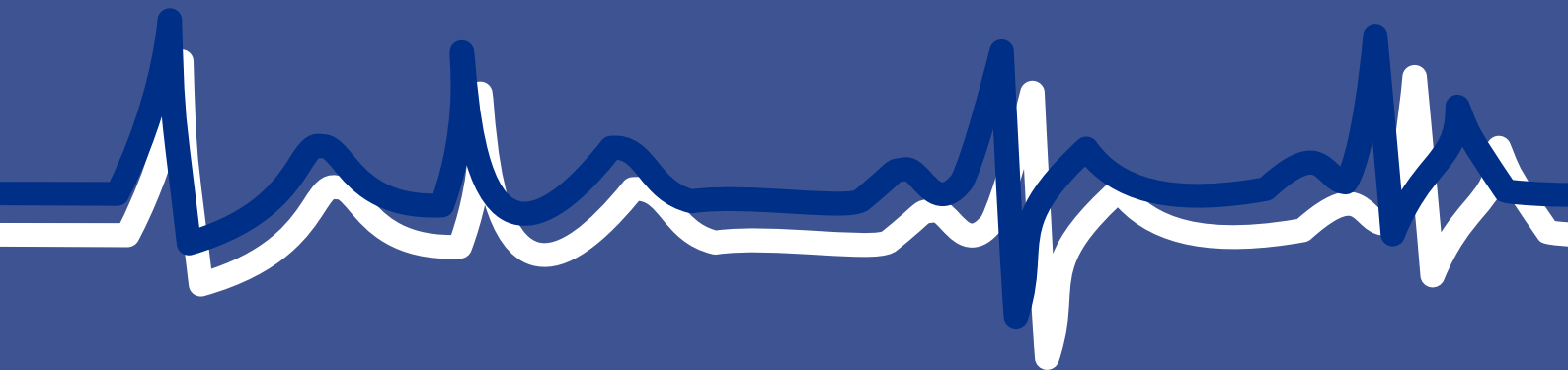
Name of National Cardiac Society, National Working Group or arrhythmia body

- Polish Heart Rhythm Society
- Polish Society of Cardiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- EHRA White Book 2016
- Official statistics

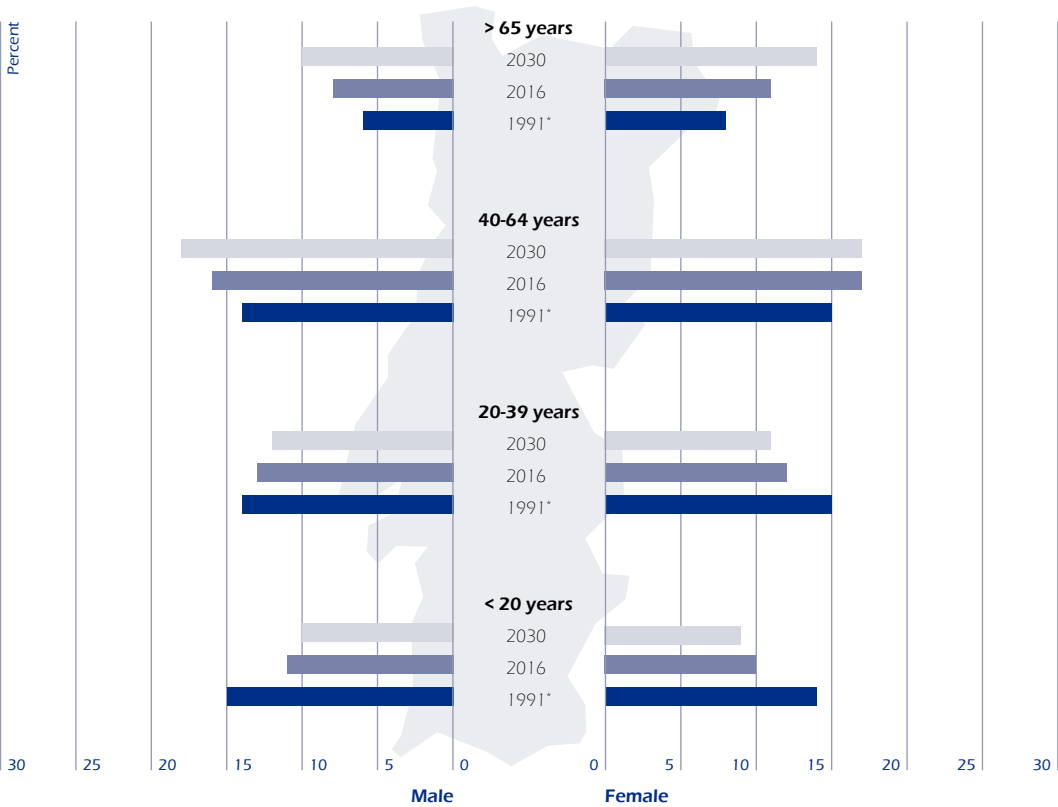
PORTUGAL





1. Statistics

Age pyramid for Portugal



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,2	2014
Beds (per 100.000 population)	331,9	2014
Density of physicians (per 1.000 population)	4,4	2014
Density of nurses (per 1.000 population)	6,4	2014
Demographic information		Year
Population	10.833.816	2016
Population annual growth rate (%)	0,1	2016
Life expectancy at birth (in years)	79	2016
Death rate (per 1.000 population)	10,2	2013
Live births (per 1.000 population)	7,9	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	205,86	2016*
Gross domestic product per capita (U.S dollar-units)	19.758,74	2016*
Total expenditure on health as % of GDP	9,5	2014
General government expenditure on health as % of total expenditure on health	64,8	2014
Private expenditure on health as % of total expenditure on health	35,2	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	30,6%	30%

3. Healthcare System

In 2006, 81,1% of the resident population resorted mostly the National Health Service (NHS) to have access to health services. The second most mentioned subsystem corresponded to the Civil Servants Health Subsystem (ADSE), used by 10,1% of residents in 2006. In the same year private insurances supported 2,4% of the health expenditure and the private health subsystem supported 1,9% of the health expenditure (Source: Portuguese National Health Plan 2012–2016, Portuguese Directorate-General of Health, and Organization for Economic Co-operation and Development).

Basic insurance availability		Yes					
Requirements for citizens to qualify for public insurance: All residents in Portugal have access to health care provided by the National Health Service (NHS), financed mainly through taxation. CO-payments have been increasing over time, and the level of cost sharing is highest for pharmaceutical products. Approximately one-fifth to a quarter of population enjoys a second (or more) layer of health insurance coverage through health subsystems and voluntary health insurance.							
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	100%	100%					
Uninsured citizens	0%	0%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	100%	100%					
Private insurance company	0%	0%					
Private co-payment	0%	0%					
Possibility to subscribing to private health insurance plans			Yes				
Co-payment necessary for the following therapy							
ICD devices			No				
Pacemakers			No				
Ablation			No				
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: Physicians: co-payment only in the private sector



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

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portuguese Medical Association
Invasive electrophysiology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portuguese Medical Association (Ordem dos Médicos), College of Subspecialty in Electrophysiology
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portuguese Medical Association

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Portuguese Medical Association (Ordem dos Médicos), College of Subspecialty in Electrophysiology	

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	No answer
Training centres availability	
Pacemaker	31
ICD implantation	32
CRT implantation	21
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	5
Number of universities (Schools of Medicine)	7
Percentage of academic centres among all practicing EP centres	20%
Percentage of academic centres among all practicing implanting devices centres	20%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	40	43
Total Pacemaker units implanted	8.769	9.613
Thereof, Leadless Pacemaker	16	50
First implants	6.974	8.114
Replacements	1.795	1.499
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	26	28
Total CRT units implanted	772	801
Thereof, CRT pacemaker	210	204
Thereof, CRT ICD	562	597
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	29	32
Total ICD units implanted	1.224	1.141
Thereof, Single chamber	975	889
Thereof, Dual chamber	241	185
Thereof, Subcutaneous ICD	8	67
First implants	1.001	954
Replacements	223	187
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	40	31
Total loop recorders implanted	320	450
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	6
Total lead extraction procedures	not available	91
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	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: INFARMED		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	25	21
Number of ablations performed	2.580	2.974
Mean number of ablations per centre	103	142
Number of AF ablations	743	885
Number of ablation centres (> 50 AF ablations)	6	5
Number of VT/VF ablations	not available	102
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	4
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	25	24
Number of physicians under training to become independent electrophysiologists	not available	20
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	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

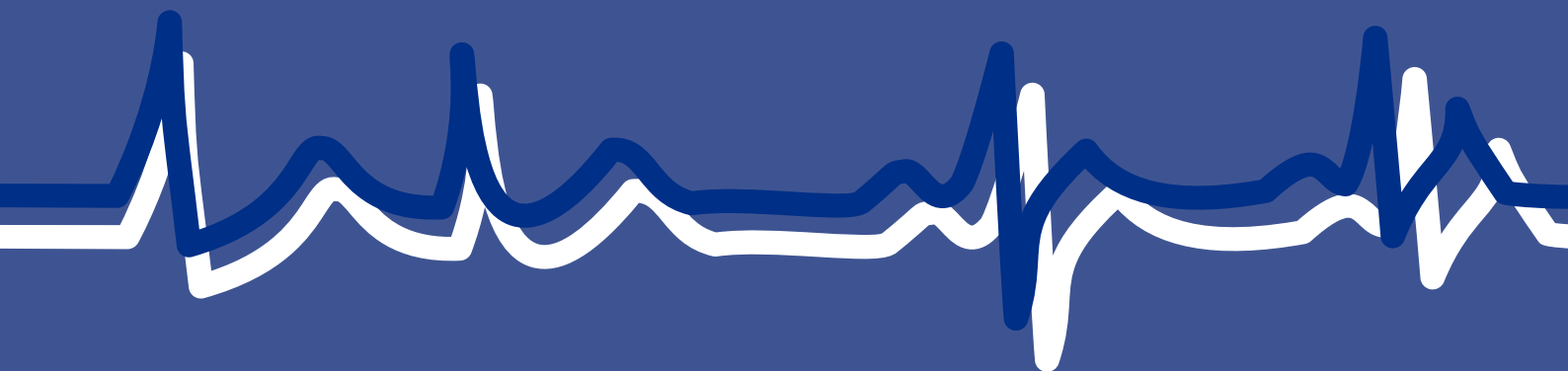
1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

Name of National Cardiac Society, National Working Group or arrhythmia body
<div><div></div><div>· APAPE: Portuguese Asociacion of Arrhythmology Pacing and Eletrophysiology</div></div>
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
<div><div></div><div>· EHRA White Book 2016</div><div>· Official statistics</div><div>· Survey from professional association</div></div>

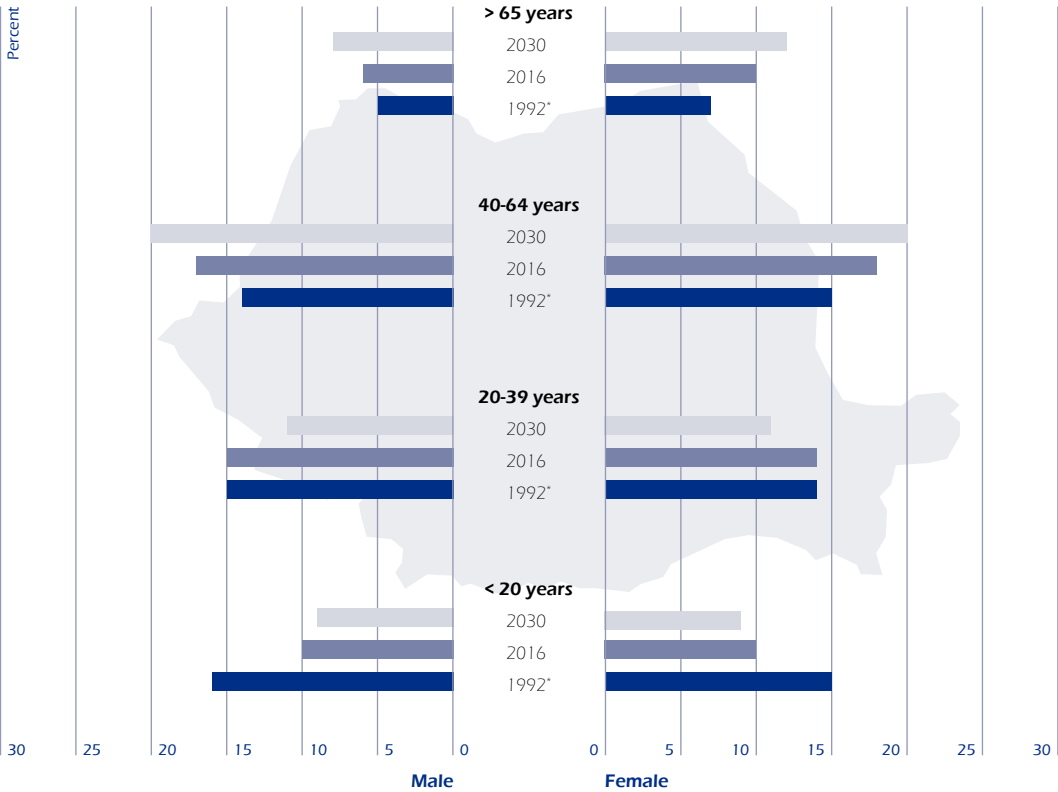
ROMANIA





1. Statistics

Age pyramid for Romania



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,4	2013
Beds (per 100.000 population)	596,4	2013
Density of physicians (per 1.000 population)	2,4	2013
Density of nurses (per 1.000 population)	5,5	2013
Demographic information		Year
Population	21.599.736	2016
Population annual growth rate (%)	-0,3	2016
Life expectancy at birth (in years)	75	2016
Death rate (per 1.000 population)	11,4	2014
Live births (per 1.000 population)	8,8	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	186,51	2016*
Gross domestic product per capita (U.S dollar-units)	9.438,99	2016*
Total expenditure on health as % of GDP	5,6	2014
General government expenditure on health as % of total expenditure on health	80,4	2014
Private expenditure on health as % of total expenditure on health	19,6	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

National Health System, some private clinics and hospitals, some of them receiving partial funds from NHS (The Ministry of Health is the coordinator of Health System).

Basic insurance availability	Yes
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Requirements for citizens to qualify for public insurance: to be employed, socially assisted or retired.

Percentage of insured and uninsured citizens		
	2015	2016
Insured citizens	not available	not available
Uninsured citizens	not available	not available

Distribution of insurance modality		
	2015	2016
Public insurance company	100%	100%
Private insurance company	0%	not available
Private co-payment	0%	not available

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

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

Comments: Yes, only in the private sector.

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

Comments: Hospitals: National Programs are available in selected centers, but limited by budget.



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

Comments: The centers receive money from National Programmes, but there is a fixed budget.

4. Education and Quality Control

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

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

Comments: We advanced the formalities for National Certification.

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
--	----

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

1 year



National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
We do not have one.	
Training centres availability	
Pacemaker	9
ICD implantation	9
CRT implantation	9
Electrophysiological studies and catheter ablation	8
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	12
Percentage of academic centres among all practicing EP centres	80%
Percentage of academic centres among all practicing implanting devices centres	85%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	24	24
Total Pacemaker units implanted	3.918	5.161
Thereof, Leadless Pacemaker	0	0
First implants	3.538	4.651
Replacements	380	510
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	12	12
Total CRT units implanted	276	421
Thereof, CRT pacemaker	156	238
Thereof, CRT ICD	120	183
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	16	15
Total ICD units implanted	300	535
Thereof, Single chamber	210	413
Thereof, Dual chamber	89	122
Thereof, Subcutaneous ICD	1	0
First implants	257	466
Replacements	43	69
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	3
Total loop recorders implanted	3	13
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	4	5
Total lead extraction procedures	15	31
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
	Official name	
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	12	14
Number of ablations performed	1.194	1.180
Mean number of ablations per centre	100	84
Number of AF ablations	132	227
Number of ablation centres (> 50 AF ablations)	1	2
Number of VT/VF ablations	50	68
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	18	22
Number of physicians under training to become independent electrophysiologists	3	8
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	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

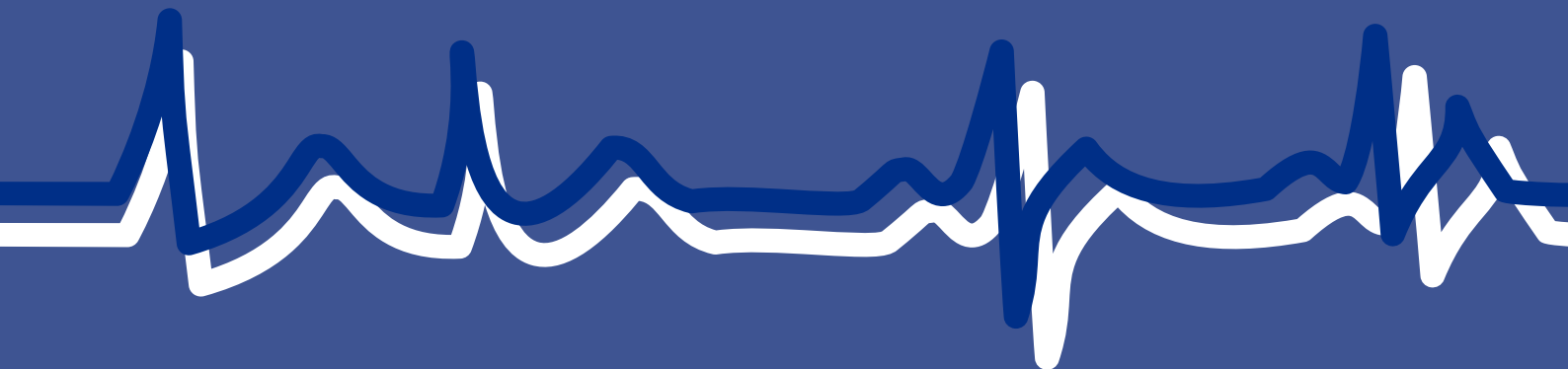
Name of National Cardiac Society, National Working Group or arrhythmia body

- | |
|---|
| <ul style="list-style-type: none">· Working Group of Arrhythmias, Electrophysiology and Implantable Devices of Romanian Society of Cardiology |
|---|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

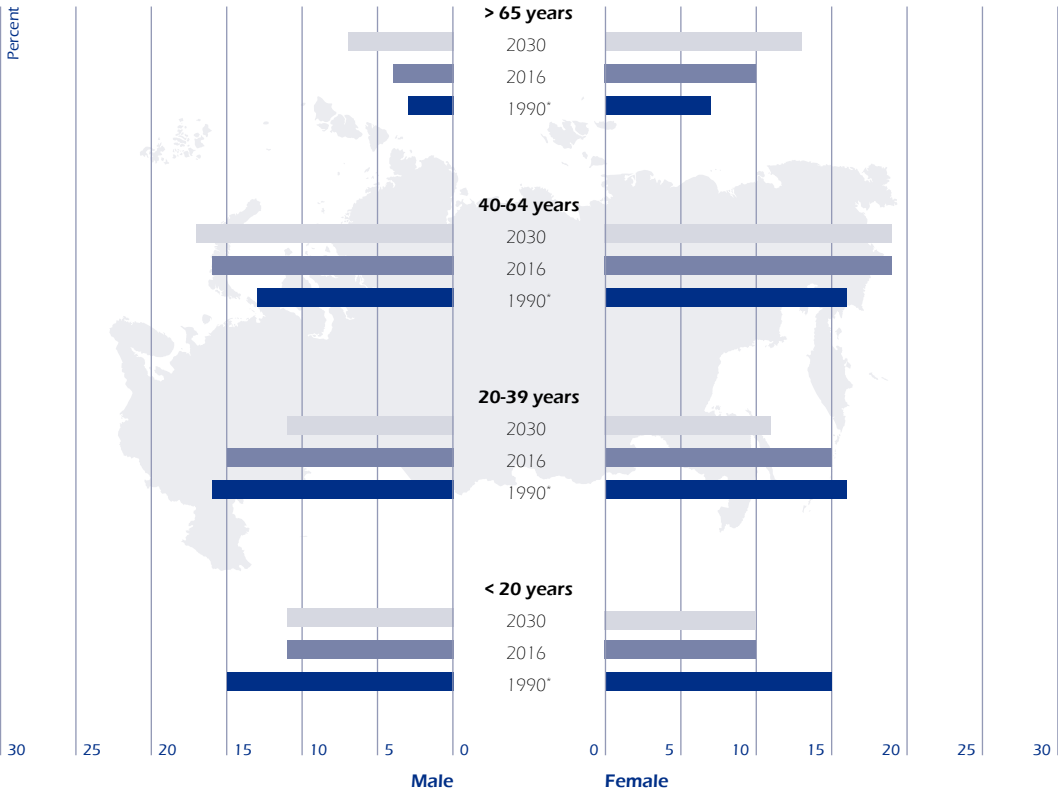
- | |
|--|
| <ul style="list-style-type: none">· EHRA White Book 2016· Survey from professional association· Estimation |
|--|

RUSSIAN FEDERATION



1. Statistics

Age pyramid for Russian Federation



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	3,5	2013
Beds (per 100.000 population)	817,5	2013
Density of physicians (per 1.000 population)	3,3	2014
Density of nurses (per 1.000 population)	4,6	2014

Demographic information		Year
Population	142.355.415	2016
Population annual growth rate (%)	-0,1	2016
Life expectancy at birth (in years)	71	2016
Death rate (per 1.000 population)	13,5	2011
Live births (per 1.000 population)	12,6	2011

Economic information		Year
Gross domestic product (U.S dollar-billions)	1.267,75	2016*
Gross domestic product per capita (U.S dollar-units)	8.838,23	2016*
Total expenditure on health as % of GDP	7,1	2014
General government expenditure on health as % of total expenditure on health	52,2	2014
Private expenditure on health as % of total expenditure on health	47,8	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	53%	53%

3. Healthcare System

Compulsory health insurance system.

Basic insurance availability			Yes						
Requirements for citizens to qualify for public insurance: all citizens.									
Percentage of insured and uninsured citizens									
	2015	2016							
Insured citizens	not available	not available							
Uninsured citizens	not available	not available							
Distribution of insurance modality									
	2015	2016							
Public insurance company	90%	90%							
Private insurance company	7%	7%							
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				Yes					
Ablation				No					
Reimbursement availability for physicians and hospitals									
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer		
Physician		Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital	
Internal loop recorders		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
RSSA	

Required period of training to perform implantations	Yes
	3 years

Suggested period of training to perform implantations	Yes
	3 years
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
RSSA	
Training centres availability	
Pacemaker	10
ICD implantation	7
CRT implantation	7
Electrophysiological studies and catheter ablation	12
Atrial fibrillation ablation	9
Number of universities (Schools of Medicine)	not available
Percentage of academic centres among all practicing EP centres	not available
Percentage of academic centres among all practicing implanting devices centres	not available

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	140	142
Total Pacemaker units implanted	40.461	36.462
Thereof, Leadless Pacemaker	not available	not available
First implants	32.811	28.411
Replacements	7.650	8.051
Specialist performing implants		
Cardiologists	Yes	80%
Surgeons	Yes	18%
Other	Yes	2%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	37	39
Total CRT units implanted	1.006	995
Thereof, CRT pacemaker	340	284
Thereof, CRT ICD	666	711
Specialist performing implants		
Cardiologists	Yes	60%
Surgeons	Yes	40%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	48	49
Total ICD units implanted	2.401	1.418
Thereof, Single chamber	894	511
Thereof, Dual chamber	1.507	907
Thereof, Subcutaneous ICD	not available	0
First implants	1.742	1.126
Replacements	659	292
Specialist performing implants		
Cardiologists	Yes	70%
Surgeons	Yes	30%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
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		
	2015	2016
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	RSSA
Pacing	Yes	RSSA
Electrophysiology	Yes	RSSA
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: Federal center for interventional and surgical arrhythmology		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	69	72
Number of ablations performed	25.020	22.618
Mean number of ablations per centre	363	314
Number of AF ablations	8.289	7.219
Number of ablation centres (> 50 AF ablations)	27	29
Number of VT/VF ablations	1.771	1.719
Number of ablation centres (> 10 VT ablations on structural heart diseases)	34	35
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	66	89
Availability of a national registry for interventional electrophysiology		Yes
Official name: RSSA		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1 = no obstacle, 5 = great obstacle						
1 = top, 6 = lowest						

13. Sources

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

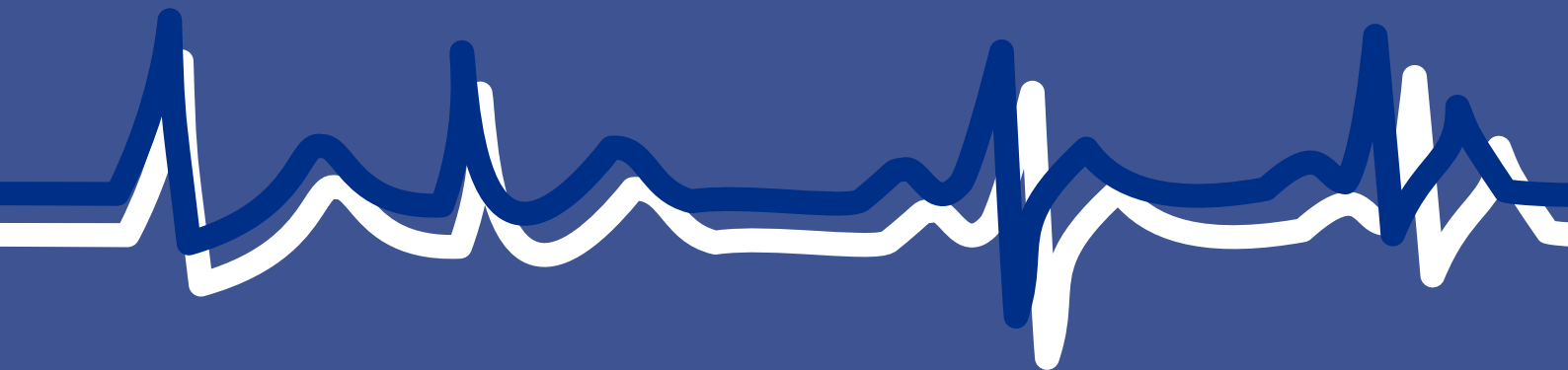
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| <ul style="list-style-type: none">· Russian Scientific Society of Arrhythmology, Electrophysiology and Pacing (RSSA) |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association |
|---|

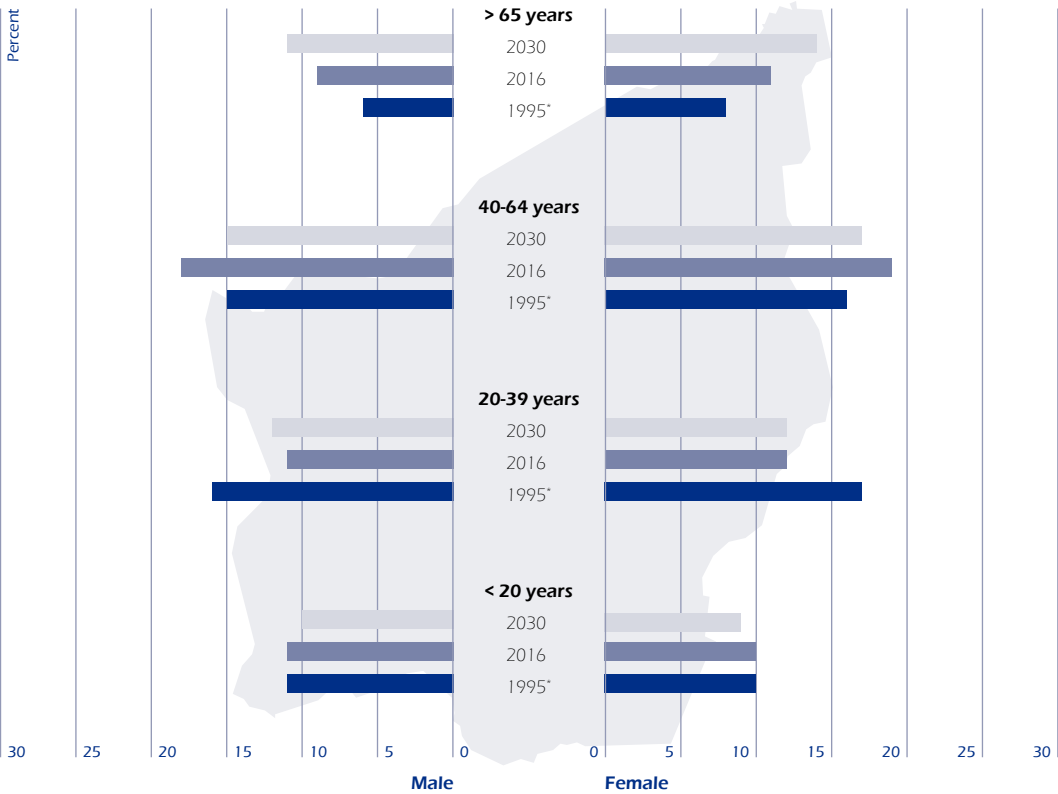


SAN MARINO



1. Statistics

Age pyramid for San Marino



* 1990 or last available



Healthcare data		Year
Hospitals (per 100.000 population)	3,2	2014
Beds (per 100.000 population)	357,7	2014
Density of physicians (per 1.000 population)	6,4	2014
Density of nurses (per 1.000 population)	8,5	2014

Demographic information		Year
Population	33.285	2016
Population annual growth rate (%)	0,8	2016
Life expectancy at birth (in years)	83	2016
Death rate (per 1.000 population)	7,3	2005
Live births (per 1.000 population)	8,2	2015

Economic information		Year
Gross domestic product (U.S dollar-billions)	1,56	2016*
Gross domestic product per capita (U.S dollar-units)	49.579,45	2016*
Total expenditure on health as % of GDP	6,1	2014
General government expenditure on health as % of total expenditure on health	93,6	2014
Private expenditure on health as % of total expenditure on health	6,4	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	28,6%	28%

3. Healthcare System

Healthcare system in San Marino is organized as a Free Public National Health System, in which every citizen can receive free medical assistance from birth to death. Healthcare is one of the main spending items of our country. Therefore nobody needs to pay any kind of insurance to get medical assistance.

Basic insurance availability		Yes						
Requirements for citizens to qualify for public insurance: San Marino citizenship.								
Percentage of insured and uninsured citizens								
	2015	2016						
Insured citizens	100%	100%						
Uninsured citizens	0%	0%						
Distribution of insurance modality								
	2015	2016						
Public insurance company	100%	100%						
Private insurance company	0%	0%						
Private co-payment	0%	0%						
Possibility to subscribing to private health insurance plans			Yes					
Co-payment necessary for the following therapy								
ICD devices		No						
Pacemakers		No						
Ablation		No						
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
	Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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

4. Education and Quality Control

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

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

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologist with expertise and proficiency in electrophysiology
ICD or pacemaker implants	Yes	Cardiologist with expertise and proficiency in electrophysiology

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
National Ministry of Health	
Training centres availability	
Pacemaker	0
ICD implantation	0
CRT implantation	0
Electrophysiological studies and catheter ablation	0
Atrial fibrillation ablation	0
Number of universities (Schools of Medicine)	0
Percentage of academic centres among all practicing EP centres	0%
Percentage of academic centres among all practicing implanting devices centres	0%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	0
Total Pacemaker units implanted	11	21
Thereof, Leadless Pacemaker	0	0
First implants	7	12
Replacements	4	9
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	0
Total CRT units implanted	2	2
Thereof, CRT pacemaker	0	0
Thereof, CRT ICD	2	2
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	1	0
Total ICD units implanted	8	10
Thereof, Single chamber	4	4
Thereof, Dual chamber	3	5
Thereof, Subcutaneous ICD	1	1
First implants	5	8
Replacements	3	2
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	1	0
Total loop recorders implanted	2	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		
	2015	2016
Hospitals performed lead extractions	0	0
Total lead extraction procedures	0	1
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	San Marino State Hospital Cardiology registry of cardiac devices
Pacing	Yes	San Marino State Hospital Cardiology registry of cardiac devices
Electrophysiology	Yes	San Marino State Hospital Cardiology registry of cardiac devices
Availability of a national quality insurance system or complication registry		Yes
Official name: San Marino State Hospital Cardiology registry of cardiac devices		
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		
	2015	2016
Number of ablation centres	0	0
Number of ablations performed	0	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 VT/VF ablations	0	0
Number of ablation centres (> 10 VT ablations on structural heart diseases)	0	0
Number of LAA closures	0	2
Number of centres (LAA closures)	0	1
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	0	0
Number of physicians under training to become independent electrophysiologists	0	0
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle 1 = top, 6 = lowest

13. Sources

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

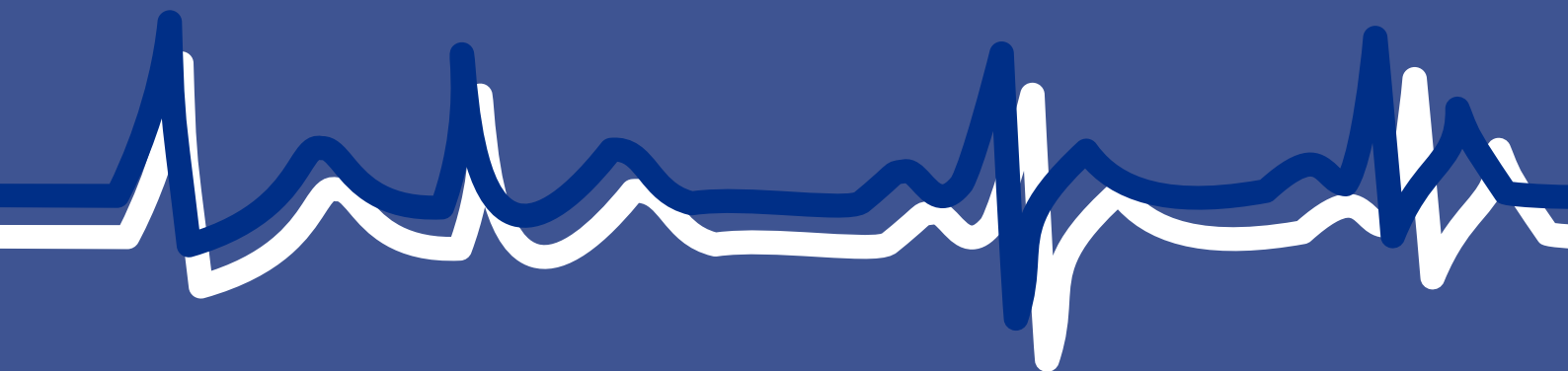
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| <ul style="list-style-type: none">· San Marino Society of Cardiology |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Estimation |
|---|

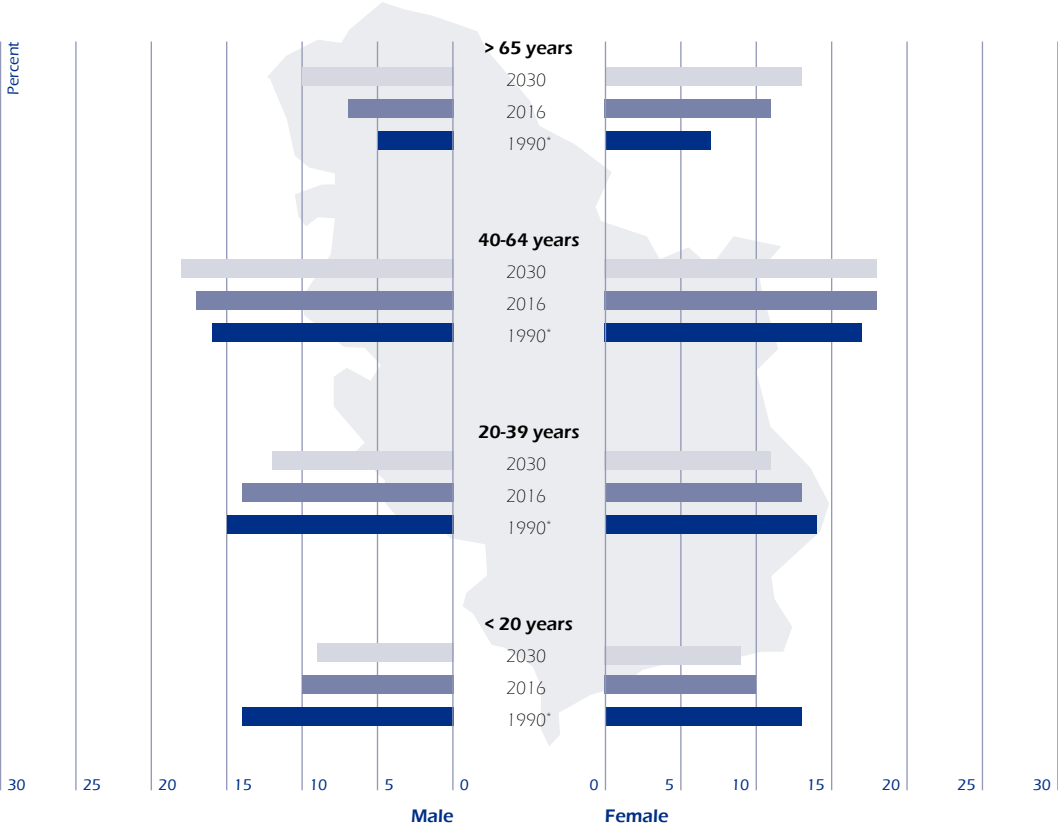


SERBIA



1. Statistics

Age pyramid for Serbia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,4	2014
Beds (per 100.000 population)	552,4	2014
Density of physicians (per 1.000 population)	3,1	2014
Density of nurses (per 1.000 population)	6,3	2014
Demographic information		Year
Population	7.143.921	2016
Population annual growth rate (%)	-0,5	2016
Life expectancy at birth (in years)	76	2016
Death rate (per 1.000 population)	14,2	2014
Live births (per 1.000 population)	9,3	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	37,76	2016*
Gross domestic product per capita (U.S dollar-units)	5.293,92	2016*
Total expenditure on health as % of GDP	10,4	2014
General government expenditure on health as % of total expenditure on health	61,9	2014
Private expenditure on health as % of total expenditure on health	38,1	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	56%	56%

3. Healthcare System

National Health System; medical insurance for all.

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

Requirements for citizens to qualify for public insurance: All

Percentage of insured and uninsured citizens	2015	2016
--	------	------

Insured citizens	100%	95%
Uninsured citizens	0%	5%

Distribution of insurance modality	2015	2016
------------------------------------	------	------

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 private sector 100%. For all implanting devices patients are charged 10% of the price of the device, with maximal amount of 200 Euros; some categories of pts (diabetic, etc) are free of charge.

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

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

Comments:
Hospitals: State Insurance Fund organizes state tender (biannual) according to the rate of implantation (ablation) from the previous year per all hospitals.

Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input type="checkbox"/>
Restricted to certain number of treatments/budget	<input checked="" type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>
Comments: Budget is the only factor for the restrictions (physicians are faced to choose between numbers and latest technology).	

4. Education and Quality Control

National certification availability					
	Yes, it's required for practice	Yes, but it's not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Confirmation of pacemaker/ICD implantation and follow up training
Invasive electrophysiology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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

Specialist required for		
	Specialist	
Catheter ablation	Yes	Internal medicine specialist, cardiologist
ICD or pacemaker implants	Yes	Internal medicine specialist, cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Working Group for electrophysiology, Cardiology Society of Serbia	

Required period of training to perform implantations	Yes
0,5 year	

Suggested period of training to perform implantations	Yes
	1 year
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
Ministry of health	
Training centres availability	
Pacemaker	4
ICD implantation	4
CRT implantation	3
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	17	16
Total Pacemaker units implanted	3.724	3.004
Thereof, Leadless Pacemaker	7	0
First implants	3.289	2.704
Replacements	435	300
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	6	6
Total CRT units implanted	313	313
Thereof, CRT pacemaker	234	242
Thereof, CRT ICD	79	71
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	11	13
Total ICD units implanted	437	586
Thereof, Single chamber	357	466
Thereof, Dual chamber	80	120
Thereof, Subcutaneous ICD	0	not available
First implants	396	506
Replacements	41	80
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	10	5
Total loop recorders implanted	25	36
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	3	1
Total lead extraction procedures	28	24
Specialist performing lead extractions		
Cardiologists	Yes	90%
Surgeons	Yes	10%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Price		
National registry for		
	Official name	
ICD	Yes	National referral pacemaker center data base
Pacing	Yes	National referral pacemaker center data base
Electrophysiology	Yes	Working group on Electrophysiology and ablation 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		
	2015	2016
Number of ablation centres	3	4
Number of ablations performed	1.052	1.030
Mean number of ablations per centre	351	258
Number of AF ablations	305	335
Number of ablation centres (> 50 AF ablations)	2	2
Number of VT/VF ablations	75	41
Number of ablation centres (> 10 VT ablations on structural heart diseases)	2	2
Number of LAA closures	35	not available
Number of centres (LAA closures)	20	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	11	11
Number of physicians under training to become independent electrophysiologists	1	4
Availability of a national registry for interventional electrophysiology		Yes
Official name: Working Group on Electrophysiology and ablation registry		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

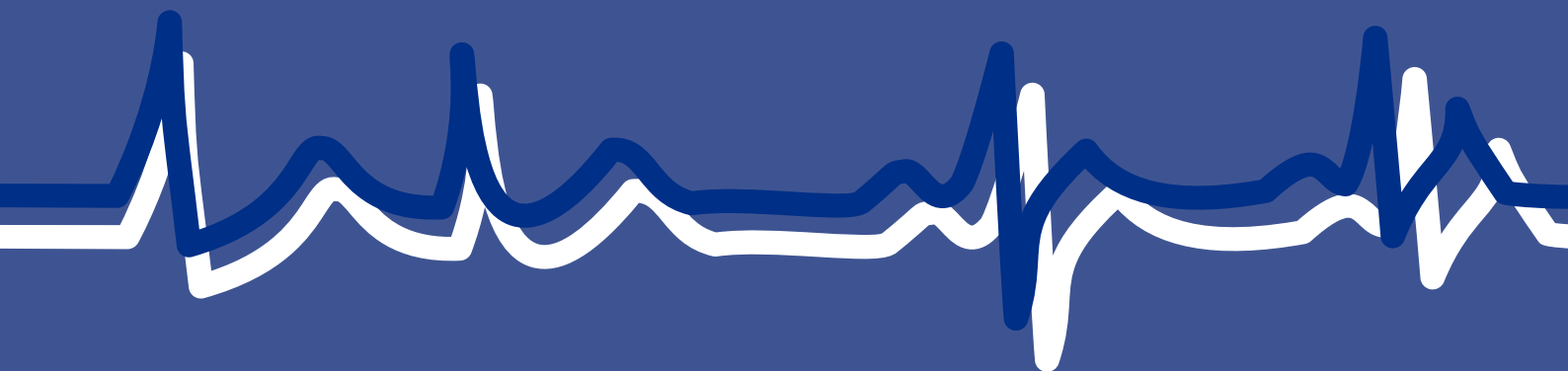
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1 = top, 6 = lowest

13. Sources

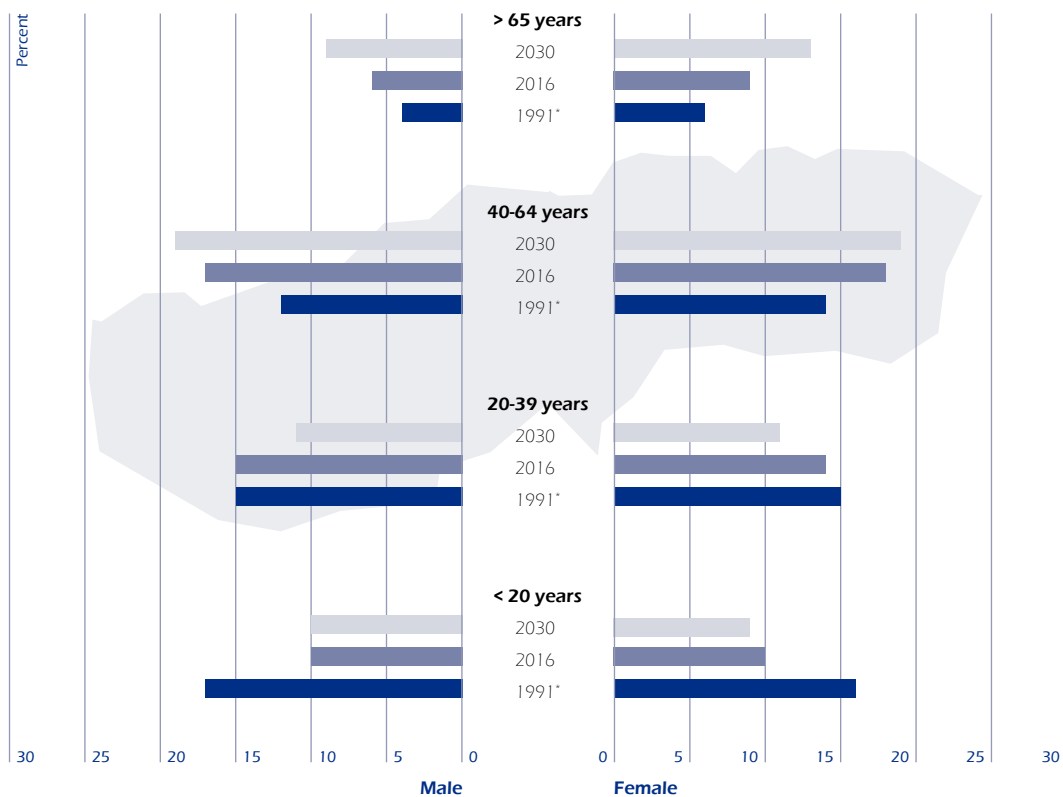
Name of National Cardiac Society, National Working Group or arrhythmia body
<ul style="list-style-type: none"> · Working Group on cardiac pacing and resynchronization · Cardiology society of Serbia · Working Group on electrophysiology and ablation · Cardiology society of Serbia
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
<ul style="list-style-type: none"> · EHRA White Book 2016 · Ministry of health · National institute for statistics in medicine „Batut“ · National referral pacemaker center data base · Working Group on EPS and ablation registry

SLOVAKIA



1. Statistics

Age pyramid for Slovakia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,5	2014
Beds (per 100.000 population)	578,5	2014
Density of physicians (per 1.000 population)	3,0	2007
Density of nurses (per 1.000 population)	6,1	2014
Demographic information		Year
Population	5.445.802	2016
Population annual growth rate (%)	0,0	2016
Life expectancy at birth (in years)	77	2016
Death rate (per 1.000 population)	9,5	2014
Live births (per 1.000 population)	10,2	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	90,26	2016*
Gross domestic product per capita (U.S dollar-units)	16.648,06	2016*
Total expenditure on health as % of GDP	8,1	2014
General government expenditure on health as % of total expenditure on health	72,5	2014
Private expenditure on health as % of total expenditure on health	27,5	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	45%	50%

3. Healthcare System

National Health System.

Basic insurance availability				Yes				
Percentage of insured and uninsured citizens								
				2015		2016		
Insured citizens				100%		100%		
Uninsured citizens				0%		0%		
Distribution of insurance modality								
				2015		2016		
Public insurance company				75%		70%		
Private insurance company				25%		30%		
Private co-payment				0%		0%		
Possibility to subscribing to private health insurance plans								No
Co-payment necessary for the following therapy								
ICD devices								No
Pacemakers								No
Ablation								No
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician		Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiologists
ICD or pacemaker implants	Yes Cardiologists, surgeons

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Cardiologists	

Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No answer
Willingness to install quality control system	No answer
Responsible for quality control	
State Institute for Drug Control	
Training centres availability	
Pacemaker	3
ICD implantation	3
CRT implantation	3
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	3
Number of universities (Schools of Medicine)	4
Percentage of academic centres among all practicing EP centres	75%
Percentage of academic centres among all practicing implanting devices centres	50%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	14	14
Total Pacemaker units implanted	3.664	3.776
Thereof, Leadless Pacemaker	0	0
First implants	2.810	2.908
Replacements	854	868
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	4	5
Total CRT units implanted	588	490
Thereof, CRT pacemaker	209	164
Thereof, CRT ICD	379	326
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	4	4
Total ICD units implanted	665	615
Thereof, Single chamber	513	488
Thereof, Dual chamber	152	127
Thereof, Subcutaneous ICD	0	0
First implants	514	490
Replacements	151	125
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	12	14
Total loop recorders implanted	120	300
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	3	3
Total lead extraction procedures	119	82
Specialist performing lead extractions		
Cardiologists	Yes	99%
Surgeons	Yes	1%

10. Device specific

Availability of remote monitoring of devices		Yes
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
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		
	2015	2016
Number of ablation centres	4	4
Number of ablations performed	1.204	1.329
Mean number of ablations per centre	301	332
Number of AF ablations	224	271
Number of ablation centres (> 50 AF ablations)	3	3
Number of VT/VF ablations	106	132
Number of ablation centres (> 10 VT ablations on structural heart diseases)	3	3
Number of LAA closures	not available	3
Number of centres (LAA closures)	not available	60
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	22	15
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		Yes
Official name: SLOVABLO		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	No					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Low awareness of guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

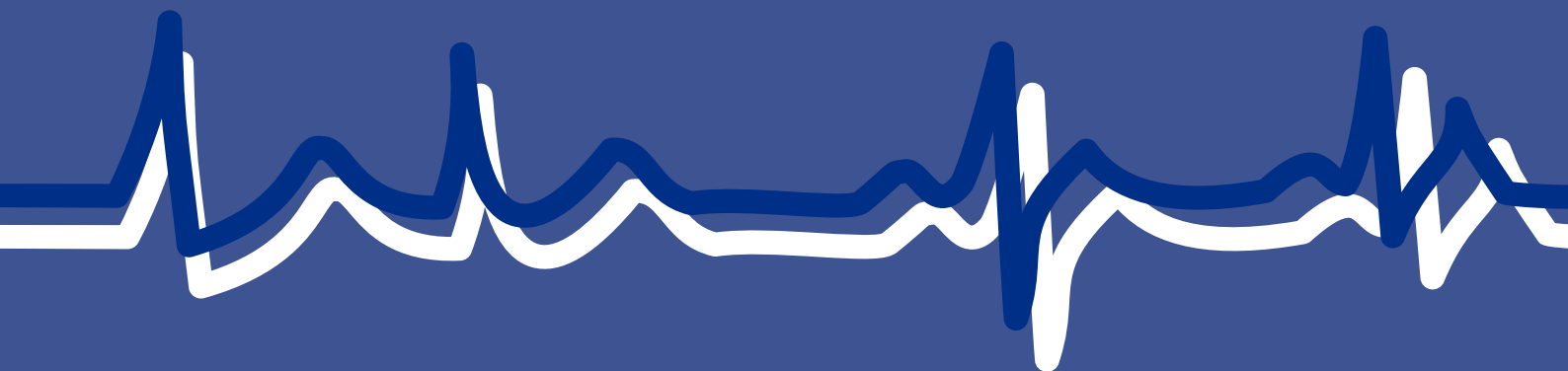
Name of National Cardiac Society, National Working Group or arrhythmia body

- | |
|--|
| <ul style="list-style-type: none">· Slovak Heart Rhythm Association - SASA |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics - Ministry of Health· Survey from professional association - Slovak Heart Rhythm Association SASA |
|---|

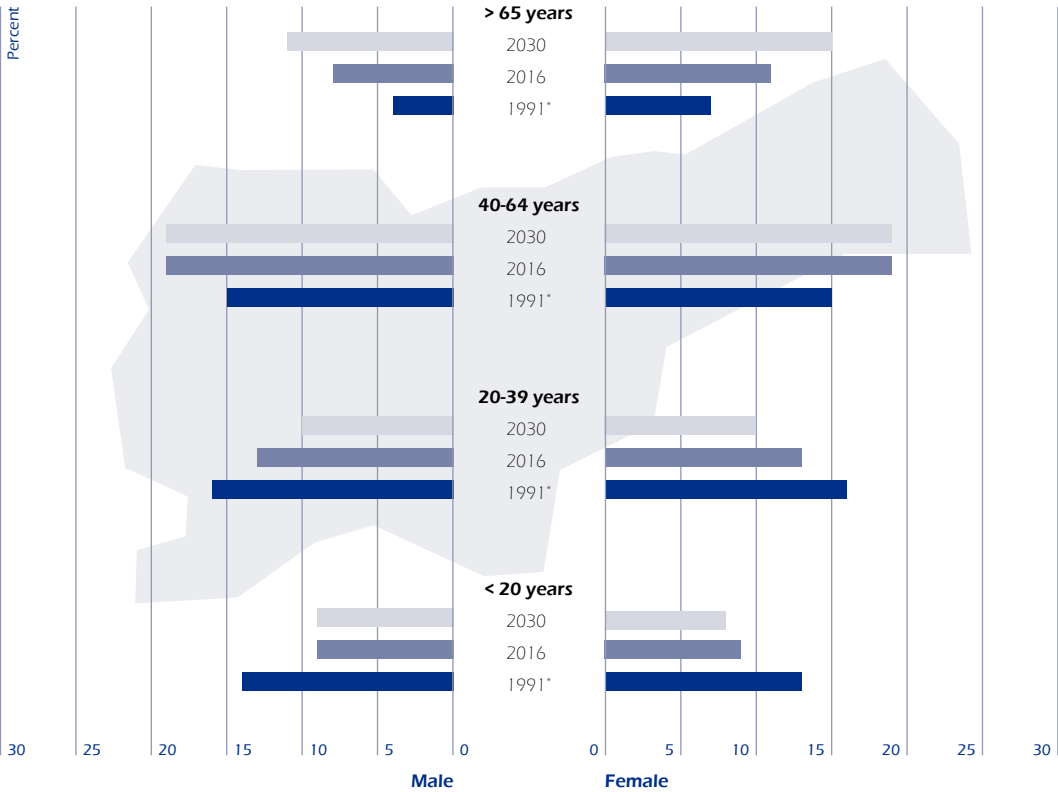
SLOVENIA





1. Statistics

Age pyramid for Slovenia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,4	2015
Beds (per 100.000 population)	453,8	2014
Density of physicians (per 1.000 population)	2,8	2014
Density of nurses (per 1.000 population)	8,6	2014
Demographic information		Year
Population	1.978.029	2016
Population annual growth rate (%)	-0,3	2016
Life expectancy at birth (in years)	78	2016
Death rate (per 1.000 population)	9,1	2010
Live births (per 1.000 population)	10,1	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	44,12	2016*
Gross domestic product per capita (U.S dollar-units)	21.370,00	2016*
Total expenditure on health as % of GDP	9,2	2014
General government expenditure on health as % of total expenditure on health	71,7	2014
Private expenditure on health as % of total expenditure on health	28,3	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

NHS Fund

Basic insurance availability				Yes				
Percentage of insured and uninsured citizens								
				2015		2016		
Insured citizens				99%		99%		
Uninsured citizens				1%		1%		
Distribution of insurance modality								
				2015		2016		
Public insurance company				4%		4%		
Private insurance company				0%		0%		
Private co-payment				96%		96%		
Possibility to subscribing to private health insurance plans				No answer				
Co-payment necessary for the following therapy								
ICD devices				No				
Pacemakers				No				
Ablation				No				
Reimbursement availability for physicians and hospitals								
Physician/Hospital receives per process reimbursement			Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician		Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICD primary prevention		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICD secondary prevention		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CRT devices		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ablation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Leadless Pacing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subcutaneous ICD		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Internist, cardiologist
ICD or pacemaker implants	Yes Internist, cardiologist, surgeon

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	No
Responsible for quality control	
Agency of the Republic of Slovenia for Medicines and Medical Devices	
Training centres availability	
Pacemaker	2
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	2
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	2
Percentage of academic centres among all practicing EP centres	100%
Percentage of academic centres among all practicing implanting devices centres	22%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	9	9
Total Pacemaker units implanted	1.235	1.620
Thereof, Leadless Pacemaker	0	0
First implants	1.015	1.424
Replacements	220	196
Specialist performing implants		
Cardiologists	Yes	30%
Surgeons	Yes	70%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	2	2
Total CRT units implanted	164	135
Thereof, CRT pacemaker	47	45
Thereof, CRT ICD	117	90
Specialist performing implants		
Cardiologists	Yes	89%
Surgeons	Yes	11%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	3	2
Total ICD units implanted	228	315
Thereof, Single chamber	177	not available
Thereof, Dual chamber	51	not available
Thereof, Subcutaneous ICD	0	0
First implants	204	280
Replacements	24	35
Specialist performing implants		
Cardiologists	Yes	58%
Surgeons	Yes	42%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	3	4
Total loop recorders implanted	40	41
Specialist performing implants		
Cardiologists	Yes	83%
Surgeons	Yes	17%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	1	1
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
		Official name
ICD	Yes	Working Group on Arrhythmias, Slovenian Society of Cardiology
Pacing	Yes	Working Group on Arrhythmias, Slovenian Society of Cardiology
Electrophysiology	Yes	Working Group on Arrhythmias, Slovenian Society of Cardiology
Availability of a national quality insurance system or complication registry		Yes
Official name: Agency of the Republic of Slovenia for Medicines and Medical Devices		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: Agency of the Republic of Slovenia for Medicines and Medical Devices		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	3	2
Number of ablations performed	712	639
Mean number of ablations per centre	237	320
Number of AF ablations	214	207
Number of ablation centres (> 50 AF ablations)	2	1
Number of VT/VF ablations	28	64
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	1
Number of LAA closures	17	8
Number of centres (LAA closures)	1	1
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	7	7
Number of physicians under training to become independent electrophysiologists	1	2
Availability of a national registry for interventional electrophysiology		Yes
Official name: Working Group on Arrhythmias, Slovenian Society of Cardiology		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No answer					
U.S.	No answer					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1

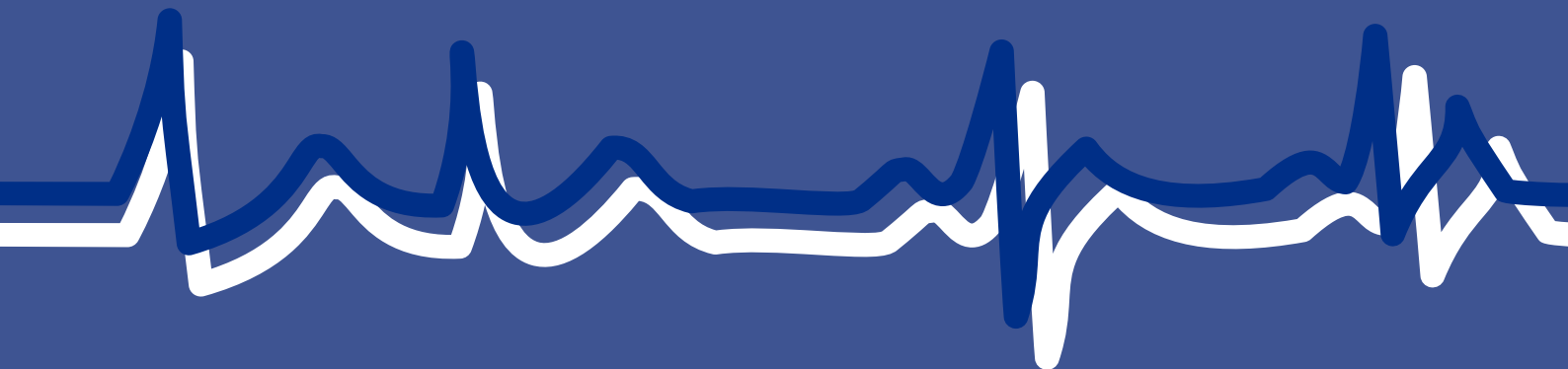
1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

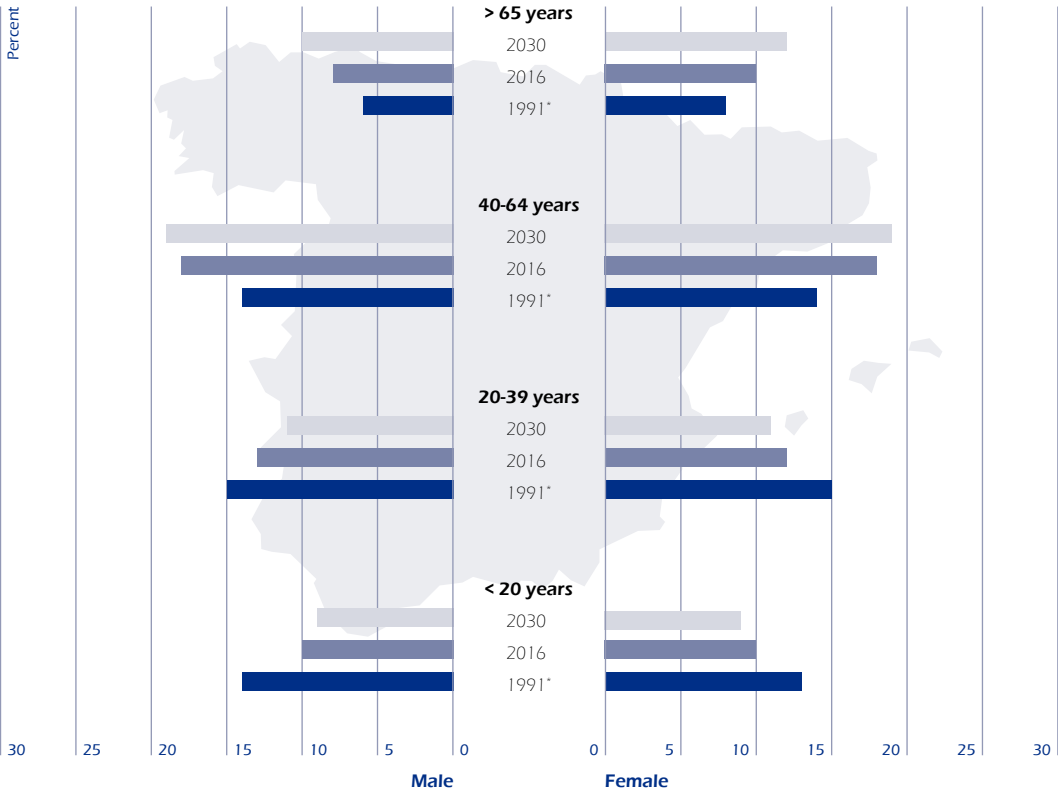
Name of National Cardiac Society, National Working Group or arrhythmia body
<div><div>· Working Group on Arrhythmias, Slovenian Society of Cardiology</div></div>
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
<div><div>· EHRA White Book 2016</div><div>· Survey from professional association</div><div>· Estimation</div></div>

SPAIN



1. Statistics

Age pyramid for Spain



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	1,6	2014
Beds (per 100.000 population)	296,9	2014
Density of physicians (per 1.000 population)	3,8	2014
Density of nurses (per 1.000 population)	5,3	2014
Demographic information		Year
Population	48.563.476	2016
Population annual growth rate (%)	0,9	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	8,5	2014
Live births (per 1.000 population)	9,2	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	1.252,16	2016*
Gross domestic product per capita (U.S dollar-units)	27.012,16	2016*
Total expenditure on health as % of GDP	9,0	2014
General government expenditure on health as % of total expenditure on health	70,9	2014
Private expenditure on health as % of total expenditure on health	29,1	2014
* IMF estimative		

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	30,09%	30%

3. Healthcare System

Spanish healthcare is based on a national health system that covers almost all population. Regional autonomous communities have their own budget and decide how to organize and deliver resources. Private insurance companies offer complementary healthcare coverage.

Basic insurance availability	Yes
Requirements for citizens to qualify for public insurance: Employed or self-employed persons affiliated (contributors) to the Social Security System Pensioners of the Social Security System Unemployed persons receiving unemployment benefits Unemployed persons who have exhausted unemployment benefits Persons not previously covered, with incomes less than 100000€ annually, which are in some of the following situations: Spanish nationality residing in Spanish territory Nationals of a Member State of the European Union, the European Economic Area or Switzerland registered in the Central Register of Foreigners. Nationals of a country other than those mentioned in the preceding paragraphs, or stateless persons, and holders of an authorization to reside in Spanish territory, while it remains in force under the terms provided in their specific legislation. A person has the status of beneficiary of an insured person when is one of the following situations: Being the spouse of the insured person or live with it with a relationship similar to marriage affectivity, forming a partnership. Be former spouse, or be judicially separated. Descent, or person assimilated to it, the insured person or spouse, even if it is legally separated from his former dependent spouse or your partner, in both cases by the insured and under 26 years or, should be over that age have a disability recognized in an equal or greater than 65% grade.	
Percentage of insured and uninsured citizens	
	2015
Insured citizens	99%
Uninsured citizens	1%
Distribution of insurance modality	
	2015
Public insurance company	79%
Private insurance company	5%
Private co-payment	16%
Possibility to subscribing to private health insurance plans	Yes
Co-payment necessary for the following therapy	
ICD devices	Yes
Pacemakers	Yes
Ablation	No
Comments: Yes, only in the private sector.	

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

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

4. Education and Quality Control

National certification availability					
	Yes, it´s required for practice	Yes, but it´s not required for practice	No	No answer	Official name
Device therapy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cardiac stimulation accreditation (Acreditación en estimulación cardiaca)
Invasive electrophysiology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acreditación de formación específica y excelencia para la práctica en Electrofisiología Cardiaca Intervencionista
Allied professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Training centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acreditación de Centros para la formación en Electrofisiología

National Cardiac Society supporting EHRA certification system		
Yes, the Society demands EHRA certification for practice		<input type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification		<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification		<input checked="" type="checkbox"/>
No		<input type="checkbox"/>
No answer		<input type="checkbox"/>
Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiologist
ICD or pacemaker implants	Yes	Cardiologist, cardiac surgeon
Official national competency guidelines for electrophysiological studies or catheter ablation		Yes
Spanish Society of Cardiology		
Required period of training to perform implantations		No
Suggested period of training to perform implantations		Yes
		2 years
National quality control system availability		Yes
Pacemaker		No
ICD implantation		No
CRT implantation		No
Catheter ablation		Yes
Responsible for quality control		
Sociedad Española de Cardiología: SEC Excelente		
Training centres availability		
Pacemaker		not available
ICD implantation		not available
CRT implantation		not available
Electrophysiological studies and catheter ablation		26
Atrial fibrillation ablation		26
Number of universities (Schools of Medicine)		39
Percentage of academic centres among all practicing EP centres		70%
Percentage of academic centres among all practicing implanting devices centres		35%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	230	230
Total Pacemaker units implanted	38.662	37.466
Thereof, Leadless Pacemaker	not available	182
First implants	28.996	28.099
Replacements	9.666	9.367
Specialist performing implants		
Cardiologists	Yes	72%
Surgeons	Yes	24%
Other: Intensive care specialists	Yes	4%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	130	130
Total CRT units implanted	3.415	3.156
Thereof, CRT pacemaker	1.228	1.124
Thereof, CRT ICD	2.187	2.032
Specialist performing implants		
Cardiologists	Yes	98%
Surgeons	Yes	2%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	180	180
Total ICD units implanted	6.406	5.656
Thereof, Single chamber	not available	not available
Thereof, Dual chamber	not available	not available
Thereof, Subcutaneous ICD	not available	201
First implants	4.612	4.072
Replacements	1.794	1.584

Specialist performing implants		
Cardiologists	Yes	92%
Surgeons	Yes	8%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	145	145
Total loop recorders implanted	3.008	3.000

Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	35	35
Total lead extraction procedures	400	400

Specialist performing lead extractions		
Cardiologists	Yes	30%
Surgeons	Yes	70%

10. Device specific

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

National registry for		
		Official name
ICD	Yes	Spanish Implantable Cardioverter-defibrillator Registry. Arrhythmia Working Group. Spanish Society of Cardiology
Pacing	Yes	Spanish Pacemaker Registry. Working Group on Cardiac Pacing. Spanish Society of Cardiology
Electrophysiology	Yes	Spanish Catheter Ablation Registry. Arrhythmia Working Group. Spanish Society of Cardiology

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

Official name: Ministry of Health in collaboration with Arrhythmia Working Group and Working Group on Cardiac Pacing, Spanish Society of Cardiology

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	80	80
Number of ablations performed	12.863	13.378
Mean number of ablations per centre	161	167
Number of AF ablations	2.640	2.938
Number of ablation centres (> 50 AF ablations)	20	60
Number of VT/VF ablations	1.124	668
Number of ablation centres (> 10 VT ablations on structural heart diseases)	8	28
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available

Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	235	235
Number of physicians under training to become independent electrophysiologists	50	50

Availability of a national registry for interventional electrophysiology	Yes
Official name: Spanish Catheter Ablation Registry, Arrhythmia Working Group, Spanish Society of Cardiology	

12. Guidelines

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



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

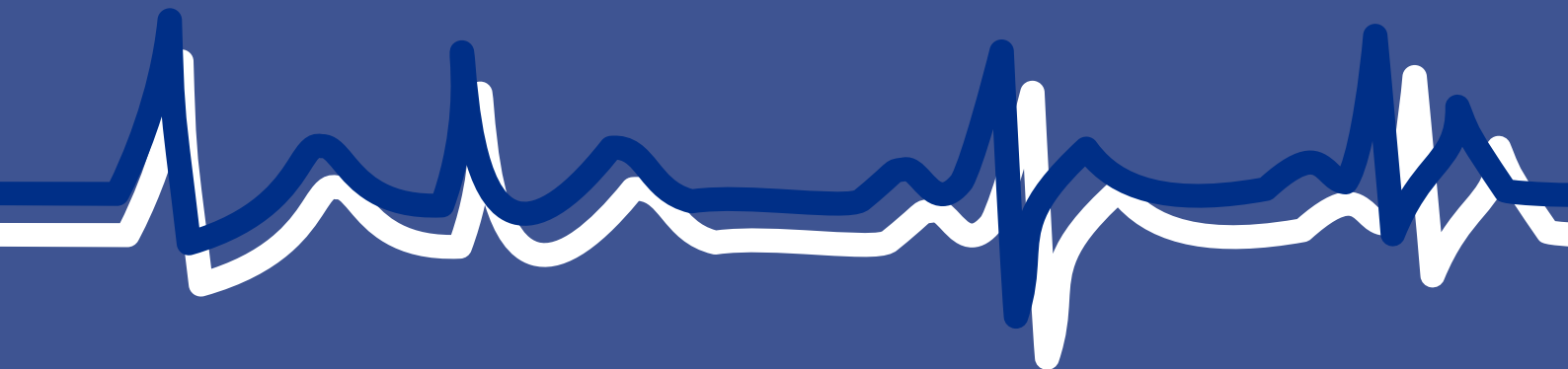
1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

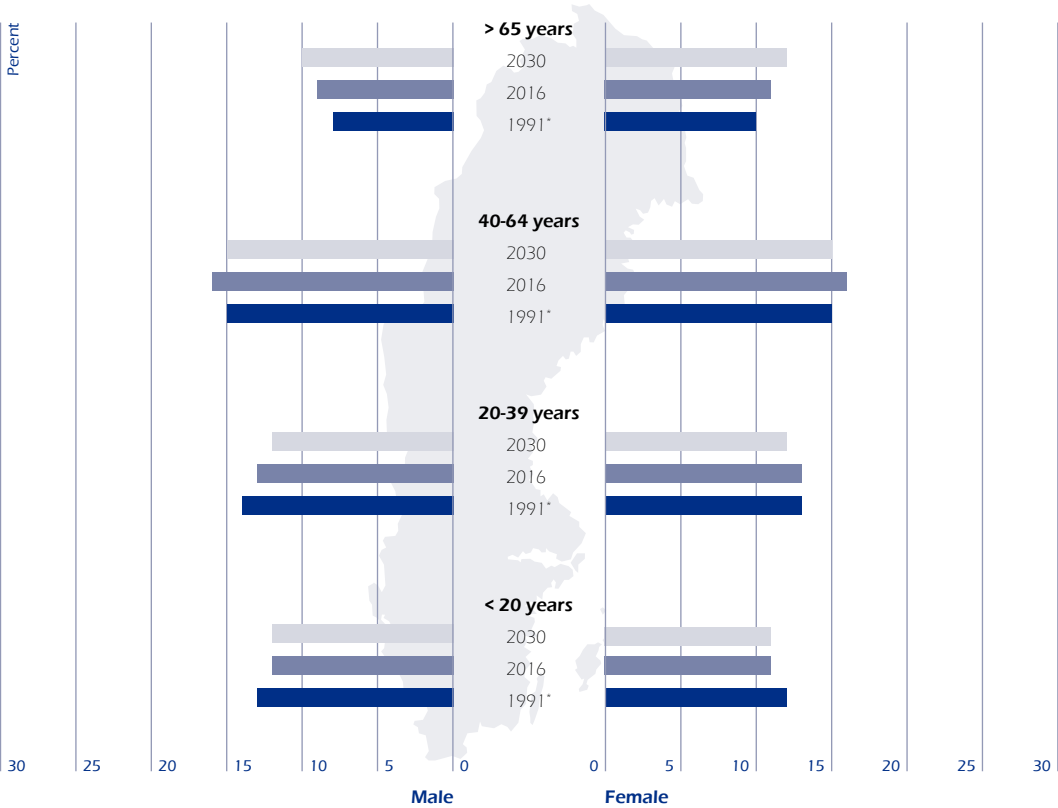
Name of National Cardiac Society, National Working Group or arrhythmia body
· Sección de Electrofisiología y Arritmias de la Sociedad Española de Cardiología (Arrhythmia Working Group of the Spanish Society of Cardiology) - Sección de Estimulación Cardíaca de la Sociedad Española de Cardiología (Working Group of Cardiac Pacing of the Spanish Society of Cardiology)
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
· EHRA White Book 2016 · Official statistics · Survey from professional association · Sample short survey · Sales data · Estimation

SWEDEN



1. Statistics

Age pyramid for Sweden



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	0,9	2003
Beds (per 100.000 population)	253,7	2014
Density of physicians (per 1.000 population)	4,1	2013
Density of nurses (per 1.000 population)	not available	2013
Demographic information		Year
Population	9.880.604	2016
Population annual growth rate (%)	0,8	2016
Life expectancy at birth (in years)	82	2016
Death rate (per 1.000 population)	9,2	2014
Live births (per 1.000 population)	11,7	2015
Economic information		Year
Gross domestic product (U.S dollar-billions)	517,44	2016*
Gross domestic product per capita (U.S dollar-units)	51.603,94	2016*
Total expenditure on health as % of GDP	11,9	2014
General government expenditure on health as % of total expenditure on health	84,0	2014
Private expenditure on health as % of total expenditure on health	16,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	37%	35%

3. Healthcare System

National Health System free health care through tax payer system.

Basic insurance availability			Yes				
Percentage of insured and uninsured citizens							
		2015	2016				
Insured citizens		not available	100%				
Uninsured citizens		not available	0%				
Distribution of insurance modality							
		2015	2016				
Public insurance company		not available	100%				
Private insurance company		not available	0%				
Private co-payment		not available	not available				
Possibility to subscribing to private health insurance plans			Yes				
Co-payment necessary for the following therapy							
ICD devices			No				
Pacemakers			No				
Ablation			No				
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: Physicians: Only if you work in the one only private hospitals.

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

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
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National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
There is none.	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	7
Atrial fibrillation ablation	7
Number of universities (Schools of Medicine)	7
Percentage of academic centres among all practicing EP centres	64%
Percentage of academic centres among all practicing implanting devices centres	16%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	44	43
Total Pacemaker units implanted	9.282	9.378
Thereof, Leadless Pacemaker	5	18
First implants	6.939	6.896
Replacements	2.343	2.482
Specialist performing implants		
Cardiologists	Yes	51%
Surgeons	Yes	25%
Other: Anesthesiologists	Yes	21%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	25	22
Total CRT units implanted	1.512	1.702
Thereof, CRT pacemaker	656	709
Thereof, CRT ICD	856	993
Specialist performing implants		
Cardiologists	Yes	not available
Surgeons	Yes	not available

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	30	30
Total ICD units implanted	1.358	1.375
Thereof, Single chamber	501	484
Thereof, Dual chamber	852	876
Thereof, Subcutaneous ICD	5	15
First implants	1.113	1.049
Replacements	245	326
Specialist performing implants		
Cardiologists	Yes	68%
Surgeons	Yes	15%
Other	Yes	10%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	43
Total loop recorders implanted	789	828
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		
	2015	2016
Hospitals performed lead extractions	not available	5
Total lead extraction procedures	not available	275
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	Swedish ICD and Pacemaker Registry
Pacing	Yes	Swedish ICD and Pacemaker Registry
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		Yes
Official name: Swedish ICD and Pacemaker Registry (institutional)		
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		
	2015	2016
Number of ablation centres	not available	11
Number of ablations performed	4.764	4.887
Mean number of ablations per centre	not available	444
Number of AF ablations	1.868	2.019
Number of ablation centres (> 50 AF ablations)	not available	9
Number of VT/VF ablations	not available	not available
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	51	60
Number of centres (LAA closures)	5	7
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	49
Number of physicians under training to become independent electrophysiologists	not available	6
Availability of a national registry for interventional electrophysiology		Yes
Official name: Swedish catheter ablation registry		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

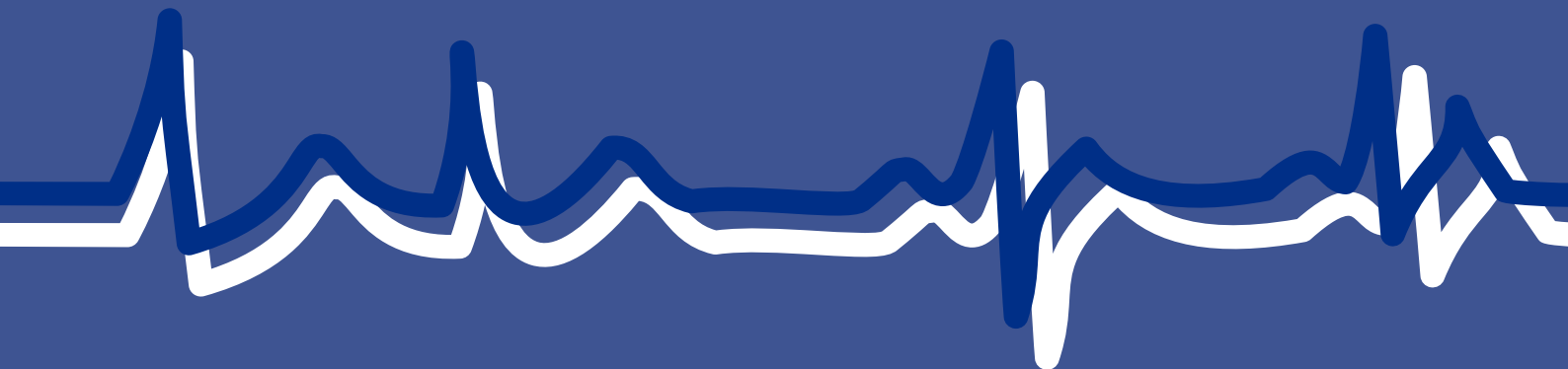
- | |
|---|
| <ul style="list-style-type: none">· Swedish Society of Cardiology, Swedish Heart Rhythm Group |
|---|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Official statistics· Survey from professional association· Sales data· National Society |
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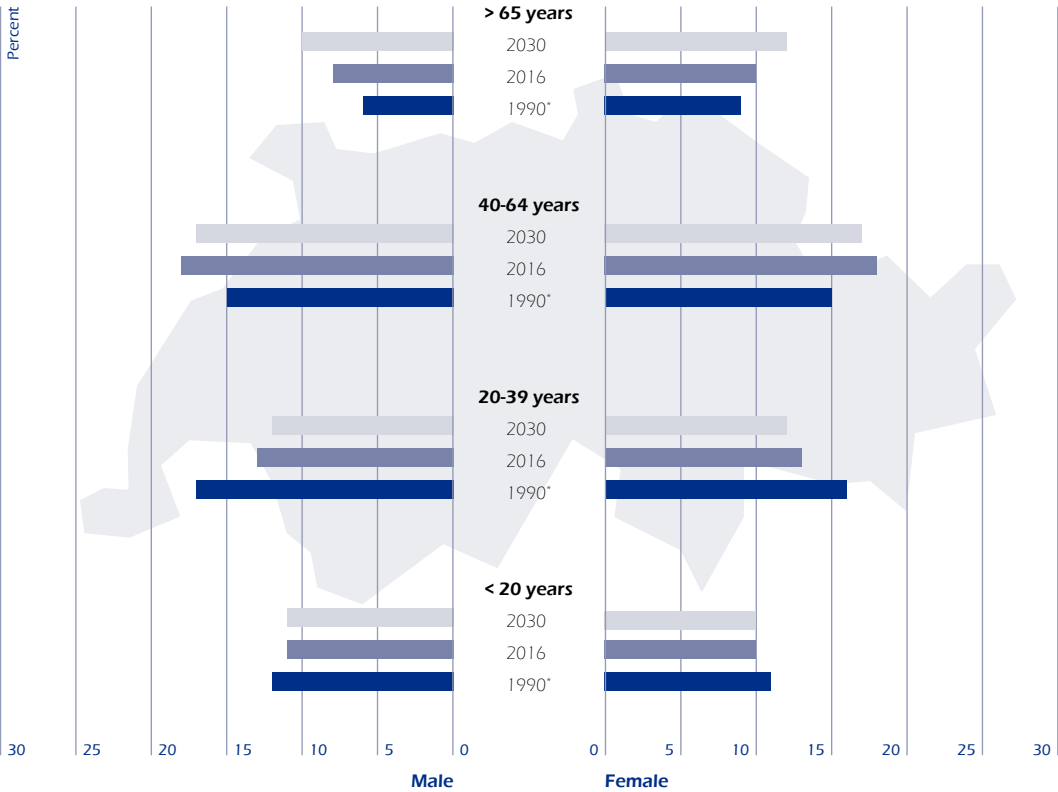


SWITZERLAND



1. Statistics

Age pyramid for Switzerland



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	3,5	2014
Beds (per 100.000 population)	457,2	2014
Density of physicians (per 1.000 population)	4,1	2014
Density of nurses (per 1.000 population)	17,8	2014
Demographic information		Year
Population	8.179.294	2016
Population annual growth rate (%)	0,7	2016
Life expectancy at birth (in years)	83	2016
Death rate (per 1.000 population)	8,0	2013
Live births (per 1.000 population)	10,4	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	662,48	2016*
Gross domestic product per capita (U.S dollar-units)	79.577,56	2016*
Total expenditure on health as % of GDP	11,7	2014
General government expenditure on health as % of total expenditure on health	66,0	2014
Private expenditure on health as % of total expenditure on health	34,0	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

National health system and obligatory private insurances.

Basic insurance availability		Yes					
Requirements for citizens to qualify for public insurance: None. Those without obligatory private insurance are taken care of by the social services.							
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	not available	90%					
Uninsured citizens	not available	10%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	0%	0%					
Private insurance company	0%	0%					
Private co-payment	100%	100%					
Possibility to subscribing to private health insurance plans		Yes					
Co-payment necessary for the following therapy							
ICD devices		No					
Pacemakers		No					
Ablation		No					
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

4. Education and Quality Control

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

National Cardiac Society supporting EHRA certification system	
Yes, the Society demands EHRA certification for practice	<input checked="" type="checkbox"/>
Yes, the Society advises EHRA certification and homologates national certification	<input type="checkbox"/>
Yes, the Society advises EHRA certification, but it does not homologate national certification	<input type="checkbox"/>
No	<input type="checkbox"/>
No answer	<input type="checkbox"/>
Comments: We require it but unfortunately there is no legal obligation.	

Specialist required for		
	Specialist	
Catheter ablation	Yes	Cardiology specialization
ICD or pacemaker implants	Yes	Cardiology or cardiac surgery specialization

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Swiss Working Groupe for Pacing and Electrophysiology	

Required period of training to perform implantations	Yes
At least 1 year	

Suggested period of training to perform implantations	Yes
	At least 1 year
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
Swiss Working Group on Pacing and Electrophysiology	
Training centres availability	
Pacemaker	5
ICD implantation	5
CRT implantation	5
Electrophysiological studies and catheter ablation	5
Atrial fibrillation ablation	5
Number of universities (Schools of Medicine)	5
Percentage of academic centres among all practicing EP centres	21%
Percentage of academic centres among all practicing implanting devices centres	7%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	71	71
Total Pacemaker units implanted	6.381	6.601
Thereof, Leadless Pacemaker	44	167
First implants	4.955	5.079
Replacements	1.426	1.522
Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	36	31
Total CRT units implanted	1.148	1.038
Thereof, CRT pacemaker	399	329
Thereof, CRT ICD	749	709
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	49	49
Total ICD units implanted	1.080	1.121
Thereof, Single chamber	658	629
Thereof, Dual chamber	411	442
Thereof, Subcutaneous ICD	11	50
First implants	811	767
Replacements	269	354
Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	not available
Total loop recorders implanted	not available	not available
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	6	8
Total lead extraction procedures	not available	not available
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	CHPACEWEB
Pacing	Yes	CHPACEWEB
Electrophysiology	Yes	CHPACEWEB
Availability of a national quality insurance system or complication registry		Yes
Official name: CHPACEWEB		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	25	25
Number of ablations performed	5.746	6.409
Mean number of ablations per centre	230	256
Number of AF ablations	2.003	2.278
Number of ablation centres (> 50 AF ablations)	13	not available
Number of VT/VF ablations	148	175
Number of ablation centres (> 10 VT ablations on structural heart diseases)	7	not available
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		Yes
Official name: CHPACEWEB		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

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

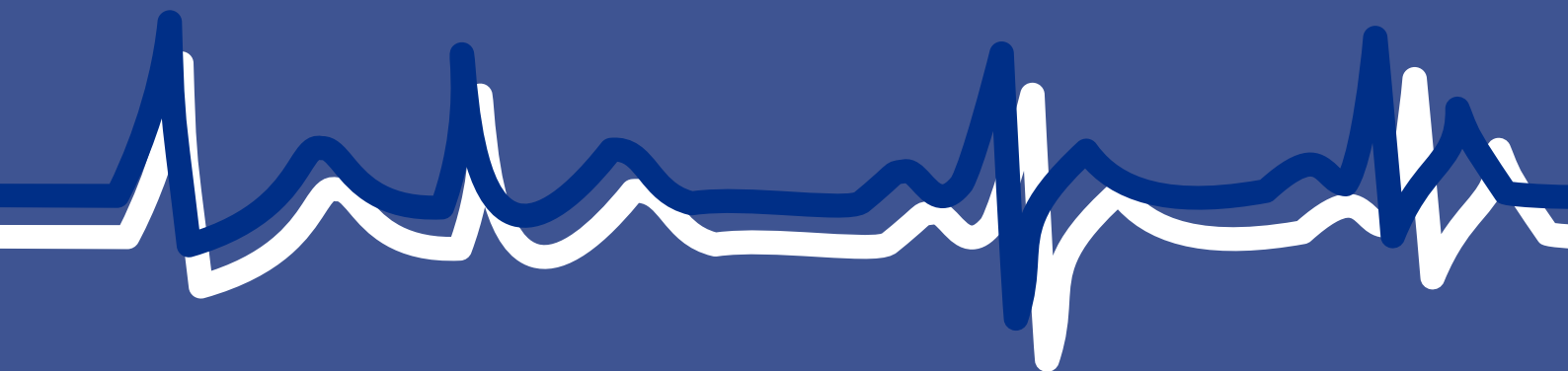
- | |
|--|
| <ul style="list-style-type: none">· Working Group of Pacing and Electrophysiology of the Swiss Society of Cardiology |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Estimation· National registry CHPACEWEB |
|---|

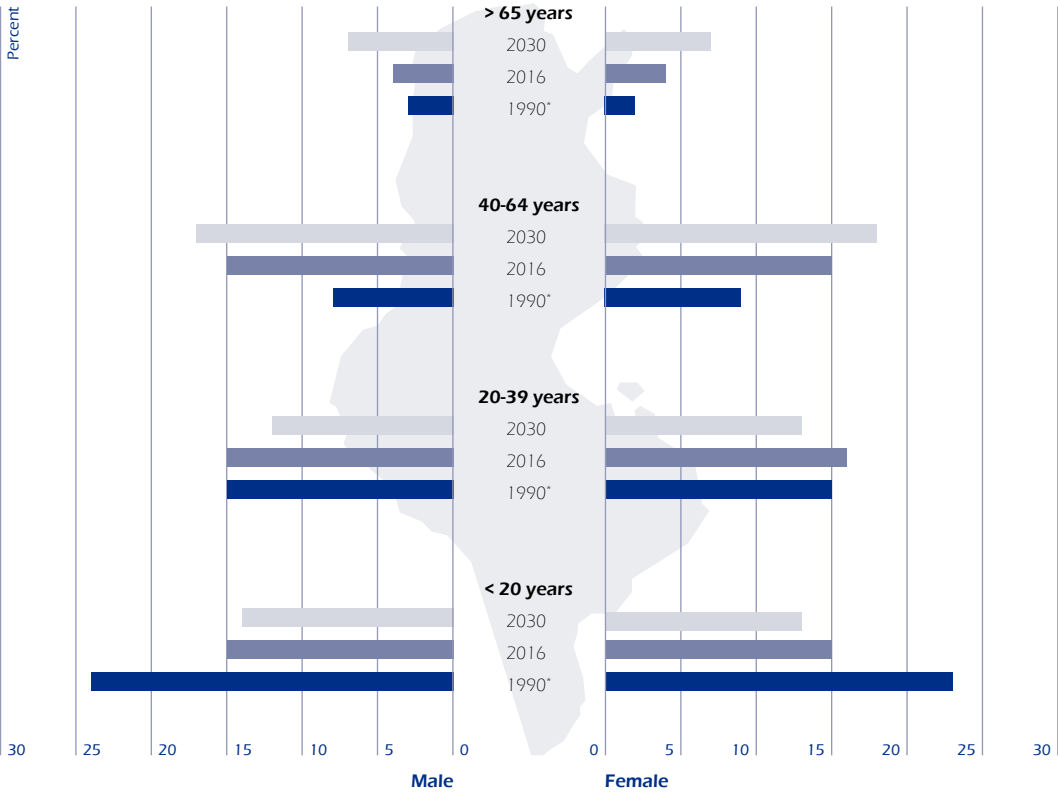


TUNISIA



1. Statistics

Age pyramid for Tunisia



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	not available	not available
Density of physicians (per 1.000 population)	not available	not available
Density of nurses (per 1.000 population)	not available	not available
Demographic information		Year
Population	11.134.588	2016
Population annual growth rate (%)	0,9	2016
Life expectancy at birth (in years)	76	2016
Death rate (per 1.000 population)	not available	not available
Live births (per 1.000 population)	not available	not available
Economic information		Year
Gross domestic product (U.S dollar-billions)	42,39	2016*
Gross domestic product per capita (U.S dollar-units)	3.776,71	2016*
Total expenditure on health as % of GDP	not available	not available
General government expenditure on health as % of total expenditure on health	not available	2014
Private expenditure on health as % of total expenditure on health	not available	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	15%

3. Healthcare System

National Health System in collaboration with a wide National insurance (CNAM).

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

Requirements for citizens to qualify for public insurance: Stable Work either Private or Public.

Percentage of insured and uninsured citizens		
	2015	2016
Insured citizens	not available	70%
Uninsured citizens	not available	30%

Distribution of insurance modality		
	2015	2016
Public insurance company	not available	90%
Private insurance company	not available	10%
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	Yes

Comments: For ablation with a 3D system a co-payment is necessary; ICD and CRT are reimbursed only in the public hospitals.

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

Comments: Physician: ICD and CRT are reimbursed only in public hospitals.

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes 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
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
National Health Minister	
Training centres availability	
Pacemaker	7
ICD implantation	5
CRT implantation	3
Electrophysiological studies and catheter ablation	3
Atrial fibrillation ablation	2
Number of universities (Schools of Medicine)	4
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		
	2015	2016
Implanting centres	not available	19
Total Pacemaker units implanted	2.550	2.700
Thereof, Leadless Pacemaker	not available	0
First implants	not available	2.000
Replacements	not available	700
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	4
Total CRT units implanted	210	190
Thereof, CRT pacemaker	not available	150
Thereof, CRT ICD	not available	40
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	8
Total ICD units implanted	143	201
Thereof, Single chamber	not available	150
Thereof, Dual chamber	not available	50
Thereof, Subcutaneous ICD	not available	1
First implants	not available	161
Replacements	not available	40
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	0
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		
	2015	2016
Hospitals performed lead extractions	not available	4
Total lead extraction procedures	not available	33
Specialist performing lead extractions		
Cardiologists	Yes	75%
Surgeons	Yes	25%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: No reimbursement for remote monitoring.		
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	not available	15
Number of ablations performed	840	850
Mean number of ablations per centre	not available	57
Number of AF ablations	60	65
Number of ablation centres (> 50 AF ablations)	not available	0
Number of VT/VF ablations	not available	25
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	1
Number of LAA closures	not available	8
Number of centres (LAA closures)	not available	4
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	30
Number of physicians under training to become independent electrophysiologists	not available	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	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Lack of trained personnel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

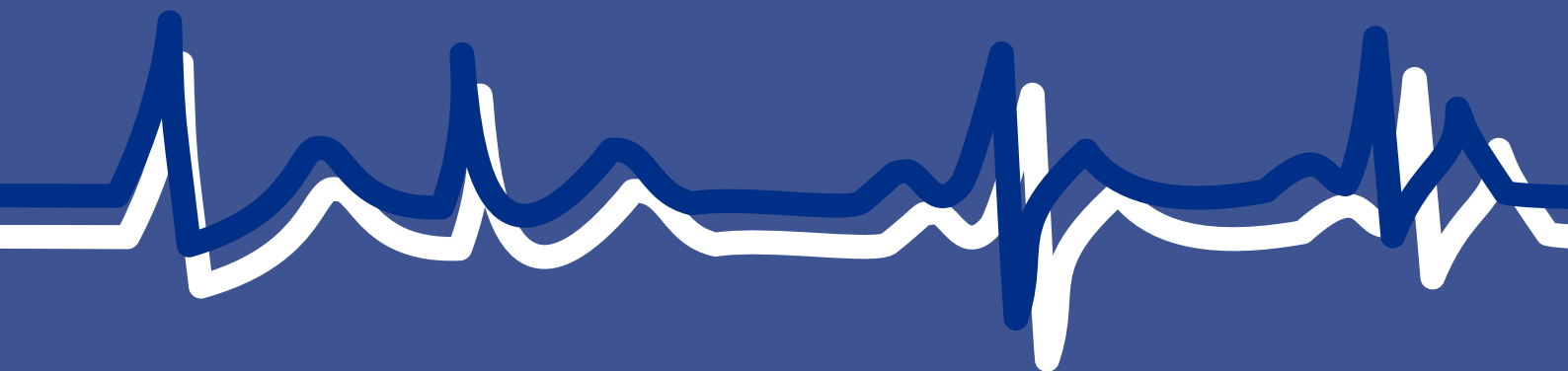
Name of National Cardiac Society, National Working Group or arrhythmia body

- Tunisian Society of Cardiology and Cardiovascular Surgery
- National Working Group of Pacing and Electrophysiology

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- EHRA White Book 2016
- Official statistics
- Survey from professional association
- Sales data
- Estimation

TURKEY





1. Statistics

Age pyramid for Turkey



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	2,0	2014
Beds (per 100.000 population)	266,8	2014
Density of physicians (per 1.000 population)	1,7	2014
Density of nurses (per 1.000 population)	2,5	2014
Demographic information		Year
Population	80.274.604	2016
Population annual growth rate (%)	1,1	2016
Life expectancy at birth (in years)	75	2016
Death rate (per 1.000 population)	4,7	2013
Live births (per 1.000 population)	16,9	2013
Economic information		Year
Gross domestic product (U.S dollar-billions)	735,72	2016*
Gross domestic product per capita (U.S dollar-units)	9.316,76	2016*
Total expenditure on health as % of GDP	5,4	2014
General government expenditure on health as % of total expenditure on health	77,5	2014
Private expenditure on health as % of total expenditure on health	22,6	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	not available	not available

3. Healthcare System

National Health Care System (Social Security Institution -SSI) covers almost all population. Private insurance companies offer complementary health care.

Basic insurance availability		Yes
Percentage of insured and uninsured citizens		
	2015	2016
Insured citizens	99%	99%
Uninsured citizens	1%	1%
Distribution of insurance modality		
	2015	2016
Public insurance company	99%	99%
Private insurance company	1%	1%
Private co-payment	not available	not available
Possibility to subscribing to private health insurance plans		Yes
Co-payment necessary for the following therapy		
ICD devices		Yes
Pacemakers		Yes
Ablation		Yes

Comments: Yes, only in the some private sector. Co-payment is not necessary in the public sector.

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

Treatment availability	
No restrictions	<input type="checkbox"/>
No restrictions, but the indications have to follow the ESC guidelines	<input type="checkbox"/>
No restrictions, but the indications have to follow the National guidelines	<input checked="" type="checkbox"/>
Restricted to certain number of treatments/budget	<input type="checkbox"/>
Not funded	<input type="checkbox"/>
No answer	<input type="checkbox"/>
Body issuing the guidelines: Health Application Instructions	
Comments: Social Security Institution publish a guideline called 'Health Application Instructions' which reports the indications and the amount of reimbursement for each procedure. Indications follow ESC guidelines.	

4. Education and Quality Control

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

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

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

Official national competency guidelines for electrophysiological studies or catheter ablation	No
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Required period of training to perform implantations	No
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Suggested period of training to perform implantations	No
National quality control system availability	No
Willingness to install quality control system	Yes
Responsible for quality control	
None	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	82
Percentage of academic centres among all practicing EP centres	20%
Percentage of academic centres among all practicing implanting devices centres	5%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	245
Total Pacemaker units implanted	9.200	9.993
Thereof, Leadless Pacemaker	0	2
First implants	6.650	7.175
Replacements	2.250	2.818
Specialist performing implants		
Cardiologists	Yes	95%
Surgeons	Yes	5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	170
Total CRT units implanted	2.810	3.485
Thereof, CRT pacemaker	230	359
Thereof, CRT ICD	2.580	3.126
Specialist performing implants		
Cardiologists	Yes	97%
Surgeons	Yes	3%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	220
Total ICD units implanted	6.381	9.254
Thereof, Single chamber	3.340*	4.639*
Thereof, Dual chamber	1.975*	3.480*
Thereof, Subcutaneous ICD	2	3
First implants	5.315	8.122
Replacements	1.066	1.132
* First implants only		
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	Yes	1%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	not available	3
Total loop recorders implanted	15	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		
	2015	2016
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	420	not available
Specialist performing lead extractions		
Cardiologists	Yes	75%
Surgeons	Yes	25%

10. Device specific

Availability of remote monitoring of devices		No
Reasons why remote monitoring is not available: Reimbursement problems.		
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	not available	160
Number of ablations performed	13.000	10.920
Mean number of ablations per centre	not available	68
Number of AF ablations	2.200	1.215
Number of ablation centres (> 50 AF ablations)	not available	not available
Number of VT/VF ablations	120	130
Number of ablation centres (> 10 VT ablations on structural heart diseases)	not available	not available
Number of LAA closures	0	26
Number of centres (LAA closures)	0	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	No					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
Lack of reimbursement, limited financial resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest



13. Sources

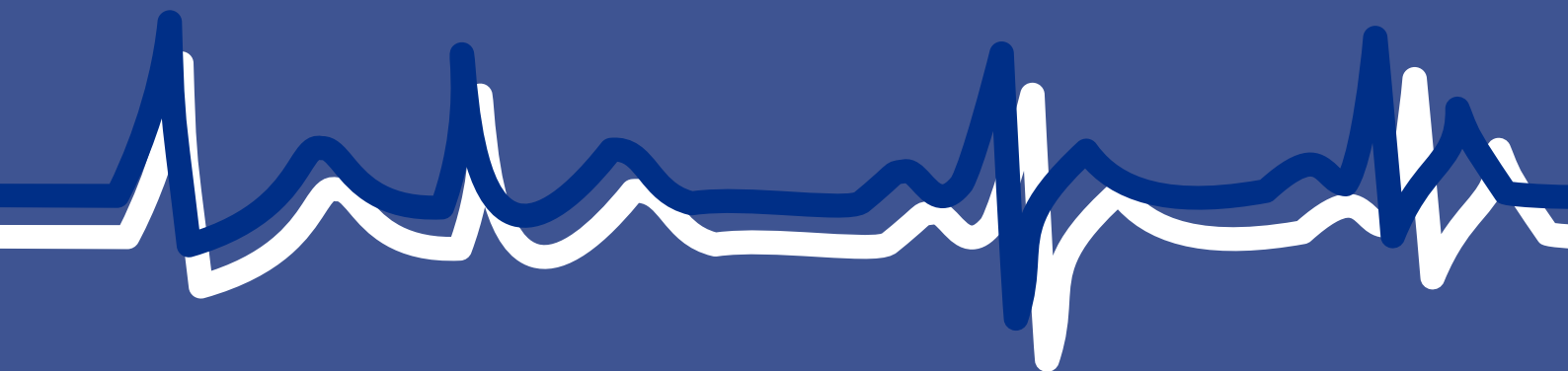
Name of National Cardiac Society, National Working Group or arrhythmia body

- Turkish Society of Cardiology
- Working Group on Arrhythmias

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

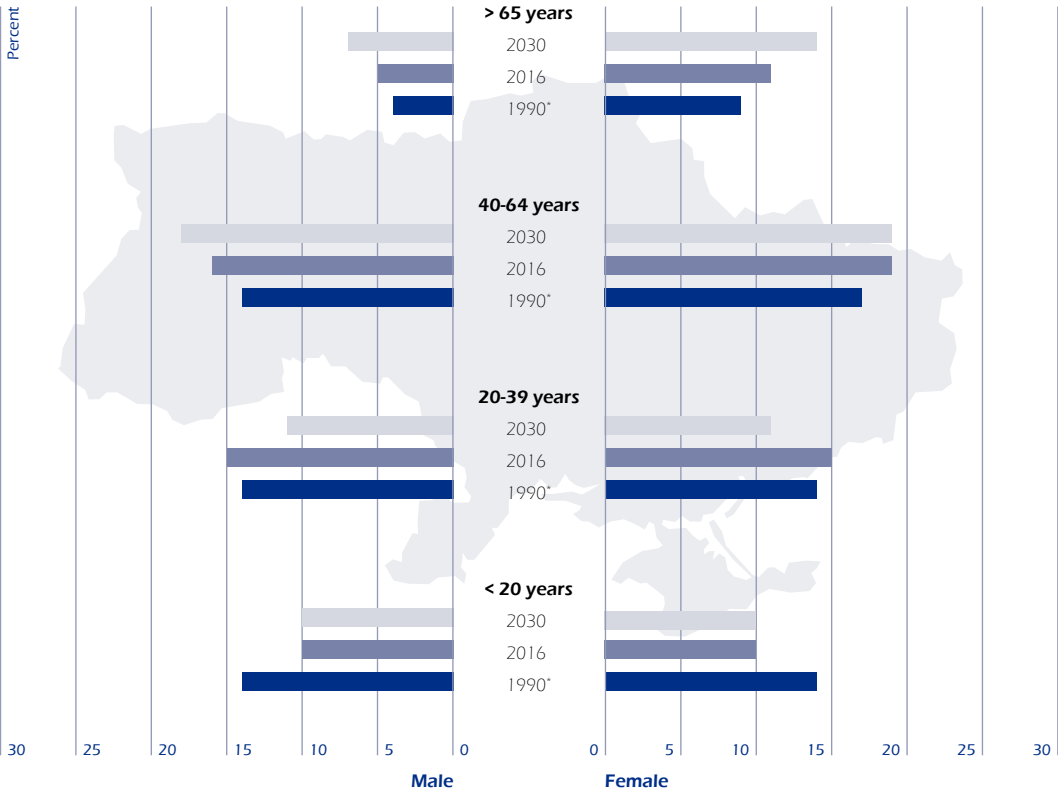
- EHRA White Book 2016
- Official statistics
- Sales data
- Estimation

UKRAINE



1. Statistics

Age pyramid for Ukraine



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	4,8	2013
Beds (per 100.000 population)	784,1	2014
Density of physicians (per 1.000 population)	3,2	2014
Density of nurses (per 1.000 population)	7,0	2014
Demographic information		Year
Population	44.209.733	2016
Population annual growth rate (%)	-0,5	2016
Life expectancy at birth (in years)	72	2016
Death rate (per 1.000 population)	14,8	2014
Live births (per 1.000 population)	10,9	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	87,20	2016*
Gross domestic product per capita (U.S dollar-units)	2.051,64	2016*
Total expenditure on health as % of GDP	7,1	2014
General government expenditure on health as % of total expenditure on health	50,8	2014
Private expenditure on health as % of total expenditure on health	49,2	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	68,02%	not available

3. Healthcare System

Ministry of Public Health of Ukraine, National Academy of Medical Sciences of Ukraine (National Scientific Centres – 36 in total), profile institutional hospitals (hospital of the Ministry of Internal Affairs, hospital of the Ministry of Defence so on), State sanitary and epidemiological service, State Administration of Ukraine on medical products, State service of Ukraine on HIV/AIDS and other socially dangerous diseases. National Health System provides free medical and preventive care for all citizens of Ukraine in accordance to acting legislation by: emergency, inpatient (general profile and specialized) and outpatient (ambulatory-polyclinic) care.

Basic insurance availability				No							
Percentage of insured and uninsured citizens											
				2015		2016					
Insured citizens				not available		not available					
Uninsured citizens				not available		not available					
Distribution of insurance modality											
				2015		2016					
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/Hospital receives per process reimbursement				Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer			
Physician		Hospital		Physician		Hospital		Physician		Hospital	
Internal loop recorders		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
ICD primary prevention		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
ICD secondary prevention		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
CRT devices		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Ablation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Leadless Pacing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Subcutaneous ICD		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>	

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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes Cardiovascular surgeon or cardiologist
ICD or pacemaker implants	Yes Cardiovascular surgeon or cardiologist

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
Рекомендації Асоціації Кардіологів України/Recommendations of Association of Cardiologists of Ukraine/ Рекомендації Асоціації Аритмологів України/Recommendations of Association of Arrhythmologists of Ukraine	

Required period of training to perform implantations	No answer
Suggested period of training to perform implantations	No answer
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
Ministry of Health of Ukraine, National Academy of Medical Sciences of Ukraine	
Training centres availability	
Pacemaker	4
ICD implantation	2
CRT implantation	2
Electrophysiological studies and catheter ablation	4
Atrial fibrillation ablation	4
Number of universities (Schools of Medicine)	19
Percentage of academic centres among all practicing EP centres	27,3%
Percentage of academic centres among all practicing implanting devices centres	8,6%

5. Pacemakers

Pacemaker units implanted and number of implanting centres		
	2015	2016
Implanting centres	38	38
Total Pacemaker units implanted	4.851	5.444
Thereof, Leadless Pacemaker	0	0
First implants	4.110	4.653
Replacements	741	791
Specialist performing implants		
Cardiologists	Yes	10,5%
Surgeons	Yes	89,5%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	10	10
Total CRT units implanted	73	72
Thereof, CRT pacemaker	60	43
Thereof, CRT ICD	13	29
Specialist performing implants		
Cardiologists	Yes	10%
Surgeons	Yes	90%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	14	8
Total ICD units implanted	52	49
Thereof, Single chamber	44	40
Thereof, Dual chamber	8	9
Thereof, Subcutaneous ICD	0	0
First implants	39	40
Replacements	13	9
Specialist performing implants		
Cardiologists	Yes	25%
Surgeons	Yes	75%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	2	3
Total loop recorders implanted	2	4
Specialist performing implants		
Cardiologists	Yes	30%
Surgeons	Yes	70%

9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	6	9
Total lead extraction procedures	45	69
Specialist performing lead extractions		
Cardiologists	No	0%
Surgeons	Yes	100%

10. Device specific

Availability of remote monitoring of devices		No
National registry for		
		Official name
ICD	No	
Pacing	No	
Electrophysiology	No	
Availability of a national quality insurance system or complication registry		No
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		No

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	11	11
Number of ablations performed	2.294	2.342
Mean number of ablations per centre	209	213
Number of AF ablations	634	731
Number of ablation centres (> 50 AF ablations)	5	6
Number of VT/VF ablations	29	46
Number of ablation centres (> 10 VT ablations on structural heart diseases)	1	2
Number of LAA closures	not available	0
Number of centres (LAA closures)	not available	0
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	not available
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		No

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	Yes					
European	Yes					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
Lack of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
Lack of operators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4

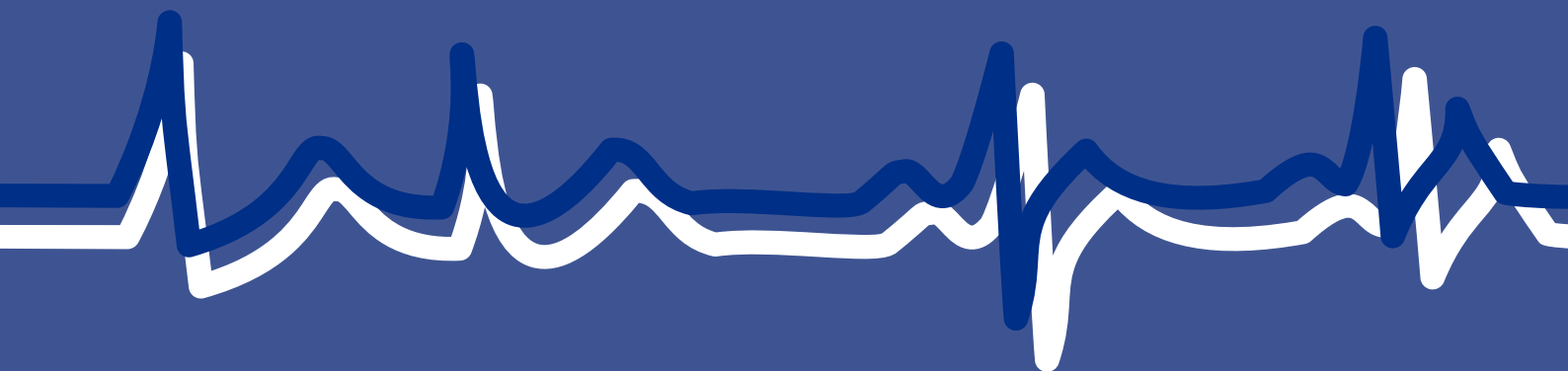
1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

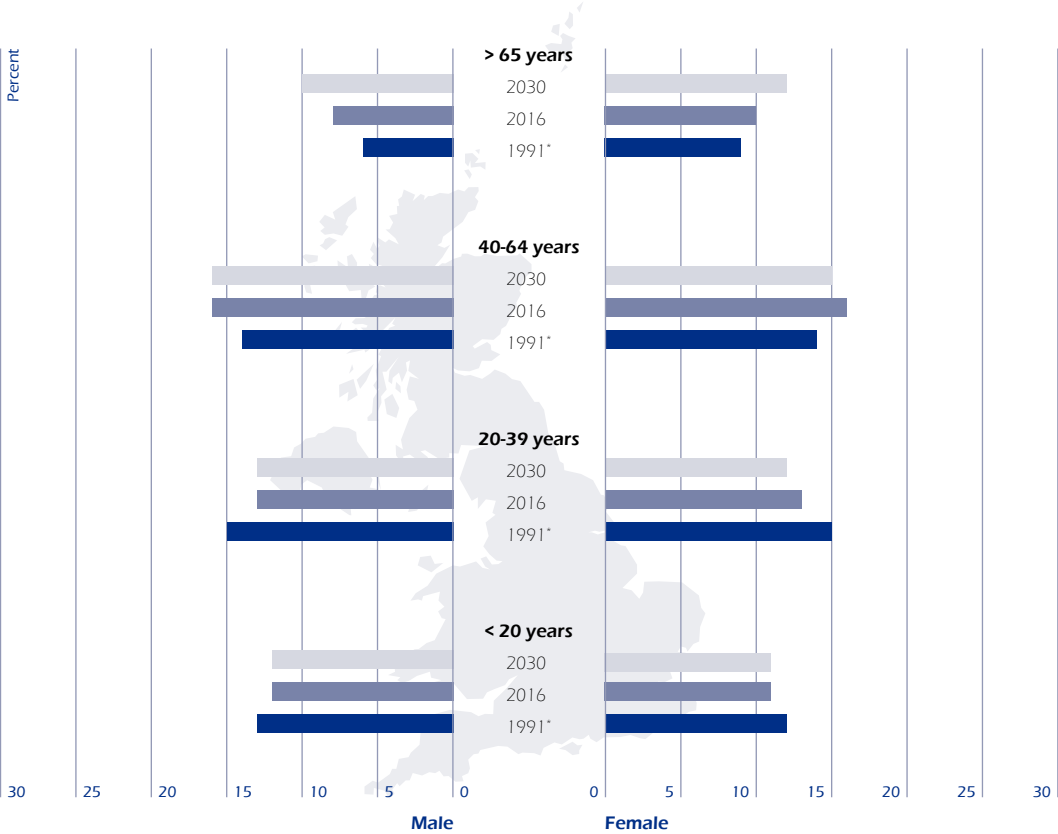
Name of National Cardiac Society, National Working Group or arrhythmia body
<div>· Association of Arrhythmologists of Ukraine</div>
All sources that were used to fill out the questionnaire for the EHRA White Book 2017
<div>· EHRA White Book 2016</div> <div>· Official statistics</div> <div>· Survey from professional association</div>

UNITED KINGDOM



1. Statistics

Age pyramid for United Kingdom



* 1990 or last available

Healthcare data		Year
Hospitals (per 100.000 population)	not available	not available
Beds (per 100.000 population)	274,1	2014
Density of physicians (per 1.000 population)	2,8	2015
Density of nurses (per 1.000 population)	8,4	2015
Demographic information		Year
Population	64.430.428	2016
Population annual growth rate (%)	0,5	2016
Life expectancy at birth (in years)	81	2016
Death rate (per 1.000 population)	9,0	2013
Live births (per 1.000 population)	12,1	2014
Economic information		Year
Gross domestic product (U.S dollar-billions)	2.649,89	2016*
Gross domestic product per capita (U.S dollar-units)	40.411,71	2016*
Total expenditure on health as % of GDP	9,1	2014
General government expenditure on health as % of total expenditure on health	83,1	2014
Private expenditure on health as % of total expenditure on health	16,9	2014

* IMF estimative

2. Country

Proportion of deaths resulting from cardiovascular disease		
	2015	2016
	22%	22%



3. Healthcare System

NHS for all citizens. Private healthcare optional.

Basic insurance availability		No					
Percentage of insured and uninsured citizens							
	2015	2016					
Insured citizens	5%	5%					
Uninsured citizens	95%	95%					
Distribution of insurance modality							
	2015	2016					
Public insurance company	95%	89%					
Private insurance company	0%	11%					
Private co-payment	5%	0%					
Possibility to subscribing to private health insurance plans							
Yes							
Co-payment necessary for the following therapy							
ICD devices							
No							
Pacemakers							
No							
Ablation							
No							
Reimbursement availability for physicians and hospitals							
Physician/Hospital receives per process reimbursement		Physician/Hospital does not receive reimbursement, but incentives (e.g. more salary on the following year)		Physician/Hospital does not receive reimbursement neither incentive		No answer	
Physician	Hospital	Physician	Hospital	Physician	Hospital	Physician	Hospital
Internal loop recorders	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD primary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICD secondary prevention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CRT devices	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ablation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadless Pacing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcutaneous ICD	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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

4. Education and Quality Control

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

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

Specialist required for	
	Specialist
Catheter ablation	Yes A cardiac electrophysiologist is required for catheter ablation.
ICD or pacemaker implants	Yes A trained cardiologist or cardiac surgeon may undertake device implants.

Official national competency guidelines for electrophysiological studies or catheter ablation	Yes
BHRS standards documents in CIEDs and electrophysiology	

Required period of training to perform implantations	Yes
Cardiology trainees have a 5 year training programme. If they wish to specialise in device implantation, the final 2 years are focused in this area.	



Suggested period of training to perform implantations	No
National quality control system availability	Yes
Pacemaker	Yes
ICD implantation	Yes
CRT implantation	Yes
Catheter ablation	Yes
Responsible for quality control	
BHRS through national audit	
Training centres availability	
Pacemaker	not available
ICD implantation	not available
CRT implantation	not available
Electrophysiological studies and catheter ablation	not available
Atrial fibrillation ablation	not available
Number of universities (Schools of Medicine)	33
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		
	2015	2016
Implanting centres	211	215
Total Pacemaker units implanted	46.110	46.227
Thereof, Leadless Pacemaker	0	54
First implants	36.354	36.446
Replacements	9.756	9.781
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

6. Cardiac resynchronization therapy devices

CRT units implanted and number of implanting centres		
	2015	2016
Implanting centres	126	126
Total CRT units implanted	10.198	11.381
Thereof, CRT pacemaker	4.160	4.318
Thereof, CRT ICD	6.038	7.063
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

7. Implantable Cardiac Defibrillator

ICD units implanted and number of implanting centres		
	2015	2016
Implanting centres	125	125
Total ICD units implanted	6.701	7.242
Thereof, Single chamber	2.484	2.820
Thereof, Dual chamber	4.021	4.112
Thereof, Subcutaneous ICD	196	310
First implants	5.291	5.718
Replacements	1.410	1.524
Specialist performing implants		
Cardiologists	Yes	100%
Surgeons	No	0%

8. Loop recorders

Loop recorders implanted and number of implanting centres		
	2015	2016
Implanting centres	129	138
Total loop recorders implanted	5.804	8.297
Specialist performing implants		
Cardiologists	Yes	99%
Surgeons	No	0%
Other: Physiologist	Yes	1%



9. Lead extractions

Lead extractions procedures and and number of centers that performed lead extractions		
	2015	2016
Hospitals performed lead extractions	not available	not available
Total lead extraction procedures	not available	not available
Specialist performing lead extractions		
Cardiologists	Yes	100%
Surgeons	No	0%

10. Device specific

Availability of remote monitoring of devices		Yes
National registry for		
	Official name	
ICD	Yes	National Cardiac Rhythm Management Audit (NICOR)
Pacing	Yes	National Cardiac Rhythm Management Audit (NICOR)
Electrophysiology	Yes	National Cardiac Rhythm Management Audit (NICOR)
Availability of a national quality insurance system or complication registry		Yes
Official name: National Cardiac Rhythm Management Audit (NICOR)		
Availability of a national institution coordinating and guiding device recalls and complications related to lead extractions		Yes
Official name: Medicines and Healthcare Regulatory Authority (MHRA)		

11. Interventional electrophysiology

Number of ablations performed and number of centres		
	2015	2016
Number of ablation centres	65	66
Number of ablations performed	17.622	18.637
Mean number of ablations per centre	271	282
Number of AF ablations	6.390	6.744
Number of ablation centres (> 50 AF ablations)	32	36
Number of VT/VF ablations	674	1.049
Number of ablation centres (> 10 VT ablations on structural heart diseases)	23	27
Number of LAA closures	not available	not available
Number of centres (LAA closures)	not available	not available
Number of electrophysiologists		
Number of electrophysiologists performed catheter ablation independently	not available	500
Number of physicians under training to become independent electrophysiologists	not available	not available
Availability of a national registry for interventional electrophysiology		Yes
Official name: National cardiac rhythm management audit NICOR)		

12. Guidelines

Guidelines adhered to ICD implants and pacemaker implants						
National	Yes					
U.S.	No					
European	No					
Obstacles to guideline implementation	1	2	3	4	5	Ranking of importance
Lack of centres	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of reimbursement, limited financial resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lack of referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of trained personnel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Low awareness of guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lack of operators	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

1 = no obstacle, 5 = great obstacle

1 = top, 6 = lowest

13. Sources

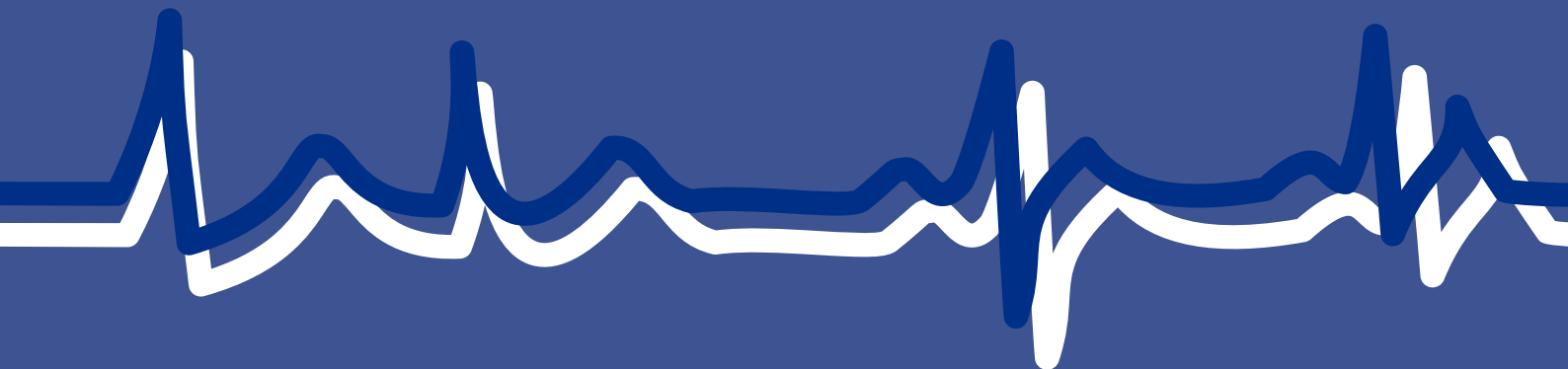
Name of National Cardiac Society, National Working Group or arrhythmia body

- | |
|--|
| <ul style="list-style-type: none">· British Heart Rhythm Society |
|--|

All sources that were used to fill out the questionnaire for the EHRA White Book 2017

- | |
|---|
| <ul style="list-style-type: none">· EHRA White Book 2016· Estimation |
|---|

5. APPENDIX



5. EHRA Certification

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 of professionals (2006-2016) who are officially fully certified, as well as the candidates who have passed the written part of the certification process.

Candidates successful to the written exam then need to have their logbook assessed by an EHRA grader to be fully certified.

The EHRA Certification is valid for 10 years.

Electrophysiology

EHRA EP Certified professionals (Written Exam + Logbook)

ACENA RAMOS	Marta	Spain	2014
ACOSTA MARTINEZ	Juan	Spain	2016
ACOU	Willem-Jan	Belgium	2015
ADİYAMAN	Ahmet	Netherlands	2014
AHMED TAHER MAHMOUD	Ahmed	Egypt	2016
AHUMADA	Miguel	Spain	2016
ALCALDE RODRIGUEZ	Oscar	Spain	2012
ALI	Hussam	Italy	2015
ALZAND	B.	Netherlands	2012
ANDERSON	Mark H.	United Kingdom	2010
ANGUERA CAMOS	Ignacio	Spain	2009
ANNE	Wim	Belgium	2013
ARBELO	Elena	Spain	2009
ARCOCHA TORRES	Maria Fe	Spain	2012
ARGUEDAS-JIMENEZ	Hugo	Spain	2016
ARIAS PALOMARES	Miguel Angel	Spain	2013
ARMENTA PASTOR	Juan Fernandez	Spain	2012
ARNID	Christoph	Germany	2016
AROLA	Olli Tapani	Finland	2016
ATTANASIO	Philipp Johannes	Germany	2016
AVELLA	Andrea	Italy	2009
ÁVILA ALONSO	Pablo	Spain	2013
AYALA PAREDES	Felix	Canada	2009
AZEM	Tareq	Germany	2016
BALT	Jippe	Netherlands	2016
BALTA	Osman	Germany	2013
BARDYSZEWSKI	Aleksander	Poland	2015
BASTIAN	Dirk	Germany	2016
BAYRAK	Duhan Fatih	Belgium	2012
BEAUPORT	Joelle	Germany	2013
BEHAR	Nathalie	France	2016
BELOTTI	Giuseppina	Italy	2008
BENCSEK	Gabor	Hungary	2009
BENEZET MAZUECOS	Juan	Spain	2016

EHRA EP Certified professionals (Written Exam + Logbook)

BERRUEZO SANCHEZ	Antonio	Spain	2010
BERTAGNOLLI	Livio	Italy	2016
BERTOMEU-GONZALEZ	Vicente	Spain	2012
BIANCHI	Francesca	Italy	2016
BISBAL	Felipe	Belgium	2015
BLAAUW	Yuri	Netherlands	2015
BLANDINO	Alessandro	Italy	2016
BONANNO	Carlo	Italy	2014
BORDIGNON	Stefano	Italy	2016
BOTROS	Maichel Sobhy Naguib	Egypt	2016
BROUZET	Thomas	Spain	2015
BRUGADA	Josep	Spain	2009
BUCHHOLZ	Jochen	Germany	2016
BUERKLE	Gerd	Austria	2011
BUIATTI	Alessandra	Italy	2016
BUN	Sok-Sithikun	France	2012
BURRI	Haran	Switzerland	2008
CABANAS GRANDIO	Pilar	Spain	2016
CALVANESE	Raimondo	Italy	2016
CALVO CUERVO	David	Spain	2013
CALVO GALIANO	Naiara	Spain	2012
CAÑADAS GODOY	Maria Victoria	Spain	2016
CANO PEREZ	Oscar	Spain	2011
CASTREJON CASTREJON	Sergio	Spain	2016
CASTRO URDA	Victor	Spain	2012
CATANCHIN	Andrei	Australia	2012
CELIKUYURT	Yengi Umut	Turkey	2016
CHATTERJEE	Debjit	United Kingdom	2013
CHEN	Shaojie	Austria	2016
CHONG	Daniel	Singapore	2013
CIPOLLETTA	Laura	Italy	2015
CLEMENS	Marcell	Hungary	2015
CONTE	Giulio	Italy	2016
CONTI	Sergio	Italy	2016
CORTEZ-DIAS	Nuno	Portugal	2015
COZAR LEON	Rocio	Spain	2012
DAR	Mehboob	Saudi Arabia	2016
DATINO	Tomas	Spain	2012
DAVOODI	Gholamreza	Ireland	2008
DE DIEGO	Carlos	Spain	2015
DE FILIPPO	Paolo	Italy	2012
DE GROOT	Joris R.	Netherlands	2012
DE JONG	Jonas	Netherlands	2013
DE MEYER	Grim	Belgium	2014
DE RIVA SILVA	Marta	Spain	2013
DELGADO	Hugo Emilio	Argentina	2014
DEUTSCH	Alexandru	Romania	2012
DI CORI	Andrea	Italy	2015
DILLIER	Roger	Switzerland	2016
DJAJADISASTRA	Achmad Iskandar	Germany	2012
DOMINGUEZ MAFE	Eloy	Spain	2014

EHRA EP Certified professionals (Written Exam + Logbook)

DURAY	Gabor Zoltan	Germany	2008
DYRDA	Katia	Canada	2012
EISENBERGER	Martin	Czech Republic	2012
EL KADRI	Moutaz	United Kingdom	2013
ELDER	Douglas	United Kingdom	2013
EVERTZ	Reinder	Netherlands	2015
EWERTSEN	Niels Christian	Germany	2014
FERNANDEZ GOMEZ	Juan Manuel	Spain	2016
FERNANDEZ PASTOR	Julia	Spain	2015
FILGUEIRAS RAMA	David	Spain	2016
FONTENLA	Adolfo	Spain	2012
FORCLAZ	Andrei	Switzerland	2012
FOSCH	Javier	Spain	2015
FRANCK	Harald	Germany	2011
FRANCO DIEZ	Eduardo	Spain	2016
FRANZINI	Christine	Switzerland	2015
FRONTERA	Antonio	Italy	2016
GALLARDO LOBO	Rodrigo	Spain	2012
GAROFALO FORTE	Daniel	Spain	2014
GAWRYSIAK	Marcin	Poland	2013
GLOWNIAK	Andrzej	Poland	2012
GODA	Sherif	Egypt	2016
GONZALEZ FERRER	Juan Jose	Spain	2015
GONZALEZ VASSEROT	Maria Del Mar	Spain	2009
GONZALEZ-ENRIQUEZ	Susana	Spain	2012
GOPALAMURUGAN	A. B.	United Kingdom	2014
GRECU	Mihaela	Romania	2007
GREYLING	Adele	Belgium	2016
GRIECO	Domenico	Italy	2016
GRUBB	Neil	United Kingdom	2014
GUGUCHEV	Pavel	United States of America	2010
HASSINK	Rutger	Netherlands	2016
HEMELS	Martin	Netherlands	2012
HERCZKU	Csaba	Hungary	2012
HLIVAK	Peter	Slovakia	2012
HUYBRECHTS	Wim	Belgium	2009
IATROPOULOS	Dimitrios	Greece	2016
INFUSINO	Tommaso	Italy	2013
JAN	Matevz	Slovenia	2016
JANDA	Igor	Germany	2012
JANSEN	Ward	Netherlands	2010
JASTRZEBSKI	Marek	Poland	2008
JILEK	Clemens	Germany	2012
JIMENEZ JAIMEZ	Juan	Spain	2015
JIMENEZ LOPEZ	Jesús	Spain	2016
JIMENEZ-DIAZ	Javier	Spain	2015
JOHAR	Sofian	United Kingdom	2012
JONES	David Gareth	United Kingdom	2012
JOST	Colin	Germany	2015
JULIA CALVO	Justo	Spain	2016
KACZMAREK	Krzysztof	Poland	2013

EHRA EP Certified professionals (Written Exam + Logbook)

KARDOS	Attila	Hungary	2012
KEMME	Michiel	Netherlands	2009
KIEDROWICZ	Radoslaw	Poland	2016
KILISZEK	Marek	Poland	2010
KONSTANTINIDOU	Melanie	Germany	2013
KOOPMAN	Pieter	Belgium	2014
KOSTOPOULOU	Anna	Greece	2014
KRISTENSEN	Jens	Denmark	2014
KUHNE	Michael	Switzerland	2012
KUMAR	Narendra	Netherlands	2016
LANG	Christopher	United Kingdom	2014
LAURENZI	Francesco	Italy	2009
LE POLAIN DE WAROUX	Jean-Benoit	Belgium	2015
LERCHER	Peter	Austria	2012
LETSAS	Konstantinos	Greece	2009
LEVENTOPOULOS	Georgios	Greece	2016
LOUW	Ruan	South Africa	2014
LUEDORFF	Guido	Germany	2012
LUERMANS	Justin	Netherlands	2014
LUQUE	Antonio	Spain	2015
MADRID	Antonio	Spain	2008
MAKOWSKI	Karol	Portugal	2016
MARINI	Massimiliano	Italy	2011
MARTINEK	Martin	Austria	2010
MARTINEZ SANDE	Jose Luis	Spain	2012
MATIA FRANCES	Roberto	Spain	2011
MATIELLO	Maria	Spain	2011
MATOSHVILI	Zviad	Georgia Republic of	2016
MEJIA MARTINEZ	Elena	Spain	2016
MOLATTA	Stephan	Germany	2016
MORENO	Jose	Spain	2016
MORENO REVIRIEGO	Sara	Spain	2014
MUELLER	Stephan Andreas	Switzerland	2012
MUNDEL	Markus	Germany	2013
NAGEH-ARMANIOS	Maged	United States of America	2012
NAVARRETE CASAS	Antonio Javier	United States of America	2008
NAVARRO	Javier	Spain	2016
NENTWICH	Karin	Germany	2013
NG	Fu Siong	United Kingdom	2016
NOVAK	Jan	United Kingdom	2013
OLSZEWSKI	Rafał	Poland	2016
OSCA ASENSI	Joaquin	Spain	2010
ÖZCAN	Emin Evren	Turkey	2014
PACHON	Marta	Spain	2014
PADFIELD	Gareth	United Kingdom	2015
PAPIASHVILI	Giorgi	Georgia Republic of	2009
PARK	Chan-Il	Switzerland	2016
PAURIAH	Maheshwar	United Kingdom	2015
PAVLOVIC	Nikola	Croatia	2014
PELAEZ GONZALEZ	Antonio	Spain	2015
PENELA	Diego	Spain	2016

EHRA EP Certified professionals (Written Exam + Logbook)

PEREZ ALVAREZ	Luisa	Spain	2014
PEREZ DIEZ	Diego	Spain	2012
PEZAWAS	Thomas	Austria	2016
PISON	Laurent	Netherlands	2013
POELSLEER	Robert	Germany	2014
POZZETTI	Daniela	Italy	2007
PRISECARU	Raluca	Belgium	2015
PUCHOL	Alberto	Hungary	2012
RACKAUSKAS	Gediminas	Lithuania	2015
RADELJIC	Vjekoslav	Croatia	2016
RAJU	Hariharan	United Kingdom	2016
REBELLATO	Luca	Italy	2012
REICHLIN	Tobias	Switzerland	2016
RIAH	Leila	Tunisia	2016
RICCIARDI	Danilo	Belgium	2013
RICCIARDI	Giuseppe	Italy	2016
RISTIC	Velibor	Serbia	2016
RIVAS GANDARA	Nuria	Spain	2013
RIVERA	Santiago	Canada	2013
ROCA LUQUE	Ivo	Spain	2014
RODRIGUEZ MANERO	Moises	Belgium	2013
RORDORF	Roberto	Italy	2012
ROSSI	Luca	Italy	2014
ROTEN	Laurent	Switzerland	2009
ROUBICEK	Tomas	Czech Republic	2016
ROUX	Antoine	France	2013
RUBIO	Jose Manuel	Spain	2016
SALGADO ARANDA	Ricardo	Spain	2014
SALGUERO BODES	Rafael	Spain	2009
SAMO AYOU	Romeo	Sweden	2011
SANZO	Antonio	Italy	2015
SARRIAS	Axel	Spain	2016
SAUSE	Armin	Germany	2009
SAYGI	Serkan	Turkey	2016
SCHIMPF	Rainer	Germany	2012
SCHOONDERWOERD	Bas	Netherlands	2012
SEBAG	Frederic	France	2014
SEGRETI	Luca	Italy	2013
SEGURA VILLALOBOS	Federico	Spain	2012
SEILER	Jens	Switzerland	2013
SEOW	Swee-Chong	Singapore	2007
SERVATIUS	Helge	Switzerland	2014
SGARITO	Giuseppe	Italy	2014
SIEIRA RODRIGUEZ-MORET	Juan Antonio	Spain	2015
SILISTE	Calin	Italy	2013
SKENE	Christopher	United Kingdom	2014
SMIT	Jaap Jan	Netherlands	2009
SOHAL	Manav	United Kingdom	2016
STANLEY	Anthony	South Africa	2014
STEFFEL	Jan	Switzerland	2012
STOECKEL	Holger	Switzerland	2015

EHRA EP Certified professionals (Written Exam + Logbook)

STUEHLINGER	Markus	Austria	2010
SZABO	Albin Arpad	Hungary	2012
SZEPLAKI	Gabor	Hungary	2012
TEJEIRA FERNANDEZ	Elvis	United Kingdom	2012
TEMPLE	Ian	United Kingdom	2016
TER BEKKE	Rachel M.A.	Netherlands	2015
TOMAN	Ondrej	Czech Republic	2013
TONIOLO	Mauro	Italy	2016
TORCIVA	Riccardo	Italy	2015
TRAN	Van Nam	Switzerland	2016
TRINES	Serge Alexander Ivo Petrus	Netherlands	2008
TRUCCO DE RINAUDO	Maria Emilce	Spain	2015
TÜLÜMEN	Erol	Germany	2016
TURRENI	Federico	Italy	2016
TUTDIBI	Osman	Germany	2013
TUTUIANU	Cristina Ioana	Romania	2015
TZEIS	Stylianios	Greece	2010
UCER	Ekrem	Germany	2012
VACCARI	Diego	Italy	2013
VALVERDE ANDRE	Irene	Spain	2013
VAN CASTEREN	Lieve	Belgium	2012
VAN DER HEUDEN	Jeroen	Netherlands	2015
VAN DIJK	Vincent	Netherlands	2016
VAN HEUVERSWEYN	Frederic	Belgium	2015
VAN MALDEREN	Sophie	Netherlands	2016
VAN OPSTAL	Jurren	Netherlands	2014
VATASESCU	Radu-Gabriel	Romania	2009
VEDRAN	Velagic	Croatia	2016
VENABLES	Paul	United Kingdom	2013
VERNOOY	Kevin	Netherlands	2016
VILLUENDAS SABATE	Roger	Spain	2013
VITALE	Raffaele	Italy	2012
VOCKE	Wolfgang	Germany	2013
VOSS	Frederik	Germany	2009
VUKAJLOVIC	Dejan	Germany	2010
WETZEL	Renate Ulrike	Germany	2015
WIJCHERS	Sip	Belgium	2015
WINTER	Siegmund	Austria	2012
WOLF	Michael	Belgium	2016
YAP	Sing-Chien	Netherlands	2016
YEO	Wee Tiong	Singapore	2013
ZELJKO	Hrvjka Marija	Croatia	2013
ZELLERHOFF	Stephan	Germany	2015
ZOPPO	Franco	Italy	2008
ZUBERI	Zia	United Kingdom	2016
ZUCCHELLI	Giulio	Italy	2012

EP Certification candidates who have successfully completed the written exam

ABALEA	Jerome	France	2014
ABDELWAHED	Ahmed	Finland	2016
ABEDIN	Zainul	United States of America	2007
ÁBRAHAM	Pál	Hungary	2013
ACENA RAMOS	Marta	Spain	2011
ACOSTA MARTINEZ	Juan	Spain	2014
ACOU	Willem-Jan	Belgium	2013
ADİYAMAN	Ahmet	Netherlands	2014
AHMED TAHER MAHMOUD	Ahmed	Egypt	2013
AHUMADA	Miguel	Spain	2013
AKERSTROM	Finn	Sweden	2015
AL AMOURA	Alaa	France	2015
AL BUNNI	Muhamad	Italy	2007
ALCALDE RODRIGUEZ	Oscar	Spain	2010
ALGARRA CULLELL	Maria	Spain	2013
ALI	Hussam	Italy	2014
ALIYEV	Farid	Turkey	2010
ALKAHACHI	Hayder Riyadh	Iraq	2016
ALONSO FERNANDEZ	Pau	Spain	2016
ALZAND	Bakr	Netherlands	2012
AMET	Denis	France	2011
ANDERSON	Mark H	United Kingdom	2010
ANDRES LAHUERTA	Ana	Spain	2016
ANGUERA CAMOS	Ignacio	Spain	2008
ANIC	Ante	Croatia	2013
ANNE	Wim	Belgium	2010
ANTOLIC	Bor	Slovenia	2015
ANTON ARANZANA	Mercedes	Spain	2016
ARBELO	Elena	Spain	2007
ARCOCHA TORRES	Maria Fe	Spain	2009
ARGUEDAS-JIMENEZ	Hugo	Spain	2014
ARIAS PALOMARES	Miguel Angel	Spain	2010
ARISHA	Mohamed Mousa	France	2015
ARMENTA PASTOR	Juan Fernandez	Spain	2011
ARND	Christoph	Germany	2014
AROLA	Olli Tapani	Finland	2016
ATTA	Salah Eldin Sayed	Saudi Arabia	2010
ATTANASIO	Philipp Johannes	Germany	2016
AVELLA	Andrea	Italy	2007
ÁVILA ALONSO	Pablo	Spain	2013
AYALA PAREDES	Felix Alejandro	Canada	2007
AZEM	Tareq	Germany	2014
BALDINGER	Samuel Hannes	Switzerland	2016
BALT	Jippe	Netherlands	2013
BALTA	Osman	Germany	2010
BARBRAUD	Cynthia	Belgium	2016
BARDYSZEWSKI	Aleksander	Poland	2014
BARRY	James	United Kingdom	2012
BARSAMYAN	Sergey	United Kingdom	2016
BASTANI	Hamid	Sweden	2015
BASTIAN	Dirk	Germany	2014

EP Certification candidates who have successfully completed the written exam

BASTOS AMADOR	Pablo	Spain	2016
BAUERNFEIND	Tamas	Hungary	2013
BAYRAK	Duhan Fatih	Belgium	2011
BEAUPORT	Joelle	Germany	2012
BEDNAREK	Jacek	Poland	2011
BEHAR	Nathalie	France	2014
BELOTTI	Giuseppina	Italy	2006
BENCARDINO	Gianluigi	Italy	2015
BENCSIK	Gabor	Hungary	2009
BENEZET MAZUECOS	Juan	Spain	2014
BENITO MARTIN	Eva Maria	Spain	2015
BERRUEZO SANCHEZ	Antonio	Spain	2006
BERTAGNOLLI	Livio	Italy	2013
BERTERO	Giovanni	Italy	2012
BERTINI	Matteo	Italy	2016
BERTOMEU-GONZALEZ	Vicente	Spain	2010
BEUKEMA	Rypko	Netherlands	2016
BIANCHI	Francesca	Italy	2014
BISBAL	Felipe	Belguim	2014
BLAAUW	Yuri	Netherlands	2011
BLANDINO	Alessandro	Italy	2013
BOGDAN	Stefan Nicolae	Romania	2014
BOHORA	Shomu	India	2012
BON	Laurens Bastiaan	Netherlands	2016
BONANNO	Carlo	Italy	2011
BORDIGNON	Stefano	Italy	2013
BORLICH	Martin	Germany	2016
BOROV	Stefan	Bulgaria	2015
BORREGO BERNABE	Luis	Spain	2013
BOTROS	Maichel Sobhy Naguib	Egypt	2014
BOULÉ	Stéphane	France	2016
BOULLIN	Julian Paul	United Kingdom	2010
BRAVO	Loreto	Spain	2016
BROCKMEIER	Johannes Paul	Germany	2013
BRODHERR	Turgut	Germany	2016
BROUZET	Thomas	Spain	2012
BRUGADA	Josep	Spain	2007
BUCHHOLZ	Jochen	Germany	2013
BUERKLE	Gerd	Austria	2008
BUIATTI	Alessandra	Italy	2015
BUN	Sok-Sithikun	France	2012
BURKHARDT	Dietmar	Germany	2014
BURRI	Haran	Switzerland	2007
CABANAS GRANDIO	Pilar	Spain	2014
CABRERA GOMEZ	Sandra	Spain	2014
CALVANESE	Raimondo	Italy	2014
CALVO CUERVO	David	Spain	2010
CALVO GALIANO	Naiara	Spain	2011
CAMPOS GARCIA	Bieito	Spain	2010
CAÑADAS GODOY	Maria Victoria	Spain	2013
CANO PEREZ	Oscar	Spain	2009

EP Certification candidates who have successfully completed the written exam

CAPUTO	Maria Luce	Switzerland	2016
CARBALLEIRA	Lidia	Spain	2015
CASADO ARROYO	Ruben	Spain	2015
CASTAGNO	Davide	Italy	2015
CASTILLO	Jesús	Spain	2013
CASTREJON CASTREJON	Sergio	Spain	2012
CASTRO FIGUEROA	Lena Del Pilar	Spain	2015
CASTRO URDA	Victor	Spain	2009
CATANCHIN	Andrei	Australia	2008
CELKYURT	Yengi Umut	Turkey	2016
CHALDOUPI	Sevasti-Maria	Netherlands	2015
CHAPURNYKH	Alexander	Russian Federation	2015
CHATTERJEE	Debjit	United Kingdom	2010
CHEN	Shaojie	Austria	2016
CHONG	Daniel	Singapore	2011
CIPOLLETTA	Laura	Italy	2015
CISMARU	Gabriel	Romania	2015
CLEMENS	Marcell	Hungary	2012
CLEMENTY	Nicolas	France	2010
CONTE	Giulio	Italy	2015
CONTI	Sergio	Italy	2015
CORTEZ-DIAS	Nuno	Portugal	2013
COSTA	Alessandro	Italy	2015
COZAR LEON	Rocio	Spain	2011
DANMAYR	Franz	Austria	2016
DAR	Mehboob	Saudi Arabia	2013
DATINO	Tomas	Spain	2011
DAVOODI	Gholamreza	Ireland	2007
DE DIEGO	Carlos	Spain	2012
DE FILIPPO	Paolo	Italy	2011
DE GROOT	Joris R	Netherlands	2009
DE JONG	Jonas	Netherlands	2011
DE LUCIA	Raffaele	Italy	2015
DE MEYER	Grim	Belgium	2011
DE POOTER	Jan	Belgium	2016
DE RIVA SILVA	Marta	Spain	2011
DEL CASTILLO ARROJO	Silvia	Spain	2006
DELCOUR	Alexandre	Belgium	2015
DELGADO	Hugo Emilio	Argentina	2013
DEPREZ	Frederic	Belgium	2016
DEUTSCH	Alexandru	Romania	2009
DI CORI	Andrea	Italy	2012
DIAMANTE	Rafael	Brazil	2016
DICHTL	Wolfgang	Austria	2011
DIDENKO	Maxim	Russian Federation	2016
DILLIER	Roger	Switzerland	2016
DINOV	Borislav	Germany	2012
DJAJADISASTRA	Achmad Iskandar	Germany	2011
DOMINGUEZ MAFE	Eloy	Spain	2012
DURÁN GUERRERO	Juan Manuel	Spain	2016
DURAY	Gabor Zoltan	Germany	2008

EP Certification candidates who have successfully completed the written exam

DUTHOIT	Guillaume	France	2010
DYRDA	Katia	Canada	2010
EIGENBERGER	Bernd	Switzerland	2016
EJSBOUTS	Sabine	Netherlands	2014
EISENBERGER	Martin	Czech Republic	2008
EIZMENDI GOICOECHEA	Maria De Iciar	Spain	2011
EL KADRI	Moutaz	United Kingdom	2012
EL MAGHAWRY	Mohamed	Egypt	2015
ELDER	Douglas	United Kingdom	2010
ELICES TEJA	Juliana	Spain	2015
EL-OMRI	Youssef	France	2016
ENE	Elena	Germany	2016
ESTRADA	Alejandro	Spain	2013
EVERTZ	Reinder	Netherlands	2014
EWERTSEN	Niels Christian	Germany	2013
EXPOSITO	Victor	Spain	2015
FEDIDA	Joel	Belgium	2016
FERNANDEZ GOMEZ	Juan Manuel	Spain	2016
FERNANDEZ PASTOR	Julia	Spain	2012
FICHTNER	Stephanie	Germany	2014
FIGUEROA	Jorge Alejandro	Argentina	2014
FILGUEIRAS RAMA	David	Spain	2012
FONTENLA	Adolfo	Spain	2010
FORCLAZ	Andrei	Switzerland	2009
FOSCH	Javier	Spain	2013
FRANCISCO PASCUAL	Jaume	Spain	2016
FRANCK	Harald	Germany	2010
FRANCO DIEZ	Eduardo	Spain	2015
FRANZINI	Christine	Switzerland	2014
FRONTERA	Antonio	Italy	2016
FUKUNAGA	Masato	Czech Republic	2015
GALLARDO LOBO	Rodrigo	Spain	2009
GANDOLFI	Edoardo	Italy	2016
GAROFALO FORTE	Daniel	Spain	2013
GAWRYSIAK	Marcin	Poland	2009
GLOWNIAK	Andrzej	Poland	2009
GODA	Sherif	Egypt	2014
GOMEZ	Federico	Spain	2014
GONZALEZ FERRER	Juan Jose	Spain	2012
GONZALEZ TORRES	Luis	Spain	2016
GONZALEZ VASSEROT	Maria Del Mar	Spain	2007
GONZALEZ-ENRIQUEZ	Susana	Spain	2008
GOPALAMURUGAN	A B	United Kingdom	2011
GOURRAUD	Jean Baptiste	France	2014
GRANDJBAKHCH	Estelle	France	2013
GRANIER	Mathieu	France	2011
GRECU	Mihaela	Romania	2006
GREYLING	Adele	Belgium	2016
GRIECO	Domenico	Italy	2014
GRUBB	Neil	United Kingdom	2014
GUENANCIA	Charles	France	2015

EP Certification candidates who have successfully completed the written exam

GUGUCHEV	Pavel	United States of America	2010
GUY-MOYAT	Benoit	France	2010
HAGGUI	Abdeddayem	Tunisia	2015
HASSINK	Rutger	Netherlands	2016
HAYASHI	Kentaro	Germany	2016
HEMELS	Martin	Netherlands	2011
HENDRICKS	Neil	South Africa	2012
HENKENS	Ivo	Netherlands	2015
HERCZKU	Csaba	Hungary	2009
HLIVAK	Peter	Slovakia	2010
HOBBS	William Julian	United Kingdom	2007
HOFFMANN	Andrzej	Poland	2012
HOGLUND	Niklas	Sweden	2008
HOOFT VAN HUYSDUYNEN	Bart	Netherlands	2011
HORDYNSKI	Grzegorz	Poland	2012
HUEMER	Martin	Germany	2013
HUYBRECHTS	Wim	Belgium	2008
IATROPOULOS	Dimitrios	Greece	2015
IMNADZE	Guram	Germany	2015
INFUSINO	Tommaso	Italy	2011
IORGULESCU	Corneliu-Nicolae	Romania	2012
JAN	Matevz	Slovenia	2014
JANDA	Igor	Germany	2009
JANSEN	Ward	Netherlands	2009
JARMAN	Julian	United Kingdom	2012
JASTRZEBSKI	Marek	Poland	2007
JAUREGUI ABULARACH	Miguel Eduardo	Spain	2010
JILEK	Clemens	Germany	2011
JIMENEZ JAIMEZ	Juan	Spain	2013
JIMENEZ LOPEZ	Jesús	Spain	2015
JIMENEZ-DIAZ	Javier	Spain	2013
JOHAR	Sofian	United Kingdom	2009
JONES	David Gareth	United Kingdom	2009
JOST	Colin	Germany	2012
JUAREZ PRERA	Ruben Alfonso	Spain	2016
JULIA CALVO	Justo	Spain	2015
KACZMAREK	Krzysztof	Greece	2010
KADHIM	Mohammed Ameen	Iraq	2016
KANDIL	Mehmet	Germany	2011
KARDOS	Attila	Hungary	2010
KARFOUL	Nizar	Germany	2016
KEMME	Michiel	Netherlands	2008
KIEDROWICZ	Radoslaw	Poland	2016
KILISZEK	Marek	Poland	2009
KIRUBAKARAN	Senthil	United Kingdom	2012
KOCH	Lydia	Germany	2012
KONRAD	Torsten	Germany	2014
KONSTANTINIDOU	Melanie	Germany	2011
KONTOGEORGIS	Andrianos	United Kingdom	2015
KOOPMAN	Pieter	Belgium	2011
KOSTOPOULOU	Anna	Greece	2012

EP Certification candidates who have successfully completed the written exam

KOUROUKLIS	Spyridon	Greece	2016
KOX	Thomas	Germany	2015
KRISTENSEN	Jens	Denmark	2013
KRIVOLAPOV	Sergey	Russian Federation	2013
KUHNE	Michael	Switzerland	2011
KUMAR	Narendra	Netherlands	2015
KUPICS	Kaspars	Latvia	2015
LALLEMAND	Benedicte	France	2012
LANG	Christopher	United Kingdom	2012
LANGBEIN	Anke	Germany	2014
LAURENZI	Francesco	Italy	2008
LAURIBE	Philippe	France	2016
LE POLAIN DE WAROUX	Jean-Benoit	Belgium	2012
LEO	Milena	United Kingdom	2016
LEPIECE	Caroline	Belgium	2016
LERCHER	Peter	Austria	2010
LETSAS	Konstantinos	Greece	2008
LEVENTOPOULOS	Georgios	Greece	2014
LINDE	Antonio	Spain	2013
LINHART	Markus	Germany	2016
LOUSBERG	Philippe	Belgium	2016
LOUSINHA	Ana	Portugal	2016
LOUW	Ruan	South Africa	2014
LUEDORFF	Guido	Germany	2012
LUERMANS	Justin	Netherlands	2013
LUQUE	Antonio	Spain	2014
LYAN	Evgeny	Russian Federation	2016
LYSEGGEN	Erik	Norway	2016
MADRAZO DELGADO	Ines	Spain	2012
MADRID	Antonio	Spain	2008
MAKIMOTO	Hisaki	Germany	2016
MAKOWSKI	Karol	Portugal	2010
MANENTI	Vladimir	France	2016
MANTZIARI	Aglaia-Angeliki (Lilian)	United Kingdom	2013
MANUSAMA	Randy	Netherlands	2015
MARINI	Massimiliano	Italy	2010
MARTINEK	Martin	Austria	2008
MARTINEZ SANDE	Jose Luis	Spain	2009
MARZAK	Halim	France	2016
MASSIN	Francois	France	2009
MATIA FRANCES	Roberto	Spain	2009
MATIELLO	Maria	Spain	2007
MATOSHVILI	Zviad	Georgia Republic of	2016
MCCREADY	James	United Kingdom	2010
MCLELLAN	Alex	Australia	2016
MEJIA	Elena	Spain	2014
MELLOR	Greg	United Kingdom	2013
MENDOZA LEMES	Haridian	Spain	2016
MENET	Aymeric	France	2016
MEYER	Christian	Germany	2011
MOISEI	Radu Eugen	Romania	2015

EP Certification candidates who have successfully completed the written exam

MOLATTA	Stephan	Germany	2015
MOLINA LERMA	Manuel Jose	Spain	2016
MORENO	Jose	Spain	2013
MORENO REVIRIEGO	Sara	Spain	2011
MUELLER	Dirk	Germany	2008
MUELLER	Stephan Andreas	Switzerland	2011
MUNDEL	Markus	Germany	2011
MUNOZ ESPARZA	Carmen	Spain	2015
MUNTEAN	Bogdan	Germany	2013
NAGEH-ARMANIOS	Maged	United States of America	2010
NAMDAR	Mehdi	Switzerland	2016
NAVARRETE CASAS	Antonio Javier	United States of America	2007
NAVARRO	Javier	Spain	2012
NELLESSEN	Eric	Belgium	2016
NENTWICH	Karin	Germany	2012
NG	Fu Siong	United Kingdom	2014
NOTI	Fabian	Switzerland	2013
NOVAK	Jan	United Kingdom	2013
OLORIZ SANJUAN	Teresa	Spain	2013
OLSZEWSKI	Rafał	Poland	2016
OOMEN	Ad	Netherlands	2016
OSCA ASENSI	Joaquin	Spain	2006
ÖZCAN	Emin Evren	Turkey	2013
PACHON	Marta	Spain	2011
PADFIELD	Gareth	United Kingdom	2013
PAISEY	John	United Kingdom	2008
PANCHETTI	Luca	Italy	2014
PAPIASHVILI	Giorgi	Georgia Republic of	2007
PARK	Chan-Il	Switzerland	2014
PAURIAH	Maheshwar	United Kingdom	2012
PAVACI	Heribert	Germany	2015
PAVLOVIC	Nikola	Croatia	2014
PAWLIK	Tomasz	Poland	2013
PEDRETTI	Stefano	Italy	2016
PELAEZ GONZALEZ	Antonio	Spain	2012
PENELA	Diego	Spain	2014
PEREZ	Armando	Spain	2010
PEREZ ALVAREZ	Luisa	Spain	2011
PEREZ DIEZ	Diego	Spain	2010
PERROTTA	Laura	Italy	2014
PEZAWAS	Thomas	Austria	2015
PIQUERAS	Eric	France	2015
PISON	Laurent	Netherlands	2010
POELSLE	Robert	Germany	2014
POOSAPADDI RAJA	Bhima Shankar	India	2012
POSTEMA	Pieter Gerard	Netherlands	2016
POZZETTI	Daniela	Italy	2007
PRISECARU	Raluca	Belgium	2015
PUCHOL	Alberto	Hungary	2009
QURESHI	Norman	United Kingdom	2013
RACKAUSKAS	Gediminas	Lithuania	2015

EP Certification candidates who have successfully completed the written exam

RADELJIC	Vjekoslav	Croatia	2016
RAJU	Hariharan	United Kingdom	2015
RAMANNA	Hemanth	Netherlands	2008
REBELLATO	Luca	Italy	2009
REGOLI	Francois	Switzerland	2016
REICHLIN	Tobias	Switzerland	2016
RENZULLO	Elvira	Italy	2015
RIAH	Leila	Tunisia	2013
RICCIARDI	Daniilo	Belgium	2012
RICCIARDI	Giuseppe	Italy	2015
RISTIC	Velibor	Serbia	2015
RIVAS GANDARA	Nuria	Spain	2010
RIVERA	Santiago	Canada	2013
ROCA LUQUE	Ivo	Spain	2011
ROCHA COSTA	Sergia	Portugal	2015
RODRIGUEZ MANERO	Moises	Belgium	2012
RORDORF	Roberto	Italy	2009
ROSER	Mattias	Germany	2012
ROSSI	Andrea	Italy	2011
ROSSI	Luca	Italy	2012
ROTEN	Laurent	Switzerland	2008
ROUBICEK	Tomas	Czech Republic	2016
ROUX	Antoine	France	2010
RUBIO	Jose Manuel	Spain	2015
RUDIC	Boris	Germany	2016
SAGUNER	Ardan Muammer	Switzerland	2016
SALGADO ARANDA	Ricardo	Spain	2013
SALGUERO BODES	Rafael	Spain	2007
SALMAS	Jozef	Germany	2015
SAMMUT	Mark Adrian	Malta	2012
SAMO AYOU	Romeo	Sweden	2010
SANCHEZ BORQUE	Pepa	Spain	2015
SANCHEZ GOMEZ	Juan Miguel	Spain	2013
SANCHEZ MILLAN	Pablo Javier	Spain	2016
SANDILANDS	A	United Kingdom	2010
SANZO	Antonio	Italy	2014
SARRIAS	Axel	Spain	2013
SAUSE	Armin	Germany	2008
SAYGI	Serkan	Turkey	2015
SCHERR	Daniel	Austria	2013
SCHIMPF	Rainer	Germany	2012
SCHOENBAUER	Robert	Austria	2011
SCHOONDERWOERD	Bas	Netherlands	2008
SCHREIBER	Doreen	Switzerland	2016
SCOPINARO	Alice	Italy	2016
SEBAG	Frederic	France	2014
SEGRET	Luca	Italy	2010
SEGURA VILLALOBOS	Federico	Spain	2011
SEILER	Jens	Switzerland	2010
SEOW	Swee-Chong	Singapore	2007
SERVATIUS	Helge	Switzerland	2014

EP Certification candidates who have successfully completed the written exam

SGARITO	Giuseppe	Italy	2012
SIEIRA RODRIGUEZ-MORET	Juan Antonio	Spain	2014
SIELSKI	Slawomir	Poland	2007
SILBERBAUER	John	United Kingdom	2013
SILISTE	Calin	Italy	2011
SKENE	Christopher	United Kingdom	2013
SKODA	Jan	Czech Republic	2008
SMIT	Jaap Jan	Netherlands	2008
SOHAIB	Syed Mohammad Afzal	United Kingdom	2016
SOHAL	Manav	United Kingdom	2015
SONNE	Kai	Germany	2015
SORREL	Jeremie	France	2015
SOLUSA	Pedro	Portugal	2016
SPADACINI	Gianmario	Italy	2006
STANLEY	Anthony	South Africa	2012
STEC	Sebastian	Poland	2014
STEFFEL	Jan	Switzerland	2012
STOECKEL	Holger	Switzerland	2012
STUEHLINGER	Markus	Austria	2010
SUMAN HORDUNA	Irina	United Kingdom	2008
SVETLOSAK	Martin	Slovakia	2016
SZABO	Albin Arpad	Hungary	2010
SZEPLAKI	Gabor	Hungary	2011
SZTANISZLAV	Aron	Hungary	2015
TAHAPARY	Giovanni	Netherlands	2013
TAHIN	Tamas	Hungary	2015
TAKARADA	Ken	Belgium	2016
TAN	Vern Hsen	Singapore	2016
TAPANAINEN	Jari Matti	Sweden	2016
TEUEIRA FERNANDEZ	Elvis	United Kingdom	2012
TEMPLE	Ian	United Kingdom	2013
TER BEKKE	Rachel M.A.	Netherlands	2013
THOMAS	Dewi	United Kingdom	2016
TOMAN	Ondrej	Czech Republic	2012
TOMLINSON	David	United Kingdom	2008
TONIOLO	Mauro	Italy	2014
TORCIVIA	Riccardo	Italy	2012
TRAN	Van Nam	Switzerland	2014
TRAYKOV	Vassil B	Hungary	2010
TREGUER	Frederic	France	2009
TRINES	Serge Alexander Ivo Petrus	Netherlands	2006
TRUCCO DE RINAUDO	Maria Emilce	Spain	2013
TSCHOLL	Verena	Germany	2015
TÜLÜMEN	Erol	Germany	2016
TUOHY	Stephen	Ireland	2015
TURRENI	Federico	Italy	2014
TUTDIBI	Osman	Germany	2012
TUTUIANU	Cristina Ioana	Romania	2014
TZEIS	Stylianios	Greece	2009
ÜCER	Ekrem	Germany	2011
URBAN	Lubos	Slovakia	2009

EP Certification candidates who have successfully completed the written exam

VACCARI	Diego	Italy	2012
VALVERDE ANDRE	Irene	Spain	2010
VAN ALEM	Anouk	Netherlands	2012
VAN CASTEREN	Lieve	Belgium	2010
VAN DER HEUDEN	Jeroen	Netherlands	2013
VAN DIJK	Vincent	Netherlands	2015
VAN HEUVERSWYN	Frederic	Belgium	2012
VAN MALDEREN	Sophie	Netherlands	2015
VAN OOSTROM	Antonie	Netherlands	2012
VAN OPSTAL	Jurren	Netherlands	2013
VANDUYNHOVEN	Philippe	Belgium	2015
VATASESCU	Radu-Gabriel	Romania	2007
VEASEY	Rick	United Kingdom	2014
VEDRAN	Velagic	Croatia	2016
VEGA OLVERA	Mercedes	Spain	2012
VENABLES	Paul	United Kingdom	2010
VERNOOY	Kevin	Netherlands	2014
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
WATANABE	Masaya	Netherlands	2014
WEBERNDORFER	Vanessa	Switzerland	2015
WESTRA	Sjoerd	Netherlands	2012
WETZEL	Renate Ulrike	Germany	2013
WIJCHERS	Sip	Belgium	2012
WILKOWSKI	Mateusz	Poland	2016
WINTER	Siegmund	Austria	2010
WIWATWORAPAN	Weerapan	Thailand	2016
WO	Hung-Ta	Taiwan	2015
WOLF	Michael	Belgium	2015
WYNN	Gareth	United Kingdom	2014
YAMASE	Miki	Italy	2015
YAP	Sing-Chien	Netherlands	2016
YEO	Wee Tiong	Singapore	2013
ZELJKO	Hrvjka Marija	Croatia	2012
ZELLERHOFF	Stephan	Germany	2011
ZHELYAKOV	Eugeny	Russian Federation	2012
ZOPPO	Franco	Italy	2006
ZUBERI	Zia	United Kingdom	2013
ZUCCHELLI	Giulio	Italy	2008

Cardiac Pacing & Device Therapy

EHRA CP Certified professionals (Written Exam + Logbook)

AARDEMA	Margriet W.	Netherlands	2014
ACENA RAMOS	Marta	Spain	2012
ACOU	Willem-Jan	Belgium	2014
ADDONISIO	Luigi	Italy	2016
ADIYAMAN	Ahmet	Netherlands	2014
AL BUNNI	Muhamad	Italy	2007
ALCALDE RODRIGUEZ	Oscar	Spain	2012
AL-HASHIMI	Hisham	Netherlands	2015
ALIZADEH DEHNAVI	Reza	Netherlands	2016
ALZAND	Bakr	Netherlands	2012
ANNE	Wim	Belgium	2011
APOSTOLOPOULOS	Theodoros	Greece	2007
ARBELO	Elena	Spain	2013
ARIAS PALOMARES	Miguel Angel	Spain	2013
ARNOLD	Alfred E. R.	Netherlands	2016
AYALA PAREDES	Felix Alejandro	Canada	2009
AZEM	Tareq	Germany	2015
BACCHIONI	Giuseppe	Italy	2012
BAHGAT	Amr Kamal	Egypt	2012
BALT	Jippe	Netherlands	2014
BALTA	Osman	Germany	2013
BARSAMYAN	Sergey	Armenia	2016
BAYRAK	Duhan Fatih	Belgium	2012
BENCSIK	Gabor	Hungary	2009
BENEZET MAZUECOS	Juan	Spain	2016
BERTOMEU-GONZALEZ	Vicente	Spain	2012
BIJSTERVELD	Nick	Netherlands	2012
BISSINGER	Andrzej	Poland	2007
BLAAUW	Yuri	Netherlands	2012
BLANDINO	Alessandro	Italy	2016
BLICHARZ	Jaroslav	Poland	2015
BOHM	Adam	Hungary	2009
BONANNO	Carlo	Italy	2014
BOOS	Christopher	United Kingdom	2009
BORGER VAN DER BURG	Alida Elisabeth	Netherlands	2009
BORGHOUTS	Virginie	Netherlands	2016
BORLEFFS	Jan Willem	Netherlands	2016
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
CABANAS GRANDIO	Pilar	Spain	2016
CALVO CUERVO	David	Spain	2013
CALZOLARI	Vittorio	Italy	2007
CANADAS	Victoria	Spain	2013
CARAVATI	Fabrizio	Italy	2012
CARROZ	Patrice	Switzerland	2016
CASSIDY	Christopher John	United Kingdom	2015

EHRA CP Certified professionals (Written Exam + Logbook)

CHATTERJEE	Debjit	United Kingdom	2013
CHONG	Daniel	Singapore	2013
CHONG YU	Eric	Singapore	2013
CHRISTOPHE	Arnd	Germany	2014
CHRISTOU	Apostolos	Greece	2015
CIPOLLETTA	Laura	Italy	2014
CLEMENS	Marcell	Hungary	2015
CROSATO	Martino	Italy	2009
CURNIS	Antonio	Italy	2007
CZUNKO	Agnieszka	Poland	2016
DAVID	Laura-Alice	Romania	2015
DE DOELDER	Marieke	Netherlands	2012
DE GROOT	Joris R.	Netherlands	2011
DE JONG	Jonas	Netherlands	2012
DE LA FUENTE	Sam	Netherlands	2010
DE LUCIA	Raffaele	Italy	2016
DE MARIA	Elia	Italy	2016
DE MEYER	Grim	Belgium	2013
DE SENSI	Francesco	Italy	2015
DI CORI	Andrea	Italy	2015
DICHTL	Wolfgang	Austria	2012
DIJMAN	Barbara	Netherlands	2015
DILAVERIS	Polychronis	Greece	2007
DINH	Trang	Netherlands	2013
DOMENICHINI	Giulia	Spain	2014
DORMAN	Reinhart	Netherlands	2013
DULBECCO	Massimo	Italy	2013
DURAY	Gabor Zoltan	Germany	2008
DYRDA	Katia	Canada	2012
EHRLICH	Joachim	Germany	2012
EIJSBOUTS	Sabine	Netherlands	2015
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
EXPOSITO	Victor	Spain	2016
FACCHIN	Domenico	Italy	2013
FERNANDEZ PASTOR	Julia	Spain	2012
FERNANDEZ-ARMENTA PASTOR	Juan	Spain	2015
FIROUZI	Mehran	Netherlands	2015
FOLDESI	Csaba Laszlo	Hungary	2012
FOLEY	Paul	United Kingdom	2012
FOLKERINGA	Richard	Netherlands	2009
FONTENLA	Adolfo	Spain	2012
FRANCK	Harald	Germany	2011
FRANCOIS	Bart	Belgium	2012
FRANZINI	Christine	Switzerland	2015
FURNISS	Guy	United Kingdom	2015
GALLARDO LOBO	Rodrigo	Spain	2012

EHRA CP Certified professionals (Written Exam + Logbook)

GARCIA	Rodrigue	France	2016
GARCIA ALMAGRO	Francisco Jose	Spain	2016
GARWEG	Christophe	Belgium	2014
GERMANS	Tjeerd	Morocco	2016
GERRITSEN	Jean Georges	Netherlands	2013
GHANI	Abdul	Netherlands	2012
GIANNOLA	Gabriele	Italy	2012
GIL	Ricardo	Portugal	2013
GIL ORTEGA	Ignacio	Spain	2013
GJESTVANG	Finn Tore	Norway	2009
GONZALEZ FERRER	Juan Jose	Spain	2016
GONZALEZ-ENRIQUEZ	Susana	Spain	2013
GRABOWSKI	Marcin	Poland	2016
GRADAUS	Rainer	Germany	2007
GRAUSS	Robert Willem	Netherlands	2016
GRECU	Mihaela	Romania	2009
GRIECO	Domenico	Italy	2014
GRUBB	Neil	United Kingdom	2016
HAJKO	Erik	Hungary	2016
HAMEL	John John	Switzerland	2011
HARTOG	Jasper	Netherlands	2015
HASSINK	Rutger	Netherlands	2015
HAUER	Herbert	Netherlands	2012
HAUER	Arnaud	Netherlands	2015
HAYES	Chris	United Kingdom	2012
HAZELEGER	Ronald	Netherlands	2012
HEGGELUND	Geir	Norway	2016
HEIB	Klausdieter	Germany	2010
HEMELS	Martin	Netherlands	2012
HENKENS	Ivo	Netherlands	2016
HERCZKU	Csaba	Hungary	2012
HERSBACH	Ferry	Netherlands	2016
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
JOHAR	Sofian	United Kingdom	2015
JONES	David Gareth	United Kingdom	2012
KACZMAREK	Krzysztof	Poland	2013
KAHN	Matthew	United Kingdom	2016
KARABINOS	Ilias K.	Greece	2009

EHRA CP Certified professionals (Written Exam + Logbook)

KEMME	Michiel	Netherlands	2009
KETELS	Stefan	Belgium	2009
KLAUSZ	Gergely	Hungary	2015
KLEIN	Gunnar	Germany	2007
KLEIN	Norbert	Germany	2013
KOEPFLI	Pascal	Switzerland	2010
KOEPP	Ulf	Norway	2009
KOOPMAN	Pieter	Belgium	2014
KORANTZOPOULOS	Panagiotis	Greece	2011
KOSTOPOULOU	Anna	Greece	2012
KOULOURLIS	Spyridon	Greece	2010
KOUROUKLIS	Spyridon	Greece	2012
KRAVCHUK	Borys	Ukraine	2012
KRISTENSEN	Jens	Denmark	2013
KRUPA	Wojciech	Poland	2010
KRYZE	Lukas	Czech Republic	2016
KRZYZANOWSKI	Krystian	Poland	2016
KUJAWSKI	Tomasz	Switzerland	2016
KWASNIEWSKI	Wojciech	Poland	2016
LANGERAK	Susan	Netherlands	2013
LEFEBVRE	Kristof	Netherlands	2016
LENNERZ	Carsten	Germany	2016
LERCHER	Peter	Austria	2013
LEVENTOPOULOS	Georgios	Greece	2016
LEWANDOWSKI	Michael	Poland	2015
LINDE	Antonio	Spain	2015
LIPCHENCA	Igor Ariel	Israel	2009
LIPTON	Jonathan	Netherlands	2015
LITTERFELDT	Ingrid	Sweden	2011
LOUW	Ruan	Belgium	2014
LUBBERTVERBERKMOES	Addy	Netherlands	2013
LUEDORFF	Guido	Germany	2009
LUERMANS	Justin	Netherlands	2014
LUTHJE	Lars	Germany	2013
MAC GILLAVRY	Melvin	Netherlands	2011
MACIAG	Aleksander	Poland	2009
MADEIRA	Joao	Portugal	2012
MARGULESCU	Andrei Dumitru	Romania	2014
MARINI	Massimiliano	Italy	2008
MARTENS	Eimo	Germany	2016
MARTINEK	Martin	Austria	2010
MARTINEZ SANDE	Jose Luis	Spain	2012
MASCIOLI	Giosue	Italy	2007
MASSA	Thomas	Germany	2011
MAXIM	George Razvan	Romania	2015
MEINE	Mathias	Netherlands	2010
MENNE	Jochen	Germany	2016
MERKELY	Bela	Hungary	2007
MICHAELSEN	Jochen	Germany	2011
MJOLSTAD	Ole Christian	Norway	2016
MOLLNAU	Hanke	Germany	2014

EHRA CP Certified professionals (Written Exam + Logbook)

MONNINK	Stefan	Netherlands	2012
MORENO	Jose	Spain	2015
MORTSELL	David	Sweden	2013
MORTTADA	Ayman	Egypt	2016
MUELLER	Stephan Andreas	Switzerland	2014
MUNDEL	Markus	Germany	2011
MUNTINGA	Harm-Jans	Netherlands	2012
NAGEH-ARMANIOS	Maged	United States of America	2015
NENTWICH	Karin	Germany	2013
NEVEN	Kars	Netherlands	2008
NIIRANEN	Jussi	Finland	2016
NOVAK	Jan	Switzerland	2013
NOVIKOV	Dmitry	Russian Federation	2013
OMAR	Salama	Egypt	2012
OOMEN	Ad	Netherlands	2015
OREZIAK	Artur	Poland	2015
ORSIDA	Daniela	Italy	2014
OSMAN	Faizel	United Kingdom	2007
OSZTHEIMER	István	Hungary	2015
OUSS	Alexandre	Netherlands	2014
PACHON IGLESIAS	Marta	Spain	2016
PADFIELD	Gareth	United Kingdom	2015
PATWALA	Ashish	United Kingdom	2012
PAULUSSEN	Guido	Netherlands	2007
PAWLIK	Tomasz	Poland	2016
PENA HERNANDEZ	Jose Luis	Spain	2011
PEREZ ALVAREZ	Luisa	Spain	2013
PEREZ DIEZ	Diego	Spain	2012
PERNA	Francesco	Italy	2015
PERROTTA	Laura	Italy	2016
PETRACCI	Barbara	Italy	2012
PETTIT	Stephen	United Kingdom	2013
PHILIPS	Thomas	Belgium	2016
PINDADO RODRIGUEZ	Javier	Spain	2010
PLASEK	Jiri	Czech Republic	2016
PLUTA	Slawomir	Poland	2012
POELSLEER	Robert	Germany	2013
PORRO	Rosa	Spain	2010
POZZETTI	Daniela	Italy	2007
PREDOVSKI	Milen	Bulgaria	2013
PRISECARU	Raluca	Belgium	2015
PROIETTI	Riccardo	Italy	2014
PRUSKI	Maciej	Poland	2013
PRZYBYLSKI	Andrzej	Poland	2008
PUCHOL	Alberto	Spain	2012
PUGH	Peter	United Kingdom	2009
PYATT	Jason	United Kingdom	2012
RAO	Archana	United Kingdom	2009
RASSIAS	Ioannis	Greece	2014
REBELLATO	Luca	Italy	2012
REGOLI	François	Switzerland	2016

EHRA CP Certified professionals (Written Exam + Logbook)

REICHLIN	Tobias	Switzerland	2016
RESTLE	Christian	Germany	2013
RIAH	Leila	Tunisia	2016
RICCIARDI	Danilo	Belgium	2013
RICCIARDI	Giuseppe Gilberto	Italy	2016
RIENSTRA	Michiel	Netherlands	2014
RIVAS GANDARA	Nuria	Spain	2013
ROBERT	Jens	Switzerland	2014
ROBERTSON	Alan James	United Kingdom	2016
ROBLES DE MEDINA	Ramon Mariano	Netherlands	2015
ROCA LUQUE	Ivo	Spain	2015
ROCHA	Sérgia	Portugal	2016
RODRIGUEZ MANERO	Moises	Belgium	2013
RORDORF	Roberto	Italy	2014
ROSA	Antonio	Switzerland	2013
ROSSI	Andrea	Italy	2014
ROTEN	Laurent	Switzerland	2009
ROUKAS	Kriton-Ioannis	Greece	2012
ROUX	Antoine	France	2013
RUZICKA	Petr	United Kingdom	2013
SAFAK	Erdal	Germany	2014
SALGADO ARANDA	Ricardo	Spain	2014
SARRIAS	Axel	Spain	2016
SCHÄR	Beat Andreas	Switzerland	2013
SCHAUMANN	Anselm	Germany	2012
SCHEFFER	Michael G.	Netherlands	2011
SCHLIEPHAKE	Florian	Switzerland	2016
SCHOONDERWOERD	Bas	Netherlands	2012
SCHREVE-STEENSMA	Ariadne Midori	Netherlands	2014
SCHURMANS	Joris	Belgium	2016
SEDLACEK	Kamil	Czech Republic	2013
SEGRET	Luca	Italy	2013
SEGURA VILLALOBOS	Federico	Spain	2012
SEILER	Jens	Switzerland	2013
SEMICHON	Marc	France	2014
SEOW	Swee-Chong	Singapore	2008
SEPSI	Milan	Czech Republic	2014
SERVATIUS	Helge	Switzerland	2016
SGARITO	Giuseppe	Italy	2007
SIMEONIDOU	Eftihia	Greece	2007
SJOBLOM	Johanna	Sweden	2009
SKENE	Chris	United Kingdom	2014
SKIADAS	Ioannis	Greece	2012
SLOTTE	Fredrik	Finland	2016
SMILDE	Tom	Netherlands	2012
SONESSON	Linus	Sweden	2014
SPIERENBURG	Han	Netherlands	2009
STATESCU	Cristian	Romania	2012
STEEN	Torkel	Norway	2013
STEFAN	Liliana	Czech Republic	2012
STEFAN NICOLEA	Bogdan	Romania	2012

EHRA CP Certified professionals (Written Exam + Logbook)

STEFFEL	Jan	Switzerland	2012
STERLINSKI	Marciej	Poland	2009
STOCKBURGER	Martin	Germany	2012
STOECKEL	Holger	Switzerland	2015
STRANDERS	Ischa	Netherlands	2015
STUEHLINGER	Markus	Austria	2012
SZAMLEWSKI	Piotr	Sweden	2011
TAHAPARY	Giovanni	Netherlands	2013
TEJUEIRA FERNANDEZ	Elvis	Spain	2014
TER BEKKE	Rachel	Netherlands	2013
TIBITANZL	Jan	United Kingdom	2016
TIELEMAN	Robert	Netherlands	2012
TIMMERS	Liesbeth	Belgium	2015
TOMASI	Luca	Italy	2016
TORCIVIA	Riccardo	Italy	2012
TORN	Marieke	Netherlands	2012
TRAN	Van Nam	Switzerland	2016
TRAYKOV	Vassil B.	Bulgaria	2011
TRUCCO	Maria Emilce	Spain	2015
TUINENBURG	Anton	Netherlands	2013
TUININGA	Ype	Netherlands	2011
TUREL	Baybars	Turkey	2012
TURK	Ugur Onsel	Turkey	2015
TUTUIANU	Cristina Ioana	Romania	2015
UCER	Ekrem	Germany	2012
VACCARI	Diego	Italy	2007
VALK	Suzanne	Netherlands	2011
VALZANIA	Cinzia	Italy	2010
VAMOS	Mate	Hungary	2014
VAN ALEM	Anouk	Netherlands	2013
VAN BEMMEL	Marnix	Netherlands	2016
VAN CASTEREN	Lieve	Belgium	2011
VAN DE POLL	Sweder	Netherlands	2016
VAN DEN AKKER-BERMAN	Lily	Netherlands	2015
VAN DEN BOS	Ewoutjan	Netherlands	2011
VAN DEN BRINK	Olivier Wv	Netherlands	2014
VAN DER GALIEN	Albert	Netherlands	2016
VAN DER HEIJDEN	Robert	Netherlands	2011
VAN DER HEIJDEN	Dirk	Netherlands	2011
VAN DER HEIJDEN	Jeroen	Netherlands	2013
VAN DIJK	Vincent	Netherlands	2015
VAN DOORN	Dirk Jan	Netherlands	2015
VAN GENT	Marco	Netherlands	2016
VAN HEUVERSWIJN	Frederic	Belgium	2015
VAN KRAAIJ	Dave	Netherlands	2010
VAN MALDEREN	Sophie C.H.	Belgium	2015
VAN OOSTROM	Antonie	Netherlands	2012
VAN OPSTAL	Jurren	Netherlands	2009
VAN REIJ	Frank	Netherlands	2012
VAN ROOSMALEN	Radboud	Netherlands	2015
VAN SCHAARDENBURGH	Pepijn	Netherlands	2012

EHRA CP Certified professionals (Written Exam + Logbook)

VAN VLIES	Bob	Netherlands	2013
VAN WOERKENS	Leon	Netherlands	2012
VANDUYNHOVEN	Philippe	Belgium	2016
VASILOPOULOS	Charalambos	Greece	2007
VATASESCU	Radu-Gabriel	Romania	2007
VELTMANN	Christian	Germany	2016
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
VOLKOV	Dmytro	Ukraine	2015
VOSS	Frederik	Germany	2009
VRAZIC	Hrvoje	Croatia	2014
WEBERNDORFER	Christina Vanessa	Switzerland	2016
WESTENBRINK	B. Daan	Netherlands	2016
WESTENDORP	Iris	Netherlands	2009
WESTRA	Sjoerd	Netherlands	2012
WETZEL	Ulrike Renate	Germany	2015
WIJCHERS	Sip	Belgium	2012
WILLEMS	Albert Richard	Netherlands	2012
WOLF	Michael	Belgium	2015
WOLLMANN	Christian	Austria	2012
YAP	Sing-Chien	Netherlands	2014
YEO	Wee Tiong	Singapore	2014
ZACA'	Valerio	Italy	2016
ZAJAC	Dariusz	Poland	2016
ZAKY	Hosam	United Arab Emirates	2007
ZALEVSKY	Valery P.	Ukraine	2011
ZELJKO	Hrvojka Marija	Croatia	2015
ZERVOPOULOS	George	Greece	2007
ZIMA	Endre	Hungary	2012
ZOPPO	Franco	Italy	2007
ZUCCHELLI	Giulio	Italy	2012

CP Certification candidates who have successfully completed the written exam

AANHAAANEN	Wim	Netherlands	2016
AARDEMA	Margriet W	Netherlands	2006
ABRAHAM	Pal	Hungary	2011
ACENA RAMOS	Marta	Spain	2010
ACOU	Willem-Jan	Belgium	2011
ADDONISIO	Luigi	Italy	2012
ADYAMAN	Ahmet	Netherlands	2014
AERTS	Arnaud	Netherlands	2009
AKERSTROM	Finn	Sweden	2015
AL AMOURA	Alaa	France	2015
AL ANANY	Alaa Allah Mohamed	Egypt	2013

CP Certification candidates who have successfully completed the written exam

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
ALIPOUR	Arash	Netherlands	2016
ALIYEV	Farid	Turkey	2010
ALIZADEH DEHNAVI	Reza	Netherlands	2013
ALMEIDA	Sofia	Portugal	2014
ALTMANN	David	Switzerland	2016
ALZAND	Bakr	Netherlands	2011
AMET	Denis	France	2011
AMMON	Michael	Switzerland	2014
ANDERSON	Mark H	United Kingdom	2012
ANDREOLI	Chiara	Italy	2016
ANGHEBEN	Carlo	Italy	2015
ANNE	Wim	Belgium	2008
ANSABERGA	Ieva	Latvia	2015
APOSTOLOPOULOS	Theodoros	Greece	2006
ARBELO	Elena	Spain	2012
ARGUEDAS-JIMENEZ	Hugo	Spain	2015
ARIAS PALOMARES	Miguel Angel	Spain	2010
ARNOLD	Alfred E R	Netherlands	2012
ARNOLD	Martin Bernhard	Germany	2016
ARO	Aapo	Finland	2013
ARRIZABALAGA AROSTEGI	Haritz	Spain	2016
ARVANITIS	Panagiotis	Sweden	2015
ASSAAD	Hany	Egypt	2015
ASSELMAN	Maarten	Netherlands	2012
ATTANASIO	Philipp Johannes	Germany	2016
AYALA PAREDES	Felix Alejandro	Canada	2006
AYDIN	Alper	Turkey	2014
AZEM	Tareq	Germany	2013
BACCHIONI	Giuseppe	Italy	2008
BACQUELIN	Raoul	France	2016
BADRAN	Haitham	Egypt	2013
BAHGAT	Amr Kamal	Egypt	2009
BALMER	Christian	Switzerland	2013
BALT	Jippe	Netherlands	2011
BALTA	Osman	Germany	2010
BARBRAUD	Cynthia	Belgium	2015
BARKER	Diane	United Kingdom	2011
BAROUDI	Rabah	France	2014
BARSAMYAN	Sergey	Armenia	2013
BARTHEZ	Olivier	France	2009
BAYRAK	Duhan Fatih	Belgium	2011
BEAUPORT	Joelle	Germany	2012
BEDNAREK	Jacek	Poland	2013
BELVITO	Chiara	Italy	2013

CP Certification candidates who have successfully completed the written exam

BENCSIK	Gabor	Hungary	2008
BENEZET MAZUECOS	Juan	Spain	2014
BENNIK	Jasper	Netherlands	2015
BERENJKOUB	Ehssan	Germany	2015
BERGET	Trude	Norway	2016
BERGNER	Michael	Switzerland	2015
BERLI	Reto	Switzerland	2015
BERTE	Benjamin	Belgium	2012
BERTOMEU-GONZALEZ	Vicente	Spain	2010
BEUKEMA	Rypko	Netherlands	2015
BHAR-AMATO	Justine	United Kingdom	2016
BHELEEL	Osama	Libya	2013
BIANCHI	Francesca	Italy	2015
BIANCO	Daniele	Italy	2015
BIEWENER	Sebastian	Germany	2016
BIJSTERVELD	Nick	Netherlands	2009
BISH	Laurence	Switzerland	2015
BISSINGER	Andrzej	Poland	2006
BLAAUW	Yuri	Netherlands	2009
BLANDINO	Alessandro	Italy	2015
BLICHARZ	Jaroslav	Poland	2011
BLOMGREN	Jan	Sweden	2012
BOHM	Adam	Hungary	2008
BOLDERMAN	Robert	Netherlands	2016
BOLOGNESI	Maria Giulia	Italy	2015
BON	Laurens Bastiaan	Netherlands	2015
BONANNO	Carlo	Italy	2012
BONCOMPAGNI	Andrea	Italy	2014
BONGARTZ	Lennart Guido	Netherlands	2016
BOOS	Christopher	United Kingdom	2008
BORGER VAN DER BURG	Alida Elisabeth	Netherlands	2007
BORGHOUTS	Virginie	Netherlands	2014
BORGQUIST	Rasmus	Sweden	2013
BORLEFFS	Jan Willem	Netherlands	2015
BORREGO BERNABE	Luis	Spain	2013
BORRELLI	Alessio	Italy	2009
BORRELLO	Francesco	Italy	2013
BOS	Hans	Netherlands	2012
BOSKER	Hans	Netherlands	2012
BOULE	Stéphane	France	2015
BOUWELS	Leon H.R	Netherlands	2007
BRAAM	Richard	Netherlands	2010
BREULS	Nico	Netherlands	2009
BRODHERR	Turgut	Germany	2016
BROERS	Bernard	Netherlands	2009
BRONIS	Konstantinos	United Kingdom	2015
BUERKLE	Gerd	Austria	2008
BUGA	Laszlo	United Kingdom	2012
BULUT	Suat	Netherlands	2010
BUN	Sok-Sithikun	France	2012
BURKART-KUETTNER	Dagmar	Austria	2015

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BUSER	Marc	Switzerland	2015
CABANAS GRANDIO	Pilar	Spain	2014
CABANELAS	Nuno	Portugal	2016
CAKCO	Andrzej	Poland	2015
CALVO CUERVO	David	Spain	2010
CALZOLARI	Vittorio	Italy	2006
CAMPOS GARCIA	Bieito	Spain	2010
CANADAS	Victoria	Spain	2010
CANDEIAS	Rui	Portugal	2008
CARAVATI	Fabrizio	Italy	2010
CARBALLEIRA POL	Lidia	Spain	2015
CARROZ	Patrice	Switzerland	2015
CASSIDY	Christopher John	United Kingdom	2014
CASTERJON CASTEJON	Sergio	Spain	2013
CELIKYURT	Yengi Umut	Turkey	2016
CHALDOUPI	Sevasti-Maria	Netherlands	2016
CHAMBERS	John	United Kingdom	2013
CHATEL	Marie Pierre	France	2015
CHATTERJEE	Debjit	United Kingdom	2010
CHENEVARD	Remy	Switzerland	2012
CHONG	Daniel	Singapore	2011
CHONG YU	Eric	Singapore	2013
CHRISTOPHE	Arnd	Germany	2011
CHRISTOU	Apostolos	Greece	2014
CIPOLLETTA	Laura	Italy	2014
CISMARU	Gabriel	Romania	2016
CLAPPERS	Nick	Netherlands	2014
CLEMENS	Marcell	Hungary	2012
CORTEVILLE	Ben	Belgium	2015
COSER	Alessio	Italy	2011
CROSATO	Martino	Italy	2008
CSONTOS	Pal	Hungary	2009
CURNIS	Antonio	Italy	2006
CZUNKO	Agnieszka	Poland	2016
DALEFFE	Elisabetta	Italy	2016
DAVID	Laura-Alice	Romania	2012
DAVIDSEN	Ulla	Denmark	2015
DAVIES	Edward	United Kingdom	2015
DAYAL	Nicolas	Switzerland	2016
DE CLERCO	An	Netherlands	2013
DE DIEGO RUS	Carlos	Spain	2013
DE DOELDER	Marieke	Netherlands	2010
DE GROOT	Joris R	Netherlands	2009
DE GROOT	Cornelis Andreas	Netherlands	2012
DE JONG	Jeroen	Netherlands	2006
DE JONG	Richard M	Netherlands	2007
DE JONG	Jonas	Netherlands	2009
DE LA FUENTE	Sam	Netherlands	2009
DE LEEUW	Martin	Netherlands	2008
DE LUCIA	Raffaele	Italy	2014
DE MARIA	Elia	Italy	2012

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DE MEYER	Grim	Belgium	2010
DE POOTER	Jan	Belgium	2015
DE POTTER	Tom	Belgium	2008
DE RIVA SILVA	Marta	Spain	2011
DE SENSI	Francesco	Italy	2013
DE TOMMASI	Francesco	Italy	2015
DE VAAN	Marco	Netherlands	2016
DE VOS	Bernardus Cornelis	Belgium	2016
DE VREY	Evelyn	Netherlands	2016
DE WAARD	Daan	Netherlands	2007
DE WEERD	Gerjan	Netherlands	2009
DEIB	Michael	Germany	2015
DEMONIERE	Fabrice	Martinique	2011
DEN UJL	Dennis	Netherlands	2016
DERNDORFER	Michael	Austria	2013
DI CORI	Andrea	Italy	2012
DI MARCO	Andrea	Spain	2016
DI STOLFO	Giuseppe	Italy	2015
DIAB	Ihab Gomaa	United Kingdom	2009
DIAZ BUSCHMANN	Isabel	Spain	2011
DICHTL	Wolfgang	Austria	2010
DIDENKO	Maxim	Romania	2010
DIJMAN	Barbara	Netherlands	2012
DILAVERIS	Polychronis	Greece	2006
DILLIER	Roger	Switzerland	2015
DINH	Trang	Netherlands	2012
DOMENICHINI	Giulia	United Kingdom	2011
DORMAN	Reinhart	Netherlands	2012
DULBECCO	Massimo	Italy	2010
DUNKER	David	Germany	2013
DURAY	Gabor Zoltan	Germany	2008
DUSCEAC	Dinu	Sweden	2014
DUTHOIT	Guillaume	France	2010
DYRDA	Katia	Canada	2010
EDWARDS	Carey	United Kingdom	2016
EHL	Niklas Florestan	Switzerland	2014
EHRLICH	Joachim	Germany	2011
EIGENBERGER	Bernd	Switzerland	2016
EJSBOUTS	Sabine	Netherlands	2011
EISENBERGER	Martin	Czech Republic	2008
EIVINDSON	Gunvald	Norway	2008
EL KADIKI	Abdelhadi	Lebanon	2014
EL KADRI	Moutaz	United Kingdom	2012
ELDER	Douglas	United Kingdom	2010
ELICES TEJA	Juliana	Spain	2013
EL-OMRI	Youssef	France	2016
ENGBERS	Jos G	Netherlands	2009
ERCKERT	Martin	Italy	2006
ERIKSEN	Ulrik Hedegaard	Denmark	2011
ERNTELL	Hans	Sweden	2011
ESCHEN	Ole	Denmark	2009

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ESMAIL	Shani	United Kingdom	2011
EURLINGS	Luc	Netherlands	2014
EVERTZ	Reinder	Spain	2012
EXPOSITO	Víctor	Spain	2013
FACCHIN	Domenico	Italy	2010
FEDIDA	Joel	Belgium	2016
FEDORCO	Marian	Czech Republic	2011
FERNANDEZ LOZANO	Juan Antonio	Spain	2013
FERNANDEZ PASTOR	Julia	Spain	2011
FERNANDEZ-ARMENTA PASTOR	Juan	Spain	2014
FERRER HITA	Julio Jesus	Spain	2016
FIROUZI	Mehran	Netherlands	2011
FLEVARI	Panayota	Greece	2008
FOGLIA	Pietro	Switzerland	2016
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
FRANCISCO PASCUAL	Jaume	Spain	2016
FRANCK	Harald	Germany	2010
FRANCOIS	Bart	Belgium	2011
FRANZINI	Christine	Switzerland	2014
FREUND	Niclas	Germany	2013
FROMMEYER	Gerrit	Germany	2014
FRYKMANN	Viveka	Sweden	2007
FUKUNAGA	Masato	Czech Republic	2016
FUNK	Sabine	Switzerland	2010
FURNISS	Guy	United Kingdom	2014
GABRIEL	Mario	Netherlands	2011
GALLARDO LOBO	Rodrigo	Spain	2009
GANIERE	Vincent	Switzerland	2010
GARCIA	Rodrigue	France	2014
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
GIMMLER	Carsten	Germany	2016
GIOMI	Andrea	Italy	2015
GIORGI	Davide	Italy	2014
GISLER	Sabrina	Switzerland	2016
GJESTVANG	Finn Tore	Norway	2008
GOANTA	Emilia-Violeta	Romania	2015
GONZALEZ FERRER	Juan Jose	Spain	2012
GONZALEZ-ENRIQUEZ	Susana	Spain	2008

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GORLO	Adam	Poland	2012
GRABOWSKI	Marcin	Poland	2014
GRADAUS	Rainer	Germany	2006
GRANDJBAKHCH	Estelle	France	2013
GRAUSS	Robert Willem	Netherlands	2012
GRECU	Mihaela	Romania	2006
GREYLING	Adele	South Africa	2015
GRIECO	Domenico	Italy	2012
GROSFELD	Marcel	Netherlands	2013
GRUBB	Neil	United Kingdom	2015
GRUBER	Norbert	Germany	2013
GUGUCHEV	Pavel	United States of America	2010
GUINAND	Alexandre	Switzerland	2016
GUSTEU	Nicolae-Gabriel	Romania	2015
GUTLEBEN	Klaus Juergen	Germany	2011
HAEMERS	Peter	Belgium	2013
HAENNY	Gianluca	Switzerland	2016
HAGGUI	Abdeddayem	Tunisia	2014
HAJKO	Erik	Hungary	2013
HAMEL	John John	Switzerland	2010
HAMRAOUI	Karim	Netherlands	2010
HARTOG	Johannes	Netherlands	2011
HARTOG	Jasper	Netherlands	2014
HASSAN	Ahmed Abdulwadoud	Netherlands	2012
HASSINK	Rutger	Netherlands	2014
HAUER	Herbert	Netherlands	2009
HAUER	Arnaud	Netherlands	2013
HAUGAN	Ketil	Denmark	2014
HAWKINS	Nathaniel Mark	United Kingdom	2012
HAYAT	Sajad	United Kingdom	2012
HAYDOCK	Paul	United Kingdom	2015
HAYES	Chris	United Kingdom	2009
HAZELEGER	Ronald	Netherlands	2010
HEGARD	Terje	Norway	2015
HEGGELUND	Geir	Norway	2013
HEIB	Klaus Dieter	Germany	2009
HELLIGE	Gerrit	Switzerland	2014
HEMELS	Martin	Netherlands	2009
HENKENS	Ivo	Netherlands	2013
HERCZKU	Csaba	Hungary	2009
HERRING	Neil	United Kingdom	2013
HERSBACH	Ferry	Netherlands	2014
HERZOG	Bernhard	Switzerland	2015
HJORTSHOJ	Soren	Denmark	2008
HLIVAK	Peter	Slovakia	2013
HOBBS	William Julian	United Kingdom	2010
HOEKSTRA	Eduard Henk	Netherlands	2011
HOFFMANN	Mario	Switzerland	2014
HOLM	Katja Fiedler	Denmark	2014
HOOFT VAN HUYSDUYNEN	Bart	Netherlands	2010
HORDYNSKI	Grzegorz	Poland	2011

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HORNSTEN	Jonas	Sweden	2007
HOTTKOWITZ	Christoph	Switzerland	2015
HUANG	Sung-Hao	China People's Republic of	2014
HUEMER	Martin	Germany	2015
HUUSKES	Raymond	Netherlands	2012
HURLIMANN	David	Switzerland	2009
HUYBRECHTS	Wim	Belguim	2008
IGNATIUK	Barbara	Italy	2016
IONNIDIS	Panagiotis	Greece	2006
IORGULESCU	Corneliu	Romania	2008
ISAKSEN	Tor Olav	Norway	2014
JACOBS	Jimmy	Belgium	2016
JACOBSEN	Alexander	United Arab Emirates	2015
JACON	Peggy	France	2010
JAMALYAN	Smbat	Armenia	2010
JANSEN	Annemieke	Netherlands	2008
JANSEN	Ward	Netherlands	2010
JANSSSENS	Cornelis	Netherlands	2006
JARMAN	Julian	United Kingdom	2012
JASTRZEBSKI	Marek	Poland	2006
JAUREGUI ABULARACH	Miguel Eduardo	Spain	2010
JAUSLIN	Daniel	Switzerland	2016
JELANI	Anwar D	Canada	2010
JILEK	Clemens	Germany	2012
JIMENEZ LOPEZ	Jesus	Spain	2016
JOHANSEN	Mette	Norway	2014
JOHANSSON	Peter	Sweden	2008
JOHAR	Sofian	United Kingdom	2011
JONES	David Gareth	United Kingdom	2009
JONSSON	Jon Erik	Sweden	2010
JUAREZ PRERA	Ruben Alfonso	Spain	2015
KACZMAREK	Krzysztof	Poland	2010
KAHN	Matthew	United Kingdom	2015
KALLIANOS	Christos	Greece	2011
KAMAL	Ziaullah	Norway	2015
KARABINOS	Ilias K	Greece	2007
KARLSEN	Finn Michael	Denmark	2015
KATARIA	Vikas	India	2014
KATSIKAS	Christos	Greece	2012
KEILEGAVLEN	Håvard	Norway	2015
KEMME	Michiel	Netherlands	2007
KETELS	Stefan	Belgium	2007
KG KAM CHUEN	Marie Jennyfer	United Kingdom	2013
KHALILI	Payam	Sweden	2016
KHLYNIN	Mikhail	Russian Federation	2016
KIENCKE	Stephanie	Switzerland	2015
KIEVIT	Cornelis	Netherlands	2016
KJELLMAN	Bjorn	Sweden	2007
KLAUSZ	Gergely	Hungary	2013
KLEIN	Gunnar	Germany	2007
KLEIN	Norbert	Germany	2011

CP Certification candidates who have successfully completed the written exam

KLEIN	Lucas	Netherlands	2013
KNOLL	Mathias	Germany	2015
KNOPP	Helge	Germany	2016
KNOPS	Reinoud	Netherlands	2008
KOEPFLI	Pascal	Switzerland	2007
KOEPP	Ulf	Norway	2008
KOERMENDY	Dezsoe	Switzerland	2016
KOL	Amir	Italy	2013
KOLB	Christophe	Germany	2010
KOLLIAS	Georgios	Greece	2013
KOLOVOS	Vasileios	United Kingdom	2016
KOMANOVA	Erika	Slovakia	2011
KOOMEN	Egbert M	Netherlands	2010
KOOPMAN	Pieter	Belgium	2011
KORANTZOPOULOS	Panagiotis	Greece	2009
KORTZ	Mikael	Netherlands	2010
KOSTOPOULOU	Anna	Greece	2011
KOULOURIS	Spyridon	Greece	2007
KOURGIANNIDIS	Georgios	Greece	2007
KOUROUKLIS	Spyridon	Greece	2011
KOUTSOGEOGRIS	Ilias	Greece	2014
KOVACS	Andras	Hungary	2012
KRAAIER	Karin	Netherlands	2015
KRAVCHUK	Borys	Ukraine	2007
KRIJNE	Rudolf	Netherlands	2012
KRISTENSEN	Jens	Denmark	2012
KRONBORG	Mads Brix	Denmark	2011
KRUPA	Wojciech	Poland	2006
KRYZE	Lukas	Czech Republic	2013
KRZYZANOWSKI	Krystian	Poland	2014
KUIJPER	Aaf	Netherlands	2011
KUJAWSKI	Tomasz	Switzerland	2013
KUMMER	Marco	Switzerland	2015
KUPICS	Kaspars	Latvia	2015
KWASNIEWSKI	Wojciech	Poland	2013
LAN	Rongfang	China People's Republic of	2014
LANGERAK	Susan	Netherlands	2012
LARGAESPADAZ PEREZ	Gabriel	Spain	2015
LAURIBE	Philippe	France	2016
LEBEDEVA	Viktoriia	Russian Federation	2013
LEDEBVRE	Kristof	Netherlands	2015
LENNERZ	Carsten	Germany	2015
LERCHER	Peter	Austria	2010
LERNER	Martin Robert	Sweden	2010
LEVENTOPOULOS	Georgios	Greece	2014
LEWANDOWSKI	Michael	Poland	2012
LIEUW-A-FA	Mariska	Netherlands	2009
LINDE	Antonio	Spain	2012
LINDEBOOM	Jan Eize	Netherlands	2016
LINDELL	Peter	Sweden	2007
LINDGREEN	Ulf	Denmark	2008

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LINDNER	Bjoern	Germany	2016
LIPCHENCA	Igor Ariel	Israel	2008
LIPOLDOVA	Jolana	Czech Republic	2009
LIPTON	Jonathan	Netherlands	2012
LITTERFELDT	Ingrid	Sweden	2008
LOEPRICH	Bruno	Germany	2015
LOUW	Ruan	Belgium	2013
LUBBERTVERBERKMOES	Addy	Netherlands	2010
LUEDORFF	Guido	Germany	2008
LUERMANS	Justin	Netherlands	2012
LUNDE	Torbjorn	Norway	2015
LUQUE	Antonio	Spain	2014
LUTHJE	Lars	Germany	2011
LUZI	Mario	Italy	2008
MAASS	Alexander	Netherlands	2007
MAC GILLAVRY	Melvin	Netherlands	2008
MACIAG	Aleksander	Poland	2007
MADEIRA	Joao	Portugal	2011
MAGNUSSON	Peter	Sweden	2007
MAHFOUD	Mohanad	France	2010
MANENTI	Vladimir	France	2015
MANOLA	Sime	Croatia	2015
MANTZIARI	Lilian	United Kingdom	2015
MANUSAMA	Randy	Netherlands	2011
MARGATO	Renato	Portugal	2013
MARGULESCU	Andrei Dumitru	Romania	2013
MARICONTI	Barbara	Italy	2008
MARINI	Massimiliano	Italy	2007
MARTENS	Eimo	Germany	2013
MARTIN	Alix	France	2013
MARTINEK	Martin	Austria	2008
MARTINEZ SANDE	Jose Luis	Spain	2009
MARTINEZ-RUBIO	Antonio	Spain	2016
MARZAN	Alessandro	Switzerland	2016
MASCIOLI	Giosue	Italy	2006
MASSA	Thomas	Germany	2008
MATHIEU	Frederic	Belgium	2015
MATOSHVILI	Zviad	Georgia Republic of	2016
MATTLE	Daniel	Switzerland	2015
MAXIM	George Razvan	Romania	2014
MAZZA	Andrea	Italy	2016
MAZZUCCO	Raffaele	Italy	2009
MEDINA PALOMO	Maria Del Carmen	Spain	2013
MEILTZ	Alexandre	Switzerland	2009
MEINARDI	Martin	Netherlands	2015
MEINDERSMA	Esther	Netherlands	2013
MEINE	Mathias	Netherlands	2007
MELANDER	Kjell	Sweden	2008
MELMAN	Paul G	Netherlands	2011
MENET	Aymeric	France	2016
MENICHETTI	Francesca	Italy	2016

CP Certification candidates who have successfully completed the written exam

MENNE	Jochen	Germany	2014
MERCE KLEIN	Jordi	Spain	2016
MERKELY	Bela	Hungary	2007
MICHAELSEN	Jochen	Germany	2010
MICHALAK	Marcin	Poland	2015
MIHALCZ	Attila	Austria	2011
MIRANDA	Rita	Portugal	2014
MISOVOULOS	Platon	Switzerland	2015
MITKOWSKI	Przemyslaw Piotr	Poland	2016
MJOLSTAD	Ole Christian	Norway	2015
MLCOCHOVA	Hanka	Czech Republic	2009
MOISEI	Radu Eugen	Romania	2015
MOLHOEK	Sander G	Netherlands	2008
MOLLNAU	Hanke	Germany	2013
MONDESERT	Blandine	Canada	2014
MONNARD	Simon	Switzerland	2011
MONNINK	Stefan	Netherlands	2011
MOORE	Philip R	United Kingdom	2014
MORENO	Jose	Spain	2012
MORO LOPEZ	Jose Antonio	Spain	2016
MOROSATO	Martina	Italy	2015
MORTSELL	David	Sweden	2012
MORTTADA	Ayman	Egypt	2012
MUELLER	Dirk	Germany	2008
MUELLER	Stephan Andreas	Switzerland	2011
MUELLER	Iris Irmgard	Germany	2014
MUHAMMAD	Shireen Shaaban	Saudi Arabia	2016
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
NEUHOFF	Istvan	Romania	2016
NEVEN	Kars	Netherlands	2007
NG	Sunanto	Netherlands	2011
NICASTIA	Deborah	Netherlands	2009
NICOLAIDES	Eleftherios	United Kingdom	2007
NIIRANEN	Jussi	Finland	2015
NOTI	Fabian	Switzerland	2012
NOVAK	Jan	Switzerland	2011
NOVIKOV	Dmitry	Russian Federation	2012
NUSSLI	Dominique	Switzerland	2013
ODLAND	Hans Henrik	Norway	2009
OIKARINEN	Lasse	Finland	2008
OLORIZ	Teresa	Spain	2015
OMAR	Salama	Egypt	2010
OOMEN	Ad	Netherlands	2011

CP Certification candidates who have successfully completed the written exam

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
PAOLTTI PERINI	Alessandro	Italy	2015
PAPACHRISTIDIS	Alexandros	United Kingdom	2014
PARAVOLIDAKIS	Konstantinos	Greece	2008
PASCALE	Patrizio	Switzerland	2009
PATWALA	Ashish	United Kingdom	2010
PAULUSSEN	Guido	Netherlands	2006
PAVACI	Heribert	Albania	2014
PAWLIK	Tomasz	Poland	2012
PELLATON	Cyril	Switzerland	2016
PENA HERNANDEZ	Jose Luis	Spain	2008
PENTEADO	Jose Otavio P	Brazil	2012
PEREPEKA	Eugene	Ukraine	2016
PEREZ ALVAREZ	Luisa	Spain	2010
PEREZ DIEZ	Diego	Spain	2009
PERIK	Patrick	Netherlands	2010
PERMENTIER	Lianne	Netherlands	2015
PERNA	Francesco	Italy	2014
PERROTTA	Laura	Italy	2012
PESTREA	Catalin Gabriel	Romania	2016
PETERS	René	Netherlands	2015
PETKAR	Sanjiv	United Kingdom	2008
PETRACCI	Barbara	Italy	2009
PETRU	Jan	Czech Republic	2009
PETTIT	Stephen	United Kingdom	2011
PEZAWAS	Thomas	Austria	2016
PHILBERT / JENSEN	Berit Thornvig	Denmark	2010
PHILIPS	Thomas	Belgium	2014
PINDADO RODRIGUEZ	Javier	Spain	2009
PIQUERAS	Eric	France	2015
PIRO	Agostino	Italy	2016
PLASEK	Jiri	Czech Republic	2014
PLUTA	Slawomir	Poland	2010
POELSLEER	Robert	Germany	2013
POGGI	Alessio	Italy	2014
POLGAR	Balazs	Hungary	2015
PORRO	Rosa	Spain	2009
POS	Lambertus	Netherlands	2013
POSTEMA	Pieter	Netherlands	2015
POZZETTI	Daniela	Italy	2006
PRASAD	Rachana	United Kingdom	2013
PREDOVSKI	Milen	Bulgaria	2011
PRENNER	Guenther	Austria	2015

CP Certification candidates who have successfully completed the written exam

PRISECARU	Raluca	Belgium	2014
PROIETTI	Riccardo	Italy	2013
PRONK	Arjen	Netherlands	2010
PRUSKI	Maciej	Poland	2010
PRZYBYLSKI	Andrzej	Poland	2007
PSYCHARI	Stavroula	Greece	2011
PUCCIONI	Enrico	Italy	2016
PUCHOL	Alberto	Spain	2009
PUDULIS	Janis	Latvia	2014
PUETZ	Vanessa	Germany	2013
PUGH	Peter	United Kingdom	2008
PYATT	Jason	United Kingdom	2011
RAHEL	Braim M	Netherlands	2011
RAMANNA	Hemanth	Netherlands	2008
RAMAZZINA	Carola	Switzerland	2015
RAMCHURN	Hemant	Belgium	2011
RAO	Archana	United Kingdom	2007
RASSIAS	Ioannis	Greece	2013
REBELLATO	Luca	Italy	2009
REGOLI	François	Switzerland	2015
REICHLIN	Tobias	Switzerland	2015
REIF	Sebastian	Germany	2015
RESTLE	Christian	Germany	2009
REVERDIN	Stephane	Switzerland	2013
RIABI	Leila	Tunisia	2014
RICCIARDI	Danilo	Belgium	2012
RICCIARDI	Giuseppe Gilberto	Italy	2013
RICHTER	Dagmar	Austria	2016
RIENSTRA	Michiel	Netherlands	2013
RIVAS GANDARA	Nuria	Spain	2010
ROBERT	Jens	Switzerland	2012
ROBERTSON	Alan James	United Kingdom	2014
ROBLES DE MEDINA	Ramon Mariano	Netherlands	2011
ROCA LUQUE	Ivo	Spain	2011
ROCHA	Sérgia	Portugal	2013
RODE	Susanne	Germany	2013
RODRIGUEZ MANERO	Moises	Belgium	2012
ROHNER	Andreas	Switzerland	2014
RORDORF	Roberto	Italy	2013
ROSA	Antonio	Switzerland	2011
ROSSI	Andrea	Italy	2011
ROSSI	Luca	Italy	2012
ROTEN	Laurent	Switzerland	2008
ROUKAS	Kriton-Ioannis	Greece	2011
ROUX	Antoine	France	2010
RUDZIK	Roxana	Romania	2016
RUSSI	Ian	Switzerland	2015
RUSSO	Giovanni	Italy	2009
RUZICKA	Petr	United Kingdom	2011
SAFAK	Erdal	Germany	2011
SAGUNER	Ardan Muammer	Switzerland	2016

CP Certification candidates who have successfully completed the written exam

SALAHSHOURI	Pegah	United Kingdom	2011
SALEH	Karim	Austria	2016
SALGADO ARANDA	Ricardo	Spain	2013
SALIM	Belgin	Romania	2014
SALMAS	Jozef	Germany	2015
SANCHEZ GARCIA	Manuel	Spain	2015
SANTOS	Nuno	Portugal	2013
SANTOS CALLE	Francisco José	Spain	2013
SARDIN-FUENTES	Maria De Gracia	Spain	2013
SARRIAS	Axel	Spain	2013
SASOV	Michal	Slovakia	2016
SAURER	Georg	Austria	2013
SCHAR	Beat Andreas	Switzerland	2013
SCHAUMANN	Anselm	Germany	2009
SCHEFFER	Michael G	Netherlands	2008
SCHELLINGS	Dirk	Netherlands	2015
SCHGOER	Wilfried	Austria	2015
SCHILLACI	Vincenzo	Italy	2016
SCHLIEPHAKE	Florian	Switzerland	2015
SCHMIDT	Jan	Germany	2016
SCHMUTZ	Mathieu Thomas André Hermann Ghislain	Switzerland	2013
SCHOENBAUER	Robert	Austria	2015
SCHOLZ	Brit	Germany	2011
SCHOONDERWOERD	Bas	Netherlands	2008
SCHRAGO	Gregoire	Switzerland	2010
SCHREVE-STEENSM	Ariadne Midori	Netherlands	2012
SCHUKRO	Christoph	Austria	2011
SCHURMANS	Joris	Belgium	2013
SCHWAGTEN	Bruno	Belgium	2008
SCHWERG	Marius	Germany	2014
SCIARAFFIA	Elena	Sweden	2011
SEDLACEK	Kamil	Czech Republic	2010
SEGRETI	Luca	Italy	2010
SEGURA VILLALOBOS	Federico	Spain	2011
SEIFERT	Martin	Germany	2013
SEILER	Jens	Switzerland	2011
SEMICHON	Marc	France	2013
SENOUF	David	Switzerland	2009
SEOW	Swée-Chong	Singapore	2007
SEPSI	Milan	Czech Republic	2011
SERVATIUS	Helge	Switzerland	2014
SGARITO	Giuseppe	Italy	2006
SHCIPPER	Jurjan	Netherlands	2015
SILBERBAUER	John	United Kingdom	2013
SILVEIRA CORREA	Alejandro	Spain	2016
SIMEONIDOU	Eftihia	Greece	2006
SJOBLOM	Johanna	Sweden	2008
SKENE	Chris	United Kingdom	2013
SKIADAS	Ioannis	Greece	2011
SKRETTEBERG	Per Torger Skretteberg	Norway	2013
SLOOTWEG	Andries	Netherlands	2014

CP Certification candidates who have successfully completed the written exam

SLOTTE	Fredrik	Finland	2014
SMEELE	Frank	Netherlands	2011
SMEETS	Frans	Netherlands	2011
SMILDE	Tom	Netherlands	2011
SMITS	Jeroen	Netherlands	2012
SOEZENER	Korkut	Germany	2016
SOM	Zoltan	Hungary	2014
SONESSON	Linus	Sweden	2013
SORREL	Jeremie	France	2015
SPIERENBURG	Han	Netherlands	2008
SPRENGER	Martin	Switzerland	2016
STARTARIS	Umberto	Italy	2014
STATESCU	Cristian	Romania	2009
STEEN	Torkel	Norway	2007
STEFAN	Liliana	Czech Republic	2010
STEFAN NICOLEA	Bogdan	Romania	2009
STEFFEL	Jan	Switzerland	2012
STERLINSKI	Marciej	Poland	2006
STEVENHAGEN	Jeroen	Netherlands	2008
STIERLE	Daniel	Germany	2016
STOCKBURGER	Martin	Germany	2011
STOECKEL	Holger	Switzerland	2012
STOLT STEIGER	Valerie	Switzerland	2016
STRAND	Arne	Norway	2016
STRANDERS	Ischa	Netherlands	2011
STRIKWERDA	Sipke	Netherlands	2009
STUEHLINGER	Markus	Austria	2011
STUMPF	Tamas	Sweden	2016
SUN	Qi	China People's Republic of	2014
SUPRYN	Rafal	Poland	2014
SUTER	Yves Martin	Switzerland	2013
SVETLOSAK	Martin	Slovakia	2016
SWART	Hp	Netherlands	2009
SYSKA	Pawel	Poland	2015
SZAMLEWSKI	Piotr	Sweden	2010
SZILAGYI	Szabolcs	Hungary	2013
SZTANISZLAV	Áron	Hungary	2013
TAHAPARY	Giovanni	Netherlands	2009
TAHIN	Tahin Tamas	Hungary	2016
TAKENS	Lambertus H	Netherlands	2014
TAN	Vern Hsen	Singapore	2015
TASIC	Jerneja	Slovenia	2015
TEJEIRA FERNANDEZ	Elvis	Spain	2013
TER BEKKE	Rachel	Netherlands	2010
TEUBL	Alexander	Austria	2009
THEISS	Söhnke	Germany	2013
TIBITANZL	Jan	United Kingdom	2015
TIELEMAN	Robert	Netherlands	2009
TIMMERS	Liesbeth	Belgium	2011
TOMASI	Luca	Italy	2012
TOMLINSON	David	United Kingdom	2009

CP Certification candidates who have successfully completed the written exam

TORCIVIA	Riccardo	Italy	2010
TORN	Marieke	Netherlands	2009
TOSSEBRO	Morten Shoren	Norway	2009
TRAN	Van Nam	Switzerland	2015
TRAYKOV	Vassil B	Bulgaria	2010
TREGUER	Frederic	France	2009
TRINES	Serge Alexander Ivo Petrus	Netherlands	2008
TROFIN	Monica	Germany	2015
TRUCCO	Maria Emilce	Spain	2012
TSCHOLL	Verena	Germany	2015
TUINENBURG	Anton	Netherlands	2011
TUININGA	Ype	Netherlands	2009
TUREL	Munir Baybars	Turkey	2009
TURK	Ugur Onsel	Turkey	2011
TUTUIANU	Cristina Ioana	Romania	2013
UCER	Ekrem	Germany	2011
UDO	Erik	Netherlands	2015
URBAN	Lubos	Slovakia	2009
VACCARI	Diego	Italy	2006
VALENTE	Bruno	Portugal	2015
VALK	Suzanne	Netherlands	2010
VALZANIA	Cinzia	Italy	2007
VAMOS	Mate	Hungary	2014
VAN ALEM	Anouk	Netherlands	2010
VAN ASSELDONK	Jan	Netherlands	2015
VAN BEMMEL	Marnix	Netherlands	2014
VAN CASTEREN	Lieve	Belgium	2010
VAN DE POLL	Sweder	Netherlands	2013
VAN DEN AKKER-BERMAN	Lily	Netherlands	2011
VAN DEN BERGH	Paulus	Netherlands	2013
VAN DEN BOS	Ewout Jan	Netherlands	2009
VAN DEN BRINK	Olivier Wv	Netherlands	2013
VAN DER GALIEN	Albert	Netherlands	2012
VAN DER HEUDEN	Robert	Netherlands	2010
VAN DER HEUDEN	Dirk	Netherlands	2010
VAN DER HEUDEN	Jeroen	Netherlands	2011
VAN DER KLEY	Tim	Netherlands	2011
VAN DER MEER	Peter	Netherlands	2013
VAN DER VEEN	Maurits	Netherlands	2012
VAN DER WAL	Henriette	Netherlands	2010
VAN DER WEERDT	Arno Peter	Netherlands	2007
VAN DER ZEE	Marc	Netherlands	2016
VAN DEURSEN	Caroline	Netherlands	2012
VAN DIJK	Vincent	Netherlands	2013
VAN DOORN	Dirk Jan	Netherlands	2011
VAN EMPEL	Vanessa	Netherlands	2010
VAN ES	Robert	Netherlands	2011
VAN GASTEL	Henk Christiaan	Netherlands	2010
VAN GENT	Marco	Netherlands	2012
VAN HAELST	Paul	Netherlands	2012
VAN HALM	Vokko	Netherlands	2016

CP Certification candidates who have successfully completed the written exam

VAN HERENDAEL	Hugo	Belguim	2009
VAN HEUVERSWIJN	Frederic	Belgium	2011
VAN HORSEN	Elisabeth Veronica	Netherlands	2013
VAN KRAAIJ	Dave	Netherlands	2009
VAN MALDEREN	Sophie C.H.	Belgium	2013
VAN NOORD	Trudeke	Netherlands	2007
VAN OFWEGEN-HANEKAMP	Clara Emilia Emese	Netherlands	2013
VAN OOSTROM	Antonie	Netherlands	2009
VAN OPSTAL	Jurren	Netherlands	2007
VAN PETEGHEM	Sylvie	Belgium	2014
VAN POPELE	Nicole	Netherlands	2013
VAN REIJ	Frank	Netherlands	2010
VAN ROOSMALEN	Radboud	Netherlands	2011
VAN SCHAARDENBURGH	Pepijn	Netherlands	2009
VAN SCHAIVAN DER WIELEN	Marielouise	Netherlands	2009
VAN VLIES	Bob	Netherlands	2010
VAN WIJK	Leendert M	Netherlands	2013
VAN WOERKENS	Leon	Netherlands	2011
VANDER	Marianna	Russian Federation	2015
VANDUYNHOVEN	Philippe	Belgium	2014
VASILOPOULOS	Charalambos	Greece	2006
VATASESCU	Radu- Gabriel	Romania	2006
VELTMANN	Christian	Germany	2014
VENABLES	Paul	United Kingdom	2010
VERBUNT	Robert	Netherlands	2011
VERGARA	Pasquale	Italy	2009
VERNOOY	Kevin	Netherlands	2010
VET	Thijs	Netherlands	2008
VICENTINI	Alessandro	Italy	2009
VIERGEVER	Eric Paul	Netherlands	2010
VIJN	Arie Gerhard	Netherlands	2010
VILLUENDAS SABATE	Roger	Spain	2010
VISMAN	Roeland	Netherlands	2015
VITALE	Raffaele	Italy	2013
VITALI SERDOZ	Laura	Germany	2015
VOGLER	Julia	Germany	2016
VOLKOV	Dmytro	Ukraine	2013
VON BARY	Christian	Germany	2011
VOSS	Frederik	Germany	2008
VRAZIC	Hrvoje	Croatia	2011
VRIEND	Joris	Netherlands	2011
WALHOUT	Ronald	Netherlands	2011
WALKER	Alexander Josef	Switzerland	2014
WEBERNDORFER	Christina Vanessa	Switzerland	2013
WERETKA	Slawomir	Germany	2011
WESTENBRINK	B. Daan	Netherlands	2015
WESTENDORP	Iris	Netherlands	2006
WESTPHALEN	Alexander	Switzerland	2015
WESTRA	Sjoerd	Netherlands	2009
WETZEL	Ulrike Renate	Germany	2013
WHINNETT	Zachary	United Kingdom	2011

CP Certification candidates who have successfully completed the written exam

WIDDERSHOVEN	Josef Jos	Netherlands	2009
WIJCHERS	Sip	Belgium	2009
WUFFELS DE GROOT	Sofia	Netherlands	2015
WIJNMAALEN	Adrianus	Netherlands	2015
WILLEMS	Albert Richard	Netherlands	2009
WILLEMS	Rik	Belgium	2016
WINTER	Siegmund	Austria	2010
WITT	Christoffer Tobias	Denmark	2015
WO	Hung-Ta	Taiwan	2015
WOLF	Michael	Belgium	2014
WOLLMANN	Christian	Austria	2011
WONG	Ka Lam	China People's Republic of	2013
WOZNIAK	Aleksandra	Poland	2016
YAP	Sing-Chien	Netherlands	2012
YEO	Wee Tiong	Singapore	2013
YERRAMASU	Ajay	United Kingdom	2016
YOUNG	Mabelle	Switzerland	2016
YUNG	Arthur	China People's Republic of	2015
ZACA'	Valerio	Italy	2015
ZAGKLI	Fani	Greece	2013
ZAJAC	Dariusz	Poland	2012
ZAKY	Hosam	United Arab Emirates	2007
ZALEVSKY	Valery P	Ukraine	2007
ZBINDEN	S.	Switzerland	2016
ZELJKO	Hrvojka Marija	Croatia	2013
ZEMAN	Kamil	Czech Republic	2013
ZERVOPOULOS	George	Greece	2006
ZIMA	Endre	Hungary	2009
ZIZEK	David	Slovenia	2015
ZOPPO	Franco	Italy	2006
ZUCCHELLI	Giulio	Italy	2008
ZYCINSKI	Pawel	Poland	2014

Allied Professionals

Certified Allied Professionals

AAGENBORG	Christiaan	Netherlands	2016
AGOSTINI	Roberta	Italy	2016
AMAZINE	Natja	Netherlands	2015
AMIRANDA	Giuseppe	Italy	2015
ANSELM	Vittorio	Italy	2015
ANTENBRINK	Johannes Fredericus	Netherlands	2011
ARNDELL	Dianne	Netherlands	2015
ARTS	Germaine	Netherlands	2011
ARUMUGAM	Paul Ayyappan	United Kingdom	2014
AUSTIN	Tracey	United Kingdom	2016
BAKKER	Emiel	Netherlands	2015
BATSIKAS	Kimón	Greece	2013
BENEDUCE	Roberta	Italy	2015

Certified Allied Professionals

BERGERVOET	Jan	Netherlands	2015
BERNARDES	Ana	Portugal	2015
BERTOLI	Fabrizio	Switzerland	2013
BESTEN DEN	Truus	Netherlands	2013
BETTEN	Jort	Netherlands	2015
BIJL	Jeroen	Netherlands	2015
BIJVOET	Eleonora	Netherlands	2011
BLOEM	Jan Jurjen	Netherlands	2016
BOCK	Dirk	Germany	2016
BOWEN	Daniel	United Kingdom	2015
BRAAM	Nort	Netherlands	2014
BRANTS	Ruud	Netherlands	2014
BROENINK	Ingrid	Netherlands	2014
BRUEGGEMANN	Thomas	Germany	2013
BURGOS	Jesús	Spain	2013
BURKHARDT	Dr.Dietmar	Germany	2015
BUSKES	Marjo	Netherlands	2014
BUTTER	Miranda	Netherlands	2016
CALABRESE	Michele	Italy	2016
CARCONI	Marco	Italy	2015
CARRERO	David	Spain	2014
CASSINADRI	Elena	Italy	2016
CHAITSING	Rismy	Netherlands	2015
CLAESSEN-VERGEER	Marion	Netherlands	2016
DE BLAAUW	Mariska	Netherlands	2014
DE CLERCO	Katrien	Belgium	2014
DE GRAAF	Hendrik	Netherlands	2014
DE JONG	Niko	Netherlands	2016
DE KEYZER-VAN MUJLWIJK	Klara	Netherlands	2012
DE KONING	Rens	Netherlands	2015
DE LA VIEJA ALARCON	Juan José	Spain	2015
DE MELKER	Robert	Netherlands	2012
DE RONDE	Anna	Netherlands	2016
DE ROVER	Vincent	Netherlands	2013
DE RUITER	Wouter Arie	Netherlands	2015
DE VRIES - VAN DER MOLEN	Carla	Netherlands	2014
DE WINTER	Peter	Netherlands	2014
DEBIE	Luuk	Netherlands	2013
DELGADO	Delgado Ana Sofia	Portugal	2016
DELLEA	Alessandro	Italy	2015
DEMOZZI	Marilena	Italy	2015
DEUNK	Gerhard	Netherlands	2015
DIJKERS-SICCAMA	Maria Martina	Netherlands	2015
DOTTI	Irene	Italy	2016
DUTTON	Amy	United Kingdom	2016
EBES	F.J.	Netherlands	2015
EDENS	Joran	Netherlands	2011
EDWARDS	Beverly	United Kingdom	2016
ENGELAER	Paulus Johannes Maria	Germany	2013
FABRIZI	Agnese	Italy	2015
FERRARI	Catia	Italy	2016

Certified Allied Professionals

FRSINI	Gabriele	Italy	2015
FOCARDI	Alessandro	Italy	2015
FOGH JONNASSON	Pernille	Denmark	2014
FULCO	Linda	Italy	2016
GERCAMA	Ale	Netherlands	2012
GEURS	Paul	Netherlands	2015
GIACOPELLI	Daniele	Italy	2015
GOMEZ LLAUGER	Albert	Spain	2015
GOPINATH	Binoob	United Kingdom	2013
GOUGH	Jacqueline	Netherlands	2012
GRASDIJK	Michel	Netherlands	2013
GRASSINI	Diego	Italy	2015
GRAUENKAMP	Caspar	Netherlands	2012
GRESSONI	Sara	Italy	2015
GRIFFITHS	Jon	United Kingdom	2014
GRIMBERG	Arenda	Netherlands	2013
GROEN	Henk	Netherlands	2014
GROVE	Ulrik	Denmark	2014
HAAS DE	Oudshoorn	Netherlands	2013
HAMOEN	Marinus	Netherlands	2014
HAUGAARD	Thomas Roosevelt	Denmark	2016
HAUGDAL	Martin Aar	Denmark	2013
HEINEN	Robert Henk	Netherlands	2016
HELLKVIST	Karin	Sweden	2016
HENDRIKS	Thijs	Netherlands	2013
HLAUSCHKA	Florian	Austria	2016
HOFSTEDE	Jan	Netherlands	2013
HOJGAARD	Susanne	Denmark	2014
HOP	Henri Marco	Netherlands	2011
HULSKOTTE	J.H.N.	Netherlands	2015
HUSKENS	Paul	Netherlands	2013
IGLESIAS BRAVO	Jose Antonio	Spain	2014
JAMES	Cheryl	United Kingdom	2016
JANSSEN	Michel	Netherlands	2013
JONGEJAN	Niels	Netherlands	2016
JOSEPH	Marielle	Netherlands	2014
KAMMEIJER	Willem	Netherlands	2013
KAMPHUIS	Johan Hendrik	Netherlands	2016
KEUZER	Rens	Netherlands	2012
KEUKEN	Johannes	Netherlands	2014
KILK	Anton	Estonia	2016
KINCH WESTERDAHL	Annika	Sweden	2013
KNOPS	Paul	Netherlands	2013
KOFLER	Ruth	Austria	2012
KRUMP	Nejc	Italy	2016
KUUR VAN DER	Erwin Ronald	Netherlands	2014
LA GRAND	Reinalda	Netherlands	2011
LAST	Tim	Netherlands	2012
LAU	Tsan Fung	China People's Republic of	2014
LAURETTI	Maurelio Domenico	Italy	2015
LEGGIERO	Angelo	Italy	2015

Certified Allied Professionals

LESS	Sandra	Germany	2016
LEWIS	Peter	United Kingdom	2015
LINSEN-ABEN	Maria Helena Hendrica	Netherlands	2011
LO GIUDICE	Vincenzo	Italy	2015
LUJTEN	Kees	Netherlands	2014
MAARSE	Albert	Netherlands	2013
MAAT-POOT	Barbara Maria	Netherlands	2014
MARCHANT	Isabelle	Netherlands	2014
MARTIN JIMENEZ	Samuel	Spain	2016
MAWHOOD	Sue	United Kingdom	2014
MEIJER	Karin Maria	Netherlands	2013
MEIJER	Kim	Netherlands	2014
MEISINGER	Markus	Austria	2016
MIEDEMA	Pieter	Netherlands	2014
MIKKELSEN	Kirsten Rask	Denmark	2016
MINTJENS	Martin	Netherlands	2015
MOL	Daniel	Netherlands	2013
MOOLMAN	Magdaleen	South Africa	2016
MOORE	Chris	United Kingdom	2015
MORINI	Filippo	Italy	2015
MUNOZ	Julio	Spain	2011
NASTA	Gianluca	Italy	2015
NATHOE	Mohamed Djabbaar	Netherlands	2014
NEVE	Eric	Netherlands	2014
NUKAMP	Dennis	Netherlands	2015
OLIVEIRA	Joao Rodrigo	Portugal	2014
OOSTERWEGHEL	Jeannette	Netherlands	2012
OPPEN VAN	Paul	Netherlands	2016
OSKAM	Aart	Netherlands	2013
OVEREEM	Bartjan	Netherlands	2012
PAIANO	Salvatore	Italy	2015
PALETTA	Alessandro	Italy	2015
PALUMBO	Annalisa	Italy	2015
PARMIGIANI	Chiara	Italy	2016
PASMAN	Harrold	Netherlands	2014
PASTORE	Cosimo	Netherlands	2013
PATTERSON-ROTTGERING	Wendy	Netherlands	2012
PEARSON	Theodore	United Kingdom	2015
PEIXOTO MARTINS	Tiago Emanuel	Portugal	2016
PEREIRA	Helder	United Kingdom	2012
PILAGE	Robert	Netherlands	2014
PIMENTA	Ricardo	Portugal	2012
PINHEIRO DOS REIS	Ivone	Belgium	2016
PISCEDDA	Valerio	Belgium	2011
PISCITELLI	Gioacchino	Italy	2015
PRATAS DA SILVA	Francisco Emanuel	United Kingdom	2014
PURCHASE	Nicole	United Kingdom	2014
QVARNSTRÖM	Eva	Sweden	2013
RAMSOEKH	Wandana	Netherlands	2015
RAVERS	Henry	Netherlands	2013
REK	Anita	Netherlands	2014

Certified Allied Professionals

REKKER	Kees	Netherlands	2013
RESCIGNO	Stefania	Italy	2015
RICH	Caroline	United Kingdom	2014
RIERA	Marta	Spain	2015
RIETRAE	Rachel	Netherlands	2015
RUIJSWIJK	Nathalia Hillegonda	Netherlands	2014
RITZEN	John	Netherlands	2014
RODRIGUES DA SILVA ANDRADE	Jose Tomas	United Kingdom	2014
RUSSELL	Mark	Ireland	2015
RUSSO	Gerardo	Italy	2015
SAITTA	Monica	Italy	2016
SANCHEZ HUETE	Gonzalo	Spain	2015
SANGIOVANNI	Luca	Italy	2016
SANTOS CALLE	Francisco José	Spain	2013
SCHAIBLE	Bernd	Germany	2015
SCHENK-LUURSEN	Nadine	Netherlands	2016
SCHERER	Brenda	Netherlands	2014
SCHROEMGES	Johannes	Netherlands	2014
SCHUMM	Steven	Netherlands	2012
SCHUURMAN	Bert	Netherlands	2013
SCHUURMAN-VAN DER ZWAAN	Marielle	Netherlands	2014
SEFFINGA	Kees	Netherlands	2012
SERGI	Cesario	Italy	2016
SIEBERT	Sijmon	Netherlands	2015
SILVA	Ines	United Kingdom	2015
SLIJKERMAN	Myrna	Netherlands	2012
SLOOTHAAK	Douwe Pieter	Netherlands	2016
SMITS	Monique	Netherlands	2016
SMITS	Xavier	Netherlands	2015
SMITS-GELISSEN	Marloes	Netherlands	2015
SOARES	Filipe	Germany	2011
SOESBERGEN	Joop	Netherlands	2013
SOUGIANNIS	Dimitrios	Greece	2012
SPRINGORUM	Bob	Netherlands	2014
STEUJAERT	Patrick	Netherlands	2014
STEL	Erik	Netherlands	2013
STOFFELS	Kim	Netherlands	2015
STOLL	Eric	Netherlands	2012
STORM	Margaretha	Netherlands	2013
STUART	Jonas	Denmark	2014
SULLIVAN	Siobháin	United Kingdom	2015
SVENSSON	Emma	Sweden	2011
TER AVEST- ROELINK	Leonie	Netherlands	2013
TERBURG	Bonnie	Netherlands	2014
THERON	Adam	United Kingdom	2015
THIJSEN	Robert Vincent Matthias	Netherlands	2014
TIDDENS	Ronaldus	Netherlands	2015
TREBUS	Bas	Netherlands	2016
TRIASUT	Grisana	Netherlands	2013
UGEN	Ad	Netherlands	2011

Certified Allied Professionals

UITERWAAL	Hans	Netherlands	2011
VAN CRUIJSEN	Marc	Netherlands	2013
VAN DER DRIFT	Mireille	Netherlands	2011
VAN DER KEMP	Peter	Netherlands	2011
VAN DER LAAN	Pieter Jelle	Netherlands	2016
VAN DER NAGEL	Roel	Netherlands	2015
VAN DER SALM	K.	Netherlands	2014
VAN DER SMAN	Yoei Walter	Netherlands	2011
VAN DIJK	Frederik	Netherlands	2013
VAN DOORN	Arjan	Netherlands	2011
VAN ELS - RUTTEN	Anna	Netherlands	2012
VAN ELSACKER	Andreas	Netherlands	2015
VAN GOOL	Stephan	Netherlands	2015
VAN KOOTEN	Andre	Netherlands	2014
VAN OORT	Geeske	Netherlands	2013
VAN SCHUNDEL	Jan	Netherlands	2016
VAN VELDHUIZEN	Erny	Netherlands	2013
VASCONCELOS	Hugo Morujo	Portugal	2013
VENANCIO GALVAO	Julia Maria	Netherlands	2012
VERSTEEG	Astrid	Netherlands	2014
VILLADEAMIGO	Juan Manuel	Spain	2012
VISSCHER-HARINK	Sabine	Netherlands	2015
VOS	H.D.	Netherlands	2016
VOS	Jeroen	Netherlands	2015
WALLIS	Edward	United Kingdom	2016
WALRAVEN	Jacintha	Netherlands	2015
WALSH	Andrea	Ireland	2015
WASSEN	Jeroen	Netherlands	2014
WHITAKER	Lynne	United Kingdom	2014
WILS	Alexandra	Netherlands	2013
WOLTING	Roelof John	Netherlands	2012
WULFF	Christian	Germany	2016
XAVIER	Ana	Portugal	2012
ZANELLA	Michela	Italy	2015
ZERIKIOTIS	Evangelos	Greece	2013
ZUMBRINK	Jacobus Johannes Maria	Netherlands	2013



European Heart Rhythm Association

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The EHRA White Book 2017 is supported by
BIOTRONIK SE & Co. KG in the form of an educational grant

