



Health Consumer Powerhouse



Euro Heart Index 2016

Secondary Prevention Index 2017

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Secondary Prevention Index
2017

Report

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Health Consumer Powerhouse Ltd.
2017-08-26
Number of pages: 25

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ISBN 978-91-980687-4-0

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This study was made possible by an unconditional development grant from Amgen Europe, GmbH.

1. Summary

1.1 Overview of Secondary prevention of CVD situation in Europe.

The intention with this extension of the Euro Heart Index (EHI), which was published December 2016, is to evaluate or at least describe the situation across European countries regarding secondary prevention of CVD, describing that as a sub-index to the EHI 2016: the Euro Heart Index – Secondary Prevention Index 2017 (EHI-SPI). This is in order to identify and review, more in detail, important and immediate needs including the lack of enough national data to enable accurate assessment of the situation.

The first thing the study detected is the need to understand the specifics of secondary prevention *vs.* disease prevention for the general population, outside cardiologist professional circles: it is essential to **increase awareness** about the meaning of secondary prevention among primary physicians, people working in national bodies, community worker and policy makers. It is still not fully understood that secondary prevention is a very important step to improve outcomes and reduce hospital readmission after any ischaemic heart condition. That is probably one reason why most European countries still lack a comprehensive national CVD action plan with targets for secondary prevention of CVD. And also the reason why currently, **funding** for secondary prevention services is fragmented, largely discretionary, and fails to guarantee the continuity of existing services. The resulting uncertainty impedes long-term service planning, prevents the implementation of quality-improvement initiatives, and restricts health professionals' capacity to provide good clinical services. Action on secondary CVD prevention requires a positive policy environment with top-level leadership and government support but for all this there is the need of increasing awareness and measure what secondary prevention brings. There are significant gaps between evidence-based improvement measures for secondary prevention and actual practice. For example, a very unequal use of medication, access to rehabilitation programs, assessment, long-term follow ups *etc.*

1.2 What countries provide good secondary prevention in Europe?

1.2.1 Sweden

#1 with 956 points – the closest to the “perfect” 1000 ever scored in a Health Consumer Powerhouse index.

Sweden came third in the overall EHI 2016. Even with government initiatives, Sweden struggles with primary prevention of obesity and sedentary lifestyles. A national registry for cardiac care exists to monitor the adherence to recommended international guidelines for myocardial infarction. Since 2009, SWEDEHEART audits, lists and follows up every patient that has suffered heart attacks. This information provides live feedback on the outcomes and performance of cardiovascular care and treatment in Sweden. A recent report from SWEDEHEART stated that in Sweden there is a need to reduce the mortality rate of younger women after a heart attack.

In addition to this, Sweden also has a registry called SEPHIA, which monitors secondary prevention after heart surgery in the intensive care. Rehabilitation is available to the

patients and reimbursed either by the national health or private insurance. It also has been noted that in Sweden the implementation of the follow up guidelines is not standardised, nor do they emphasise family involvement in the follow-up process.

The strong and lasting Swedish tradition of healthcare quality registries helps to explain its high position in the EHI; just as in other sectors of society, Swedes trust authorities to have access to data about almost anything. Hence, Sweden is one of very few countries to get no **n.a.** scores.

The good data availability has an even greater impact in the EHI-SPI 2017. Swedish quality registries provide comprehensive data also on Secondary Prevention – an area where most countries struggle to provide data, which is specific for SP.

It is unusual for Sweden to get as many Green scores for accessibility as it does in the EHI and EHI-SPI, as there is an attitude problem in Swedish healthcare creating some of the worst waiting time problems anywhere in European healthcare. One reason for this is probably that some EHI wait indicators are measures on process efficiency rather than classical waiting times for an operation *etc.* The same phenomenon was observed in the Euro Diabetes Index 2014, where Sweden ranked #1 for the first time in a HCP Index.

“Attitude problem” is because the waiting lists are not linked to lack of resources, but rather to a decades-old culture, where the problem of waiting for healthcare services has become an accepted phenomenon.

The process efficiency aspect was noted in the Swedish responses to indicator questions in sub-discipline 2 about “referral to secondary rehab”: “Whaddy’a mean, referral? Secondary Prevention starts before discharge for the original cardiac event!”

1.2.2 France

France, is second with 911 points. It is not a surprise that France scores high because this also happened in the EHI 2016, where they were #1.

There are some reasons for such a good performance in the Index. Primarily, France supplied really good data quality on all indicators. France performs particularly well in Cardiac rehabilitation, with many patients having timely access to the rehabilitation they need, and accessing it for free.

France is a leader in the care and treatment of CVD with their successful best practice guideline programs. The National Authority for Health has been working with all major stakeholders in focusing on developing and sharing best practices, based on international recommended guidelines. There is consistent monitoring and recording of outcomes of care and treatment from the moment the patient experiences chest pain, the reperfusion treatment to discharge and finally the follow-up appointments of the heart patient.

The close and trusting relationship that general practitioners (GPs), have with their patients is also a rarity among European nations. This allows general practitioners to stimulate primary prevention like lifestyle changes such as smoking cessation or even open conversations to reduce obesity and alcohol consumption. The GPs also play an important role after discharge from hospital, lifestyle risk factor follow ups and medication management.

1.2.3. Slovenia

Slovenia, #3 at 872 points, is struggling with budget restrictions and limitations in the health care system but has managed very well to keep an effective CV care.

The secondary prevention including rehabilitation is provided according to the National Guideline on Secondary Prevention and Rehabilitation after Myocardial Infarction, developed first in 2004 and renewed in 2009, by the nationally appointed multidisciplinary group of professionals, including also representatives of patients. Slovenia has been able to continue its high quality cardiac rehab programmes and provide good access. Rehabilitation is provided at all three levels of health care.

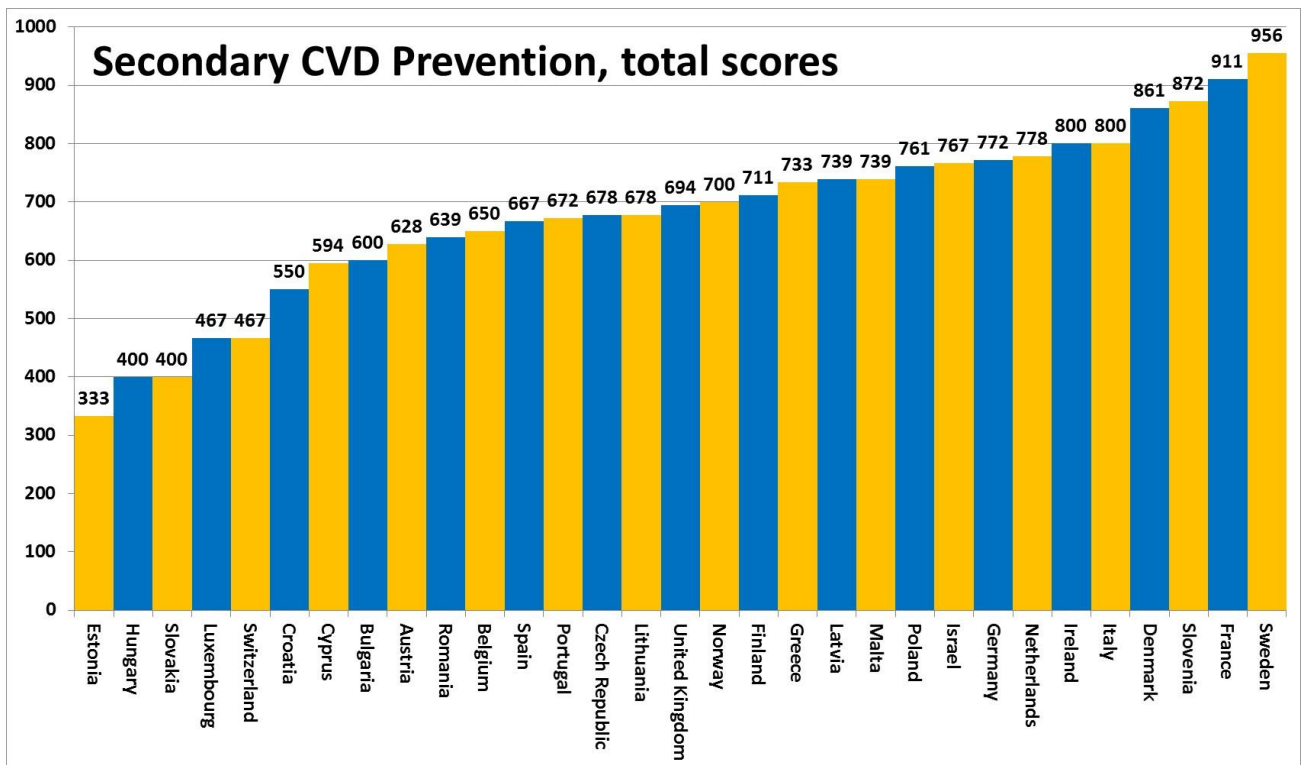
Still, many patients do not have optimised risk factors; they are obese or/and have elevated blood pressure or another condition that could be prevented.

The system of quality control is set internally by each centre and the publication of the results is at their discretion. In most cases this is by periodical analysis of practice and presentation at local/national meetings and/or publications/journals. Quality indicators are set in accordance with national guidelines. Institutions are not obliged to report outcomes to any central body (or registry), which is a shortcoming.

2. Results in the Secondary Prevention Index 2017

Sub-discipline	Indicator	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Israel	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	United Kingdom	
1. Risk assessment and control	1.2 Prevalence of obesity in cardiac patients.								n.a.					n.a.		n.a.				n.a.							n.a.				n.a.		
	1.3 Prevalence of current smoking in cardiac patients	n.a.							n.a.					n.a.						n.a.							n.a.				n.a.		
	1.4 Prevalence of elevated blood pressure								n.a.						n.a.		n.a.				n.a.						n.a.					n.a.	
	1.5 Prevalence of patients with LDL-C ≥ 1.8mmol/L								n.a.						n.a.						n.a.						n.a.				n.a.		
	Subdiscipline weighted score	133	133	100	117	117	117	150	67	167	150	133	133	67	167	100	117	150	117	67	133	133	100	133	133	133	67	133	167	167	67	133	
2. Cardiac rehabilitation (CR)	2.1 % of eligible patients referred to CR?																							n.a.									
	2.2 Waiting time between referral for CR to patient enrollment.						n.a.			n.a.				n.a.												n.a.	n.a.						
	2.3 % of CR patients in program for post-hospital discharge.															n.a.																	
	2.4 CR (with referral) subsidized																																
	Subdiscipline weighted score	117	183	100	100	67	117	200	67	100	183	183	67	133	167	133	150	133	183	200	183	167	133	117	117	83	133	183	100	200	200	150	
3. Access to treatment	3.1 % of patients on anti platelet agents								n.a.					n.a.						n.a.							n.a.						
	3.2 % of patients on Beta blockers								n.a.					n.a.							n.a.							n.a.					
	3.3 % of patients on Statins								n.a.					n.a.							n.a.						n.a.						
	Subdiscipline weighted score	178	133	133	133	178	178	178	67	133	178	133	200	67	133	200	133	200	111	67	89	156	133	156	156	156	67	156	200	200	67	89	
4. Discharge, transition, on going prevention	4.1.1 Risk factor measurement (Blood pressure)								n.a.					n.a.		n.a.					n.a.					n.a.		n.a.					
	4.1.2 Risk factor measurement (Cholesterol)								n.a.					n.a.		n.a.					n.a.					n.a.		n.a.					
	4.1.3 Risk factor measurement (Glucose)								n.a.					n.a.		n.a.					n.a.					n.a.		n.a.					
	4.2 Hospital readmission rates for heart failure.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.	n.a.				n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.
	Subdiscipline weighted score	67	67	67	67	167	133	133	67	111	200	189	133	67	133	133	200	122	133	67	133	122	133	156	67	133	67	200	67	189	67	122	
5. Data quality	5.1 Data quality								n.a.					n.a.														n.a.					
	Subdiscipline weighted score	133	133	200	133	67	133	200	67	200	200	133	200	67	200	200	200	133	133	67	200	200	200	200	200	133	67	200	133	200	67	200	
	Total score	628	650	600	550	594	678	861	333	711	911	772	733	400	800	767	800	739	678	467	739	778	700	761	672	639	400	872	667	956	467	694	
Rank	23	21	24	26	25	17	4	31	14	2	8	13	29	5	9	5	11	17	27	11	7	15	10	19	22	29	3	20	1	27	16		

2.1 Total scores and ranking in Secondary Prevention Index 2017



Graph 2.1 Total scores and country rank in Secondary Prevention Index 2017.

As the graph shows, there is some cluster formation in the ranking; a set of top 4 countries, scoring 956 – 861 points, followed by another large set where most countries are included, scoring 800 – 594 points. The 5 last countries in the ranking, end up there because data for most indicators is not available.

3. Results in "Pentathlon"

The Secondary Prevention index is made up of five sub-disciplines. As no country excels across all aspects of measuring a healthcare system, it can therefore be of interest to study how the 31 countries rank in each of the four parts of the "pentathlon". The scores within each sub-discipline are summarized in the following table:

Sub-discipline	Sweden	France	Slovenia	Denmark	Ireland	Italy	Netherlands	Germany	Israel	Poland	Latvia	Malta	Greece	Finland	Norway	United Kingdom	Czech Republic	Lithuania	Portugal	Spain	Belgium	Romania	Austria	Bulgaria	Cyprus	Croatia	Switzerland	Luxembourg	Hungary	Slovakia	Estonia
1. Risk assessment and control	167	150	133	150	167	117	133	133	100	133	150	133	133	167	100	133	117	117	133	167	133	133	133	100	117	117	67	67	67	67	67
2. Cardiac rehabilitation (CR)	200	183	183	200	167	150	167	183	133	117	133	183	67	100	133	150	117	183	117	100	183	83	117	100	67	100	200	200	133	133	67
3. Access to treatment	200	178	156	178	133	133	156	133	200	156	200	89	200	133	133	89	178	111	156	200	133	156	178	133	178	133	67	67	67	67	67
4. Discharge, transition, on going prevention	189	200	200	133	133	200	122	189	133	156	122	133	133	111	133	122	133	133	67	67	67	133	67	67	167	67	67	67	67	67	67
5. Data quality	200	200	200	200	200	200	200	133	200	200	133	200	200	200	200	200	133	133	200	133	133	133	133	200	67	133	67	67	67	67	67
Total score	956	911	872	861	800	800	778	772	767	761	739	739	733	711	700	694	678	678	672	667	650	639	628	600	594	550	467	467	400	400	333
Rank	1	2	3	4	5	5	7	8	9	10	11	11	13	14	15	16	17	17	19	20	21	22	23	24	25	26	27	27	29	29	31

Sweden performed good in all sub-disciplines and it is best in 4 out of 5. The results are very good almost in all indicators, and Sweden has the best data quality in the index.

The 2nd and 3rd positions are occupied by two traditional good performers on CVD treatment: France and Slovenia.

Sub-discipline	Top country/countries	Top Scores	Maximum score
Risk assessment and control	Finland, Ireland, Spain, Sweden.	167	200
Cardiac rehabilitation (CR)	Denmark, Luxembourg, Sweden, Switzerland.	200	200
Access to treatment	Greece, Latvia, Spain, Sweden.	200	200
Discharge, transition, on going prevention	France, Italy, Slovenia.	200	200
Data quality	Bulgaria, Denmark, Finland, France, Greece, Ireland, Israel, Italy, Malta, The Netherlands, Norway, Poland, Slovenia, Sweden, UK.	200	200

4. Production of the Secondary Prevention Index (EHI-SPI) 2017

The secondary prevention Index is an appendix of the Euro Heart Index published on December 2016. It follows the same methodology as previous indexes (pp. 51 – 63, Euro Heart Index 2016 report¹) but specifically concentrating on the situation regarding secondary prevention of CVD. The project started in January 2017. A total of 31 countries were included, the 28 EU member states plus Israel, Switzerland and Norway.

It has been important to have a mix of indicators in different areas and different part of the secondary prevention process; Risk assessment and control, Cardiac rehabilitation, Access to treatment and discharge, transition or on going prevention. Additionally, it was decided with the assistance of the external Expert Panel to bring extra attention into the lack of uniform and good quality data. Therefore one sub-discipline with one indicator on data quality was included to show the kind of data is available in the countries or at least what there is public access to.

Most European countries included in this project participate in either EUROASPIRE or SURF surveys. Access to the data generated by both projects has been important as a starting point. Data from the surveys has been replaced/modified for national data if available. Frequently, national data was similar to the data provided by the surveys. This is the case *e.g.* for **Denmark**, where data coming from registries and surveys were quite consistent. In other countries, the data from these surveys has a poor coverage. This is the case in **Spain** where only one hospital in Madrid was included. In **Germany** or **Romania** there is not national data available so only data coming from EUROASPIRE is presented in the Matrix.

There are 5 countries where it was impossible to access any data; In **Luxembourg**, the data on these indicators is collected and included in the patient's medical records but until now no figures or analysis are available. Lack of available data is the reason why Luxembourg is so low in the ranking. For the other 4 countries Estonia, Hungary, Slovakia and Switzerland all efforts did not help to find any data.

In **Austria** the only data available and the one presented in this project comes from the AGAKAR Database, which includes all patients who received outpatient cardiac rehabilitation (CR) between 2005 and 2015. Comparison of results between Austria and the rest of countries can only be considered as a broad estimation.

The project was met with positive interest from national bodies and other health officials and stakeholders around Europe. A large number of professionals were happy to contribute providing indicator data and other information about their own countries. HCP is grateful for the high participation of physicians in this project, mostly national coordinators from EAPC. Their views, knowledge and data provision have been essential to complete the Secondary Prevention Index. The completion of this study would not have been possible without the generous support of authorities and health professionals in many countries. This report has benefitted from the expertise and material received from many health officials, health professionals, and health experts. They spent time to study and find the information the HCP was requesting.

During the European Association of Preventive Cardiology congress (EAPC) in April 2017, possible synergies between our project and the association's interest was discussed with the president of EAPC. They endorse the EHI-SPI and encouraged their national coordinators to contribute to the index by supporting HCP on the data/researching collection process. HCP interaction with the national coordinators has been extremely fruitful. Their views and knowledge and data provision have been essential to complete the Index and the HCP believes that the results present a good overview of the actual situation in Europe.

¹ www.healthpowerhouse.com/files/EHI_2016/EHI_2016_report.pdf

In connection with the project a number of countries organised meetings to which all relevant stakeholders were invited. The purpose of the meetings was to discuss data availability and data quality before sending it to the HCP.

One of the aims of this project has been to demonstrate the situation of data availability on the European level. The HCP team spent time discussing the quality and the representativeness of the data sent to us with country representatives and public health experts.

4.1 How to interpret the Index results?

The first and most important consideration on how to treat the Euro Indexes results is: with caution! Just like any of the Euro Indexes, also the EHI-SPI is an attempt at measuring and ranking the performance of healthcare provision. The results definitely contain information quality problems.

While by no means claiming that the EHI-SPI results are dissertation quality, the findings should not be dismissed as random findings.

The Secondary Prevention index is an attempt at measuring and ranking the performance of healthcare provision of the countries included in the study. Most of the data presented has been reviewed more than once, not only by HCP staff but by different stakeholders and experts in countries.

It is important to mention that the exact position that a country gets in the ranking should not be subject to overly detailed analysis. Small variations in the scoring in any of the indicators may alter the rank. For purely mathematical reasons, this is particularly true for countries in the middle of the ranking. However, it is very relevant if a country is on the top 5 of the ranking, in the middle or at the bottom.

Previous experience from Euro Indexes indicates that consumer ranking by indicators of this nature are looked upon as important tools to reflect healthcare service quality. The HCP hopes that the results can serve as inspiration for how and where European cardiac care can be improved.

5. Indicator definitions and data sources for the Secondary Prevention Index

The aim has been to select a limited number of indicators, within a definite number of evaluation areas, which in combination can present a telling tale of how healthcare is being served by the respective systems.

It is important to notice that data on European level were not available for any of the indicators of interest. The project had access to data from some National registries, data from EUROACTIVE and SURF, published reports, articles and national audits as SWEDEHEART. The assistance of national coordinators from EAPC to guide us through the national data was extremely useful.

Table 5.1: Indicator definitions and data sources for the Secondary Prevention Index 2017.

Sub-discipline	Indicator	Explanatory comment	Score 3 👍	Score 2 👉	Score 1 👎	Main Information Sources
1. Risk assessment and control	1.2 Prevalence of obesity in cardiac patients.	BMI \geq 30 kg/m ²	Less than 30%	30-40%	More than 40%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
	1.3 Prevalence of current smoking in cardiac patients		Less than 15%	15-20%	More than 20%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
	1.4 Prevalence of elevated blood pressure	% of patients with BP \geq 140/ 90 mmHg	Less than 40%	40-50%	More than 50%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
	1.5 Prevalence of patients with LDL-C \geq 1.8mmol/L	LDL-C \geq 1.8mmol/L	Less than 60%	60-80%	More than 80%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
2. Cardiac rehabilitation (CR)	2.1 % of eligible patients referred to CR?		More than 60%	60-30%	Less than 30%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
	2.2 Waiting time between referral for CR to patient enrollment.	Median number of days between reception of referral for CR to patient enrollment.	Less than 30 days	30-60 days	More than 60 days	National publications, Interviews with health care officials, physicians and public health experts.
	2.3 % of CR patients in program for post-hospital discharge.	% of CR eligible patients enrolled in a program post-hospital discharge.	More 50%	50-40%	Less 40%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

	2.4 CR (with referral) subsidized		Fully subsidized	Partially subsidized or Subsidized only in some indications (e.g Myocardial infarction, coronary artery bypass graft surgery or PCG)	Only private paid or high percent of the total cost is private paid	National publications, Interviews with health care officials, physicians and public health experts.
3. Access to treatment	3.1 % of patients on anti platelet agents	Proportions of patients on aspirin and/or other antiplatelets	More than 95%	95-90%	Less than 90%	National publications, Interviews with health care officials, physicians and public health experts.
	3.2 % of patients on Beta blockers		More than 80%	80-70%	Less than 70%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
	3.3 % of patients on Statins		More than 90%	90-80%	Less than 80%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
4. Discharge, transition, on- going prevention	4.1.1 Risk factor measurement (Blood pressure)	Approx one year after event (Mean 16 months)	More than 80%	80-70%	Less than 70%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
	4.1.2 Risk factor measurement (Cholesterol)	Approx one year after event (Mean 16 months)	More than 80%	80-70%	Less than 70%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.
	4.1.3 Risk factor measurement (Glucose)	Approx one year after event (Mean 16 months)	More than 80%	80-70%	Less than 70%	Data from National registries, national surveys, national publications, EUROASPIRE, SURF, interviews with health care officials, physicians and public health experts.
	4.2 Hospital readmission rates for heart failure.	Re-hospitalizations for HF in patients with HF. 1 year after discharge.	Less than 40%	40-50%	More than 50%	Data from National registries, national surveys, national publications.
5. Data quality	5.1 Data quality		National data: National registries/ national surveys /national data from specific registries/ Public social security data	Partial data/Regional data: Euroaspire/ SURF/Data from data bases including only patients in rehabilitation/regio nal data	Hospital based data/ Estimations	

6. General information on Secondary Prevention of CVD.

By definition, **Secondary prevention** consists of tailored long-term help to prevent new cardiovascular events or complications in patients with diagnosed CVD. This involves medical care, modification of behavioural risk factors, psychosocial care, education and support for self-management (including adherence to prescribed medicines), which can be delivered in various settings. Rehabilitation programs normally consist of three phases: I) in-patient, II) out-patient, III) long-term intervention. Cardiac rehabilitation improves exercise tolerance, blood lipid levels, sense of general wellbeing, chances of quitting smoking, and survival rates^{2,3}.

The cost-effectiveness of cardiac rehabilitation and multidisciplinary management is well described in the literature in other regions of the world, such as Australia^{4,5}, but in Europe more cost-effectiveness evaluations are needed. This might not be necessary if the Not Invented Here syndrome in public healthcare could be eradicated.

Large variations between European countries are observed in the provision of services for lifestyle and risk factor management, and also in the use of cardioprotective medications in patients and the provision of cardiac prevention and rehabilitation.

6.1.1 Access

In order to implement high quality secondary prevention it is necessary to provide flexible and integrated service options, linking the different rehabilitation needs requested. These need to be tailored to the needs of populations (patient-centered care) and individuals, appropriate to various stages of CVD management (acute, subacute and ongoing care), easy to access, with enough funding and short waiting times. Furthermore, It is essential that countries develop and fund a framework for comprehensive secondary prevention of CVD within primary care, special for long term outpatient prevention (Cardiac rehabilitation, phase III). Supervision of patient adherence to prescribed lifestyle behaviour and constitutes a joint effort of patient, primary care physician and cardiologist.

As described in Euroaspire IV and SURF surveys and also looking at the results of the EHI, cardiac rehabilitation and home care services in Europe are underused and in many countries not provided in the form of home care. In general, there are poor referral and low participation rates. Wide variations exist between countries in the participation in rehabilitation and in the provision and quality of home care services. Programmes offered are of different length and variable content. The personnel providing home care have a very different range of qualifications.

² Servey J et al; Cardiac Rehabilitation: Improving Function and Reducing Risk. *Am Fam Physician*. 2016 Jul 1;94(1):37-43.

³ Kikkenborg Berg S et al; Comprehensive cardiac rehabilitation improves outcome for patients with implantable cardioverter defibrillator. Findings from the COPE-ICD randomised clinical trial. *European Journal of Cardiovascular Nursing* 2015, Vol. 14(1) 34–44.

⁴ National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand (Chronic Heart Failure Guidelines Expert Writing Panel). *Guidelines for the prevention, detection and management of chronic heart failure in Australia*, 2006. Melbourne: National Heart Foundation of Australia, 2006.

⁵ Briffa TG et al; *Cost-effectiveness of rehabilitation after an acute coronary event: a randomised controlled trial*. *Med J Aust* 2005; 183: 450–5.

7. Main findings in the different sub-disciplines

7.1 Risk assessment and control

Availability/Subsidised (All CVDs patients)							
	Physical activity and exercise counselling	Diet/nutrition management	Exercise training	Weight management	Smoking cessation program	Psychosocial management	Alcohol consumption Management
Austria	👉	👉	👉	👉	👉	👉	👉
Belgium							
Bulgaria	👈	👈	👈	👈	👈	👈	👈
Croatia	👈	👈	👈	👈	👈	👈	👈
Cyprus	👈	👈	👈	👈	👈	👈	👈
Czech Republic							
Denmark							
Estonia							
Finland	👈	👈	👈	👈	👈	👈	👈
France	👉	👉	👉	👈	👈	👉	👉
Germany	👉	👉	👉			👈	👉
Greece	👈	👈	👈	👈	👈	👈	
Hungary							
Ireland	👈	👈	👈	👈	👈	👈	👈
Israel	👈	👉	n.a	👉	👉	n.a	👉
Italy	👉	👉	👉	👉	👉	👉	👉
Latvia	👈	👈	👈	👈	👈	👈	👈
Lithuania	👉	👈	👉	👈	👈	👈	👈
Luxembourg	👉	👉	👉	👈	👈	👉	n.a
Malta	👉	👉	👉	👉	👉	👉	👉
Netherlands	👉	👉	👉	👉	👉	👉	👉
Norway	👉	👉	👉	👉	👈	👉	👉
Poland	👈	👈	👈	👈	👈	👈	👈
Portugal	👉	👉	👈	👉	👈	👈	👉
Romania	👈	👉	👈	👈	👈		👈
Slovakia							
Slovenia	👉	👉	👈	👉	👉	👈	👉
Spain	👉	👉	👈	👉	👈	👈	👉
Sweden	👉	👈	👈	👈	👉	👈	👉
Switzerland	👉	👉	👉	👉	👉	👉	👉
UK							

Table 7.1.1 (previous page) Access to; Smoking, nutrition, psychosocial, alcohol, physical activity and weight management. This table contains information on indicator 1.1. It was exclusively measured availability (widely or partially in the country) and reimbursement of the mentioned services. It was neither measured the quality of the services or the outcomes. Since these data are only estimations (based on subjective opinions from experts). It was decided by the members of our panel to present the information collected as a table and not to include this indicator in the matrix.

The benefits of modifying risk factors in people who have already developed a cardiovascular disease are known, to prevent new episodes to decrease the risk of suffering a new event and/or improve quality of life. As it can be appreciated in table 7.1.1, the availability and access to relevant services necessary to improve management of the main CVD risk factors such as body weight, smoking or alcohol consumption varies a lot between countries in Europe.

It can be said that in most countries a large majority of coronary patients do not achieve the guideline standards for secondary prevention, with high prevalence of persistent smoking, unhealthy diets and physical inactivity. A very high percent of patients are obese and do not achieve recommended standard regarding blood pressure or cholesterol levels.

7.2 Cardiac rehabilitation (CR)

7.2.1 Rehabilitation

Rehabilitation programmes are divided into 3 phases. They all involve a multidisciplinary team such as physiotherapist, nurses, psychologist, cardiologists and occupational therapists. Focus is given to increasing patients' physical activities, cessation of smoking, nutritional management, diabetic management, weight management, lipid management, alcohol reduction and psychosocial issues encountered by patient post procedures. Phase 1 occurs directly after surgery in the hospital and involves health education and intervention in the hospital to prevent weaknesses and complications by early ambulation. Phase 2 occurs in a supervised out-patient setting where the patient is introduced to exercise and reduction of risk factors. Phase 3 is the long-term maintenance and enforcement of what the patient has learnt in phase 2.

Even though rehabilitation reduces patient's re-admission rates with minimal risks⁶, it remains an underutilized, cost effective resource in a patient's recovery process⁷.

Only countries in the western part of the EU have the economic ability to carry out all 3 phases. Nevertheless, barriers to implementation include gender; less women are referred to the programmes than men, those from the lower social economic groups or ethnic minorities lack the means to adhere to the programmes. Patients themselves may lack the ability to understand the goals of rehabilitation. Other restrictions for participation also include limited patient referral by physicians, logistics coverage by insurance and finally the lack of clear standardized guidelines and legislations between countries on how to implement and who is responsible. The rehab picture in Europe does not look too good, and only few countries provide rehabilitation to most patients who are advised to attend it. Unfortunately, the project does not record information on the quality of those programs, or the outcomes.

Another factor restricting CR for patients are the re-imbursement procedures, which vary greatly between the regions in Europe. Like the rehabilitation programme, there is no agreement on who should be involved in implementation, the targets and how costs should

⁶ Hasnain M Dolal, Patrick Doherty. Cardiac rehabilitation. Clinical Review. The BMJ. Sept.29 2015

⁷Mampuya WM. Cardiac rehabilitation past, present and future: an overview. Cardiovasc.Diagn Ther 2012;2(1)38-29.doi:10.3978/j.issn.2223-3652.2012.01.02

be covered⁸. Only in half of the countries is CR fully subsidised for those patients referred to it. In the other half is only partially subsidised or it has to be privately paid, which represents a barrier, particularly for the poorest patients.

7.3 Access to treatment

Most patients reported taking the recommended drugs to control risk factors but large variations between European countries were observed.

It was almost impossible to find available data on drug linkage, despite a number of observational studies that demonstrated that good adherence to drug therapy is associated with positive health outcomes⁹.

7.4 Discharge, transition, on-going prevention

Ongoing maintenance of behaviour change beyond the period of inpatient and outpatient rehabilitation is critical if long-term health benefits are to be realised. Services offered in this period have an emphasis on supporting behaviour that decreases the risk of future cardiovascular events. This involves sustained activities and behaviour to reduce cardiovascular disease risk factors. Healthy nutrition, an active lifestyle, moderate alcohol intake and being a non-smoker are key lifestyle factors supported in ongoing prevention programs. The importance of continuing with prescribed medication is also reinforced during this time. This ongoing approach is not necessary, or required for all patients. However, some people may require regular, consistent, up-to-date information as well as further skills training for behaviour change, relapse prevention and self-management.

This data presented in the matrix is from the EUROASPIRE survey. The research team was unable to find this data anywhere else for any country. Most answers were estimations assuming that all patients that are following a pathway attend recommended follow-ups.

7.5 Data Quality

From the very beginning, one of the index aims was to bring attention into the importance of collecting data on Secondary Prevention indicators. The starting data was from EUROASPIRE and SURF surveys and in many countries this data has been completed with other studies, data bases, registries and other sources. We are aware the data supplied is not the same quality for all countries but just the fact of presenting the best data (closest to the reality) already deserved in our opinion a Green score. The HCP would claim that this is a quite generous approach; with a more strict definition, only Sweden, Denmark, Norway, France and the U.K. would have received Green scores.

There are countries like Germany or Romania, both participants in the EUROASPIRE and with not national data available. It was agreed that the EUROASPIRE data would be shown in the matrix instead of a number of not available (**n.a.**'s).

⁸ Jaarsma.T, Larsen.T, Strömberg.A. Practical guide on home health in heart failure patients. International Journal of Integrated care. Vol.13 (2013)

⁹ Simpson SH, Eurich DT, Majumdar SR, et al. A metaanalysis of the association between adherence to drug therapy and mortality. BMJ 2006; 333: 15.

Finally, there are other kinds of data which may be national, such as in Austria, but only include certain patients or are “well documented” estimations. In this case countries got a Red score.

8. How the secondary Prevention Index 2017 was built

8.1 Production phases

The Index does not take into account whether a national healthcare system is publicly or privately funded and/or operated. The purpose is health consumer empowerment, not the promotion of political ideology. Aiming for dialogue and co-operation, the ambition of the HCP is to be looked upon as a partner in developing healthcare around Europe.

The Secondary Prevention Index 2017 was constructed under the following project plan.

8.1.1 Phase 1

1. Selection of a number of experts to be part of the expert panel and set up the first meeting.

The composition of the Expert panel can be found in Section 9.

2. Start-up meeting with the Expert Reference Panel - Mapping of existing data

The major area of activity was to evaluate to what extent relevant information is available and accessible for the selected countries and Pre-design a number of interesting indicators and possible sub-disciplines for the project which were discussed during the first expert panel meeting.

8.1.2 Phase 2

8.1.2.1 Indicators design, long list of indicators, sub-disciplines

For the design and selection of quality indicators it was proceeded similar to the Delphi process. The starting points were research in Internet, guidelines and scientific articles for indicators. A “long list” of indicators was composed. The Pre-design indicators of interest and possible sub-disciplines for the project were presented and discussed with the members of the expert panel during the first Expert Panel meeting on January 31st 2017. During the meeting a large number of indicators were selected as being relevant for inclusion in the project. This “long-list” included more than 30 indicators.

8.1.2.2 Indicator scoring.

The experts then performed an indicator scoring in an organized and systematic manner to shorten the list and select the indicators most relevant for the project; based on Relevance, Scientific Soundness and Feasibility. This exercise ended up with 20 indicators all considered relevant for the Index. From those, 3 had to be discarded; two for data availability reasons and one because the definition of the indicator was too unspecific.

The Index is built up by 17 indicators on secondary prevention grouped in five sub-disciplines as shown in the Table below:

Sub-discipline	Number of indicators
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1. Risk assessment and control	5
2. Cardiac rehabilitation (CR)	4
3. Access to treatment	3
4. Discharge, transition, on-going prevention	4
5. Data quality	1

One additional indicator, 1.1 with information on **Access to**; Smoking, nutrition, alcohol, physical activity and weight management is presented as additional information in an extra table and commented (See Section 7.1.1).

8.1.3 Phase 2 (Data collection)

Data collection. Once the indicators were properly defined we started with the data collection process.

A round of personal visits by HCP researchers to Health Ministries and/or State Agencies for supervision and/or Quality Assurance of Healthcare Services and national coordinators from the EAPC.

Regular contacts with the Expert Reference Panel mainly to discuss issues related with the indicators, the criteria to score them, and the data acquisition problems. A second and final expert panel meeting took place on July 19th, 2017. During that meeting each of the indicators was discussed in detail; data collected, criteria, contradictions, including those that eventually cannot be included in the Index due to lack of data. Also, the discrepancies between data from different sources were analysed. Sub-discipline and relative weights were also discussed and set.

8.1.3.1 Weight coefficients

In the Secondary Prevention Index, the scores for the five sub-disciplines were all given the same weights:

Sub-discipline	Relative weight ("All Green" score contribution to total maximum score of 1000)	Points for a Green score in each sub-discipline
1. Risk assessment and control	200	40.00
2. Cardiac rehabilitation (CR)	200	50.00
3. Access to treatment	200	66.66
4. Discharge, transition, on-going prevention*)	200	100
5. Data quality	200	200
Total sum of weights	1000	

*) On this sub-discipline the weights are slightly different: Indicators 4.1.1 – 3 each have one-third of the weight of Indicator 4.2 Readmission rates.

8.1.3.2 "Single Country Score Sheets" send-out.

On July 10th 2017, single country score sheets (SCSS) were sent out for revision. All 31 states received their respective preliminary score sheets (with no reference to other states' scores) as an e-mail send-out asking for updates/corrections by August 1st. The send-out was made to contacts at ministries/state agencies as advised by states during the contact efforts and to all EAPC national coordinators and **European Heart Network (EHN)** members. Extensive e-mail exchanges, telephone contacts and additional personal visits to ministries/agencies were made until the data from each country was completed to the best of ability of all involved. In the table below, the countries from which feedback responses were received are shown.

Country	Responded	Country	Responded
Austria	✓	Latvia	✓
Belgium		Lithuania	
Bulgaria	✓	Luxembourg	✓
Croatia	✓	Malta	✓
Cyprus	✓	Netherlands	✓
Czech Republic		Norway	✓
Denmark	✓	Poland	✓
Estonia		Portugal	✓
Finland	✓	Romania	✓
France	✓	Slovakia	
Germany	✓	Slovenia	✓
Greece	✓	Spain	✓
Hungary		Sweden	
Ireland	✓	Switzerland	
Italy	✓	United Kingdom	

Table 8.1.3 Responses from national bodies.

8.1.4 Phase 3

Project presentation and reports

- A short report/chapter describing the results was constructed.
- Presentation of Secondary prevention Index is taking place on Saturday 26th of August during the ESC congress in Barcelona in a multi-speaker event.
- The day of the index launch, the HCP will send out press releases to ~2500 press contacts in all 31 countries commenting on the results. Once published, the index will be freely available on our website and all the data collected has open access.
- On-line launch on www.healthpowerhouse.com.

8.2 Content of indicators in the EHI-SPI 2017

EUROASPIRE and SURF surveys included the same kind of patients. Reviewing data from those countries included in both projects we observed similar results. Therefore we used as a denominator for the study, patients older than 18 years and <80 years of age at the time of their index event or procedure, with the following first or recurrent clinical diagnoses or treatments for coronary heart disease (CHD) were retrospectively identified from diagnostic registers, hospital discharge lists or other sources: (i) elective or emergency CABG, (ii) elective or emergency PCI, (iii) acute myocardial infarction (AMI; ICD-10I21), and (iv) acute myocardial ischaemia (ICD-10 I20).

8.2.1 Risk assessment and control

1.2 Prevalence of obesity in cardiac patients:

Obesity was defined as a body mass index $BMI \geq 30$ kg/m².

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

1.3 Prevalence of current smoking in cardiac patients

Persistent smoking was defined as smoking at interview with patients reporting to be smokers in the month prior to the index event.

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

1.4 Prevalence of elevated blood pressure

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

1.5 Prevalence of patients with LDL-C ≥ 1.8 mmol/L

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

8.2.2 Cardiac rehabilitation (CR)

Rehabilitation in Europe continues to be widely underused with enormous heterogeneity in service provision between countries. The indicators in this sub-discipline collect information in different topics related with CR, trying to show a picture of the current situation and detecting possible barriers of accessing the different services.

2.1 % of eligible patients referred to CR?

This indicator measures the number of eligible patients according to guidelines followed in the country being referred to cardiac rehabilitation.

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

2.2 Waiting time between referral for CR to patient enrollment.

In general there is not waiting time in inpatient CR, this indicator looks for information on the time that patients need to wait to access the rehabilitation they had been referred to.

Sources: National publications, Interviews with health care officials, physicians and public health experts.

2.3 % of CR patients in program for post-hospital discharge

This indicator collected information in how many of the patients advices to attend CR really attend it after post-hospital discharge.

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

2.4 Is CR (with referral) subsidised?

In some countries, it is difficult to access subsidised CR, or only privately paid CR is available. This indicator collected information about on which terms CR is accessible.

Sources: National publications, Interviews with health care officials, physicians and public health experts.

8.2.3 Access to treatment

Cardioprotective drug therapies are recommended in every guideline for CVD secondary prevention.

3.1 % of patients on antiplatelet agents

Proportions of CVD patients on aspirin and/or other antiplatelets.

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

3.2 % of patients on beta blockers

Proportion of CVDs patients on beta blockers.

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

3.3 % of patients on Statins

Statin therapy can safely reduce the five-year incidence of coronary events, revascularization and stroke by about one-fifth per mmol/l of LDL cholesterol reduction, regardless of the starting level.¹⁰

The indicators measures proportion of CVD patients on statins.

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

8.2.4 Discharge, transition, on-going prevention**4.1.1/4.1.2/4.1.3 Risk factor measurement (Blood pressure, cholesterol and glucose)**

How many coronary patients had received risk factor measurements (blood pressure, cholesterol, or glucose)? 1 year after coronary event.

Sources: Data from National registries, national surveys, national publications, EUROASPIRE, SURF, Interviews with health care officials, physicians and public health experts.

4.2 Hospital readmission rates for heart failure (HF).

Re-hospitalisations for Heart failure in patients with HF, 1 year after the first event.

Sources: Data from National registries, national surveys, national publications.

¹⁰ Cholesterol Treatment Trialists' (CTT) Collaboration. Efficacy and safety of cholesterol-lowering treatment: Prospective meta-analysis of data from 90 056 participants in 14 randomised trials of statins. *Lancet* 2005; 366: 1267–1278.

8.2.5 Data quality

This is an indicator included to show the nature of the data available from the respective countries, as easy access to good quality data is in itself strongly coordinated with quality of care.

Green: National data: National registries/ national surveys /national data from specific registries/ Public social security data

Yellow: Partial data/Regional data: Euroaspire/ SURF/Data from databases including only patients in rehabilitation/regional data

Red: Hospital based data from one/few hospitals, Estimations

9. External Expert Reference Panel

As is the standard working mode for all HCP Indexes, an external Expert Reference Panel was recruited. The panel met for two 6-hour sittings during the course of the project. The following persons have taken part in the Expert Reference Panel work for the EHI-SPI 2017:

Name	Affiliation
Carlos Brotons, Dr.	Sardenya Primary Health Care Centre. Biomedical Research Institute Sant Pau. Barcelona. Spain.
Zlatko Fras, Prof.	Division of Internal Medicine, University Medical Centre Ljubljana, Slovenia
Dan Gaita Prof.	University of Medicine & Pharmacy "Victor Babes", Timisoara, Romania
Ian Graham, Prof.	Trinity College, Dublin. Secretary/Treasurer, European Society of Cardiology.
Kornelia Kotseva, Prof.	National Heart & Lung Institute. Imperial College London. UK
Miguel Mendes, Prof.	Cardiology department at Hospital de Santa Cruz, Centro Hospitalar de Lisboa Ocidental, Carnaxide/Lisboa/Portugal
Massimo Piepoli, Prof.	Heart Failure Unit, Cardiac Dept, Guglielmo da Saliceto Polichirurgico Hospital, Piacenza, Italy

The Expert Reference Panel for a HCP Index has two core tasks:

- To assist in the design and selection of sub-disciplines and indicators. This is obviously of vital importance for an Index. They also assist with the criteria selection to evaluate the data collected.
- To review the final results of research undertaken by HCP researchers before the final scores are set and also to set the relative weights of each sub-discipline depending on

the relevance of the indicators for the disease and also on the quality and the availability of the data collected. If the information obtained seems to clash too violently with the many decades of healthcare experience represented by the panel members, this has been taken as a strong signal to do an extra review of the results.

The HCP wishes to extend its sincere thanks to the members of the panel for their fundamentally important contribution to the Index work, and for very valuable discussions during the course of the project.

10. References

10.1 Main sources

The main sources of input for the various indicators are given in Table 7.1 above. For all indicators, this information has been supplemented by interviews and discussions with healthcare officials in both the public and private sectors.