

Think Tank - Innovation and Healthcare Process in the Cardiovascular Patient in Portugal

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Executive summary

In Portugal, cardiovascular diseases (CVD) are among the **principal causes of morbidity, mortality and disability**. In fact, CVD are the leading cause of death among women and are second to cancer for men. Additionally, Portugal is characterized by a higher contribution of cerebrovascular disease to mortality relative to coronary heart disease, as compared to most other European countries.

Among the **cardiovascular risk factors**, there are those that are modifiable (hypertension, hypercholesterolemia, dyslipidemia, obesity, smoking, physical inactivity, diet, and long-standing higher systolic blood pressure, alcohol abuse and stress) and non-modifiable (gender, age, diabetes mellitus, and personal and family history). In the case of Portugal, its population shows high and relevant data on these modifiable risk factors: over 26% of the overall burden of disease in Portugal in 2015 can be attributed them and most notably to the elevated rates of hypertension among the population.

As such, the heavy CV burden in Portugal causes **significant economic, social and cultural impact**, and still presenting considerable potential for further decreases in morbidity and mortality through the implementation of the adequate strategies.

Being aware of the seriousness of the current context, the 2004-2010, 2012-2016 and 2020 **Portuguese National Health Plans** established various priorities, including cardiovascular disease prevention, treatment and rehabilitation and promotion of healthy lifestyles, as well as equality in healthcare. However, the discussion of a health strategy in Portugal has focused on financial issues, that is, **short-term economic and financial sustainability** of the National Health System. This strictly economic and financial approach does not offer prospects for the future and does not respond to the challenges that NHS is facing.

In conclusion, Portugal needs policies which address current and future health problems with a clear action plan. So, given the priorities set by the Plan Nacional de Saude and the current situation of cardiovascular diseases, we set ourselves the **objective of creating a TT "Think Tank" rewording the health environment of the Portuguese population**, where experts can debate about the health program in cardiovascular diseases.

Positioning and conclusions reached

The main conclusions reached by this panel of experts, which are derived from the discussion and analysis carried out, are set out below:

TOPIC	QUESTION	SUMMARY OF THE CONCLUSIONS REACHED
<p>CVD context in Portugal</p>	<ul style="list-style-type: none"> - What is the burden of CVD on the Portuguese system? - What is its relevance in programs for the prevention and treatment of chronic diseases? 	<ul style="list-style-type: none"> - Portugal has a high burden of cardiovascular diseases that has increased in recent years becoming the first cause of death. - Causes of this burden: lifestyle, physical inactivity, high consumption of salt in daily diet and prevalence of diabetes. - Patients are usually treated in the acute phase, so the problem lies in the stages prior to treatment, in the prevention setting, particularly in primary prevention. Currently, there are more centers available for secondary prevention performing cardiovascular, but primary prevention remains a big issue.
	<p>Are there other pathologies that are more relevant for Portugal? Which ones? Why?</p>	<ul style="list-style-type: none"> - There are other disorders are also relevant in Portugal, as in other parts of Europe, such as the oncological diseases. They create a big tension in health systems due to high prevalence and mortality - Oncological and cardiovascular diseases have a lot of factors in common, both share the same paths of pathological mechanism.
	<p>Does the Portuguese health system organization and / or its geographical distribution / organization help or hinder the implementation of such programs? Why?</p>	<ul style="list-style-type: none"> - Most hospitals and most centers are located around the big cities, so there are a lot of people who are out of reach of the health system. - There is a lack of coordination between the different health professionals involved in the management of patient with CVD. - Another difficulty is the Portuguese health system organization in 5 administrative regional systems which act as autonomous and independent health departments.
<p>Block 1: Incorporation of Innovation in the cardiovascular area.</p>	<ul style="list-style-type: none"> - Types of innovations that are currently being considered. - Do you consider that Portugal is an innovative country in this area? 	<ul style="list-style-type: none"> - Digital tools (tele-monitoring, tele-consultation, education and prevention at distance) are identified as the most disruptive and promising innovations in Portugal. - Experts consider Portugal to be an innovative country, specifically in the CV area with a high level of national and clinical investigation. - A clear example of Portugal's commitment to innovation is the participation in the European initiative the Valletta Declaration Group which objective is to improve patients' access to new and innovative medicines.
<p>Block 2: Innovation and improvement of processes, disruptive innovation</p>	<ul style="list-style-type: none"> - What is meant by disruptive innovation in the Health environment of Portugal? - What disruptive innovation actions are being taken in Portugal? 	<ul style="list-style-type: none"> - Undoubtedly, Big Data management is a relevant point nowadays. Big Data could have a direct effect on the incorporation of new treatments and act as a facilitator. - Despite its potential Portugal doesn't have a national strategy on it.

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	<ul style="list-style-type: none"> - To what extent can this type of innovation be directly related to the incorporation of new treatments? - What do you understand and what is the value of incremental innovation in Portugal? Why? 	<ul style="list-style-type: none"> - Incompatibility between the different computer systems present in the health system prevents the sharing of data and information. - The main obstacle for this innovation in Portugal is how to determine the difference between incremental and disruptive innovation. - The financing of innovation is not considered as a limiting factor, the problem lies in the lack of planning of such financing and its investment in unnecessary measures. - Incremental innovation involves small changes aimed at increasing the functionality and performance of the product or service, but which do not change the nature in which the product or service is produced or provided.
Block 3: Adherence	<ul style="list-style-type: none"> - Are there national programs that favor adherence to the treatment of CV patients? - How relevant can they be to ensure adherence in the design of care routes? - What measures do you think should be appropriate in Portugal to ensure adherence to treatment in the CV patient? 	<ul style="list-style-type: none"> - Experts ensure that routes of care are vital to protect adherence to treatment in CV patients. - Portugal does not have a national program or plan on adherence for patients with CVD, but there are some at the local and regional level. There is a lack of implementation of guidelines. - Portugal health system should be investing in all these areas: information, education, coaching and training.
Block 4: Patient's path	<ul style="list-style-type: none"> - What are the most relevant processes in this "journey" of the CV patient in the Portuguese healthcare system? - What can be the bottlenecks of the same, or the opposite, the fastest flow points? 	<ul style="list-style-type: none"> - GP's and family nurse are the key to enter in the health system, but patients have to be referred to the hospital where they will be diagnosed and treated. - The most important processes in the patient journey is the education of the patients and their families or caregivers. This process should involve the various health professionals who are in contact with CV patients. - One of the most relevant barriers is the lack of human resources. - Another barrier to be overcome is inadequate communication and coordination between the different health professionals in charge of managing the CV patients.
Block 5: Organizing continuous care	<ul style="list-style-type: none"> - Based on your experience, what are the main obstacles in the CV patient journey? - What would be the optimal way to implement best practices in Portugal? Which ones could be them? 	<ul style="list-style-type: none"> - One of the most important problem is that access to health system is not equal due to geographical distribution of health system and also to state of poverty. - Integration is the key factor to achieve a correct implementation of best practice in CVD or any chronic illness. This would be possible through disseminating multidisciplinary prevention/rehabilitation programs throughout the country.
Block 6: Awareness	<ul style="list-style-type: none"> - From your perspective and responsibility in the health system, what are the main clinical professionals that interact in the CV "patient journey"? - What should be the role of the patient? Proactive or Reactive? 	<ul style="list-style-type: none"> - All clinical professionals have to learn how to work together in a multi-disciplinary way not only in the hospital, but there should also be a wide and dynamic network in the community. - This way of working requires training all of them, which should start from the university studies.

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		<ul style="list-style-type: none"> - Experts agreed that the patient must have a central role in Portuguese health system and should be more involved.
Block 7: Service management	<ul style="list-style-type: none"> - What should be considered to produce a substantial change in the management of services? - About these changes, how could they be prioritized? - To what extent would these changes contribute to improve the efficiency of the system and the quality of life of the patient? 	<ul style="list-style-type: none"> - The development of national programs and plans on primary and secondary prevention in cardiovascular disease should be encouraged. - GP's in Portugal should play a more relevant role in secondary prevention. - Experts consider essential to prioritize in technical and human issues in order to improve the efficiency of the system.
Block 8: Patient experience	<ul style="list-style-type: none"> - To what extent can patients' experiences be collected with the objective of continuous improvement in the patient's care processes? - In what practical way should such experience be collected to be representative of a large majority of patients? - Does Portugal have databases with which to analyze "big data"? - What part of the continuity of care process is most relevant? 	<ul style="list-style-type: none"> - Inclusion of patients in clinical decision is a good method to get them to take responsibility for their own health. - One way in order to get this inclusion, is to create patient associations and groups with the same disease. - However, it must be taken into account that these patients must be formed, or they may otherwise make decisions that are not in the best interests of their health. - In this inclusion of patients, Big Data has enormous potential in terms of efficiency gains and improvement of users' living conditions. - One of the best examples is perhaps the Citizens Area of the National Health Service, where each person can make appointments with the family doctor, renew medications, access and manage their health data, search for pharmacies, hospitals and others.
Block 9: Improvement of process management	<ul style="list-style-type: none"> - How does process management affect the itinerary of the CV patient? - What routes and how are they defined in the health system with the aim to ensure a correct care of the CV patient? 	<ul style="list-style-type: none"> - Previously, decisions of process management at the healthcare level were mainly based on cost-effectiveness issues, however increasingly in Portugal the opinion of patients, their families and careers and the media are being taken into account. - In order to improve process management, investment in the quality of the software could be an interesting initiative because if health professionals could save time in administrative issues, they would attend more patients.
Block 10: Health education	<ul style="list-style-type: none"> - What measures are proposed in the health system with the aim to improve the knowledge in the patient about their pathology? - Are there defined programs that allow the patient to be placed at the center of the system? - If these programs do not exist, what initiatives could you suggest in this regard to improve the awareness of the Portuguese CV patient? 	<ul style="list-style-type: none"> - In Portugal, there are various initiatives to improve public awareness of CVD, but experts agree that these measures are insufficient are in a limited number, and structure education programs must be multiplied. - It is needed to establish health promotion and awareness campaigns to improve the knowledge and awareness of those diseases.

List of person and / or participating organizations

- **Prof^a. Ana María Ferreira Abreu.** Cardiologist at Santa María Lisboa Hospital; Professor of Cardiology University of Lisbon.
- **Prof. Doctor Manuel Carrageta.** Professor of Cardiology University of Lisbon.
- **Prof. Adalberto Campos Fernandes.** Health Minister 2015-2018; Invited Associate Professor at the National School of Public Health at Universidade Nova de Lisboa.
- **Prof^a. Maria do Céu Machado.** Full Professor at the Faculty of Medicine of the University of Lisbon.
- **Prof. Hélder Mota-Filipe.** Associate Professor, Social Pharmacy, University of Lisbon; Executive Member of the National Ethics Committee for Clinical Research.
- **Prof. Fausto Pinto.** President of the World Health Federation. Professor of Cardiology at Hospital de Santa Maria.

1. Situation of cardiovascular diseases in Portugal

One of the areas of strategy where the National Health Plan (NHP) is focused is the Cardiovascular disease (CVD). CVD is the **most common cause of death** globally. The Global Burden of Disease study estimated that CVD caused 15.6 million deaths worldwide in 2010¹ and 17.3 million in 2013², representing nearly one-third of the overall number of deaths and 45% of those due to non-communicable diseases. This was two times as many deaths as was caused by cancer and was more than all communicable, maternal, neonatal, and nutritional disorders combined³. Furthermore, CVD is projected to remain among the most important contributors to mortality up to 2030⁴.

Statistics also report that CVD is also the most common cause of death among Europeans and that despite steady decreases in CVD mortality rates, 4 million Europeans die of CVD every year³.

Specifically in Portugal, CVD is among the **principal causes of morbidity, mortality and disability**. Cardiovascular diseases are the leading cause of death among women but are second to cancer for men (Figure 1). In 2014, cardiovascular diseases accounted for one third of all deaths among women and just over a quarter of all deaths in men⁵.

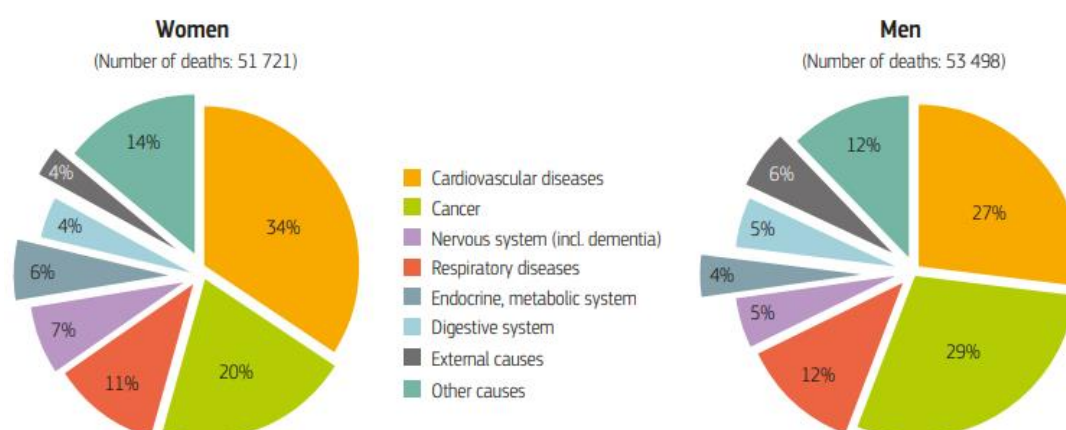


Figure 1. Main causes of mortality in Portugal in both sex during 2014⁵.

At the head are stroke and coronary heart disease (CHD) accounting for 6.1% and 6.0%, respectively, of total disability-adjusted life years in 2015⁶ and leading cause of death in Portugal in both sexes⁷. Additionally, Portugal is characterized by a higher contribution of cerebrovascular disease to mortality relative to coronary heart disease, as compared to most other European countries⁸.

Among the **cardiovascular risk factors**, there are those that are modifiable (hypertension, diabetes mellitus, hypercholesterolemia, dyslipidemia, obesity, smoking, physical inactivity, diet, alcohol abuse and stress) and non-modifiable (gender, age, and personal and family history). Both subtypes contribute to its onset, clinical course, complications and prognosis, but it is estimated that 75% of cases of CVD be attributed to modifiable factors and are thus preventable, treatable and

controllable⁹. In the case of Portugal, modifiable risk factors are present in its population (Table 1). In fact, based on Institute of Health Metrics and Evaluation (IHME) estimations, over 26% of the overall burden of disease in Portugal in 2015 can be attributed to such risk factors¹⁰.

Table 1. Dates of main factors for cardiovascular disease in Portugal¹¹.

Main risk factors for cardiovascular disease in Portugal
24% of the population are smokers
27.5% present metabolic syndrome
53% of the population between 18 and 64 years old are overweight and obese
3 million people have diabetes or impaired glucose metabolism
42% of the adult population has hypertension

There has been a considerable decline in CVD mortality in recent decades due to increasing use of evidence-based pharmacological treatments, smoking reduction or the benefit from technological innovations, both medical devices and drugs, which have improved clinical outcomes and quality of care, among others factors¹². However, CVD remains one of the leading causes of death in Portugal with **significant economic, social and cultural impact**¹³, and still presenting considerable potential for further decreases in morbidity and mortality through strategies¹⁴.

Relative to the **economic burden**, CVD has a considerable impact on society, in terms of both direct costs incurred in its management and indirect costs related to absenteeism, lost productivity, and mortality¹⁵. Overall CVD is estimated to cost the EU economy €210 billion a year. Of the total cost of CVD in the EU, around 53% (€111 billion) is due to health care costs, 26% (€54 billion) to productivity losses and 21% (€45 billion) to the informal care of people with CVD¹⁶. Specifically in Portugal only the heart failure had in 2014 an estimated direct cost of €299 million (39% for hospitalizations, 24% for medicines, 17% for exams and tests, 16% for consultations, and the rest for other needs, including emergencies and long-term care)¹⁷. Indirect costs were €106 million (16% for absenteeism and 84% for reduced employment). Between 2014 and 2036, due to demographic dynamics, total costs is expected to increase from €405 to €503 million¹⁷.

Given the magnitude of the problem, that **highlights the need for health promotion and disease prevention strategies** that take account of different population characteristics, such as gender, ethnicity and socioeconomic status⁹.

Being aware of the seriousness of this difficulty, the 2004-2010, 2012-2016 and 2020 **Portuguese National Health Plans**^{7,18,19} established various priorities, including cardiovascular disease prevention, treatment and rehabilitation and promotion of healthy lifestyles, as well as equality in healthcare⁴.

2. Plano Nacional De Saude 2020

For many years, the Ministry of Health had a prestigious Department of Studies and Planning (DEPS) that carried out research on the operation of the health system and the planning of infrastructure, human resources, etc. Unfortunately, the DEPS was extinguished in 1997 (Decreto-Lei 122/97/), and its functions were diluted in different units in the Ministry. Since then, the Ministry of Health has rarely produced reports or white papers of equivalent importance, and many of the planning exercises have not been completed due to a lack of support of medium-term thinking and planning²⁰, except for the Plano Nacional de Saude.

The Plano Nacional de Saude or Portuguese National Health Plan (NHP), is a **basic element of health policies in Portugal**, charting the strategic course for intervention in the framework of the Health System¹⁹.

The document presented here fulfils an **aggregating and guiding role of the measures** considered more relevant for obtaining more health gains from the population living in Portugal. These measures include from training to research, health promotion, prevention and care.

Even though its Health Programs focus on various areas of health (Diabetes, **Cardiovascular Diseases**, Oncological Diseases, Respiratory Diseases, Viral Hepatitis, HIV Infection, Tuberculosis, Mental Illnesses, Healthy Eating, Physical Activity, Infection Control and antibiotic resistance, Smoking), its **major goals** proposed for 2020 are:

- a) Reduce **premature mortality** (≤ 70 years), to less than 20%.
- b) Increase healthy **life expectancy** at age 65 by 30%
- c) Reduce the prevalence of **tobacco** use in the population at ≥ 15 years and eliminate exposure to environmental tobacco smoke.
- d) To control the incidence and prevalence of **overweight and obesity** in the child and school population, limiting growth until 2020.

To achieve these goals, all health interventions must be based on **four Strategic Axes Transversal** (Figure 2): Citizenship in Health, Equity and Adequate Access to Health Care, Quality in Health and Healthy Policies.



Figure 2. Conceptual model of the Portuguese National Health Plan¹⁹.

The plan mainly focuses on the following challenges:

- Reduction of **inequality** and improvement of the condition of the general population.
- Strengthening the governance of **Primary Health Care (PHC)**.
- Strengthening the development and **implementation of processes**.
- **Integrated care services** for the most common pathologies and health problems with the greatest impact.
- Development of **care referral networks** not only geographically based, but also but also of hierarchy of technical competences.
- Promote **articulation between national and local** planning.
- Strengthening **financing strategies** that promote equity in achieving health potential.
- The development of **intersectoral actions** that strengthen the participation of all government sectors.
- Strengthening **equitable access** to the national immunization, detection and other disease prevention programs (specifically, tobacco and childhood obesity)
- Increase access for the most **vulnerable populations**.

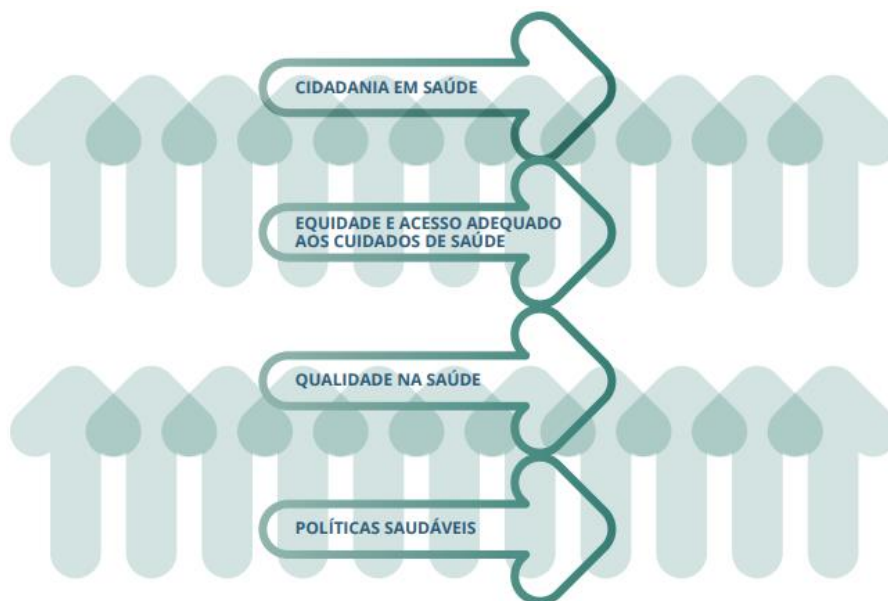


Figure 3. Implementation model of the Portuguese National Health Plan¹⁹.

Despite the quality of this document, the discussion of a health strategy in Portugal has focused on financial issues, that is, **short-term economic and financial sustainability of the National Health System (NHS)**. This strictly economic and financial approach does not offer prospects for the future and does not respond to the challenges that NHS is going to face²⁰, such as:

- Aging
- Disease chronification
- Comorbidities
- High rate of innovation in the health sector

- Impact of globalization: the free movement of capital, technology, people, knowledge and culture.

Looking to the next decade, health policies will have to address situations with clarity forms of action²⁰. These problems can only be sustainably approached with a series of medium-term interventions **focus on the problems and needs identified by patients and healthcare providers**.

Patients

Portugal's life expectancy increased by over four years between 2000 and 2015, to 81.3 years, outpacing the EU average (Figure 4), but remains two years less than in other European countries such as Spain, Italy or France. Furthermore, there is a substantial gap in life expectancy between men (78.1 years) and women (84.3 years) and between socioeconomic groups⁵.

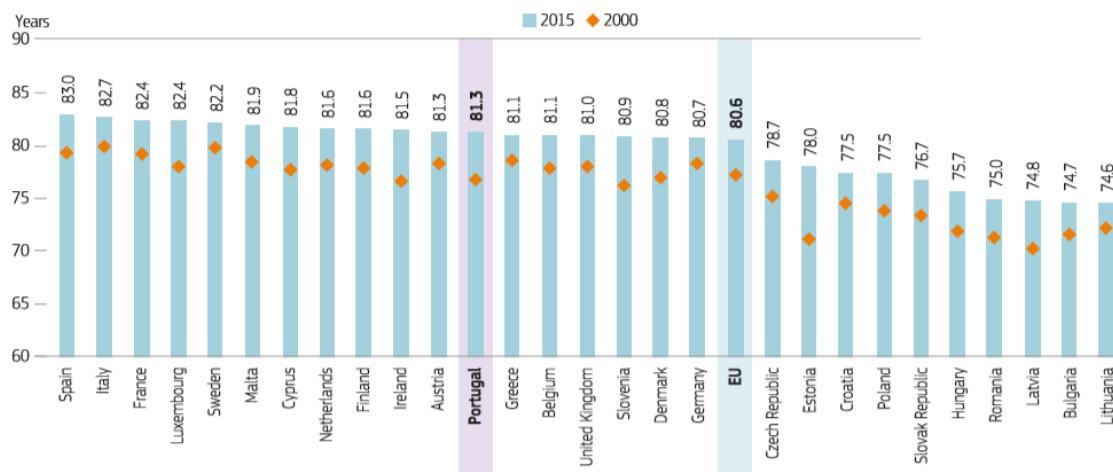


Figure 4. Evolution of life expectancy in European countries during 2000 and 2015⁵.

Despite these improvements in life expectancy, this has **not been reflected in other relevant aspects of health**. Less than half of people in Portugal regard themselves as being in good health, and there are substantial disparities by income group⁵.

This may be due to the fact that the **population may not have received the medical care they needed**: many beneficiaries are unable to enroll in the NHS list of general practice doctors, long waiting lists in the public system that force them to use the private sector, financial strain due to specialized tests and queries that are not easily accessible in the public service²⁰. On the other hand, the **support provided by social services** to the aging population, increasingly dependent and isolated, remains very limited.

Health care providers

In general, there is **dissatisfaction among health professionals** in the Portuguese NHS²⁰. On the one hand, this is caused by low remuneration of health care workers in the public sector. Health care personnel in the NHS are paid less than in the private sector. To this low remuneration, we must add the long working hours, the administrative staff overload and few opportunities for professional development.

All this is incentivizing both doctors and nurses to move out of the NHS or even to emigrate to other countries, in fact, recent years have seen a **wave of emigration** among health care workers⁵. For example, in the specific case of nursing, the Order of Nurses has recorded an increasing number of applications from nurses wishing to work abroad, from 179 in 2010 to around 2,700 per year between 2012 and 2015. For its part, the Physicians' Order recently stated that, in 2016, 600 Medical Doctors (MDs) requested documentation to emigrate, an increase of 30% compared to 2015. The future challenge for the NHS is to be able to maintain the motivation of its workforce and a certain level of social peace so that professionals can focus their energies on patient care.

Public Health Management:

If we focus on what administrators and managers have to say, we will hear that health planning has lost status in the Ministry of Health (MoH). For many years, the Ministry of Health had a prestigious Department of Studies and Planning (DEPS) that carried out research on the operation of the health system and the planning of infrastructure, human resources, etc. His reports were highly valued and guided, for many years, the medium and long-term development of the health system.

Unfortunately, the DEPS was extinguished in 1997 (Decree-Lei 122/97 /), and its functions were diluted in different units in the Ministry of Health. Since then, the Ministry of Health has rarely produced reports or white papers of equivalent importance.

To compensate for the lack of internal thinking and planning, the Health Ministry has turned to external consultants and announcements of specific policy notes. It is not surprising that many of these "aspiring" planning exercises disappear due to a lack of proper institutionality. Because politicians lack the support of medium-term thinking and planning, they are often directed to make decisions on the ground, without sufficient buy-in, and many of these decisions are announced, but never implemented.

In conclusion, Portugal needs policies which address current and future health challenges with a clear strategy and action plan. So, given the goals and strategic priorities defined by the Plan Nacional de Saude and the current situation of cardiovascular diseases, we set ourselves the **objective of creating a TT "Think Tank" in the health environment of the Portuguese population**, in order to analyze and propose new measures related to cardiovascular diseases.

3. Methodology

A think tank, laboratory of ideas, research institute, strategic cabinet, think tank or center of reflection, is an institution or group of experts of a research nature, whose function is intellectual reflection on issues of social policy, political strategy, economy, military, technology or culture. They may or may not be linked to political parties, pressure groups or lobbies, but they are characterized by having some kind of ideological orientation that is more or less evident to public opinion. They **result in advice or guidelines** that political parties or other organizations may or may not later use for their actions in their own fields.

In addition to promoting the adoption of policies, among the functions that think tanks perform are those of creating and strengthening spaces for dialogue and debate, developing and training future political panels in their decision-making, legitimizing the narratives and policies of the regimes in power or the opposition movements, offering an auditing role for public actors, and channeling funds to movements and other political actors.

A Think Tank will be truly useful when it manages to contribute to the public having the basis on which to form an objective opinion, and to politicians having more information in order to be able to act.

The process that has been followed for the construction of the Think Tank is reflected in the following figure (Figure 5).

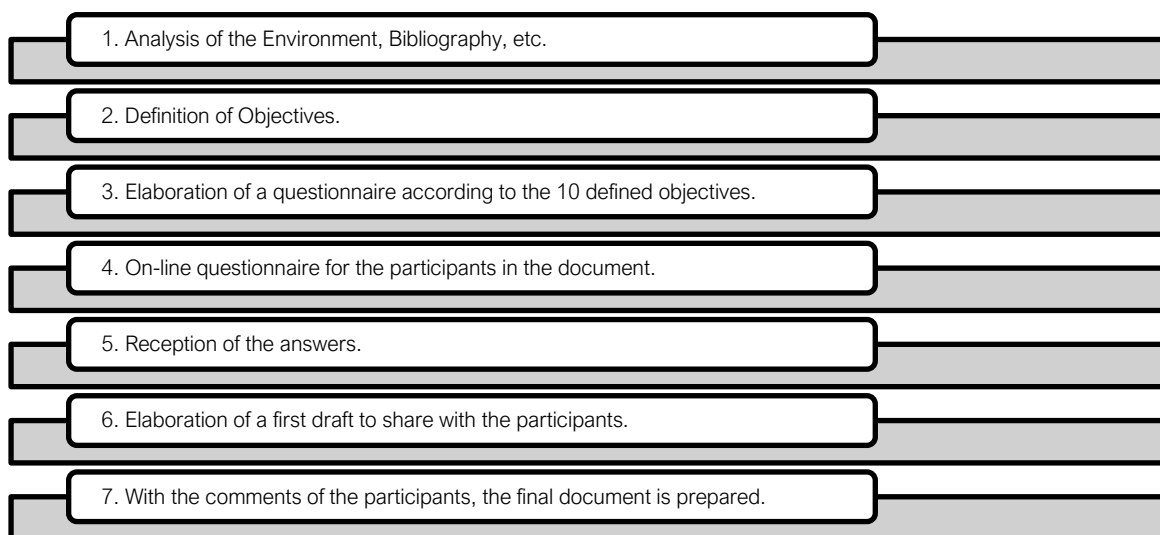


Figure 5. How the whole process has been carried out.

4. Goals

We propose the following objectives that allow us to define a document that **provides answers to the current situation in the cardiovascular area in Portugal**:

1. To study the incorporation of innovation in prevention, rehabilitation, continuous care, pharmaceutical products, medical devices, medical and surgical procedures and health systems.
2. To analyze access level to disruptive innovation and the actions/proposals being taken in this regard.
3. To examine the level of adherence to treatment of patients with cardiovascular disease and to provide possible measures for its improvement.
4. To draw a map of the patient's journey and identify where the processes or activities are considered positive or negative for the patient's care or flows.
5. To raise awareness of how other clinical and non-clinical personnel affect the "patient journey".
6. To make suggestions about a transformative change in service directions.
7. To identify barriers, find solutions and implement best practices regarding the organization of the continuum of care.
8. To address the continuity of care by improving patient-centered care.
9. To drive of process management by implementing standardized quality improvement models.
10. To promote health education strategies and practices in order to improve cardiovascular health knowledge among the Portuguese population.

5. Questionnaire

Previous Questions

- What is the burden of cardiovascular disease on the Portuguese system? What is its relevance in programs for the prevention and treatment of chronic diseases?

As in most countries, Portugal has a **high burden of cardiovascular diseases** that has increased in recent years becoming **the first cause of deaths** in this country. In fact, if we focus on data on deaths from causes sensitive to primary prevention or health care, we can see how deaths from cerebrovascular diseases have increased significantly to the top of the ranking (Table 2). For example, when the second health plan was created in Portugal in 2009, deaths caused by ischemic heart disease was ranking 9th, while in 2009 it reached the second position. This same trend can be seen in deaths caused by cerebrovascular diseases which rose from eighth place in 2009 to fifth in 2017.

Table 2. Potential Years of Life Lost (per 100,000 habitants) due to sensible causes to primary prevention or health care. Portugal, 2017. *Potential Years of Life Lost (PYLL).

	Cause of deaths	PYLL 2017*
1	Breast cancer (3rd 2009)	237,2
2	Ischemic heart disease (9th 2009)	230,9
3	Tracheal lung and bronchial cancer (4th 2009)	222,4
4	Suicide (7th 2009)	150,1
5	Cerebrovascular disorders (8th 2009)	132,8
6	Transport accident with motor vehicles	129,2
7	Rectal, anal and colon cancer (10th 2009)	128,9
8	Perinatal disorders	106,0
9	Chronic liver disease and cirrhosis	101,1
10	HIV/AIDS	56,3

In view of this increasing trend, it is high relevant and necessary to understand why this is happening. Broadly speaking, we have two main problems in

Portugal that are causing this burden of cardiovascular diseases. One of them is related to **lifestyle**, the Portuguese population has high levels of physical inactivity (Figure 6) and a high consumption of salt in its daily diet. And furthermore, the prevalence of **diabetes** detected is very high, the number of patients suffering from diabetes is much higher than expected in a population like the Portuguese. All this is related to the **socioeconomic and cultural level** of this country.

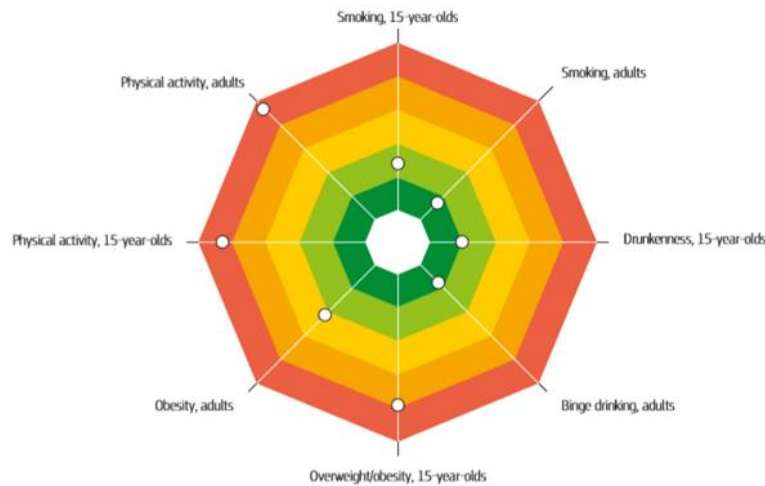


Figure 6. Physical inactivity is an important public health issue in Portugal⁵.

Note: The closer the dot is to the centre the better the country performs compared to other EU countries.

On the other hand, we have to take into account that patients are usually treated in the acute phase. In this respect, there have been important advances in the development of treatments in the acute phase which improve the myocardial function for example. Or the creation of a green pathway for those patients who are doing primary percutaneous coronary intervention has also been an important improvement. However, the problem lies in the stages prior to treatment, in the **prevention**. According to experts, Portugal continues to have a relevant problem in this area. Currently, there are more centers available for secondary prevention performing cardiovascular, but primary prevention remains a big issue. This is why it is considered essential to start working on prevention programs, being more informatives and increasing literacy. Portuguese population is more and more educated and aware about the importance of a good lifestyle but there is a large part of the population that needs to improve.

- Are there other pathologies that are more relevant for Portugal? Which ones? Why?

There are other disorders also relevant in Portugal, as in other parts of Europe, such as the **oncological diseases**. According to data reported by the WHO International Agency for Research on Cancer, 58,199 new cases were diagnosed in Portugal during 2018²¹. Furthermore, cancer caused 28,960 deaths and it had a prevalent cases (5-year) of 155,645²¹.

Due to these dates, CVD and oncology diseases are creating a big tension in health systems due to high prevalence and mortality, that is mainly caused by our high ageing rates.

But the most interesting aspect here is that oncological and cardiovascular diseases have a lot of factors in common, both share the same paths of pathological mechanism. For this reason, it is tremendously interesting to establish programs of prevention and also rehabilitation in which the target is both diseases at the same time.

- Does the Portuguese health system organization and / or its geographical distribution / organization help or hinder the implementation of such programs? Why?

If we analyze the **geographical distribution** of Portuguese health system, we can find another important problem to face. Most hospitals and most centres are located around the big cities, so there are some regions which are completely forgotten. In addition to this, only 55% of the population lives in this urban centre, so there's a lot of people, especially older people, who are out of reach of the health system. The distribution of health resources in Portugal is not even across different regions and, within regions, across municipalities. There are also significant differences in wealth and health indicators between the great metropolitan areas of Lisbon and Oporto and the interior regions. Many of those living in rural areas are at-risk of poverty and face barriers (particularly distance) to access quality health services. Moreover, health workers are concentrated in the coastal areas and greater Lisbon and Oporto⁵.

Evidence suggests that there are also major geographical disparities in the distribution of NHS health workers by profession. This is also the case in the distribution of public primary care facilities.

No less important is the **lack of coordination** between the different health professionals involved in the management of patient with cardiovascular disease. According to experts opinion, the Portuguese health system has a problem in the interface between hospitals and general practice doctors (GPs). Despite great progress in diagnostic and therapeutic techniques, the organization of outpatient care for patients with CVD has not changed substantially in years. Consensus protocols for referrals and joint, coordinated follow-up are still uncommon. This absence of the link between the specialists and GPs cause a lot of problems in following up with patients. It is necessary the improvement of connection between the hospital, cardiologist department in particular, and primary care.

Finally, another difficulty identified by the experts is the Portuguese health system organization in **5 administrative regional systems**. Each regional system acts as a health department autonomus and independent, with the attendant organizational difficulties and this brings with it a problem of inequity. Furthermore, in this respect, there is not a link between national and regional/local health plans. It is very relevant to involve local and municipal authorities in the national plan because in the end, it is local and municipal authorities' responsibility to take action. In order to improve the coordination between national and local system, it could be a interesting measure to create a document or a guideline in a national level but with concrete actions at the local level.

Block 1: Incorporation of Innovation in the cardiovascular area.

According to the International Network of Health Technology Assessment Agencies (Inahta), health technology (TS) can be defined as any intervention that promotes health and prevents, diagnoses or treats the disease. This includes prevention, rehabilitation, ongoing care, medications, medical devices, medical and surgical procedures and health systems themselves. The involvement of the patient and civil society, by defining priorities in the use of resources, adoption of innovative financing models and definition of strategies for financing new TS, organizational innovation, regulation and evaluation and reinforcement of information systems.

Questions and answers:

- **What is meant by innovation in the Portuguese health system?**
- **Types of innovations that are currently being considered? Multiple Choice Treatment, Processes, Diagnoses, Precision Medicine, Mix.**
- **Do you consider that Portugal is an innovative country in this area?**

Experts identify **digital tools** as the most disruptive and promising innovation in Portugal. This includes tele-monitoring, tele-consultation, education and prevention at distance. Although the use of digital tools is considered a current obstacle, at the same time it is a **good opportunity**. During the current situation due to the health emergency experienced with the coronavirus, society has had a great opportunity in this area because during the isolation the whole world has had to use different devices to be able to communicate with their relatives and friends. Even people who were not users of these tools, have had to learn and we have got relevant results in a short period of time. So Portuguese health system should take advantage of this and target new devices and digital tools which are ready to be developed.

Despite the enormous potential of these tools, **the entire target population must be taken into account**. In general young people use new technologies in their daily lives, consequently they are more open to health alternatives such as follow-up programs and consults at distance. However, older patients are not as familiar with them. For example, with the current situation, rehabilitation programmes with cardiovascular

disease patient have been cancelled and transformed into distance programs to which patients have generally adapted well. But the oldest patients continually ask when they can return to their usual programs because for them the effect of the group is vital. With these particularities in mind, different tools for the different age segments have to be developed. Even regarding education, these tools have to look different way according to gender, social economical aspects and the disease itself.

In general, and despite the obstacles that must be overcome, experts consider Portugal to be an innovative country. Specifically in cardiovascular area, health professionals are innovative and enthusiastic. Portugal has a high level of national and clinical research with relevant key opinion leaders. It is fine and it is an open country doesn't have specific barriers to the best medicines and techniques.

A clear example of Portugal's commitment to innovation is your participation in the European initiative the **Valletta Declaration Group**. This group, formed by Malta, Cyprus, France, Italy, Greece, Portugal, and Spain, has emerged as potentially the most disruptive of Europe's cross-border market collaborations and its objective is for the Ministers of Health of the participating countries to improve patients' access to new and innovative medicines and to support the sustainability of their national health systems. The group explores legal and political ways to bring about better transparency when it comes to the pricing of medicines, with a view towards facilitating joint procurement initiatives.

However, despite these efforts, one of the main problem in Portugal and in many European countries, that usually when we talk about innovation we only focus on drugs and medical devices, and according to experts we need a **global approach to innovation** in order to deliver higher-value health care. To produce real change in health outcomes and bend the cost curve, health care models themselves also must be innovative.

Block 2: Innovation and improvement of processes, disruptive innovation.

Disruptive innovation, i.e. those new products (drugs and devices) that represent a radical increase in cost, but that bring a high beneficio, and at the same time leave conventional treatment totally obsolete. This innovation exceeds cost-effectiveness evaluations (otherwise, they are no longer a challenge financiero, as they should not be financiados), but they imply indigestion financiera in the short term for health systems. They also suggest that, in addition to improving access to effective medical intervention, there is a need for a comprehensive strategy for health promotion and disease prevention that takes into account individual, cultural and socio-economic characteristics.

Questions and answer:

- **What is meant by disruptive innovation in the Health environment of Portugal? Multiple Choice: Pharmacogenetic, Technology, Genetic Medicine, New technologies, Big Data Management.**
- **What disruptive innovation actions / proposals are being taken in Portugal?**
- **To what extent can this type of innovation be directly related to the incorporation of new treatments?**
- **What do you understand and what is the value of incremental innovation in Portugal? High, Medium, Low Is it as relevant (or more/less) than the disruptive one? Why?**

Undoubtedly, **Big Data management** is a relevant point nowadays. It could have a direct effect on the incorporation of new treatments and act as a facilitator. Automating health monitoring favors a proactive approach that relieves medical facilities by saving costs related to hospitalization, and it also enhances healthcare services by improving waiting time for consultations. For example, If we had information about the number of patients with a specific disease and got predictions about trends in the next few years, we could use this information to negotiate with governments and afford new treatments and health technologies. But despite Big Data potential **Portugal doesn't have a national strategy on it.**

In this regard, a very interesting initiative has emerged from the Portuguese Society of Cardiology which created a centre in Coimbra, the **National Cardiology Data Collection Center (CNCDC)**. The CNCDC was established to facilitate the development of studies on cardiovascular disease involving different elements of the Portuguese health system, including cardiology departments, coronary care units, catheterization laboratories, interventional cardiology centers, internal medicine departments, medical societies such as the Portuguese Societies of Hypertension and Atherosclerosis, the Ministry of Health, and health centers. These studies could be in the form of national registries, prospective multicenter trials, or epidemiological studies²².

Despite these developments, there is an added difficulty in Portugal and that is the incompatibility between the **different computer systems** present in the health system which prevent the sharing of data and information. Hospital and primary care use different sources without a common interface and incompatible with each other, but it happens even in the same hospital between the emergency department and the rest of the departments. This means that the specialist is obliged to copy and paste all the patient information from one program to another, with the consequent loss of time.

Apart from big data, experts also consider **genetic medicines** relevant as a disruptive treatment strategies for hereditary disorders, and think that Portugal is taking innovation about percutaneous valves, resynchronizers, specific medications such as pulmonary hypertension or hemato / oncological disease.

The main obstacle for this innovation in Portugal, as in the rest of countries in Europe, is how to determine the difference **between incremental and disruptive innovation**. Innovations can mainly be classified as disruptive or incremental depending on whether there is a variation in the nature of the service provision or whether it simply improves the characteristics of the service. Thus, we understand by incremental innovation that which

involves small changes aimed at increasing the functionality and performance of the product or service, but which do not change the nature in which the product or service is produced or provided. In contrast, we consider an innovation to be disruptive if it involves a break with the way in which the produces or provides the service. Disruptive innovations usually differ from incremental innovations in that disruptive innovations propose a solution to an unmet problem or need in the product or service they improve, while incremental innovations attempt to meet the same need with improvements. Although the definitions of both categories is well defined, in practice, and specifically in the field of health, it is quite difficult to discern between the two.

Regarding economic issues, experts do not consider the **financing of innovation** as a limiting factor, the problem lies in the lack of planning of such financing and its investment in unnecessary measures. The key factor is the important thing of the innovation is to make see the benefit and cost effectiveness of a product.

Finally, they also argue that Portugal is a country sensitive to innovation where brilliant ideas are born and with motivated health professionals but it is highly necessary the work of personalities and/or politicians to support and encourage these initiatives. Without real support from health decision-makers, innovative initiatives cannot be properly developed and implemented

Bock 3: Adherence

Adherence to treatment is key to reach health outcomes in the cardiovascular patient care route.

Questions and answer:

- **Are there national programs that favor adherence to the treatment of cardiovascular patients? Y/N Examples.**
- **How relevant can they be to ensure adherence in the design of care routes in the cardiovascular patient? High / Medium / Low.**
- **If not, what measures do you think should be appropriate or could be implemented in Portugal to ensure adherence to treatment in the cardiovascular patient? Multiple choice: Information, Education, Coaching, Training.**

Portugal does not have a national program or plan on adherence for patients with cardiovascular disease, but there are some at the local and regional level. In these programs, **community pharmacy** play a relevant role for its proximity to patients because especially in those farthest away from large cities, pharmacies are the health institution closest to patients. In pharmacy it is important to reinforce personalised health education and can offer Pharmacotherapy Follow-up Program as a program that includes attention to therapeutic adherence. The role of the pharmacist, thanks to its strategic position, its knowledge of the patient and its environment, as well as their knowledge of patient pharmacotherapy (both prescription from public and private medicine and what the patient takes without a doctor's prescription), is one of the pillars of the health and is a key part of monitoring chronic patients.

Experts ensure that routes of care are vital to protect adherence to treatment in cardiovascular patients. Furthermore, if a patient with any chronic disease is able to take responsibility for their own health and manage their disease, this is a great advance. We have learned over the years at our center that effective chronic illness care requires active, involved patient. This model of care have the underlying concept: The patient is at the center and is actively involved in his or her own health care. Several studies show that when patients are encouraged to be more

involved, patients do have better outcomes. This approach does not take any more time but, in fact, can be more efficient.

However, experts warn about the **lack of implementation** of guidelines in relation to adherence. Despite the increase in knowledge about cardiovascular disease in recent years, the development of new drugs and strategies to treat these patients, the results are not the desirable ones due to the implementation of these guidelines is still deficient. This situation is not only happening in Portugal, but in many of the European countries. Multiple studies have been carried out by the European Society of Cardiology in which the implementation of guidelines to primary and secondary prevention is evaluated. The gap between state-of-the-art knowledge and its implementation in clinical practice remains wide, as shown in recent surveys such as the European Action on Secondary and Primary Prevention by Intervention to Reduce Events III (EUROASPIRE III)²³. This is a survey with the aim to determine whether the Joint European Societies' guidelines on cardiovascular prevention are being followed in everyday clinical practice in Europe. The EUROASPIRE III survey shows that large proportions of coronary patients do not achieve the lifestyle, risk factor and therapeutic targets for cardiovascular disease prevention. There is still considerable potential throughout Europe to raise standards of preventive care in order to reduce the risk of recurrent disease and death in patients with CVD²³.

This is due, on the one hand, to the fact that doctors do not inform the patient about rehabilitation programs, and on the other hand, patients do not take care of their own health. **Patient counseling** is essential to drive compliance. Ensuring that patients know the reasons for their medications and the consequences of not taking them may be essential to increase adherence. Whenever possible, a simplified regimen is easier for patients to follow. Combination pills are very helpful. Using simple electronic reminders, such as daily messages or follow-up phone calls, and tech-

assisted interventions, such as using smartphone or tablet applications. Healthcare providers should assess nonadherence at each clinic visit.

To improve this situation it would be necessary to increase the endurance of the programs, study different alternatives on how the patient have to be integrated into the program and focus on strengthening **education**. Current education strategy is not enough, it is an effort that we can't do it for a short period of time, is an ongoing process.

In conclusion, Portugal health system should be invest in all these areas: **information, education, coaching and training**. All four aspects should be included in the rehabilitation programmes.

Block 4: Patient's path

To map the patient's path and identify where the processes or activities are considered positive or negative for patient care or flows, each participant has the opportunity to give their opinion about the "patient journey" of the CV patient.

Questions and answer:

- **Which touch points in the “patient journey” of the cardiovascular patient are most relevant regarding the Portuguese healthcare system? Multiple choice: Hospital, GP's, Pharmacy, Nursing, Patients Association.**
- **What are the most relevant processes in this “journey” of the cardiovascular patient in the Portuguese healthcare system?**
- **What can be the bottlenecks of the same, or the opposite, the fastest flow points? Can you get lessons from other pathologies, from which ones, why? Multiple Choice: Human Resources, Technical Resources, Information.**

Experts agree that the most crucial stage in cardiovascular patient journey is the **hospital**. GP's and family nurse are the key to enter in the health system and play an important role as gatekeepers, but patients have to be referred to the hospital where they will be diagnosed and treated. Especially in the case of patients with cardiac events, with whom most GP's are not comfortable making decisions or changing medication. Those patients with cardiac event belongs to the hospital. On the opposite, if the patient does not suffer a cardiac event, such as in diabetic patients, they can be attended by GP's.

At this stage in the hospital, one of the most important processes in the patient journey is the **education** of the patients and their families or caregivers. As the hospital stage is the most important phase in the patient journey, this education effort should be intensified at this point. For the hospitalized CV patient and their family, patient education often covers the continuum of primordial, primary, secondary, and tertiary disease prevention as well as acute to chronic phases of disease management. Hence, the hospitalization can serve as a critical "tipping

point," an ideal moment at which patients and their families are susceptible to patient education²⁴.

Upon leaving the hospital, not only should patients be fully instructed in their illness and treatment, but they should also receive calls from the hospital in order to check if they are following the treatment regimen, if they have any doubts...This must be a repetitive and **multidisciplinary** work. This process should involve the various health professionals who are in contact with cardiovascular patients: nurses, GP' s, pharmacist... In addition in this phase, the informed discharge process could be useful to continue with good adherence to treatment.

Experts detect several barriers in cardiovascular patient journey, but one of the most relevant is the **lack of human resources**. Specifically, human resources are one of three principle health system inputs, with the other two major inputs being physical capital and consumables. As well as the balance between the human and physical resources, it is also essential to maintain an appropriate mix between the different types of health promoters and caregivers to ensure the system's success. This lack of human resources affects, among other things, the above-mentioned education process, because the time of health professionals is very limited so adequate education is not feasible.

Another barrier to be overcome by the Portuguese health system is **inadequate communication and coordination** between the different health professionals in charge of managing the cardiovascular patients. Team collaboration is essential. When health care professionals are not communicating effectively, patient safety is at risk for several reasons: lack of critical information, misinterpretation of information, unclear orders over the telephone, and overlooked changes in status²⁵. Lack of communication creates situations where medical errors can occur. These errors have the potential to cause severe injury or unexpected patient death. Effective communication among staff encourages effective teamwork and promotes continuity and clarity within the patient care team.

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At its best, good communication encourages collaboration, fosters teamwork, and helps prevent errors²⁵.

Finally, in order to improve the “patient journey” of the cardiovascular patient, experts consider important the creation of more contacts point with the system. That is, to stablish open gates and bridges between people and health professionals to do a system easier to use and friendly.

Block 5: Awareness

Increased awareness of how other clinical and non-clinical staff can affect the "patient journey".

Questions and answer:

- **From your perspective and responsibility in the health system, what are the main clinical roles/professionals that interact in the cardiovascular "patient journey"? To what extent are each of them relevant to accelerate or slow this journey? Multiple Choice: Specialist, GP's, Pharmacy or Nurses.**
- **What should be the role of the patient? Proactive or Reactive?**

More than the roles of individual health professionals, what is important with cardiovascular diseases is the coordination between them. All clinical professionals have to learn how to work together in a **multi-disciplinary** way. It should be a team work, where cardiologist has to be the leader, because the cardiology has the general view and they are responsible for the problems patients might have. And this flexible and communicative team should not only be present in the hospital, but there should also be a wide and dynamic network in the community.

But this way of working requires **training** all of them, which should start from the university studies, because you work according to the ones you have studied. This type of training should not only be limited to cardiovascular diseases, but also to improve the efficiency and effectiveness of other chronic diseases.

In this sense, it's also a question of **sharing information**. For example, the congresses are focused on certain specific health professionals; there are congresses for GP's, for nurses, for cardiologists... If this type of formation was not focused in only one professional, but by putting all the staff together, the results would improve considerably. And also it could be interesting the creation of an expanding network of cardiologists, general practitioners, pharmacists, nurses, and social workers for the benefit from emerging technologies.

Finally, experts agreed that the patient must have a central role in Portuguese health system and should be more involved. What is needed is a fundamental redesign of the patient's role, from that of a passive recipient of care to an active participant charged with defined responsibilities, equipped to dispatch them, and accountable for the results. Patients, in all settings, deserve care that is centered on their unique needs. A transformed health care system in Portugal is required to achieve this goal .

Block 6: Service management

Make suggestions about a transformative change in service management.

Questions and answers:

- **From your perspective and role in the health system, what should be considered to produce a substantial change in the management of services? Multiple Choice: Allocate resources in GPs area, Allocate resources in Specialist Area, Increase Primary Prevention Resources, Increase Secondary Prevention Resources, Adherence Programms.**
- **About these changes, how could they be prioritized? 1 low 5 high Resources : Human, Economical, Techincal, Education.**
- **To what extent would these changes contribute to improve the efficiency of the system and / or the quality of life of the cardiovascular patient?**

High-quality primary care is critical to CVD prevention, due to the opportunity to assess risks and to provide lifestyle and pharmacological interventions. But **prevention** is an ongoing process, so talking about improving only primary prevention without enhancing secondary prevention does not make sense, it is highly necessary to improve prevention in general. Where cardiovascular disease has already manifested itself, emphasis should be placed on measures to reduce the risk of recurrence and mortality, which constitutes secondary prevention. The development of **national programmes and plans** on primary and secondary prevention in cardiocascular disease should be encouraged in Portugal.

A relevant aspect to be addressed in this national plan would be the prevention work of GP' because they play a key role in assessment and management of CVD risk. At this point the work being done on prevention is not good, usually due to lack of time and motivation. It is a question of GP's training and involve so assignment of multidisciplinary human resources to primary could be a interesting approach. They can assume responsibility for providing 'continuing and comprehensive medical care to individuals, families and communities In fact, in some european countries,

GP's play also a relevant role in secondary prevention. Since cardiovascular risk factors are often associated, on many occasions, in clinical practice, preventive actions must be carried out jointly on the various risk factors; thus, interventions acquire a multifactorial character.

Apart from this, experts consider essential to prioritize in technical and human issues in order to improve the efficiency of the system.

Block 7: Organizing continuous care

The key to this principle is the use of intersectoral and multidisciplinary teams. In all interventions, multidisciplinary teams have worked together to identify barriers, find solutions and implement best practices to ensure that each patient receives optimal cardiovascular care.

Questions and answers:

- **Based on your experience, what are the main obstacles in the cardiovascular patient journey? Training, New Medical Processes, Investment.**
- **What would be the optimal way to implement best practices in Portugal? Which ones could be them?**

One of the most important problem in Portugal and in others European countries, is that **access to health system is not equal**. Health inequalities remain a general problem in the country. First of all, this is due to geographical distribution of Portuguese health system which creates differences between great cities and the countryside. And also this inequality in access is related to the state of poverty.

Health inequalities remain a challenge more generally in Portugal. The Portuguese population has become concentrated in Lisbon, Oporto and along the coast, leaving an increasingly sparse and elderly population inland. With the recent economic crisis, the rates of people leaving Portugal have risen, and traditional immigration has fallen. Portugal remains one of the most unequal countries in the EU, with the fourth highest Gini coefficient in the EU, and major health differences between women and men; on average, women live longer than men, but they are also disproportionately affected by musculoskeletal disorders, depression and obesity. Combined with similar demographic ageing as elsewhere in Europe, these inequalities represent a major challenge to both social security and the health system²⁶.

On the other hand, **integration** is the key factor to achieve a correct implementation of best practise in cardiovascular diseases or any chronic

illness. This would be possible through disseminating multidisciplinary prevention/rehabilitation programs throughout the country, interrelated with central services. Health professionals should work together to get guidelines with integrated management patient, in which there is the figure of a general coordinator management as is the case in other countries.

Block 8: Patient experience

Provide people-centered attention from the beginning, the focus on patient experience has been a priority. To address continuity of care, to implement best practices and, ultimately, to improve patient outcomes has been an integral part of each intervention. Patients surveyed as part of the evaluation process have mentioned on the value of having services near home and access to browsers, and higher levels of comfort that their needs are important.

Questions and answers:

- **To what extent can patients experiences be collected with the objective of continuous improvement in the cardiovascular patient's care processes? Multiple Choice: Include Patients in Clinical Decisions, Include Patients in Regulatory Decisions, Include Patients in Education Programms (Expert Patient).**
- **In what practical way should such experience/information be collected to be representative of a large majority of patients? Multiple Choice: Patients questionnaire, Pathology Patients Association, Involve Patient in clinical processes.**
- **Does Portugal have databases with which to analyze “big data” in order to complete patient’s information? Y/N if yes said wich.**
- **What part of the continuity of care process is most relevant and why? In patient /Out Patient.**

Inclusion of patients in clinical decision is a good method to get them to take responsibility for their own health. In addition, it can help to better understand difficulties, question and doubts that patients may have that are not detected by health professionals in their daily medical processes. For this reason patients should be included in all processes, not only in education programms, but also in clinical and regulatory decisions. Regulatory decisions are often based on multiple clinical end points, but the perspectives used to judge the relative importance of those end points are predominantly those of expert decision makers rather than of the patient. However, there is a growing awareness that active patient and public participation can improve decision making, increase acceptance of decisions, and improve adherence to treatments²⁷.

One way in order to get this inclusion, is to create **patient associations** and groups with the same disease. The mission of the CVD associations is to help patients in advising and guiding patients with difficulties in decision making, mood disorders, problems in communication with health professionals and in the family, work or social environment; lack of therapeutic adherence, difficulties in incorporating healthy lifestyles, etc. They meet a wide range of educational and social objectives through their events, campaigns and activities.

In this sense, this is something that is already being done in Portugal, for example the National Society of Cardiology has an association for coronary patients, along with other measures, such as inviting a patient representative from these associations to groups of rehabilitation groups formed by health professionals. However, it must be taken into account that these patients must be formed, or they may otherwise make decisions that are not in the best interests of their health.

Furthermore, in this inclusion of patients, **Big Data** has enormous potential in terms of efficiency gains and improvement of users' living conditions (speed, access, information, etc.). In Portugal, one of the best examples is perhaps the Citizens Area of the National Health Service, where each person can make appointments with the family doctor, renew medications, access and manage their health data, search for pharmacies, hospitals and others. Healthcare providers, among many other things. However, it is little used by patients. On the other hand, electronic prescription, which allows the entire process of prescribing and purchasing medicines to be carried out without paper, is a good example of "digitization" of the health system.

Block 9: Improvement of process management

Implementation of standardized models of quality improvement based on evidence-based guidelines has resulted in improved process management. Implementation of consistent care pathways and treatment and transfer guidelines has ensured that each cardiovascular patient receives adequate care, despite its geographic location.

Questions and answers:

- **How does process management affect the itinerary of the cardiovascular patient? Delay in consultation process, Low Economical Investements, Include the processes in the Health National Plan.**
- **What routes and how are they defined in the health system with the aim to ensure a correct treatment / care of the cardiovascular patient?**
- **What are the limitations and strengths of these predefined routes? How could they be improved? Increment the number of Professionals, Information Systems, Other (specify).**

Previously, decisions of process management at the healthcare level were mainly based on cost-effectiveness issues, however increasingly in Portugal the opinion of patients, their families and carers and the media are being taken into account.

A clear example of that has been the subcutaneous valve in patients with stenosis. In the beginning, only patients who could not be operated, could benefit from this innovation due to its high cost. In the beginning, only patients who could not be operated on could benefit from this innovation due to its high cost. However, currently the management of this valve has grown considerably, and its use is greater in Portugal than in other European countries. This change has occurred due to increased demand from patients and their families to avoid the many complications and consequences of surgery. In addition, patients rely on the media to amplify their message and put more pressure on this type of decision.

In order to improve process management, invest in the quality of **computer systems** could be interesting. The national health system, like any other economic sector, also has to undergo a digital transformation and has gradually adapted to the needs of the present era. The adoption of new technologies is excellent for saving time for both patients and health care providers and avoids to some extent the saturation of patients in hospitals and health centres. For example, if health professionals could save time in administrative issues thanks to new technologies, they would attend more patients.

Experts consider that it is also necessary to increase the number of **human resources**. In a recent study showing the results of a review of the Portuguese health system concludes that it is highly necessary sectorial reforms and human resources measures²⁶. In 2014, the Ministry of Health employed 124.260 people, of which 97% were related to institutions providing primary and hospital care and 3% to central and regional technical and administrative services. Nurses are the professional group in healthcare with the largest number of workers, accounting for about one-third of all Ministry of Health (workers (38.089), although numbers are low when compared to international standards²⁶. The next largest group is medical staff (26.645, 22%), followed by operational assistants (24.600, 20%). In the case of medical doctors, about 67% are specialists and 33% interns²⁶. Rural areas, especially interior areas with low density of population (and in many cases declining populations) are poorly provided with skilled human resources.

In line with most European Union countries, human resource policy making and planning for service provision and management needs to be placed clearly ahead of the needs curve²⁶.

Block 10: Health education

There are important gaps in the knowledge related to cardiovascular health in the Portuguese population. Health education strategies and practices should be sensitive to differences in health literacy, in order to improve cardiovascular health awareness among the Portuguese population.

Questions and answers:

- **What measures are proposed from their responsibility in the health system with the aim to improve the knowledge in the cardiovascular patient about their pathology?**
- **Are there defined programs that allow the patient to be placed at the center of the system and to reverse this deficit? Y/N**
- **If these programs do not exist, what initiatives could you suggest in this regard to improve the awareness of the Portuguese CV patient?**

Structured education programs in rehabilitation programs.

In Portugal, there are various initiatives to improve public awareness of cardiovascular disease, but experts agree that these measures are **insufficient** and they are in limited number. In fact, a recent study where specific knowledge on cardiovascular disease was characterized, concludes that there are important gaps in cardiovascular health-related knowledge in the Portuguese population¹⁴. In particular, around 30% of participants were unable to estimate the risk of myocardial infarction or stroke. “Not smoking” (36.8%) and a “healthy diet” (32.8%) were identified as the most important behaviors for prevention of cardiovascular disease, and less than half of the participants responded that the most appropriate option in the presence of acute cardiovascular signs or symptoms was to call the emergency number. The large proportion of non-respondents to questions addressing health-related knowledge on stroke and myocardial infarction, which are common conditions in Portugal, as well as participants’ lack of knowledge about vital aspects of these diseases, highlight the existence of important gaps in cardiovascular health-related knowledge¹⁴.

Undoubtedly, structure education programs must be multiplied and in these programs, patients associations and citizens should be involved and medical doctors in primary centres empowered.

It is needed to establish **health promotion and awareness campaigns** to improve the knowledge and awareness of those diseases. In order to achieve this goal, media and social networks could be used depending on the age group on which we want to act, older or younger people respectively. Furthermore, the use of these tools by many European governments during the coronavirus health crisis may serve as an example, and why not be replicated for chronic diseases such as cardiovascular diseases.

6. Key findings

Context

- Portugal has a **high burden of cardiovascular diseases**. Despite that there has been a considerable decline in CVD mortality in recent Decades, CVD are still the first cause of deaths in this country.
- Geographical distribution of Portuguese health system creates difficulties for certain sectors of the population in accessing the health system and therefore generating **inequity**.

Challenges

- It is necessary to improve the lack of **coordination and communication between the different health professionals** involved in the management of patient with cardiovascular disease.
- In order to improve the **coordination between national and local system**, it could be a interesting measure to create a document or a guideline in a national level but with concrete actions at the local level. (top to down guidelines)
- Portugal needs a **global approach to innovation** that includes digital tools, big data management and disruptive innovation in general.
- Before the lack of implementation of guidelines in relation to **adherence** of patients with cardiovascular disease, it is essential to develop a national program or plan that contemplates this aspect.
- It is essential to highlight the importance of future **prevention strategies** improving the education of the population.
- Patients should be included in all processes of the **cardiovascular patient care route**, including clinical and regulatory decisions, in order to detect needs not covered.

7. Action plan proposal

In relation to the main conclusions of the TT debate blocks, we can focus on various actions to be implemented in the short or medium term. These actions are a starting point for the challenges that have been identified throughout the document. They are configured as quick wins that would lay the foundation for more ambitious and holistic initiatives.

- Adapt the **new technologies** (for example an app) for the **monitoring of the cardiovascular patient** by all the interlocutors who are involved in the monitoring of the patient, defining some KPIs such as adherence, etc.
- **Awareness** :Create specific **training programs** for patients in relation to their cardiovascular disease, in line with the **Patient Expert programs**.
- To **promote coordination** between the different healthcare systems, it would be good to identify and define the **healthcare path of the cardiovascular patient**, or what is the same as working on the development of the **Patient Journey**.
- Create **models** that allow, **through big data**, to **predict the incidence** taking into account all cardiovascular risk factors (classical and genetic) that allow us to have **predictive models that can be territorialized**.
- Development of **specific regional plans** that have as their origin the health plan, and that allow **monitoring** of the **health indicators** defined in the plan.

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