PREFÁCIO

In due time Teresa Ferreira Rodrigues and Maria Rosário de Oliveira Martins decided to coordinate the publication of the results of a set of work carried out by eight researchers, focusing on ageing and health in Portugal, and its possible implications in health policy.

The Portuguese population has undergone a process of accelerated ageing, due to a rapid decline in birth and mortality rates, and an increase in the average age of the population. It is known that these changes have led to a shift in the more frequent causes of morbidity and mortality, as well as in levels of disability and dependency. The authors document these phenomena in a much more sophisticated quantitative way than others who have written about the demographic and epidemiological transition in Portugal.

Long-term future scenarios have been developed (2030). These projections are based on mathematical models that relate birth, mortality, disability, gender, level of education, use of healthcare, and health expenditure, public and private. Altogether, the projections suggest that Portugal will have an elderly population, but with a better education and more years of healthy life. This population will give a better and more efficient use to healthcare services and, therefore, may not burden health accounts even more. They also suggest that Portugal has a large number of people over the age of 80. Many are living alone or in a household of two elderly, while multi-generational homes will reduce. Thus, pointing to the need to adapt health services, medical education and the education of related professionals. Moreover, it calls the attention to the undervaluing of networks of informal care provided by family, friends and neighbours that allow older people to continue to live in their homes.

The reliability of long-term projections may be questioned by many, who might state that the projections made 50 years ago have not materialised. They might claim that the projections now made may be impaired by natural phenomena, social revolutions, technological innovation... they will certainly cite the possible impact of climate change, wars, migrations... of technological revolutions... that cannot be predicted nowadays.

Although the argument is valid, these projections are still very useful to enhance policy discussion in general, as well as discussion on demographic, health, social security, and regional planning policies. As long as the limitations of the models and projections developed now are recognised, they are also very useful as a working tool for planning. But it is better to plan based on evidence and serious quantitative projections than based on speculation or ideological dogmas.

The book also includes framework chapters. These chapters describe the historical development and the present health and education systems structure in Portugal. Furthermore, it includes an analysis of financing and national health accounts, trying to relate them to the demographic and epidemiological transition and its future projections. These chapters are well developed, far beyond the framework introduction one might expect. I am sure that will be much appreciated by readers like me, who are unfamiliar with one or more of these sectors.

In conclusion, congratulations to the authors! A thank you from someone who read the book with pleasure and, not an expert in the field, who learned a lot on the subject.

Lisboa, agosto de 2014

Alexandre Abrantes

Escola Nacional de Saúde Publica – Universidade NOVA de Lisboa

Notes on Contributors

Alexandra Carvalho (b.1978) graduated in Economics from the Universidade de Évora (2000). She has a master degree in Analysis and Information Management from the Instituto Superior de Estatística e Gestão de Informação - NOVA de Lisboa (ISEGI-UNL) (2011). She is a statistician at the National Statistical Institute. Her experience as statistician began in 2001, in the field of the Regional Accounts. Between 2001 and 2003 she worked in the Agriculture and Fisheries Statistics Department as responsible for the compilation of the Regional Accounts for Agriculture, Forestry and Fisheries. Since 2004 she has been working in the National Accounts Department, in the field of the Health Accounts.

E-mail: alexisabcarv@gmail.com

Carla Leão (b. 1969) is an invited professor of Political Sciences and International Relations at the Department of Political Studies at the NOVA de Lisboa (Portugal). She teaches Demography and Human Ecology. She holds a Physiotherapy graduation (1991) at Escola Superior de Saúde de Alcoitão (ESSA), a master degree in Political Sciences and International Relations specialization in Globalization and Environment (2008) at NOVA University. She holds the title of National Defense Adviser (2011). She is PhD student in Political Sciences-Public Policies at NOVA University, with a dissertation titled "Ageing, Health, and education in Portugal. Practices and challenges" financed by the Portuguese Foundation for Science and Technology (FCT). Conference speaker in national and international conferences and author of articles, focused on migration, health and health security studies.

E-mail: carla.leao@fcsh.unl.pt

Filipa de Castro Henriques (b. 1978) is an advisor at Vice-Mayor's office at the Municipality of Cascais for Research, Innovation and Knowledge. This author is a PhD student in FCSH- NOVA de Lisboa (Portugal) - in International Relation - Globalization and Environment on Globalization, Ageing and Economic sustainability for Portuguese society. Has a Master in Statistics Management and Information System – Demography; Degree in Economy. She was an Economist at GEE- office for strategy and studies of Ministry of Economy, developed studies and data analysis on Portuguese economy. Was an assistant Professor in NOVA de Lisboa (Portugal), in the Faculty of Social Science and on the Institute of Statistic and Information System, in areas of Demography, Demography forecast analysis and planning; International

Economy and European Economy, in Master's program and in degree program in Political Science and International Relations.

She is a researcher in Demography and Population; Economic, educational, health impacts on an ageing society; demographic and prospective analysis.

Author of articles, books, researcher for national and international projects focused on population, ageing, health and demographic forecast analysis and planning.

E-mail: a.filipa.henriques@cm-cascais.pt

Gabriela Soares Machado (b.1964) Master in Human Ecology from FCSH, UNL degree in Social Work, ISSSL, with postgraduate studies in Social Gerontology, member of the clinical advice Grouping Health Centers (ACES) Almada-Seixal, Coordinator of the Unit for Maternal Health, Child and Adolescent integrates the Commission on Quality and Safety ACES Almada-Seixal, and the working group of the Local Health Plan of ACES Almada-Seixal. PhD student in Political Science specializing in Public Policy with the dissertation, "The new health policies in Portugal: Impact of the restructuring of primary care in customer satisfaction," FCSH, UNL

E-mail: gabsoaresmachado@gmail.com

Inês Rodrigues (b. 1986) graduated in Statistics and Information Management from the Instituto Superior de Estatística e Gestão de Informação, NOVA de Lisboa (Portugal) in 2010, and holds a Master degree in Biostatistics from the Faculdade de Ciências, Universidade de Lisboa (Portugal), since 2012. As a Research Fellow at the Centro de Estudos da População, Economia e Sociedade (CEPESE/Universidade do Porto), she worked for the project Health and Ageing in Portugal: Policy and Practice, co-financed by the Fundação para a Ciência e Tecnologia and the Programa Operacional Temático Fatores de Competitividade – COMPETE. She is currently a PhD student in the Laboratory of Statistical Demography, Max Planck Institute for Demographic Research (Rostock, Germany).

Email: rodrigues.inesc@gmail.com

João Estevens (b. 1987) holds a degree in Economics (NOVA de Lisboa) and also in Political Science and International Relations (NOVA de Lisboa). He also finished a postgraduate course in Cultural Management and Programming (Universidade Lusófona de Humanidades e Tecnologia). Now he's finishing his master degree in Political Science and International Relations – Globalization and Environment (NOVA de Lisboa). His research interests

are focused on ageing, migration, forecast analysis and planning, security studies and economic history.

E-mail: jpgestevens@gmail.com

Maria do Rosário Oliveira Martins is currently Full Professor of Biostatistics at the IHMT at the NOVA University of Lisbon (UNL). Between February 2010 and October 2012 she was the Vice-President of its Scientific Committee. She is a member of the UNL's General Council. She was President of the Mission Unit for e-Learning and Pro-Rector of the NOVA University of Lisbon from May 2004 to January 2007 and Vice President and Director of the Pedagogical Council of ISEGI UNL, from September 2000 to January 2010. For 6 years, she was also Director of the Degree in Statistics and Information Management. Doctor in Econometrics by the Free University of Brussels, and Master in Econometrics by the same university. In addition to the functions performed in ISEGI and IHMT, she was for 6 years Researcher in ECARES (European Center for Advanced Research in Economics and Statistics). Simultaneously to the academic activities, she has coordinated several projects within the Foundation for Science and Technology, the European Community and FLAD-NIH. Moreover, has been consultant of institutions such as INE, the ACSS and the Center for Medicine and Rehabilitation of Alcoitão. She is the author of two books in the area of Statistics and around 50 books papers published in national and international journals. She has written over 40 reports on her activities as a consultant and researcher and guided 35 Masters' Dissertations and 3 Doctoral Theses. She was also consultant at the University of Cape Verde in the area of Statistics, where she was responsible for creating the Degree in Statistics and Information Management. She regularly collaborates with UniZambeze and the UniLurio in Mozambique. Is responsible for several courses of Statistics in INS-MoH in Mozambique. And a member of several networks, of which highlights the CPLP RIDES-Malaria Network. She is currently referee in the following Journals: Journal of Applied Econometrics, International Review of Applied Economics and Applied Economics. In addition to teaching courses in the Degree and Masters' of ISEGI IHMT and was responsible for the discipline of Quantitative Methods in the Master's Programme in Public Policies and Administration given by the UNL in collaboration with Columbia University.

E-mail: mrfom@ihmt.unl.pt

Maria João Moreira has a Degree in History (1984), is Master in Social and Historical Demography (1992) and Doctor in Sociology, in the field of Demography, (2001), by the Faculty of Social and Human Sciences of the

NOVA University of Lisbon. She did a Post-doc in Study Group of Population and Society (GEPS) of the Faculty of Political Science and Sociology – Sociology II Department, from the Complutense University of Madrid (benefiting from a grant from the Foundation for Science and Technology in the project: "Portuguese emigrants in Spain in the National Survey of Immigrants [ENI 2007]: current features and comparative perspective". Coordinator Professor in the Polytechnic Institute of Castelo Branco, where she coordinates the Masters in Social Gerontology and the Social and Human Sciences Scientific and Technical unit. Researcher at the Centre for Population Studies, Economics and Society (CEPESE). Vice-President of the Association of Historical Demography (ADEH). Has written several publications and is a researcher in national and international projects in the areas of population aging, migration and health.

E-mail: mjgmoreira@ipcb.pt

Teresa Rodrigues (b. 1960) is an associate professor of International Relations at the Department of Political Studies and a visiting professor at the Instituto Superior de Estatística e Gestão de Informação, both at the NOVA de Lisboa (Portugal). She teaches Security Studies, Demography, Human Ecology and Globalization Studies. She holds a PhD in Contemporary History (1993) and Aggregation in Political Science and International Relations (2002), both at NOVA University. She holds the title of National Defense Adviser (2009). She is head of the PhD program in International Relations and of the Master's program in Political Science and International Relations at the NOVA University. She is also Head of the postgraduate programs in a) Strategic Studies and Security (3rd edition), a partnership between NOVA and the Portuguese Ministry of National Defense; b) Globalization, Diplomacy and Security, a partnership between NOVA and the Ministries of Foreign Affairs and National Defense and c) Information Management and Security, a partnership between NOVA, the Portuguese Republic intelligence System and the Ministry of National Defense. Author of more than 150 articles and seven books, she is a senior researcher for national and international projects focused on migration, mortality, health, forecast analysis and planning, security studies.

E-mail: trodrigues@fcsh.unl.pt

INTRODUÇÃO

Demographic ageing is a global issue today (Glenn, et al., 2008). Its symptoms and its consequences are well known, particularly in the sector of social policies. Although the economic impacts associated with these changes are not consensual, they are inevitable (Adams and White, 2004). One lives longer and healthier, while scientific advances tend to reduce the average level of dependency and disability, and thus promote a more positive future. The problem lies in the reduction of the young/old ratio, since the increasing number of elderly can lead to an escalation in the costs of healthcare, as well as pension expenditure, in a context of regression of the active force required to ensure its payment (Paquy, 2004; Mackenbach, 2006; Caselli, et al., 2006).

What adjustments should be done in terms of policy options and health practices, as the population ages (Durand, et al., 2008)? Can an increase in the schooling of the future elderly Portuguese influence the possible scenario of lack of sustainability of the social protection systems? How can the health status forecast help policy-makers find appropriate national and regional responses?

Answers to many of these questions have already been found in regard to other European countries (Mackenbach, 2006; Kunst, et al., 2004; Huisman, et al., 2004; Koivusalo, 2007). But not for Portugal. And that was the challenge embraced by the project team and from which this book was born: "Ageing and Health. Political Priorities in a Changing Portugal".

Portugal follows the trend of ageing that today, in a more or less rapid pace, tends to be global. Technological advances, particularly in the field of health, have boosted the number of years we can expect to live, while increasingly reducing the average degree of dependency and disability. We hope that the elderly of the future live with better health than those of today.

In a context where fertility levels and migration cannot guarantee the age rejuvenation, nor even the increase of population, the elderly dependency ratio continues to rise, creating challenges to policy-makers and other stakeholders. These developments have inevitable impacts on the public policy sector, particularly in terms of social support, healthcare or the labour market.

With regard to the health system, major changes will be imposed by demographic changes. Studies in countries with similar characteristics to Portugal confirmed that there is a significant association between factors such as level

of education, age, income and the subjective evaluation of health status. Apparently, the impact of each of these variables depends to some extent on the region/country considered, but the most important is that the magnitude of these associations does not seem to change over time. Age and schooling are also considered relevant in assessing determinants of health status. The data available on this topic in the Portuguese case comes mainly from the answers given in the National Health Surveys and indicate that older individuals tend to classify their health more negatively. But they also indicate that those more educated tend to assign a more positive rating to their health status. What should be the balance in regard to the future effect of these two variables? Do the increasing levels of education of the elderly population change the expected pressure due to the effect of ageing on the systems of social protection? And to what extent can the prediction of the population health status contribute to the decision making at the political level, in a context of substantial ageing and increased schooling? What adjustments should be made as these changes are processed?

The discussion of these issues, the presentation of results and the attempt to identify possible paths justify the publication of this study. It is our aim to analyse the interconnection between ageing and health in Portugal, considering the lack of studies of this nature (Nogueira, et al., 2006; Santos, et al., 2006; Santana, et al., 2003), the clarity with which the phenomenon of ageing presents itself and its inevitability and urgency to reduce the current burden on the health system, in particular with regard to public expenditure associated with the healthcare.

The conclusions presented in this book are based on the results of the project "Envelhecimento e Saúde em Portugal. Políticas e Práticas" (AgHeP)[1], co-financed by the Foundation for Science and Technology of the Portuguese Ministry of Education and Science and the Thematic Operational Programme Factors of Competitiveness[2] - COMPETE.

The project started in March 2009 and lasted three years. The research aimed to measure the relationship between the health status of the Portuguese population and the expected increase in their educational levels in the coming decades, in a context of a predictable increment in the indicators of ageing age structures. Thereby it was our intention to assess the scope and implications of this co-relation in the Portuguese case, crossing demographic and econometric analysis techniques, capable of providing a systemic view of the ageing phenomenon of the age structures of the population residing in

[1]AgHeP – Ageing and Health in Portugal. Politics and Practise (PTDC/CS-DEM/109967/2009).
[2]In Portuguese: 'Programa Operacional Temático Fatores de Competitividade'.

Portugal and contributing to a more sustained decision making within public health policies. Additionally, we sought to generate prospective information, in order to estimate the likely evolution of different vectors, in a time horizon sufficiently broad to allow for planning and programming equipment in the health sector in Portugal. This latter purpose explains the choice of 2030 as the deadline for the prospective exercise. We understand that choosing a more distant date would introduce too much uncertainty, with negative consequences on the conclusions obtained.

The five main objectives of the investigation, whose findings are presented in this book and are reflected in its structure, seek to identify and discuss some of the emerging needs of the current Portuguese socio-demographic context and the enormous changes it will suffer. We should also add to those the effort to review the impact of population ageing on health policies and practices from a prospective point of view. The objectives are: 1) to assess the effects of social and demographic changes in the health profile of the Portuguese population; 2) the assessment of the importance that has been given to the policies of health and well-being in recent decades; 3) the analysis of changes in age structure, inter-relating them with the educational level and health status; 4) to estimate the influence of each of these variables as socioeconomic predictors of the health status; and 5) the identification of the consequences of these transformations in supporting decision making in the context of public health and in what concerns the health expenditure by 2030.

To achieve these objectives a research matrix was created and we resorted to methodologies that are not much used in Portugal within this context. The criteria used to constitute the team also sought to ensure the success of the investigation, by including researchers with proven experience in the fields of demographic analysis, economics, health sciences and political sciences.

In terms of methodological options this diverse approach was sustained in several qualitative and quantitative exercises:

a) Regional demographic projections by NUT III, gender, age and level of education (2011-2030);
b) Use and integrated study of three different databases:
   1) demographic (Census 1991, 2001 and 2011; Population Estimates and Demographic Statistics from 1990 to 2010);
   2) education (Employment Surveys, 2006, 2008, 2010); and
   3) the perception of health status (National Health Surveys, 1998-99, 2005-06, 2010-11);
c) In-depth study of the relationship between demographic variables, educational levels and health status between 1990 and 2030, to identify

strengths and weaknesses;

d) Constructing a comprehensive model on the relationship between the results of the statistical theoretical model, the existing healthcare policies and the opinion of selected experts (using interviews, public discus sion in International Fora and workshops and conducting a Delphi exercise).

The structure of the book "Ageing and Health. Political Priorities in a Changing Portugal" largely coincides with the goals outlined for the project. The information disclosured allows us to:

(1) evaluate the effects of social and demographic changes in the health profile of the Portuguese population and the importance attributed to the policies of health and well-being at the institutional level;

(2) measure changes in age structure in the last decades of the twentie thecentury, inter-relating them with the educational level and health status;

(3) assess the influence of each of these variables with socio-economic deter minants of health status;

(4) point out the main consequences of these transformations in supporting decision making in the field of health policies. By opting for ananalysis at the NUT III regional-level we sought to guarantee the possibility of reaching a specific diagnosis and more precise guidelines for decision makers, in regard to public and/or private investments in the healthcaresector.

In addition to these purposes, the research team aimed to provide to a wide and not necessarily specialised public an easy to read synthesis, of the broad lines and trends which in a strategic sector such as health condition the indicators of quality of life and well-being of the Portuguese, today and in the coming decades. We believe not only that this publication may constitute a reference work for those who, in different areas of knowledge and with different goals, want to access updated information on this topic, but it is also our belief that it can be used as an instrument to support decision making in different sectors of activity.

The achievement of the goal defined (a first synthesis of easy reading, while safeguarding scientific rigor) was achieved at the cost of options, the first of which involved the exclusion of certain themes. This publication keeps a configuration, which includes the development of three themes, each of which divided into two chapters, with a final enlarged synthetises at the end.

In the first part, e*ntitled Demography and health. The path to modernity*, it was our purpose to introduce the reader to the two components that depict the backdrop of this publication. Those portray today's policy decisions concerning the

health sector and how to adapt to the recent and fast changes of the age structures and nosological profile of the Portuguese population.

In the first chapter, dedicated to the *Health in Portugal: actors and temporalities*, the authors, Carla Leão and Teresa Rodrigues, give special attention to the period between the second half of the twentieth century and the present day. In methodological terms, they adopt an essentially descriptive approach, supported by the reading and analysis of the legislative body published on the topic of health insurance and access to healthcare of the Portuguese population, which allows us to track the key policy choices made in different historical moments. This analysis was complemented by information obtained in different studies published on the topic. With this exercise it becomes easier for the reader to follow how the policy options in the field of public health in Portugal evolved. The chapter is divided into three topics. The first describes the historical context of health policy in Portugal since the establishment of the Republic, through the Military Dictatorship and the Estado Novo. The second summarises the milestones of health policy decisions in Portugal, between the establishment of a democratic regime and the present day. Finally, the third part attempts a systematisation of the main stages of the Portuguese health policy in the twentieth century, and analyses its stronger lines, highlighting the relationship between political stability, resources and welfare state.

We then focus our analysis on the portrait of the demographic dynamics, marked in the last decades by significant changes and some constraints, among which excels the ageing of the population age structures and the increasing dependence on the migration process. We draw a historical perspective on the alternation between the period of major changes and investments and a slowdown after the turn of the century.

Afterwards, Maria João Guardado Moreira and Filipa Castro Henriques present the chronology of the signs of change. Chapter 2 is devoted to *Demographic changes and health in Portugal between 1970 and 2013*. Portugal has undergone profound changes over the twentieth century which, mainly from the '70s, led to a modernisation and social change that progressively approached Portugal's demographic regime to that of Centre and Northern European countries. Currently, the dynamics of the Portuguese population are characterised by negative natural and migratory balances and ageing of its age structures. In order to understand these profound changes in the population dynamics we analysed the chronology of the process of demographic change, including the characteristics and specifics of the demographic and epidemiological transition of the population, and the implications of this process, particularly in terms of the ageing of age

structures. The question of ageing is a compelling issue in the Portuguese scenario. Thus, there is regional diversity in the intensity and chronology that will be also analysed. It is particularly important to recognise the different impacts of the phenomenon of ageing in terms of the necessary adjustment of Health Services to current and new emerging regional and national realities.

The following two chapters compose the second part of the study, entitled *The new elderly. Predictors of future*. Both chapters adopt a prospective approach, which as defined above has the time horizon of 2030.

Chapter 3 assesses The importance of education. The educational levels of the Portuguese (2010-2030). In order to identify the impact of the educational level for the average health status of the Portuguese population, Maria do Rosário Oliveira Martins, Inês Rodrigues and Teresa Rodrigues developed population projections for the resident population in Portugal and each NUT II region, by gender, age group and educational level, for the period from 2011 to 2030. They resorted to a multi-state projection model, in order to incorporate the dynamic way of the demographic behaviour. The population was projected at five-year intervals, using estimates of probabilities of survival and fertility rates and net migration, specific for gender, age group and educational level. Specific transition probabilities between levels of education for all the variables under study were also estimated, in order to consider the completion of higher levels of education by elements of each cohort. Two scenarios of evolution were established in order to deal with the uncertainty associated with the results, particularly in regard to changes in the level of schooling of the Portuguese population.

The same authors propose new findings in the next chapter, entitled *Projections of health indicators (2010-2030)*, linking the differences in health indicators between levels of education with the needs and characteristics of use of health services. Projections on the health status of the population is a complex and challenging task, given the difficulties associated with the estimation of changes in morbidity and measurement of health (European Commission, 2012). The projections presented follow a 'what if' approach based on the definition of different scenarios for the evolution of the educational levels and differences between educational levels with regard to the health status and use of health services. Thus, the uncertainty associated with the results is evident. Nevertheless, these projections are useful, in that they can serve as a basis to study the possible evolution of public expenditure and the impact of the population schooling and their health status as the main drivers of health expenditure. Thus, they can be a basis for policy-makers decision making.

We can thus assume that if increased longevity is accompanied by an increase in the number of years lived in good health, the ageing of the Portuguese population age structures may not necessarily translate into a rise in health costs. A better health status will be reflected at the outset in a lower use of health services and can consequently lead to reduced expenditure.

However, the results point to a future improvement of the health status (particularly the self-reported health status and the prevalence of chronic diseases, especially among men), but also to the increased use of the health services considered (medical appointments and use of prescription medicine). As such, we can question whether it is not rather the increased use of health services in the coming decades that will lead to a better health status, which would reverse the expected developments regarding spending on this sector. These are some of the hypotheses that we try to infer in the following chapter, devoted to health expenditure and political options, to effectively face the challenges and opportunities associated with the ageing of the Portuguese population's age structures in the coming decades, although it is accompanied by changes in the health status of the new elderly.

We then come to the third and final part of the book, devoted to *Ageing and health status. Costs and political options*.

Chapter 5, written by Maria do Rosario O. Martins and Alexandra Carvalho, is based on the analysis of National Health Accounts in Portugal. The accounting of spending on health in Portugal is based on an integrated accounts system, internally consistent, and internationally comparable. In the first part of Chapter 5, the main features of the National System of Health Accounts are presented and described, in terms of provision of healthcare activities, healthcare functions and functions related to health and financial agents of healthcare. Finally the accounting of the total health expenditure is presented. The second part analyses the National Health Accounts in Portugal during the years 2000 to 2012, based on information published by INE, regarding Health satellite account 2013. Not only the trends in health expenditure between 2000 and 2012 are analysed, but also its framework at the national and international economic context, its main financing agents and how this expense is being apportioned among the main providers of healthcare, including hospitals, outpatient and pharmacy services. Lastly, information is presented on the evolution of health expenditure since 2000, according to the main modes of production (inpatient, day hospital, outpatient, and home care).

In the sixth and final chapter, the authors, Maria do Rosario O. Martins and João Estevens, seek to identify existing conceptual models in the literature that allow to assess the possible effects of ageing on Health expenditure.

The methodology adopted is descriptive and based on a review of literature, at the Portuguese level and in the European context. A brief diagnosis of the Portuguese ageing scenario and the evolution of health expenditure frames the Portuguese reality within the European context. From the results of the major studies in this area, we try to point out other factors that may have been the genesis of rising health expenditure in Portugal and understand if the increase of ageing was one of the key factors for this development.

Lastly, the main conclusions of all the research undertaken are presented in the final reflections, in order to identify and suggest courses of action that seem appropriate and are, in our opinion, some of the future challenges. Chapter 7, *Portugal 2030. Policy priorities in health*, begins with the implementation of the PEST model to the research areas of the book - Demography, Education, Health, Economy, Technology, Social and Health Policies. To conceptualise this model we developed a table common to the different areas, giving the reader a common thread, while reading and learning on the various themes. In this table we tried to systematise the indicators, legislation, the options and the most relevant information on each of the topics addressed, giving it a temporal dimension of past, present and future. Moreover, we developed an analysis of possible threats and opportunities of the vectors that we considered most important. As mentioned, this option was aimed to provide the general reader and also possible decision-makers in the health sector a feature of fast and accurate reading for decision making. Furthermore, we drew the developments registered in different spheres and the respective lines of strength that had guided them. We aimed to foresee the role that some of them are likely to have in the coming years and their specific impact on Portuguese society. While the exercise progressed, with the goal of delineating, in a perspective of future, possible upgrades of all vectors considered structural (demographic ageing, health policies, average education levels of the population, social impacts and health expenditure), we discussed possible ways to ensure the sustainability of the healthcare model to the future users of health services. Thus, given the outcomes of the research and the reasoned opinions of about two dozen experts interviewed through the application of a Delphi exercise, the study concludes with suggestions on how Portugal should build its strategy combining legitimate individual expectations with its commitments within the European Union. The Bibliography and References were referred to the end of the book, divided by chapter, in order to facilitate the consultation of each reader's preferred themes.

Convinced that there are gains in this exercise of systematisation of knowledge on different perspectives to assess the importance and the determinism

of decision making in the sector of health policies in Portugal's history, from the early twentieth century to the near future; it is however, characteristic of the coordinators and authors some dissatisfaction with what could have been accomplished and what is now possible to present. Nevertheless, we have managed to achieve some of our initial designs. In adverse circumstances, such as the one that characterises the Portuguese reality, we should not forget that Portugal is now a more prosperous country than earlier in the last century or even at the time of political change of the '70s.

The good results achieved so far do not prevent some concern about the future. The economic turmoil triggered by worldwide globalisation and the subsequent reconfiguration of power on a global scale are situated in a scenario of uncertainty and transformation. In these circumstances, the academy will have to undertake an exercise of reflection on what has already been achieved and the options that are offered to us.

We could not conclude these introductory pages without publicly express our appreciation for the valuable contributions that the various experts and external consultants have printed to this publication. Their thoughts and suggestions represented an invaluable contribution to the fruition of this project. Firstly, we would like to emphasise the availability of approximately two dozen experts who agreed to answer the questionnaire that formed the basis of the Delphi Exercise. Also to Professors Jan Sundin, Professor Emeritus at the University of Linköping (Sweden), Wilm Quentin, University of Technology of Berlin and at the European Observatory on Health Systems and Policies and Pedro Guedes de Carvalho, Professor at the University of Beira Interior, external consultants to this project, to them our Thanks.

Lisboa, 3 de julho de 2014

Teresa Ferreira Rodrigues
Maria do Rosário Oliveira Martins

PART I

Demography and health.
The path to Modernity

1. Health in Portugal: actors and temporalities[3]

Teresa Rodrigues e Carla Leão

Throughout history Portugal has registered considerable changes in the way the sectors of healthcare and protection in disease have been perceived. Therefore urgent measures have been taken in these fields.

Similarly to what happened in most European countries, the provision of healthcare and welfare had its genesis in religious and corporate initiative. Local stakeholders and the central government have progressively regarded these issues as a sector worthy of a legislative framework and permanent intervention. Nevertheless, this is a contemporary reality, from the late nineteenth century. Indeed, in earlier times, and in part even today, the "Misericórdias"[4] were the most relevant institutions in the treatment of those affected by diseases. The prominent role played by the "Misericórdias" since the Middle Ages is largely the result of their closeness to the people, as well as their regular allocation throughout the national territory. These two essential characteristics turned it into the visible face of populations' support in situations of disease.

In fact, until the mid-twentieth century, the deliberations adopted in the sphere of healthcare have taken an ad hoc character and one of response to specific incidents. At the political level, decision making on matters of health and disease almost always materialised, as a response to situations of national emergency, of which the epidemic outbreaks of imminent risk of importation are the best example (Rodrigues, 1993).

However, in Portugal, from the sixteenth century on, the health issue gradually assumed a growing and cutting edge importance that guaranteed its rulers some recognition in international terms. At the beginning of the

[3] This chapter was partially written by Pedro Silveira (CES-NOVA), PhD candidate in Political Science at the FCSH-NOVA from Lisbon, within the project PTDC/CS-DEM/109967/2009, Ageing and Health in Portugal. Politics and Practices (2009-2014).

[4] The 'Misericórdias' are institutions created in order to assist the needy. They have over five centuries of existence in Portugal. It was Queen Leonor, wife of King John II, who had in the late fifteenth century a very important and decisive role in the effective and institutional foundation of the Portuguese 'Misericórdias'. They were created in major urban centres but also in small towns and in the Portuguese colonies. The human character and efficiency rendered by these institutions throughout time gave them high prestige and a definite role as major providers of care assistance and solidarity. Currently, the 'Misericórdias' remain active in Portugal, with strong ties to the state, despite its financial autonomy.

nineteenth century the existing and tested structure in Portugal was considered one of the most effective in what referred to the prevention of external epidemics. However, the same could not be said in what concerns the fight against morbidity and mortality of the Portuguese people. The average levels of mortality were still very high, though far from exceptional in international comparative terms. Only after the implementation of democracy in April 1974 was there a concerted and coherent action by the different actors responsible for this sector.

Over time, the evolution of the indicators of health, illness and mortality of the Portuguese people reflect the priority given to these issues by the various governments. Especially the greater or less attention paid to public hygiene and to the sanitary control system which influenced the levels of micro-demographic variables, particularly in terms of morbidity and mortality. Or the way these varied according to the gradual development and generalisation of populations' access to healthcare, even if just supported by one incipient network restricted in its results by the limits imposed by medical science's progress.

Throughout the twentieth century, Portugal has undergone major social, political, cultural and economic transformations and also in what concerns the provision of healthcare. The major changes in the way government officials perceive the need and urgency of a real and as effective as possible health policy is an achievement of the post-25 April 1974. Swiftly Portugal moves from a narrow approach in terms of provision of healthcare to a universal approach, based on prevention and conscious of new needs, such as the provision of continued care. The public perception, of both politicians and civil society, on the social relevance of health has also been changing.

Despite speeches on the importance of public health by policy makers and technicians, whose frequency increases as we approach the present, it is incorrect to speak of health policies before the second half of the twentieth century. The emergence of some Ministries of Health throughout Europe during the second half of the twentieth century is a sign of full awareness of the importance assigned to the health of populations in the public policy sector. In Portugal, the Ministry of Health was only created in 1958. However, it is important to reflect on how the management of the legislative and organisational network of hygiene and public health of the Portuguese population in the past was organised (Campos and Simões, 2011). As mentioned, public health policies are relatively new and do not surpass sixty to eighty years in terms of concerted decision making. But its understanding implies a retreat in time. For previous times the issue of health and combating disease and death should be appreciated from the ability of each poli-

cy-maker to legislate and enforce measures to ensure public hygiene. The latter has been considered a public policy since the Enlightenment and, in a more consensual form, since the mid-nineteenth century.

Given the above, and taking into account the objectives of this book, this chapter devotes special attention to the period between the second half of the twentieth century and today. In methodological terms we adopted an essentially descriptive and chronological approach, based on the available studies on the topic of health policies in Portugal, which allow us to identify the main characteristics and particular constraints of the various reforms in the sector. In addition, we analysed and interpreted the legislative body on the subject in the period concerned, highlighting the main options taken at each time. While sometimes the approval of legislation does not mean a practical realisation of the purposes identified therein, it is nevertheless the expression of informed choices about health policy in a particular historical moment. From this analysis it is effortless to track how policy options in the field of public health in Portugal evolved.

This chapter is divided into three parts. The first two are predominantly descriptive. The first one is an historical framework, since the establishment of the Republic, through the Military Dictatorship and the 'Estado Novo'. The second chapter summarises the lines of force of health policies in Portugal between the establishment of a democratic regime and the present day. Finally, the third and last part is a systematisation of the main stages of the Portuguese health policy in the twentieth century, and analyses its strengths.

1.1. The historical context of health policy in Portugal (1910- 1974)

The Republican Revolution of 5 October 1910 generated justifiable expectations on the reform of the health sector. The reformist rhetoric of the Republican Party in opposition, the national and international expansion of the hygienist movement, as well as the recent advances in medical knowledge and experimental medicine, suggested that the new political regime would have the will and capacity to develop and implement a coherent and effective health policy. Thus, the 1901 Reformation, known as the "Ricardo Jorge Reform", was applied and developed. This reform reorganises the public health of the Kingdom and regulates the Health and Public Charity Services (24 December 1901). We can regard this reform as an attempt to build the foundation of public health in Portugal, inspired by the example of England which was recognised as the fatherland of hygiene and a model in terms of medical-health organisation (Simões, 2005; Ministério da Saúde[5])

One of the first measures of the republican regime aimed to establish the mandatory formula "Health and Fraternity", which should appear at the end of all officially issued correspondence. This decision meets one of its political flags (Alves, 2010): the guarantee of a fraternal society and a healthy life for all Portuguese. The fact that a considerable number of physicians were among the Members of the Constituent Assembly and among the members of successive governments gave emphasis to the health sector as a real political objective of the new regime. This fact also explains the number and regularity of parliamentarians who directly or indirectly focused on the theme of public health on debates (Garnel, 2010).

The First Republic considered the health of the people as a right which governments were obliged to provide. Indeed, the 1911 Constitution enshrines in its text the right to public welfare (Art. 3º No.29º). However, as had happened in the past, health continued to be understood as welfare, i.e., as the provision of basic medical and healthcare services to economically disadvantaged groups.

Early in 1911, the General Directorate of Public Health and Charities was abolished and replaced by two General Directorates: the General Directorate of Health, headed by Ricardo Jorge, responsible for the resolution and expedient of public health services (Decree of 9 February 1911), and the General Directorate of Welfare (Decree with force Act of 25 May 1911). This division between Health and Welfare reflects the difference assumed by stakeholders in the sector between the promotion of hygiene and health for all the Portuguese and the provision of aid (particularly in medical terms) devoted to the neediest.

However, in terms of Welfare, the nature of state intervention was limited, as it concerned the "effective and adequate protection of the poor with no other recourse"[6] in close liaison with private action, which was essentially deemed. In turn, in terms of health, the state only had the faint obligation to promote everyday public health practices and to fight exceptional situations, including disease outbreaks. In a decree published on the same day, the Joint Municipal Doctors Parties ('Junta de Partidos Médicos Municipais') was also established and regulated. The Joint's mission was to standardise and control the medical care provided by medical assistance at the municipal level, considering "the primary, technical and enforceability element of our

[5] Ministério da Saúde, História do Serviço Nacional de Saúde, Portal da Saúde. Retrieved from: http://www.min-saude.pt/portal/conteudos/a%2Bsaude%2Bem%2Bportugal/servico%2Bnacional%2Bde%2Bsaude/historia%2Bdo%2Bsns/historiadosns.htm

[6] In the original: "efectivo e suficiente amparo dos pobres sem outro recurso".

entire healthcare system"[7] (Decree with force of law of 25 May 1911). The Doctors Parties were now mandatory in all municipalities, thus extending to the entire country the experience of primary healthcare. The Republican emphasis on the importance of education also led to the reform of the curricula and the establishment of the Faculties of Medicine in Lisbon and Oporto (22 February 1911).

In 1914 Hospitals were reorganised and the Civil Hospitals of Lisbon were created[8]. This decision was originally due to a forecast of worsening of the administrative and technical deficiencies in the capital's Hospitals, as well as of the need for more beds following the outbreak of World War I (although Portugal will only enter the war until two years later). However, it should be stressed that the State's Hospitals continued to be intended only to "assist the underprivileged classes"[9], as referred in its founding Diploma. Other hospital reorganisations of minor significance would not take place until 1923, when several public institutes were reorganised or created (Alves, 2010; Correia, 1954).

Nevertheless, the severe economic and financial crisis in which Portugal dived into in the first decades of the twentieth century brought new difficulties for the effective implementation of legal reforms envisaged in the sector. Therefore, it was impossible to provide the bureaucratic apparatus hitherto created with sufficient means for its effective performance. The latter was even more complex given the difficulty of laicisation of hospital services and the dependence of supportive care provided by the 'Misericórdias' and other church-related institutions. Indeed, despite the difficult relations between the State and the Church in this period, triggered by the Law of Separation of Church and State, the 'Misericórdias' and other religious institutions continued to play a key role in assisting populations (Ramos, 1994).

Two other barriers to the successful implementation of the health reforms were due to the dispersion in various ministries related to the public health sector that made its matters ancillary when addressing the priority issues for each service, to which should be added the effects of successive changes in services between Ministries (Alves, 2010).

But even with difficulties, legislative initiatives in the sector were still adopted. The Decree 5727 of 10 May 1919 harmonised the organisation of health services in the colonies and, on the same day, Decrees 5636 to 5640 created mandatory social insurance for sickness, invalidity, old age and

[7] In the original: "o elemento primário, técnico e executório de todo o nosso sistema sanitário".
[8] Decree 1137 of 3 December 1914.
[9] In the original: "assistência às clases desvalidas".

survival, establishing the Institute of Mandatory Social Insurance and General Welfare (ISSOPG)[10] , for the purpose of administering and overseeing such insurances. These Diplomas revealed that the concept of public health was changing and demonstrated an increasing willingness to expand population's access to health and strengthen the state's role (Garnel, 2010).

The relationship between the state and individuals changed gradually, endowing the latter with rights that the first should promote (Garnel, 2010). Thus taking the first steps towards the creation of the welfare state, although still at a very early stage. Portugal could then be considered a liberal welfare state, with a "modest social security based on the inspection of means and aimed at the working classes"[11] (Pereira, 1999, p. 61).

The Director-General of Health, Ricardo Jorge, then took a relevant role. Knowledgeable of the forefront of international health practices, he produced a variety of reformist legislation. This earned him the accusation by some Representatives and Senators (from which Sousa Junior stands out) of wanting to establish a legal health dictatorship, worrying more about the legislative production than the efficiency of prevention practices (Alves, 2010). Nevertheless, Ricardo Jorge himself did a discourageing balance of the actions taken, giving an account of the "bureaucratic difficulties, lack of resources, political and even medical difficulties"[12] (Ricardo Jorge apud Correia, 1960; Alves, 2010, p.127), which he faced during his term of office. Indeed, there were many constraints to the success of the reforms attempted. We can point three main reasons:

1) the availability of healthcare services highly centralised in Lisbon and the lack of financial means for its territorial expansion;
2) an insufficient number of State's health facilities that would enable to achieve the goals established; and 3) the constant political instability, which fettered the operation and especially the efforts to improve the medical and health system (Alves, 2010).

Indeed, the reformist impetus of the First Republic was mitigated by the unfavourable economic and financial environment, which left at the background what had been from the outset a political design priority. Still, during its term, reforms of medical education and healthcare, as well as school health and mandatory vaccination took place in the Colonies. Moreover, public health evolved, particularly in the sectors of water supply, sanitation, housing conditions and food quality control. These achievements were highlighted in the

[10] ISSOPG is the Portuguese acronym for 'Instituto de Seguros Oficiais e Previdência Geral'.
[11] In the original: "segurança social modesta baseada na verificação de meios e destinada às classes trabalhadoras".
[12] In the original: "dificuldades burocráticas, falta de meios, dificuldades políticas e até médicas".

official discourse in 1925, reaffirming that Public Welfare was the greatest Republican work.

A few months after the coup of 28 May 1926 which installed a military dictatorship in Portugal, the Reform of Public Health Services was published -Decree 12477 of 12 October 1926, regulated by Decree 13166 of 28 January 1927. The diagnosis made on the evolution of public health and hygiene was very pessimistic, and Portugal was considered to be with a "(...) considerable delay, detrimental to the life and health of citizens, vexing to the national pride..."[13], unlike a wide range of countries, some with equal economic difficulties, which after the World War waged on preventive medicine "(...) without looking at the sacrifices..."[14] (Decree 12477 of 12 October 1926).

Therefore, considering the reorganisation of health services, district offices were abolished and municipal health authorities were given greater autonomy. At the municipal level, Boards of Hygiene were instituted as well as sub-inspectors of health, the municipal Doctors Parties were improved and municipal sanitary brigades were created with the mission of addressing possible disease outbreaks. However, this reform did not have the desired effect since the priorities of the new regime soon focused on maintaining the order and control of public finances (Rosas, 1994).

After the rise to power of Salazar and the implementation of the 'Estado Novo', the political and doctrinal stability conditions were gathered to talk about renovation or improvement of healthcare services. The propaganda of the new regime immediately focused on the critique to the First Republic's health policy, considered nationalising. Salazar's position on this issue, which he already sustained as Ombudsman of the 'Misericórdia' of Coimbra, was very clear: "God forbid that the State intended to substitute the old institutions providing welfare on its own"[15] (Salazar apud Costa, 2009, p.77). And so begins what Correia de Campos called the beginning of "disestablishing welfare"[16] , starting a "(...) golden age of private welfare institutions..."[17] (Campos, 1983, p.26), with special emphasis on the "Misericórdias", which served as institutional support: "(...) an organised and awarded charitable welfare on the basis of ethical-religious criteria…"[18] (Hespanha, 2000, p.121).

[13] In the original: "(…) considerável atraso, lesivo para a existencia e saúde dos cidadãos, vexatório para o brio nacional ...".
[14] In the original: "(…) sem olhar a sacrificios…".
[15] In the original: "Deus nos livre que o Estado pretendesse substituir-se às velhas instituições, fazendo por si a assistência".
[16] In the original: "desoficialização da assistência".[14] In the original: "(…) sem olhar a sacrificios…".
[17] In the original: "(…) uma época de ouro das instituições particulares da assistência...".
[18] In the original: "(...) um assistencialismo caritativo organizado e concedido na base de critérios étnico-religiosos...

The corporate model of the state, based on the Statute of the National Labour approved in 1933, which embodied the system of representation of interests created from above and administratively controlled by the state, framed and sustained this vision of welfare (Schmitter, 1999). The model predicted solidarity within each corporation and the upgrading of private public charitable initiatives that the state should regulate, promote and support in a subsidiary way (Costa, 2009). Along this line, it is also relevant the 1940 Concordat which established the relationship between the state and the Catholic Church. It confers the ecclesiastical institution an official role and the deliberate choice to integrate the Church in the welfare system, which contradicted the design of Healthcare and Welfare of the First Republic.

The 1933 Constitution sustained in its art. 40 thereof the "right and obligation of the State in the defence of morality, public health nutrition, and sanitation"[19] and in art. 41 claimed the state's obligation to "promote and encourage charities, welfare, cooperation and mutual aid"[20] . The document did not include any direct reference to public welfare or health, but advocated the need for charitable welfare, essentially private, irregular and partial. In fact, charity prevailed as a traditional form of aid to those who were in a precarious situation. The state continued to have just supervisory assignments on private entities that practiced it, and its intervention was supplementary.

In 1940, the Secretariat of State for Welfare was created to exercise upper coordination and guidance, and in the following year the welfare services were reorganised, according to four priorities[21]:

1) "assistance to life at birth and early childhood"[22];
2) "assistance to life in their training and physical, intellectual and moral preparation"[23];
3) "defence of life threatened by physical, mental or moral infections"[24]; and
4) "assistance to life diminished by economic destitution or physical, mental or moral inability"[25] (Law Decree 31666 of 22 November). Some official welfare institutions become private, thus reaffirming the appraisal of

[19] In the original: "direito e obrigação do Estado na defesa da moral, da salubridade da alimentação e da higiene pública".
[20] In the original: "promover e favorecer as instituições de solidariedade, previdência, cooperação e mutualidade".
[21] According to Fernanda Rodrigues (2002, p. 155) the maintenance of this Ministry reveals a "sanitary version of welfare and a welfare version of health, both restrictive and insufficient" (in the original: "uma versão sanitarista da assistência e uma versão assistencialista da saúde, ambas restritivas e insuficientes").[16] In the original: "desoficialização da assistência".[14] In the original: "(…) sem olhar a sacrificios…".
[22] In the original: "assistência à vida no seu nascimento e primeira infância".
[23] In the original: "assistência à vida na sua formação e preparação física, intelectual e moral".
[24] In the original: "defesa da vida ameaçada por infecções físicas, mentais ou morais".
[25] In the original: "assistência à vida diminuída pela miséria económica ou pela incapacidade física, mental ou moral

> the private sector, while the State was responsible for its guidance, coordination, provision, inspection and enforcement. This "disestablishing/privatisation finds its extension in the form of contracts with welfare staff"[26] (Lopes, 1987, p.103), except for senior and leadership positions, according to the stipulated by Decree 31913 of 12 March 1942.

Following this general design, the basis of the legal regime of Social Security was established. The 1998 Act of 15 May 1944 reaffirmed the supplementary nature of the state's action, proposing the gradual 'disestablishing' of institutions and charity work created by the same State. The Act maintains the central role of the 'Misericórdias' in providing healthcare (Base XVII). These measures were the culmination of the "charitable-corporatist"[27] phase (1937-1944) (Campos, 1983, p.25), as Correia de Campos called it, the most ideologically marked period. Indeed, according to Octavio Lopes Gonçalves (1987, p.103), "this law encapsulates the ideology of the system"[28].

Meanwhile, the gradual assertion of the welfare state is consolidated in European democracies. The tendency to include health in the construction of social security systems is actually one of the tenets of post-War Europe (Costa, 2009). In 1942 the United Kingdom issues the Beveridge Report, which would create the National Health Service (1948). It was a universal system of medical care, which was considered to be socialising by the Portuguese regime, since it clearly contradicted the official doctrine. Four years later, on 1 July 1948, the World Health Organisation was created. In its preamble it states that "Governments have responsibility for the health of their peoples, which can only be fulfilled by the establishment of sanitary and social adequate means"[29].

The 'Trigo Negreiros Reform'[30] took place in this international environment, and within a national context of transitional freedom and claim that characterises the election period for the elections in November 1945. The welfare system was divided into palliative, curative, preventive and constructive. This initiative demonstrates the will for change by recognising that there are "instant and immediate needs of intensification and development of activity in the field of welfare"[31] and that "private initiatives do not always fit the needs"[32] (Lopes, 1987, p.104).

---

[26] In the original: "desoficialização/privatização encontra o seu prolongamento nas formas de contrato do pessoal de assistência".
[27] In the original: "caritativo-corporativista".
[28] In the original: "esta lei condensa a ideologia do sistema".
[29] In the original: "os Governos têm responsabilidade pela saúde dos seus povos, a qual só pode ser cumprida pelo estabelecimento de medidas sanitárias e sociais adequadas".
[30] Law Decree 35108 of 7 November 1945.[17] In the original: "(…) uma época de ouro das instituições particulares da assistência...".
[31] In the original: "instantes e imediatas necessidades de intensificação e desenvolvimento da actividade no campo da assistência".

A more clear separation between healthcare and welfare takes place, a process that culminates in the creation of two Directorates-General: the first with a predominantly educational and preventive action in the field of individual and collective hygiene, prophylaxis and improved living conditions; the second with the aim to boost, direct, and coordinate the activities of official establishments and private institutions. In terms of territorial organisation the district health offices, regional, municipal and parish welfare committees were reinstalled. Moreover, the functions of the health sub-delegates were defined and strengthened. The Superior Board of Health and Social Care undergoes a significant reform, now working with specialised sections. Institutes were established or strengthened to coordinate welfare activities in specific sectors, including the Family Welfare Office, the Maternal Institute, the Child Welfare Institute, the Disabled Welfare Office and the National Institute for Tuberculosis Care.

The 'Trigo Negreiros Reform' recognised the weaknesses of individual welfare and advocated as a solution the "improvement of the administrative supervision of the State in its threefold purpose - guiding, cooperating and supervising"[33] (Law Decree 35108 of 7 November 1945), in particular through the Commission for Social Care Inspection. The fundamental principles of welfare were maintained, leaving the private sector with a leading role, with particular emphasis on the 'Misericórdias'. Despite appearing already lagged in time in the European international context, this reform illustrates a national progress.

Following this reform, law on hospital organisation was enacted, the 'Lei de Bases hospitalar' (Hospital Acts, Law 2011 of 2 April 1946). It provided a plan of hospital regional and sub-regional structures, exempting the State from its management, which was hand over to the 'Misericórdias'. However, no regional Hospital was ever built (Costa, 2009).

Despite these failures, the emergence of the Federation of 'Caixas de Previência', Social Security Funds (Law 35611 of 25 April 1946), allowed the gradual extension of socio-medical services outside state's health services (Costa, 2009, p. 89). The 'Caixas de Previdência' were created and the State authorised the creation of several independent health subsystems, although of difficult or even impossible coordination and effectiveness. This system continued to exclude a large percentage of the Portuguese population and created differences among the beneficiaries, since each had different services (Costa, 2009, p.89). Thus, the Portuguese had no health service, but

[32] In the original: "as iniciativas nem sempre se ajustam às necessidades".
[33] In the original: "melhoria da tutela administrativa que incumbe ao Estado na sua tríplice finalidade – orientadora, cooperadora e fiscalizadora"

various health services of a vertical type, which increased social inequalities (Sampaio, 1981).

Nevertheless, in the '50s, contributions from the State to healthcare institutions were high, reaching 75% in construction and 70% in maintenance services (Ferreira, 1957). Doctor Miller Guerra, director of the College of Physicians, would be in those years one of the biggest critics of the archaic principles of the charitable nature of Healthcare in Portugal (Guerra, 1958). In fact, many doctors were already asking for the creation of a Ministry of Health (Costa, 2009).

This Ministry would be created in 1958, resulting from the promotion of the Secretariat of State for Welfare. However, its skills and the available resources did not experience significant improvements when compared to previous ones (Sampaio, 1981). The permanent budget difficulties and the rivalry with the Ministry of Finance due to distrust over the effectiveness of the implementation of new investments in poorly organised health services, led to a mistreatment of the Ministry of Health (Campos, 1983). Years later, Minister Martins de Carvalho confessed that "Salazar condescended with public opinion and created the Ministry of Health; but basically, had no great interest in equating this and act energetically on essential problems in the sector"[34] (Henrique Martins de Carvalho apud Gonçalves, 1990, p. 355). Nevertheless, the creation of the Ministry witnesses a re-evaluation of the health sector and illustrates a slight change in the design and practice of welfare in Portugal (Santos, 1996).

The '60s were a period of economic growth based on the industrialisation and controlled economic liberalisation allowed by the European Free Trade Association (EFTA). This period is marked by the beginning of the Colonial War and the rise of internal disputes, as a result of greater information on the living conditions in other European countries, namely in the context of social security systems (Costa, 2009). Still, the creation and development of health subsystems remains the official policy of the regime and in 1963 the Social Welfare for the Public Servants of the State (ADSE)[35] was founded by Law Decree 45002 of 27 April 1963. The ADSE was a Fund created for public servants, with the aim of endowing this professional class with health medical-surgical and maternal-infant services, nursing, and medicines, "within gradual

[34] In the original: "Salazar transigira com a opinião pública e criara o Ministério da Saúde; mas, no fundo, não tinha grande interesse em que este equacionasse e procurasse actuar com alguma energia nos problemas essenciais do sector".

[35] ADSE is the Portuguese acronym for 'Assistência Social para os Servidores Civis do Estado'.

implementation throughout the country in order to cover all servers"[36] (Law Decree 45002 of 27 April 1963). Thus, presenting itself as a model to replicate to the remaining resident population.

In parallel, although over the '60s the state maintained the basic principles of its welfare policy practically unchanged, other attempts at reform were outlined. One of the most significant was the Law on Health Policy and Welfare, 'Lei de Bases da Política de Saúde e Assistência' (Law 2120 of July 19, 1963), which recasts the 1944 Basic Law, essentially by removing the charitable character of welfare and starting a movement of centralisation of the services provided[37]. However, the Diploma also revealed the incongruities of the state's intervention in the field of healthcare, since

1) it kept the supplementary nature of state action and privileges of private institutions;
2) it blamed the state for the creation of those institutions; and simultaneously
3) stated its intention to implement a comprehensive health policy.

Thus, barriers to the development of a consistent health policy continued to exist. Neto de Carvalho, Minister of Health, testifies in his memories that the country's health coverage progressed very slowly, combining the action of private institutions with the activity of the state, although the latter was "expanding its participation in various sectors (hospital, maternal and child, prevention)"[38] . However, "there was no health policy"[39] nor could there be, since this would imply "the recognition of the basic right to health, still out of the mind-set of many people"[40]. In particular, the Ministry of Finance, whose collaboration was essential to modernise the health sector, dominated by the "spirit of Public Accounting"[41] (Neto de Carvalho apud Gonçalves, 1990, p. 360).

The fact that health was addressed by the 1965-67 Development Plan represented a victory for the sector, because it ensured financial autonomy from the Ministry of Finance. This political decision allowed the anticipation of a new perception of the importance given to the issue and a desire to ensure a growing state intervention to guarantee it (Lopes, 1987). This change

[36] In the original: "em realização gradual por todo o país, a fim de abranger a totalidade dos servidores".
[37] Octávio Gonçalves Lopes (1987, p.109) refere mesmo que é, comparativamente àquele texto legal, tecnicamente superior e menos marcadamente ideológico, marcado inclusivamente por uma "concepção assente em valores humanistas".
[8] In the original: "alargando a sua participação em vários sectores (hospitalar, materno-infantil, prevenção)".
[39] In the original: "não havia uma política de saúde".
[40] In the original: "o reconhecimento básico do direito à saúde, ainda fora da mentalidade muita gente".
[41] In the original: "espírito da Contabilidade Pública".

was certainly interlinked with the increase of young technocrat staff with international experience in public administration, thus putting an end to social and cultural autarky, which in the '50s had replaced the predominant economic autarky at the time (Reis, 1990).

In 1965 the Office of Joint Use of Hospitals (SUCH)[42] was created[43]. This Office sought to obviate the lack of an entity that ensured a uniform way to solving some problems of economic exploitation and hospital management. Among other important Diplomas promulgated stands out Law Decree 48357 of 27 April 1968, which created the Hospitals Statute and the Decree 48358 of 27 April 1968 which promulgated the General Regulation of Hospitals. They both highlight the entrance of the Portuguese hospital system in a new phase of modernisation, supposing "a rationalising unit of hospital activities where the patient is the polarising centre, origin and purpose of all activities"[44] (Lopes, 1987, p.111; Costa, 2009, p.123). Thus, guaranteeing the uniformity of the organic functioning of all hospitals, public and private, and reinforcing hospital regionalisation under Law 2011 of 2 April 1946, as well as the creation of specific medical careers and the affirmation of the social principle in conjunction with the principle of efficiency. However, the funding to implement the statute depended on the welfare, and this was probably one of the reasons for its failure (Sampaio, 1981). Correia de Campos believes that this initiative "lagged in time, as a strange body in a health system characterised by its anchylosis"[45] (Campos, 1983, p.41). Indeed, the regulation lasted only five months, although it was not repealed.

In health, the 'Misericórdias' continued to have a prominent role, particularly in the context of healthcare and vocational training. The concern for quality was one of the foundations of the services provided and the training given to health workers was considered essential for the proper functioning of the institution. The 'Misericórdias' created courses in Physiotherapy and Occupational Therapy (1957) and Speech Therapy (1962). Its contents were inspired by internationally recognised programmes and relied on the cooperation of international organisations, particularly from the World Rehabilitation Fund.

[42] SUCH is the Portuguese acronym for 'Serviço de Utilização Comum dos Hospitais'. t
[43] Law Decree 46668 of 24 November 1965.
[44] In the original: "uma unidade recionalizadora de actividades hospitalares em que o doente é o centro polarizador, origem e fim de tais actividades".
[45] In the original: "desfasada no tempo, como corpo estranho num sistema de saúde caracterizado pela sua anquilose".

But the reality was changing. Seizing the window of opportunity allowed by the rise to power of Marcello Caetano, critics to the medical profession arose. In 1969, Miller Guerra claimed the creation and enhancement of the public health career, the establishment of sub-regional Hospitals or Health Centres, the unification of medical, health and social action, the increase in the number of qualified medical staff and other health personnel and even the creation of a new Ministry that integrated Healthcare and Welfare and improved the coordination of healthcare policies (Guerra, 1969).

Despite this long way, and the improvements achieved, in the beginning of the '70s the balance was slightly positive, especially when compared to other realities. In Portugal, one of the major problems continued to be the scarce role of the state, along with the fact that the number of priv ate health institutions continued to be by far superior to state-owned ones (Reis, 2009). The problem was not so much the number of people covered by the various subsystems, which was rather significant, essentially following the 1962 welfare reform, but "the diversity of schemes and [weak] degree of utilisation of resources"[46] (Carreira,1996), which generated social inequalities and promoted inefficiency. In 1972, when Arnaldo Sampaio took office as Director-General of Health he emphasised that "in recent years the Nation has made a significant financial investment in the health sector that has not translated into the income that might have been expected"[47] (Sampaio, 1972, p.518).

A new reform of health had been attempted in the previous year (Law Decree 413/71 of 27 September)[48] , which had as its fundamental goal the scientific and technical improvement, effective planning and programming, unification and multidisciplinary in the design and implementation of the Health policy. It aimed to defend the right of all Portuguese to healthcare guaranteed by the state, innovating in the intentions of its coverage and how they should be rendered (Barbosa, 1972; Sampaio 1981). In fact, this reform is a turning point in delegating responsibilities to the State in the coordination of a health policy centralised in its conception but decentralised in the provision of services. The centralisation was ensured by the creation of the National School of Public Health, the Office of Research and Planning and, especially, the Secretariat General. Decentralisation was established through the creation of local Health Centres and Health Units, both eminently with preventive functions, which reflected a commitment in the prevention and

[46] In the original: "a diversidade de regimes e o [fraco] grau de aproveitamento de recursos".
[47] In the original: "a Nação, nos últimos anos, tem feito um importante investimento financiero no sector da saúde de que não se tem traduzido no rendimento que seria legítimo esperar".
[48] Also denominated 'Gonçalves Ferreira Reform' (Secretary of State for Health at the time).

proximity of services and populations. From this point of view the 1971 Reform, or the 'Gonçalves Ferreira Reform' as it became known given the relevance of the author, was extremely advanced for its time, anticipating the creation of a National Healthcare System and the guidelines of the 1978 International Conference of Alma-Ata, especially if we take into account the national context[49] . But as expected, it does not definitively disrupt the role of private entities providing health services, in particular on the coordination between Health Centres and public and private services dispersed across the country.

The Directorate-General took on a prominent role since the early '70s, acquiring human, technical and financial resources that had never had before. Namely it had the fundamental coordination of all intermediate bodies created under its tutelage, such as the Regional Coordinated Inspections, the Coordination District Councils and Health Centres. This Reform ensured a certain standardisation of the health policy in Portugal, although it was impossible to integrate the Medical Social Welfare Services in a single healthcare system, which would only take place in 1984.

The changing role of the State in the provision of health services was accelerated in large by a combination of factors, among which are noteworthy the international conjuncture that sustained the accountability of governments for ensuring access of all citizens to primary care. Internally, the government felt pressured by repeated complaints of technicians and experts on the national delay compared to several European health indicators, considering it "an urgent and pressing need, given the delay in which we found ourselves"[50]. However, these measures could only be taken because there was political openness, along with a new generation of technicians with international experience who ascended to leadership positions in Public Administration and/or political office during Marcello Caetano's period, as was the case of Arnaldo Sampaio (Ferreira, 1975).

In 1973, by Law Decree 584/73 of 6 November, the Ministry of Health and Welfare was split. Health was now an autonomous Ministry, thus recognising its importance and specificity. Nevertheless, as Arnaldo Sampaio refers, the political conditions persisted in essence preventing the full realisation of the 1971 Reformation (Sampaio, 1981).

[49] The Director-General of Health Arnaldo Sampaio would say in the eve of the 25th of April, date of the Portuguese Revolution (interview of March 10, 1974) to the 'Jornal de Lisboa' that given the political philosophy that guided the Government he admired the enactment of this legislation.

[50] In the original: "uma necessidade urgente e imperiosa, dado o atraso em que nos encontrávamos".

1.2. Health policies of the Portuguese Democracy (1974 – 2013)

The Revolution of 25 April 1974 provided a break with the recent past and the political impediments which hitherto precluded the extension of universal healthcare. In the mid-'70s, the state's role in health promotion changed as all health services were integrated in a single system.

The Programme of the First Provisional Government[51] reflects from the first moment this breakthrough and states in Point 5g the goal to create a national health system. The same normative act gathered once again in the Ministry of Social Affairs both health and social security. This decision, only apparently contradictory, sought to promote the effective integration of medical and social services under the welfare state. Moreover, it is within this logic that Law Decree 589/74 of 6 November transfers the services of medical and social action of compulsory insurance to the custody of the State Department of Health[52] .

In addition to the attempted integration of medical and social services, which standardises the performance of state services, decentralisation was attempted in providing such services, including through the establishment of District Administrations[53] and Medical Office to the Outskirts, established by the Order of 23 June 1975 (Ferreirinho, et al., 2006). The latter consisted of the movement of young doctors to areas without adequate medical care. Another clear sign of the application of the new principles of the state's operation and its accountability to collective health is given by integrating in public management the hospitals managed by the 'Misericórdias'[54].

The 1976 Portuguese Constitution established in its art.64 that Health was a universal right that should be carried out through the creation of a national system of universal, comprehensive and free health. The state was accredited with several responsibilities, including ensuring universal access to healthcare and medical and hospital coverage nationwide. By this time, the constitutional consecration of the right to health acquires reinforced legality, imposing itself as a constitutional obligation (Novais, 2011). But it also conquers political relevance because it results from the constituent process founder of the Portuguese democracy, extended to several parties and socio-political trends. Indeed, political democratisation had become inseparable from social democratisation (Guillén, et al., 2003).

[51] Law Decree 203/74 of 15 May.
[52] However, only two years later – through Law Decree 17/77 of January 12 – will this integration be inforced in practice.
[53] Law Decree 488-75, of 4 September,[51] Law Decree 203/74 of 15 May.
[54] Law Decree 704/74 of December 7 and 618/75 of 11 November.

With the entry into force of the 1976 Constitution, Portugal recovers the political stability essential to the realisation of a true national health system (Santos, 1987, p. 13-74). The Order of 29 July 1978 (Arnaut, 2009), or the 'Arnaut Order'[55], anticipates the National Health Service, guaranteeing to all citizens access to medical and social services regardless of their ability to pay. This important Order, which aimed to overcome the impossibility of passing a Bill in Parliament in this regard, would be followed by Law 56/79 of 15 September, establishing the National Health Service (SNS)[56].

The SNS was formed by a network of agencies and services under a single unified direction but through a network of decentralised management, which aimed to include all residents in the country. It was a universal, comprehensive and free service that António Arnaut defined as follows:

> Universal means it covers all Portuguese, without distinction or discrimination, placing them in terms of perfect equality. General means comprising all medical care and not just curative medicine (...). Gratuity, taken literally, means that the services are rendered without allocation to users, i.e. for free[57] (Arnaut, et al., 1979, p.122)[58] .

Nevertheless, user fees could be expected (art.7) as well as the relationship with the private sector, although the latter would be in a complementary way (art.53 and art.54).

Several models could have been adopted to frame the Portuguese National Health Service, but underlying its creation was the political option to ensure a universal and free SNS, where the State assumed a leading role contrary to the private sector (Campos, 2008). Broadening the coverage of services to the entire population had a positive impact on health indicators in the post-25 April (Campos, 1983; Simões, 2009; Santana, 2011). It was a slow process and not always linear, implying a strong public investment, in terms of personnel, infrastructures and services. Despite the advances carried out, in 1980 Correia de Campos (1980) identified a number of issues that remained in the new analysis held seven years later.

Although there were some variations in the priority given to health and the development of the SNS throughout the '80s, including some public disinvestment between 1980 and 1983 (Simões and Lourenço, 1999), measures

[55] As António Arnaut was the Minister of Health and its supporter.
[56] SNS is the Portuguese acronym for "Serviço Nacional de Saúde".
[57] In the original: "Universal significa que abrange todos os portugueses, sem distinções nem discriminações, colocando-os, portanto, em condições de igualdade perfeita. Geral significa que compreende todos os cuidados médicos e não apenas a medicina curativa (...). A gratuidade, tomada à letra, significa que os serviços são prestados sem dispêndio para os utentes, ou seja, de graça".
[58] Analysis of the interview of António Arnaut to "O Jornal", on July 2, 1978, in Arnaut, 1979, p. 122.

were still taken to deepen the universality of healthcare provided by the State. Law Decree 357/82 of 6 September assigned to the SNS financial and administrative autonomy. Medical careers were restructured. Law Decree 310/82 of 3 August, defines the careers of General Practice, and Decrees 767/1981, 539/1982 and 520/1983, create the Institutes of General Practice (North, Centre and South), aimed at adequate training of Family Physicians. This investment in primary care validated a real decentralisation of care, culminating in the creation of the so-called 'second generation Health Centres' (Legislative Order 97/83 of 22 April). The goal would be, as stated in the Preamble of the latter Order, "(...) to enter a more advanced stage of the project for the integration of health services"[59].

In 1983 the Ministry of Health comes back into existence[60], this time permanently and to the present day, and in the following year the General Directorates of Primary Healthcare and Pharmaceutical Affairs were created[61]. At the governmental level, the Health sector acquires a new organic relevance, and two operational aspects regarded as fundamental were strengthened, the preventive aspect of health policy and the regulation of drugs. The first was described as a result of the fact that "our country [was] in an advanced stage of transition characterised by the dominance of infectious diseases to the prevalence of the so-called diseases of civilisation"[62], to which primary care should respond accordingly (Preamble of the Law Decree 74-C/84 of 2 March). The second aimed to respond to "a set of emerging problems, either from the industrial activity or the determinants of consumption"[63] (Preamble of the Law Decree 103-A/84 of 30 March).

Until 1984 the reimbursement of medicines was determined based on the source of the product rather than its therapeutic importance. Law Decree 68/84 of 27 February, tried to establish rules and priorities, increasing the reimbursement of the State on "medicines for chronic diseases, highly traumatic from a psychological and social point of view, graduating this same reimbursement according to utility of the product"[64]. The same law established the State's reimbursement system of the price of the medicines prescript to the users of the National Health Service, in the official health services, and to beneficiaries of ADSE.

---

[59] In the original: "(…) entrar numa fase mais avançada do projecto de integração de serviços de saúde".
[60] Law Decree 344-A/83 of 25 July.
[61] Law Decree 74-C/84 of 2 March and Law Decree 103-A/84 of 30 March.
[62] In the original: "o nosso país [estar] em avançada fase de transição do estádio caracterizado pelo domínio das doenças infecto-contagiosas para o predomínio das chamadas doenças de civilização".
[63] In the original: "um conjunto de problemas emergentes, quer da actividade industrial quer dos factores determinantes do consumo".
[64] In the original: "medicamentos para tratamento de doenças crónicas, altamente traumatizantes do ponto de vista psíquico e social, graduando essa mesma comparticipação de acordo com a utilidade do produto".

In the mid-'80s begins a social democrat political cycle with parliamentary majority and the economic and financial conditions of the country improve, following its entrance in the European Economic Community (EEC). Meanwhile, at the international level, arises a vision of Health calling for the need for greater involvement of the private sector, and calling for a greater individual responsibility in the financing and transformation of the SNS (Simões, 2009). This change of perspective arrives to Portugal, with a reference event: the SEDES Seminar[65] entitled "What policy of Health for Portugal?" which took place in 1987 (SEDES, 1987).

In the following years several measures to ensure the financial sustainability of the system were enacted, such as the introduction of user fees (Decree 57/86 of 20 March), and others which aimed at changing hospital management, converging with the logic of business management (Law Decree 19/88 of 21 January). The Regulatory Decree 3/88 of 22 January introduces the "principles of business and clearly based on the inescapable integration of hospital activity in the country's economy"[66] (Preamble of Law Decree 19/88 of 21 January).

After the 1982 constitutional revision which had left untouched the right to health, the second constitutional revision of 1989 would change the framework for delivering healthcare for "free" to "tendentiously free", although safeguarding the need for this change to take into account the economic and social conditions of citizens. Thus, easing up the original constitutional norm, transforming it into a programmatic principle and opening the door to a greater private contribution of citizens (Art. 64º of the Constitution of the Portuguese Republic). This new rule will have a legislative impact on Law on Health[67], which not only allows but encourages the participation of private entities in promoting public health (Bases I, II Fe XII). Thus, the State assumes the functions of regulator, supervisor, manager, evaluator and inspector (Base VI). In this context, the 1992 legislation regulates inland transport of patients[68], with the exception of the service provided by military or militarised forces, except in the event of an agreement with the Ministry of Health services.

Following these amendments, the Statute of the SNS was adopted[69], regulating the Basic Law and deepening the options implemented in order

[65] SEDES is the Portuguese acronym for the Association for Economic and Social Development, which is an important Portuguese civil association, created in 1970.
[66] In the original: "princípios de natureza empresarial e claramente assente na iniludível intragração da actividade hospitalar na economia do País".
[67] Law 48/90 of 24 August.
[68] Law Decree 38/92 of 28 March, as amended in 27 April 1993 by Ordinance No. 439/93.

to: ensure the regionalisation[70] of government services; promoting the development of the private health sector; ensuring business management of public health units; encouraging citizens to opt for private health insurances (Simões, 2009). The statute still had the ambitious goal of promoting the integration of primary and hospital care through health facilities, invoking the principle of indivisibility. In the year of 1993, the Ministry of Health was reorganised and the Directorates-General for Primary Healthcare and Hospitals were merged in the Directorate General of Health. The National Institute of Pharmacy and the Institute of Informatics and Financial Management were created in an attempt to rationalise the administrative services of the Ministry.

The regulation of the Regional Health Authorities, as contemplated by the Statute of the SNS, was delivered through Law Decree 335/93 of 29 September. It aimed to regionalise health policy decision, by allocating powers and reinforcing assignments to health entities designated by the Regional Health Authority (Lisbon, North, Centre, Alentejo and the Algarve) and allow the articulation between health centres and hospitals, through the creation of the Integrated Healthcare Units.

In the second half of the '90s begins a new political cycle led by the Socialist Party, which will govern the country until 2002. This was a period of major legislative profusion in the field of health, some of which are still in force. Multiple structures were created and new regimes were tested. From the political and social consensus on the urgent need to strengthen the SNS and to rationalise its management, the measures adopted aimed at making such rationalisation without jeopardising the principles of the system (Barros, 1999). Thus, measures to create a contractual model between payers and providers[71], to modernise public health administration[72] and reform the salaries of professionals according to their performance were adopted[73].

The new hospital status was adopted with an experimental basis, which led to the creation of the Hospital of St. Sebastian in Santa Maria da Feira[74], which was the first example of a new public management regime. Nevertheless, the management of human resources and the acquisition of goods and services took place in accordance with the practices of the private sector.

---

[69] Law Decree 11/93 of 15 January.
[70] Law Decree 10/93.
[71] Creation of Regional Contract Agencies (Legislative Order 46/97 of 8 August and Legislative Order 61/99 of 12 September).
[72] Creation of the users' card (Law Decree 198/95 of 29 July) and the Institute for Quality in Health (Decree 286/99 of 27 April). [69] Law Decree 11/93 of 15 January.
[73] Law Decree 117/98 of 5 May.
[74] Law Decree 151/98 of 5 June.

Following this ideological orientation the Local Health Systems (SLS)[75] were established[76]. These consisted of "health centres, hospitals and other services and institutions, public and private, profit or non-profit, with direct or indirect intervention, in the field of health, in a certain geographical area of a health region"[77]. The SLS assured in their geographical area the promotion of health, continuity in healthcare and the rationalisation of the use of resources.

In the field of primary care, Law Decree 157/99 of 10 May created the third generation of Health Centres, with legal personality and greater technical, administrative and financial autonomy than earlier. This was a recognition of the centrality of primary care in public health policy. Health Centres were clustered in Local Health Units, experimentally created to coordinate the activities of all providers of health services at the local level, including Hospitals, to improve access and reduce inequalities[78].

Law Decree 284/99 of 26 July established the regime to restructure hospitals according to their geographical location, capacities and technological differentiation, "through their integration in hospital centres"[79] or the creation of hospital groups, "subject to common coordination, which, of course, allowed greater profitability and efficiency in the delivery of healthcare"[80].

Law Decree 374/99 of 28 September regulated the Centres for Integrated Responsibility in hospitals, with the goal of combining the intermediate coordination and management typical of business management with the demands of a public service.

In 1999, the SNS was restructured to include two levels of territorial activity: regional and local[81]. At the regional level, Regional Health Centres were assigned the functions of planning, coordination and definition of strategies for technical assistance. At the local level, and endowed with a flexible organisation, worked the Public Health Units of local health systems and the Operative Units of Public Health of the Health Centres.

---

[75] SLS is the Portuguese acronym for 'Sistemas Locais de Saúde'

[76] Law Decree 156/99 of 10 May.

[77] In the original: "centros de saúde, hospitais e outros serviços e instituições, públicos e privados, com ou sem fins lucrativos, com intervenção, direta ou indireta, no domínio da saúde, numa determinada área geográfica de uma região de saúde".

[78] The first Local Health Unit – from Matosinhos (ULSM in the Portuguese acronym) – was created in 1999.I

[79] In the original: "através da sua integração em centros hospitalares".[72] Creation of the users' card (Law Decree 198/95 of 29 July) and the Institute for Quality in Health (Decree 286/99 of 27 April).

[80] In the original: "sujeitos a coordenação comum, o que, decerto, permitirá maior rendibilidade e eficiência na prestação dos cuidados de saúde".

[81] Law Decree 286/99 of 27 July.

This era is also marked by major changes in terms of training and careers of non-medical health professionals such as nurses[82] and professionals included in the career of Diagnostics and Therapeutics Technicians (TDT[83])[84]. The Resolution of the Council of Ministers 140/98 of 4 December defines:

> a set of measures for the development of education in the field of health, including the reinforcement of tutorial learning in community health centres and hospitals, under a curricular restructuring of the undergraduate courses of Medicine; the reorganisation of the network of nursing and health technology schools, through the tutelage of the Ministry of Education; and the reorganisation of nursing education, with the transition from general formation to a degree level (...)[85] (Ministério da Saúde).

The major changes from the '90s culminated with national claims from professionals and students due to the duality in the treatment given to professionals with a similar level of basic training, compounded by the differentiation conferred to the same professions internationally. Take the example of physiotherapy[86]. In the new millennium the Bologna Process entered into force[87], which recognises Nursing and TDT's courses as degrees, similarly to what happens at the European level.

The turn of the century coincided with new legislative acts, which proposed, among other things, permanent and exclusive contracts for physicians, the opening of new job postings for the career[88], the regulation of pharmacy and medicine[89] , the prevision of the establishment of public-public partnerships (based on public sector partners), public-private partnerships (com-

---

[82] The nursing training began in 1918. Law Decree 437/91 of 8 November approves the legal regime of the career and its regulated exercise. In 1998 the Order of Nurses (Law Decree No. 104/98 of 21 April) was established as a professional association of public law.[7]

[83] TDT is the Portuguese acronym for 'Técnicos de Diagnóstico e Terapêutica'.

[84] The formation of most of these professionals is relatively recent, although it has always existed for auxiliary health professionals who performed these functions and held training that was given to them, normally in hospitals, with the sole purpose of performing tasks without basic theoretical knowledge. In 1985 the TDT Career is created (Law Decree 384-B/85) followed by the approval of the definitions of the functional content and its technical expertise (Law Decree 123 of April 14, 1986, refererred by Leão, 2008). Later, Law Decree 320/99 of 11August regulated the professions concerned, based on the granting of a professional title as guarantee for its lawful exercise.

[85] In the original: "define um conjunto de medidas para o desenvolvimento do ensino na área da saúde, entre as quais o reforço da aprendizagem tutorial na comunidade, nos centros de saúde e nos hospitais, no quadro de uma reestruturação curricular dos cursos de licenciatura em Medicina, a reorganização da rede de escolas superiores de enfermagem e de tecnologia da saúde, através da sua passagem para a tutela do Ministério da Educação, e a reorganização da formação dos enfermeiros, com a passagem da formação geral para o nível de licenciatura (…)".

[86] The courses came to be Bi-stage courses according to Ordinance 413-A of 17 July 1998 and the 505-D Order of 15 July 1999. Schools are now authorised to confer bachelor's degrees and degree allowing the academic progress by obtaining a master's degree and PhD, thus increasing research and the quality of professionals and professions.

[87] InLaw Decree 74/2006 of 24 March and 107/2008 of 25 June.

[88] Amendment to the Statute of the SNS (Law Decree 68/2000 of 26 April).

bining public financing with private capital), as well as partnerships within the social sector (Resolution of the Council of Ministers 162/2001, of 16 November).

A new system of hospital management was approved by Law 27/2002 of 8 November and Law Decree 272 a 292/2002 of 9 and 10 December, which created the figure of Hospital-companies. These Diplomas coincide with the new political cycle that extends to 2005, with the Social Democratic Party in government in coalition with the Popular Party. In those years were adopted the measures that will change the essence of the national health system, still prevalent, despite increasing openness to the private sector. In fact, Portugal moves from a model primarily funded in the National Health Service (SNS) to another one where both public and private initiatives coexist. These are to be governed by a separate and independent entity. We refer to the Regulatory Authority for Health, created by Law Decree 309/2003 of 10 December, with the goal of framing the participation and performance of private and social workers in the provision of public health services.

This change in the design of the national health system, which Pita Barros calls the "big bang solution" given the amount and size of discontinuities made (Barros, 2007, p.115), also had an impact on the provision of primary care, through the provision of a primary care network that included a very diverse set of providers: health centres, public health units run by private bodies and private health professionals employed by the Regional Health Authority (Law Decree 60/2003 of 1 April).

The creation of a Continuing Care Network was also envisaged[90], comprising public, private and social entities, thus fulfilling the growing need of "(...) the provision of healthcare to promote, restore and maintain the quality of life, welfare and comfort of needy citizens thereof"[91] (Preamble of Law Decree 281/2003 of 8 November). This issue has gained particular prominence due to the ageing population and the social-familiar changes that increased the isolation of the elderly (Gonçalves, 2011). The network was rebuilt in 2006 under the name of National Network of Integrated Care, taking advantage of EU funds to finance its execution, and to include palliative care[92]. The need to adapt the services to the rapidly changing demographic structure of the Portuguese population had already influenced the design of various plans that guided health policy in this period, namely the 2004-2010 National Health

[89] Law Decree 204, 205 and 206/2000 of 1 September.
[90] Law Decree 281/2003 of 8 November..
[91] In the original: "(...) prestação de cuidados de saúde destinados a promover, restaurar e manter a qualidade de vida, o bem-estar e o conforto dos cidadãos necessitados dos mesmos".

Plan, the National Programme for the Health of Elderly People and the National Palliative Care Programme (Gonçalves, 2011).

Waiting lists did not undergo a process of decrease, although there were attempts to reverse the process, including the resource to overtime. In this sense the Resolution of the Council of Ministers 79/2004 of 3 June, established the Integrated Management System for Surgery Patients (SIGIC)[93], with the goal "(...) to minimise the period between the time that a patient needs a surgery and its performance, ensuring in a progressive way, that surgical treatment occurs within a maximum set of time (...)"[94].

The need to adapt services to the rapidly changing demographic structure of the Portuguese population had already influenced the design of various plans that guided the health policy in this period, namely the 2004-2010 National Health Plan, the National Programme for the Health of Elderly People and the National Palliative Care Programme[95]. These were innovative plans which placed the citizen and the services' quality in the spotlight, acknowledging the importance of primary, continuing and terminal healthcare and the interconnection between all levels of services' performance in order to prosecute healthcare, in line with the objectives set in the '70s.

Regarding the health of the elderly and under those Plans, the Resolution of the Council of Ministers 84/2005 of 27 April, approved the guiding principles for structuring the healthcare of older people and those in situations of dependency. The same document established the Commission for the Development of Healthcare for Elderly People and People in Situations of Dependency, suggesting an intervention model of continuing integrated care for people in situations of dependency.

In 2005, after the Socialist Party returned to government and thus initiate a political cycle that would continue until 2011, a wave of transfers of Hospital-companies to the state's business sector took place[96]. However this innovation in the public control of the hospitals did not reverse the previous trend of corporatisation of Health, although it incorporated the purpose of concentrating hospital units. The goal of the Government was, according to

[92] Law Decree 101/2006 of 6 June.[89] Law Decree 204, 205 and 206/2000 of 1 September.
[93] SIGIC is the Portuguese acronym for 'Sistema Integrado de Gestão de Inscritos para Cirurgia'.
[94] In the original: "(…) minimizar o período que decorre entre o momento em que um doente carece de uma cirurgia e a realização da mesma, garantindo, de forma progressiva, que o tratamento cirúrgico ocorre dentro de um tempo máximo estabelecido (…)".
[94] Order of 8 June 2004 (Regulatory Circular No. 13/DGCG 2 July 2004),, Regulatory Circular 13/DGCG of 2 July 2004, Order of 15 June 2004, and Regulatory Circular 14/DGCG of 13 July 2004.
[95] Order of 8 June 2004 (Regulatory Circular No. 13/DGCG 2 July 2004),, Regulatory Circular 13/DGCG of 2 July 2004, Order of 15 June 2004, and Regulatory Circular 14/DGCG of 13 July 2004.
[96] Law Decree 233/2005 of 29 December.

its own Minister Correia de Campos, "(...) to enable economies of scale, productive specialisation and quality (...) to gain accountability and managerial autonomy"[97] (Campos, 2008, p.42). This principle of concentration was also applied to health centres after the revocation of the organisation of 2003 and parts of the 1999[98 99], as well as maternity hospitals[100]. Regarding health centres, Normative Order 9/2006 of 16 February, regulated the establishment and implementation of Family Health Units (USF)[101]. These were regarded as "basic organisational cells to provide individual and family healthcare, consisting of a multidisciplinary team with organisational, functional and technical autonomy, integrated in a network with other functional units of the health centre". Thus, USF's should guarantee the accessibility, continuity and interconnection of healthcare.

Continuing the legislative production which aimed to ensure seniors' quality of life, Normative Order 30/2006 of March 31 was published. This Order instituted the rules for the implementation of establishments corresponding to nursing homes, i.e. structures built with similar objectives to those of nursing homes, yet different, with a distinct type, in what regards its capacity, scope and organisation model and profit.

With the entry into force of the Restructuring Programme for the State Central Administration (PRACE[102])[103], the Ministry of Health was reorganised in order to:

> *(...) introduce a new organisational model based on the rationalisation of structures, strengthening and homogenisation of strategic and support functions to governance, closeness of citizens to Central Administration and devolution of powers to the local or regional level[104] (Law Decree 212/2006 of 27 October).*

Most changes concerned the creation of the Central Administration of the Health System, a body designed to ensure integrated management of the National Health Service resources, with enhanced competences from Regional

[97] In the original: "(…) permitir ganhos de escala, especialização produtiva e qualidade (...) para ganhos de responsabilização e autonomia gestionária".[93] SIGIC is the Portuguese acronym for 'Sistema Integrado de Gestão de Inscritos para Cirurgia'.

[98] The reinstatement of the Law Decree 157/99, of 10 May was implemented through the Law Decree 88/2005 of 3 June, revoking the Law Decree 60/2003 of 1 April.[94] Order of 8 June 2004 (Regulatory Circular No. 13/DGCG 2 July 2004),, Regulatory Circular 13/DGCG of 2 July 2004, Order of 15 June 2004, and Regulatory Circular 14/DGCG of 13 July 2004.

[99] Reset the organisation of 1999, the Family Health Units are revived by the Decree 9/2006 of February 16.

[100] Decree 727/2007 of January 15 and Decree 7495/2006 of 14 March.

[101] USF is the Portuguese acronym for 'Unidades de Saúde Familiares'.

[102] PRACE is the Portuguese acronym for 'Programa de Reestruturação da Administração Central do Estado'.

[103] Resolution of the Council of Ministers 39/2006 of 21 April.

Health Administrations and the Directorate General of Health. The major changes are described in Law Decree 200/2006 of 25 October, which "establishes the procedural framework for the dissolution, merger and restructuring of government services and rationalisation of staff". Thus, printing large changes to the SNS, from the extinction of health services, such as extensions of health centres; the merger of hospitals and health centres; and the restructuring of bodies with management functions.

In 2007 and 2008 additional attempts of hospital and health centres' corporatisation took place[105], justified by the need to consolidate an agile and flexible organisation that would meet the recommendations of the European Union and the expressions of interest from some health facilities[106]. The emergency units were reorganised[107] and the groups of health centres were structured[108], although they only started operating in 2009[109].

Measures to solve other immediate problems were also taken in 2008, such as waiting lists for surgery[110], and quality of services[111].

On measures of social protection for the elderly and to reduce inequalities and improve the quality of life of this group, Law Decree 252/2007 of 5 July created a system of additional health benefits for citizens covered by the supplement of solidarity.

[103] Resolution of the Council of Ministers 39/2006 of 21 April.
[104] In the original: "(...) a introdução de um novo modelo organizacional que tem por base a racionalização de estruturas, o reforço e a homogeneização das funções estratégicas de suporte à governação, a aproximação da Administração Central dos cidadãos e a devolução de poderes para o nível local ou regional".
[105] Law Decree 50-A/2007 of 28 February, Law Decree 326/2007 of 28 September, Law Decree 23/2008 of 8 February, Law Decree 180/2008 of 26 August and Law Decree 183/2008 of 4 September
[106] Preamble of the Law Decree 50-A/2007 of 28 February.
[107] Decree 5414/2008 of 28 January.
[108] Law Decree 28/2008 of 22 February.
[109] Decree 275/2009 of 18 March.
[110] Decree 45/2008 of 15 January.
[111] Order 24101/2007 of 22 October, Notice 12/2008 of 23 January, Decree 1529/2008 of 26 December, and Order 14223/2009 of 24 June (National Strategy for Quality in Health).
[112] In the original: "na definição e execução de todas as políticas e acções da União é assegurado um elevado nível de protecção da saúde (…). A acção da União, que é complementar das políticas nacionais, incide na melhoria da saúde pública, bem como na prevenção das doenças e afecções humanas e das causas de perigo para a saúde física e mental. Esta acção abrange a luta contra os grandes flagelos (…) e a vigilância das ameaças graves para a saúde com dimensão transfronteiriça, o alerta em caso de tais ameaças e o combate contra as mesmas (…). A União incentiva a cooperação entre os Estados-Membros (…). A União e os Estados-Membros fomentam a cooperação com países terceiros e as organizações internacionais competentes no domínio da saúde pública" (Esteves and Pizarro, 2008).

Under EU policy it is important to mention that in 2007 the Lisbon Treaty highlights in Title XIV, Art. 168 the importance of health for the EU:

> *in the definition and implementation of all Union policies and activities a high level of health protection is ensured (...). The Union's action, which shall complement national policies, is directed towards improving public health, as well as the prevention of diseases and human illness and disease and the causes of danger to physical and mental health. Such action shall cover the fight against the major health scourges (...) and the surveillance of serious health threats with a transnational dimension, early warning of such threats and the fight against them (...). The Union shall encourage cooperation between Member States (...). The Union and the Member States shall foster cooperation with third countries and the international organisations competent in the field of public health (Esteves and Pizarro, 2008)*[112].

This document, along with the International Health Regulations - IHR (2005)[113] - brought changes at the level of national decision making, namely to the National Institute of Medical Emergency, the definition of the emergency network and hospital emergencies, the definition and improvement of surveillance, alert and response mechanisms, as well as the increase in primary care. All these improvements imprinted quality to health, of which we should emphasise the efficacy of the medical emergency number 112.

In order to facilitate the flow of clinical information and citizens' access to specialist appointments, a Regulation for the integrated referral system and the management of access to the first hospital specialist appointments in the SNS institutions was approved (Decree 615/2008 of 11 July). Called 'Consulta a Tempo e Horas' (CTH)[114], it intended to improve the relationship and interconnection between health centres and the SNS' hospitals, through a single, integrated and updated database of registered users. The maximum guaranteed response times (TMRG)[115] was set for "access to appointments and home care health centres, hospital outpatient services, scheduled surgery and certain complementary diagnostic and therapeutic within cardiology" (Decree 1529/2008 of 26 December).

[113] Transposed into national law by Notice No. 12/2008 of 23 January 2008. IHR (2005) was issued by the World Health Organization and the Directorate General of Health, the body responsible for its implementation in Portugal.

[114] ICTC is the Portuguese acronym for appointment on time.[106] Preamble of the Law Decree 50-A/2007 of 28 February.

[115] TMRG is the Portuguese acronym for 'tempos máximos de resposta garantidos'.

In 2009 a restructuring of health services takes place, which aimed "to establish to the operational services of public health a technical and flexible organisational model, to ensure a swift and effective protection of the health of populations"[116] (Law Decree 81/2009 of 2 April). The operation of the services would go through two levels of activity: regional, functioning as a structure of surveillance and health monitoring, in a comprehensive perspective of epidemiologic surveillance, health planning and formulation of regional strategies; and the local level, also acting as a structure for surveillance and monitoring of the population's health, but providing a flexible organisation that would maintain the proximity of services to users. These measures should be in accordance with the provisions of the World Health Organisation, specifically the RSI[117] (2005), and those of the European Union. In order to achieve the desired reform, information systems were implemented in healthcare centres "constituting an element of support for the professionals' activity and the pursuit of various objectives"[118] (Decision 18846/2009 of 14 August).

On the 24 June 2009, the National Strategy for Quality in Healthcare was published, with a time horizon of implementation of five years and with ten years for consolidation. In this context, the recognition of the medical career as a special career in Public Administration was included, given the "specificity, functional content and technical independence"[119] of the services provided.

During that year, according to the ongoing reform arising from the PRACE, investment in health tended to be non-existent, except with regard to the expansion of the Network of Integrated Care, particularly those provided under the 2007-2016 National Mental Health Plan (Resolution of the Council of Ministers 49/2008 of 6 March) and on the improvement of primary care, namely in the installation of Family Health Units. The same reform created the Shared Services of the Ministry of Health, EPE[120], with the goal of managing the provision of services, avoiding duplication in support activities and the multiplication of costs.

The assessment made by the World Health Organisation on the implementation of the 2004-2010 National Health Plan was positive in most

[116] In the original: "estabelecer para os serviços operativos de saúde pública um modelo organizacional e técnico flexível, com vista a garantir de forma célere e eficaz a protecção da saúde das populações".
[117] RSI is the Portuguese acronym for the Social Insertion Income ('Rendimento Social de Inserção')
[118] In the original: "constituindo um elemento de apoio à actividade dos profissionais e ao prosseguimento dos diversos objectivos".
[119] In the original: "especificidade, conteúdo funcional e independência técnica".
[120] Law Decree 19/2010 of 22 March.

factors, but warned to the need to achieve the goals set out in the 2011-2016 National Health Plan in respect to equity in access to healthcare and the quality of services (Portal da Saúde, 2010).

But the economic crisis experienced since 2008 instructs decision-makers to reduce and contain costs and stresses what was foreseen in the PRACE programme. Founded on the need for fiscal consolidation, the government required to all health services integrated in the State's business sector and the general government sector to draw up a plan to reduce expenditure for 2010 (Decision 10760/2010 of 29 June). Nevertheless, the support to the elderly remained. An example of this orientation consists of Order 3020/2011 of 11 February, which states that:

> *RNCCI teams' coordinators guarantee, in units of long-term hospitalization and maintenance (ULDM), priority admission for users coming directly from nursing homes with cooperation agreements with the Social Security, up to a maximum of 10% of its capacity.*[121]

Still, with the measures taken by the Government to overcome the economic and financial weakness of the country, particularly with the implementation of the Stability and Growth Pact (PEC)[122], the situation became untenable. This was aggravated by the unsettled political situation that led to a change in government, succeeding the Social

Democratic Party (PSD)[123] to the Socialist Party (PS)[124], and the need for foreign aid became an imperative. In May 2011 the Memorandum of Understanding on Specific Economy Policy Conditionality – MoU, was signed in Lisbon between representatives of the Portuguese Government, the European Commission, the European Central Bank (ECB) and the International Monetary Fund (IMF), with the consequent Programme of Economic and Financial Assistance (EFAP). The latter included a set of restrictions on the financing of the National Health Service and provided measures to extend costs to the users (Governo de Portugal, 2011). From this moment on, until 2013[125], the decision making in all ministries, and specifically the Ministry of Health, had the maximum objective of ensuring sustainability, rationalise, restructure, reduce, and extinguish, as can be read in most preambles of the legislative documents.

---

[121] In the original: "as equipas coordenadoras da RNCCI garantem, nas unidades de internamento de longa duração e manutenção (ULDM), a admissão prioritária de utentes provenientes diretamente de lares de idosos com acordos de cooperação com a Segurança Social, até ao máximo de 10% da sua capacidade".
[122] PEC is the Portuguese Acronym for 'Programa de Estabilidade e Crescimento'.
[123] PSD is the Portuguese acronym for 'Partido Social Democrata'.
[124] PS is the Portuguese acronym for 'Partido Socialista'.
[125] We end our analysis in 2013, but we shall safeguard that the programmes set are still in force.

Arising from the Memorandum, the generalisation of electronic prescribing and electronic invoicing was seen as an effective way to dematerialise the cycle of providing-prescription-conferencing and generate management information that would enable a strict control of the National Health Service's expenditure.

The restructuring of health facilities continued, with the change of status of the Hospital Centres and the Clusters of Health Centres, which were renamed Local Health Units. The recruitment of health professionals was hampered, as it became dependent on tutelage's prior consent, upon proof of extreme necessity. Following the priority given to primary healthcare, Law Decree 93/2011 of 27 July allowed the hiring of "medical experts in general and family medicine indefinitely engaged in public functions (...) for the exercise of functions in health centres"[126] in the 42 hours' regime (in spite of the 35 hours per week which constituted the working period of the special medical career). Order 10428/2011 of 18 August states that:

> *the employment of physicians by type of service delivered, by all institutions and services of the SNS, observes the legal terms applicable to public procurement and is admissible only in cases of urgent necessity and after having first exhausted all general and special mobility mechanisms foreseen by law*[127].

This situation is replicated to all healthcare professionals and all services , as well as cost reduction with overtime work in health services[128] (Decision 10429/2011).

The creation and implementation of the Social Emergency Programme (PES)[129], which began in October 2011 and remains in force until December 2014, pays special attention to the family and the elderly. Within the measures to be taken in what concerns the elderly, several actions of improvement and facilitation stand out, of which we stress the update of minimum pensions, the stock of medicines, the pharmacist bank, pharmacies with social responsibility, home support, telecare, night centres, signalling situations of isolation, better access for the elderly to healthcare, continuing care and better regulation of nursing homes.

---

[126] In the original: "especialistas em medicina geral e familiar contratados em funções públicas por tempo indeterminado (…) para o exercício de funções em centros de saúde".

[127] In the original: "a contratação de médicos através da modalidade de prestação de serviços, por todas as instituições e serviços do SNS, observa os termos legais aplicáveis à contratação pública e só é admissível em situações de imperiosa necessidade e depois de se terem esgotado previamente todos os mecanismos de mobilidade, geral e especial, previstos na lei".

[128] Order 12083/2011 of 15 September.

[129] PES is the Portuguese acronym for 'Programa de Emergência Social'.

The prescription of Supplementary Diagnostic and Therapeutic in hospitals now have to be implemented in the same service, or using the "outsourcing of specialised external entities in the public sector, with reference to the price list of the SNS or the private and social sector, with reference to the agreed price list in the sector concerned"[130] (Order No. 10430/2011). Prescriptions and medicine prescriptions made by physicians in Health Centres' Clusters[131], shall be monitored and regulated by the Regional Health Authority in terms of volume and value[132].

In the political conjuncture in analysis, the system of user fees and exemptions suffered new regulation and review (Law Decree 113/2011 of 29 November). The exemptions were allocated only to relevant clinical situations of higher risk for health or situations of economic failure and user fees have been updated. Indeed, user fees introduced in 1992[133] were being subject to periodic updates and situations of exemption were defined as well as target medical interventions. While there have been periods of decline in its scope, these rates have tended to increase with respect to the amount payable by reference to the rate of inflation.

In this line of policy exception compared to primary care, Law Decree 253/2012 of 27 November makes the fourth amendment to the Decree[134] founder of the Clusters of Health Centres from the National Health Service. It defines the maximum number of clusters to be created, changing the geo-demographic criteria for its implementation, the items relating to the appointment of executive directors and the composition of clinical and health advice:

1 - The maximum number of ACES is fixed at 74 (...)

2 - The geographical demarcation (...) must correspond to NUTS III, a grouping of counties or a county, taking into account the need for a more effective combination of available resources and the following geo-demographic factors: The effects of this change are exemplified by Ordinance No. 394-A/2012 of 29 November, which rearranges the Clusters integrated into Regional Health Center, IP, reducing them from 14 to 6 units.

In the course of 2012, Organic Laws of the various bodies of the Ministry of Health were approved, enhancing its responsibilities. Take Infarmed - National Authority of Medicines and Health Products, IP and INEM, IP for example . The latter was reorganised in order to acquire "greater consistency

[130] In the original: "subcontratação de entidades externas especializadas do sector público, tendo como referência a tabela de preços do SNS, ou do sector privado e social, tendo como referência a tabela de preços do sector convencionado".

[131] ACES is the Portuguese acronym for 'Agrupamentos de Centros de Saúde'.

The effects of this change are exemplified by Ordinance No. 394-A/2012 of 29 November, which rearranges the Clusters integrated into Regional Health Center, IP, reducing them from 14 to 6 units.

In the course of 2012, Organic Laws of the various bodies of the Ministry of Health were approved, enhancing its responsibilities. Take Infarmed - National Authority of Medicines and Health Products, IP[136] and INEM, IP for example[137] . The latter was reorganised in order to acquire "greater consistency and responsiveness in their duties (...) eliminating redundancies and substantially reducing their operating costs"[138] (Ordinance 158/2012 of 22 May). Its organisational structure is replaced by central departments and geographically dispersed services (Regional Office North, Centre and South).

The European Parliament and the European Commission declared 2012 the European Year of Active Ageing and Solidarity between Generations[139]. Subsequently, Portugal elaborated a Programme of Action (Governo de Portugal, 2012), in accordance with Resolution of the Council of Ministers 61/2011 of 22 December. Initiatives covering the national territory were developed, which involved the Institute of Social Security, IP; the Institute of Employment and Vocational Training, IP; the Directorate General for Innovation and Curriculum Development; the General Directorate of Health; the National Institute of Rehabilitation, IP; and the Portuguese Institute of Sport and Youth, IP, as well as counties, municipalities, local organisations, civil society organisations and individual citizens. Among the operating axes we highlight health, welfare and living conditions.

State budgets approved for 2012 and 2013 show widespread contention in what concerns remuneration, career progression, reduction of workers, reaching human resources and health expenditure. The reforms of the elderly were also changed, with implications for this age group in terms of quality of life and ability to access healthcare and purchase medicines.

---

[132] Order 12950/2011 of 28 September.
[133] Law Decree 54/92 of 11 April.
[134] Law Decree 28/2008 of 22 February.
[135] In the original: "1 - É fixado em 74 o número máximo de ACES (…) 2 - A delimitação geográfica (…) deve corresponder a NUTS III, a um agrupamento de concelhos ou a um concelho, devendo ter em conta a necessidade da combinação mais eficiente dos recursos disponíveis e os seguintes fatores geodemográficos: a) O número de pessoas residentes na área do ACES; b) A estrutura de povoamento; c) O índice de envelhecimento; d) A acessibilidade da população ao hospital de referência; 3 - Podem ainda ser criados ACES correspondentes a grupos de freguesias, ouvido o município respectivo".
[136] Law Decree 46/2012 of 24 February.
[137] Law Decree 34 /2012 of 14 February.
[138] In the original: "maior coerência e capacidade de resposta no desempenho das funções (…) eliminando redundâncias e reduzindo substancialmente os seus custos de funcionamento".
[139] Decision 940/2011/UE, of 14 September 2011.

Still, in what concerns the sector of health, the elderly benefited from some emergency measures. Ordinance 67/2012 of 21 March standardised existing legislation and defined the conditions for the organisation, operation and installation of residential facilities for the elderly. Showing the Assembly of the Republic's concern about the elderly, and taking into account the events resulting from the isolation of this population, several initiatives were adopted, which should:

> 1- Invigorate and encourage screenings of the elderly population's health status.
>
> 2- Revise the law relating to the social network (...) within the assigned role (...) to proximity bodies.
>
> 3- Encourage volunteering neighbourhood (...) and in close coordination with the security forces and the social security services, with the purpose of identifying elderly people at risk of isolation, abandonment and violence, and refer to the social network (...) taking into consideration the will and autonomy of the elderly (...).
>
> 4- Value active ageing (...) ensuring an effective combat to the isolation of the elderly and encouraging their physical and mental health.
>
> 5- Generalise the use of technology, with particular emphasis on telematics, ensuring the elderly's security, surveillance, electronic monitoring and alarm[140].

In 2013 the National Pharmacy and Therapeutics Committee (CNFT)[141] was created[142], which established the compulsory use of the National Formulary of Medicine and the compliance with the protocols of medicine use by National Health Service's prescriber professionals. By the end of the year, Ordinance 335-A/2013 of 15 November points to Slovenia, Spain and France as a reference for setting medicine prices, for being the "European countries with lower medicine price levels"[143]. This measure was the culmination of a

[140] In the original: "1 - Dinamize e incentive rastreios da situação de saúde da população idosa. 2 - Proceda à revisão da legislação relativa à rede social (…) no âmbito do papel atribuído (…) aos organismos de proximidade. 3 - Incentive o voluntariado de vizinhança (…) e em estreita articulação com as forças de segurança e os serviços da segurança social, com o fim de identificar pessoas idosas em situação de isolamento, abandono e violência, e encaminhar para a rede social (…) tendo em consideração a vontade e autonomia da pessoa idosa (…). 4 - Valorize o envelhecimento ativo (…) assegurando um combate efetivo ao isolamento da pessoa idosa e favorecendo a sua saúde física e mental. 5 - Generalize a utilização da tecnologia, com especial relevo para a telemática, garantindo a segurança, vigilância, monitorização eletrónica e alarme das pessoas idosas".

[141] CNFT is the Portuguese acronym for "Comissão Nacional de Farmácia e Terapêutica".

[142] Order 2061-C/2013 of 1 February.

[143] In the original: "países europeus com nível de preços de medicamentos mais baixos".

political process on medicine, which started in 1984 with the establishment of standards that set out the State's contribution, a process which has undergone changes and updates along with the process of introduction of generics in the Portuguese market according to Community Directives. This route had a relatively linear development until 2005, but the worsening economic situation in the country has led to the update of the prices of reimbursed medicines and the reduction of selling prices to the public. A "reduction of 5% of the maximum threshold by the state"[144] also took place, as well as a rise in financial contributions for pensioners with lower incomes, the elimination of the 10% increase in the contribution to generic medicines[145] and the allowance to sale products not subject to medical prescription outside pharmacies[146]. In this context we would also make reference to a measure which has caused some controversy in 2010, that provided for the distribution of medicines to the public in individualised quantity in pharmacies installed in hospitals[147] and the adequacy of contributions according to users' income[148].

In what concerns non-emergency transport of patients, Ordinance 142-A/2012 of 15 May[149] provides that "it is ensured by ambulances and passenger vehicles"[150], since "like the scheme already in practice in many European countries, there are many situations in which patient transport does not necessarily mean that it has to be done by ambulance (...) simple passenger vehicles may be used"[151] whenever the clinical situation of the patient does not inspire differentiated care during transport. Ordinance No. 142-B/2012, states that "non-emergency patient transport that is instrumental to the achievement of health services, within the SNS, is free of charge to the user when the clinical situation warrants, and provided that the respective economic failure is proven"[152]. The medical conditions covered are those considered of higher risk for health. This legislative norm concerning the payment of transport has existed since 2010[153] and enclosed a process of successive regulations since 1992, where payment of transportation was being sharply restricted.

[144] In the original: "redução em 5% no escalão máximo de comparticipação do Estado".
[145] Law Decree 129/2005 of 11 August.
[146] Law Decree 134/2005 of 16 August.
[147] Ordinance 455-A/2010 of 30 June.
[148] Ordinance 1319/2010 of 28 December.
[149] This document has undergone rectification through Rectification Statement 36/2012.
[150] In the original: "é assegurado por ambulâncias e por veículos ligeiros de transporte simples".
[151] In the original: "à semelhança do regime já praticado em diversos países europeus, existem muitas situações em que o transporte de doentes não implica necessariamente que o mesmo tenha de ser efetuado em ambulância, podendo ser utilizado (…) veículos simples de passageiros".

Following the Social Emergency Program (PES)[154], and in a context of substantial increase in the number of elderly, Ordinance 38/2013 of 30 January establishes the conditions for the installation and operation of the home care services, in order to meet their needs.

In terms of support for the creation of infrastructures for the elderly, the 'Programa Modelar'[155], on the grant of financial assistance by the Regional Health Authorities, IP to Collective Private Nonprofit People, under the National Network of Integrated Care, states that "in exceptional circumstances and subject to prior authorisation by the responsible member of the Government"[156] should "enable the allocation of buildings constructed and facilities made by attribution of financial support[157] to structures for housing and residence for the elderly" (Decree 168/2013 of 30 April).

In May 2013 the final version of the new 2012-2016 National Health Plan (Direcção-Geral de Saúde, 2013) was published, aiming to be the "foundation for the health system of the 21st Century"[158], with four strategic axes: "[c]itizenship in Health; Equity and Access to proper Healthcare; Quality in Healthcare; Healthy Policies"[159]. It also states "[t]he Health Systems are permeable to external threats and socio-demographic and economic characteristics"[160], expressing that demographic changes, such as ageing, should be expressed in decision making on health.

In order to strengthen the procedures required for the maintenance of the National Health Security, Law Decree 137/2013 of 7 October has changed the rules and principles of functions of an operating nature of public health and services' organisation, based in the Centres' Clusters, due to "the need to adjust the skills of the public health services of operating nature, in order to guide its intervention in the pursuit of the Core Public Health Operations, as defined by the World Health Organization".

---

[152] In the original: "o transporte não urgente de doentes que seja instrumental à realização das prestações de saúde, no âmbito do SNS, é isento de encargos para o utente quando a situação clínica o justifique e desde que seja comprovada a respetiva insuficiência económica".
[153] Despacho 19264/2010 de 29 de dezembro
[154] PES is the Portuguese acronym for 'Programa de Emergência Social'.
[155] Ordinance 168/2013, of 30 April.
[156] In the original: "em situações excepcionais, e mediante autorização prévia do membro do Governo responsável".
[157] By the 'Programa Modelar'.
[158] In the original: "fundação para o Sistema de Saúde do Século XXI".
[159] In the original: "[c]idadania em Saúde; Equidade e Acesso adequado aos Cuidados de Saúde; Qualidade em Saúde; Políticas Saudáveis".
[160] In the original: "[o]s Sistemas de Saúde são permeáveis a ameaças exteriores e às características sociodemográficas e económicas".

In October 2013, with Law Decree 138/2013, the Ministry of Health defines the articulation procedures of the Ministry and the institutions and services of the National Health Service, with private institutions of social solidarity. In the context of economic constraint and fusion and concentration of health services, this legislative document (Law Decree 138/2013) may generate uncertainties. It reflects a backlash against the prevailing trend since the implementation of democracy in Portugal. In the document it can be read that the Ministry of Health "establishes the regime to restore the hospitals object of the measures provided in Law Decrees No. 704/74 of 7 December and 618/75 of 11 November, currently managed by establishments or services of the SNS, to the 'Misericórdias'[161]. These directives of 2013 remain in 2014, as evidenced by Law No. 83-C/2013 of 31 December 2013, the State Budget Law.

1.3. The State and Health: political stability, resources and Welfare State

As we saw in the previous pages, the route of healthcare policies in Portugal in the twentieth century has been subject to different constraints that shaped the way the promotion of health services was seen and executed, resulting in a complex and multifaceted process. In this process, the state played a key role, decisively influencing the articulation of providers, the breadth and quality of services. The legislation enacted expresses this influence, allowing the identification of the main options of the central government in terms of health in a long-term perspective. Having considered the primary legislation of the sector between 1910 and 2013, we realised that health policies have been subject to several constraints attached to the figure of the State and its importance as an actor in the different political, economic and social contexts that characterise the contemporary Portuguese history.

In this sense, when projecting the evolution of health policies in Portugal in the twentieth century we take the State, its configuration and its resources, as a key element. Thus, we identified six phases in health policies in Portugal (**Table 1**), which differ in terms of three factors or conditions:

1- the degree of political stability;
2- the existence of public financial resources; and
3- the configuration of the welfare state.

[161] In the original: "estabelece o regime de devolução às Misericórdias dos hospitais objeto das medidas previstas nos Decretos-Leis nºs 704/74 de 7 de dezembro, e 618/75 de 11 de novembro, atualmente geridos por estabelecimentos ou serviços do SNS".

Table 1.
Health Policy in Portugal. Attempted periodization (1910-2013)

	Public financial resources	Political stability	Substantial intervention of State
1910 to 1926	NO	NO	YES
1926 to 1933	NO	NO	NO
1933 to 1971	YES	YES	NO
1971 to 1995	YES	YES	YES
1995 to 2011	NO	YES	NO
2011 to 2013	NO	YES	NO

Source: Author's elaboration

By political stability we mean the existence of the necessary governance conditions for the design and implementation of public policies in the medium or long term. The existence of public financial resources refers to the financial capacity of the state to promote public policies that it considers as priorities. State intervention concerns the role it assumes in its relation with economy and society, largely reflecting the model adopted for the provision of public policies. Indeed, if on the one hand, the political stability and the existence of financial resources are important conditions in the definition of a health policy, on the other, setting the role of the state determines the model of healthcare.

The first phase covers the years 1910 to 1926, which corresponds to the First Republic and can be identified with the desire to provide the State with mechanisms for effective intervention in the field of Health. Although the role of the central government was not consensual, the fact that the health of populations has been taken as a symbol of the regime had the merit to make it a permanent aspiration which could not, however, have a very effective implementation. This failure is mainly explained by the known political instability of the period concerned, to which we can add the constant shortage of public funds, essential to meet many of the Republican proclamations in this matter.

The period from 1926 to 1933 corresponds to the Military Dictatorship. Besides the previous financial difficulties, conditions of political stability that allowed the design and implementation of a coherent and sustainable policy in the sector ceased to exist, due to disputes within the regime and its

transience. Health was no longer considered a political priority and the resources available were mainly directed to the maintenance of order. Ensuring healthcare by the state remained distant from the ideology of the military in power in this period (Rosas, 1994).

The third phase begins with the 'Estado Novo' and extends until 1971, the year of the 'Gonçalves Ferreira' Reform. Although this is a very extensive period and subject to significant cyclical variations, political stability was ensured, having recorded an increase in public funding, which especially after the accession of Portugal to the EFTA, were substantially higher than those in the recent past (Rosas, 1994). Over these years a conception of the State based on subsidiary intervention in economic and social terms prevailed, which did not decrease its role in the implementation of specific measures, although it withdrew the initiative, and oddly enough for the first time, had the ability to exercise healthcare.

Between the Reforms of 1971 and 1995 takes place a fourth phase. In the final stretch of the 'Estado Novo' and especially since the establishment of democracy, the State resumed a central role in the definition and implementation of health policy. Thus developing a network of primary and hospital care, which from 1979 will characterise the National Health Service (SNS). In fact, the social protection systems were consolidated, within a context of favourable economic conjuncture coinciding with the integration in the European project, as well as political stability (despite the regime change in 1974 and the transition between 1974 and 1976), contributing both to provide structural conditions of the consolidation of the welfare state (Barreto, 1995; Guillén, et al., 2003; Pereirinha and Nunes, 2006).

A penultimate stage, which begins in 1995 and extends until 2011 (although from 2006 the economic crisis has some influence) is characterised by political stability and a tendency of State's disengagement in health, along with the phenomenon of containment verified by many other Western political partners, despite the role of the central government in terms of healthcare (Pierson, 2006). This phenomenon, involving the upgrading of social systems to changing realities, such as ageing of the age structures and weak levels of economic growth, can focus on three dimensions: re-commercialization, cost reduction and re-calibration (Pierson, 2006). Portugal, sharing many of the socioeconomic factors behind the need for restraint, was no exception to this trend and in the second half of the '90s began a process of adjustment (Barreto, 2005), which in the case of Portugal was aggravated by the lack of maturation of its Welfare State, and thus the adjustment to new realities gradually became more difficult and inevitable (Pierson, 2006; Rodrigues, 2002; Adão e Silva, 2002).

The last phase began in May 2011 with the signing of the Memorandum of Understanding on Specific Economic Policy Conditionality between representatives of the Portuguese Government, the European Commission, the European Central Bank (ECB) and the International Monetary Fund (IMF). This phase is characterised by the loss of sovereignty by the Portuguese State, bound to the achievement of goals set by external institutions. Decisions of restrictive character predominate in the health sector, less pronounced in primary care and in continuing and palliative care. A profound restructuring of departments and agencies within the National Health Service and the Ministry of Health takes place. The number of health facilities and human resources is reduced and mega health units are created by merging/grouping health centres and hospitals. There is an increase in healthcare costs for users. This phase is represented by the use of the words and expressions 'Crisis', 'Restructuring', 'Sustainability of the National Health Service' and 'reductions', and is also a period of State's disinvestment in health and civil society dissatisfaction.

2 Demographic changes and health status in Portugal between 1970 and 2013

Maria João Guardado Moreira, Filipa Castro Henriques

The Portuguese society has undergone profound changes over the twentieth century. The country began the century with a monarchy, went through the establishment of a Republic, through a dictatorial regime that ended in 1974 due to a revolution[1] that was one of the most decisive events. And, in 1986, Portugal signed the accession to the then European Economic Community (EEC). Alongside these political events, other factors contributed to the (re)configuration of society. From the '70s on the country knows a process of modernisation and social change, gradually approaching the levels of modernisation and social conditions of life of other European countries. In fact, the improvements in population´s the well-being took place at different times, sometimes intelligible only in the long-term, reflect the interdependence between population dynamics, quality of life and public policies, particularly those implemented in healthcare.

At the beginning of twenty first century, the cycles of long and stable life, with null and negative natural growth continuously since 2009, characterise the dynamics of the Portuguese population, both nationally and regionally. The continuous decrease in fertility levels and the decline of mortality levels, not only at early ages but also in the elderly groups contribute to the ageing of age structures. In fact, the issue of ageing has become an essential aspect of today's reality, with consequences in the adaptation of healthcare to new types of population, to the creation of support services for the elderly, and to the reshaping of the pension and social security system. On the contrary, emigration, immigration and internal migrations experienced large changes in volume, intensity and characteristics, making it the key variable in explaining the new demographic dynamics.

However this picture has changed. Since the end of the twentieth century. The number of inhabitants has been gradually reducing (due to the sustained decline in fertility levels and to a context of low mortality) and there has been an increasing dependence on migration. Now, according to the latest data released by INE (INE, 2014), since 2010 the number of residents in the country decreased by about 145,000 people, whether through natural balances whether through migration. Both indicators have been accumulating losses since 2011 as a result of both the increase in emigration flows and a decrease in immigration[2].

Alongside the negative evolution of natural and migration balances, the process of demographic ageing of the Portuguese population, both at the

[1] "Revolução dos Cravos"- Carnations Revolution.

[2] Between 2010 and 2013 there was a natural balance (difference between total number of births and deaths in a given year or period) of less 47,505 people and a net migration (the difference between the total number of immigrants and emigrants in a given year or period) of less 97,915 people (INE, 2014).

base and at the top[3], has worsened in recent years. According to the ageing ratio[4], it has risen from 129.6 elderly per one hundred young people in 2011 to 133.5 in 2013 (PORDATA, 2014).

In order to perceive the different impacts of the ageing phenomenon, particularly in terms of the health system, we will outline a summary of the chronology of the evolution process. We will particularly focus on the period between the '70s of last century to the present day, analysing the characteristics and specifics of the demographic and epidemiological model of the Portuguese population.

2.1. Trends

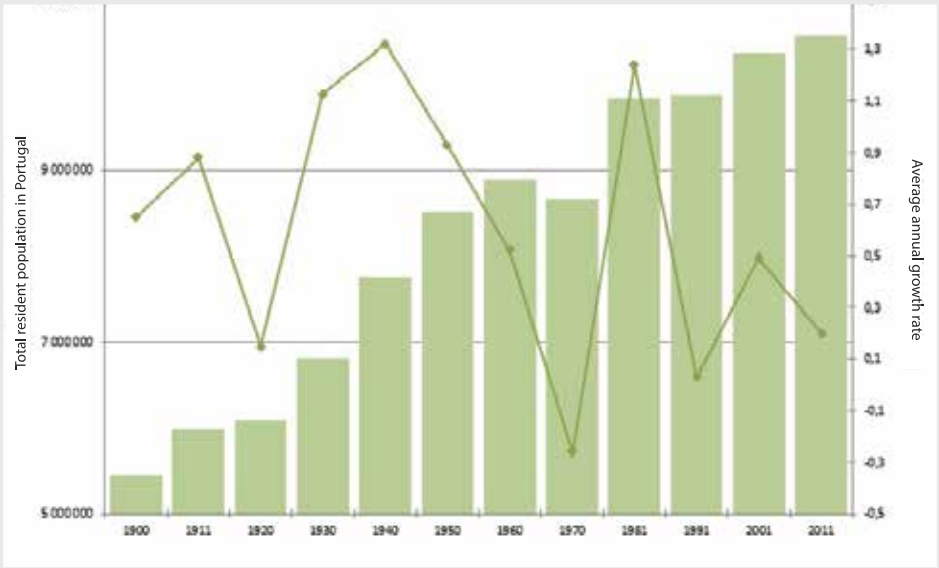
In 1970, 8,611,125 people were considered in census, less 278,267 individuals than in the previous census. This difference is the result of a strong migratory wave that went mainly to the more industrialised Europe. It is estimated that between the mid-'60s and mid-'70s about 1 million and 200 thousand Portuguese have left the country (Baganha and Marques, 2001; Cheetahs and Rose, 2010). This trend was reversed in the next decade due to the Revolution of April 1974, which opened the door to the decolonisation movement in the Portuguese territories in Africa. About 700 thousand Portuguese returned, to which we should add the return of some migrants (**Figure 2.5**). As a result, the number of residents increased 2.6 percent in 1974 and 4.4 percent in the following years (Henriques and Rodrigues, 2008). The impact of this return was felt, not only at the level of demographic change, mitigating the effects of the exodus of thousands of young people at working age in the previous decade, but also in economic and social terms. That effect, however, was not felt evenly throughout the territory. Mainly the urban areas, and the more coastline rather than the inland of the country benefited from this return.

The following censuses registered once again population increases, although modest (**Figure 2.1**). This was the result of the fast trend approaching Portugal to the attitudes towards fertility and mortality that characterised other European countries.

Indeed, the Revolution of 1974 not only led to a change in political regime and greater openness of society and economy to foreign investment and influence, but also led to an improvement in the living conditions of the populations, the development of the welfare state, the creation of the

[3] It is said that the population is ageing at the base when the percentages of young people are declining, and that it is getting older at the top, when the percentages of elderly are increasing.
[4] The ageing ratio is a ratio that compares the number of elderly by each one hundred of youth.

Figure 2.1.
Growth trend of the Portuguese population, 1900-2011



Source: *Recenseamentos Gerais da População*, INE, 1900 to 2011

National Health Service and the generalisation of the education system, which allowed a gradual increase in the level of education of the Portuguese. Simultaneously, the concentration of population in urban areas intensified and tendency of households to concentrate along the coastline contributed to a progressive depopulation of the inland regions, especially rural. In 2011, this pattern of population distribution accentuates: in the inland there is a decrease in the number of municipalities whose population has a positive variation (only eleven, excluding the Algarve given its specificity in the country), while in the coast and mainly in the Metropolitan Areas of Lisbon and Oporto, around 43 per percent of the residents in Portugal are concentrated.

All these events are interrelated in complex ways and progressively influence individual behaviours, paving the way for new forms of parenthood and conjugal life (the increase in stepfamilies and single-parent families is due to the increase in divorce, cohabitation without formal marriage, and the growth in the number of births outside marriage), greater participation of women in the labour market and changes in the level and timing of fertility.

Such changes indicate a modernisation of the country that will translate into a reduction in fertility levels (**Figure 2.2**). If in 1960, the total fertility rate recorded averages of 3.2 children per woman, a figure that has hardly chan-

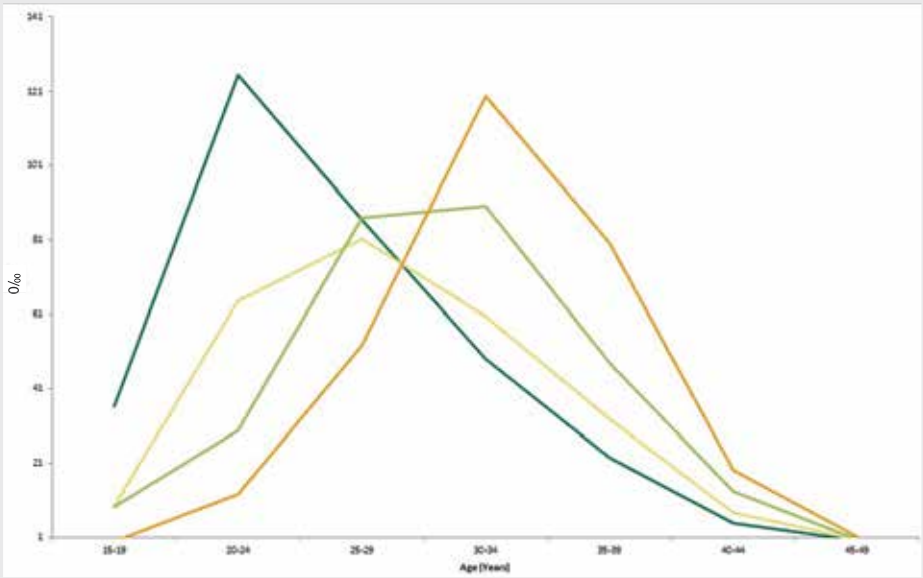
ged in 1970 (3.0 children), from 1982 on, generational renewal is no longer ensured. In fact, fertility drops below 2.1 children, figure necessary for every woman to leave an expectant mother to the next generation. In 2013, this indicator records the lowest level ever, 1.2 children, which places Portugal among the European countries with the lowest fertility rate and confirms that the pattern of fertility in Portugal, in these last thirty years, is characterised by a marked downward trend in the average number of children per woman. This evolution to a low fertility profile occurs, as mentioned, in the context of social changes associated with new family models. But it also reflects the postponement of the average age of women at birth of the first child, which in the 1960s was around the ages of 24 or 25 on average and in 2013 takes place at 29.7 years (**Figure 2.2**).

Figure 2.2.
Average age of women at birth of 1st child and Total Fertility Rate, Portugal 1970 to 2013

Source: PORDATA, 2014

The impact of the changes observed in terms of the role and the intervention of women in society could have also been influenced by different reproductive behaviours, particularly when relating the time of motherhood with the mothers' levels of education. Therefore, women with higher levels of education tend to delay motherhood, which can be explained by the attendance of a longer school career, as can be seen in 2010 (Rodrigues, 2012) (**Figure 2.3**).

Figure 2.3.
Fertility rate by age group and educational level of the mother, in 2010



Source: Rodrigues, 2012, p.36

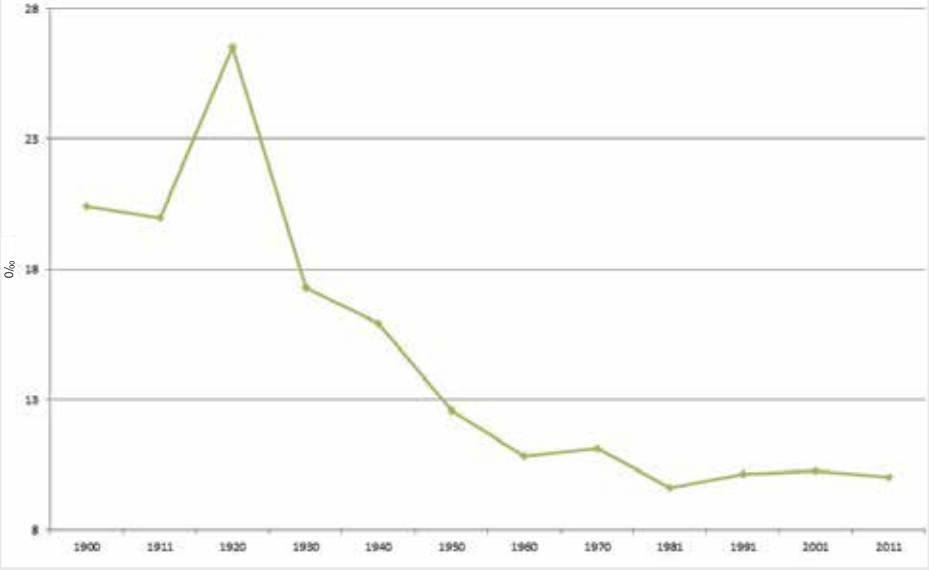
In consequence of Arising from this trend, declining fertility levels, the number of live births has declined sharply. In 2013 there were 82,787 births, a figure that lies very far from the 180,690 live births in 1970 (**Figure 2.6**). Consequently of this trend is the decrease in the number of children and youth, reflected in the progressive narrowing of the base of age pyramid of Portuguese population.

Alongside the reduction in fertility, mortality reduction also contributed to the ageing of the Portuguese population and indicates substantial improvements in the quality of life of populations and access of all social groups to the national health system. Throughout the twentieth century, the decline in mortality, which was reflected in the lengthening of life expectancy[5], contributed to the enlargement of the top of the pyramid, allowing the progressive increase of the population aged 65 and over. In 1970, life expectancy at birth was about 67 years (64.2 for men and 70.8 for women), while the same

indicator for older ages (65 years[6]) was 13.5 years, with advantage for women (14.6 years against 12.2 years for men). About forty years later, in 2012, these values reached the age of 80 for both genders, 77.3 for men and 83.6 for women (PORDATA, 2014). With regard to life expectancy at the age of 65, there were also significant gains: over 5.5 years, both genders combined, a little less than 5 years for men and about 6 for women (17.1 and 20.4, respectively) (PORDATA, 2014).

On the basis of this evolution of mortality (**Figure 2.4**) is progress in terms of medical science, regarding diagnosis and treatment, and also at the level of socio-economic conditions, such as the mainstreaming of certain hygienic practices and the development of public health (Fernandes, et al., 2004; Moreira and Rodrigues, 2010). The changing pattern of mortality structure lies in the reduction of the weight of deaths in Portugal, which in the recent past occurred during the first year of life, while now there is a higher concentration of deaths at older ages. Simultaneously, changes in the profile of the causes of death, as infectious and parasitic diseases, give rises to chronic and degenerative diseases as major causes of death.

Figure 2.4.
Evolution of the crude death rate, Portugal 1900-2013



INE - General Census of Portuguese Population, between 1900 and 2011 and Estatísticas Demographic Statistics between 1900 and 2013

[5] Average number of years a person can expect to live at birth, while mortality rates by age are those observed at the time of reference (INE).

[6] Average number of years that a person who reaches 65 can still expect to live, while mortality rates by age are those observed at the time of reference (INE).

These changing patterns of mortality, to which we should add the behaviour of fertility, reflect the processes of demographic and epidemiological transition, to which we will return later.

However, between 1970 and 2011 the dynamics of the Portuguese population mirrors the trends of natural growth, but also the direction and intensity of migratory movements. Until the 1990s, population growth is mainly due to natural growth. However, from 1991 to 2001 it is migration that becomes determinant (**Table 2.1** and **Figure 2.5**). The analysis of annual growth rates (total, natural and migratory) highlights the importance of migratory flows as explanatory factors of the dynamics of the Portuguese population in that period. Indeed, emigration is since the nineteenth century a structural constant, although the intense emigration flows of the '60s and '70s had the greatest impact on the evolution of the population during the twentieth century, as mentioned earlier.

Table 2.1.
Annual growth average total, natural and migratory rate

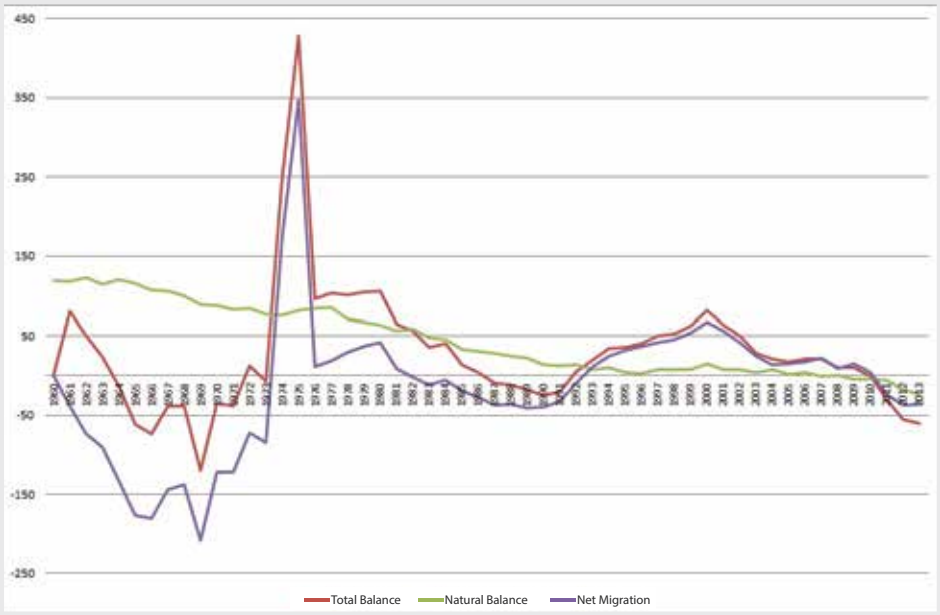
	Total	Natural	Migratory
1960 – 1970	-0.32%	1.15%	-1.47%
1970 – 1981	1.34%	0.87%	0.46%
1981 – 1991	0.03%	0.34%	-0.31%
1991 – 2001	0.48%	0.09%	0.39%
2001-2011	0.20%	0.02%	0.18%

Source: INE - General Census of Portuguese Population and Demographic Statistics, between 1970 and 2011

Along with the exit flows, the internal mobility that occurred in the '60s and '70s contributed to the redistribution of the population in the territory, variable according to the greater or lesser attractiveness of regions. Simultaneously, the model of development that the country was adopting was anchored in a territorial organisation that focused on the coast, where the majority of the urban population was concentrated, as well as the economic activity and centres of political decision. In opposition, there was a gradual abandonment of the youth at working age from rural areas of the inland. Thus, we conclude that the evolution of the Portuguese population, both at a national and regional level, has been conditioned by the intensity and direction of migratory flows. In some areas its impact was doubly

penalising, for being regions of origin both to other countries, as well as to urban areas in the coast.

Figure 2.5
Evolution of the natural balance and net migration between 1960 and 2011



Source: PORDATA, 2014

2.2. Demographic Transition and Epidemiologic Transition

The relationship between mortality and population ageing should be framed in the demographic transition process. In Portugal it occurred later than in the countries of northern and central Europe (Henriques and Rodrigues, 2008; Bandeira, 1996).

Changes in fertility and mortality in Western Europe throughout the nineteenth and twentieth centuries, led to the formulation of the theory of demographic transition[7]. This theory sought to analyse the process of changes in the behaviour of people regarding those micro demographic variables. Therefore, this concept refers to the historical process that led to the transition from an old demographic regime, in which high levels of fertility outweighed high mortality levels, to a new demographic regime, in which

[7] This theory was first developed in the 1930s by W. S. Thomson and Landry, and later, between the '40s and '50s by Notestein, K. Davis, Blacker, Coale and Hoover (Nazareth, 1982).

mortality and fertility declined in the context of economic, social and political transformations that led to the industrial revolution.

In other words, this process allowed the transition from a short and unstable cycle of life, due to morbidity and mortality conditioned by structural conditions of the surrounding environment (nutritional deficiencies, poor health, sanitary shortages), to a long and stable life cycle. The latter is characterised by low overall levels of mortality, high life expectancy and less dependence on sanitation. Aspects that change the traditional profile of causes of death and the mortality model (Moreira and Rodrigues, 2010).

In its formulation, the theory of demographic transition mainly emphasised the decline in fertility, while sidelining the analysis of the decline in mortality. However, the need to understand the evolution of mortality levels and the factors that support its sustained decline, as well as the importance of this variable in population dynamics has resulted in the development of theories related to mortality, arising from the fields of epidemiology, public health and social sciences. The pioneer was the epidemiological transition theory, developed by Abdel R. Omran, in the late '60s, which recognises "the limitations of demographic transition theory and of the need for comprehensive approaches to population dynamics stimulated the development of this theory" (2005, p.732). Omran considered that a multidisciplinary approach was highly desirable to understand the improvements registered in mortality indicators, since "conceptually, the theory of epidemiologic transition focuses on the complex change in patterns of health and disease and on the interactions between these patterns and their demographic, economic and sociologic determinants and consequences" (2005, p. 732).

Therefore, this author distinguishes between three stages or steps in the modernisation process by which societies went through, reflecting their scientific, economic, and health progress and the health status of populations. The first step, dedicated to pests and hunger (*Age of Pestilence and Famine*), is characterised by high mortality and subject to strong fluctuations, with a low average life expectancy (between 20 and 40 years) and in which mortality influences more the dynamics of populations than fertility. It is followed by a stage of decrease and disappearance of pandemics (*The Age of Receding Pandemics*), in which mortality begins to decline due to the progressive disappearance of epidemics. There is an increase in average life expectancy (between 30-50 years) and mortality and fertility play a similar role in the evolution of the population. Finally, the third stage is designated by the age of degenerative and man-made diseases (*The Age of Degenerative and Man-Made Diseases*). This stage is characteri-

sed by a continuous decline in mortality, which is fixed at low levels, with an average life expectancy of more than 50 years, and wherein the nosological situation typified by infectious and parasitic diseases is replaced by another one mainly characterised by degenerative pathologies and pathologies produced by man. During this phase, fertility becomes a determining factor in population's development (Omran, 2005, pp. 737-738).

According to Omran, the decline of mortality in Western European societies was mainly due to eco-biological and socio-economic factors, while scientific-medical factors were only felt late in the twentieth century.

This theory of epidemiological transition was therefore a pioneer in the analysis of changes in causes of death and their interrelationship with increased survival at younger ages, in a first stage, and then at older ages. Therefore, Meslé and Vallin (2002) stated that this theory also examines the processes of transformation at the ages of deaths. However, is not without its critics. One of the problems identified is the difficulty in finding in time the beginning and the end of that transition (González, et al., 1996). However, Vallin and Meslé (2004) argue, that the phases described by Omran are the result of a historical process that began in the mid-eighteenth century and ends in the '60s of the 20th century. Therefore, excluding the positive evolution of average life expectancy that occurred afterwards due to the decline in cardiovascular disease. Besides, this is a model framed within the context of the industrial revolution development, which firstly took place in Western Europe, and only later began in many other European countries, such as in southern and eastern countries. In other countries on other continents, the process is still ongoing.

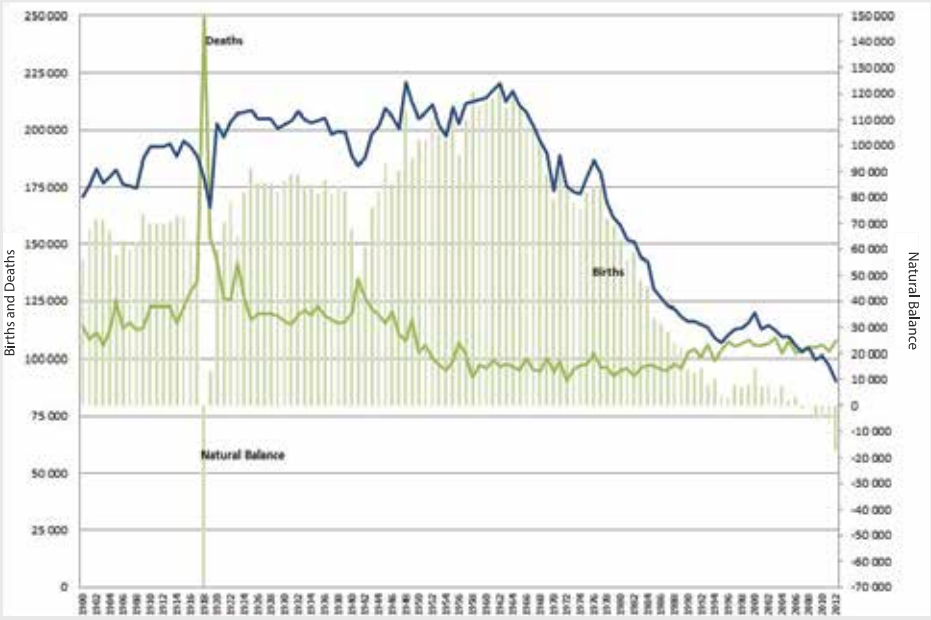
Despite these constraints, it is accepted that the concept has practical interest as it allows an understanding on the changes of the structures of population's mortality. Thus, it is a very useful tool for the planning of appropriate health services (González, et al., 1996).

The chronology of the demographic transition process in Portugal is later than in other European countries. Moreover, the evolution of mortality (**Figure 2.4**) reveals a path of slow decrease, with a long lag between the decline in mortality and the decrease in the birth rate, allowing the existence of relatively high natural balances until the '70s (**Figure 2.6**).

The decline in mortality becomes more visible on the '20s and then in the '40s, despite the unfavorable environment of World War II. From the mid-twentieth century, the general levels of mortality would continue to decline, as reflected in the figures of total life expectancy (**Figure 2.7**) that rised from 58 years in 1950 (Fernandes, et al., 2004), to 80 years, in 2012.

Figure 2.6.

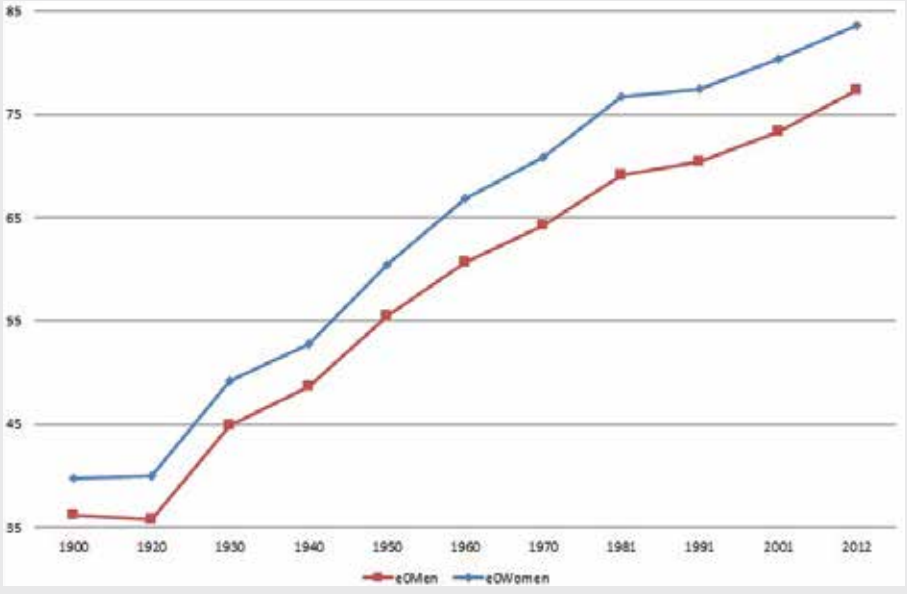
Evolution of births, deaths and natural balance of the population, Portugal 1900-2012



Source: INE - *Demographic Statistics* between 1900 and 2012

Figure 2.7.

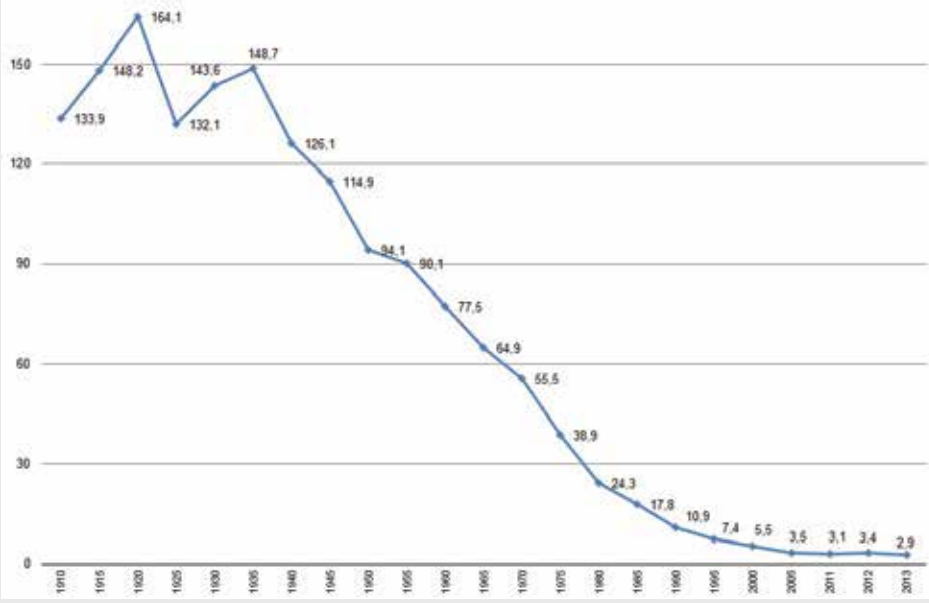
Evolution of life expectancy at birth for men and women, Portugal 1900-2012



Source: *General Census of Portuguese Population, between 1900 and 2011 and Demographic Statistics* between 1900 and 2012

The evolution trend of mortality and life expectancy at birth refers, however, to the chances of survival of children, especially after the mid-twentieth century, thus highlighting the relationship between the decrease in infant mortality (**Figure 2.8**) and in overall mortality. The decline in mortality that occurs in the first year of life, and currently registers some of the lowest levels in the world (2.9 per thousand in 2013), can be attributed to improvements in general health conditions, arising from the implementation of public health policies (as is the case of development in terms of maternal and child care and primary healthcare, widespread family planning, and the implementation of the national vaccination plan, as mentioned in the previous chapter), but also to improvements in the economic and social conditions of the Portuguese population (Veiga, et al., 2004).

Figure 2.8.
Evolution of infant mortality rate (‰), 1910-2013



Source: Henrique e Rodrigues, 2008, p. 426; General Census of Portuguese Population, INE, 2011 e Demographic Statistics, INE, 2001-2013

In the 1970s, the Portuguese population had an average life expectancy of 67 years, which placed Portugal on the third phase of Omran's transition model. That is, at the age of degenerative and man-made diseases. According to Morais (2002, p. 258), "the loss of expression of infectious and parasitic diseases in the context of epidemiological transition, as well as respiratory infection, paralleled with worsening cardiovascular diseases as diseases that negatively contributed to an unfavorable over 45 years' evolution"[8]. As seen in Table 2.2, only after the

age of 50 do deaths caused by infectious and parasitic diseases (closely linked to the social environment and hygiene start declining) start declining, which seems to be related to improvements in life conditions, as well as progresses achieved within specific therapies (Fernandes, et al., 2004).

As we saw in Chapter 1, the Revolution of 25 April 1974 created favourable conditions to the implementation of a National Health Service to respond to the need for greater territory coverage and a more equitable treatment, with regard to the access of all citizens.

The impacts of the health system are visible in the increase registered in life expectancy at birth for both male and female, in the '70s and '80s (**Figure 2.7**). Also the positive changes in life expectancy at the age of 65, that occured during this period (**Table 2.3**), reveal the achievements in terms of survival and may be related to greater efficiency in the provision of primary healthcare and a more effective and widespread hospital network (Fernandes, et al., 2004).

Thus, if it is true that changes in the profile of mortality and morbidity contributed to a positive evolution of mortality rates, it is also necessary to take into account the social, behavioural and "answers from society to health status"[9] (Meslé and Vallin, 2002, p. 440). In this sense, since the '80s, academics have developed the concept of health transition[10], as a reaction to the epidemiological transition theory which they considered reducing, and focusing on the determinants of health; i.e., the state of health depends on the resources, values and behaviours. Moreover, they are based on a dynamic perspective, which takes into account the aspects underlying the changes that occur in the health status of populations and considers local and regional dynamics.

However, the concept of health transition is also not without its limitations, particularly with regard to the definition of health status. Infant mortality, life expectancy and the structure of mortality by causes of death have traditionally been considered indicators of health. However, the changes that have occurred in age structures in more developed countries (higher proportion of adults and elderly), due to the decline in infant mortality, and also those that took place in the epidemiologic profile (prevalence of chronic and degenerative diseases), require a refocusing of research on mortality and morbidity in adults (Gonzalez, et al., 1996).

---

[8] In the original: "a perda de expressividade das doenças infeciosas e parasitárias no quadro da transição epidemiológica, bem como das doenças do foro respiratório, esteve em paralelo com o agravamento das doenças do aparelho circulatório enquanto patologias que contribuíram negativamente para uma evolução desfavorável acima dos 45 anos".

[9] In the original: "des réponses de la sociètè à cet état sanitaire".

[10] This concept was first developed in 1973 by Lerner. However, interest on this concept will only grow from the '80s on, due to research at the Health Transition Centre, Canberra (Australia) driven by John Caldwell and Julio Frenk (Gonzalez, et al., 1996; Meslé and Vallin, 2002).

Table 2.2.
Evolution of some causes of death. Portugal 1930-2012 (%)

Causes of death	1930	1940	1950	1960	1970	1980	1990	2000	2010	2012
Infectious and parasitic diseases	21.1	20.9	13.5	1.9	1.0	1.5	-	-	-	-
Tuberculosis	11.2	9.8	11.7	4.3	1.6	-	0.3	0.3	0.2	0.2
Disease caused by human immunodeficiency virus (HIV)	-	-	-	-	-	-	0.1	0.9	0.6	0.5
Diseases of the circulatory system	8.5	11.7	14.2	14.8	17.0	42.8	44.2	38.7	31.8	30.4
Tumores malignos	2.7	2.9	4.8	9.2	11.7	15.1	17.6	20.3	23.5	23.9
Doenças do aparelho respiratório	9.6	10.8	8.7	9.8	12.0	7.3	7.2	9.7	11.1	12.9
Doenças do aparelho digestivo	2.1	3.5	3.8	10.1	7.5	4.9	4.5	3.9	4.4	4.2
Doenças do aparelho geniturinário	2.0	2.5	2.3	2.0	2.0	1.2	1.2	1.5	3.1	2.7
Sintomas, sinais, exames anormais, causas mal definidas	16.8	16.4	17.0	15.6	15.3	13.6	11.8	12.4	9.5	9.5
Outras causas por doenças	22.9	18.2	20.4	27.6	26.5	6.2	6.6	7.8	11.6	12.1
Causas externas	3.0	3.3	3.6	4.4	5.5	7.4	6.5	4.5	4.3	3.7

Source: *Anuário Estatístico*, INE, 1940, 1940, 1950, 1979, 1980, 2011, 2012 (Author's calculations)

Table 2.3.
Life expectancy at the age of 65, by gender

YEARS	Life expectancy at the age of 65		
	M	F	Diferences
1970	12.2	14.65	2.45
1981	14.35	17.95	3.6
1991	14.83	18.39	3.56
2001	15.55	19.01	3.46
2010	16.9	20.2	3.3
2011	16.9	20.3	3.4
2012	17.1	20.4	3.3

Source: *Fernandes, et al. 2004, p. 92 and PORDATA*

Population ageing poses therefore a set of new questions. Especially because the outcomes in life expectancy are no longer the result of a recess in youth mortality, but rather in elderly mortality, which is now a cause of population ageing. At the heart of these issues lies paradoxically population health (Meslé and Vallin, 2002), and in particular health at older ages, but also the limits of human life (Oeppen and Vaupel, 2002). Although longevity may be considered an achievement, longevity is not synonymous of health. That is, living many years does not necessarily mean living them with quality of life.

On the one hand, healthy ageing and having a healthy survival became a main goal for populations (Fernandes, 2007). In fact, it may even be at the origin of the postponement of senescence and death (Vaupel, 2010). On the other hand, it also became important to know the vectors which determine health status (how the economic, social, cultural, biological, and environmental aspects are interrelated) in order to understand the different survival capacity of men and women. Indeed, population ageing will require policies in the field of health and social protection to respond to different levels of vulnerability of an ageing population that will continue to increase (Fernandes, 2007). Undeniably, the extension of life expectancy is accompanied by increased physical and/or mental dependence responsible for the loss of mobility and autonomy, increasing chronic illness and of prolonged evolution, which increases the number of consumers of specific healthcare and the requirements regarding the quality and complexity of care.

In this sense, some health indicators that allow to realise if the increase in life expectancy is accompanied or not by an increase on the time lived without disability have been developed. This is the case of life expectancy with health that measures the number of years a person of a certain age can expect to live without any moderate or severe health problem.

If we compare the life expectancy at birth and at the age of 65 with the healthy life expectancy for the same ages, we find that, despite the fact that Portuguese women can expect to live longer, both at birth and at the age of 65 (**Figure 2.7** and **Table 2.3**) they live shorter lives without disabilities. In 2011 (**Table 2.4**), the number of "healthy years of life", which corresponds to the number of years of life without long-term limitations, was 60.7 for men and 58.6 for women and 7.8 and 6.3, respectively, in the case of healthy life expectancy at the age of 65. This may suggest a greater need for healthcare, particularly because it mainly affects females.

Table 2.4.
Life expectancy at the age of 65, by gender

	65e +			Total population
	M/F	M	F	
1970	15.2	12.5	16.9	1.5
1981	14.9	11.7	17.1	1.7
1991	19.1	15.5	21.7	2.6
2001	20.9	17.5	23.3	3.4
2011	26.5	22.4	29.4	5.0

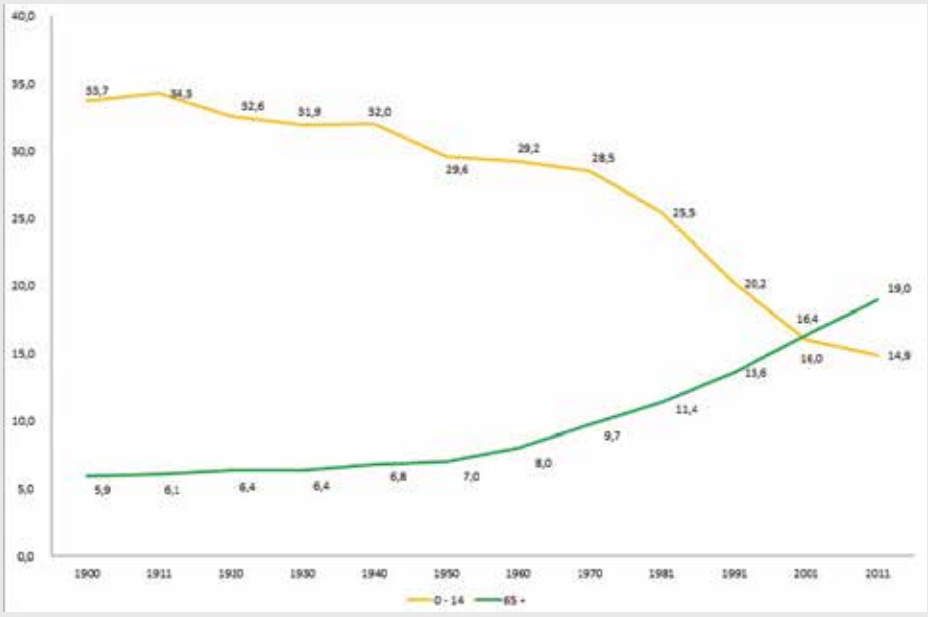
Source: *Eurostat*[11]

[11] The healthy life years are calculated based on mortality tables on the EU and on data collected in surveys about personal perceptions regarding disability.

2.3. The ageing process

The historical process of demographic transition characterised by a reduction in mortality and fertility, can also be described based on changes that have occurred over the years in age structures. In the early twentieth century, Portugal was a young country (about 34 percent of the individuals were under the age of 15), but by the mid of the century it started changing. Thus, the proportion of the age groups at the top of the age pyramid gradually increased, while simultaneously there was a reduction in the younger age groups (**Figure 2.9**). This evolution is reflected in the progressive increase of the average age of the Portuguese population. In 1970 it was of 32.1 years, but in 2011 it reached 41.8 years (40.3 if we consider men and 43.3 in the case of women). Hence, this process by which the Portuguese society went from young to aged, is another possible way to frame the outcome of the inter-relationship between trends in mortality and fertility.

Figure 2.9.
Evolution of infant mortality rate (‰), 1910-2013



Source:*Recenseamentos* da População, INE, 1900 to 2011

The decline in fertility is a key factor to understand ageing at the base of the population's pyramid. That is, a decline in the younger age groups, as a result of progressive and continuous decrease in total fertility rate, i.e. the average number of children per woman, which currently is well below the

level needed for generational renewal (**see Figure 2.2**). The discussion on the role of immigration in mitigating or reversing ageing levels has shown that this effect can only be conjunctural and that, at least in the medium term, Portugal will continue to age (Rose, et al., 2004; Pink, 2012).

The increased life expectancy of the Portuguese people during the twentieth century has no parallel: between 1900 and 2012 it meant an increase of 41 years for men and 44 years for women. This increase is due to, in a first stage, the contributions of the decline in infant mortality (Mendes and Oliveira, 2010), which began as a rejuvenating factor of age structures. But then, due to the evolution of levels of mortality for older ages (Oliveira, 2010), it contributed to its ageing[172]. This change in the ages at which deaths occur relates to the type of causes of death, which has changed as a result of the epidemiological transition.

Today, the profile of mortality causes is characterised by the prevalence of chronic and degenerative diseases that primarily affect the elderly population, such as cardiovascular diseases or neoplasms. According to Table 2.5 these are the most representative causes, both in the deaths of individuals between the ages of 65 and 79, and those who are 80 years and older. A situation which has existed since the mid-'90s of the last century and throughout the first decade of this century. However, diseases of the circulatory system register a decreasing trend since 1994. In fact, in 2010 they were overtaken by neoplasms, in the case of deaths of individuals between the ages of 65 and 79. According to Oliveira and Mendes (2010), since the '90s, the decrease in mortality associated with diseases of the circulatory system has been responsible for the increase in life expectancy (see also Ribeiro, et al., 2013). As far as the diseases of the respiratory system are concerned they have been increasing in the older groups (as seen in the age group of 80 years and older), which may negatively contribute to the evolution of life expectancy (Mendes and Oliveira 2010).

[172] "In short, up to the age of 80, improvements in life expectancy for both men and women are highly dependent on mortality of young people and particularly children up to their 1st birthday. From the '80s on, the evolution of life expectancy depends more significantly on the health of adults and the elderly and by the end of the period [2007] it mainly depends on the mortality of the elderly" (Oliveira and Mendes, 2010, p. 125). In the original: "Em suma, até aos anos 80, os ganhos na esperança de vida, tanto para homens como para mulheres, estão muito dependentes da mortalidade dos jovens e em particular das crianças até ao 1º aniversário. A partir dos anos 80, a evolução da esperança de vida depende mais significativamente da saúde dos adultos e dos idosos e no final do período em análise [2007] depende fundamentalmente da mortalidade dos mais velhos".

Table 2.5.
Deaths according to some causes of death by older age groups (%)

	1994			2001			2010		
	65-79	80 and +	TOTAL	65-79	80 and +	TOTAL	65-79	80 and +	TOTAL
Infectious and parasitic diseases	0.8	0.4	1.5	1.2	0.6	2.0	2.3	1.9	2.5
Neoplasms	23.7	10.6	19.6	26.5	12.4	21.2	32.1	14.6	24.0
Endocrine, nutritional and metabolic diseases	4.7	3.0	3.5	5.4	3.9	4.2	6.3	5.6	5.3
Diseases of the circulatory system	45.0	54.5	42.9	38.2	49.0	38.6	28.6	39.6	31.8
Diseases of the respiratory system	7.2	8.9	7.1	8.0	11.1	8.5	9.0	14.7	11.1
Diseases of the digestive system	4.6	2.6	4.4	4.5	2.7	4.2	4.6	3.4	4.4
Symptoms, signs, abnormal clinical and laboratory findings, not elsewhere classified	7.7	15.7	11.5	8.5	13.8	11.3	7.3	9.9	9.5
External causes	3.0	1.6	1.6	2.9	1.7	4.9	3.4	2.1	4.3

Source: Eurostat (author's calculations)

Increased longevity seems, however, to be associated with increased inequalities in life expectancy between both genders (Mendes and Oliveira, 2010). Therefore, in Portugal, as happens in other countries, the probability of reaching older ages is not the same for men and women. Women's advantage has been increasing: in 1900 there was a difference of 3.6 years between the life expectancy of men and women, in 1981 ws registered the biggest difference ever (7.6 years separate life expectancies between both genders). Since then there has been a progressive decline in this inequality, which in 2012 was placed at 5.9 years.

Due to the increasing survival of women, their relative predominance in the older age groups (**Table 2.3**) contributed to the feminisation of ageing. A phenomenon that is even more visible in the population aged 80 and over (**Table 2.6**). Women in this age group show higher percentages than men, since 1970. The preponderance of the female population becomes more evident as the population ages. In 2011 there were 72.1 men per 100 women over 65 years, a number that dropped to 54.9, for men aged 80 and over, while the gender ratio for the total population was 91.5.

It should also be noted that with the increase in life expectancy increases the number of the very elderly. On 2011, there were 532,219 individuals aged 80 years and over, representing 5 percent of the total population. This group was the fastest growing, with a variation of over 300 percent compared with 1970, reflecting an ageing of ageing, a result of greater longevity of the older population.

Table 2.6.
Evolution of the proportion of people aged 80 and over in the age group of 65 + years and the total population (%)

	65e +			Total population
	M/F	M	F	
1970	15.2	12.5	16.9	1.5
1981	14.9	11.7	17.1	1.7
1991	19.1	15.5	21.7	2.6
2001	20.9	17.5	23.3	3.4
2011	26.5	22.4	29.4	5.0

Source: *Recenseamentos* da População, INE, 1970 to 2011

Besides the variables that make up natural dynamics, in the Portuguese case migration also had an important role in triggering the process of ageing. As mentioned earlier, migratory movements are a structural constant of the Portuguese population dynamics and, when we consider the impact of European emigration waves of the mid-twentieth century, its influence in triggering the phenomenon of ageing is evident, especially at regional level. We have previously observed that the internal mobility and the mobility to Europe that characterised the '60s and '70s, had a very significant impact on the redistribution of population and largely justifies the asymmetries that can be found in the territory. The advantage was that in the second half of the twentieth century the coast began to grow partly at the expense of the inland.

Taking into account that the type-migrant is young, on the one hand, its mobility immediately causes a rejuvenation in the areas of attachment and the ageing of the regions of origin. On the other hand, migratory movements have a contradictory effect in the age structures of the regions, since a downturn in the working age population leads to an increase in the other two groups.

Thus, the combination of internal and external migration with fertility and mortality, which met different levels and speeds of decrease, are at the source of the evolution of age structures and explain the regional dynamics of ageing. The analysis of rates of population variation between censuses, in the age groups of 0-14 years and 65 and over from 1960 to 2011, provides a chronological reading of this dynamic[173].

[173] This methodology was used in Rodrigues, et al. (2010) and Moreira, et al. (2010).

A first conclusion points to a declining trend in the proportion of young people across the country, while some exceptions are observed in municipalities around the metropolitan areas of Lisbon and Oporto and the Algarve. On the contrary, there is the continuous increase of the elderly population, albeit less intense between 2001 and 2011 than in previous seasons.

The observation of the cartograms[174] representing the variation rate of young people (**Figure 2.10**) shows that in 60 years the difference between the coast and the inland starts to be drawn, though not continuously. The effects of population mobility begin to be noticed in an internal and external way. That is, emigration and internal migration towards urban centers, mostly in the coast.

The positive changes that take place in the next decade can be explained by regional net migration, although it should be borne in mind that the '70s was a complex time. In subsequent years, asymmetries become accentuated, reinforced by lower fertility levels, even in the northern regions where this variable had higher values. Already in the first decade of this century, the positive variations are restricted to municipalities that maintain some attractiveness, although at different levels.

As for the evolution of variation in elderly, between 1970 and 1981 a widespread and intense increase in the percentage of the population over 65 years can be observed (**Figure 2.11**).

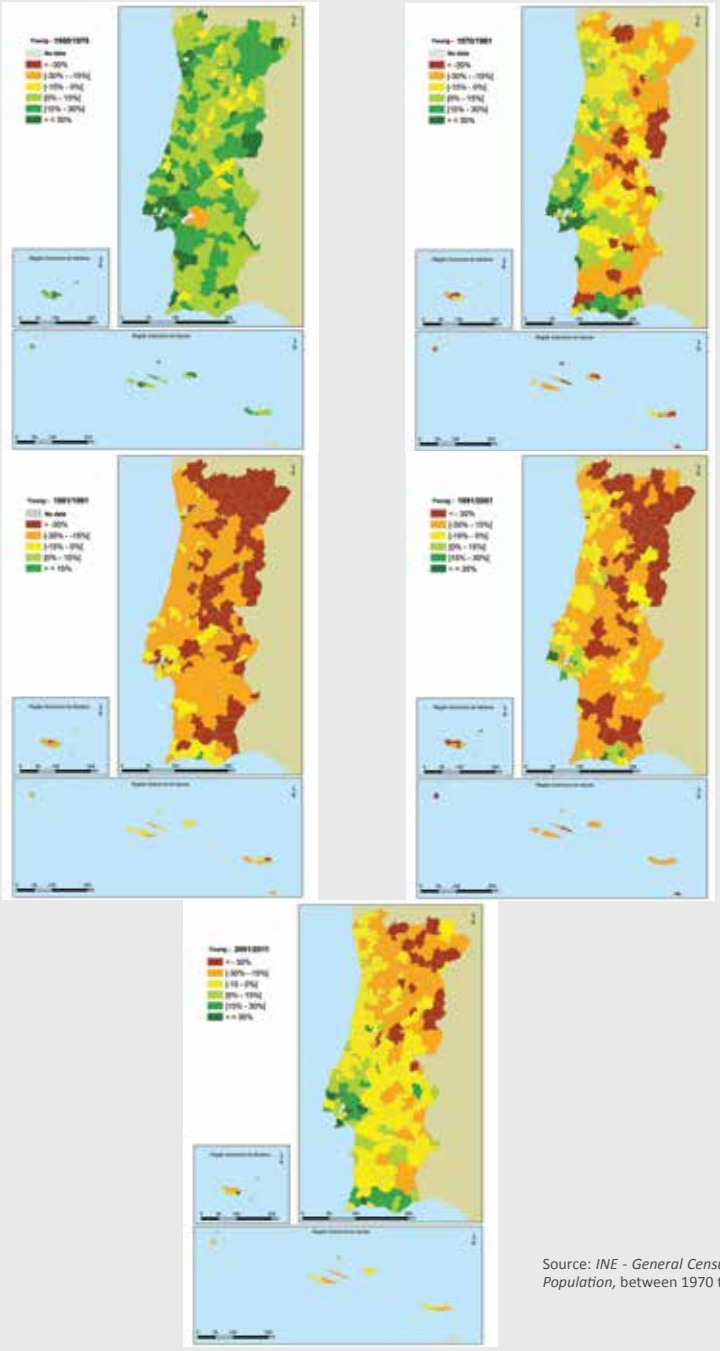
We cannot forget that in these years, besides the already mentioned migratory flows, there was a progressive increase in the probability of survival, along with a decline in fertility levels, whose effects extend to subsequent years. Indeed, the widespread use of contraception, resulting from the favourable political-social conditions offered by the Revolution of April 1974, led to a progressive standardisation of behaviours, blurring up regional differences, with consequences on the fertility decline.

In the '90s, the ageing process extends and widens considering both its territorial extension, and the top or the base of the age pyramid. However, in

Due to the ageing process, the relationship between the youth and the elderly has been changing, as demonstrated the ageing r . In 1970, only four municipalities (Pedrogão Grande, Castelo de Vide, S. Brás de Alportel e Vila Velha de Ródão) had a ratio higher than 100 (with 129.2, 121.6, 107.5 and 111.7 respectively). Thus, the number of elderly exceeded that of young people, and in 2011 the situation reversed. In that year, only 45 counties registered an ageing ratio of less than 100, i.e. only about 16 percent of counties still maintain relatively young age structures. However, there is clearly a pattern of

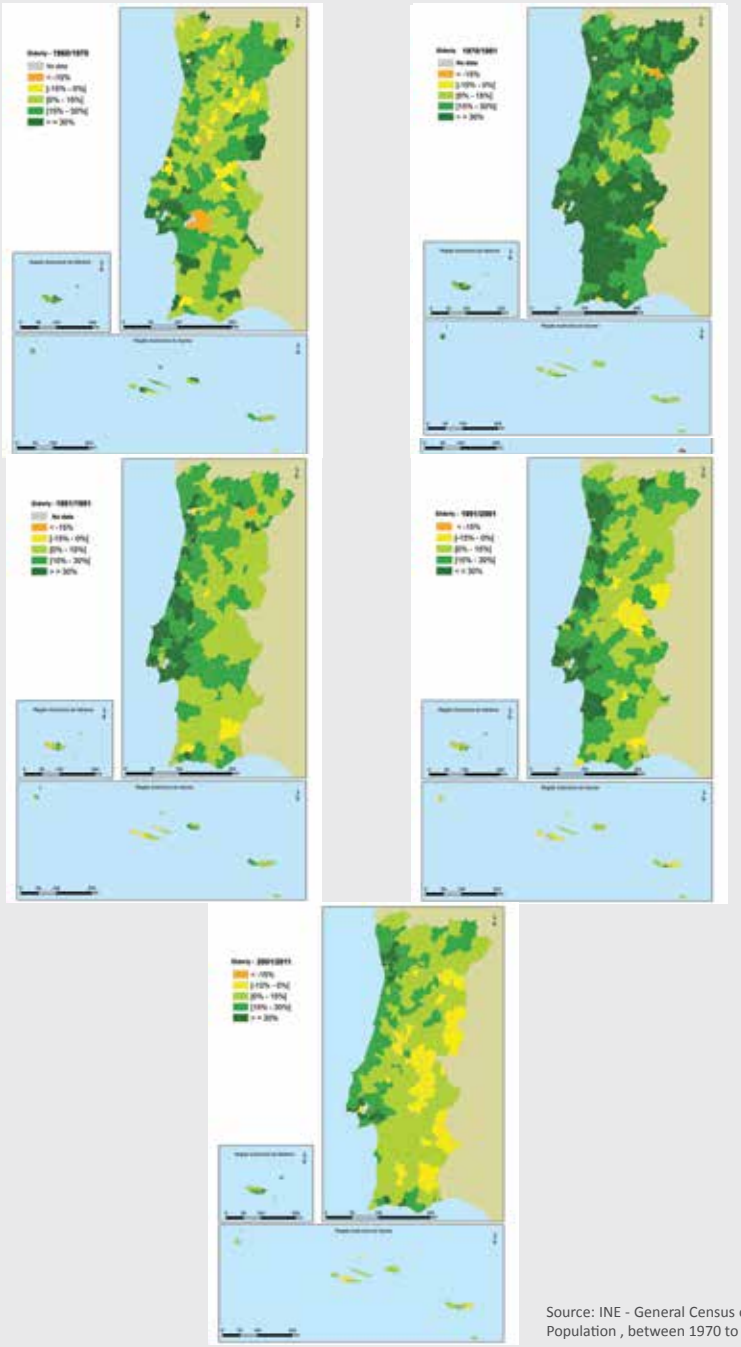
[174]The authors are grateful to Eng. Natália Roque, from SIG and CAD Laborathories, from the Agrary School of the Polytechnic Institute of Castelo Branco, for the preparation of the maps.

Figure 2.10.
Rate of change in the age group 0-14 years (%), 1960 to 2011of 65 + years and the total population (%)



Source: *INE - General Census of Portuguese Population,* between 1970 to 2011

Figure 2.11.
Rate of change in the age group 0-14 years (%), 1960 to 2011
of 65 + years and the total population (%)

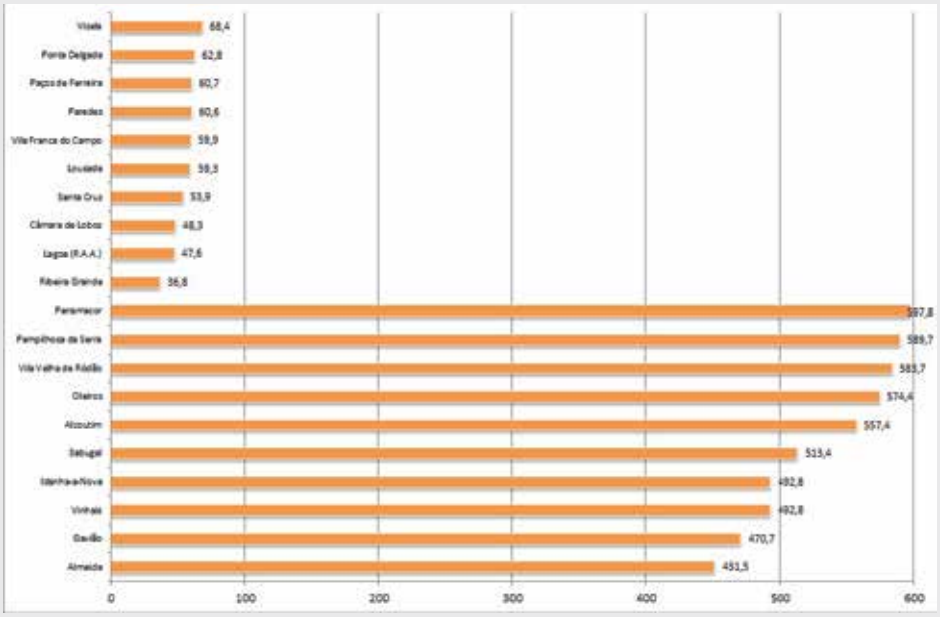


Source: INE - General Census of Portuguese Population , between 1970 to 2011

large ageing, as evidenced by the values of this indicator in more aged counties (Figure 2.12), contrasting with the values of the ten least aged. the last two decades, the municipalities that have aged sooner had minor variations, while those that aged later had larger variations in the latter period of the analysis. This is the result of different chronologies of ageing on top, as is the case of inland areas, especially the rural counties.

Due to the ageing process, the relationship between the youth and the elderly has been changing, as demonstrated the ageing[15] . In 1970, only four municipalities (Pedrogão Grande, Castelo de Vide, S. Brás de Alportel e Vila Velha de Ródão[16]) had a ratio higher than 100 (with 129.2, 121.6, 107.5 and 111.7 respectively). Thus, the number of elderly exceeded that of young people, and in 2011 the situation reversed. In that year, only 45 counties registered an ageing ratio of less than 100, i.e. only about 16 percent of counties still maintain relatively young age structures. However, there is clearly a pattern of large ageing, as evidenced by the values of this indicator in more aged counties (**Figure 2.12**), contrasting with the values of the ten least aged.

Figure 2.12.
Ageing ratio in 2011: more and less aged counties (ratio %)

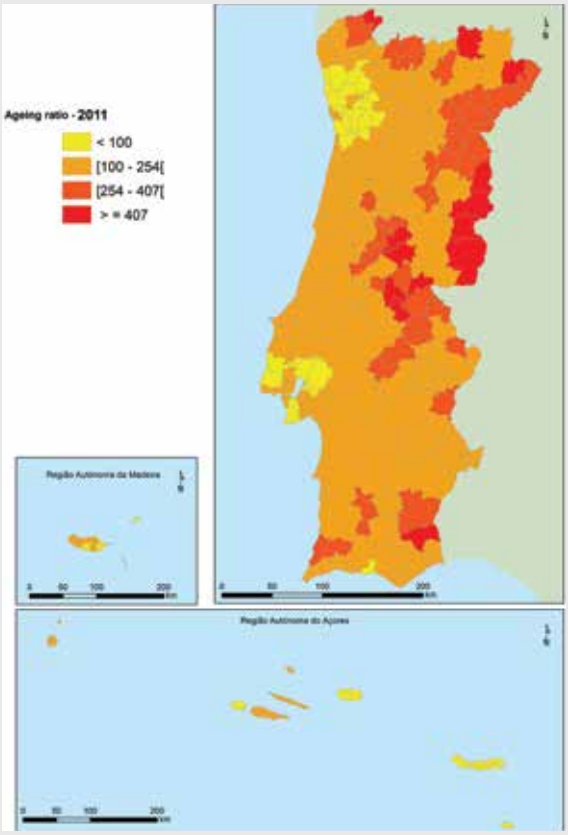


Source: INE - *General Census of Portuguese Population*, 2011

[15] Relationship between the elderly and young people, usually defined as the ratio between the number of people aged 65 years or more and the number of people aged 0 to 14 years old (INE).
[16] Vila Velha de Ródão remains among the ten municipalities more aged in 2011 (Figure 2.12).

As already mentioned, the development model adopted in Portugal has favoured the coast, resulting in a progressive loss of demographic and economic vitality of the inland regions, which is reproduced by the geographical distribution of the phenomenon of ageing. In previous studies (Rodrigues and Moreira, 2009; Moreira, 2010) it was shown that the inland regions, especially the most aged counties, had an overall low index of demographic, economic and social[17] well-being. Thus, confirming that different levels of regional development, distribution of wealth and equipment, levels of well -being, can act as another source of disadvantage and vulnerability for elderly populations (Moreira, 2010).

Figure 2.13.
Ageing ratio in 2011 (ratio %)



Source: INE - *General Census of Portuguese Population,* 2011

[17] With the goal of understanding if Portugal is or is not more homogeneous regarding the quality of life and social well-being, we built a statistical indicator to summarise and allow a stratification of what was referred to as "global rate of demographic, economic and social well-being", applicable to all districts of mainland Portugal between 1993 and 2004 (Pereira and Chorão, 2009, pp. 129-151).

Thus, regardless of the intensity, in 2011 Portugal's ageing is consolidated, both at the national level and at the local level in terms of counties. Although there still are some counties, around Lisbon and Oporto, in the autonomous regions and the Algarve (Albufeira) that maintain structures where the weight of the youth is higher than that of the elderly (Figure 2.13). Rather, it is in the inland that the more aged counties are located, both at the base and at the top, with some cases where the population aged 65 and over reaches 40 per cent of the total number of residents.

However, the location of health facilities and medical personnel, especially in urban areas, is quantitatively and qualitatively a disadvantage for older people in rural areas, hampering their use (Santana, 2000, 2002 and 2005) and revealing that this type of services does not have a dimension that is articulated in geo-demographic terms and health /family / patient professional ratio. Moreover, from the age of 65 on there is an increase in diseases related to human ageing (which are almost entirely chronic diseases, of prolonged evolution), which may tend to increase the number of consumers of health, as well as the demands regarding the complexity and quality of healthcare, creating pressure on systems and healthcare.

In 1979, Nazareth stated that:

> *Portugal is a young country in the European context and has profound regional differences. (...) when we look at the different types of structures, both at the district level and at the municipal level, we are surprised by the deep contrasts between them: from doubly too young to doubly aged structures in only some dozen kilometres (p.199)*[18].

This study, pioneer in the analysis of the phases and factors that led to the ageing process, evidences the existence of regional differences that have blurred. Today, Portugal is not only one of the most aged countries in Europe, as these asymmetries are almost imperceptible. In fact, between 1970 and 2013, the physiognomy of the Portuguese population has changed, has grown old, as a result of improved living conditions. The increase of ageing appears to be one of the biggest challenges of the Portuguese society, with consequences at the economic and social level. Those are not necessarily negative, but require planning and a paradigm shift in society (Nazareth, 2009; Rosa, 2012), in a demographic context which now takes place in a context of negative natural and migratory balances and within a trend of declining population.

[18] ReIn the original: "Portugal é um país jovem no contexto europeu e tem profundas assimetrias regionais. (…) quando observamos os diferentes tipos de estruturas, quer a nível distrital quer a nível concelhio, somos surpreendidos pelos profundo contrastes entre elas: de duplamente muito jovens passamos em algumas dezenas de quilómetros a estruturas duplamente envelhecidas".

3. The importance of education.
The educational levels of the Portuguese (2010-2030)

Mª do Rosário O. Martins, Inês Rodrigues and Teresa Rodrigues

The analysis of the demographic evolution of the Portuguese population in recent years has allowed the acknowledgment of a clear change in the age structure. There has been an increasing ageing as a result of the decrease of fertility levels and the progressive decline of the levels of mortality in both genders and in all age groups. Considering the joint influence that gender, age and the level of education have on the health of a population (Denton, et al., 2004; Vintém, 2008; Pita Barros, 2003), a prospective study of the population structure determined by these dimensions can represent an important contribution in order to adjust policies and health practices to promote better health.

The level of education is one of the attributes that leads to greater distinction between members of a population, particularly with regard to their demographic behaviour (Dustmann and Glitz, 2011; KC, et al., 2010; Lutz and KC 2010; Oliveira, 2009; Goujon, 2008; Fernandes, 2007; Gustavsson, 2006; Jejeebhoy, 1995), and also in relation to their health (Henriques and Rodrigues, 2010; Henriques, Rodrigues and Martins, 2009). Indeed, it is of great interest that the analysis of the impacts of ageing on the health profile of the population takes into account the study of population's composition by educational level. Thus, considering that older individuals tend to classify more negatively their health status and those more educated tend to attribute a more positive classification to their health (Huisman, et al., 2003; Joung, et al., 2000), it is important to study the co-evolution of these two variables, particularly because we expect a more aged Portuguese population, but also more educated. The main goal of this chapter is to present the population projections for the Portuguese population developed, at the national and regional level (NUTS II), by gender, age group and educational level, for the 2011-2031 period.

This chapter aims to present the results of the exercise of multistate demographic projections by levels of education, developed for the entire Portuguese population in the 2030 timeframe. It is, therefore, divided into three parts: a) a brief description of the current Portuguese educational system and recent changes in the level of schooling of its population; b) a description of the methodological options and the specific methodology used to prepare the projections; and c) the analysis and discussion of the results. These results will support the following chapter, where we present the outcomes arising from the preparation of forecasts of indicators of health and levels of health services' used, considering the expected changes in the demographic structure and the educational level of the Portuguese population in the same period (2011-2031).

3.1. Education in Portugal

It is important to know the specifics of the current Portuguese education system, as well as the relative tendency on the levels of schooling of the recent past. Today the Portuguese educational system is organised into four main levels (**Figure 3.1**): Pre-school, Basic Education, Secondary Education and Higher Education (GEPE, 2012).

Preschool Education, of optional frequency, is aimed at children from 3 years of age and extends until their entry in formal education which usually occurs at the age of 6. By that time, children start compulsory education, structured on three levels and for 12 years. Up to the age of 10, children should attend the first cycle of basic education, which corresponds to the first four years of compulsory schooling; the second cycle extends for two years and generally by the age of 12 children enter the third cycle, which ends three years later, with the completion of the 9th grade. Students then enter Secondary Education. The courses at this level also last three years and may currently be of four types: scientific-humanistic courses, oriented primarily to further study at a higher level; technologic courses, targeted for students seeking to enter the labour market, even allowing the continuation of studies in specialised technological courses or Higher Education; specialised artistic courses, aimed at ensuring artistic training in specialised areas of visual arts, audio-visual, dance and music, allowing entrance into the labour market or further study at post-secondary courses or in Higher Education; and professional courses, organised by modules in different areas of training, which enable both the integration into the labour market and to pursue studies in post-secondary courses or in Higher Education (GEPE, 2012).

In recent years changes to this organisational scheme have been promoted (ME, 2012). Law No. 85/2009, of 27 August, clarifies the regime of compulsory education for children and young people between the ages of 6 and 18 (considered at school age) and establishes the universality of preschool education for children from the age of 5. Thus, by wanting to assure that all students attend institutions of education or training at least between the ages of 5 and 18, it becomes necessary to reorganise the school network, whose criteria were set by Council Resolution of Ministers No. 44/2010, in order to: adapt the school system to the goal of a 12-year education for all students; adjust the size and conditions of schools to promote school success and to combat school dropout and promote the rationalisation of school clusters. Moreover, Normative Order No. 1/2005, of 5 January, provides that, in exceptional cases, progression in Basic Education may be accelerated, and the First Cycle may be completed in three years. Additionally, Normative Order

No. 29/2010 stipulates that the transition to the Second Cycle of Basic Education can occur at the age of 8, for students who have benefited from the advanced enrolment in the first year of schooling.

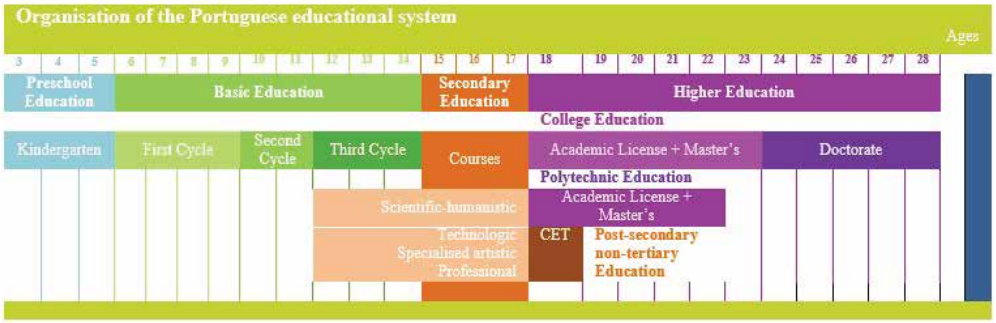
Upon completion of Secondary Education, usually around the age of 18, students can join the Post-secondary non-tertiary, through the so-called technological specialisation courses (CET)[1]. These courses aim to provide specialised training in different technological areas and allow the entrance into the labour market or the follow-up of studies at a higher level (GEPE 2012).

Individuals who have prematurely interrupted their education or are at risk of doing so, who could not attend school during their youth and who want to continue their education throughout their lives, are able to return to school through education and training for youth and adults. This training covers six different modalities that can accredit a school and/or a professional qualification, also enabling the continuation of studies of post-secondary non-tertiary or of Higher Education (GEPE 2012).

Entrance to each institution of higher education is subject to *numerus clausus*. To apply to Higher Education students must meet one of the following criteria: a) have completed Secondary School, or a legally equivalent qualification; or b) have carried out the necessary examinations for admission to the course they wish to attend with a minimum rating of 95 points and, when applicable, meet the pre-requisites required for the course they are applying to. In addition, students over the age of 23, who have no qualifications for Higher Education, may try to access it by performing specific tests, organised by the respective institutions of Higher Education, demonstrating their ability to attend the course they are applying to. Higher education in Portugal is organised according to the principles of Bologna. The following academic qualifications are conferred: Academic Licence[2], with a cycle of studies from 6 to 8 semesters; Master's degree, with a cycle of studies corresponding to 3 or 4 semesters of studies; and Doctorate, accredited to those who undertake high level research and do the public defence of the thesis (which normally comprises in total 6 to 8 semester) (GEPE 2012).

[1] CET is the Portuguese acronym for "cursos de especialização tecnológica".
[2] Called "Licenciatura" in Portuguese.

Figure 3.1
Organisation of the Portuguese Educational System



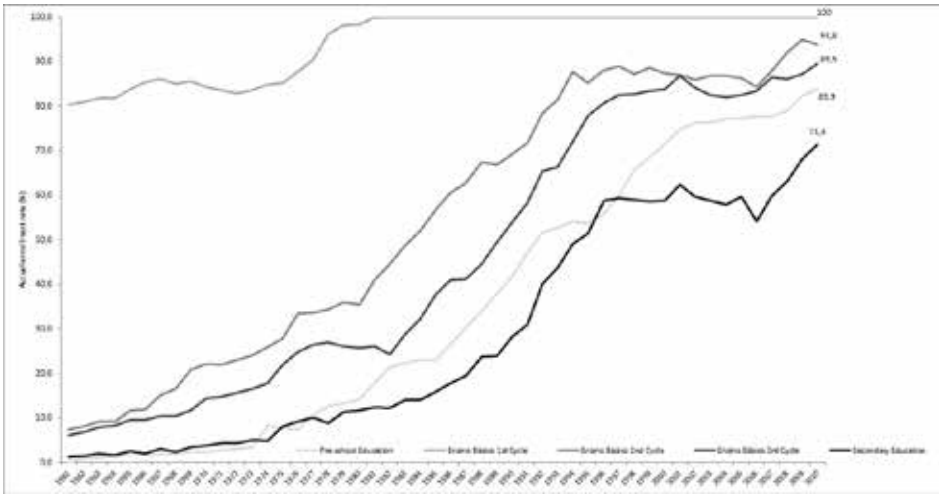
Source: Gabinete de Estatística e Planeamento da Educação, Ministério da Educação

3.1.1. Schooling of the Portuguese Population

The percentage of students enrolled in each cycle of studies until the completion of Secondary Education increased in relation to the total census population of the same age groups (actual enrolment rate), at all levels especially from the late '60s (**Figure 3.2**). We know that with the exception of Pre-school Education, of optional attendance, the enrolment rate tends to decrease as we move forward in schooling. The enrolment rate reaches approximately 100% in Primary Education since the '80s. In 2011, it was above 95% for the Second Cycle of Basic Education, above 92% for Third Cycle and it exceeded 72% in Secondary Education. However, we must take into account that this indicator does not reflect the effect of grade retentions and dropouts on the real schooling, since it refers to the number of students enrolled and not to those who concluded in fact the level of education in question. Furthermore, and especially in the higher levels of education, there are students whose age is outside the range considered normal for the attendance of that cycle and, as such, these students are not counted in determining schooling in that grade.

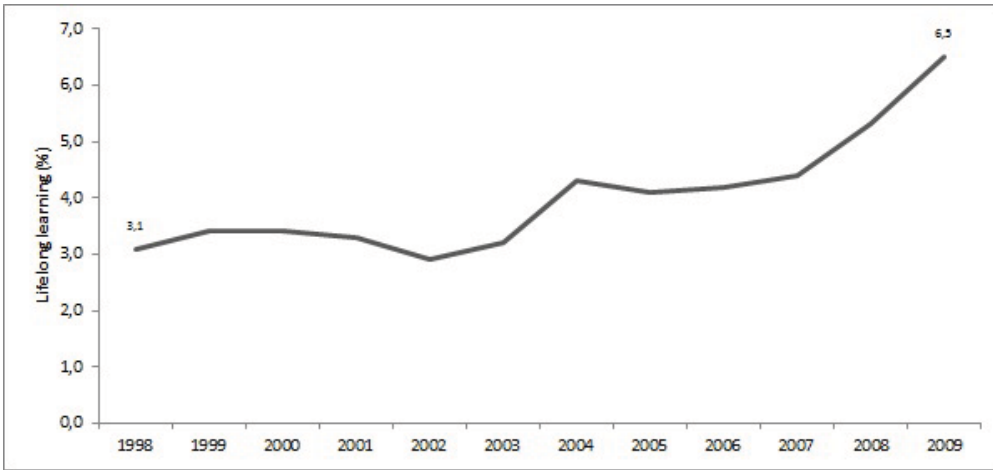
In recent decades, however, there seems to be a trend for increased education even among older individuals, even if within an informal perspective. The proportion of people aged between 25 and 64 taking part in education and training activities[3] has increased in recent years, and in 2009 it reached 6.5% (**Figure 3.3**). Although this indicator still remains relatively low, it calls our attention to the fact that increasingly more individuals can come to enhance their education even after the age at which they would have left the Educational System. We should take this aspect into accountwhen performing a qualitative analysis of the prospective exercise.

Figure 3.2
Real rate of schooling by level of education, 1961-2011



Source: GEPE/ME; INE (Data obtained from PORDATA)

Figure 3.3
Lifelong Learning, 1998-2009

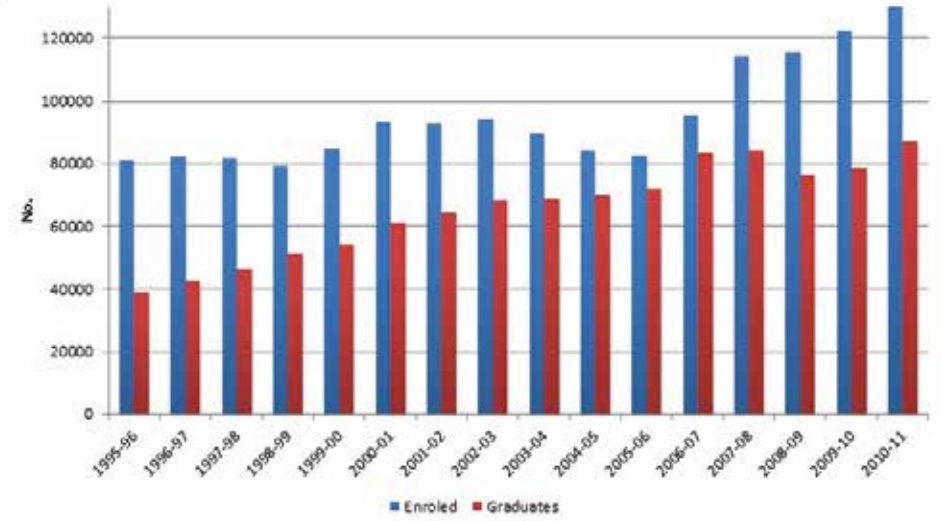


Source: INE, Inquérito ao Emprego

The rate of early education and training dropout, measured as the proportion of individuals aged between 18 and 24 who have not completed Secondary Education, and who are not included in any programme of education or training, decreased from 50 to 20.8% between 1992 and 2012, and has presented a similar behaviour for both genders.

The available data regarding Higher Education corroborates the increase in the number of those enrolled for the first time in the first year of this level of education since the 1995/96 school year, with a slight decrease between 2003 and 2006, followed by a new increase. In 2010/11, was recorded the highest number ever, with 131,508 students registered. However, with regard to the number of graduates in Higher Education institutions, higher values correspond to the years 2006/2007 and 2007/2008, and, after a slight sequential decline and recovery, this indicator again exceeded 80 thousand students in 2010/2011 (**Figure 3.4**).

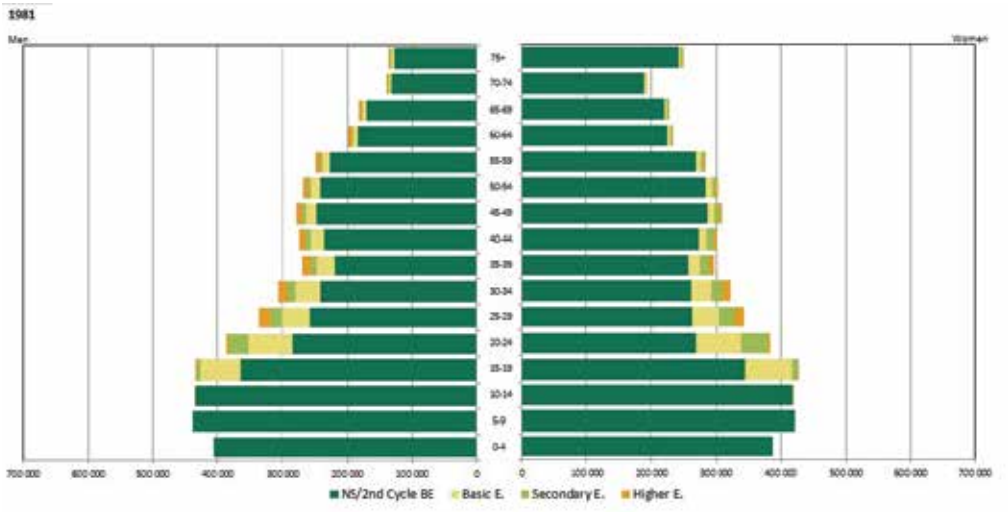
Figure 3.4
Number of enrolees and graduates in Higher Education, 1995/1996 to 2010/2011

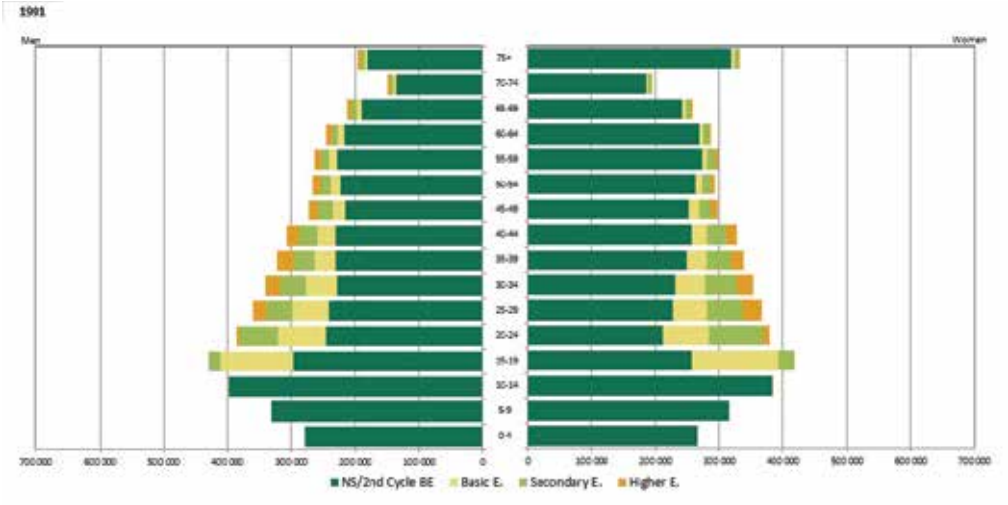


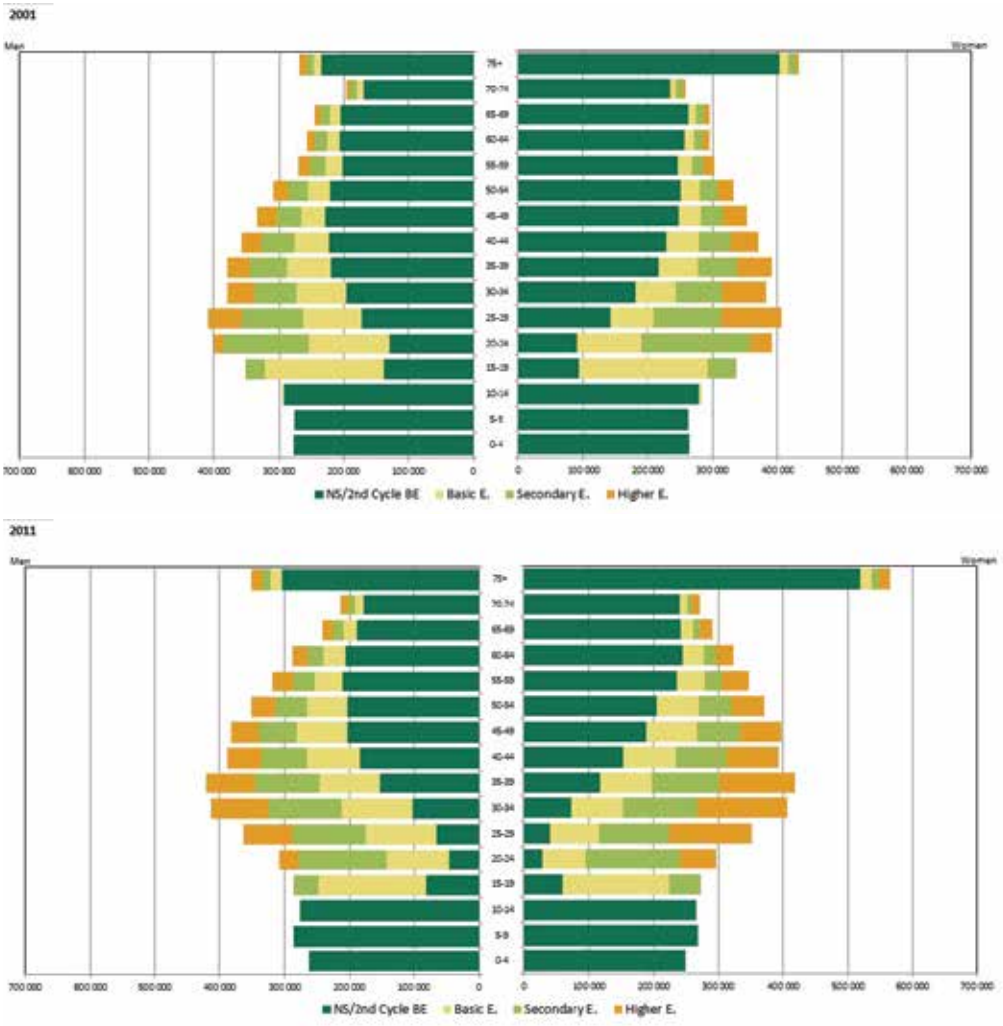
Source: Direcção-Geral de Estatísticas da Educação e Ciência (Ministério da Educação e Ciência)

Based on the data obtained in the last four General Population Censuses for the years 1981, 1991, 2001 and 2011, we can characterise the evolution of the population structure considering the three dimensions at study: gender, age and educational level. The pyramids presented in Figure 3.2, show that the population's ageing has occurred in two ways: on the one hand, increased longevity has raised the number of people aged 65 years or more, as well as the total number of older seniors aged over 75; on the other hand, the fall in fertility rates has caused a reduction in the livestock at younger ages. This process has been aggravated by a decline in the contribution of migration movements to the rejuvenation of the population. These have not only decreased in absolute terms, but they have simultaneously increased the average age of the resident foreign community in Portugal.

Figures 3.5, 3.6, 3.7 and 3.8
Portuguese population by age, gender and education level, 1981, 1991, 2001 and 2011 Census (from top to bottom)







Source: INE, XII, XIII, XIV and XV Recenseamentos Gerais da População

Increased schooling is evident in all age groups and for both genders. In each of the groups determined by these two variables there is an increasing proportion of subjects who completed at least Basic Education, especially after 1991. In 1981, 89.7% of the residents in Portugal had not completed Basic Education and by 2011 this percentage had dropped to 57.1%. The completion of a Higher Education course became more frequent and, in 2011, 11.7% of the subjects had reached this maximum level, in comparison with 1991 when the figure was only 2.9%. In younger cohorts, schooling seems to be different between the genders, with a higher proportion of women completing higher levels of education in comparison to the percentage registered among men. Since an individual's level of schooling can only remain constant or increase, we expect that

as time progresses, the older age groups become increasingly more educated, even though completion of education levels only occurs in younger ages. In this sense, we must also take into account the differences in individuals' mortality patterns by level of education, which may explain variations on the representativeness of the various levels of education in the different age groups.

3.1.2. Objectives and goals for Education

The major objectives for the development of the Portuguese population's level of education that are currently in force were established under the strategic framework for European cooperation in education and training, set in May 2009 by the Council of the European Union (EF 2020). This framework is reflected in the programme *Education and Training 2020*, based on the predecessor *programme Education and Training 2010*. Generically, it is structured around four strategic objectives which are considered common to the Member States:

1- making lifelong learning and mobility a reality;

2- improving the quality and efficiency of education and training;

3- promoting equity, social cohesion and active citizenship;

4- enhancing creativity and innovation, including entrepreneurship, at all levels of education and training". The same programme establishes a set of "reference levels for European average performance" which should not be regarded as specific goals to be achieved by each country by 2020, but rather as reference values that will enable each Member State to "consider, on the basis of national priorities and whilst taking into account the changing economic circumstances, how and to what extent they can contribute to the collective achievement of the European benchmarks through national actions". Among these reference levels it is referred, inter alia, that "by 2020, an average of at least 15 % of adults should participate in lifelong learning", that "the share of 30-34 year olds with tertiary educational attainment should be at least 40 %" and that " share of early leavers from education and training should be less than 10 %".

Internationally, Portugal also took part, along with the other countries belonging to the Organisation of Ibero-American States, in the preparation of the report entitled "Educational Goals 2021: the Education we want for the generation of Bicentenaries"[4]. This document contains a set of objectives, goals and instruments of regional evaluation for educational development, among which stands out the one to ensure that, by 2021, between 60% and 90% of young people across the European Union will finish Secondary Education (Programa Educação 2015).

[4] With the Portuguese title "Metas Educativas 2021: A Educação que queremos para a geração dos Bicentenários".

3.2. Demographic projections by level of education

The growing perception of the importance of human capital in any country or region to ensure their internal development and its importance in the international system explains the various attempts made in recent decades to estimate and project the population's composition by educational level. However, many of these efforts were not successful due to limitations concerning the quality of the statistical series in each country or the lack of appropriate methodologies, which would enable to circumvent some of the faults detected in the individual information sources. In 1992, Psacharopoulos and Arriagada provided estimates of the average years of schooling of the working age population from 99 countries. Nonetheless, these were obtained based on census data and, as such, featured limitations associated with the fact of not knowing the true value of the average number of years spent in each level of schooling, given that grade repetition and dropout rates would have to be estimated by researchers. Three years later, in 1995, Nehru, et al. estimated the average number of years of schooling in primary, secondary and tertiary levels for the working age population, but not disaggregated estimates by gender. Barro and Lee (1993; 2000) provided complete data on education levels and the average number of years of schooling for a wide range of countries, also from census data. However, the estimates obtained were related only to two broad age groups (15 and over and 25 and over), and only for the 1960-2000 period. Ahuja and Filmer (1995a) conducted a study based on population projections by gender and age group conducted by the International Labour Organisation and overlapped them with an estimated distribution of schooling for two broad age groups (6-24 and 25 and over), obtained from data on the proportions of students enrolled and respective projections provided by UNESCO. Like Nehru, et al. (1995) they used the so-called *Perpetual Inventory Method* that sums the total of students enrolled in the course of long-time series, obtaining afterwards estimates of the adult population's schooling. That is, the proportion of the population by level of education completed and/or the average years of schooling. Since these long-time series are rarely available, the suggested method involves a risky number of projections for the past, based only on sets of assumptions. In addition, this methodology presents a somewhat static nature because it does not allow the composition of the population in terms of education to influence mortality or fertility (Lutz, et al., 2005).

The application of the multistate model to the projection by gender, age and level of education has been mainly conducted at the International Institute for Applied Systems Analysis (IIASA). Several members of this Austrian

Institute have prepared projections by level of education for different countries (KC, et al., 2010; Goujon, et al., 2007; Lutz, et al., 2005; Lutz and Goujon, 2001; Lutz, 1999; Goujon and Wils, 1996), essentially trying to relate them with their levels of development. The nearest approach to that followed by IIASA is the one from the Education Policy and Data Center (EPDC), whose model (EDPOP) was developed by Annababette Wils. In 2007, the EPDC produced projections for 83 developing countries and three categories of educational level by 2025, based on the definition of specific trajectories by country (Wils, 2007). A dynamic approach has been applied in these projections, aiming to avoid some of the limitations associated with previous works (Lutz and KC, 2010).

The preparation of demographic projections aims to obtain estimates on the dimension or structure of a certain population universe at some future point (O'Neill, et al., 2001; OECD, 2001). Age and gender are the attributes most frequently taken into account in projections elaborated at national and international level (UN, 2011b; INE, 2009). In these cases, the use of the cohort component-method is the most common, recognised as a commonly accepted method.

According to O'Neill's, et al. (2001) description, the initial population of the country or region under study is grouped into cohorts and the projection proceeds step-by-step through the update of the population for each age group and gender, according to the assumptions regarding the levels of mortality, fertility and migration assumed for that universe. The five-year (and time lapses of five years) age groups are most often used to make long-term projections. The logic is the following: each cohort survives until the next age group, according to the levels of mortality and the probability of survival given for each period and specific for the age and gender considered. Migrations can be analysed applying migration rates or a specific net migration to each cohort. The size of the youngest age group is estimated based on the number of births calculated from either the fertility rates registered by the female cohorts in the age group of reproductive age, or even the actual levels of child mortality relative in recent years. A certain relation of masculinity is assumed to apportion the total male and female births (in every thousand births 488 are female and 512 male). This approach was first proposed by the British economist Cannan (1895) and formalised in mathematical terms by Leslie (1945).

However, as long as the existence of good data is guaranteed, it is possible to do more elaborate projections, considering other attributes such as marital status, educational level, occupational status, the classification of place of residence (urban/rural), type of household and income level (Alho and Keilman, 2010; KC, et al., 2010; Willekens, 2006).

In our case, in order to project the population distributed by gender, age group and educational level, it is necessary to work with multistate demographic methods, which are currently the standard methodology when considering a population divided according to various characteristics and measuring the interactions between the established subgroups (Willekens, 2006). Thereby, in this study we intend to ensure that the projections include a dynamic perspective of demographic change, approaching reality as much as possible. Therefore, we shall assume that the levels of fertility, mortality and migration, as well as transitions between schooling categories may change over time.

The most appropriate approach could be to adopt a dynamic multi-age and multistate model (see Schoen, 2006) to design and project the population. However, the substantial data requirements associated with the use of these models limits this option. Instead we chose an approach also suggested by Schoen (2006) whose application seems to be the one that best fits the data available in the Portuguese case. In the absence of a standard methodology for conducting probabilistic projections of multidimensional populations and the widespread use of deterministic projections, particularly among organisations and researchers who produce projections by level of education (KC, et al., 2010; Goujon, et al., 2007; Lutz, et al., 2005; Lutz and Goujon, 2001; Lutz, 1999; Goujon and Wils, 1996; Ahuja and Filmer, 1995), we will resort to the latter, through the development of alternative scenarios for the future evolution of the various components. The projections were produced using discrete matrix models, based on the cohort-component method adapted to a multi-dimensional population, assuming that the rates that govern population dynamics remain constant in each five-year period of projection. The structure and characteristics of the set population, along with the relative rates for each five-year period are thus the factors that determine the results of the projections.

Taking into account the structure of the Portuguese educational system and the reforms that have been implemented, we chose to divide the individuals of each gender and age group in four categories, depending on their highest level of education completed:

1- *No schooling/Second Cycle of Basic Education*, a group that includes individuals who have not completed any formal education and those who completed only the First Cycle of Basic Education, previously known as Primary Education, or the Second Cycle of Basic Education;
2- Basic Education, encompassing individuals who completed the current Third Cycle of Basic Education (9th grade), the former Unified Basic Education;

3- *Secondary Education,* for those who completed the 12th grade, previously designated as Propaedeutic Education, or Medium Courses (categorisation used in the 1981 Census, which covers Professional and Artistic Courses and Medium Courses, Nursing and Professionals);
4- *Higher Education*, a category that includes individuals who completed a Degree, reaching at least a Bachelor's Degree or Academic Licence ('Licenciatura').

The implementation of the formulated methodology for the projections was supported by Microsoft Office Excel 2010. The *R software* (version 2.13.1) was used in the design of mortality tables associated with the central scenario of the INE, I.P.[5], through *LifeTables* library, and in modelling the relative trend on the levels of education of the Portuguese population (VGAM library).

3.2.1. Set population

The prospective exercise was conducted at an early stage of the *Ageing and Health* project; and it was not yet possible to use the final results of the last Portuguese Population Census. We consider it unnecessary to update the projections, given the small margin of error featuring the 2011 Census, especially when using data concerning NUTS II and III.

The population universe in which the projections are based was calculated according to two distinct steps. Firstly, the estimates regarding the resident population in Portugal in 31 December 2010 were obtained from INE (Annual Estimates of the Resident Population), estimated based on the census population on 21 March 2011 (Censos 2011) and retreated to the end of the previous year[6] (Carrilho, 2005); subsequently, the structure observed in the 2011 Census concerning the academic qualification (higher level of education completed) was applied to each group of this population (by gender and age group). The reference moment of these projections is 1 January 2011 and as such, we assumed that the resident population in that day equalled the one estimated by INE, on 31 December 2010; we also assumed that there were no changes in the structure of academic qualification between the census moment and the reference day[7]. These steps allowed to define our set population for the projections, already divided by gender, five-year age groups (between 0-4 years and 75 years and over, represented by $z = 0, \ldots, 15$, respectively) and by highest level of education completed.

[5] INE, I.P. is the Portuguese acronym for the National Institute of Statistics ("Instituto Nacional de Estatística").
[6] This adjustment was made by the INE, based on the values of birth and death rates observed between the two moments.

3.2.2. Demographic components

Mortality

Direct measurement of mortality according to the educational level requires a system of complete and reliable record of deaths, along with information on the education of the deceased and the corresponding populations at risk. However, such empirical data exists only in a few countries and is not available in Portugal, because death certificates do not include the registration of the level of education of the deceased. As such, the study and projection of mortality differentiating the subgroups according to the respective level of education becomes difficult. Like Goujon, et al. (2007), we used the information on the infant mortality rate by mother's education group to introduce differentials in mortality by educational level in the other age groups.

The values of life expectancy at birth and infant mortality rate, obtained by the medium variant of the latest revision of the official United Nations population projections (UN, 2011b), were used to estimate the mortality tables for every five-year projection, for each gender. This procedure was based on the methodology presented by Clark and Sharrow (2011) and was conducted using *LifeTables* programme of the *R software*. Once these mortality tables were obtained, the mortality differentials by level of education were established on mortality ratios between exact ages x and $x + 5$, represented by ${}_5q_x$. The relationships found between infant mortality rates calculated for each group of maternal education and infant mortality rate for the whole population were then used to estimate specific mortality ratios by gender, age and educational level. The average of the differentials of infant mortality rates observed in the 2006-2011 period by educational level of the mother was used to introduce the differential mortality by educational level in the remaining age groups in all five-year periods subsequent to 2011. Based on these rates four distinct mortality tables were produced for each gender, one for each level of education and already reflecting differentials in mortality by educational level[8] . Later the proportion of survival for each age group was estimated, i.e., the proportion of people in the z-th age group at the initial time t that survive in order to belong to the age group $z + 1$ at the moment t +5, by specific gender and educational level. Following these steps, we do not get a true multistate mortality table as possible transitions between

[7] Given that the moment when the school year usually finishes and the subsequent transition of individuals between levels of education is not between 1 January and 12 March, this assumption is consistent with reality, as long as we also take in consideration the absence of mortality differentials and the migrations occurred between the two moments.

[8] Assuming the absence of transitions between levels of education and acknowledging that deaths in a given time interval occur at the middle of the range.

levels of education are not yet considered. Instead, the calculated survival ratios correspond not only to the survival to the next age group, but also to remaining in the same status.

In order to obtain estimates of the proportions of survival for each NUT II, we chose to use the average ratios between the proportions of each region and Portugal, calculated for the 2006-2011 five-year period, by gender, age group and educational level, admitting that they remain unchanged in the following five-year periods[9].

Fertility

The official population projections of the Population Division of the United Nations (UN, 2011b) were also used to obtain figures for the specific fertility rate for each level of education and age group of the mother in each five-year period subsequent to 2011[10]. It was assumed that the fertility differentials by level of education observed in each age group in the 2006-2011 period would remain constant until the end of the projection period. According to the estimated values (**Table 3.1**), the fertility rate of women in the younger age groups (15-19 and 20-24) would decline significantly over the projection period. The same would happen with older women (45-49 years), who have since the beginning of the period the lowest fertility levels. Rather, the female population between 25 and 39 would display increasingly higher fertility rates as we approach 2030. A fertility postponement will take place, most obviously among women who have not completed Basic Education and within that group the highest fertility levels will be observed between the ages of 20 to 24 years by 2021 and between 25 and 29 from that year on. Among the other levels of education, the ages where there are higher fertility levels will remain over time (between 25 and 29 years for women with Basic Education and between 30 and 34 years for those who completed at least the Secondary Education).

It appears, therefore, that women with higher levels of education continue to be those who have their children at a later point in their life. Still, considering all women of reproductive age, it is those who completed some level of Higher Education that have, throughout the period, the highest fertility levels.

[9] To obtain estimates for the levels of mortality in the years prior to 2011, abridged mortality tables provided by INE, for gender, at national and regional level and for biennial periods were used.

[10] Only women of reproductive age were considered, assuming that this range extends between 15 and 49 years old.

Table 3.1
Total fertility rate by education level of the mother, 2011-2031 (Portugal)

Five-year period	Mother's level of education			
	NS/2nd Cycle of Basic Education	Basic Education	Secondary Education	Higher Education
2011-2016	1.37	1.25	1.41	1.51
2016-2021	1.29	1.24	1.42	1.55
2021-2026	1.28	1.28	1.50	1.67
2026-2031	1.29	1.34	1.61	1.82

Source: Author's calculations

In regional terms, fertility rates were estimated from the national average values observed in the 2006-2011 five-year period, assuming that the observed relationships between the rates of each region for each age group and level of education, and the corresponding rate for Portugal remain in the subsequent five-year periods.

Migrations

The values of the five-year net migration by gender, age group and educational level were calculated using the annual migration balances for the central scenario of demographic projections prepared by INE, for the 2008-2060 period[11]. For each year, the distribution of total net migration by gender and age group was conducted based on the structure of international migration movements to Portugal, presented by the United Nations (UN, 2011a)[12]. The subsequent distribution by level of education assumed that the structure observed in migrants does not differ substantially from that observed in the resident population. Therefore, it was considered the average proportion of individuals at each level between 2006 and 2010 (for the age group of 10-14 years, the structure observed in the 2011 Census was always used, which was the only year for which we have data for this age group).

[11] The results of the projections of resident population in Portugal prepared by the INE include four scenarios, which derive from different combinations of variants concerning the evolution of each of the components. In view of recent demographic trends, the central scenario is the one that combines the set of hypotheses considered to be the most likely (INE, 2009). In what concerns migrations based on the analysis of the values of the estimated average net migration for the 15 years prior to the beginning of the projection period, the central scenario assumes a slight increase in the annual net migration until it reaches 36, 6000 individuals in 2018, from which point it remains constant until the end of the projection period.

[12] OAlthough this structure relates to international migration, it was applied to the entire net migration, since we ignore the proportion of internal migrants for each region.

To estimate the values of net migration for each NUT II, a five-year period variation by gender, age group and educational level, expected for Portugal, was applied to the estimated values for the 2006-2011 five-year period (following the steps described but from the annual estimates of net migration seen in Portugal and in each NUT II, encompassing individuals of both genders, all age groups and levels of education provided by the INE).

3.2.3 Transitions between levels of education

The completion of a level of education and the inherent transition to a different level is never a certain event, and these transitions do not directly relate to the time, unlike what happens with age progression. As such, the multistate modelling, centred on the estimate of the intensities or the transition probabilities between states (depending whether we work with continuous or discrete time, respectively), requires obtaining specific data on the number of transitions, and also the moment they occur (Cox and Miller, 1965; Imhoff and Keilman, 1991; Willekens, 2006). In our study we focus on the estimates of transition probabilities for each of the five-year periods in which the range of projection is divided.

Considering the expected transition ages, according to the structure of the Portuguese educational system, it is assumed that the transition from a No Schooling/Second Cycle of Basic Education status occurs around the age of 15 and therefore transition rates are calculated between these levels for the age groups of 10-14 and 15-19 years. In what concerns transitions from Basic Education to Secondary Education (which theoretically can happen around the age of 18) they may occur in the age groups of 15-19 and 20-24 years. Finally, it is assumed that the transitions from Secondary Education to Higher Education happen in the age groups of 20-24 and 25-29. Still based on the organisation of the educational system, and due to the fact that individuals cannot go back to a lower level of education, it is assumed that no transitions between educational levels occur after the age of 30.

The methodology used to estimate the transition probabilities between states for each gender, age group and five-year period is conditioned by the type of data available for this purpose. In this work, and similarly to what happens in many practical applications, only so-called aggregate data are available, where individual transitions are not observed but only the number of individuals occupying each state at different times of observation. The estimation of transition probabilities is based on the assumption that the passage of each individual by different levels of schooling can be translated into a Markov chain (Imhoff and Keilman, 1991; Willekens, 2006; Müller, 2007),

where there is a hierarchy between different grades and assuming the unidirectional passage through the various levels. Be $p_{it}(x,x+n)$ the unconditional probability of individuals between the ages x and $x + n$ at the moment t, in status i. The row vector containing the probability distribution among the various states for individuals between the ages x and x + n at the moment t is represented by $p_t(x,x+n)$. Still, $p_{ijt}(x,x+n)$ is the conditional probability of individuals in status i between the ages$x$ e $x + n$ at the moment t being in status j exactly n years later. We then have that (Willekens, 2006; Müller, 2007):

$$p_{j,t+n}(x+n,x+2n) \sum p_{it}(x,x+n)\, p_{ijt}(x,x+n)$$

or

$$p_{t+n}(x,x+2n) = p_t(x,x+n)\, p_t(x,x+n)$$

in which $p_t(x,x+n)$ is the matrix of transition probabilities $p_{ijt}(x,x+n)$.

Considering only the relevant transitions in this work, based on the assumptions described in the previous sections, we have:

$$p_{2,t+5}(10,15) = p_{1,t}(5,10) \cdot p_{1,2,t}(5,10)$$

$$p_{2,t+5}(15,20) = p_{1,t}(10,15) \cdot p_{1,2,t}(10,15) + p_{2,t}(10,15) \cdot (1 - p_{2,3,t}(10,15))$$

$$p_{3,t+5}(15,20) = p_{1,t}(10,15) \cdot p_{1,3,t}(10,15) + p_{2,t}(10,15) \cdot p_{2,3,t}(10,15)$$

$$p_{3,t+5}(20,25) = p_{2,t}(15,20) \cdot p_{2,3,t}(15,20) + p_{3,t}(15,20) \cdot (1 - p_{3,4,t}(15,20))$$

$$p_{4,t+5}(20,25) = p_{3,t}(15,20) \cdot p_{3,4,t}(15,20)$$

$$p_{4,t+5}(25,30) = p_{3,t}20,25) \cdot p_{3,4,t}(20,25) + p_{4,,t}(20,25)$$

The proportion of people in status i between the ages x e $x + n$ in the moment t, represented by $p_{1,t}(x,x+n)$, is an unbiased estimator of $p_{1,t}(x,x+n)$. Thus:

$$p_{1,2,t}(5,10) = \frac{p_{2,t+5}(10,15) = p_{2,t+5}(10,15)}{p_{1,t}(5,10)}$$

$$p_{3,4,t}(15,20) = \frac{p_{4,t+5}(20,25)}{p_{3,t}(15,20)}$$

$$p_{3,4,t}(20,25) = \frac{p_{4,t+5}(25,30) - p_{4,,t}(20,25)}{p_{3,t}20,25)}$$

$$p_{2,3,t}(15,20) = \frac{p_{3,t+5}(20,25) - p_{3,t}(15,20) + p_{4,t+5}(20,25)}{p_{2,3,t}(15,20)}$$

In which $p_{ijt}(x,x+n)$ is the estimator of $p_{ijt}(x,x+n)$ that we shall use.

Because we have a number of unknowns which exceed the number of equations, the estimation of the remaining transition probabilities is not possible solely from the proportions of state. Since both the estimates of $p_{1,2,t}p_{1,2,t}$ (10,15) as well as of may be obtained from an estimate of $p_{2,3,t}(10,15)$, the option is to assume that:

$$p_{2,3,t}(10,15) = TRE_{E.Secund.}(t, t+5) \cdot (1 - TRE_{E.Secund.}(t, t+5))$$

where $TRE_{E.Secund.}(t, t+5)$ represents the real average rate of enrolment in Secondary Education for the period $(t, t+5)$ and$TRE_{E.Secund.}(t, t+5)$ represents the average rate of grade retention and dropout in Secondary Education for the same period.

This expression stems from the following assumptions:

a) the completion of a level of education requires, first of all, the enrolment in that cycle of studies, which is the percentage of students enrolled in each cycle of studies, within the normal age for attending that cycle, given by the actual enrolment rate;

b) to complete the cycle of studies it is also necessary to approve and the students who do not dropout or are not held back are those that approve;

c) independence between the proportion of students enrolled in a particular course of study and the proportion of students held back or who dropout. Thus, $p_{2,3,t}(10,15)$ represents the proportion of students between 10 and 14 years old in t that are enrolled and approve Secondary Education, within the following five years. They now belong to the status corresponding to that level at the moment $t+5$ when they are in the following age group. The real values of schooling and grade retention and dropout rates provided by the Office of Statistics and Planning of the Ministry of Education concern both genders, resulting in estimates of $p_{2,3,t}(10,15)$ equal for both men and women.

Based on these assumptions, we can easily obtain the estimators for the remaining transition probabilities:

$$p_{1,2,t}(10,15) = \frac{p_{2,t+5}(15,20) - p_{2,t}(10,15) \cdot (1 - p_{2,3,t}(10,15))}{p_{1,t}(10,15)}$$

$$p_{1,3,t}(10,15) = \frac{p_{3,t+5}(15,20) - p_{2,t}(10,15) \cdot p_{2,3,t}(10,15)}{p_{1,t}(10,15)}$$

3.2.4. Estimation of effective population

The estimation of parameters related to the demographic components of mortality, fertility and migration and the transition probabilities allows us to estimate the number of individuals of each gender in each age group and the educational level from the initial population at the end of each five-year period projection. To this end, we use a Leslie matrix in blocks, called matrix **B**, which includes the proportions of survival, fertility rates and transition probabilities, and the vector corresponding to net migration. Thus, we get the following expression for each gender:

$$_{t+5} = \mathrm{B}_{t} + \mathrm{SM}_{t}$$

Taking the example of the female population, represented by the exponent f, we have:

$$\begin{bmatrix} {}^{f}_{1,3,t+5} \\ {}^{f}_{1,2,t+5} \\ {}^{f}_{1,1,t+5} \\ {}^{f}_{1,0,t+5} \\ {}^{f}_{2,3,t+5} \\ {}^{f}_{2,2,t+5} \\ \vdots \\ {}^{f}_{m,0,t+5} \end{bmatrix} = \begin{bmatrix} f \cdot b_{11} \cdot p_{11} & f \cdot b_{12} \cdot p_{12} & f \cdot b_{13} \cdot p_{13} & f \cdot b_{14} \cdot p_{14} & f \cdot b_{15} \cdot p_{15} & f \cdot b_{16} \cdot p_{16} & f \cdot b_{17} \cdot p_{17} & f \cdot b_{18} \cdot p_{18} & \cdots & f \cdot b_{m1} \cdot p_{m1} & f \cdot b_{m2} \cdot p_{m2} & f \cdot b_{m3} \cdot p_{m3} & f \cdot b_{m4} \cdot p_{m4} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ p_{111} & p_{121} & p_{131} & p_{141} & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ p_{112} & p_{122} & p_{132} & p_{142} & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ p_{113} & p_{123} & p_{133} & p_{143} & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ p_{114} & p_{124} & p_{134} & p_{144} & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & p_{211} & p_{221} & p_{231} & p_{241} & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & p_{212} & p_{222} & p_{232} & p_{242} & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & p_{213} & p_{223} & p_{233} & p_{243} & \cdots & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & p_{214} & p_{224} & p_{234} & p_{244} & \cdots & 0 & 0 & 0 & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \end{bmatrix} \begin{bmatrix} {}^{f}_{1,3,t} \\ {}^{f}_{1,2,t} \\ {}^{f}_{1,1,t} \\ {}^{f}_{1,0,t} \\ {}^{f}_{2,3,t} \\ {}^{f}_{2,2,t} \\ \vdots \\ {}^{f}_{m,0,t} \end{bmatrix} + \begin{bmatrix} SM^{f}_{1,3,t} \\ SM^{f}_{1,2,t} \\ SM^{f}_{1,1,t} \\ SM^{f}_{1,0,t} \\ SM^{f}_{2,3,t} \\ SM^{f}_{2,2,t} \\ \vdots \\ SM^{f}_{m,0,t} \end{bmatrix}$$

where ${}^{f}_{zjt}$ represents the number of women in the age group z and status j in t; b_{zj} represents the specific fertility rate for women in the age group z and status j (we should notice that only the first row of the table includes the contribution of women to the formation of the first age group, since all births will belong to the first status, No Schooling/Second Cycle of Basic Education); indicates the likelihood of births that take place within the timeframe being female; p_{zjK} refers to the probability of individuals that, in t, are in age group and status z who survive and are in status k in t+5 ; and SM^{f}_{zjt} indicates net migration among females, age group z and status j , during the period [t,t + 5[. The projection matrix **B** can be further simplified based on the above assumptions.

When assuming that women of reproductive age are aged between 15 and 49 years old and, as such, the specific fertility rate for age groups outside that range are null, the only non-null values in the first row of the matrix **B** are those relating to the age groups z = 4,5,…,10. Besides, we know that transitions to a lower level of education are impossible whatever the age group under consideration and, consequently, the value p_{zjk} will be null everytime $j > k$. Also the transitions from the status No Schooling/Second Cycle of Basic Education and Basic Education to Higher Education are considered impossible in the timeframe in which we work (five years).

By focusing on each specific age group we find that, depending on the events that may occur at that age and as previously assumed, there will be other transition probabilities with a null value. For example, let's assume that individuals aged between 20 and 24 in *t* which will therefore be 25 to 29 years old in *t*+5 , can transition from Secondary Education to Higher Education over this period of five years, but will not do any of the previous transitions. In this sense, anyone who has Basic Education at *t* in the age group of 20-24 years old, will remain at this level of education at the end of the next five years. Thus, the probabilities p_{zjk} turn into mere survival probabilities, where there are no possible transitions between j and k: they are now designated p_{zj} and represent the probability of people in the age group *z* and status *j* to survive the 5 years, moving from age group $z + 1$, while remaining in status *j* (these probabilities correspond to the proportions of survival previously presented).

The probabilities of individuals surviving and remaining in a given status in the age groups in which transitions take place, are given by p_{zjj}, and are obtained as $p_{zjj} = p_{zj} - \sum p_{zjk}$. Representing, for the elements of a given age group *z* at the educational level *j*, in *t*, the probability of death in the range $[t,t+5[$ por $1 - p_{zj}$, the probability of survival and transition to any other level of education by $\sum p_{zjk}$ and the probability of survival and maintaining the same level by p_{zjj},, we thus have that $1 - p_{zj}) + p_{zjj} + \sum p_{zjk} = 1 <=> p_{zjj} = p_{zj} - \sum p_{zjk}$.

The projection of the male population (distinguished by the superscript^{m}) is done in a similar way, but in this case the matrix **B** does not include the fertility rates or the total of births $[t,t+5[$ given by:

$$\ell^{m}_{1,1,t+5} = (1 - r) \sum \sum bzj \; {}^{f}_{zjt} \; {}^{f}$$

The projected population for the moment corresponding to 1 January 2016 is based on the vector ℓ_{2011}, corresponding to the starting population, and the estimates of the survival and transition probabilities, of fertility rates and net migration values obtained based on the steps listed above. The population

projected for the end of each five-year period is used as the initial population in the next five years.

3.2.5. Projection scenarios

Constant scenario

Based on the average of transition probabilities estimated for the 2001-2006 and the 2006-2011 five-year periods, we can assume a scenario of constant schooling, where these same probabilities remain constant throughout the period of projection. This scenario results in stable proportions of individuals at each level of education for the various cohorts. Thus, its only purpose is to demonstrate the effect of extending to the future the initial context, without taking into account the recent trend or the effect of any changes in the circumstances of departure.

Trend Scenario

In the trend scenario we assume that the educational levels will continue in the near future, following the trend of recent years. Therefore, we chose to model the trend of the status proportions, through a model of continuous reason, to obtain estimates on the proportions of subjects in each level of education in future moments. Based on these, we can estimate the correspondent transition probabilities, an approach also followed by Goujon, et al. (2007). To estimate $p_{2,3,t}$ (10,15) it was also necessary to model the trend for real enrollment rate in Secondary Education and the rate of grade retention and dropout at the same level of education, based on the available estimates (annual values between 1998 and 2010) and then use the average of the values projected for each five-year period of projection. In the first case, the best fit (measured by the coefficient of determination, R^2) was obtained for a logarithmic trend line (R^2 = 0, 176). For the grade retention and dropout rate, the better fit was observed with a line of log-linear trend (R^2 = 0, 798). The construction of these models was the way found to analyse the evolution of the transition proportions over time, in order to project it into the future, although they are subject to the scarcity of basic information.

To estimate the proportions of transition at the regional level, annual variation rates of the status' proportions for Portugal in the years 2011 and 2031 were initially calculated. Moreover, it was assumed that the same level of annual variation occurs in each NUT II, beginning in the proportions observed in the 2011 Census. Once estimates were obtained for the proportions of status in each NUT II for each year in the 2011-2031 period, the methodology for calculating the proportions of transition were once again applied.

3.3. Resident population in Portugal (NUTS II), by gender, age group and educational level

In both scenarios a decrease in the total number of residents in Portugal is expected, from 10,636,979 between 2011 and 2031 to 10,284,134 inhabitants, according to the constant scenario, or to 10,265,109 inhabitants according to the trend scenario. The distribution of residents according to gender should remain stable over time. In 2011, 51.6% of the residents were female and twenty years later that percentage is expected to be of approximately 51.5%, regardless of the scenario considered. In what concerns the representativeness of each age group in the total population, considerable differences are expected from the base year on. By 2031 the proportion of individuals aged 65 and over is expected to increase to about 22%, while the proportion of children and young people under 15 years old is expected to be slightly above 14%. As a result of the increasing proportion of elderly relatively to the percentage of youth in the population, the ageing ratio is expected to increase considerably. According to the trend scenario, by 2031 there will be 154.5 persons with 65 years and over per 100 individuals below the age of 15. The workforce will also become increasingly aged and it is estimated that in 2031 there will be only 70.9 people between the ages of 20 and 29 per 100 people aged between the ages of 55 and 64 (T**able 3.2**).

Table 3.2

Contents summary, 2011 and 2031, Constant Scenario and Trend Scenario

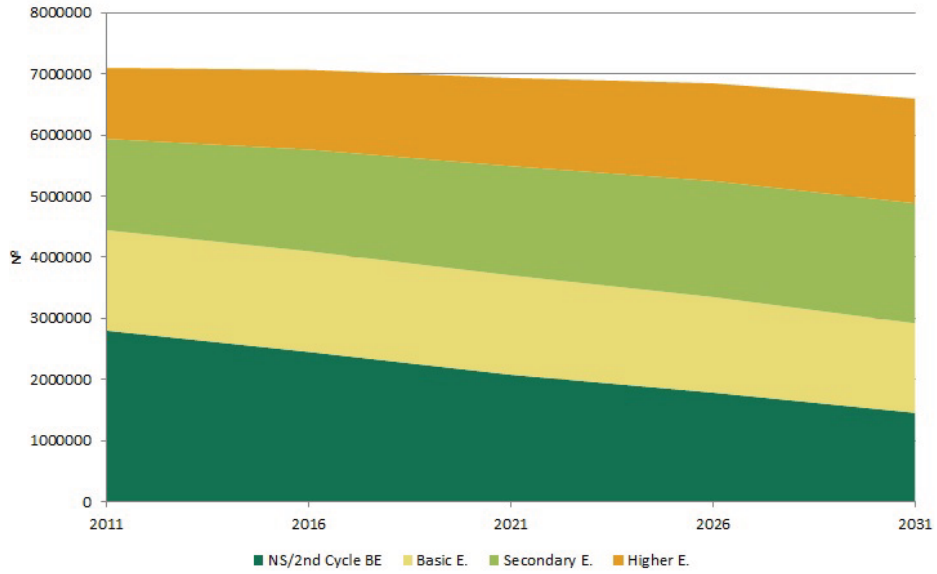
	Portugal		
	2011	2031 Constant	2031 Trend
Youth Ratio	83.2	65.6	64.7
Ageing Ratio	120.1	152.4	154.5
Longevity Ratio	47.4	42.9	42.9
Ratio of Renewal of Working Age Population	103.2	70.9	70.9
Youth Dependency Ratio	22.7	21.1	21.8
Elderly Dependency Ratio	27.2	33.8	33.7
Total Dependence Ratio	49.9	55.9	55.6

Source: Author's calculations

The proportion of residents who complete at least the Basic Education will continue to rise in the next two decades. Thus, it is possible to expect that in 2030 more than half of the population has completed this level of education (55.8%, according to the constant scenario and 58.9% according to the trend scenario). Even in the least optimistic scenario (maintaining the transition proportions or constant scenario) the schooling of the population will increase; as the younger and more educated cohorts replace the older cohorts. The trend scenario results in an acceleration of this increase, since it is based in the transition proportions that follow the tendency of the past decade, and as such, they grow over the projection period.

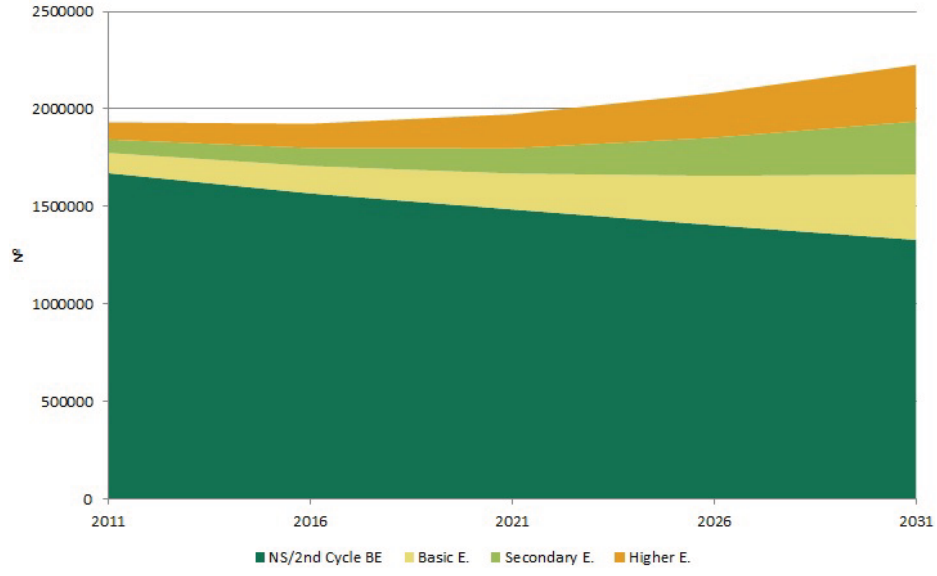
Since the completion of Basic Education usually occurs around the ages of 15, the group of children and young people up to 14 years old stays in its majority in the first group, regardless of the time lapse and levels of education considered. Thus, it is important to analyse the effects of schooling, focusing on individuals aged over 15. Considering only the livestock in the adult age group between 15 to 64 years (Figure 3.9), it appears that, although the actual number of livestock in these ages remains stable, the enhancement of human capital in this group is quite likely. Consequently, there is a decrease in the proportion of individuals who have not completed Basic Education of 39.4 to approximately 25% between 2011 and 2031 (26.65% according to the constant scenario and 22.03% in the trend scenario). As for the percentage of individuals who have a Higher Education course, in what is considered the age group corresponding to the working age, it is expected to reach values close to 25% in 2031, when it was only of 16.4% twenty years earlier. In Figure 3.10 we can observe the increase in the total number of people aged 65 years or over, along with a clear change in the structure by level of education. In the early '30s, 40.3% of the individuals in this age group should have completed at least the Third Cycle of Basic Education, which represents an increase of 26.8% when compared to 2011. Meanwhile, the percentage of Portuguese with a full Higher Education course, which was of 4.6% in the base year, will increase to 13.04% by 2031, whatever the scenario considered.

Figure 3.9
Number of residents aged 15-64, by educational level, 2011-2031, Trend Scenario



Source: Author's calculations

Figure 3.10
Number of residents aged 65 +, by educational level, 2011-2031, Trend Scenario

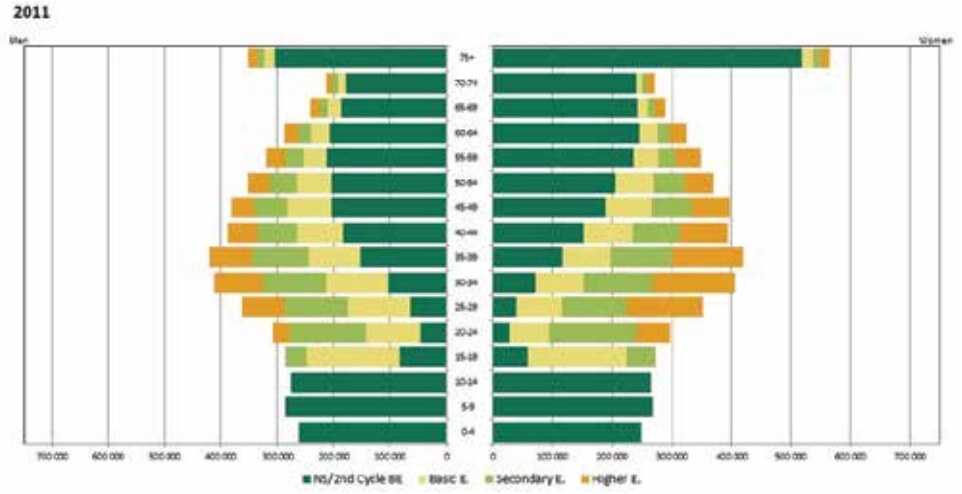


Source: Author's calculations

The distribution of residents by all three variables - gender, age group and educational level - can be analysed by constructing multistate population pyramids. The comparison between the population structure observed in 2011 and estimated for the year 2031 (**Figures 3.11** and **3.12**) indicates that the proportion of individuals who complete higher levels of education should increase in all age groups of both genders, in both scenarios.

Figure 3.11

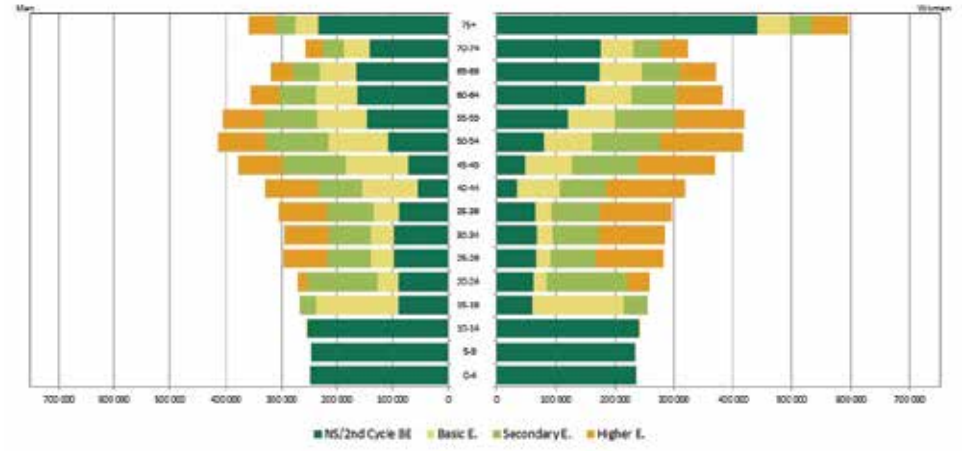
Portuguese population by age, gender and level of education, 1 January 2011

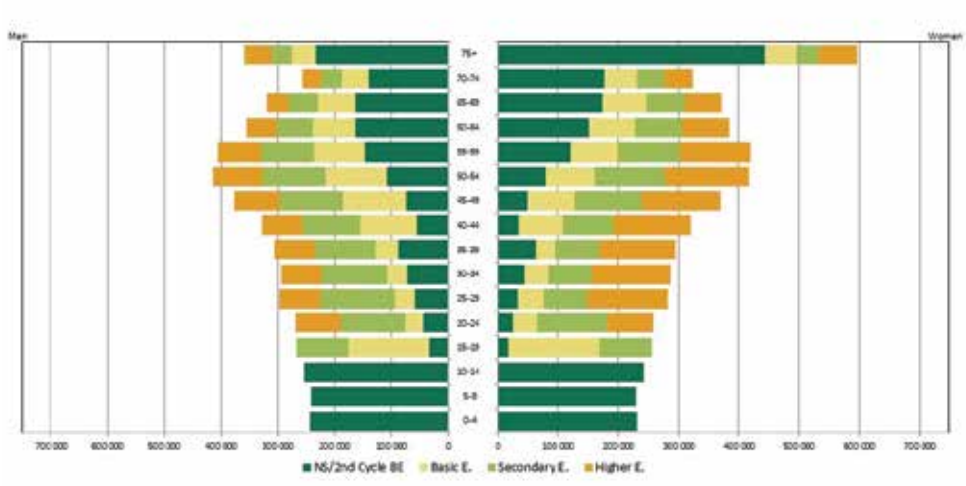


Source: INE, Estimativas Anuais da População Residente and author's calculations.

Figure 3.12

Portuguese population by age, gender and level of education, 2031 Constant Scenario (left) and Trend Scenario (right)





Source: Author's calculations

In all scenarios there will still be differences with regard to the standard enrolment between individuals of different genders. Although in older cohorts (70 and over), in 2031 there will still be a higher percentage of men than women with at least Basic Education. Education between the latter tends to exceed the levels of male schooling, which becomes evident in younger cohorts. Considering all age groups, the percentage of men who did not get to complete Basic Education in 2011 was slightly higher than of women (57.2 and 57%, respectively), a situation which increases over the projection period. In 2030, 42.4% men do not have a complete Basic Education, against 39.95% women (trend scenario). In 2011 only 13.6% women had completed some level of Higher Education, a figure that by 2031 could rise to approximately 23.4%; whereas among men, this figure was only 9.7% in 2011 and should also rise by 2031, reaching 15.5% in that year. Since moving to a higher level of education is an irreversible event, we expect the proportion of elderly in Portugal that have higher levels of education to continue to increase, since the schooling of younger cohorts seems to continue to develop positively.

In regional terms, as can be concluded from the results presented in (**Table 3.3)**, the expected demographic evolution will generally be similar to that designed for the country. According to the trend scenario, the total number of residents is expected to decline in most regions, with the exception of Lisbon, the Algarve and the Azores (RAA)[13] ; the proportion of young people will decline in virtually all regions, with only a slight increase in the Algarve, emphasising a sharp decrease in the Autonomous Regions and the North; the percentage of elderly is expected to rise in all regions, remaining at levels close to those seen in 2011 in the Alentejo and the Algarve. Increased levels

of schooling, for both the general population and the elderly in particular, should be generalised and Lisbon will remain as the region in which individuals are more educated.

Table 3.3
Population structure by gender, age group and educational level, 2011 and 2031 (Trend Scenario) by NUT II

	NUT II	North		Centre		Lisbon		Alentejo		Algarve		R.A.A.		R.A.M.[14]	
	Year	2011	2031	2011	2031	2011	2031	2011	2031	2011	2031	2011	2031	2011	2031
	Total (No.)	3,741,092	3,582,068	2,375,902	2,299,854	2,839,908	2,940,893	749,055	668,539	437,643	528,960	245,811	251,247	247,568	246,554
Gender	M	48.3%	48.4%	48.3%	48.5%	48.0%	48.5%	49.1%	48.9%	50.1%	49.5%	49.6%	49.2%	47.3%	47.6%
	F	51.7%	51.6%	51.7%	51.5%	52.0%	51.5%	50.9%	51.1%	49.9%	50.5%	50.4%	50.8%	52.7%	52.4%
Age Group (years)	0-14	15.1%	12.9%	13.7%	13.1%	16.2%	15.6%	13.3%	13.1%	15.8%	15.9%	18.3%	15.6%	17.2%	15.2%
	15-64	68.8%	64.8%	65,5%	65.2%	65.7%	64.3%	63.6%	64.7%	64.9%	65.2%	69.2%	68.4%	69.8%	69.5%
	65+	16.1%	22.3%	20.9%	21.7%	18.0%	20.1%	23.1%	22.1%	19.3%	18.9%	12.6%	16.0%	13.0%	15.3%
Level of Education	NS/2nd Cycle BE	60.5%	44.1%	58.6%	40.5%	49.5%	35.9%	60.5%	41.5%	55.5%	41.8%	64.6%	51.6%	61.0%	46.8%
	Basic Ed.	16.0%	17.7%	16.4%	18.2%	17.1%	16.9%	16.4%	19.1%	17.9%	19.9%	16.0%	18.8%	15.3%	16.3%
	Secondary Ed.	13.2%	20.3%	14.2%	22.5%	17.4%	23.7%	14.2%	23.3%	16.8%	22.9%	11.2%	16.4%	13.7%	21.8%
	Higher Ed	10.3%	18.0%	10.7%	18.9%	16.0%	23.5%	8.9%	16.1%	9.8%	15.4%	8.1%	13.2%	10.0%	15.2%
Population with 65 and over															
Level of Education	Total (No.)	602,798	797,961	496,103	499,808	511,896	590,479	173,145	148,031	84,463	99,941	30,864	40,158	32,188	37,824
	NS/2nd Cycle BE	89.5%	67.9%	91.2%	63.0%	75.7%	43.4%	92.7%	60.3%	84.9%	56.2%	88.8%	67.6%	90.0%	66.6%
	Basic Ed.	4.0%	12.5%	3.7%	14.9%	9.5%	19.0%	3.3%	16.0%	5.9%	16.7%	4.5%	12.6%	4.0%	10.9%
	Secondary Ed.	2.6%	9.5%	2.1%	11.0%	6.7%	17.5%	1.8%	12.2%	5.2%	15.3%	2.8%	9.0%	2.7%	10.9%
	Higher Ed	3.8%	10.1%	3.0%	11.1%	8.1%	20.1%	2.3%	11.4%	4.1%	11.8%	3.8%	10.8%	3.3%	11.7%

Source: Author's calculations

Table 3.4
Contents summary, 2011 and 2031 (Trend Scenario), by NUT II

	North		Centre		Lisbon		Alentejo		Algarve		R.A.A.		R.A.M.	
	2011	2031	2011	2031	2011	2031	2011	2031	2011	2031	2011	2031	2011	2031
Youth Ratio	93.8	58.1	65.4	60.2	90.1	77.6	57.7	59.3	81.7	83.9	145.4	97.6	132.6	99.1
Ageing Ratio	106.6	172.1	152.9	166.2	111.0	128.8	173.4	168.7	122.5	119.2	68.8	102.4	75.4	100.9
Longevity Ratio	46.6	41.1	50.1	43.0	44.2	44.2	52.2	42.7	48.8	43.8	45.6	34.7	45.9	32.7
Renewal of Working Age Population Ratio	111.9	66.5	103.4	68.9	87.6	79.5	96.6	70.6	97.4	86.7	164.7	88.2	153.7	79.8
Youth Dependency Ratio	22.0	20.0	20.9	20.1	24.7	24.2	21.0	20.3	24.3	24.3	26.4	22.8	24.7	21.9
Ratio	23.4	34.4	31.9	33.3	27.4	31.2	36.4	34.2	29.7	29.0	18.1	23.4	18.6	22.1
Total Dependency Ratio	45.4	54.4	52.8	53.4	52.1	55.4	57.4	54.5	54.0	53.3	44.5	46.2	43.4	44.0

Source: Author's calculations

[13] RAA is the Portuguese acronym for "Região Autónoma dos Açores".
[14] RAM is the Portuguese acronym for "Região Autónoma da Madeira".

Table 3.4 shows the values of a set of expected summary contents, in accordance with the projections prepared by region.

Compliance with the main objective of this chapter was characterised by a number of limitations associated with its complexity and the scarcity of data available, resulting in difficulties common to those observed in similar studies. In turn, the latter provided the necessary conditions to circumvent these obstacles and achieve the results presented.

The use of differentials of infant mortality by mother's education to estimate the differences in mortality rates between educational groups, as well as relative approaches on the estimate of net migration, are major limitations with regard to the projection of older individuals distributed by the four education groups considered. In fact, as individuals with 65 years or more in 2031 were at least 45 years old at the beginning of the projection period, in this group there were no transitions between levels of education during the 2011-2031 period. Moreover, the results for the younger age groups are particularly determined by the transition probabilities projected. The use of constant probabilities for the age group of 10-14 years, in which it was necessary to use only the data from the 2011 Census, as well as the limitations on the projection of the proportions of status in the trend scenario, influence the projected distribution of individuals by level of education. Despite the effect of the transition probabilities projected on the total number of people between the ages of 15 and 24 being smaller (because mortality levels for the various groups of education are very low and still very close at these ages), they will have a considerable impact on the number of children and young people aged up to 14 years old, given the differences in fertility levels among mothers with different levels of education.

Regarding the differences between the constant scenario and the trend scenario, and since these scenarios differ in estimates of the proportions of transition between levels of education; it appears that the main differences in the results are in the distribution by level of education, both in each cohort as in the overall population.

The slight discrepancies observed between the scenarios with regard to the dimension of the total population and of each group by gender and age are the result of differential fertility, mortality and migration by educational level.

4. Projections of health indicators (2010-2030)

Mª do Rosário O. Martins and Inês Rodrigues

Conducting a projection that reflects the changes in the population's life expectancy, the prevalence of severe disabilities and poor health and its likely impacts in what concerns the use of health services is a complex task.

However, the connection between these vectors has already been object of reflection. On the one hand, a possible decrease in mortality levels is due to a decrease in diseases' mortality rate rather than to the reduction of its prevalence/incidence (Olshansky, et al., 1991; Verbrugge, 1984; Gruenberg, 1977). Consequently, the decrease in overall mortality rates would be accompanied by increased morbidity and disability, known as the 'expansion of morbidity'. A second assumption, which we designate as 'compression of morbidity' (Fries, 1980; 1989), suggests that disability and poor health are deferred to the final period of life, and as such, we expect people not only to live longer but with better health status. Finally, a third hypothesis of 'dynamic equilibrium' (Manton, 1982) argues that there will be a balanced effect between the decrease in prevalence/incidence of chronic diseases and the decrease in diseases' mortality rate, leading to an increasing prevalence of disabilities. However, the existing research so far has not allowed reaching a clear conclusion on the validity of this hypothesis (Global Forum for Health Research, 2008).

Considering the influence that attributes such as gender, age and level of education have on individual health and on the population's in general, it is essential to study how the demographic structure can be modified in the future, determined by this set of variables, and the impact these changes will have on the population's health, particularly when we expect an ageing but also more educated population.

We begin this chapter by reviewing the existing research in order to study the association between gender, age and educational levels with health. Subsequently, the results of the demographic projections presented in the previous chapter will allow us to prepare the projections by NUT II for the 2011-2031 period, concerning a set of indicators on health and the degree of use of health services by the Portuguese population considering the expected changes in the demographic structure by gender, age group and educational level.

4.1 Gender, age and educational level as determinants of health

Demographic ageing is often perceived as one of the main challenges of the 21st century in socio-economic terms and in terms of public health, both at the national and international level (WHO, 2002; OECD, 2011b). As

demonstrated by Olshansky, et al. (2012), health is the determinant of the degree of functional dependence, productivity and financial dependence of individuals. As such, if older people stay healthy, they can act and be seen in a way closer to the younger members of society, which is in its majority healthier, more active and more productive.

In fact, it is essential to recognise that there is an inevitable decline in physical and cognitive functions as the human being ages. However, we should also take into account the variability between different individuals, with regard to their trajectories of ageing and the degree of loss of physical, social, emotional and cognitive abilities (Olshansky, 2012). Currently these differences reflect the effect of a set of determinants of health, both associated to individual and social characteristics.

The recognition of inequalities with regard to the health condition and use of health services among elements of the same population has supported the development of research on individual and social characteristics that are its determinants. Today we can say that the combination of several factors establish a complex effect on the health status of a population and each of its members. In addition to the influence of genetic and biological variation, several variables have been identified as being related to health inequalities. Denton, et al. (2004) have grouped these social determinants of health in three main categories: structural, behavioural and psychosocial. Gender, age and education are three of the most commonly studied determinants (Brunello, et al., 2011; Henriques and Rodrigues, 2010; Cutler and Lleras-Muney, 2006; Cavelaars, et al., 1998), constituting part of the more relevant structural social factors, along with income, occupation or marital status (Mackenbach, et al., 2005; Denton, et al., 2004). In the group of behavioural factors we may include behaviours related to lifestyle, such as tobacco or alcohol, physical activity or nutrition (Denton, et al., 2004). Finally, psychosocial factors such as critical events throughout life, the experience of chronic stress or the level of psychological resources such as self-esteem, are also important determinants of health (Denton, et al., 2004). In this chapter, we will focus on the associations between gender, age, education and health.

Gender

Health differences between genders are usually perceived through a major paradox. Women tend to have lower mortality rates when compared with men. However, according to indicators of self-assessed health condition, they register higher morbidity levels and greater likelihood of episodes of depression, psychiatric disorders, stress and a whole set of chronic conditions (Bambra, et al., 2009; Vintém, 2008; Denton, et al., 2004).

Age

Among the various structural, behavioural, social and psychosocial factors, age has been, in fact, closely associated with health status. The results reported by Orfila, et al. (2000) suggest that, in addition to an increased likelihood of death, an increasing ageing is also associated with a greater deterioration of the self-perceived health status. However, the same study shows that the association between age and declining health status loses its significance when co-morbidities are considered, suggesting that this decline is not due to chronological age in itself.

Education

Several studies have linked health and education (Brunello, et al., 2011; Karmakar and Breslin, 2008; Franks, et al., 2003). Hammond (2002) refers three ways in which positive correlations between education and health can be explained:

- Individuals with better health may tend to continue their studies for a longer period;
- Factors such as family structure, income or parents' educational levels can affect both the education and health of an individual;
- Increased levels of education may result in improvements in health.

With regard to the latter explanation, Albert and Davia (2007) introduce two hypotheses commonly used by health economists to investigate this causal relationship. The first refers to productive efficiency, whereby the relationship between the level of education and health is due to the fact that educated individuals are more efficient in the use of health services. The second is allocative efficiency, according to which the more educated individuals are, the more aware of the consequences of unhealthy habits and will tend to invest more time and resources in healthcare.

Taking into consideration the associations between health, age and education previously analysed it is important to study the joint effect of these variables. On the one hand, older individuals tend to have a poorer health status when compared to younger individuals; on the other hand, those who have higher levels of education tend to show a better health status when compared with those least educated (Henriques and Rodrigues 2010, Huisman, et al., 2003; Joung, et al., 2000). So it is essential to understand if the effect of education can somehow counterbalance the influence of advancing age on the health status, when an increasingly aged but also more educated population is expected.

4.2 Data and projection methodology

4.2.1 Data

The study of the differences concerning the health status and the use of health services by age and level of education was based on data corresponding to observations of the fourth edition of the National Health Survey (4th INS). A representative survey of the Portuguese population planned and conducted by the National Statistics Institute, IP (INE), and the National Institute of Health Dr. Ricardo Jorge (INSA[1]), in collaboration with the Directorate General of Health.

The 4th INS collected information on health status, determinants of health, use of health and sociodemographic characteristics of individuals. It was the first edition to include the entire national territory, including the Azores and Madeira. The questionnaire was administered between February 2005 and February 2006 by direct interview, to a probability sample representative of the Portuguese population, selected from a sample frame defined by the INE. The studied population included individuals living in family households, thereby excluding those living in collective accommodation. 41,193 individuals and 15,239 residents in housing units were interviewed, and the success rate of the interviews was of 76% nationwide.

The construction of scenarios for the future evolution of differences by level of education was based on the study of the observations corresponding to all the past three editions of INS. Thus, besides the data of the 4th INS, we also worked with data from the 2nd and 3rd INS, conducted between April 1995 and April 1996 and between October 1998 and September 1999, respectively. Nevertheless, there is no data for the Autonomous Regions for periods prior to 2005/2006.

As indicators of health status we considered the following:

- Self-perception of health status, dichotomised as 'very good' or 'good' and 'fair', 'poor' or 'very poor';
- Chronic diseases determined by the presence of at least one of the 19 chronic diseases presented;
- Long-term disability, reported difficulty or complete inability in performing at least one of a set of tasks of daily living.

Regarding indicators of use of health services we considered the following:

- The existence of at least one medical appointment in the past three months;
- The use of prescription medicines in the two weeks preceding the sur vey (**Table 4.1**).

Table 4.1
Studied variables

Variable	Section in Survey INS	Question(s) Survey INS	Reply option Survey INS	Categorisation
Self-perception of health status	2 – General health information	1 – In general terms, how do you regard your health?	1: Very good 2: Good 3: Fair 4: Poor 5: Very Poor 9: Doesn't know	0: Very Good / Good 1: Fair / Poor / Very Poor
Chronic diseases	5 – Chronic diseases	1 – Do you have or have you had diabetes?	1: Yes 2: No 9: Doesn't know	
		10 – Do you have or have you had asthma?	1: Yes 2: No 9: Doesn't know	
		16 – Do you have or have you had high blood pressure (hypertension)?	1: Yes 2: No 9: Doesn't know	
		21 – Do you have or have you had chronic pain (constant or repetitive pain for at least three months)?	1: Yes 2: No 9: Doesn't know	
		24.1 – Do you have or have you had rheumatic disease (osteoarthritis, tendonitis)?	1: Yes 2: No 9: Doesn't know	0: no answer 'Yes' 1: at least 1 answer 'Yes'
		24.2 – Do you have or have you had osteoporosis?	1: Yes 2: No 9: Doesn't know	
		24.3 – Do you have or have you had glaucoma?	1: Yes 2: No 9: Doesn't know	
		24.4 – Do you have or have you had retinopathy (Retinal Disease)?	1: Yes 2: No 9: Doesn't know	
		24.5 – Do you have or have you had malignant tumour or cancer?	1: Yes 2: No 9: Doesn't know	
		24.6 – Do you have or have you had kidney stone?	1: Yes 2: No 9: Doesn't know	
		24.7 – Do you have or have you had renal failure?	1: Yes 2: No 9: Doesn't know	
		24.8 – Do you have or have you had chronic anxiety?	1: Yes 2: No 9: Doesn't know	

Variable	Section in Survey INS	Question(s) Survey INS	Reply option Survey INS	Categorisation
		24.9 – Do you have or have you had chronic wound (leg ulcers, bedsores)?	1: Yes 2: No 9: Doesn't know	
		24.10 – Do you have or have you had emphysema (chronic obstructive pulmonary disease), chronic bronchitis?	1: Yes 2: No 9: Doesn't know	
		24.11 – Do you have or have you had a stroke?	1: Yes 2: No 9: Doesn't know	
		24.12 – Do you have or have you had obesity?	1: Yes 2: No 9: Doesn't know	
		24.13 – Do you have or have you had depression?	1: Yes 2: No 9: Doesn't know	
		24.14 – Do you have or have you had infarction?	1: Yes 2: No 9: Doesn't know	
		24.15 – Do you have or have you had another chronic disease?	1: Yes 2: No 9: Doesn't know	
Long-term inabilities	4 – Long-term inability	1 – Are you always bedridden, i.e., cannot get out of bed even though there may be someone to help?	1: Yes 2: No 9: Doesn't know	
		3 – Do you sit in a chair (not a wheel-chair) all day (except at night), i.e., unable to walk even if there may be someone to help?	1: Yes 2: No 9: Doesn't know	
		4 – Are you limited to your home?	1: Yes 2: No 9: Doesn't know	0: no answer 'Yes' 1: at least 1 answer 'Yes'
		5 – How far can you walk on a flat site, without stopping and without severe discomfort?	1: 200 metres or more 2: More than a few steps but less than 200 meters 3: Only a few steps 4: Cannot walk, but moves alone in a wheelchair 5: Cannot walk, but moves with the help of others in a wheelchair 9: Doesn't know	
		8 – Can you use public transport?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	

Variable	Section in Survey INS	Question(s) Survey INS	Reply option Survey INS	Categorisation
		9 – Can you go shopping?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		9 – Can you go shopping?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		10 – Can you climb up and down a flight of stairs of 12 steps (a 1st Floor)?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		11 – Can you lie down and get up from bed?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		12 – Can you sit and get up from a chair?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		13 – Can you go to the toilet and use it??	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		14 – Can you clean up the house?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		15 – When standing, can you bend and grab, for example, a shoe from the floor?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		16 – Can you pinch, that is, grab a small object?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		17 – Can you dress and undress?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		18 – Can you prepare meals?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		19 – Can you wash in the shower?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		20 – Can you wash your hands and face?	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	
		21 – Can you eat (cut the food, bring the food and drinks to the	1: Alone, without difficulty 2: Alone, but with difficulty 3: Only with help 9: Doesn't know	

Variable	Section in Survey INS	Question(s) Survey INS	Reply option Survey INS	Categorisation
		22 – Can you hear a TV or radio programme?	1: In a volume that does not disturb others 2: Only at high volume 3: Cannot hear even with high volume	
		23 – Can you see in a way to recognise a friend?	1: At a distance of 4 meters, let's say, across the street 2: At a distance of 1 meter 3: Cannot even at a distance of 1 meter 9: Doesn't know	
		24 – Do you have trouble talking?	1: Yes 2: No 9: Doesn't know	
Medical appointments	6 – Health care	1 – In the past three months, how often did you go to a medical appointment?	≥ 0 99: Doesn't know	0: 0 1: ≥ 1
Use of prescription medicines	8- Consumption of medicines	1 – Did you take prescription medicine (including contraceptive pills or other hormones, ointments, creams, injections, vaccines), in the last two weeks?	1: Yes 2: No 9: Doesn't know	0: No 1: Yes

4.2.2 Methods

To study the differences in health status and use of health services by age and educational level, we used logistic regression models (Hosmer and Lemeshow, 2004; Joung, et al., 2000), separately adjusted for each gender and NUTS II regions. Dummy variables referring to five-year age groups and levels of education were used as explanatory variables. As we intended to include only cases in which answers were provided by the individual himself, and since for children the instruction should not have a material impact on the health status and the use of health services, only individuals aged over 15 years were considered. With regard to educational attainment, four categories were considered, depending on the higher level completed: No schooling/Second Cycle of Basic Education; Basic Education; Secondary Education and Higher Education. Either with regard to the variables corresponding to age as to those corresponding to the level of education, an effects coding scheme was adopted, where the effect of each category is compared to the average effect of all groups (Hair, et al., 1998).

The results of the logistic regression were used to estimate the expected proportion of individuals in each category of the dependent variable for each gender, age group and educational level in each region. These ratios were then applied to the estimated number of individuals in each of the strata defined by gender, age group and educational level, obtained from the projections presented in the previous section.

Two projection scenarios on the differences in health status and use of health services by level of education were considered: a *stable scenario*, which assumes that the differences estimated based on the 4th edition of INS will remain throughout the period; and a *variable scenario* in which these differences follow the changes established in previous editions of the INS. To study the evolution of differences over time, tests on the permanence of structure of the regression models were held, taking into account the second and fourth editions of the INS (conducted in 1995/1996 and 2005/2006 respectively). In cases where the variation in the impact of education was statistically significant, the coefficient relating to the impact at the beginning of the projection (estimated using the most recent INS) was multiplied by the same factor, to obtain the magnitude of differences 10 years later. Since the samples of the 1995/1996 edition were only representative of the population of Portugal's mainland and not the population of the Autonomous Regions, only the regions of Portugal's mainland were considered in these calculations. Furthermore, due to the absence of data concerning the consumption of prescription medicine in the two weeks preceding the survey on the issue of 1995/1996, we decided to use multiplication factors estimated for the existence of at least one medical appointment in the past three months.

In order to analyse the influence of education on the health status and use of health services in the Portuguese population, we compared the results of the projections performed according to each of the scenarios considered in the previous chapter: the constant scenario, where levels of schooling prior to 2011 will remain constant until the end of the projection period; and the trend scenario, whereby it is assumed that they follow the trend observed in previous years at the beginning of the projection. In this second scenario, the evolution trend in the proportion of individuals of each gender and age group to be located on each level of education was modelled using the continuous ratio models.

The data analysis was performed using I*BM SPSS Statistics 19 software and Microsoft Office Excel 2010.*

4.3 Differences in health indicators between levels of education

The results of logistic regression models based on data from the 4th INS (**Table 4.2**), suggest that there is an effect of education (adjusted to age) on health status self-perception, both among men and women, and in all NUT II. Generally, individuals who have completed Higher Education tend to rate more positively their health status, within the whole population, and those who have not completed Basic Education tend to give it more negative ratings.

In turn, the values presented in (**Table 4.3** suggest that in general the presence of chronic diseases does not seem to be strongly associated with individuals' level of education, when considering this relationship adjusted to age. Indeed, only in the regions of Lisbon and Alentejo and among women in the Algarve and men in the North region, are there differences that may be considered statistically significant for the prevalence of at least one chronic disease among individuals with different levels of education. In these cases, the odds ratios values indicate an increasing risk of the presence of chronic diseases among individuals with lower educational levels and a decreasing risk for cases that have reached higher levels of education.

Table 4.2

Differences in self-rated health status as 'fair', 'poor' or 'very poor', between levels of education, by gender and NUTS II, adjusted for age (odds ratio)

Gender	Educational level	NUT II													
		North		Centre		Lisbon		Alentejo		Algarve		R.A.A.		R.A.M.	
		OR	P	OR	P	OR	P	OR	P	OR	P	OR	P	OR	P
Male	NS/2nd Cycle BE	2.27**	0.00	2.45**	0.00	2.51**	0.00	1.73**	0.00	2.18**	0.00	1.90**	0.00	2.58**	0.00
	Basic Ed.	0.91	0.54	1.21	0.20	1.06	0.67	1.14	0.42	1.08	0.56	1.35**	0.04	0.87	0.55
	Secondary Ed.	0.92	0.62	0.78	0.14	0.72**	0.02	0.81	0.25	0.75**	0.05	0.74*	0.08	0.88	0.63
	Higher Ed.	0.53**	0.00	0.43**	0.00	0.53**	0.00	0.63**	0.03	0.56**	0.00	0.53**	0.00	0.50**	0.02
Female	NS/2nd Cycle BE	2.28**	0.00	2.21**	0.00	2.20**	0.00	2.12**	0.00	2.29**	0.00	1.95**	0.00	2.32**	0.00
	Basic Ed.	1.21	0.16	1.29**	0.05	1.07	0.56	1.14	0.33	1.10	0.40	1.36**	0.02	1.14	0.42
	Secondary Ed.	1.35**	0.04	0.78*	0.07	0.87	0.23	0.72**	0.03	0.84	0.15	0.87	0.32	0.74*	0.07
	Higher Ed.	0.27**	0.00	0.45**	0.00	0.49**	0.00	0.57**	0.00	0.47**	0.00	0.43**	0.00	0.51**	0.00

** $p \leq 0.05$
* $p \leq 0.10$
$n =$ 23839

Source: Author's calculations*

Table 4.3

Differences in the presence of at least one chronic disease among levels of education, by gender and NUTS II, adjusted for age (odds ratio)

Gender	Educational level	NUT II													
		North		Centre		Lisbon		Alentejo		Algarve		R.A.A.		R.A.M.	
		OR	P	OR	P	OR	P	OR	P	OR	P	OR	P	OR	P
Male	NS/2nd Cycle BE	1.45**	0.01	1.19	0.39	1.22*	0.06	1.32*	0.09	1.13	0.25	1.12	0.35	1.45	0.13
	Basic Ed.	1.45**	0.01	1.19	0.39	1.22*	0.06	1.32*	0.09	1.13	0.25	1.12	0.35	1.45	0.13
	Secondary Ed.	0.95	0.70	1.04	0.82	0.75**	0.03	0.84	0.31	0.83	0.16	0.82	0.15	0.78	0.31
	Higher Ed.	0.86	0.37	0.91	0.57	1.15	0.28	1.03	0.89	1.14	0.40	0.99	0.93	0.86	0.57
Female	NS/2nd Cycle BE	1.24	0.11	1.28	0.13	1.15	0.12	1.41**	0.01	1.35**	0.00	1.21	0.17	1.09	0.58
	Basic Ed.	1.04	0.76	0.90	0.42	0.96	0.69	1.08	0.58	0.88	0.26	1.01	0.91	1.00	0.99
	Secondary Ed.	0.94	0.64	0.91	0.47	1.16	0.20	0.89	0.44	0.72**	0.00	0.89	0.32	0.81	0.21
	Higher Ed.	0.83	0.16	0.96	0.76	0.79**	0.04	0.74**	0.04	1.17	0.24	0.92	0.51	1.13	0.49

** $p \leq 0.05$
* $p \leq 0.10$
n = 23840

Source: Author's calculations*

Differences associated with the educational level concerning the presence of at least one long-term disability occur particularly among residents of Lisbon and women in Alentejo. Contrary to what happens in the rest of the country, the relationship between education and the presence of disabilities does not seem to be direct between the women of the Azores, where the increase on the instruction does not seem to be associated with a lower risk of having at least one long-term disability. Indeed, women with complete Secondary Education are at greater risk compared to the average; yet, those who complete Higher Education seem to see their risk decrease significantly, similarly to what happens in the other regions (**Table 4.4**).

Table 4.4

Differences in the presence of at least one long-term disability among levels of education, by gender and NUTS II, adjusted for age (odds ratio)

Gender	Educational level	NUT II													
		North		Centre		Lisbon		Alentejo		Algarve		R.A.A.		R.A.M.	
		OR	P	OR	P	OR	P	OR	P	OR	P	OR	P	OR	P
Male	NS/2nd Cycle BE	1.95	0.12	1.70	0.20	1.89**	0.03	188.70	0.13	1.61	0.15	1.51	0.42	9223.20	0.88
	Basic Ed.	1.33	0.45	0.91	0.80	1.36	0.32	46.81	1.00	1.18	0.59	1.14	0.76	0.00	1.00
	Secondary Ed.	0.72	0.50	0.70	0.45	1.67	0.11	62.92	1.00	0.43*	0.07	0.32	0.14	3945.88	1.00
	Higher Ed.	0.54	0.27	0.92	0.85	0.23**	0.01	0.00	1.00	1.22	0.61	1.83	0.18	0.00	1.00
Female	NS/2nd Cycle BE	1.74*	0.08	2.16	0.11	2.09**	0.00	2.00*	0.10	1.54	0.14	1.49*	0.06	1.67	0.43
	Basic Ed.	0.82	0.58	0.97	0.95	0.67	0.17	1.43	0.34	0.96	0.89	0.84	0.65	0.78	0.67
	Secondary Ed.	0.81	0.62	0.25*	0.08	1.46	0.15	1.95*	0.09	0.64	0.19	2.04**	0.03	1.16	0.77
	Higher Ed.	0.86	0.65	1.89*	0.09	0.49**	0.05	0.18**	0.02	1.05	0.88	0.39**	0.04	0.66	0.49

** $p \leq 0.05$
* $p \leq 0.10$
n = 23840

Source: Author's calculations*

The effect of schooling on medical appointments seems to be less evident. It has more expression in the region of Lisbon, among men in the North and Centre and, once more, among women in the Alentejo and Azores (**Table 4.5**). In most cases an increase in schooling translates into an increase in the use of this type of health service. Usually individuals who have not completed Basic Education are less likely to have gone to at least one medical visit in the past three months.

Table 4.5

Differences in the existence of at least one medical appointment in the past three months, between levels of education, by gender and NUTS II, adjusted for age (odds ratio)

Gender	Educational level	NUT II													
		North		Centre		Lisbon		Alentejo		Algarve		R.A.A.		R.A.M.	
		OR	P	OR	P	OR	P	OR	P	OR	P	OR	P	OR	P
Male	NS/2nd Cycle BE	0.99	0.12	0.90	0.20	0.76**	0.03	0.97	0.13	0.95	0.15	0.67	0.42	0.90	0.88
	Basic Ed.	0.77**	0.05	0.81	0.13	1.32**	0.02	0.92	0.56	0.90	0.35	1.22	0.10	0.81	0.31
	Secondary Ed.	1.01	0.92	0.93	0.64	0.86	0.20	1.18	0.31	0.95	0.70	1.08	0.54	1.23	0.37
	Higher Ed.	1.29*	0.10	1.49**	0.01	1.16	0.21	0.96	0.80	1.23	0.17	1.13	0.44	1.12	0.65
Female	NS/2nd Cycle BE	0.89*	0.08	1.04	0.11	0.98**	0.00	1.08*	0.10	1.05	0.14	0.91	0.06	0.87	0.43
	Basic Ed.	1.04	0.74	1.06	0.66	0.84*	0.10	0.79**	0.05	0.98	0.87	0.85	0.14	0.78	0.12
	Secondary Ed.	1.01	0.94	0.84	0.18	1.05	0.64	0.97	0.84	1.02	0.87	0.91	0.36	1.19	0.26
	Higher Ed.	1.07	0.62	1.08	0.51	1.15	0.19	1.21	0.17	0.95	0.66	1.43**	0.00	1.23	0.20

** $p \leq 0.05$
* $p \leq 0.10$
$n =$ 23831

Source: Author's calculations*

Only the answers of women in the North region have shown that there is a clear relationship between the consumption of prescription medicine and schooling. Indeed those who have not completed Basic Education and those who have attained Secondary Education have a higher rate of consumption of medicines (**Table 4.6**). But the relationship between schooling and medicines' use is not obvious or similar in the different regions. Thus, among the women of Lisbon and Alentejo an increased education seems to be associated with a lower consumption of prescription medicine, but the opposite occurs in men surveyed in Lisbon and the Algarve, as well as in the Azores.

Table 4.6

Differences in the use of prescription medicines in the past two weeks, between levels of education, by gender and NUTS II, adjusted for age (odds ratio)

Gender	Educational level	NUT II													
		North		Centre		Lisbon		Alentejo		Algarve		R.A.A.		R.A.M.	
		OR	P	OR	P	OR	P	OR	P	OR	P	OR	P	OR	P
Male	NS/2nd Cycle BE	1.27	0.12	0.95	0.20	0.96**	0.03	1.04	0.13	0.83	0.15	0.92	0.42	1.26	0.88
	Basic Ed.	0.86	0.34	1.07	0.67	1.00	1.00	1.01	0.94	0.83	0.13	1.16	0.27	0.89	0.61
	Secondary Ed.	0.86	0.35	0.97	0.87	0.88	0.34	0.92	0.65	1.02	0.89	0.93	0.64	1.14	0.61
	Higher Ed.	1.07	0.71	1.01	0.96	1.18	0.20	1.03	0.88	1.42**	0.03	1.00	0.99	0.79	0.40
Female	NS/2nd Cycle BE	1.31*	0.08	1.00	0.11	1.09**	0.00	1.52*	0.10	1.16	0.14	0.96*	0.06	0.85	0.43
	Basic Ed.	0.76**	0.03	0.96	0.79	1.06	0.61	1.01	0.91	0.79**	0.02	0.85	0.17	1.08	0.63
	Secondary Ed.	1.60**	0.00	0.98	0.90	0.89	0.29	0.73**	0.02	1.03	0.76	1.04	0.75	1.19	0.28
	Higher Ed.	0.63**	0.00	1.06	0.68	0.97	0.81	0.89	0.41	1.06	0.65	1.17	0.22	0.91	0.56

** $p \leq 0.05$
* $p \leq 0.10$
n = 23837

Source: Author's calculations*

4.4. Indicators of health status and use of health services

Taking into consideration the whole population residing in Portugal, the results suggest an improvement in health status, which may come along with a greater use of health services (medical appointments and use of prescription medicines), particularly among men. For 2030 the trend scenario presents more favorable results for both genders in regard to all indicators, except for the presence of long-term disability and, among men, the presence of chronic diseases. The major differences between the results obtained by the two scenarios are true with respect to the use of prescription medicine to men, the attendance of medical appointments by women and self-assessment of health status in both genders.

In the female group, the relative weight of respondents who rate negatively their health status, who report having a chronic disease or long-term disability will continue to be considerably higher than within men. In regard to the use of health services there are also differences between genders. Indeed, particularly in what concerns the use of prescription medicine and the prevalence of chronic diseases, the proportions among women are higher than among men.

Table 4.4

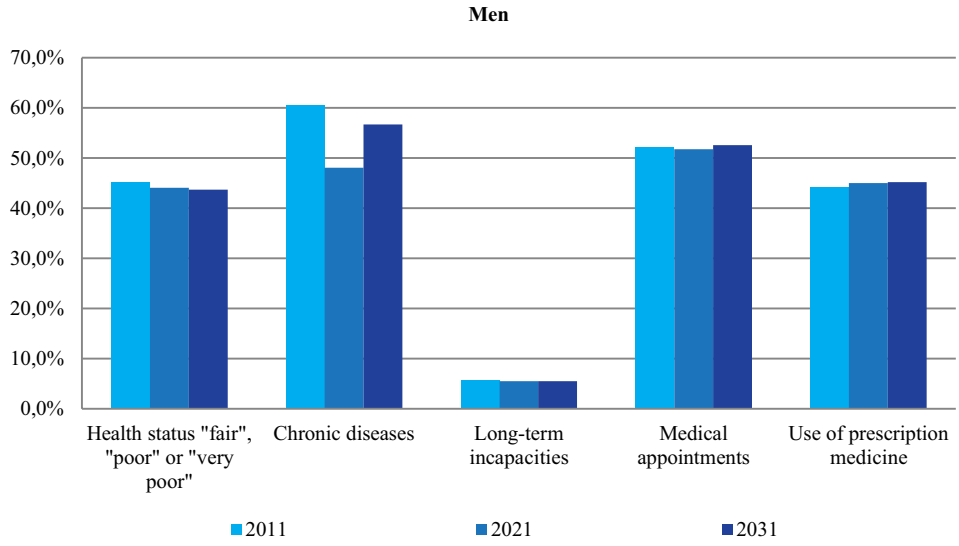
Prevalence projected for each indicator of health, by gender, 2011-2031, Portugal, Constant Scenario and Trend Scenario (%))

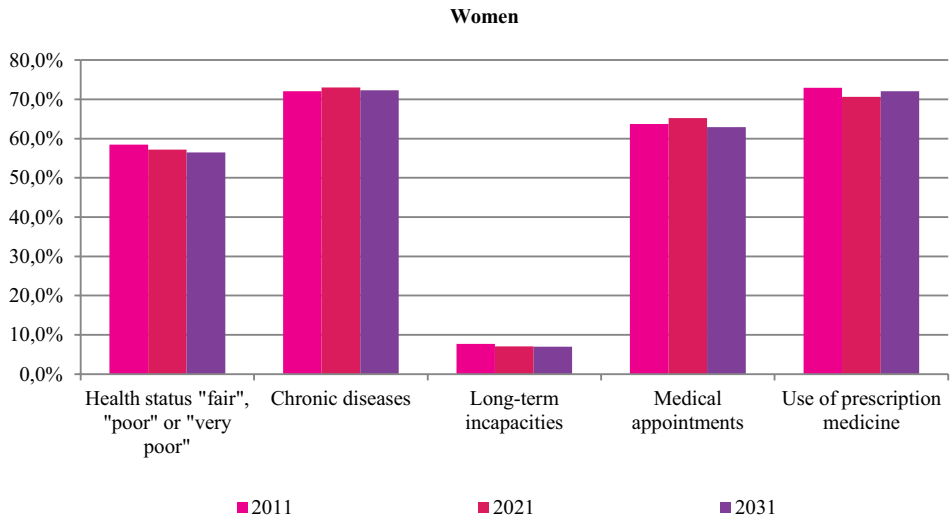
	Gender	Scenario	2011	2021	2031
Heath status 'fair', 'poor' or 'very poor'	M	Constant	45.3%	44.3%	44.4%
		Trend		44.1%	43.7%
	F	Constant	58.5%	57.5%	57.4%
		Trend		57.2%	56.5%
Chronic diseases (≥1)	M	Constant	60.5%	48.1%	55.7%
		Trend		48.1%	56.7%
	F	Constant	72.1%	73.1%	73.2%
		Trend		73.0%	72.3%
Long-term impairment (≥1)	M	Constant	5.7%	5.5%	5.4%
		Trend		5.5%	5.5%
	F	Constant	7.7%	7.1%	6.9%
		Trend		7.1%	7.0%
Medical appointments (≥1)	M	Constant	52.1%	51.8%	53.6%
		Trend		51.8%	52.6%
	F	Constant	63.7%	65.3%	64.5%
		Trend		65.2%	62.9%
Use of prescription medicine	M	Constant	44.2%	45.0%	47.2%
		Trend		45.0%	45.2%
	F	Constant	72.9%	70.5%	72.3%
		Trend		70.6%	72.1%

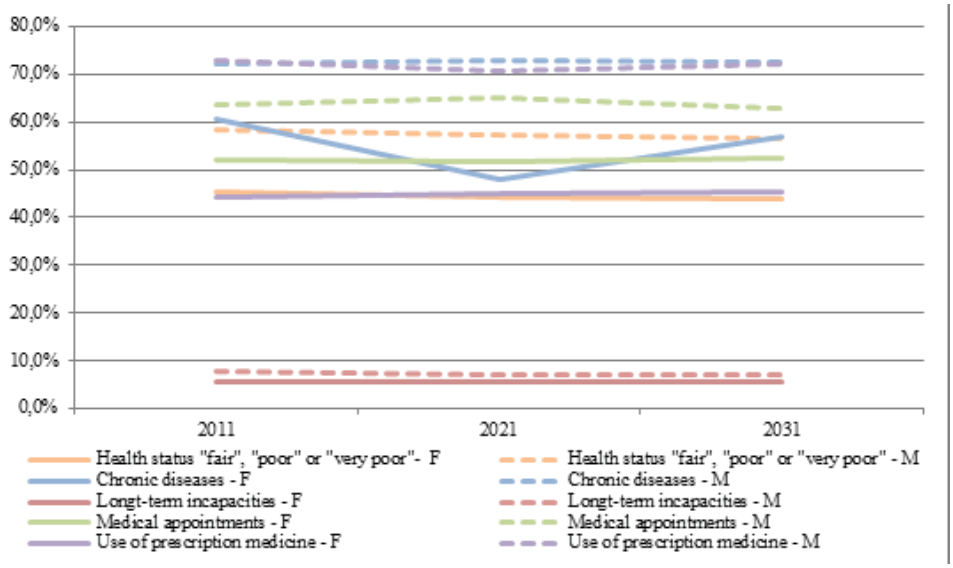
Source: Author's calculations*

Table 4.1

Prevalence projected for each indicator of health, by gender, 2011-2031, Portugal, Constant Scenario and Trend Scenario (%))







4.5. Indicators of health status and use of health services, 2011-2031, by NUT II

4.5.1. Health status self-perception

Table 4.7 shows for each region and gender, the projected proportions of individuals that evaluate their health status as 'fair', 'poor' or 'very poor', in the years 2011, 2021 and 2031, comparing the constant scenario with the trend scenario. Differences between the estimated proportions according to the two scenarios depend on the level of education, previously analysed through the odds ratio of logistic regression models.

More educated individuals have a lower risk to rank their health status in a negative way (for the same age) over those less educated. Thus, it is expected that an increase in schooling rates leads to a decrease in the proportion of people with a negatively self-assessed health status, as the proportion of individuals with tertiary levels will be higher in comparison with the constant scenario.

Table 4.6

Prevalence projected for self-rating of health status as 'fair', 'poor' or 'very poor', 2011, 2021 and 2031, by gender and NUTS II, Constant Scenario and Trend Scenario (%)

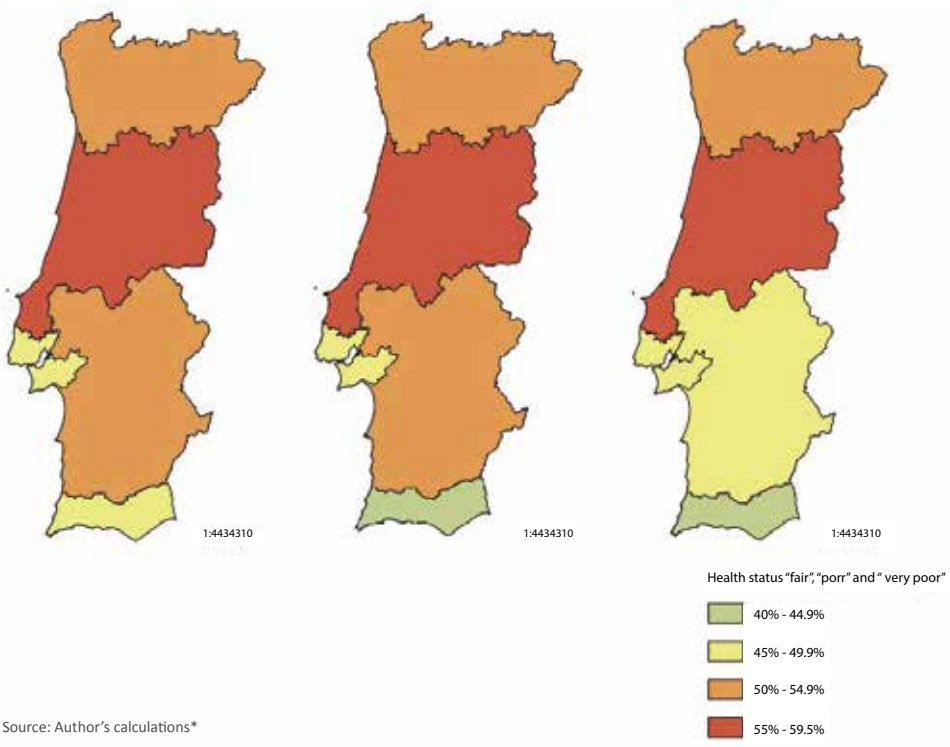
NUT II	Year	Gender	Constant Scenario	Constant Scenario
North	2011	M	44.3%	44.3%
		F	58.8%	58.8%
	2021	M	44.6%	44.4%
		F	58.8%	58.4%
	2031	M	45.6%	45.1%
		F	59.4%	58.3%
Centre	2011	M	53.1%	53.1%
		F	63.3%	63.3%
	2021	M	51.2%	50.9%
		F	61.5%	61.2%
	2031	M	51.2%	50.3%
		F	61.2%	60.4%
Lisbon	2011	M	41.9%	41.9%
		F	55.4%	55.4%
	2021	M	40.4%	40.2%
		F	54.6%	54.3%
	2031	M	39,8%	39.1%
		F	53,9%	53.2%
Alentejo	2011	M	44.2%	44.2%
		F	60.3%	60.3%
	2021	M	42.3%	42.2%
		F	57.8%	57.7%
	2031	M	42.3%	41.9%
		F	57.1%	56.6%
Algarve	2011	M	40.8%	40.8%
		F	52.8%	52.8%
	2021	M	38.8%	38.7%
		F	50.5%	50.3%
	2031	M	37.8%	37.5%
		F	49.4%	48.8%
R.A.A.	2011	M	35.5%	35.5%
		F	48.8%	48.8%
	2021	M	36.3%	36.2%
		F	49.5%	49.3%
	2031	M	38.2%	38.0%
		F	51.5%	51.1%
R.A.M.	2011	M	42.6%	42.6%
		F	55.9%	55.9%
	2021	M	41.1%	40.9%
		F	54.8%	54.7%
	2031	M	41.3%	40.7%
		F	54.9%	54.6%

Source: Author's calculations*

In the same table it is still possible to see that the proportions of women with a negative self-reported health status outweigh in all regions the proportions recorded in the opposite gender. The Centre region will continue to have a less favourable health status, in contrast to the Azores, where the proportions reach lower values.

Table 4.2

Prevalence projected for self-rating of health status as 'fair', 'poor' or 'very poor', 2011, 2021 and 2031, Portugal, Trend Scenario (%)



Source: Author's calculations*

4.5.2 Chronic diseases

The prevalence of the presence of at least one chronic disease is shown in Table 4.8, which compares the results of the stable scenario with the variable scenario with regard to the evolution of the differences between levels of education, as well as the constant scenario and the trend scenario, concerning the evolution in levels of education. We can assess that generally the most favourable results correspond to the variable scenario.

Moreover, although the differences between the constant scenario and the trend scenario are small, they become more evident when we assume that the differences between the levels of education are accentuated (variable scenario). It is in the North region that the prevalence projected is higher in contrast to the Autonomous Region of Madeira, which registers minimum values. Women always have higher prevalence rates than men, regardless of the region and the scenario considered.

4.5.3 Long-term disability

The projected prevalence for long-term disability (Table 4.9) registers a trend of decrease in various scenarios and for the different regions, only increasing in the Azores and in the North as well as among women of the Centre, but only if we consider the variable scenario.

Women have the highest prevalence of disability. In 2031, and according to regional diversity, it is expected that the North will be the region where one can expect higher proportions of individuals with long-term disability in both genders. And this happens even though in 2011 the values in this region were lower than those of the Alentejo region, particularly among women. The Autonomous Region of Madeira will continue to display the lowest prevalence of disability, a characteristic that maintains since the year when the observation begins.

4.5.4. Medical appointments

In most regions and with regard to the expected evolution of the proportions of individuals who go to medical appointments in the previous three months (**Table 4.10**) the results for 2030 are relatively similar to those of 2011. Besides this fact, in 2031, except for the regions of Lisbon and the Algarve, the lowest percentage of use of this service is expected in the variable scenario, where an increasing level of education is assumed (trend scenario). Once again the major differences in results can be observed between the constant scenario and the trend scenario, with lower prevalence rates projected by the second.

The region of Lisbon shows the highest levels in visits to medical appointments. In the opposite extreme, the lowest proportions correspond to the Autonomous Regions. In all areas of Portugal women go more often to medical appointments.

Table 4.7

Prevalence projected for the presence of at least one chronic disease, 2011, 2021 and 2031, by gender and NUTS II, Constant Scenario and Trend Scenario (%)

			Stable Scenario		Variable Scenario	
NUT II	Year	Gender	Constant Scenario	Trend Scenario	Constant Scenario	Trend Scenario
North	2011	M	60.1%	60.1%	60.1%	60.1%
		F	73.2%	73.2%	73.2%	73.2%
	2021	M	61,7%	61.6%	40.7%	40.5%
		F	75.1%	75.0%	75.1%	75.0%
	2031	M	63.9%	63.6%	59.7%	61.0%
		F	77.0%	76.8%	76.4%	74.7%
Centre	2011	M	62.8%	62.8%	62.8%	62.8%
		F	72.8%	72.8%	72.8%	72.8%
	2021	M	63.0%	62.9%	46.2%	46.0%
		F	73.2%	73.1%	73.1%	73.0%
	2031	M	64.5%	64.4%	59.8%	61.3%
		F	74.3%	74.1%	72.6%	72.2%
Lisbon	2011	M	63.2%	63.2%	63.2%	63.2%
		F	73.4%	73.4%	73.4%	73.4%
	2021	M	64.5%	64.4%	60.5%	60.7%
		F	74.2%	74.1%	74.3%	74.2%
	2031	M	65.0%	64.6%	52.3%	52.3%
		F	74.5%	74.2%	74.1%	73.2%
Alentejo	2011	M	57.8%	57.8%	57.8%	57.8%
		F	69.7%	69.7%	69.7%	69.7%
	2021	M	57.4%	57.3%	42.6%	42.5%
		F	69.2%	69.0%	69.1%	69.0%
	2031	M	58.1%	57.9%	53.4%	56.1%
		F	69.6%	69.3%	67.9%	68.3%
Algarve	2011	M	53.0%	53.0%	53.0%	53.0%
		F	67.2%	67.2%	67.2%	67.2%
	2021	M	52.8%	52.7%	45.8%	45.8%
		F	67.0%	67.0%	66.3%	66.3%
	2031	M	52.9%	52.8%	50.8%	52.6%
		F	67.0%	67.1%	60.9%	62.7%
R.A.A.	2011	M	50.1%	50.1%	50.1%	50.1%
		F	64.6%	64.6%	64.6%	64.6%
	2021	M	51.8%	51.7%	62.6%	62.5%
		F	66.6%	66.5%	67.1%	67.0%
	2031	M	54.4%	54.3%	36.1%	31.7%
		F	69.4%	69.3%	69.9%	67.9%
R.A.M.	2021	M	45.2%	45.2%	45.2%	45.2%
		F	57.9%	57.9%	57.9%	57.9%
	2021	M	45.9%	45.7%	45.5%	45.7%
		F	59.7%	59.6%	60.6%	60.4%
	2031	M	47.7%	47.5%	33.8%	30.4%
		F	62.3%	62.1%	62.1%	61.4%

Source: Author's calculations*

Table 4.8

Prevalence projected for the presence of at least one long-term disability, in 2011, 2021 and 2031, by gender and NUTS II, Constant Scenario and Trend Scenario (%)

			Stable Scenario		Variable Scenario	
NUT II	Year	Gender	Constant Scenario	Trend Scenario	Constant Scenario	Trend Scenario
North	2011	M	6.0%	6.0%	6.0%	6.0%
		F	8.1%	8.1%	8.1%	8.1%
	2021	M	6.1%	6.1%	6.1%	6.1%
		F	8.1%	8.1%	7.8%	7.8%
	2031	M	6.3%	6.2%	6.3%	6.1%
		F	8.2%	8.2%	7.8%	7.7%
Centre	2011	M	6.1%	6.1%	6.1%	6.1%
		F	7.1%	7.1%	7.1%	7.1%
	2021	M	5.6%	5.6%	5.6%	5.6%
		F	6.6%	6.6%	7.8%	7.8%
	2031	M	5.5%	5.4%	5.5%	5.6%
		F	6.3%	6.3%	7.7%	8.6%
Lisbon	2011	M	5.4%	5.4%	5.4%	5.4%
		F	7.7%	7.7%	7.7%	7.7%
	2021	M	5.1%	5.1%	5.1%	5.1%
		F	7.3%	7.2%	6.3%	6.3%
	2031	M	5.1%	5.1%	5.1%	5.1%
		F	6.7%	6.7%	6.0%	5.9%
Alentejo	2011	M	6.0%	6.0%	6.0%	6.0%
		F	9.2%	9.2%	9.2%	9.2%
	2021	M	5.0%	5.0%	5.0%	5.0%
		F	8.4%	8.4%	5.6%	5.5%
	2031	M	4.4%	4.4%	4.4%	5.0%
		F	8.0%	7.9%	5.4%	4.7%
Algarve	2011	M	5.4%	5.4%	5.4%	5.4%
		F	7.3%	7.3%	7.3%	7.3%
	2021	M	4.9%	4.9%	4.9%	4.9%
		F	6.8%	6.8%	6.8%	6.8%
	2031	M	4.8%	4.7%	4.8%	4.9%
		F	6.4%	6.4%	6.5%	6.9%
R.A.A.	2011	M	3.8%	3.8%	3.8%	3.8%
		F	6.9%	6.9%	6.9%	6.9%
	2021	M	3.9%	3.9%	3.9%	3.9%
		F	7.1%	7.1%	5.6%	5.6%
	2031	M	4.3%	4.3%	4.3%	3.9%
		F	7.6%	7.5%	5.9%	5.1%
R.A.M.	2011	M	3.0%	3.0%	3.0%	3.0%
		F	5.2%	5.2%	5.2%	5.2%
	2021	M	2.6%	2.6%	2.6%	2.6%
		F	5.0%	5.0%	4.5%	4.5%
	2031	M	2.4%	2.4%	2.4%	2.6%
		F	5.1%	5.1%	4.5%	4.3%

Source: Author's calculations*

4.5.5. Medicines consumption

In most regions, the analysis of the prevalence projected for people who consume prescription medicines in 2031 (**Table 4.11**) testifies to the fact that the lowest proportions result from the scenario which considers that the differences between educational groups are accentuated over time (variable scenario) and admits changes in the level of education (trend scenario). Only in the Alentejo may the variable scenario lead to higher prevalence in comparison to the stable scenario. The biggest differences arise when comparing the constant scenario with the trend scenario, assuming the variation of the effect of education (variable scenario), as the trend scenario usually results in a lower prevalence.

Women continue to have levels of medicine consumption considerably higher than men in all regions. The Autonomous Region of Madeira registers the lower values of medicine consumption, in contrast to the Centre, where the prevalence projected for 2031 is close to 50% among men and 80% among women.

So, to conclude, the results of the logistic regression models based on data from the 4th INS suggest that in both genders and in all NUT II the effect of education (adjusted to age) is mainly observed on the self-perception of health status. Generally, individuals who have completed Higher Education tend to rate more positively their health status over the whole population. As for those who have not completed Basic Education they tend to give more negative ratings. These results go in the line of findings of previous studies (Henriques and Rodrigues, 2010).

For the remaining indicators, the effect of education does not seem to be so evident. In regions where there are statistically significant differences, they point to a higher risk of individuals without Basic Education having at least one chronic disease or long-term disability. There is a reduction of this risk among holders of Higher Education degrees, especially among women in all regions. Indeed, in general, it seems to be among women that the effects of schooling are more decisive. As regards visits to medical appointments, the results suggest that an increase in education is associated with an increased risk of having had a medical appointment in the last three months. Moreover, the use of prescription medicines among women of the North region seems to be closely associated with their levels of education. As for the region of Lisbon it is the one where the differences for the whole set of indicators seems to be more significant.

When analysing the expected prevalence for each of the five indicators considered, we found that self-perception of health status is the indicator showing the most obvious improvements. There has been a substantial increase in the proportion of residents who rate their health as 'good' or 'very good' in all scenarios and both genders.

Table 4.9

Prevalence projected for the existence of at least one medical appointment in the last three months 2011, 2021 and 2031, by gender and NUTS II, Constant Scenario and Trend Scenario (%)

			Stable Scenario		Variable Scenario	
NUT II	Year	Gender	Constant Scenario	Trend Scenario	Constant Scenario	Trend Scenario
North	2011	M	51.9%	51.9%	51.9%	51.9%
		F	64.4%	64.4%	64.4%	64.4%
	2021	M	52.9%	53.0%	50.5%	50.6%
		F	65.9%	66.0%	66.8%	66.7%
	2031	M	54.2%	54.4%	53.6%	52.3%
		F	67.6%	67.7%	66.8%	64.8%
Centre	2011	M	52.6%	52.6%	52.6%	52.6%
		F	64.7%	64.7%	64.7%	64.7%
	2021	M	52.7%	52.8%	51.3%	51.4%
		F	64.5%	64.6%	65.4%	65.4%
	2031	M	54.2%	54.4%	54.0%	52.4%
		F	65.1%	65.2%	64.4%	63.2%
Lisbon	2011	M	56.8%	56.8%	56.8%	56.8%
		F	66.0%	66.0%	66.0%	66.0%
	2021	M	57.7%	57.7%	58.4%	58.4%
		F	66.6%	66.6%	66.7%	66.5%
	2031	M	57.9%	57.9%	58.1%	58.0%
		F	67.2%	67.3%	67.0%	65.7%
Alentejo	2011	M	47.2%	47.2%	47.2%	47.2%
		F	59.4%	59.4%	59.4%	59.4%
	2021	M	47.4%	47.4%	46.7%	46.7%
		F	59.4%	59.4%	62.2%	61.9%
	2031	M	48.1%	48.2%	48.0%	47.2%
		F	59.8%	59.9%	57.2%	55.1%
Algarve	2011	M	44.3%	44.3%	44.3%	44.3%
		F	58.3%	58.3%	58.3%	58.3%
	2021	M	44.5%	44.6%	43.9%	43.9%
		F	58.2%	58.1%	57.5%	57.5%
	2031	M	44.8%	44.9%	44.7%	44.4%
		F	58.3%	58.3%	58.7%	58.8%
R.A.A.	2011	M	38.9%	38.9%	38.9%	38.9%
		F	52.7%	52.7%	52.7%	52.7%
	2021	M	40.7%	40.8%	42.9%	43.0%
		F	53.8%	53.9%	60.5%	60.1%
	2031	M	43.3%	43.4%	43.8%	41.4%
		F	55.4%	55.6%	47.0%	43.9%
R.A.M.	2011	M	40.4%	40.4%	40.4%	40.4%
		F	49.6%	49.6%	49.6%	49.6%
	2021	M	41.1%	41.2%	39.2%	39.3%
		F	51.1%	51.1%	54.7%	54.7%
	2031	M	42.6%	42.8%	42.0%	40.6%
		F	53.2%	53.3%	50.4%	46.7%

Source: Author's calculations*

Table 4.10

Prevalence projected for the use of prescription medicines in the past two weeks, in 2011, 2021 and 2031, by gender and NUTS II, Constant Scenario and Trend Scenario (%)

			Stable Scenario		Variable Scenario	
NUT II	Year	Gender	Constant Scenario	Trend Scenario	Constant Scenario	Trend Scenario
North	2011	M	41.9%	41.9%	41.9%	41.9%
		F	72.4%	72.4%	72.4%	72.4%
	2021	M	43.8%	43.7%	42.6%	42.6%
		F	73.1%	72.9%	66.0%	66.4%
	2031	M	46.4%	46.3%	46.2%	43.4%
		F	74.3%	73.8%	70.4%	70.9%
Centre	2011	M	46.5%	46.5%	46.5%	46.5%
		F	77.3%	77.3%	77.3%	77.3%
	2021	M	47.1%	47.1%	47.5%	47.5%
		F	77.4%	77.4%	777%	77.6%
	2031	M	49.3%	49.3%	49.4%	47.2%
		F	78.2%	78.2%	78.1%	77.0%
Lisbon	2011	M	47.1%	47.1%	47.1%	47.1%
		F	72.9%	72.9%	72.9%	72.9%
	2021	M	48.3%	48.3%	48.3%	48.3%
		F	72.5%	72.5%	72.5%	72.6%
	2031	M	49.2%	49.2%	49.2%	48.3%
		F	73.3%	73.3%	73.2%	72.4%
Alentejo	2011	M	44.0%	44.0%	44.0%	44.0%
		F	68.0%	68.0%	68.0%	68.0%
	2021	M	43.9%	43.9%	44.0%	44.0%
		F	66.5%	66.4%	65.0%	65.1%
	2031	M	45.0%	45.0%	45.1%	43.9%
		F	66.0%	65.8%	66.1%	67.2%
Algarve	2011	M	41.7%	41.7%	41.7%	41.7%
		F	69.8%	69.8%	69.8%	69.8%
	2021	M	42.0%	42.1%	41.1%	41.1%
		F	69.3%	69.3%	69.7%	69.6%
	2031	M	42.8%	43.0%	42.7%	41.8%
		F	69.5%	69.4%	69.3%	68.8%
R.A.A.	2011	M	37.6%	37.6%	37.6%	37.6%
		F	68.0%	68.0%	68.0%	68.0%
	2021	M	39.8%	39.7%	41.3%	41.3%
		F	69.2%	69.3%	71.1%	70.9%
	2031	M	43.0%	43.0%	43.4%	40.2%
		F	71.2%	71.2%	68.5%	66.0%
R.A.M.	2011	M	34.0%	34.0%	34.0%	34.0%
		F	60.5%	60.5%	60.5%	60.5%
	2021	M	34.4%	34.4%	33.2%	33.2%
		F	62.0%	62.1%	60.6%	60.7%
	2031	M	36.6%	36.5%	36.3%	34.0%
		F	64.3%	64.5%	64.8%	63.3%

Source: Author's calculations*

The increased levels of schooling (trend scenario) seem to have a great impact in this indicator, in comparison to the maintenance of the levels of education (constant scenario). The same is true regarding the use of prescription medicines among men and the visit to medical appointments by women. We can consider that this impact is always positive, since the trend scenario results in lower prevalence of individuals who negatively rate their health status, less use medical appointments and less use prescription medicines.

Projections on the health status of the population is a complex and challenging task, given the difficulties associated with the estimation of changes in morbidity and the measurement of health (European Union, 2012). The projections presented follow an approach of 'what if', based on the definition of different scenarios for the evolution of educational levels and differences between educational levels with regard to the health status and the use of health services. Thus, the uncertainty associated with the results is evident. Nevertheless, these projections are useful, in that they can be a basis to study the possible evolution of public expenditure and the impact of population's schooling and their health status as the main drivers of health expenditure, thus substantiating decision-making by policy makers.

We can thus assume that if increased longevity is accompanied by an increase in the number of years lived in good health, the ageing of the Portuguese population's age structures may not necessarily translate into an increase in health costs. A better health status will contribute to a lower use of health services and can consequently lead to reduced spending (Rechel, et al., 2009; European Union, 2012).

However, the results point to a future improvement of the health status (particularly in self-reported health status and the prevalence of chronic diseases, especially among men), but also to the increased use of the health services considered (medical appointments and use of prescription medicines). As such, we can question whether it is not the increasing use of health services in the coming decades that will lead to a better health status, which would reverse the expected developments regarding spending on this sector.

5. National health accounts

Mª do Rosário O. Martins and Alexandra Carvalho

What a country spends on health and the rate at which these costs are changing over time are a reflection of a diverse set of economic and social factors, as well as of the funding and organisation structures of its healthcare system. Total health expenditure measures the final consumption of goods and services (i.e. all current health expenditure), plus capital investment in the infrastructure of healthcare. It includes public and private expenditure on medical goods and services, public health, prevention programmes on expenditure management and administration. Currently, accounting for health expenditure in Portugal is based on a national accounts system described in detail in the manual *The System of Health Accounts Version 1.0 (SHA 1.0 Manual*[1]*)*.

The first harmonised data on health expenditure dates back to 1995[2] and is available for 188 countries. After an intense methodological development by major international organisations[3] (OECD, World Health Organization (WHO) and European Union institutions), the manual *A System of Health Accounts Version 1.0 (SHA Manual 1.0*[4]) was published in 2000. This manual presents a system of health accounts, internationally comparable, and harmonised as much as possible with other aggregated social and economic statistics (§ 1:27, SHA 1.0 Manual). It is methodologically consistent with the 1993 UN System of National Accounts (SNA 93) (1.34 subparagraph, SHA 1.0 Manual).

Moreover, it also constitutes the methodological basis for the development of another manual, the *Guide to producing national health accounts with special applications for lower and middle-income countries* (NHA Guide)[5], published in 2003 by the World Bank, the U.S. Agency for International Development (USAID) and the WHO, with application to non-OECD countries.

5.1 Main characteristics of the National System of Health Accounts

National health accounts are a comprehensive, consistent, and flexible accounts system, internationally comparable, based on the concepts, classifications and accounting rules defined by the SHA 1.0 Manual (page 3 of the SHA manual).

[1] Available at: http://www.oecd.org/health/health-systems/1841456.pdf
[2] Available at: http://apps.who.int/nha/database/DataExplorer.aspx?ws=0andd=1
[3] Summary presented in paragraphs 1.12 to 1.17 of the SHA 1.0 Manual
[4] Available at: http://www.oecd.org/health/health-systems/1841456.pdf
[5] Available at: http://www.who.int/nha/docs/English_PG.pdf

According to the SHA 1.0 Manual (paragraph 1.6, SHA 1.0 Manual), the central issues of the System of Health Accounts are:

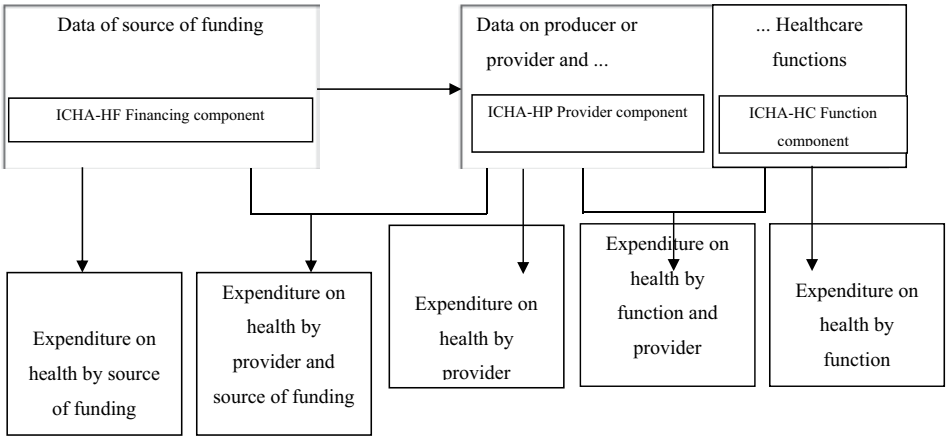
1- Where does the money come from? (source of funding);
2- Where does the money go to? (provider of healthcare services and goods;
3- What kind of (functionally-defined) services are performed and what types of goods are purchased?

The System of Health Accounts (paragraph 1.7, SHA1.0 Manual) involves the accounting of health expenditure considering the International Classification for Health Accounts (ICHA), determining:

1- Healthcare providing activities (ICHA-HC);
2- Healthcare Service provider industries (ICHA-HP);
3- Healthcare by function (ICHA-HF)

The provision of healthcare and its financing is a complex, three-dimensional process (paragraph 1.6, SHA Manual 1.0), represented by the following information flows in health accounts:

Figure 5.1
Information flows in Health accounts

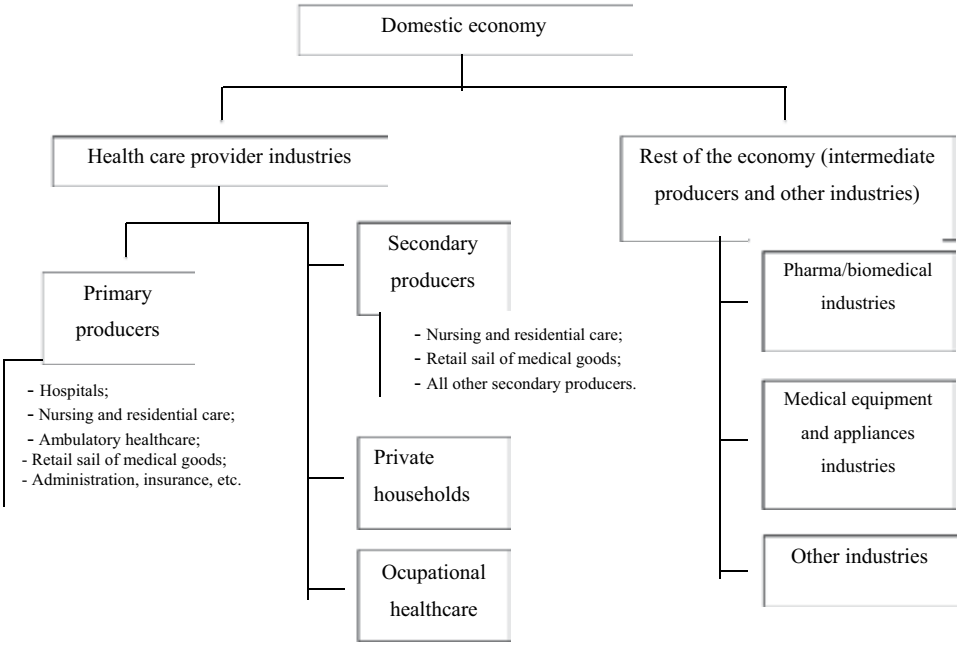


Source: SHA 1.0 Manual (p. 24)

5.1.1 Healthcare providing activities (ICHA-HP)

The basic criterion for the classification of Institutional Units of the Healthcare System (ICHA-HP) is the main activity of the establishments (paragraph 4.3, SHA Manual 1.0). The ICHA-HP classification integrates both primary and secondary producers of healthcare services (paragraph 4.5, SHA 1.0 Manual). Excluding producers of intermediate products of ICHA-HP (paragraph 4.6, SHA 1.0 Manual).

Figure 5.2
Healthcare providers within economy



Source: SHA 1.0 Manual (p. 52

5.1.2 Functions of healthcare and health-related functions (ICHA-HC)

The functional approach refers to "the goals or purposes of health care such as disease prevention, health promotion, treatment, rehabilitation and long-term care" (paragraph 3.2, SHA 1.0 Manual).

According to the SHA 1.0 Manual, the statistical unit in the functional distribution is the specific production feature of healthcare providers for final use. As such, all intermediate procedures resulting from the completion of a medical act are not individually classified, but according to the final goal (paragraph 3.27, SHA 1.0 Manual).

Healthcare services include personal healthcare services, provided directly to individuals, and collective healthcare services that include public health activities such as health promotion and disease prevention, including the development and implementation of standards (HC.6), health administration and health insurance (HC.7). Personal healthcare services include services of curative care, rehabilitative care, continuing or long-term care services, ancillary services and medical goods dispensed to outpatients (paragraph 3.5, SHA 1.0 Manual).

The functional classification allows the separation of expenditure according to the mode of production: inpatient care, day hospital, outpatient and home care (paragraph 3.7, SHA 1.0 Manual).

Health-related functions (ICHA-HC.R.) are also included in the functional classification. These functions can be closely linked to healthcare in terms of operations, institutions and human resources, but should, whenever possible, be excluded from expenditure on the basic functions of healthcare (paragraph 3.22, SHA 1.0 Manual). These include: the activities of gross capital formation of healthcare providers (HC.R.1), education and training of health personnel (HC.R.2), research and development in the field of health (HC.R.3), food, hygiene and quality control of drinking water (HC.R.4), environmental health (HC.R.5), administration and provision of social services intended to take care of the sick and disabled (HC.R. 6), and administration and provision of health-related subsidies (HC.R.7), as described in paragraph 3.23, of the SHA 1.0 Manual.

Table 5.1

Functional classification of healthcare (ICHA-HC)

ICHA - HC	Functions of health care
HC.1 – HC.5	Personal health care services and goods
HC.1	Services of curative care
HC.2	Services of rehabilitative care
HC.3	Services of long-term nursing care
HC.4	Ancillary services to health care
HC.5	Medical goods dispensed to out-patients
HC.6 - HC.7	Collective health care services
HC.6	Prevention and public health services
HC.7	Health administration and health insurance
HC.R	Health-related functions
HC.R.1	Capital formation of health care provider institutions
HC.R.2	Education and training of the health personnel
HC.R.3	Research and development in health
HC.R.4	Food, hygiene and drinking water control
HC.R.5	Environmental health
HC.R.6	Administration and provision of social services in kind to assist living disease and impairment
HC.R.7	Administration and provision of health-related cash-benefits

Source: SHA 1.0 Manual (p. 43)

5.1.3 Healthcare financing agents (ICHA-HF)

The classification of financing agents/sources of funding (ICHA-HF) presents a complete breakdown of health expenditure by public and private units incurring in its funding. This classification derives from the central structure of the institutional sectors of the economy established by the SNA93 (paragraph 6.7, SHA 1.0 Manual).

Table 5.2

Classification of financing agents (ICHA-HF)

ICHA - HF	Sources of funding
HF.1	General government
HF.1.1	General government excluding social security funds
HF.1.1.1	Central government
HF.1.1.2	State/provincial government
HF.1.1.3	Local/municipal government
HF.1.2	Social security funds
HF.2	Private sector
HF.2.1	Private social insurance
HF.2.2	Private insurance (other than social insurance)
HF.2.3	Private households
HF.2.4	Non-profit institutions serving households (other than social insurance)
HF.2.5	Corporations (other than health insurance)
HF.3	Rest of the world

Source: SSHA 1.0 Manual (p. 68)

According to the SHA 1.0 Manual (paragraph 6.8), the financing of healthcare can be recorded from two different perspectives:

- The first approach, commonly used in National Health Accounts, refers to the balance of health expenditure in a complex series of third-party-payment combinations plus the direct household payments or other direct financing;
- The second perspective takes into account the sources of funding of the financing intermediary agents (social security, private social insurance and other private insurance, non-profit institutions serving households (NPISHs)), which are considered in its origin. Additionally, transfers, such as intergovernmental transfers, tax deductions, subsidies to providers and funding for the rest of the world, are included in the complete picture.

5.1.4 Accounting for total health expenditure

According to the SHA 1.0 Manual (paragraph 5.2), the total expenditure on health evaluates the final use of resident units on health goods and services, including the Gross Capital Formation in healthcare providing activities (as main activity). This means that the total expenditure on health measures the economic resources spent by a country in the HC.1 and HC.7 functions on goods and healthcare services, including health administration and health insurance plus gross capital formation (paragraph 5.2, SHA 1.0 Manual).

Table 5.3

Conceptual boundary of total health expenditure

ICHA - HF	Sources of funding
HF.1	General government
HF.1.1	General government excluding social security funds
HF.1.1.1	Central government
HF.1.1.2	State/provincial government
HF.1.1.3	Local/municipal government
HF.1.2	Social security funds
HF.2	Private sector
HF.2.1	Private social insurance
HF.2.2	Private insurance (other than social insurance)
HF.2.3	Private households
HF.2.4	Non-profit institutions serving households (other than social insurance)
HF.2.5	Corporations (other than health insurance)
HF.3	Rest of the world

Source: SSHA 1.0 Manual (p. 68)

Total expenditure is part of the gross domestic expenditure, excluding exports of healthcare services (rendered by resident providers to non-residents) but including imports (health expenditures made by residents outside the economic territory) (paragraph 5.3, SHA 1.0 Manual).

Gross Capital Formation (GCF) in health activities (as main activity) corresponds to the expenditure that increases the stock of resources of the healthcare system, with superior durability to an accounting period (one year) (paragraph 5.2, SHA 1.0 Manual). According to the SHA 1.0 Manual (§ 5:37), GCF on health does not include the GCF of providers primarily engaged in the retail sale of medical articles.

The SHA 1.0 Manual suggests the application of the principles of the SNA 93 in the calculation of healthcare production. Namely, the separation between market and non-market output in order to evaluate correctly the production of healthcare services in monetary terms (paragraph 5.21, SHA 1.0 Manual).

The output record respects the principle of economic accrual ('accrual basis'): flows are recorded when economic value is created, transformed, exchanged, transferred or extinguished. The services are recorded when they are provided. The output is recorded when the product is created and the intermediate consumption is recorded when materials are used. The accounting period is the calendar year (§ 5.21, SHA 1.0 Manual).

5.2. National Health Accounts in Portugal: a decade of time series

In this section we begin by considering the trends in health expenditure between 2000 and 2012 and its framework at the national and international economic context. Afterwards, we will examine the major financing agents as well as the way how the health expenditure has been apportioned among the main providers of healthcare, including hospitals, outpatient and pharmacy services. Finally, we will assess how expenditure on health has evolved since 2000, according to the main means of production (inpatient care, day hospital, outpatient care, and home care). Whenever possible these different components of health expenditure will be analysed in the light of its potential linkage with the ageing population phenomenon.

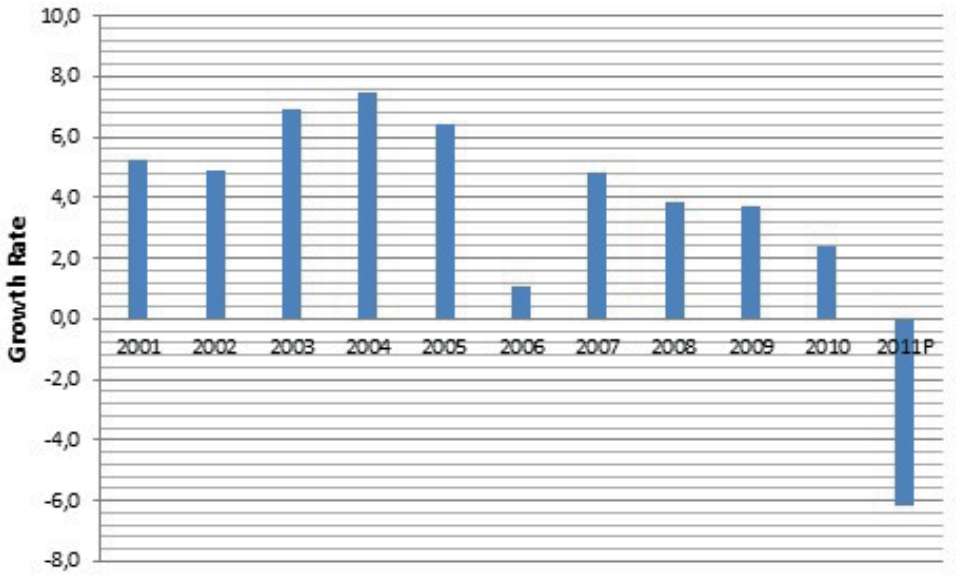
At the end of this section, based on existing data since 2000, we intend to answer the following questions:

- Has health expenditure increased significantly since 2000? Is its behaviour related to economic factors?
- Who are the major funders of health expenditure in Portugal? Has the financing pattern been changing since 2000?
- How is the expenditure allocated by major providers of healthcare? This distribution has been consistent over time? And is it interlinked with the population ageing phenomenon?
- What are the functions and modes of production of healthcare absorbing more resources? How is the distribution of health expenditure evolving in this context over time? Is there an association between how these costs are distributed and population ageing?

5.2.1 Expenditure on Health

In 2012, the latest year for which there is available data, the current health expenditure (estimated) amounted to EUR 15,628.1 million and declined significantly compared to the previous period (-5.5%), after registering a nominal decline of 5.8% in 2011. This negative development was mainly driven by the sharp decrease in public current expenditure which reached values of 8.4% in 2011 and 9.7% in 2012 (**Tabela 5.4**).

Figure 5.3
Total health expenditure: 2000-2011



Source: INE, Conta Satélite da Saúde (data published in 21st July 2013). Author's elaboration

In the decade 2001-2011, total health expenditure increased from EUR 11,835.8 million to EUR 17,507.7 s, reaching a maximum increase of 7.4% in 2004 to a minimum of -6.2% in 2011 (Figure 5.3). Health expenditure has grown over the first five years, with a more moderate growth since 2006.

Trends in health expenditure have to be framed in the broader context and not only within the Portuguese economy, but also in the context of the OECD countries. Regarding the Portuguese economy it is important to note that in 2012 current expenditure on health corresponded to 9.5% of the GDP. This figure is only one percent higher than the one recorded in 2000 (8.6%). From the analysis of Table 5.4 we realise that in 2011 and 2012, the current health expenditure declined at a much faster rate than the GDP,

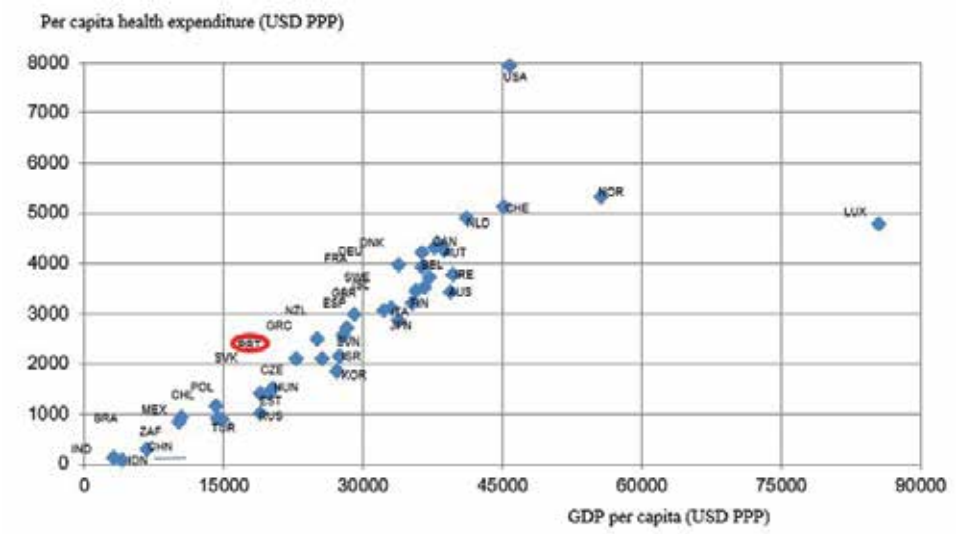
Table 5.4
Health expenditure and main aggregates. 2000-2012

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011P	2012Pe
Total health expenditure														
value	10^6€	11,835.8	12,454.1	13,065.4	13,965.0	15,004.1	15,971.9	16,138.0	16,922.0	17,574.7	18,224.2	18,663.7	17,507.7	x
Rate variation	%	x	5.2	4.9	6.9	7.4	6.5	1.0	4.9	3.9	3.7	2.4	-6.2	x
% GDP	%	9.3	9.3	9.3	9.7	10.0	10.4	10.0	10.0	10.2	10.8	10.8	10.2	x
per capita	€	1,157.4	1,210.0	1,260.1	1,337.5	1,428.7	1,514.0	1,524.7	1,595.2	1,654.5	1,714.0	1,754.5	1,643.8	x
Current expenditure on health														
value	10^6€	10,943.0	11,560.2	12,276.0	13,159.9	14,162.6	15,110.5	15,109.4	15,838.6	16,602.8	17,256.2	17,552.7	16,536.8	15,628.0
Rate variation	%	x	5.6	6.2	7.2	7.6	6.7	0.0	4.8	4.8	3.9	1.7	-5.5	-5.8
% GDP	%	8.6	8.6	8.7	9.2	9.5	9.8	9.4	9.4	9.7	10.2	10.2	9.7	9.5
per capita	€	1,070.1	1,123.1	1,184.0	1,260.4	1,348.6	1,432.4	1,427.5	1,493.0	1,563.0	1,623.0	1,650.1	1,552.6	1,474.0
Total expen.	%	92,5	92.8	94.0	94.2	94.4	94.6	93.6	93.6	94.5	94.7	94.0	94.5	x
Current public expenditure on health														
value	10^6€	7,598.2	8,057.3	8,689.9	9,196.9	9,874.0	10,548.6	10,251.5	10,712.3	10,972.3	11,657.1	11,827.8	10,835.2	9,789.5
Rate variation	%	x	6.0	7.9	5.8	7.4	6.8	-2.8	4.5	2.4	6.2	1.5	-8.4	-9.7
% GDP	%	6.0	6.0	6.2	6.4	6.6	6.8	6.4	6.3	6.4	6.9	6.8	6.3	5.9
per capita	€	743.0	782.8	838.1	880.8	940.2	999.9	968.6	1,009.8	1,032.9	1,096.4	1,111.9	1,017.3	923.3
Current private expenditure on health														
value	10^6€	3,344.7	3,502.9	3,586.1	3,963.0	4,288.6	4,561.9	4,857.9	5,126.3	5,630.5	5,599.1	5,724.9	5,701.6	5,838.6
Rate variation	%	x	4.7	2.4	10.5	8.2	6.4	6.5	5.5	9.8	-0.6	2.2	-0.4	2.4
% GDP	%	2.6	2.6	2.6	2.8	2.9	3.0	3.0	3.0	3.3	3.3	3.3	3.3	3.5
per capita	€	327,1	340,3	345,9	379,6	408,4	432,4	459,0	483,2	530,1	526,6	538,2	535,3	550,7
Gross capital formation														
value	10^6€	892,8	893,9	789,4	805,2	841,5	861,4	1.028,6	1.083,4	972,0	968,0	1.111,0	970,9	x
Rate variation	%	x	0,1	-11,7	2,0	4,5	2,4	19,4	5,3	-10,3	-0,4	14,8	-12,6	x
% GDP	%	0,7	0,7	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	x
Total expen.	%	7,5	7,2	6,0	5,8	5,6	5,4	6,4	6,4	5,5	5,3	6,0	5,5	x
GDP														
Rate variation	%	7,3	5,6	4,5	2,1	4,1	3,3	4,3	5,3	1,6	-2,0	2,6	-1,0	-3,4

Source: INE, Conta Satélite da Saúde (data published in 21st July 2013)
Caption: Provisional data (P); Preliminary Data (Pe)

which registered nominal reductions of 1.0% in 2011 and 3.4% in 2012. Within the OECD context, it appears that GDP per capita is positively associated with health expenditure (Barros, 2005; Gerdtham, et al., 2008). In general, richer countries have higher levels of health expenditure (**Figure 5.4**).

Figure 5.4
Health expenditure and GDP per capita in OECD countries. 2009



Source: OCDE. Health at a Glance, 2009

5.2.2 Expenditure by financing agent

Current Public and Private Expenditure

As previously mentioned, healthcare financing agents (ICHA-HF) encompass all institutional units which directly finance national health systems (e.g.: National Health Service, public/private healthcare subsystems, household's private expenditure). The distribution of health expenditure by financing agents allows the measurement of the total (or current) health expenditure, public and private.

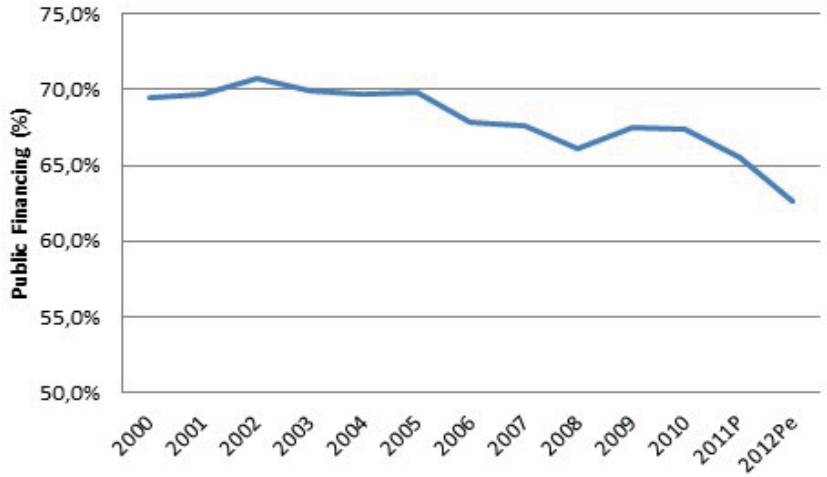
Public funding agents integrate the National Health Service (SNS), public health subsystems (ADSE, Medical and Medicine Assistance to the beneficiaries of the Armed Forces and Militarised and Social Services of the PSP and the Ministry of Justice) and other government units (including deductions from taxable income by the IRS for healthcare).

Private insurance agents (including private health subsystems (SAMS, PTACs, the CTT's Institute of Social Works (IOS), etc.) and other private insurance), private household expenditure, non-profit institutions serving households (other than social insurance) and other companies (except health insurance) are classified as private financing agents.

The public sector is the main source of funding in the area of health in Portugal (**Figure 5.5**). Given the total health expenditure, current expenditure fi-

nanced by public officials has been losing relative importance consecutively since 2000, compared to private current expenditure, reaching 62.6% of the total current expenditure in 2012.

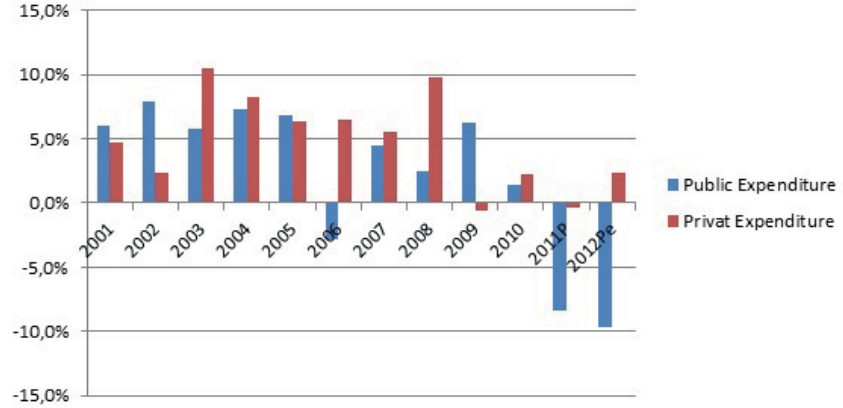
Figure 5.5
Evolution of public share (%) in total health expenditure



Caption: Provisional data (P); Preliminary data (Pe)
Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

After a 1.5% growth registered in 2010 (**Figure 5.6**), current public expenditure decreased significantly in 2011 (-8.4%) and 2012 (-9.7%). In turn, private current expenditure decreased slightly in 2011 (-0.4%), with an estimated increase of 2.4% in the following year.

Figure 5.6
Eate of growth of public and private expenditure in Portugal



Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st July 2013). Author's elaboration

Between 2000 and 2012, private current expenditure presented an average annual growth of 4.8%, while current expenditure grew only 2.3%. However, these figures show a strong variability, especially in the public sector. In 2012, the private current expenditure was 30% above the level recorded in 2005, while current public expenditure was 10% above. This evolution was strongly influenced by the decrease in public expenditure in the past two years.

Table 5.5.

Current health expenditure by financing agent

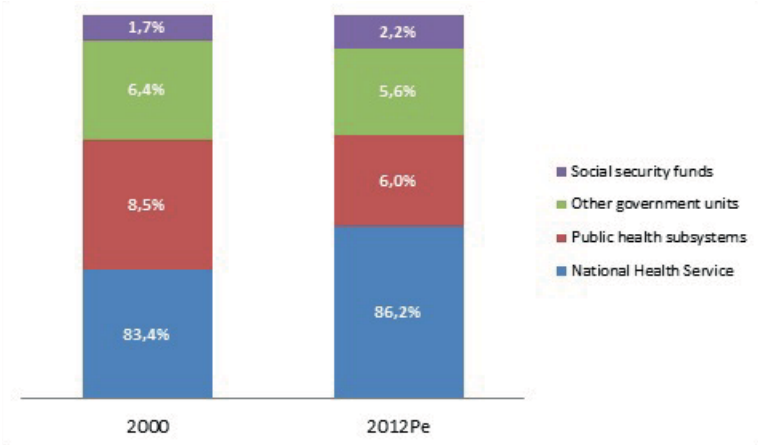
Financing Agents (ICHA-HF)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011P	2012Pe
Public service	**7,598.2**	**8,057.3**	**8,689.9**	**9,196,9**	**9,874.0**	**10,548.6**	**10,251.5**	**10,712.3**	**10,972.3**	**11,657.1**	**11,827.8**	**10,835.2**	**9.789,5**
National Health Service	6,334.2	6,622.9	7,069.6	7,437.9	7,909.9	8,415.0	8,091.9	8,431.7	8,605.8	9,137.2	9,977.3	9,107.7	8.439,4
Subsystems of public health	647.2	750.6	913.6	913.5	996.8	1,023.5	1,032.8	1,175.2	1,161.6	1,268.6	709.9	626.6	585,5
Other units of public service	485.4	544.7	573.3	690.5	804.2	948.7	951.8	918.6	997.0	1,015.4	913.4	880.4	549,6
Social security funds	131.4	139.1	133.5	155.0	163.1	161.3	175.1	186.8	207.8	236.0	227.1	220.5	215,1
Private sector	**3,344.7**	**3,502.9**	**3,586.1**	**3,963.0**	**4,288.6**	**4,561.9**	**4,857.9**	**5,126.3**	**5,630.5**	**5,599.1**	**5,724.9**	**5,701.6**	**5.838,6**
Subsystems of private health	237.6	266.0	265.2	355.1	389.6	357.5	361.9	342.7	366.3	323.2	315.3	310.6	288,4
Other private insurance	148.9	162.0	214.0	263.6	300.5	308.5	358.2	397.6	446.3	464.2	491.2	505.4	503,1
Private household spending	2,879.3	2,998.3	3,032.6	3,261.7	3,514.9	3,814.1	4,053.6	4,307.8	4,724.7	4,715.6	4,816.7	4,782.1	4,946.6
Non-profit institution serving households	18.5	15.7	16.2	21.4	23.2	17.5	19.3	14.6	14.3	15.4	14.6	14.2	14,2
Other societies	60.4	60.9	58.1	61.1	60.5	64.3	64.9	63.7	78.8	80.6	87.1	89.3	86,2

Caption: Provisional data (P); Preliminary data (Pe)
Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

When analysing the financial agents of the public sector in 2012, the SNS was the major source of funding, followed by public health subsystems (**Figure 5.7**). The biggest change from the distribution observed in 2000 is with regard to the transfer of funds concerning the subsystems of public health for the National Health System (8.5% in 2000 and only 6% in 2012).

Figure 5.7

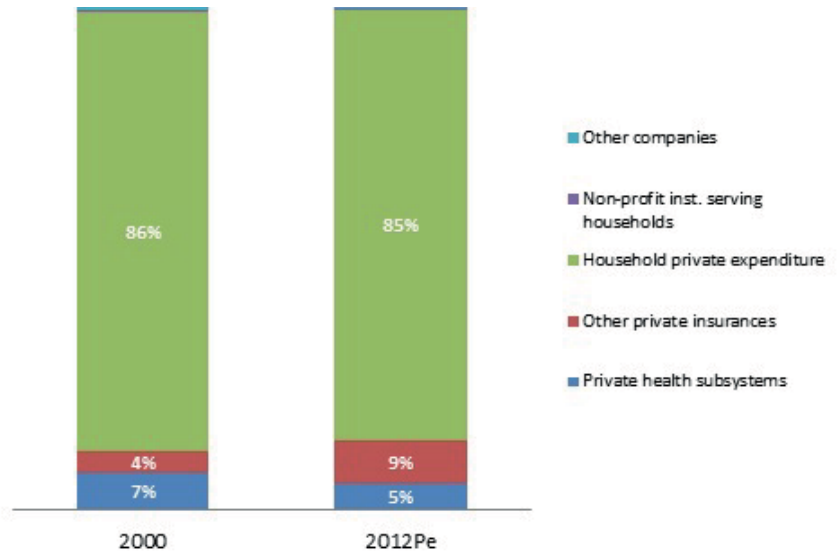
Sources of Funding of public administration in 2000 (left) and 2012 (right)



Source: INE, Conta Satélite da Saúde da Saúde (data published in 21st July 2013)

As in 2000, in 2012, the main source of funding in the private sector remains to be household expenditure. However, between 2000 and 2012, there was an increase in the share of other private insurance and a decrease of the private health subsystem (**Figure 5.8**).

Table 5.8
Funding Sources in the private sector in 2000 (left) and 2012 (right)



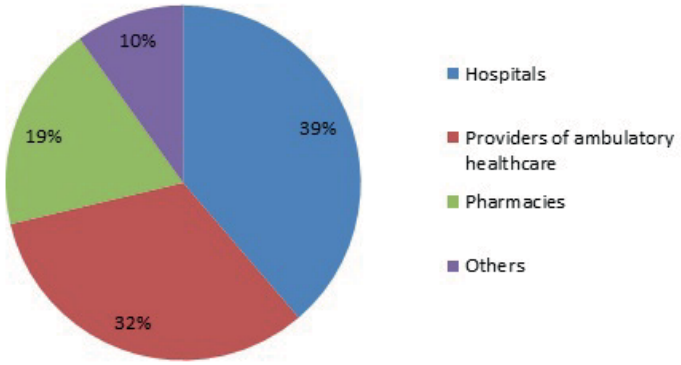
Source: INE, Conta Satélite da Saúde da Saúde (data published in 21st July 2013)

5.2.3 Expenditure by health providers

The activities providing healthcare (ICHA-HP) intended for final consumption comprise entities whose primary and secondary activity is the production of health services. These include in particular those who have as their main activity the provision of healthcare (e.g. hospitals) as well as the producers who provide healthcare as a secondary activity (e.g. nursing homes). These activities do not include the intermediate output aimed at intra-consumption activities (e.g. Pharmaceutical Industries), except occupational medicine. In 2011, hospitals (39%), outpatient healthcare (32%) and pharmacies (19%) represented the largest component of current expenditure on health (**Figure 5.9**).

Compared to 2010, in general terms, the expense of healthcare providers decreased. The fraction concerning hospitals decreased 4.1%, reflecting the decrease in 7.4% of expenditure on public hospitals (including the

Figure 5.9
Current expenditure on health by provider. 2011 (provisional value)



Source: INE, Conta Satélite da Saúde da Saúde (data published in 21st July 2013)

hospitals of Public Corporate Entities (EPE[6])). As for the expenditure on private hospitals (including hospitals with Public-Private Partnership Agreement), it increased 10.2%. The increase in expenditure on private hospitals was mainly due to the opening of new hospitals. On what concerns providers of outpatient healthcare, expenditures were reduced by 7.4% in 2011 (**Table 5.6**).

The expense related to public and private providers of outpatient healthcare decreased by 10.8% and 6.1%, respectively. A trend also registered in expenditure on pharmacies, which recorded a 9.1% decreased in 2011 (**Table 5.6**).

Table 5.6
Current health expenditure by provider

Unit: 10⁶ Euros

Providers of healthcare (ICHA-HP)		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011P
Hospitals	HP.1	4,246.8	4,338.3	4,684.8	5,046.0	5,386.7	5,864.0	5,649.8	6,017.4	6,170.4	6,566.4	6,674.0	6,402.4
Nursing inpatient establishments and specialised residential care	HP.2	101.0	109.8	119.1	129.5	143.4	148.3	157.0	178.8	207.2	234.7	251.2	264.6
Providers of outpatient healthcare	HP.3	3,274.4	3,576.6	3,747.2	4,143.1	4,493.5	4,773.8	4,824.3	4,970.6	5,394.0	5,633.0	5,813.5	5,382.1
Pharmacies	HP.4.1	2,324.2	2,538.8	2,722.5	2,863.8	3,128.5	3,267.5	3,349.3	3,470.1	3,539.7	3,507.4	3,423.7	3,113.0
All other sales of medical goods	HP.4.2-4.9	528.5	522.9	551.0	522.8	521.7	545.3	568.5	605.2	647.3	664.4	687.8	673.1
Provision and management of public health programmes	HP.5	7.8	8.6	8.1	9.8	12.0	9.3	8.3	8.0	13.9	10.2	11.9	11.8
Administration and health insurances in general	HP.6	180.0	179.9	164.7	166.0	190.8	198.7	228.7	243.5	255.2	264.1	292.4	294.3
All other activities	HP.7	132.8	146.1	148.5	155.3	164.2	171.9	183.8	193.0	208.1	222.1	230.5	226.7
Rest of the world	HP.9	147.4	139.2	130.1	123.6	121.8	131.7	139.8	152.0	166.9	154.0	167.7	168.9

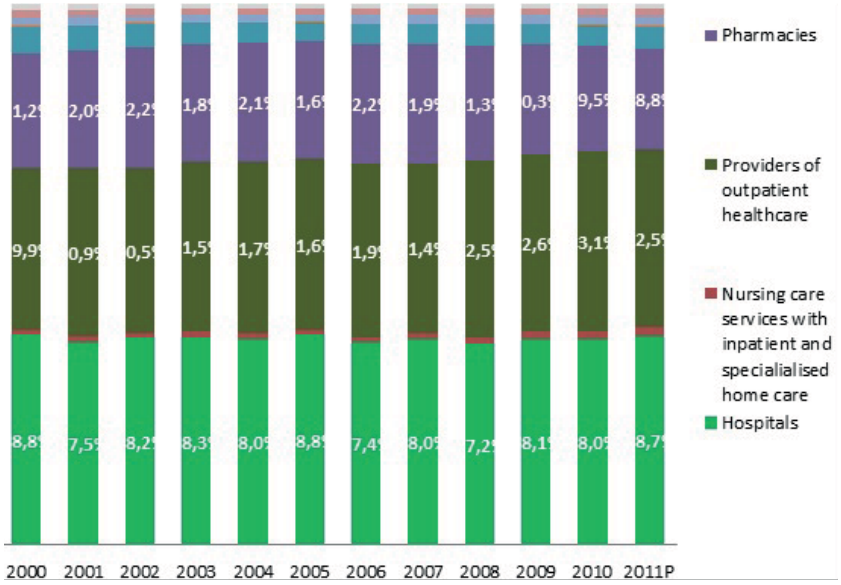
Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)
Caption: Provisional data (P); Preliminary data (Pe)

[6] EPE is the Portuguese acronym for Entidades Públicas Empresariais

In 2011, the structure of current expenditure by providers registered no significant changes compared to the previous year. Regarding the main providers, we noticed a relative increase in the share of expenditure on hospitals (38.0% in 2010 and 38.7% in 2011) and, conversely, a decrease in the proportion of expenditure on outpatient healthcare providers (33.1% in 2010 and 32.5% in 2011).

When analysing these figures for the period 2000-2011 (**Figure 5.10**), the main differences were registered in the proportion of expenditure on healthcare providers in outpatient care (29.9% in 2000 and 32.5% in 2011), and the expenditure of nursing inpatient establishments and specialist home care (0.9% in 2000 and 1.6% in 2011).

Figure 5.10
Current health expenditure by provider. 2000-2011



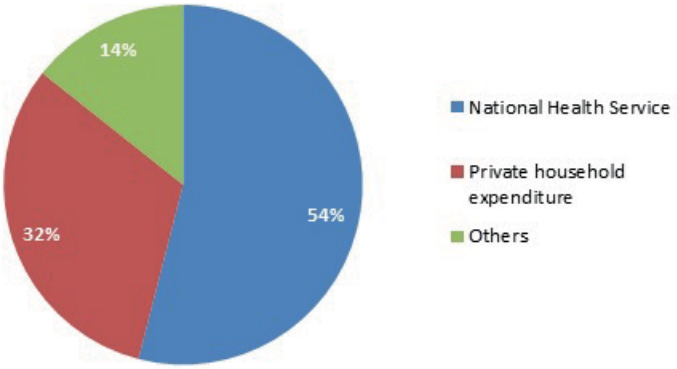
Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

Current expenditure on pharmacy has been gradually decreasing, corresponding to 18.8% of the total in 2011, and reaching a value of 21.2% in 2000 (**Figure 5.10**).

5.2.4 Current expenditure by financing agents and healthcare providers

In 2012, the proportion of current health expenditure withstand by the SNS was of 54%, of which households financed 28.9% of the total current expenditure (**Figure 5.11**).

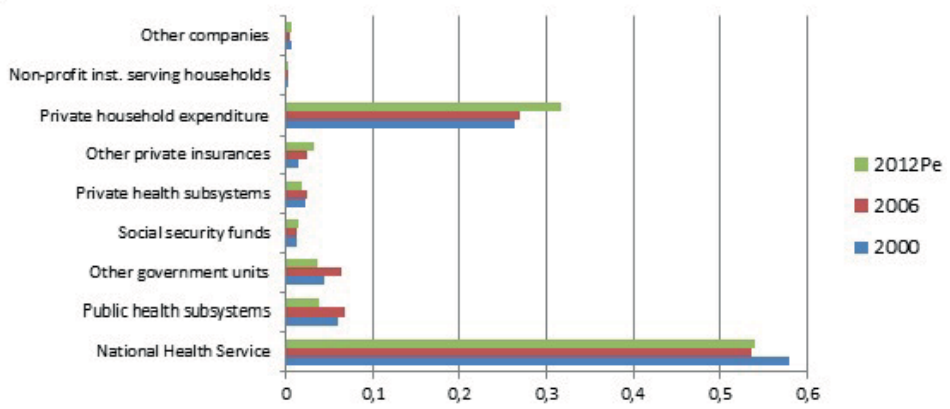
Figure 5.11
Current expenditure on health by provider. 2011 (provisional value)



Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

Between 2000 and 2012 the proportion of current health expenditure financed by households increased considerably, representing 26% and 32%, respectively. Simultaneously, there was a decrease in funding supported by the National Health Service (NHS) corresponding to 54.0% of current expenditure in 2012 and 58% in 2000 (**Figure 5.12**). For the remaining funding agents, other private insurances were the only ones experiencing an increase in the relative weight of their expenditure in the financing structure (1.3% and 3.2% in 2000 and 2012, respectively). In this period we can also highlight the significant decrease in expenditure of other government units

Figure 5.12
Current health expenditure by financing agent (2000-2012Pe)

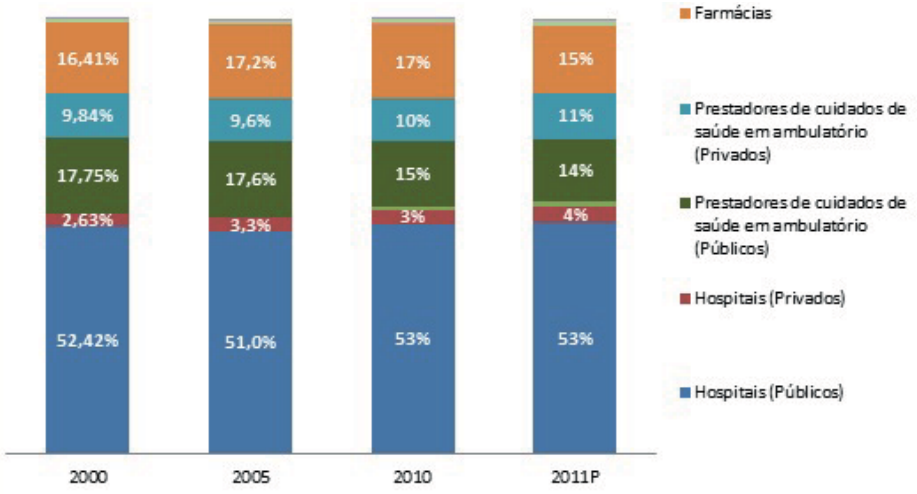


Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

(including deductions for the IRS for healthcare services). Thus, resulting in the reduction of its relative weight in the funding structure, due to revised rules applied to the calculation of deductions from IRS established in Law No. 64-B/2011, of 30th December. In 2012, households were only able to deduct 10% of health expenditure to a limit of EUR 838.44, in the case of expenditure VAT exempt or subject to the reduced rate. Until 2011 it was possible to deduct up to 30% of health expenses with goods and services exempt from VAT or with a 6% rate (and interests incurred for the payment of those), with no maximum limit established.

When analysing health expenditure by provider and major sources of funding, we realise that since 2000, current SNS expenditure has declined, reflecting the reduction in funding to public hospitals, public outpatient healthcare providers and pharmacies (**Figure 5.13**).

Figure 5.13
Current SNS expenditure by provider, 2000-2011



Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

Measures adopted in 2011 to reduce public expenditure, namely the reduction of personnel costs and intermediate consumption of public providers and the decrease in the value of the programme-contracts with EPE Entities, led to a reduction in SNS expenditure. Simultaneously, measures of medicine policy implemented in 2011 and 2012, which resulted in a decrease in medicine prices, the reduction of reimbursement by the SNS and the increase in generic medicines also led to a significant reduction in SNS expenditure with pharmacies. Moreover, the revision of medicine prices with reference to the lower prices in other European countries, the incentive

to access the market of generic medicines through the judicial unlocking of patents, and the increase of active substances with generic medicines sold and the implementation of prescription and dispensing by 'International Nonproprietary Names', contributed significantly to those savings in the SNS.

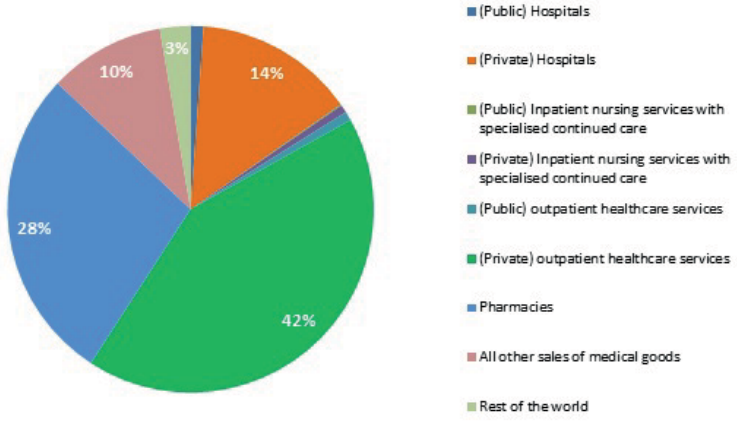
Table 5.7
Current expenditure on health by the National Health Service provider

Providers of healthcare (ICHA-HP)		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011P
Hospitals (Public)	HP.1	3,320.6	3,308.5	3,539.4	3,673.6	3,912.8	4,292.5	4,060.2	4,342.0	4.340,6	4,724.7	5,259.8	4,844.6
Hospitals (Private)	HP.1	166.7	215.2	205.2	234.0	276.1	279.3	277.3	285.4	304,3	226.1	329.6	336.6
	HP.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	35,5	48.9	67.9	90.4
Nursing services with inpatient care(Private)	HP.3	1,124.2	1,236.5	1,311.9	1,397.5	1,442.9	1,477.0	1,385.6	1.374.9	1,370,2	1,368.0	1,504.5	1,315.2
Outpatient healthcare services(Private)	HP.3	623.5	653.7	717.2	782.1	782.6	806.7	847.6	826,4	906.5	993.4	960.8	963.5
Pharmacies	HP.4.1	1,039.2	1,146.6	1,227.2	1,272.9	1,394.6	1,448.2	1,425.0	1.480,8	1,554.7	1,651.3	1,737.8	1,404.7
All other sales of medical goods	HP.4.2-4.9	5.7	4.4	4.5	5.2	5.9	10.1	7.7	7,5	7.9	7.8	7.7	8.4
Provision and management of public health programmes	HP.5	2.8	3.3	3.5	3.6	4.9	5.1	4.8	4,1	7.3	4.9	5.4	5.7
Management and health insurance in general	HP.6	38.4	38.7	41.8	49,4	62.4	69.6	64.1	72,3	57.9	87.5	93.3	104.9
Rest of the world	HP.9	13.0	15.9	18.8	19.6	27.9	26.4	19.6	27,0	20.9	24.5	10.5	33.7
Current expenditure on health		6,334.2	6,622.9	7,069.6	7,437.9	7,909.9	8,415.0	8,091.9	8.431,7	8,605.8	9,137.2	9,977.3	9,107.7

Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)
Caption: Provisional data (P); Preliminary data (Pe)

With regard to households (**Figure 5.14**), in 2011, the main components of current expenditure were those relating to outpatient healthcare in the private sector (42%), pharmacies (28%) and private hospitals (14%).

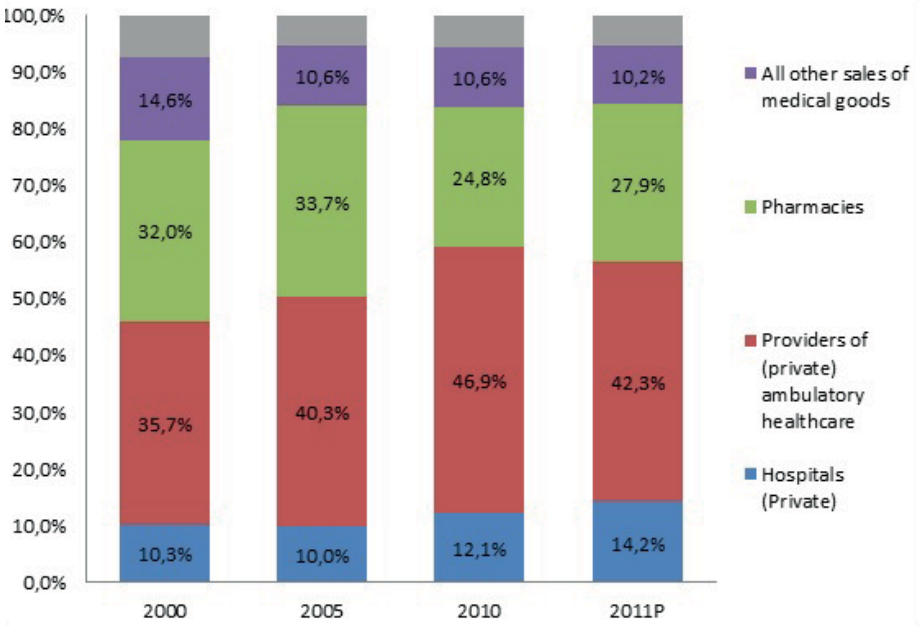
Figure 5.14
Household expenditure by provider in 2011



Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

The allocation of household expenditure has undergone significant changes since 2000, maintaining however the relative importance of its large budget lines. By 2010, there was an increase in the weight of outpatient healthcare and in private sector hospitals, along with a decrease in the fraction concerning pharmacies (**Figure 5.15**).

Figure 5.15
Division by household expenditure by major providers 2000-2011



Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

After 2010, this trend has changed, and there has been a decrease in expenditure on private providers of outpatient healthcare (-10.6%), which now represented 42.3% of its expenditure (-4.6% compared to 2010).

In contrast, there was an increase in household expenditure on public hospitals (+25.6%), in private hospitals (16.2%), with public outpatient healthcare providers (+54.4%), and in pharmacies (+11.9%). This evolution has led to an increase in the relative share of expenditure on private hospitals and pharmacies in the structure of household expenditure (Table 5.8). It should be noted that in 2011 the update of user fees in the context of services provided by public providers to users belonging to the SNS and the changes of requirements for exemption of payment (the right to exemption on the payment of user fees was granted to pensioners and the unemployed who do not receive an income above the national minimum wage) contributed to

the sharp increase in household expenditure with those providers. Moreover, in July 2011, the Government of the Autonomous Region of the Azores also introduced the collection of user fees by public providers belonging to the Regional Health Service. In turn, the recent increase in household expenditure in pharmacies resulted from medicine policy measures adopted, such as the reduction of certain pharmacy-therapeutic groups and subgroups and the change in Category A. The State's contribution in the price of medicines sold to the public is fixed according to four categories. In Category A, the share is of 90%; in Category B, 69%; in Category C, 37%; and, in Category D the contribution is of 15%. The reimbursement categories vary according to the therapeutic indications of the medicine, its use, the entities that prescribe it and the increased consumption for patients suffering from certain diseases (http://www.portaldasaude.pt/portal/conteudos/informacoes+uteis/medicamentos/comparticipacaomedicamentos.htm).

Table 5.8
Current expenditure on households health by provider

Providers of healthcare (ICHA-HP)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011P
Hospitals (Public)	46.2	61.5	35.5	30.8	34.5	35.9	38.7	41.4	45.5	45.2	43.2	54.2
Hospitals (Private)	296.7	251.5	271.6	371.0	346.8	379.7	409.9	451.9	551.1	530.6	583.0	677.5
Nursing inpatient establishments and specialised residential care (Private)	7.0	8.4	25.4	0.0	5.8	6.6	6.7	6.5	6.1	6.5	7.0	5.7
Nursing inpatient establishments and specialised residential care (Private)	5.8	12.6	9.4	28.5	31.2	41.0	48.3	51.5	42.7	39.3	41.7	33.1
Outpatient healthcare providers (Private)	23.5	24.6	26.9	20.5	22.7	25.9	26.9	27.9	26.6	25.5	24.7	38.1
Outpatient healthcare providers (Private)	1,028.6	1,129.3	1,094.1	1,210.0	1,392.9	1,535.9	1,599.6	1,709.8	1,995.7	2,105.9	2,260.8	2,020.5
Pharmacies	920.4	991.2	1,054.3	1,105.8	1,211.6	1,285.4	1,391.7	1,451.0	1,429.7	1,349.5	1,193.1	1,334.6
All other sales of medical goods	419.7	398.2	406.8	394.0	377.9	402.9	416.7	447.2	483.9	486.0	510.4	489.4
Rest of the world	131.5	121.0	108.6	101.0	91.5	100.9	115.0	120.6	143.5	127.2	152.6	128.9
Current expenditure on health	2,879.3	2,998.3	3,032.6	3,261.7	3,514.9	3,814.1	4,053.6	4,307.8	4,724.7	4,715.6	4,816.7	4,782.1

Source: INE, Conta Satélite da Saúde (data published on 21st June 2013)
Caption: Provisional data (P); Preliminary data (Pe)

5.2.4 Expenditure by functions of healthcare and modes of production

The classification of expenditure by function and modes of production allows a separate analysis of the following components (**Table 5.9**):

- Inpatient care expenditure (curative care and rehabilitation, long-term nursing care);
- Day-hospital, outpatient care expenditure (curative care and rehabilitation);
- Outpatient care expenditure, excluding inpatient care (curative care and rehabilitation);
- Expenditure on home care (curative care and (outpatient) rehabilitation; prolonged nursing care);

- Expenditure for ancillary healthcare services;
- Expenditure with medical supplies (pharmaceuticals and other non-durable medical supplies, therapeutic appliances and durable medical equipment).

Table 5.9

Current expenditure on health by function of care and modes of production

Unit: 10^6 Euros

Functions of healthcare and modes of production (ICHA-HC)		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011P
Inpatient		2,828.1	2,858.3	3,042.7	3,208.9	3,328.9	3,462.1	3,303.1	3,449.6	3,476.0	3,544.6	3,608.0	3,467.8
Curative and rehabilitation care	HC.1.1; 2.1	2,752.9	2,780.4	2,965.6	3,130.8	3,240.3	3,373.3	3,223.8	3,359.1	3,342.0	3,392.7	3,422.6	3,274.9
Prolonged nursing care	HC.3.1	75.2	78.0	77.1	78.1	88.6	88.9	79.3	90.5	134.1	151.9	185.3	193.0
Day hospital (outpatient)		485.7	428.1	450.6	474.7	527.2	640.5	622.1	715.7	876.4	1,108.6	1,203.3	1,148.0
Curative and rehabilitation care (outpatient)	HC.1.2; 2.2	485.7	428.1	450.6	474.7	527.2	640.5	622.1	715.7	876.4	1,108.6	1,203.3	1,148.0
Outpatient		3,425.8	3,770.6	4,004.3	4,412.3	4,796.8	5,244.7	5,243.4	5,491.1	5,844.2	6,105.5	6,278.7	5,886.9
Curative and rehabilitation care (outpatient)	HC.1.3; 2.3	3,425.8	3,770.6	4,004.3	4,412.3	4,796.8	5,244.7	5,243.4	5,491.1	5,844.2	6,105.5	6,278.7	5,886.9
Home care		94.0	106.9	116.3	98.9	141.4	136.7	119.7	109.1	113.4	131.7	133.9	128.1
Curative and rehabilitation care (outpatient)	HC.1.4; 2.4	54.7	62.4	66.6	48.2	87.8	82.3	61.4	44.4	41.8	47.8	44.0	38.0
Prolonged nursing care	HC.3.3	39.3	44.5	49.7	50.7	53.5	54.4	58.4	64.7	71.6	83.9	89.8	90.1
Auxiliary healthcare services	HC.4	807.7	876.0	918.9	1,095.7	1,198.6	1,257.0	1,328.9	1,381.0	1,514.0	1,549.8	1,530.3	1,451.5
Medical products available to patients not hospitalised	HC.5	2,883.7	3,094.6	3,309.2	3,428.5	3,695.5	3,860.3	3,995.9	4,167.2	4,217.6	4,195.9	4,134.1	3,810.7
Pharmaceuticals and other medical non-durable items	HC.5.1	2,354.5	2,571.0	2,757.4	2,904.8	3,172.8	3,314.0	3,426.3	3,560.9	3,568.9	3,529.4	3,444.3	3,135.6
Therapeutic appliances and durable medical equipment	HC.5.2	529.2	523.6	551.8	523.7	522.7	546.3	569.6	606.3	648.7	666.5	689.8	675.1
Personal expenditure on health		**10,524.9**	**11,134.5**	**11,842.0**	**12,718.9**	**13,688.3**	**14,601.3**	**14,613.1**	**15,313.7**	**16,041.6**	**16,636.1**	**16,888.1**	**15,893.1**
Prevention and public health services	HC.6	238.1	245.8	269.3	275.0	283.5	310.4	267.7	281.4	306.0	356.1	372.1	349.4
Health administration and health insurance	HC.7	180.0	179.9	164.7	166.0	190.8	198.7	228.7	243.5	255.2	264.1	292.4	294.3
Current expenditure on health		**10,943.0**	**11,560.2**	**12,276.0**	**13,159.9**	**14,162.6**	**15,110.5**	**15,109.4**	**15,838.6**	**16,602.8**	**17,256.2**	**17,552.7**	**16,536.8**

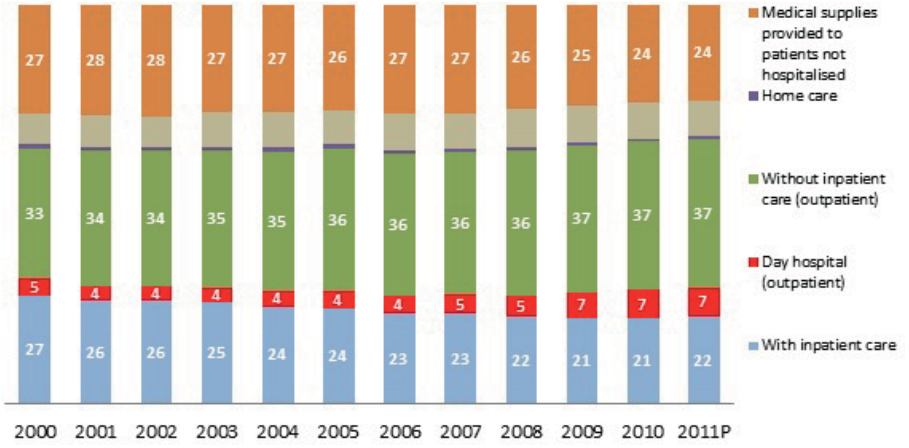
Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)
Caption: Provisional data (P); Preliminary data (Pe)

As a whole, hospital inpatient and outpatient costs are responsible for a large part of health expenditure in Portugal: 65% in 2000 and 66% in 2011 (**Figure 5.16**). In 2011, 24% of health expenditures were allocated to medical articles (mainly pharmaceuticals), 12% to long-term care and the remaining 6% in public health outgoing and prevention and administration services.

Portugal has consistently displayed a high proportion of expenditure on outpatient (38% in 2000 and 45% in 2011). This figure, which includes doctors' salaries, is considerably higher than the OECD average, which was only 33% in 2011 (OECD, 2013).

Expenditure on medical items mainly reflects the pattern of consumption of pharmaceuticals. This value depends highly on the price of medicines. The declining proportion of this expenditure in total health expenditure (27% in 2000 and 24% in 2011) is related to the medicine policy cited above.

Figure 5.16
Expenditure on health by function of care and modes of production, 2000-2011



Source: INE, Conta Satélite da Saúde da Saúde (data published on 21st June 2013)

5.3 Conclusions

The existence, since 2000, of a system of national accounts in healthcare makes it possible to know the major trends of health expenditure in Portugal, disaggregated by source of funding, by healthcare provider, by healthcare functions and modes of production. Providing information with this kind of breakdown will be, in the long-run, extremely useful to analyse the evolution of age-related expenditures. As we have seen, current health expenditure in a given year includes not only spending on personal healthcare services but also public healthcare services and prevention and the expense related to health administration and health insurance. Current expenditure on personal healthcare, which is the most important part of the expense, integrates curative care and rehabilitation (inpatient and outpatient care, day hospital and home care), extended nursing care (inpatient care, day hospital and home care), ancillary healthcare services, and medical supplies available to patients not hospitalised (pharmaceuticals and other non-durable medical supplies and therapeutic appliances and durable medical equipment). Since 2000, and especially since 2010, there has been a decrease in the growth rate of health expenditure, not only in Portugal but also in other OECD countries, particularly in Greece and Spain (OECD, 2013). Many governments have been forced to introduce measures to curb public expenditure affecting various branches of healthcare: pay cuts in the public sector, cutbacks in healthcare personnel, and reduction

of co-financing for patients are some examples (Morgan and Astolfi, 2013).

In Portugal, as in other OECD countries, the major funder of health expenditure has been the public sector (including the SNS). However, since 2000, private expenditure has been growing at a higher pace than that of public expenditure, accounting in 2012, to a share of the total expenditure considerably higher than that observed in 2000. A large part of the source of funding of the private sector continues to be related to household expenditure. In what concerns the providers of healthcare, hospitals, outpatient healthcare services and pharmacy are responsible for a high percentage of the expenditure on health. The pattern observed today does not differ substantially from that observed in 2000. The increase in the share of expenditure on healthcare in outpatient care should also be noted, as well as in inpatient nursing facilities and home care and the decrease in the share of expenditure on pharmacy.

Since 2000, families have been spending more and more on healthcare in the outpatient private sector and private hospitals.

Regarding the main functions of healthcare and the modes of production, the large percentage of expenditure continues to be on the ambulatory and medical articles. Although since 2000, prolonged inpatient nursing care and home care increased its relative share in total health expenditure, they currently represent a very small share of the total health expenditure. Expenditure on long-term care in Portugal (0.2% of GDP) is much lower than that registered in other OECD countries, such as Denmark, Norway and the Netherlands that have been implementing policies of long-term care and where these figure represent over 2% of the GDP (OECD, 2013).

There is little evidence in these 12 years of time series that enables to support the idea that the costs associated with ageing in Portugal have been increasing over time. However, the determinants of health expenditure and behaviour of its growth rate (Barros, 2014; Gerdtham, et al., 1992; Gerdtham, et al., 1998) are complex and include, in addition to ageing, many other factors of political, economic and technological nature. The next chapter of this book will examine some of these factors, as well as conceptual models related to ageing and health expenditure.

6. Expenditure on Health and Ageing: Portugal in the European context

Mª do Rosário O. Martins and João Estevens

Introduction

In recent decades there has been a considerable increase in average life expectancy in Western countries, which associated with a reduction of mortality and fertility rates led to a significant increase in demographic ageing. The increasing individual and demographic ageing is a trend that will continue to manifest itself in the coming decades. It is, with no doubt, one of the greatest events of the second half of the twentieth century. In addition to the rising longevity of the Portuguese, we are witnessing great innovations in terms of social support equipment and infrastructures (particularly in the fields of Health and Education), an increase in the average per capita income, i.e. a general improvement of life conditions. This period has coincided with a time of considerable growth in public spending, where Health is one of the most affected areas. But will there be a strong positive correlation between ageing and health expenditure? This chapter will explore this question using a literature review, enabling us to clarify how these two variables are interrelated (Breyer, et al., 2010, p. 675).

Thus, we will do a brief diagnosis of the Portuguese ageing scenario[1], in the European context, and of the evolution of health expenditure. It is our aim to illustrate other factors that may have been in the genesis of rising health expenditure and understand whether the increased ageing was one of the key factors for this development.

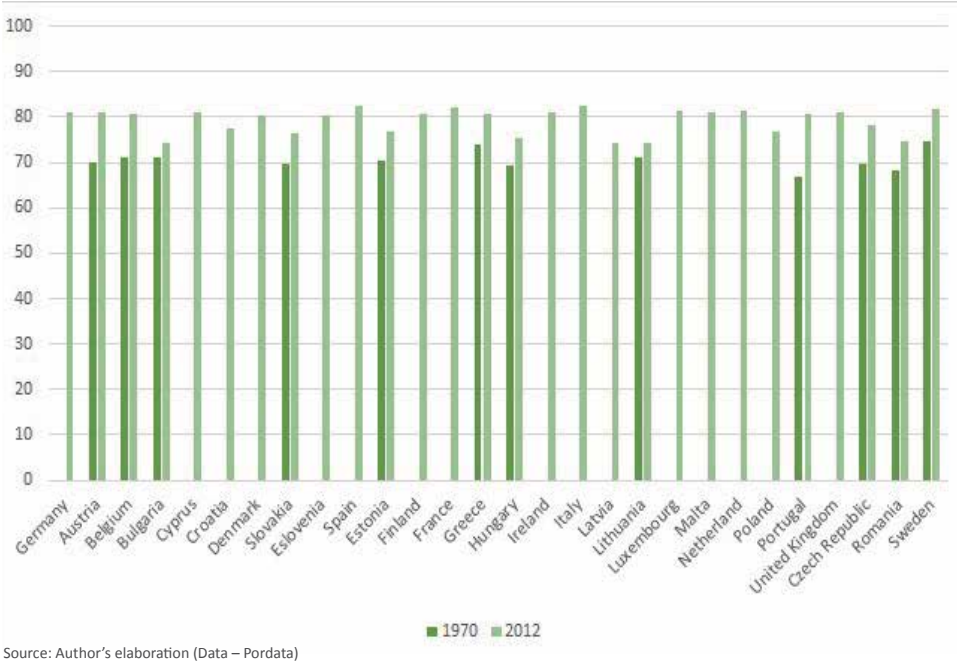
6.1 Demographic context

Life Expectancy at Birth

Europe has witnessed, over the past four decades, a continued increase in Europeans' average life expectancy. In Portugal, between 1970[2] and 2012, the average life expectancy of men and women has increased, on average, almost fourteen years, now showing similar values to most countries of the European continent. In 2012, the aggregated average life expectancy at birth of the Portuguese was 80.6 years, slightly higher than the UE28 average, which for the same year was 79.2 years.

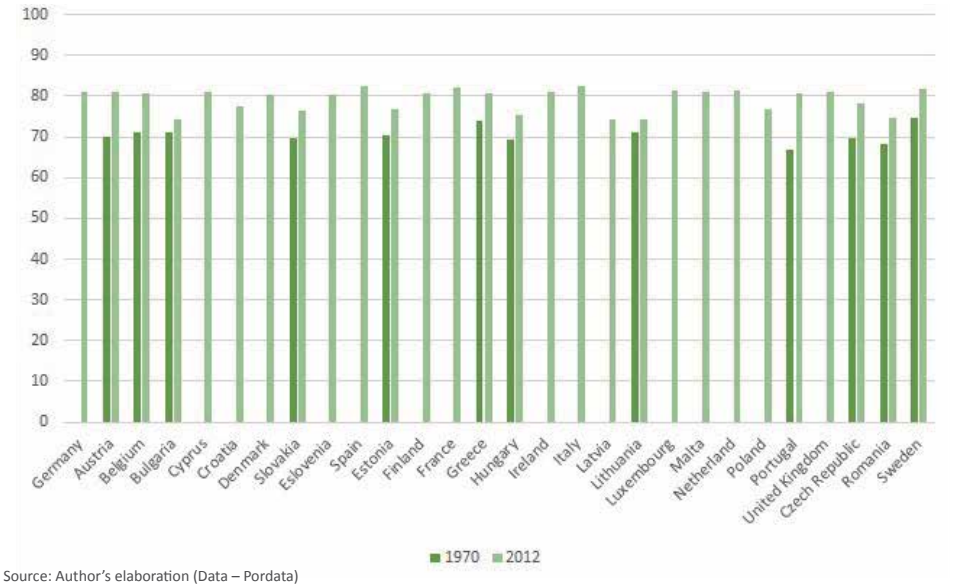
[1] Dealt with in detail in the second chapter of this book.[9] In the original: "assistência às clases desvalidas".
[2] here is no available data on the average life expectancy for most European countries, neither from EUROSTAT nor even PORDATA, for the year 1970

Figure 6.1
Life expectancy at birth MF in Europe (1970 and 2012)



Source: Author's elaboration (Data – Pordata)

Figure 6.2
Life expectancy at the age of 65 MF in Europe (1970 and 2012)



Source: Author's elaboration (Data – Pordata)

Life expectancy at the age of 65

Also the average life expectancy at the age of 65 has grown considerably over the past four decades. In Portugal, within the time period under study, men aged 65 expected to live on average 5.4 years longer and women 6.7 years longer. In 2012 the Portuguese aged 65 could, on average, expect to live 19.6 years more (17.6 for men and 21.3 for women), a slightly higher figure than the UE28 average, which in 2012 was 18.8 years. There seems to be a clear upward trend, which is expected to continue in the future.

Healthy Years of Life at the age of 65

In what concerns the population over 65 years old we should also consider the average healthy life expectancy because, when assessing the health of this age group, it allows the inclusion of the elderly's welfare factor and not only their longevity. Thus, this indicator allows us to measure the number of years a 65-year old person can expect to live without functional limitations and without being disabled.

European countries have shown a divergent development in this indicator. There are a number of countries which follow, since 1995, an escalating trend and another set of countries that have witnessed a deterioration in the number of years of healthy life expected for their populations aged 65 and more. Portugal is in this second group, along with Germany, Spain, Greece, Italy, among other countries. In 1995, both men and women of the third age group expected to live 9.1 years more of healthy life and, in 2012, only 6.3 years more of healthy life. The latter figure is well below the UE28, which was 8.6 years in 2012, placing Portugal near the tail of Europe.

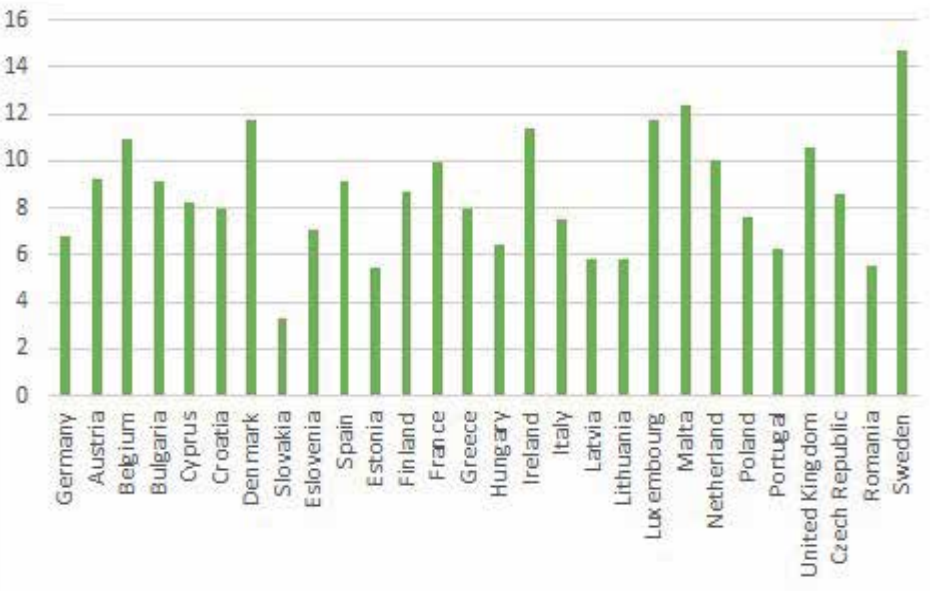
Feminisation of Ageing

Similarly to what exists in Portugal, shown in greater detail in the second chapter, there is a greater female representation in the most advanced age groups[3], i.e. the average life expectancy at birth is, for the whole European countries, longer for females

This gender difference is expressed in all the indicators mentioned above, although with different intensity in different countries. Portugal has relatively close differences to the average UE28 in regard to variations of gender associated with life expectancy at birth and life expectancy at the age of 65. Thus, the Portuguese live 6.3 and 3.7 years longer, respectively. These values correspond to deviations of 0.2 and 0.1 percent higher than the

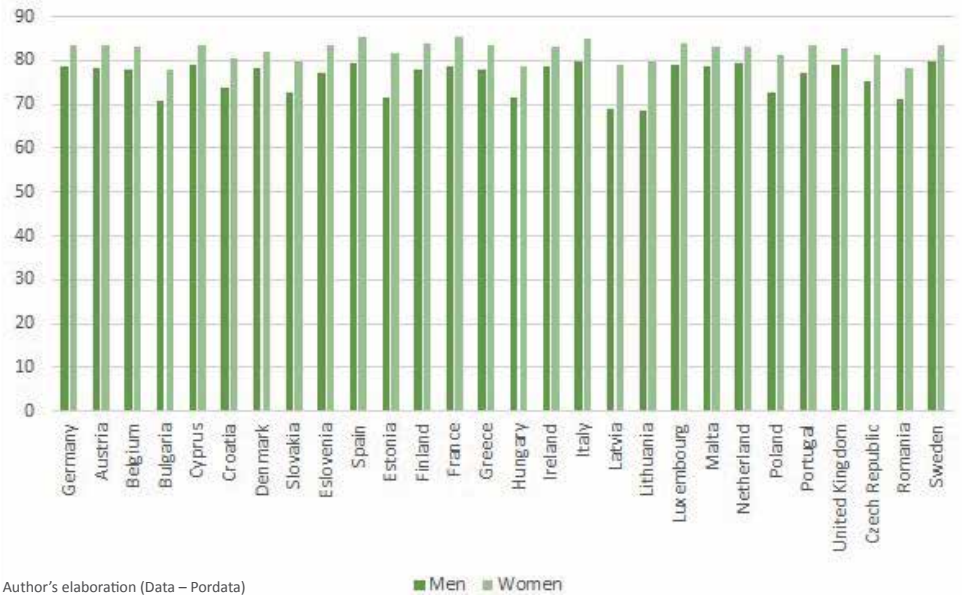
[3] As women's average life expectancy is higher than men's, there is a greater representation of women in the older age groups. In Portugal, it is expected that for individuals aged 75 and over, there are at least three women for every five individuals (Rose and Cheetahs 2010, p. 20).

Figure 6.3
Healthy years of life at the age of 65 MF in Europe (2012)



Source: Author's elaboration (Data – Pordata

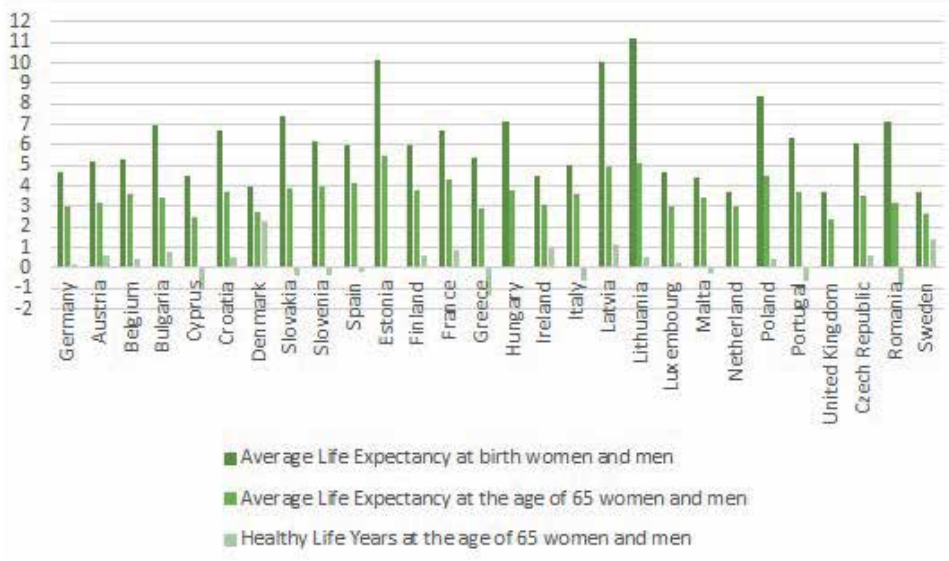
Figure 6.4
Life expectancy at birth for men and women in Europe (2012)



Source: Author's elaboration (Data – Pordata)

Figure 6.5

Variation in expected years of life for women and men[4] (2012)



Source: Author's elaboration (Data – Pordata)

European average. This harmony and behavioural alignment with Europe runs out during the analysis of healthy years at the age of 65, where Portugal has a negative gender range, of 0.6 years. Thus, indicating that, in 2012, the years of healthy life for 65-year old men was higher than for women (6.6 years for men and 6.0 for women).

Ageing Ratio

Given the increase in the average life expectancy, we realise that, the European population aged[5] in recent decades, i.e., there is a rising number of older people across Europe.

The Portuguese ageing ratio reveals a continuous and significant growth. In 1970, for every 100 young people there were around 34 elderly (32.9). Four decades later, in 2012, the ageing ratio increased to 129.4 (for each 100 young people there were 129 elderly), a value 3.9 times higher than in 1970[6].

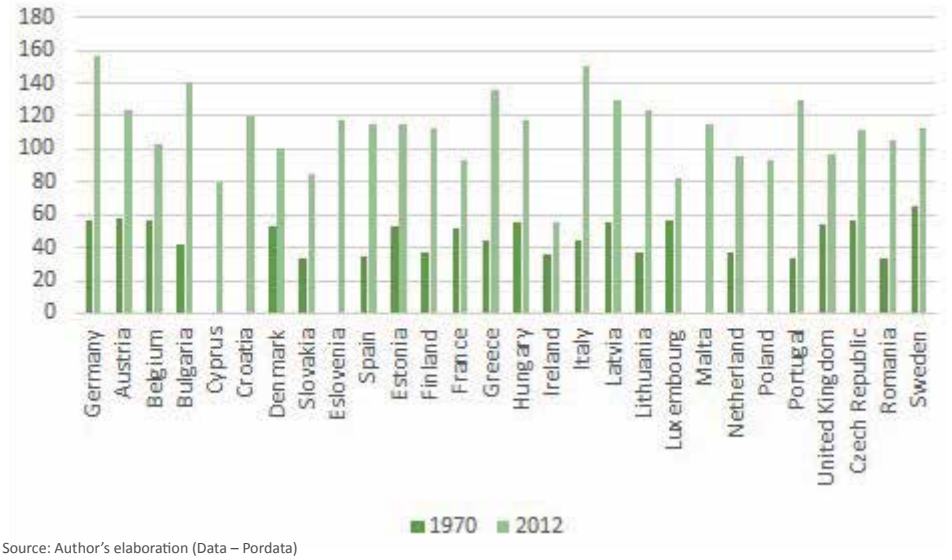
[4] Expected years of life for women minus the expected years of life for men.

[5] Individual ageing, associated with an increase in average life expectancy, but also collective (demographic) ageing, associated with a higher percentage of the elderly population in European societies (Rose, 2012, p. 21-22). Unlike the first, which is desirable, the latter jeopardizes the renewal of generations, creates barriers to productivity indicators and threatens the sustainability of the current European welfare state model.

[6] Ageing does not happen just at the top of the age pyramid. The contraction in total fertility rate (it decreased from 3.01 in 1970 to 1.28 in 2012, one of the lowest among European countries) indicates that there are fewer young people, i.e. there is also a phenomenon of ageing on the base of the pyramid.

The ageing phenomenon is obviously not restricted to Portugal[7]. It is transversely felt in all European countries. In 1970, Portugal was one of the countries that registered a lower ageing ratio (32.9) when compared with those registered in countries such as Sweden (65.6), Austria (57.8), Belgium (56.8) or Germany (56.7). In the last four decades, these values increased significantly in all countries. In Portugal, the ageing ratio almost quadrupled, presenting in 2012 a value close to 130 - the sixth highest in Europe and well above the UE28 average (111.3). Smaller increases were observed in countries with a larger capacity to attract immigrants, the case of Luxembourg (1.4) and Ireland (1.6).

Figure 6.6
Ageing ratio in Europe (1970 and 2012)



Source: Author's elaboration (Data – Pordata)

Some European societies have experienced in recent years a change in different societal factors: there was a downward revision of the economic growth and both the social and political context underwent major modifications (Silva, 2013, p. 35). Thus, demographic projections acquired a new and greater relevance. The current context, with the several restrictions imposed by the TROIKA, poses enormous challenges to the welfare state model, as we

[7] Ehe ageing of the Portuguese population is based on historical territorial dualisms, coastal versus interior and urban versus rural. In Portugal, these territorial disparities, of demographic and socio-economic nature, are relevant and should be considered within the political decision making process, whether in healthcare or any other societal area.

know it. In turn, health expenditure becomes a relevant issue, particularly given the budget restrictions which aim to consolidate public finances. Instead of perceiving the phenomenon of demographic ageing only as a negative phenomenon, which impacts the social security system, health, the labour market, productivity levels and commitment to the renewal of generations, it is also possible to equate the opportunities that arise from it. The elderly population, known as population aged 65 and over[8], is increasingly educated, and could play an active and important role in society: in the transmission of cultural heritage, in the creation of new jobs and new products targeted to the specific needs of this group, in fostering diverse areas of community service and social network support and in the promotion of family dynamics, education and socialisation. There is inevitably an economic and social value associated with this elderly population, which should be explored by local and national agents and policy-makers.

6.2 Mortality indicators

The health status of a population is a key factor to analyse health expenditure and to monitor health as an economic vector and as a constraint of the productivity levels of the population. It is essential to invest on prevention and health education. In the long-run, the money invested today can represent a better and higher saving, preferable to the costs of treating the diseases that can potentially arise due to less healthy behaviours and habits of the Portuguese population.

Infant Mortality

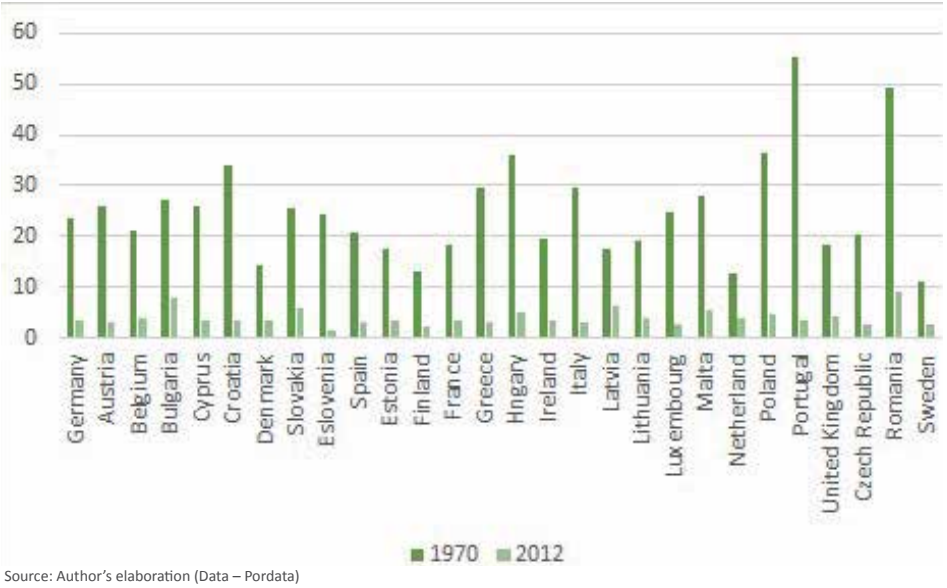
The reduction/stabilisation of mortality in Europe, associated with increased average life expectancy of Europeans, allows us to state that, in one way, Europeans, particularly the Portuguese, benefited from an increase on its levels of health and well-being over the past four decades. These results should be maintained in the future; even taking into account that there will be a greater number of elderly[9] and the levels of morbidity and prevalence of chronic diseases should undergo considerable increases.

[8] The population group 65 + is an extremely heterogeneous group. It makes sense to equate it in subgroups or, alternatively, consider a fourth group for the population aged 80 years and over.

[9] T The existence of a greater number of elderly people (mainly aged 80 or more years old) in the total population brings more pressure to the health system, because this group appears to be more susceptible to diseases and disabling conditions (Christensen, et al., 2009, p. 1197).

Between 1970 and 2012, there has been a large reduction in the infant mortality rate, which on average declined from 25.0 to 4.0, within the UE28. In 2012, Portugal had a value lower than the European average (3.4 per 1,000 live births), placing the country at the forefront of Europe. Nevertheless, in the Portuguese case, this figure is even more impressive in that it is a huge decline when compared to the figure of 1970 (55.5 per 1000 live births). Thus, Portugal has been the European country that most evolved, in this indicator, across Europe.

Figure 6.7
Infant Mortality Rate in Europe (1970 and 2012)



Source: Author's elaboration (Data – Pordata)

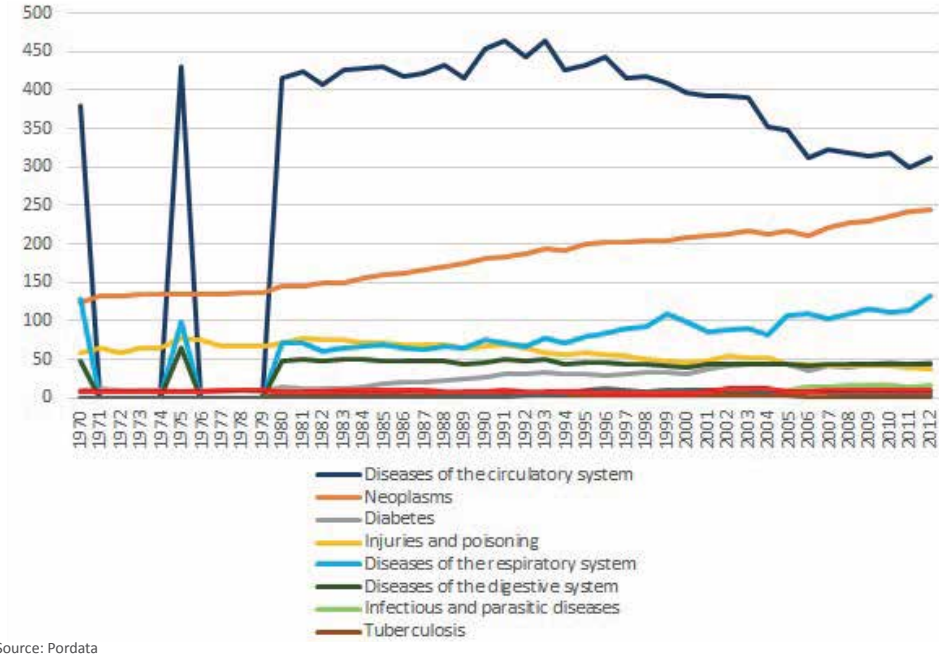
Major Causes of Mortality

In recent years we have seen a significant reduction in the number of deaths associated with diseases of the circulatory system, resulting from improved health behaviours of the Portuguese. Nevertheless, this is still the leading cause of death, followed by tumours and respiratory diseases, both clear increasing trends. In 2012, cardiovascular diseases and tumours continued to represent more than fifty percent of the causes of death.

According to information on health indicators provided by the Organization for Economic Cooperation and Development (OECD, 2013, pp. 28-35) there is, overall, a similar behaviour on the hierarchy of the leading causes of death in most European countries. At the top of the list we find circulatory diseases and tumours.

Figure 6.8

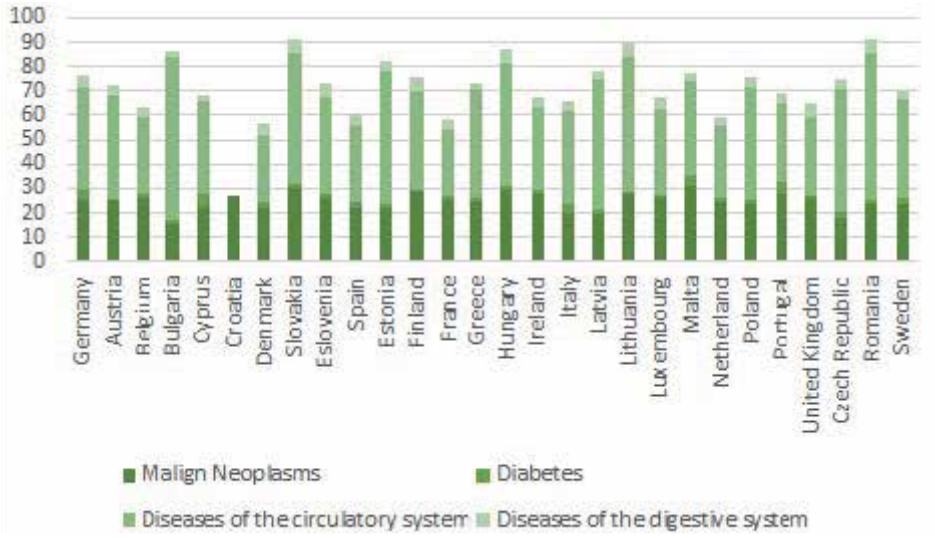
Deaths from certain causes of death per 100 thousand inhabitants in Portugal (1980-2012)[10]



Source: Pordata

Figure 6.9

Deaths from certain causes of death as a percentage of all deaths in Europe (2009)[11]



Source: Author's elaboration (Data – Pordata)

It is important to understand the health profile of the population when drafting structural reforms in this area. Nevertheless, it should be taken into account that this profile is dynamic and that the characteristics of the population today are not identical to the characteristics of tomorrow's population. It will be important to invest in prevention and understand that there will be more elderly population in the future[12]. Still, those will not have the same characteristics of today's generation of elderly people. As such, the current answers will be ineffective in responding to the problems the future will bring.

6.3 Indicators of Health and Ageing Expenditure

While demographic change occurred, with the uniformity of fertility and mortality patterns within the European scenario and the growing dependence on migration, the Portuguese welfare state was established. In fact, the similarity of the Portuguese socio-demographic reality to the other European countries was due to the implementation of various social policies on education, health and social protection, for example. That is, the creation and evolution of the Portuguese welfare state occurred based on the three pillars of the European social contract: individual enhancement (Education), protection in active life (Health) and protection in inactive lifestyle (Social Security). This restructuring of the State's model in force in Portugal, also led to a gradual redefinition of the public expenditure profile.

Therefore, we witness a change in the demographic structures, as a result of an increase in ageing. It arises new challenges for society. As noted above, it affects mostly the healthcare system, due to the increasing ageing of clients seeking their services and also due to the ageing of professionals who provide and coordinate these services.

[10] There are lots of series breaks when extending the period of study to the seventies, with a lot of information unavailable. Thus, we decided to consider only the period since 1980, for which there already are, continuous data available. In the '70s, the information was available for every five years. There are annual figures only regarding tumors, diabetes, injuries and poisonings and suicide. It should also be noted that in the case of AIDS, the first records appear only at the end of the eighties, with the systemic appearance of the disease in the Portuguese society.

[11] We consider the year 2009 as it is the one that allows us to collect a larger number of information for the vast majority of countries. Nevertheless, there are no figures for diabetes in Austria and in Croatia there is only information available on malignancies.

[12] The perception of the health status of the elderly tends to worsen with age, i.e. when age increases individuals tend to perceive their health more negatively

Public Expenditure on Health

Although there are no clear answers neither in shaping the organisation of a health system, nor in how it articulates the protection that relies on private insurance and that arises from a national health service (Barros, 2013, p. 18), any kind of restructuring in Portugal must go by the National Health Service (SNS). Although the Portuguese health system does not exhaust itself in the SNS, it is a structural element of it.

The SNS funding comes mainly from direct transfers from the State's Budget (OE[13]) and, to a lesser extent, from its own revenues, "deriving from the sale of services to other entities, such as insurers or health subsystems, and the charging of user fees[14] in some of their services"[15] (Barros, 2013, p 13.). However, those fees are insufficient to cover the costs faced by the SNS, as detailed in the previous chapter.

The increase in health expenditure turns out to be widely linked to a changing profile of public spending and strengthening of the Portuguese State's social functions. In opposition to a decrease in funds allocated to the functions of sovereignty, due to the implementation of various policies in the areas of health, education and social protection[16]. It was also due to this enhancement of health policies that the need to create a state entity to coordinate and manage the health of the Portuguese arose. Hence, the creation of the SNS in 1979. From that moment on, we witness a continuing rise in health expenditure[17] and a greater weight of the health budget in successive budgetary outcomes. Thus, healthcare is currently the second function with greater weight in the state's budget.

[13] OE (Orçamento de Estado) is the Portuguese acronym for the State Budget

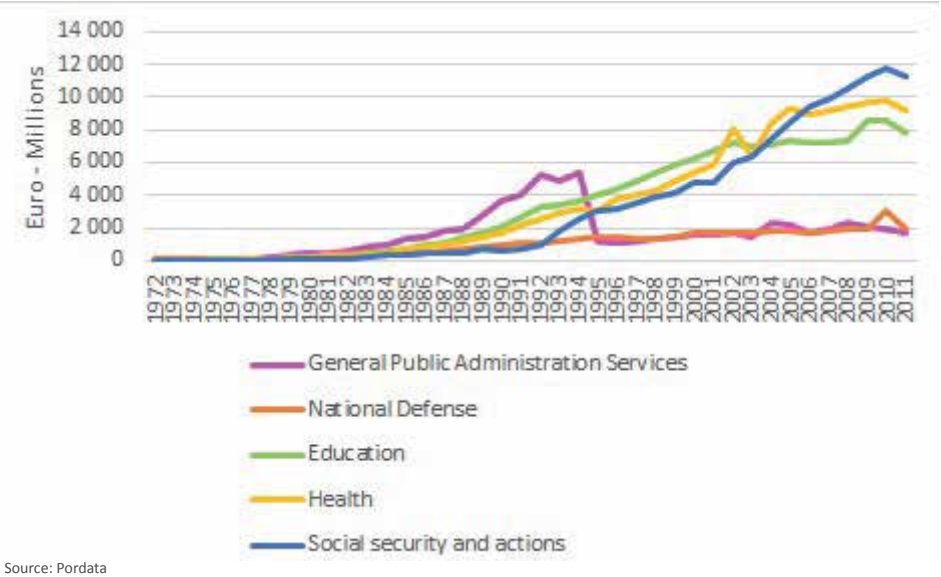
[14] The recent increase in user fees has a residual impact on the SNS revenue. Those fees aim to control the demand, i.e., its main goal is to reduce the number of users who use health institutions, and not to add significant funding to the SNS.

[15] In the original: "resultantes da venda de serviços a outras entidades, como seguradoras ou subsistemas de saúde, e da cobrança de taxas moderadoras em algumas utilizações dos seus serviços".

[16] Since the early seventies until the end of the first decade of the twenty-first century, we can assess the evolution of the state's costs with sovereign functions and social functions, and it is clear that the latter suffered a substantial increase over nearly four decades and that this increase was largely due to the implementation of the welfare state. Instead, the cost of sovereign functions are now well below the spending on social functions, a reality that resembles that observed in most European countries (Rose and Cheetahs, 2008, p. 26).

[17] The first measures adopted by the Portuguese governments were in the field of education and only later were there considerable increases in health expenditure, those initially occurred mainly at the level of primary care, maternal and child health and the construction of new equipment and infrastructure (Barros, 2013, p. 27).

Figure 6.10
Government Expenditure: Budget execution by some functions (1972-2011)



Source: Pordata

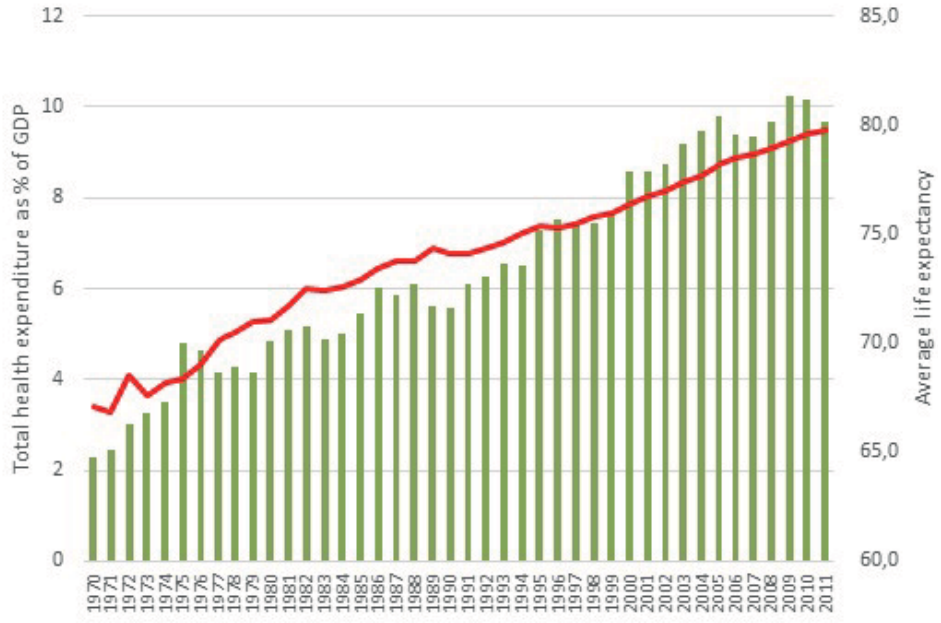
The use of health services cannot be indifferent to the phenomenon of ageing, as the elderly population is, in general, the one that requires more healthcare, mainly primary healthcare (Estevens and León, 2012, p. 261). Health expenditure tends to increase with the age of individuals, especially between the ages of 55 and over for males, and 60 and over for women. Naturally coinciding with periods of increased morbidity in older ages. There are other periods when the demand for healthcare is also particularly high: at very young ages and during the years of motherhood for women (European Commission 2012, p 160.). However, in the future, in general terms and for the vast majority of the European countries, it will be necessary to adapt the provision of healthcare to a 'new' search profile centred on the management of chronic diseases and other physical and psychological conditions associated with older ages, in which paediatric and maternal healthcare will lose relative importance.

Health expenditure as a percentage of GDP

Thus, while the Portuguese society ages, we witness a substantial increase in health expenditure. In 1970, total health expenditure, public and private, accounted for only 2.3% of the GDP. Four decades later, in 2011, the amount spent on healthcare corresponded to 9.7% of the GDP, which represents an increase of 7.4 percent. The economic and financial crisis in the

end of the last decade mitigated this rising trend of health expenditure as a percentage of the GDP, which had its peak in 2009, with a figure above 10.2% of the GDP.

Figure 6.11
Total health expenditure as a percentage of GDP and average life expectancy (1970-2011)



Source: Author's elaboration (Data- OECD)

Was the evolution of expenditure, in the Portuguese case, different from the evolution registered in other European countries? First, it should be noted that it is very difficult to make comparisons with health systems that are, in their genesis, slightly or very different. Still, it is possible to assess the percentage of gross domestic product (GDP) absorbed by the health sector, as well as relating these values with the percentage of the elderly population in the total population. When analysing the table below, we realise that all countries have increased health expenditure, which is not surprising given that spending on health followed a whole model of socioeconomic development that European societies began to experience from the second half of the twentieth century on. Overall, in 2011, the range of variation between the two variables occurred between five and ten percent. However, there are some exceptions: the Netherlands and Ireland, with figures well below and Estonia, Greece and Italy, with values above ten percent.

Table 6.1

Total health expenditure as a percentage of the GDP and population ageing (1972-2011)

		1972	1977	1982
Austria	Total healthcare expenditure as percentage of GDP	4,81	6,75	6,06
	Proportion of population aged 65 and over	14,34	15,20	14,75
Belgium	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	13,61	14,05	14,09
Czech Republic	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	12,53	13,38	12,66
Denmark	Total healthcare expenditure as percentage of GDP	..	..	8,84
	Proportion of population aged 65 and over	12,68	13,84	14,68
Estonia	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	11,95	12,46	11,98
Finland	Total healthcare expenditure as percentage of GDP	5,45	6,27	6,21
	Proportion of population aged 65 and over	9,70	11,25	12,24
France	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	13,09	13,71	13,31
Germany	Total healthcare expenditure as percentage of GDP	6,51	7,97	8,23
	Proportion of population aged 65 and over	13,63	15,02	15,04
Greece	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	11,40	12,66	13,25
Hungary	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	11,94	12,99	12,76
Ireland	Total healthcare expenditure as percentage of GDP	6,00	6,25	7,08
	Proportion of population aged 65 and over	11,04	10,82	10,63
Italy	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	..	11,74	13,13
Luxembourg	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	12,84	13,38	13,38
Netherlands	Total healthcare expenditure as percentage of GDP	6,03	6,68	7,37
	Proportion of population aged 65 and over	10,37	11,06	11,73
Poland	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	8,77	9,91	9,77
Portugal	Total healthcare expenditure as percentage of GDP	3,03	4,14	5,15
	Proportion of population aged 65 and over	9,70	10,67	11,59
Slovakia	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	9,44	10,28	9,87
Slovenia	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	10,10	11,06	10,70
Spain	Total healthcare expenditure as percentage of GDP	3,88	5,05	5,34
	Proportion of population aged 65 and over	9,93	10,93	11,48
Sweden	Total healthcare expenditure as percentage of GDP	..	..	..
	Proportion of population aged 65 and over	14,21	15,61	16,65
United Kingdom	Total healthcare expenditure as percentage of GDP	4,28	4,97	5,37
	Proportion of population aged 65 and over	13,43	14,42	15,06

Source: Author's elaboration (Data- OECD)

When relating Health expenditure with the scenario of an ageing population in each country, we cannot ascertain a clear relationship between the variables: there are countries with lower levels of ageing, spending more than countries with higher levels of ageing. Again, given the different architectures presented by health systems in European countries, it is difficult to draw meaningful conclusions from this finding.

6.4 Will ageing be a key determinant of health expenditure?

There is no consensus in literature on the influence of ageing on health expenditure. Nevertheless, it seems relatively safe to assume that the health status of a population is a dimension central for the definition of health systems' expenses in order to meet the needs of their populations[18].

At the end of the last century, the 'red herring' thesis deserved a special attention (Zweifel, et al., 1999). Briefly, this thesis is based on an econometric study that calls into question the impact of the age factor on health expenses. Age increase, while an isolated variable, does not necessarily represent an increase in healthcare costs, because the large increase of this variable was associated with a particularly high use of healthcare services, on average, two years prior to the death of the individual (Zweifel, et al., 2004, pp. 653-654), regardless of the age. Other studies reinforce the idea that the period before death has a much higher statistical impact on health expenses than the age factor itself (Lubitz and Reiley, 1993; Hogan, et al., 2001; Shang and Goldman, 2007). This approach is also advocated by Pedro Pita Barros (2013, p. 33), one of the leading experts in health economics for the Portuguese case.

Regarding health expenditure, many questions arise in evaluating the impact of the population structure and the phenomenon of ageing and its importance in regard to other factors. The available literature (Martin, et al., 2011; European Commission, 2012; Martins and Maisonneuve, 2006) identifies health expenditure as a determinant of growth, along with the structure of the population, (national and individual) income and economic growth; health status of the population; technological progress, innovation and changes in medical procedures; the intensity of human resources; and, finally, the characteristics of health systems, the level of provision and financing mechanisms of health services to the population. That is, the variable of population ageing, when analysed as an explanatory variable, may have a smaller impact than

[18] The role of education in health has been increasingly studied, since it is understood that education can contribute to a reduction of expense. Knowing that the process of population ageing is global and not reversible, an increase in the population's educational levels rises the chances of a healthier life in the age group of 65 and more..

Table 6.2
Factors of health expenditure - summary

Factor	Area	Impacte
Population structure	Demographic	Existence of more individuals with older ages creates greater pressure on health services, leading to more spending.
Health status of the population	Health	Increase in the number of individuals with disabling chronic or psychological diseases may involve more costs.
Costs associated with death	Health	The large consumption of healthcare seems to happen the two years before the individual's death.
Individual income	Socio-economic	With the improvement of living conditions people do not consider health as a luxury good and make a greater use of health services.
Technology	Socio-economic	Technological development may represent a long-term saving. However, for the moment, the development of new devices and treatments cause an increase in costs.
Market	Socio-economic	The way the economy behaves as a whole will have implications in healthcare (wages, investments or on the price of pharmaceuticals, for example).
Public policies and institutional framework	Politics	Governmental options and the management of the SNS may affect access to health and the quality of the healthcare provided, and may therefore constrain health spending.

Source: Author's elaboration (Information - Przywara and Costello, 2008, pp. 421-424)

expected on increased on health expenditure (Barros, 2013, p. 31).

However, we cannot disregard the importance of the effect associated with a real increase in the average life expectancy in Portugal, in recent decades, the result of the Portuguese process of demographic transition. Assuming that larger health expenditure takes place in the period preceding the death of the user and knowing that most of the deaths occurred in the age

group of individuals aged 65 and over, we cannot neglect the importance of increasing average life expectancy. Thus, deaths that previously happened in the age group between 15 and 64 years, now take place in the next age group. Therefore, expenditure which previously occurred in the age group of individuals between the ages of 15 and 64, started to occur in the age group of individuals aged 65 and over. Thus, there has been a transfer of expenditures between age groups, but it does not constitute a real increase on health expenditure in the most advanced age group. Hence, the increase in total healthcare expenditure associated with an increased ageing population may not be as high as is commonly referenced (Barros, 2013, p. 32).

If we assume that the costs of ageing are much lower than the costs associated with the proximity of death, the effective expenditure growth along with the existence of higher levels of ageing in the Portuguese society, will correspond to "expenses that refer only to the last additional years of life excluding the last two years of the count (on average)"[19] (Barros, 2013, p. 33). So, the increase in the average life expectancy has meant that people had their peak demand on healthcare in higher ages. The 'red herring' thesis seems to apply to the Portuguese reality. However, it is necessary to carry out a more exhaustive statistical study in order to quantify the impact of various factors on health expenditure.

Conclusions

The evidence suggested in the literature does not support the idea that the ageing phenomenon is largely responsible for the increase in health expenditure and, consequently, driver of technological innovation and more relevant incomes. Yet, that does not mean that there are no effects of ageing on health. It is inevitable that in an ageing society, there is a greater demand for support[20], services, professionals or medicines. This corresponds to the increased pressure that falls within the health system, particularly in the National Health System. The development model itself has changed and there is a population with new health needs. Research and innovation have focused on finding answers to these new requirements associated with elderly population. Many of these new technologies are expensive and represent an additional effort for public health budgets. Thus, population ageing implies, indirectly, higher costs. Claiming that population ageing is not the main driver of increased health expenditure is not to deny its importance and its

[19] In the original: "apenas às despesas tidas nos últimos anos de vida adicionais, excluindo os dois últimos anos de vida da contagem (em média)".
[20] Especially in terms of continued care.

indirect effects, rather it means to consider that there are macro factors of socio-economic dimension more relevant to the control of health expenditure (Medeiros and Schwierz, 2013, p. 2).

According to the statistical studies developed in countries with health systems and contextual framework's relatively similar to the Portuguese, it seems more relevant to the Portuguese reality to contemplate the impact of health expenditure in the period preceding the death than age itself. The latter seems to have a very low expression when considering the first (Breyer, et al., 2010, p. 676).

On the other hand, changes in the educational profile of the population, particularly the rising levels of education of the elderly population, may have an impact on health expenditure. Yet, it is not believable that it may be one of the major drivers of health expenditure. These changes may undergo a reduction in the consumption of healthcare and ultimately a more efficient management of the health-disease binomial. This change, along with new technology resources now available to the Portuguese population, can bring a more dynamic, flexible healthcare system, and potentially with lower costs. But it will hardly be a key variable in the management of national health expenditure.

Any restructuring of the health services should take into account, besides the educational profile of the population, the dual character of the Portuguese territory. Public policies should be flexible in order to adapt to the real scenario and to a closer level of intermediate management of the population that will benefit from these services or equipment. Only with this kind of dynamic and multi-sectorial responses can we tackle the problems of the future, which have increasingly a multidimensional profile.

Changes in countries' demographic structures, specifically, the phenomenon of population ageing and its economic and social consequences have been the subject of intense research and study by the scientific and academic community. The analysis of the effects of ageing is crucial in the development of policies related to the areas of health, education, employment and social security systems. While it is true that recent population demographic fluctuations imply changes, it is necessary to ensure that these changes will be able to continue to offer good quality of life for the older without mortgageing the future of younger generations. Intergenerational solidarity was never as important as it is today.

7. Final Remarks: Portugal 2030. Political priorities in health.

Filipa de Castro Henriques, Gabriela Machado, Carla Leão

In this final chapter we intend to integrate the various themes discussed in the previous chapters, give them a common direction, offering an integrated view on the link between ageing and health. At a second level, more ambitious, we would like, in this chapter, to provide to decision and policy-makers priority tools for facilitate decision making.

Priority setting is common in models of business management and they are highly needed in times of resource scarcity. The current situation is one of 'crisis' reflecting a period characterised by scarcity of resources namely, financial, economic, social, cultural and perhaps even of identity, sharpening the need to act and manage each of them in a more efficient, more intelligent and also in a more demanding way

We must acknowledge all choices that are offered, systematise them and build alternative models in order to take the right decision(s). This systematisation of 'choices' must be the result not only of a clear knowledge of history, but also a thorough knowledge of the structure and stability of the present reality, so that by anticipating future possibilities we may be able to walk the likely path that follows.

In this final chapter we decided to offer the reader the most positive aspects and opportunities suggested by each of the vectors thoroughly described in the earlier chapters of this book. From population dynamics (Chapter 2) we got the historical background of age structures, getting to know the population. Thus we realise that Portugal is living a double ageing phase. But how did we get to this point? What is the origin of the phenomenon? To answer these questions, we had the chance to analyse the evolution of health policies (Chapter 1), how they influenced demographic and health indicators and also how will they influence the future. For a more accurate forecast of these evolutionary trends we used education as a predictor of the health status of the population (Chapters 3 and 4). This decision is, as we have proved, shielded in previous research undertaken in other countries, but which had never been studied in the Portuguese case. Based on projections of the likely evolution of the Portuguese population, we measured (Chapters 5 and 6) the impact of the forecasted changes in terms of population profiles of the residents in Portugal in national finances. What weight can a decrease in birth and an increase in life expectancy have in national accounts? What costs to expect and what political answers will be the most appropriate?

7.1 Methodological options

To support priority setting in health policies and an integrated view of the various areas we adapted the PEST model, acronym for 'Political, Economic,

Social, Technological'. This is an analytical model analysis usually applied to business science for developing marketing plans and business[1]. PEST provides templates that succinctly encourage proactive thinking and allow us to analyse the external environment, with special focus on the future and the evolution of a certain reality or universe. This initial approach has been expanded and gave rise to a kind of comprehensive analysis, with a more developed facet, which was named PESTEL (adding the Environmental and Legal spheres) and later STEEPLED (Social, Technological, Economic, Environmental, Political, Legal, Ethical, Demographic and Regulatory). Adapting the original model to the reality under examination, the health sector, we changed the areas of Environment for Education and the Regulatory / Legal for Political.

To make a robust PEST analysis and ensure greater scope and consistency to the findings of the exercise, a consultation with a panel of experts on the subject in question, which should be as wide as possible, can be included. Reconciling these two features is something that we aim to achieve.

The PEST analysis should follow the following steps:

a) Identification of what is called the 'business' in the original model. In this case we chose for the identification of our purpose, i.e. the prioritisation of health policies;
b) In a second step, gathering of information from all factors under consideration, which are shown in Figure 7.1, and;
c) Finally, identification of the factors that may represent future opportunities and threats. In terms of the period of analysis the year 2031 was defined as the maximum limit of the future.

Figure 7.1
Adaptation of the PEST Model to the research

Source: Author's elaboration

[1] http://www.strategicmanagementinsight.com/tools/pest-pestel-analysis.html

7.2 The PEST Model as a tool for prioritisation of health policies

7.2.1 Demography: impact of ageing

Portugal is currently the sixth most aged country in the world (Population Reference Bureau, 2013). One in five Portuguese has over sixty-five years. In forty years, the senior population doubled and the young population reduced to half. As a result of these changes, Portugal had to rapidly adjust to an ageing society, not only by the increase in life expectancy, but mainly by the lack of births. Indeed, today the Portuguese live on average more fourteen years than in 1970, but each woman has on average half of the children than forty years ago. In this context, how can a society founded on a pay-as-you-go system, heavily dependent on economically active population structures, or rather on net contributors to support a welfare state, sustain? (**Figure 7.2**).

Figure 7.2
Adaptation of the PEST Model to the research

		Past	Present	Future		Oportunities	Ameaças
		1970/71	2010/11	2030*	2031**		
DEMOGRAPHY	**Population**						
	Residents in Portugal at the time of the Census	8,611,125	10,562,178	9,961,314	10,265,109		Loss of population
	Mortality						
	Average life expectancy at birth - Men	64	76.7	80		Challenge	Challenge
	Average life expectancy at birth - Women	70.3	82.6	86		Challenge	Challenge
	Crude Mortality Rate	10.72	9.96	16.1			
	Infant Mortality Rate	55.49	2.59				
	Birth and Fertility						
	Crude Birth Rate	20.8	9.2	8.2		Challenge	Challenge
	Total Fertility Rate	3	1.37	1.6		Challenge	
	Age of women at 1st child	24.3	28.9				
	General Fertility Rate	84.6	40				
	Migrations						
	Total Growth Rate (1970/91 and 2001/11)	1.33%	0.199%				
	Natural Growth Rate	0.87%	0.018%				
	Migration Growth Rate	0.46%	0.180%				
	Ageing						
	%<15	28.47%	14.89%	13%	14%		Difficulty
	%65+	9.90%	19.0%	27%	22%	Challenge	Challenge
	Youth Ratio	287.54	83.2		64.7		Difficulty
	Ageing Ratio	33.9	120.1	210.6	154.5		Difficulty
	Renewal of Working Age Population Ratio	142.4	103.2		70.9		Difficulty
	Youth Dependency Ratio	46.23	22.7	20.9	21.8		Difficulty
	Elderly Dependency Ratio	15.66	27.2	43.9	33.7		Difficulty
	Total Dependence Ratio	61.9	49.9	64.8	55.6		Difficulty

Source: Author's elaboration

It was also in these forty years of intensification of the so-called 'double ageing'[2] that citizens' participation in society grew and there was an increase in the secularisation of society. The latter is reflected, on the one hand, by an increase in non-Catholic marriages, which in 1970 represented thirteen in each one hundred marriages and today two out of three. On the other hand, it also explains the increase in divorce that in the same time period was less than one divorce for every hundred weddings and today represents seventy-four for every one hundred.

Today we already talk about a 'triple ageing'. This third phenomenon refers to the ageing of the average age of the population. Indeed, the average age of the Portuguese population is 42 years, an increase of thirteen years, compared with an average age of 29 years in 1970.

But how will this trend evolve? In the scenarios presented in this book and also confirmed by similar exercises (Mendes and Rosa , 2012), researchers point to a decrease in the population resident in the national territory. We identify this factor as a potential threat. We believe that the loss of quantitative population may have a negative impact on economic development, with consequences on employment and the national productive fabric. This negative effect is enhanced by the pressure exercised by the older group, at the contributory level and with regard to the investment options of public policies (for example in the promotion of child or geriatric health, day care or nursery homes...) on the younger population (which will be the next active population). It is estimated that in twenty years, for each one hundred youngsters there are two hundred elderly. We should not forget that in 1970 there were thirty-three elderly per one hundred youngsters!

There is a high probability of this scenario to take place[3]. Therefore, society and economic structures should be prepared to this reality and adapt the model of state intended in the future. In face of this population decline and deterioration of ageing, civil society should question itself on what kind of state model they want, what kind of funding, with what weight, and which areas to prioritise. We can only take as certain that the state as we know so far is unfit to the future reality that lies ahead!

7.2.2 Education: as a predictor of health

The theme of education arises to bridge the gap between the future trend of increasing life expectancy and the quality of that extra life. Several authors and researchers, as Caldwell in the *Education and literacy as factors in health* (1985) share the view that education is a key factor that can positively influence health. Thus, we analysed the evolution of education in the various cohorts of the population throughout the twentieth century and the first decade of twenty-first (**Figure 7.3**).

At the European level, Portugal continues to have a very low level of education, with a high percentage of the population with fifteen and over who does not have any schooling (about 10 percent) or, those who have, do not exceed six

[2] See Chapter 1 and its references for further clarification on this issue.
[3] See chapters 3 and 4, and the references given there for further clarification on this issue.

Figure 7.3
Analysis of the impact of the variable Education

		Past 1970/71	Present 2010/11	Future 2031	Oportunities	Threats
EDUCATION	**Portugal Total**					
	Illiteracy rate %	25.7	5.2		Continuous trend ↘	
	Actual schooling rate %					
	Pre-school Education %	2.4%	83.9		Continuous trend ↗	
	Basic Education First Cycle %	84.3	100			
	Basic Education Second Cycle %	22.2	93.8			
	Basic Education Third Cycle %	14.4	89.5			
	Secondary Education %	3.8	71.4		Continuous trend ↗	
	Life-long learning % (1998 and 2009)	*3.1*	*6.5*		Continuous trend ↗	
	No. of enrolled and graduated from High Education (1995/6)					
	No. of enrolled	81	132		Continuous trend ↗	
	No. of graduated from High Education	39	87		Continuous trend ↗	
	By Regions					
	North					
	Population with 65+		16.1%	22.3%		Continuous trend ↗
	Population with 65+ and NS/2nd Cycle BE		89.5%	67.9%		Continuous trend ↗
	Lisbon					
	Population with High Edu.		16,0%	23.5%	Continuous trend ↗	
	Population with 65+ with High Education		8.1%	20.1%	Continuous trend ↗	
	Alentejo					
	Population with 65+		23.1%	22.1%		
	High Education		8.9%	16.1%		
	Population with 65+ and NS/2nd Cycle BE		92.7%	60.3%		
	Algarve					
	Population 0-14		15.8%	15.9%	Continuous trend ↗	
	Population with 65+ with High Education		4.1%	11.8%		
	R.A.A.					
	Population 0-14		18.3%	15.6%		
	Population with NS/2nd Cycle BE		64.6%	51.6%		Region with lower %
	Population with High Edu.		8.1%	13.2%		Region with lower %
	R.A.M.					
	Female Population		52.7%	52.4%		Region with greater inequali
	Population 15-64		69.8%	69.5%		Youngest region

Source: Author's elaboration

years of schooling (about 43 percent). However, the population that cannot read or write is restricted almost exclusively to residents over 65 years (73 percent), which allows us to face the future with some optimism. This optimism is also reflected in the levels of tertiary attainment. Recent years have been truly amazing. According to reports from the OECD (2012), in 1998, only 8 per hundred of the Portuguese aged between 25 and 64 years had completed a tertiary degree. Twelve years later that percentage had doubled (to 15 percent), representing an average annual growth rate of 5.6 percent, above the average of OECD countries.

However, despite this improvement, Portugal remains on the bottom of the table exe quo with Italy. Only Turkey is below (with 13 percent). If on the one hand this indicator reveals an embarrassing scenario when compared, it is certain that in the future we have considerable potential for growth. This factor is very important in this analysis because when valued as a predictor of health[4] it presents a potential profit in the health of the elderly population, superior to its European partners, consolidating the growth theory of Solow[5].

Some international reference research (Joung, et al., 2000) proved the assumption that there is a relationship between education and health. In Portugal, researchers (Henriques and Rodrigues, 2010) have also proved this correlation to be real[6]. Thus, in Chapter 3 complex projections were made until 2031, reflecting the combination of demographics, education and health. This methodology is innovative in Portugal and provides the decision-maker with a credible and solid tool.

It is hoped that, despite the inevitable intensification of the levels of ageing of the Portuguese population's age structures, it is possible to offset the costs of the expected impact on health expenditure. As we have proved, on average, people with more education would consider themselves with better health than people with lower levels of education or even illiterate.

In this book, it was still possible to meet a Portugal by regions (NUTS II). This additional analysis is explained by the need to systematise local differences and consider the various stages of social, cultural and educational development, for a better assessment, by the reader, of potential threats and opportunities arising therefrom.

In the regional analysis, Alentejo is now the most aged region of the country. It will continue to be so in the next twenty years, along with the North. Local authorities will need to bring supply in line with demand, in healthcare and in the welfare sector. But not only. Indeed, the North Region is also one of the regions with levels of education lower than the average, which may reduce the expected benefit in terms of pressure, that we referred to in national average terms. In the Azores, the combination of being the area with (i) the highest rate of people without education or with the lowest level of education and (ii) with the lowest rate of participation in higher education, can also be seen as a potential threat and, consequently, an urgent focus for trend reversal.

---

[4] As a result of the study of various foreign authors we found that education was regarded as a reliable indicator to know the health status of a given population. Internationally renowned researchers, including Van Immhoff, Mackenbach, Cavelaars, Kunst and Joung, of different nationalities, have questioned whether education is a good predictor of a country's future health. The use of an indirect variable to estimate the health status, arises because the latter is difficult to estimate and project. Therefore, there is the need for a variable that would allow a credible and reliable estimate of the health status of the global population. See Chapter 3 for further discussion.

[5] The Solow model predicts that economies whose development level is higher, will have a lower rate of convergence, and as it approaches the steady state, the intensity of their growth will be lower. Adapting learning / education, we can say that in countries with higher completion rates in higher education, will have a lower annual growth. And this intensity of growth diminishes as they reach the optimal point. To the OECD average, the rate of completion of higher education was of 21% (1998) and 30% (2010), twice the national. Only technology can improve the parameters.

[5] The method used was the logistic regression model for binary data, and confirmed the relationship between the variables (education and health), i.e., that people with higher levels of education, compared to people with lower levels of education, presented more satisfactory results with regard to their health status.

Lisbon is the region which presents a more positive outlook and can enjoy the fact that its education levels are above the national average.

7.2.3 Health: health status

In this exercise health is associated with mortality and morbidity (Figure 7.4). In the specific case of mortality, as evidenced in Chapter 2, the process of epidemiological transition arises almost abreast with demographic transition. This phenomenon was characterised by a significant decrease in mortality levels associated with infectious diseases and gradual prevalence of 'preventable' deaths, such as those caused by failure of the circulatory system (17 percent in 1970 and 31.8 percent in 2011). Another group of causes of death that has been gradually gaining ground as a result of ageing and aggravation of less healthier life styles were malignant neoplasms (11.7 percent in 1970 and 23.5 percent in 2011).

Figure 7.4
Analysis of the impact of the variable Health

HEALTH

	Past	Present	Future	Oportunities	Threats
	1970/ 71	2010/ 11	2031**		
Portugal					
MORTALITY					
Causes of death					
Infectious and parasitic diseases	1.0%	n.d			
Diseases of the circulatory system	17.0%	31.8%			
Malignant neoplasms	11.7%	23.51%			
Diseases of the respiratory system	12.0%	11.1%			
Diseases of the digestive system	7.5%	4.3%			
Diseases of the genitourinary system	2.0%	3.08%			
Symptoms, signs and abnormal clinical and laboratory findings	15.3%	9.47%			
Disease caused by human immunodeficiency virus (HIV)	n.d	0.6%			
Tuberculosis	1.6%	0.19%			
Other causes for diseases	26.5%	11.61%			
External causes	5.5%	4.26%			
Health indicators					
Number of doctors	8 156	42 796			
Doctors per 100000 inhabitants	94	406			
Number of hospitals	634	226			
Number of Health Centres (1980)	265	388			
Number of nurses	10 000	64 478			
Number of Pharmacies	2 119	3 074			
MORBILITY					
Health status - self-perception "very bad", "bad", "reasonable"					
Men		45.3%	43.7%	Trend ↘	
Women		56.5%	56.5%	Trend ↘	
Chronic diseases					
Men		60.5%	56.7%	Trend ↘	
Women		72.1%	72.3%	Trend ↘	
Long-term disabilities					
Men		5.7%	5.5%	Trend ↘	
Women		7.7%	7.0%	Trend ↘	
Medical appointments					
Men		52.1%	52.6%		Trend ↗
Women		63.7%	62.9%		Trend ↗
Use of prescription medicine					
Men		44.2%	45.2%		Trend ↗
Women		72.9%	72.1%		
B Regions - Health status - self-perception "very bad", "bad", "reasonable"					
North					
Men		44.3%	45.1%		Trend ↗
Women		56.8%	56.3%		
Centre					
Men		53.1%	50.3%		Trend ↗
Women		63.3%	60.4%	Trend ↘	
Lisbon					
Men		41.9%	39.1%	Trend ↘	
Women		55.4%	53.2%	Trend ↘	
Alentejo					
Men		44.2%	41.9%	Trend ↘	
Women		60.3%	56.6%	Trend ↘	
Algarve					
Men		40.8%	37.5%	Trend ↘	
Women		52.8%	48.8%		Trend ↘
R.A.A.					
Men		35.5%	38.0%	Trend ↗	
Women		48.8%	51.1%	Trend ↗	
R.A.M.					
Men		42.6%	40.7%		Trend ↘
Women		55.9%	54.6%		Trend ↘

Source: Author's elaboration

On morbidity, if on one side you can go forward with reliable projections regarding the relationship between (self-declared health status) and education, regarding other health indicators the effect of schooling does not seem to be so obvious, making it more difficult for future projections of the evolution trend in these indicators. However, we did not want to leave out some references highlighted in the chapter dedicated to projections.

In a second level of results analysis, when trying to determine regional differences, it appears that there is a decrease in the risk of having one or more chronic diseases in individual's holders of higher education degrees, especially among women. Somehow, with expectable results, in the health indicator regarding the existence of medical appointments in the past three months, the results suggest that increased schooling is associated with a greater likelihood of having consulted a doctor. In fact, the higher the level of education, the greater the ability of an individual to evaluate his health and consult a healthcare professional in a preventive way, avoiding doing so already in a state of advanced, debilitating or incapacitating illness.

A better health status will be reflected in a lower need to use health services and consequently can lead to the reduction of healthcare expenditure.

The effect of increasing life expectancy and the inherent risk of increased incidence of certain chronic and incapacitating diseases can therefore be offset by the increase in the educational level of the population. Thus, if the expected longevity increase comes along with an increase in the number of years lived in good health, ageing cannot necessarily mean an increase in health costs.

7.2.4 Economy: health expenditure

With the development of the welfare state, especially after the establishment of democracy, public health expenditure increased as a result of greater state involvement in promoting the health and well-being of the population. This gradual involvement is reflected in the increase of the weight of total health expenditure in GDP, from 2.3 percent in 1972 to 9.7 percent in 2012. Nevertheless, since the year 2000, there has been a phase of stabilisation or slowdown, which was more evident after 2010. This trend of slowdown comes from the fact that the Portuguese government, grappling with the financial and economic crisis and foreign intervention, has been obliged to introduce measures to contain public spending, affecting several functions of the state, from education to defence and health, among others.

In most OECD countries, the state is considered as the main funder of

health expenditure. However, since 2000 the private financing has been acquiring its share of participation. If in 2002 private participation was 29.2 percent, currently this weight increased to 37.4 per percent. Moreover, the supply of hospitals and clinics in the private sector has increased in quantity but also in quality, causing families to change their pattern of health services consumption. Increasingly, families resort to the private sector when they get sick.

Figure 7.5

Analysis of the impact of the variable Economy

		Past		Present		Future	
						Oportunities	Threats
Economic	**Government Expenditure: Budget execution for some functions (millions of Euros)**						
	General Public Administration Services	1972	25.6	2011	1752.3		Challenge
	National defense	1972	69.2	2011	1943.6		Challenge
	Education	1972	22.3	2011	7878.5		Challenge
	Health	1972	2.8	2011	9171.7		Challenge
	Security and Social Security	1972	5.0	2011	11233.2		Challenge
	Total expenditure on health						
	In % of the GDP	1972	2.3%	2012	9.70%		Challenge
	Millions of Euros	2001	11,835.8	2011	17,507.7		
	Current expenditure on health						
	Millions of Euros			2012	15,628.1		
	Rate of change			(2012/ 2011)	-5.5%	Challenge	Challenge
	In % of the GDP			2012	9.50%		
	Current health expenditure by provider						
	Hospitals			2011	39.00%		
	Health care providers in outpatient			2011	32.00%		
	Pharmacies			2011	19.00%		
	Other private insurances			2011	10.00%		
	Rate of growth of current expenditure (% previous year)						
	Public	2001	6.00%	2012	-9.70%	Challenge	Challenge
	Private	2001	4.70%	2012	2.40%	Oportunity	
	Health Financing						
	Public (%)	2002	70.80%	2012	62.60%	Oportunity	
	Sources of funding of public administration						
	National Health Service	2000	83.40%	2012	86.20%		
	Subsystems of Public Health	2000	8.50%	2012	6.00%		
	Other units of public administration	2000	6.40%	2012	5.60%		
	Social security funds	2000	1.70%	2012	2.20%		
	Funding sources in the private sector						
	Subsystems of Private Health	2000	7.00%		5.00%		
	Other private insurances		4.00%		9.00%	Oportunity	
	Private Family Expense		86.00%		85.00%		
	Nonprofit institutions serving households		1.00%		/		
	Other companies		2.00%		1.00%		
	Current health expenditure by financing agent						
	National Health Service	2000	57.00%	2012	54.00%	Oportunity	
	Subsystems of Public Health	2000	5.90%	2012	3.70%	Oportunity	
	Other units of public administration	2000	4.40%	2012	3.50%	Oportunity	
	Social security funds	2000	1.20%	2012	1.40%		
	Subsystems of Private Health	2000	2.20%	2012	1.80%		
	Other private insurances	2000	1.40%	2012	3.20%	Oportunity	
	Private Family Expense	2000	26.30%	2012	31.70%	Oportunity	

Source: Author's elaboration

If, in the last forty years, public health investment was mostly allocated to primary healthcare, maternal and child health and to the construction of new facilities and infrastructures, the future will be very different in an increasingly ageing scenario.

Thus, in the coming decades (**Figure 7.5**), there will be greater intervention and participation of the private sector. If we add to this fact the evidence that much of the public investment in infrastructures is currently completed, the situation may give the Portuguese State an opportunity to reallocate resources, thus creating the conditions to consider its participation in different areas suiting investment to the new demographic reality. With ageing and insufficient supply of healthcare and services in the area, the State must assess the best way to invest and provide a range of healthcare to this specific population, focusing on chronic diseases, other physical and psychological pathologies and preventive medicine.

As we have seen, the increase of schooling of the Portuguese population, will allow the State to save resources, through largest pro activity in prevention, in the adoption of behaviours and healthy lifestyles. It is possible that the cost with medical appointments may increase in the future, but we believe that these will tend to be increasingly more preventive, which can mean a reduction of possible indirect prophylactic costs. As was discussed in Chapter 6, it is proven[7] that it is in the two years before death that the individual requires more healthcare, regardless of the age at which the death occurs. Thus, it is not due to increasing average life expectancy that expenditure will increase.

Another factor determinant for the decrease in health expenditure is technological progress. Indeed, it could represent savings in the future. Nevertheless, in the short and medium term it implies a substantial investment in research, innovation and new equipment, which represents an additional effort in public budgets in the health sector.

7.2.5 Social: ageing and social patterns

Some researchers have been committed to the pursuit of the determinants of health in order to systematise and organise proposals for action and preventive intervention. The social variable has been disclosed as being so or more important than biological or genetic factors. Within the social factors systematised in Chapter 4, structural factors (gender, age, education, income, occupation and marital status) were appointed; behavioural (lifestyle, such as tobacco or alcohol, physical activity or nutrition) and finally the psychosocial

[7] For a more thorough insight see Chapter 6.ther clarification on this issue.

(critical events throughout life, the experience of chronic stress or level of psychological resources, as self-esteem) were considered relevant[8] (**Figure 7.6**).

The gradual process of education of the Portuguese population allowed society as a whole to evolve and increase its awareness towards social behaviours, to parenthood, to work, health, lifestyles, cultural and family patterns.

Figure 7.6
Analysis of the impact of the Social variable

		Past 1970/71	Present 2010/11	Future: Oportunities	Future: Threats
SOCIAL	**Level of education**			General rise in educational levels of the Portuguese population.	
	elderly population			More educated elderly, improves the quality of heritage transmission, participation and promotion of societies.	
	& Lifestyle			More educated individuals more aware of healthy life habits, invest more time and resources in healthcare.	
	Family structure			Factors such as family structure, income or educational levels of parents can affect both education and health of an individual.	
	Attitudes towards life		Individuals see their economic and social contribution as a life permanent.	If the phased spirit of contribution and collection of laurels at the end of life remains.	
	Changing social expectations		European societies experience changes in societal factors. The outlook for economic growth has been revised downwards and both the social and political context underwent major modifications.		
	Generational opposition				If there are social movements that instigate "hatred" between the young and older generations.
	Sociodemographi profile	Portuguese socio-demographic approach to other European countries, regarding social policies in education, health and social protection.		Examples of good social model countries, from which Portugal seeks to learn and adapt to the Portuguese reality.	
	Changing patterns of fertility	The decline in fertility levels is part of a set of social and demographic changes characterised by the maintenance of fertility below the replacement level of generations.			Committed to the renewal of generations, society lacking young people and social disruption.
	Differences and inequality				
	social differences and inequality towards health	Inequities in Health dependent on social factors			
	of gender towards health	Gender differences towards health: mortality and morbidity.			Need to adjust this difference in society and in the SNS
	Welfare state				
	Pillars of the Welfare State	Portuguese welfare state based on the three major pillars of the European social contract: individual development (Education), protection in active life (Health) and protection in inactive lifestyle (Social Security).			
	Religion & Society & Health	Providing healthcare and assistance had its genesis in religious and corporate initiative. The "Misericórdias" were the institutions supporting population in situations of disease.	Increasingly local authorities and the central government looked at the matter as a sector deserving legislative framework and ongoing intervention.	Reveal in society the role of the third sector, as a provider of healthcare, social and economic support, etc.	The State as the sole provider.
	National Network of continuedcare			The need to adapt the services to the rapid changing demographic structure of the Portuguese population had already influenced the design of several plans that guided health policy in this period, namely the 2004-2010 National Health Plan, the National Programme for the Health of Elderly People and the National Palliative Care Program.	If the economic and financial crisis leads to blind cuts, and does not prepare the SNS to social change and changes in the health of the ageing population.

Source: Author's elaboration

[8] See Chapter 4 e its references for further clarification on this issue.

In this context, schooling will consolidate the trodden path in the future. A more educated elderly population will have a more active and relevant role in society, particularly in the prevention of diseases, increased participation in the labour market until older ages, either by traditional means or by the reinvention of new professions, in volunteering and social responsibility in the sphere of transmission of cultural heritage. Seniors will also demand that the consumer society adapts to them with new products and by offering new services targeted to their specific needs.

In this systematisation of social behaviours we still need to reinforce the importance of gender inequalities in terms of health. Women and men exhibit antagonistic behaviours in mortality and morbidity. Men die sooner, but women are sicker (with higher probability of episodes of depression, psychiatric disorders, stress and a range of chronic conditions). The inability of health facilities to adequate to these differences is seen as a future threat. It will be necessary to understand and deepen this theme to better prepare society for this adjustment, since an increase in the percentage of elderly women is predicted, which is higher than in elderly men.

With regard to psychosocial factors, some European societies and particularly the Portuguese have experienced a change in expectations on lifestyles projected for the future, which ultimately compromised the well-being and quality of life. One of its most visible effects is the increased exposure to poverty risk of the Portuguese population (INE, 2012). It is currently of 18.7 per cent, the highest since 2005. It is also accompanied by the declining poverty threshold, which now stands at 409 euros per month (compared to 416 euros in the previous year). These mismatches between expectations and reality generate social, family and personal conflicts.

Socially the population ends up being less tolerant, uncompromising, selfish and less able to accept social, political and economic failures. With the gradual ageing of the age structures, this inability to adjust may trigger serious social and generational conflicts. Policy-makers should be able to mitigate this discontent and enjoy to make structural changes in public expenditure. If, on the one hand there is greater dissatisfaction, on the other there is also a greater ability to understand changes that are effectively promoting these adjustments.

Historically, the provision of healthcare and welfare were linked to religious and corporate initiative. The 'Misericórdias' and religious institutions were responsible for providing care to the needy. With time local authorities and the central government looked at the issue as a sector worthy of legislative framework and ongoing intervention. The State now recognises the leading role of the third sector and knows that in the future must promote coo-

peration between state, religious institutions and solidarity. Social harmony will come from the ability of decision-makers to make a good connection between entities.

We believe that if governments and entrepreneurs are resilient and can recognise the points of social, generational and cultural stress, resulting from ageing, adapting the economy and the Portuguese society resulting from 'after the crisis', we can have a society in transition to a new balance. This new reality will undoubtedly be characterised by an ageing population. It is up to each of us as citizens, to make informed choices and adopt healthy lifestyles that enable this growth.

7.2.6 Political: definition of priorities in health policies

The health system, as we understand it today, is the result of the expression of policies adopted over several decades, evolving from a philosophy of individual centrality to the centrality of collective care. This knowledge of past and present is developed in Chapter 1. Thus, in this final chapter we will only highlight the framing of major legislative and policy measures in the field of health, in order to provide some guidelines for decision-makers (**Figure 7.7**). For this selection on the main orientations in health policies we support ourselves in the Delphi model, which will be presented forward.

The development of the health system was characterised by some events that came to be milestones in its evolution throughout the twentieth century, marked by profound social, political and cultural changes. Portugal enters the twentieth century with a constitutional monarchy, illustrated by the so-called 'Ricardo Jorge Reform' of 1901, focusing on public health measures that sought to protect and improve the health of the population through health check, preventing epidemics and investing in education. This lead to the creation of the School of Tropical Medicine of Lisbon.

In the First Republic, with the Constitution of 1911, the health of populations becomes a right which governments are obliged to provide. However, the model continues to be based on a charitable and religious base, with a provision essentially in terms of home care. Hence, people lived the disease and death at home and in family and hospitalisation was only for the poor and indigent. We may say that it was in the second and third decades of the twentieth century that the welfare state has its embryonic origin, with the founding of the Institute of Social Insurance Required and General Welfare. The Institute was responsible for the administration and supervision of mandatory social insurance created for illness, disability, ageing and survival of the working classes. In this period the Civil Hospitals of Lisbon and the

Figure 7.7
Analysis of the impact of the Political variable

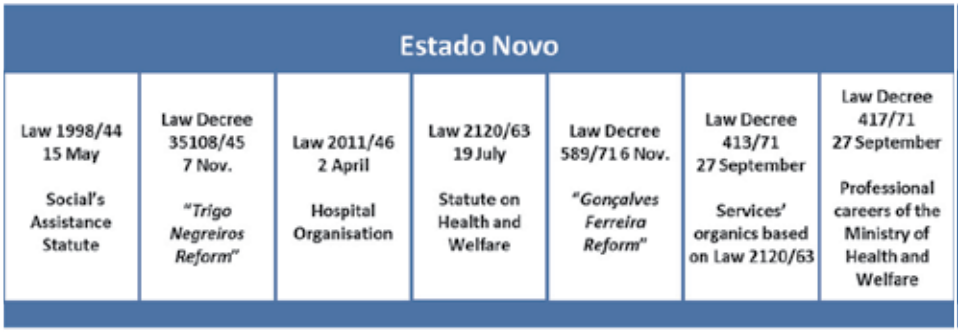
Source: Author's elaboration

Faculties of Medicine of Lisbon and Oporto were created, mandatory vaccination was implemented and Public Health starts paying special attention to the conditions and quality of water supply and sanitation.

The implementation of the 'Estado Novo' brought profound changes of doctrinal and procedural nature to the role of central government in the health of populations (**Figure 7.8**). Salazar understood that the State should not replace the institutions, distancing himself from a more active position regarding intervention. For several decades a welfare model of charitable basis continued in force, directed to the poorest, replacing in parallel a cooperative model encouraged by the state, which maintains a supervisory role and a supplementary function.

Figure 7.8

Main legislation in the Health sector (1926-1971)



Source: Author's elaboration, based on the legislation presented on Chapter 1.

This historical period is characterised at the level of healthcare policies for two moments: the 'Trigo Negreiros Reform' in 1945 and the 'Gonçalves Ferreira Reform' in 1971. The first one introduces a welfare model subdivided into palliative-curative actions, constructive and preventive, in which the state would have a guiding, cooperative and supervisory role. Therefore, several institutes were created, maintaining a private welfare basis. The hospitals built by the state were managed by private entities, particularly the 'Misericórdias' which had a prominent role in welfare. Meanwhile, the State's speech promoted corporatism, authorising the creation of Social Security Funds, which assumed the protection of its beneficiaries, without any state's involvement.

By the end of the 'Estado Novo', the 'Gonçalves Ferreira Reform' would become a milestone of healthcare, and it would later allow the creation of the National Health Service (SNS). The Decree ensures the recognition of the right of populations to access healthcare, giving the State a more inter-

ventionist role by creating Health Centres and Units. Those were proximity structures with preventive functions. However, private institutions still had the responsibility for providing healthcare.

On 25 April 1974 a big political, cultural and social shift took place and decisions in the field of Health followed these changes. The 1976 Portuguese Constitution recognises the right to health as a universal right, achieved through a universal, comprehensive and free national health system. In 1978, the publication of the 'Arnaut Order' is the first step to the creation of the National Health Service, which will take place the very next year, in 1979. This national service, based on equal rights, has its structuring pillar in primary proximity healthcare services offered to the public. Moreover, locally practiced healthcare gradually increase their coverage, moving beyond curative medicine (**Figure 7.9**).

Figure 7.9

Main legislation in the Health sector (1926-1971)

I Constitutional Gov. (1976/1978 Mário Soares)	• Decree 12/77 of 7 February • Law Decree 17/77 12 January
V Constitutional Gov. (1979/1980 Maria Lurdes Pintassilgo)	• Law 56/79 of 15 September National Health Service • Law Decree 519-02/79 of 29 December
VIII Constitutional Gov. (1981/1983 Pinto Balsemão)	• Law Decree 254/82 • Decree 97/83 of 22 April
XI Constitutional Gov. (1987/1991 Cavaco Silva)	• Law 48/90 of 24 August Law on Health
XII Constitutional Gov. (1991-1995, Cavaco Silva)	• Law Decree 11/93 of 15 January Statute of the National Health Service
XIII Constitutional Gov. (1995/1999 António Guterres)	• Law Decree 117/98 of 5 May Special Remuneration Regime
XIV Constitutional Gov. (1999-2002, António Guterres)	• Law Decree 157/99 of 10 May
XV Constitutional Gov. (2002-2004, Durão Barroso	• Law Decree 60/2003 of 1 April revogates Law Decree 157/99 and Decree 97/83
XVII Constitutional Gov. (2005-2009, José Sócrates)	•Council of Ministers Resolution 157/2005 of 12 October •Law Decree 88/2005 •Law Decree 298/2007 of 22 August •Law 31/2007 of 10 August •Law Decree 28/2008 of 22 February

Source: Author's elaboration, based on the legislation presented in Chapter 1.

This is the moment of a paradigm shift, moving from a residual government participation, where health services were centred on the private sector, to a more present state, which assumed the leading role in the direct provi-

sion of healthcare. The private sector now had an additional participation. This was the model that positively influenced health indicators of the Portuguese population.

Years later, in the '90s of the twentieth century, the approval of the Statute of the National Health Service came to regulate the Law on Health and advocate the regionalisation of service management, implemented in the creation of the Regional Health Authorities. Such structures were endowed with the competence to adapt health policy to each region. By now, the integration of primary healthcare and hospital care in Health Units was already promoted. Later theses would be designated as Local Health Units, a model adapted to the restructurings of the beginning of the 21st century.

In the late twentieth century, measures that aim to rationalise the use of resources, while maintaining the concern in the promotion of health and continued care have promoted, guided by constitutional principles. This lead to organisational and management models that sought to cluster units of providers: Local Health Systems; Local Health Units; Hospital Centres.

The previous route paves the way to the permeability of the State to the private sector, which resumes at the beginning of the 21st century with the participation of private entities in the provision of hospital care through public -private partnerships. Also noteworthy is the adoption in 2002 of a new system of hospital management. The Hospitals-company, which remains to the present day. But other models have emerged and are conquering the health sector, covering gaps that the State's services could not answer. Such as

1- the Integrated Management System for Surgery of Subscribers, which called upon the cooperation of private entities to make it possible to ensure maximum response time;

2- the National Network of Integrated Care, undertaken mostly by the private sector, in which the social sector saw a window of opportunity for its development, mainly taking over the responses of the Network;

3- Transport of non-Urgent Patients that are assumed in full by the private sector, whether by Firefighters Brigades or by companies of private transport of patients; and

4- the continuation of hemodialysis for renal failure mostly by the private sector.

It should also be noted, the successive creation of organisms with integrating management, supervision and regulating functions.

In 2006, Primary Healthcare went through an organisational turnaround. Health Centres Clusters and Family Health Units (USF) were created, consisting of self-organised teams of doctors, nurses and administrative staff. The USFs are endowed with organisational autonomy, self-regulated, sub-

ject to a process of contractual performance of indicators and may receive financial incentives for performance. This model was considered positive by professionals and users, but has created imbalances in the remaining units, sometimes even emptying them from the human resources essential to the provision of healthcare to the remaining population not covered by USFs. This has even lead to the closure of other health units and thus accentuating inequalities in access between users. The model caused great dissatisfaction among professionals developing similar activities but who did not belong to USF units and did not receive financial incentives.

Indeed, until the beginning of the twenty-first century, state's participation and policy making did not register a linear path. Nevertheless, the health services have spread at the territorial level, including those providing continued care, and palliative and rehabilitation care, although the latter have little expression. Human resources for health have also been well-developed in terms of quantity and especially in terms of quality, particularly with regard to training. The implementation of an emergency medical network, the creation of INEM and the introduction of the European medical emergency number 112 were also important milestones. Programmes of the Central Government, such as PRACE[9] and the later PECs[10], had direct influence on the National Health Service (SNS). These Programmes printed them restructurings, mergers and closures of services, particularly at the level of primary healthcare, in order to ensure better profitability and articulation of services without affecting thereof its users or reducing their rights of access to healthcare.

These different levels of evolution have ensured a positive change in demographic and health indicators, which have continuously improved in recent decades. Two of the best examples of this evolution can be observed in the levels of infant mortality and life expectancy of the Portuguese population, which have recorded very strong and continuous positive changes since the last century, although more accentuated since the '70s.

The national economic crisis, which culminates in 2011 in the signing of the Memorandum of Understanding and the consequent PREMAC , influenced the State Budget (OE) and generated subsequent measures of fiscal restraint that had great impact on the services of the Ministry of Health, in particular concerning the operation of the National Health Service. This less

[9] PRACE is the Portuguese acronym for "Restructuring Program of Central State Administration".
[10] PEC is the Portuguese acronym for "Stability and Growth Pact".

favourable political and economic environment also reflected in other sectors concerning the access of the Portuguese to healthcare. Some examples:

a) user fees, which experienced significant increases and saw their exemptions revised and limited;

b) transport costs of patients suffered restrictive measures, including the level of exemptions; and

c) the reimbursement of medicines, pointing to the need to increase the consumption of generic medicines.

Nevertheless, the agenda and the political discourse continues to stress the paramount investment in primary care and in RNCCI[12], emphasising healthcare for the elderly, with due subordination to the restraints imposed by the economic and financial environment.

7.2.7 Methodological options

The reflections here presented are based on the research conducted throughout the project and supported by the group of experts consulted, in the application of the Delphi model[13].

Political actors, academics, and professionals influence, define and give shape to policies, measures and actions. To understand the point of view of these actors regarding health services in their relation with ageing and with the level of education of the Portuguese, the latter, one of the recognised determinants of health, we resorted to the Delphi exercise. It was our intent to share the opinion of a panel of Portuguese experts, from different sectors and backgrounds, regarding the adaptation of responses to the challenges posed by the inevitable changing demographic characteristics of the population, which would simultaneously validate some of the conclusions previously obtained during the investigation performed by the authors of the book.

---

[11] PREMAC is the Portuguese acronym for "Final report of the reduction and improvement Plan of Central Administration".[2] Available at: http://apps.who.int/nha/database/DataExplorer.aspx?ws=0andd=1

[12] RNCCI is the Portuguese acronym for "National Network of Integrated Continued Care".[4] Available at: http://www.oecd.org/health/health-systems/1841456.pdf

[13] This exercise was conducted under the Doctoral Dissertation in Political Science, with specialisation in Public Policies (Faculty of Social and Human Sciences – NOVA University of Lisbon) by LEÃO, Carla, 2014, "Envelhecimento, saúde e educação em Portugal. Práticas e Desafios", nearing compleation.

[14] In Greek *Delphoi*. Refers to the Oracle of Delphi, chaired by the god Apollo. The city of Delphi was the center of the Hellenic world, the Ancient sacred site and Apollo was the god of wisdom and the image of truth. The God was questioned, and his answers were considered absolute truths (Gracht, 2008, pp 21-22;. Gracht, 2012, p. 1525.). In the '50s of the twentieth century the term acquired a new dimension, following the study by the RAND Corporation in the sphere of national security and entitled *Project Delphi*.

The Delphi method has been used since the '50s, but only from the following decade began its widespread implementation[14]. It has since been adapted and used mainly in the context of forecasting, but has spread to the different areas of knowledge, maintaining most of its original features. It is a research tool, based upon a dynamic and interactive process of collecting and analysing opinions of a panel of experts on an issue or phenomenon whose knowledge is uncertain and/or incomplete (Skulmoski, et al., 2007, p. 5). It aims to support decision making, in this particular case on health policies. The method is based on several key principles:

1- use of a panel of experts;

2- ensure the anonymity of responses;

3- not involve personal confrontation of experts, which ensures greater freedom in responses;

4- has an anonymous questionnaire as a working tool in order to prevent the 'leader effect';

5- the possibility of conducting multiple rounds of surveys to try to achieve some convergence or consensus answers when possible;

6- appeal to intuition and positioning of participants in regard to the questions under discussion;

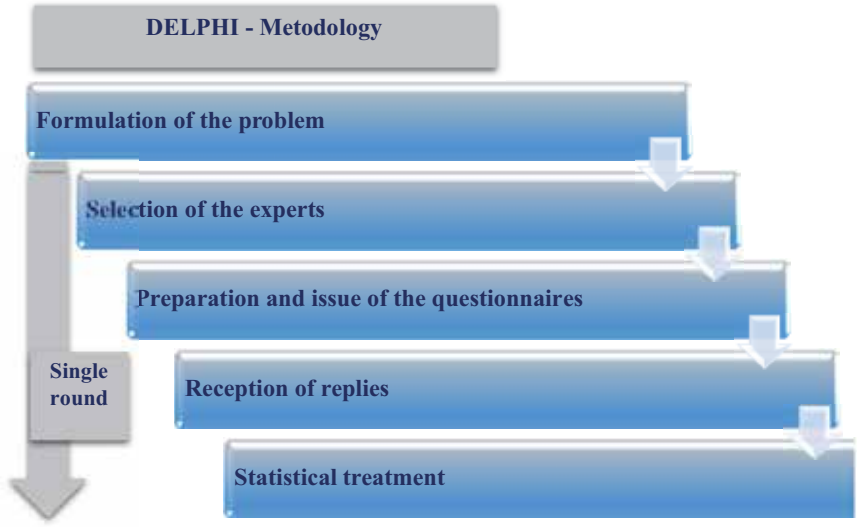
7- be interactive, since it organises the sharing of answers between participants in successive rounds (if necessary);

8- present qualitative results through the elaboration of reports and conclusions; and,

9- present quantitative results of the statistical treatment of the responses obtained. The survey's main goal is to forecast, from subsequent years, the most significant changes that will take place regarding the phenomenon in question. (**Figure 7.9**) summarises the steps we followed to implement this exercise.

The implementation of the Delphi method was considered to be the ideal in the current and future context of increase of population aged 65 and over and specifically with 80 or more years. This is the population that mostly uses health services, with specific health needs, who mostly lives alone, who is mostly uneducated, and with a decreasing informal support provided by the family. To this picture we need to add territorial differences concerning ageing and the provision of health services and the current production of restrictive health policies that place a high degree of uncertainty concerning the future with regard to the maintenance of the guideline of national policy or to the need to follow a different course. Another indicator of uncertainty must be added. The factor level of education of the elderly population, considering that this will increase in the near time horizon and has been widely

Figure 7.10
Stages of the exercise applied



Source: Author's elaboration.

regarded as a determinant of health that positively influences the health status of individuals and could eventually reduce the current problem of SNS concerning its sustainability. In this context, although the research under the AgHeP Project has given us some answers and helped to draw guidelines with potential interest to the political decision-making process, we considered it important to question a heterogeneous panel of individuals with knowledge in the area of study that contributed to confirm, refute and enrich the conclusions obtained.

The questionnaire intended to answer the following guiding questions:

1- What adjustments should be made in the health services as the Portuguese population ages?

2- Can the improvement of the educational levels of the Portuguese population contribute to mitigate the expected pressure on health expenditure in the coming years?

3- Can the results obtained in the prospective exercises help policy-makers find appropriate national and local answers?

Given this purpose we selected the panel of personalities with explicit political functions and outstanding personalities of state organisations with direct action on the healthcare system, health professionals, academics and representatives of private health and social services. To allow a wider range

Figure 7.11
Stages of the exercise applied

	No.	Name	Institutional Background
Former Ministers of Health	1	António Arnaut	Minister of Social Affairs II Constitutional Government
	2	Luís Filipe da Conceição Pereira	Minister of Health of the XV and XVI Constitutional Governments
	3	António Correia de Campos	Minister of Health of the XIV and XVII Constitutional Governments
	4	Ana Jorge	Minister of Health of the XVII and XVIII Constitutional Governments
	5	Maria de Belém Roseira	Minister of Health of the XIII Constitutional Government
	6	Leonor Beleza	Minister of Health of the X and XI Constitutional Governments
Ministers	7	Paulo Macedo	Minister of Health of the XIX Constitutional Government
	8	Pedro Mota Soares	Minister of Solidarity and Social Security of the XIX Constitutional Government
Secretaries of State	9	Manuel Ferreira Teixeira	Secretary of State for Health of the XIX Constitutional Government
	10	Fernando Leal da Costa	Secretary of State to the Minister of Health of the XIX Constitutional Government
	11	Agostinho Branquinho	Secretary of State for Solidarity and Social Security of the XIX Constitutional Government
Public bodies with a role in health	12	Francisco George	Director-General of Health
	13	Catarina Sena	Deputy Director-General of Health
	14	Graça Freitas	Deputy Director-General of Health
	15	Maria João Quintela	Directorate General of Health - Head of Health Division on Lifecycle and Specific Environments
	16	João carvalho das Neves	President of the Central Administration of the Health System
	17	Jorge Simões	President of the Regulatory Authority Health
	18	Margarida França	President of the Portuguese Society for Quality in Health
	19	Aura Duarte	National Council for Mental Health

of different areas we considered nine categories: Former Ministers of Health; Ministers; Secretaries of State; Public bodies with functions in health; Orders and Associations of health professionals; hospital Technical Councils; Public -benefit organisations with action on health; Academics; Experts.

The questionnaire comprised 55 questions, 26 of which respond primarily to the first question; 18 primarily to the second; and 11 primarily to the third question . We received 19 responses of all 44 respondents. From these 19 experts, four are representatives of the political group; ten represent health

Orders and Associations of health professionals	20	José Manuel Silva	Chairman of the Order of Physicians
	21	Germano Couto	Chairman of the Order of Nurses
	22	Carlos Maurício Barbosa	Chairman of the Order of Pharmacists
	23	Telmo Baptista	Chairman of the Order of Psychologists
	24	Isabel Maria Sander de Souza Guerra	President of the Portuguese Association of Physiotherapists
	25	Elizabete Roldão	President of the Portuguese Association of Occupational Therapy
	26	Catarina Olim	President of the Portuguese Association of Speech Therapists
	27	Fernanda Perpétua Rodrigues	President of the Association of Professional Social Workers
Hospital Technical Councils	28	Fernando Ribeiro	President of the Technical Council of the Lisbon North Hospital Centre
	29	António Galhardo Carvalhal	Technical Council of the Lisbon North Hospital Centre
	30	Pedro Pessa Santos	President of the Technical Council of the Hospital and University Centre of Coimbra
	31	Filomena Oliveira	Presidente do Conselho Técnico do Centro Hospitalar do Porto
	32	Dulce Mendonça	President of the Technical Council of the São João of Oporto
Organisations of public utility with action on the health sector	33	Pedro Santana Lopes	Ombudsman of the 'Santa Casa da Misericórdia' of Lisbon
	34	Isabel Vaz	Chairman of the Executive Committee of Group 'Espírito Santo Saúde'
	35	Salvador Maria Guimarães José de Mello	Chairman of the Board of Directors of 'José de Mello Saúde'
Academics	36	Maria João Valente Rosa	Assistant Professor, Faculty of Social Sciences and Humanities - NOVA University of Lisbon
	37	Maria Luís Rocha Pinto	Associate Professor of the Autonomous Section for Social, Legal and Political Sciences - University of Aveiro
	38	Maria Filomena Mendes	Associate Professor at the University of Évora Chairman of the Board of the Portuguese Association of Demography
	39	Pedro Pita Barros	Full Professor at the Nova School of Business and Economics - NOVA University of Lisbon
	40	Alberto Holly	Adjunct Professor at the Nova School of Business and Economics - NOVA University of Lisbon
Experts	41	Constantino Sakellarides	Director of the National School of Public Health - NOVA University of Lisbon President of the Portuguese Association for the Promotion of Public Health President elected of the European Public Health Association
	42	Manuel Villaverde Cabral	Director of the Institute on Ageing Emeritus Senior Researcher at the Institute of Social Sciences
	43	Luís Ferreira Marquês	Collaborated on several reorganisations of the health centers. Integrated the Mission for Primary Health Care
	44	Vítor Borges Ramos	Visiting professor at the National School of Public Health – NOVA University of Lisbon Integrates the advisory team to the coordinator of the Mission for Primary Health Care

Source: Author's elaboration.

professionals; four are academics; and one is a representative of the private health and social services. The responses showed no significant deviations, being statistically possible to determine the trend of the response, if it tended to be positive or negative. For this reason we did not see the relevance of enduring a second round, ending the methodological process with the statistical analysis of the responses and compilation of the observations made by the experts.

7.2.8 Strategic orientation lines

In our view, a strategy for prioritisation of health policies in Portugal, for 2030 encompasses three vectors: 1) Population features; 2) educational levels of the elderly population; and 3) Health Protection. We will analyse each of them.

Population features

Population ageing is a global phenomenon. It is not unique in Portugal, nor in the most developed societies. It should be regarded as a fact and not as a fatality. The decision-maker is confronted with dissonant and conflicting informations, but in the end he has to make a constructive opinion and informed decision. At this point, we will briefly highlight some points:

- Triple ageing: ageing on top, due to increased life expectancy; ageing at the base, due to the decline in births, and lastly increase in the average age of the population. This trilogy will remain and will intensify in the future.
- Ageing of the most advanced functional groups: ageing will be more pronounced in the age group of 80 or more years. These elderly senior 'demand' more health and social care than junior seniors (65-79).
- Changing family structures: significant reductions in the size of households. Today there rarely are multigenerational families. Reflecting this change we find two kinds of realities in old age:
  - Ageing in the company of other elderly: data have shown that there are increasingly more households consisting of only two elderly;
  - Lonely ageing: associated with a low birth rate and family dynamics, which leaves the elderly increasingly lonelier.
- Ageing by gender: men have a lower life expectancy than women, therefore ageing at older ages occurs primarily in females, a trend that will continue in the future.
- Asymmetric ageing of the country: the ageing process is not uniform, nor even in rhythm nor in shape. Local and regional asymmetries are supported by population drawings arising from migration. The North is different from

the South and the inland is different from the coast.

Local communities have characteristics that cannot be subject to centralised standardisation. In the act of decision making the challenge will be to reinvent and recreate the best and most appropriate responses, by the requirement to meet specific needs, to which there must be aligned organisational responses of the health and social sector.

Educational levels of the elderly population

The increase in educational levels of the elderly population was well demonstrated and supported in research here reproduced, evidencing its trend of future development. Also in the enquiry to experts, education was regarded as a relatively important indicator in terms of the health status, influencing their perception and management of health / disease binomial and clearly favouring the most educated individuals.

A higher education is followed by a greater demand and awareness of rights. According to the opinions of experts it is likely that a higher level of education facilitates the intervention of health professionals, through easiness of the understanding and communication dimensions on prevention and treatment. Thus, it is likely that these individuals use health services in a more weighted and directed way.

It was not clear from the analysis of the inquiries' responses whether the combination of older and more educated population would be a factor that contributed to a more sustainable use and economic sustainability of the National Health Service. There is a clear sense that the increase in educational levels provides the seniors with new technologies facilitative of capabilities, such as telemedicine, and with this, induce a decrease of the influx to health services. Factors to retain:

- Reduction of illiteracy: was evidenced as a future opportunity.
- Increased schooling: formal schooling and lifelong education. Trend that will be even more evident in the future.
- Health status of the population: will generally be better, as a result of a more educated population.
- Chronic and disabling diseases: will be lower in populations from areas with higher levels of schooling.

Here too, the regional asymmetries are striking. In this study we have presented in detail how each region will feel the impact of educational levels on their health (in health status, in disabling and chronic disease, recurrence to medical appointments and medicine). The decision-maker at the time of decision making should take into account the territorial inequality.

Health Protection

The state fulfils its function of ensuring the population's right to health through the National Health Service, providing frontline care through primary healthcare and differentiated care by hospitals, as well as continued, palliative and rehabilitative care.

In this point, we sustained our analysis in the recurring opinion of the panel of experts consulted. There was consensus in the view that health services do not respond adequately to the needs of the people, by showing an inadequacy of supply to meet the characteristics and specific needs of the elderly in each region. The current services provided do not take into account the asymmetry of the territory, the profile of the user and the provision of services, thus not giving equal and equitable access, mainly affecting the elderly. But even among this group there are differences: those residing in inland rural areas eventually are most vulnerable, because their healthcare needs are not so easily met, as opposed to those residing in urban areas where the services grant them a reasonable answer.

In the future, health services should be subject to a planning which takes into account the territorial design of populations, developing strategies to facilitate people's access to health services. Either through the desirable by proximity service or through an efficient transport network that facilitates people's access to services.

- *Primary healthcare*

Of the SNS health services, Primary Healthcare assumes a paramount position in the quality of life of the elderly by promoting and monitoring health.

Again territoriality makes a difference with a favourable response from Primary Healthcare in urban areas. In contrast, in the rural context it has still not achieved uniformity in the coverage of the national territory.

The unanimity of the respondents point to the urgent technical and human investment in Primary Healthcare, which promotes the centrality of healthcare. Its technical and scientific expertise should be recognised and valued, effectively placing them in the position of first line care, pillars of the National Health Service. Such services must be close to the people and with an accessibility that allows the community to maintain a relationship of trust with services and professionals, creating a sense of security.

Thus, in future terms, it seems essential to invest in primary healthcare. A less expensive process which would add greater value to the delivery of health services, contribute to improving the quality of life and increase their perception of security. This investment would have expression in better resource management at the level of specialised care, preventing unnecessary

admissions whose costs with assistant activity are much higher. We suggest the following priority fields of intervention:

• *Hospital network*

The hospital network is considered more satisfactory according to the evaluation of the panel, although they point out the existence of gaps in the access to appointments and specialised care, especially to the residents of rural and inland regions of the country.

In the absence of resources and to bring services closer, universal protocols could be adopted, for example. Those are less dependent on medical managers, giving autonomy to other professionals to practice a healthcare activity and to the development of a telemedicine system, contributing to the integration of people into the health system.

• *Integrated Answers*

The health sector and the social sector generally respond, each one by itself, to the needs of the user population, and in many cases may work collaboratively. Specifically with regard to the continued, palliative and rehabilitation care, RNCCI was created with its various types of units. But this network does not cover the entire country, while attempting to address the need for intermediate responses between the hospital and home. However, in terms of responses, whether in a more rural or more urban context, RNCCI does not respond effectively to the needs of the population, as it is very poor in terms of palliative care.

The location of equipment presents a regional asymmetry. This raises questions on proximity to the area of residence of patients, often pushing them to units which are away from their area of residence and leaving them out of context, unsafe, and putting them in a situation of fragility by the social isolation to which they are subject.

RNCCI responses recommends the existence of Home Continued Care Teams, which provide services of home healthcare activities according to certain clinical criteria, including the need for rehabilitation. This translates mainly into benefits in health, while it does not foresee the integration of healthcare to meet basic needs.

We point out that, in line with primary healthcare, the focus should be on equipping the country with RNCCI units, particularly in terms of palliative care. As well as the investment on creating other types of responses, including home care, whose provision integrates medical, rehabilitation and social care, thus addressing the basic needs. The previous model of ADI (Integrated Home Support) could be developed and adapted.

• *Social Answers*

Protection is not limited to healthcare in terms of elderly support. It is essential to have social answers which in complementarity support the safety of subjects.

Currently two types of response are provided. One in terms of inpatient care with a more institutionalising character and the other in terms of home support. Although apparently with greater flexibility and adaptation to the needs, it still proves to be fairly typified in its performance, not fully responding to the needs of the elderly and their support network.

These traditional social responses have on inpatient services and home support services a permeability in the country. We propose the rethinking of approaches and methodologies for both strands. Nevertheless, we would also like to stress the importance of rethinking home care, so that the intervention would allow not only to continuously adapt, and in a differentiated way, services to the basic needs of individuals, effectively supporting the support structures, but also developing domiciliary responses that minimise isolation and loneliness.

• *Qualification of human resources*

Inequity due to the lack of human resources is pointed out as one of the factors of regional asymmetries in the supply of health. Particularly regarding doctors, which conditions the operation and development of services. This situation has led to the closure of several healthcare units within the inland of the country, including health centres, and its concentration in county capitals, as geographical dispersion and weak transport network accentuates the problem of access.

We should also highlight the importance of professionals deepening their scientific knowledge, with a high incidence in the field of geriatrics, particularly those that develop their activity in primary care. It is also essential that healthcare professionals improve communication in the relationship with the patient and family, preparing professionals for the new reality.

To sum up, facing the issue of population ageing in the future, which includes the individual ageing of individuals, is not an easy matter. It requires a holistic exercise in terms of collective responses, focusing in the social and welfare vector that should be offered alongside the traditional provision of healthcare. Services and their respective branches should take into account the new characteristics of the elderly of the future, different from the current ones, and should be flexible enough to provide differentiated care according to the different regional profiles. This need requires the abandonment of the classical standardised provision, in order to obtain, through the elasticity of

supply, the most appropriate response to the challenge of guaranteeing the right to equal access to health, not allowing regional characteristics, of the territory, and of the site to become differentiating elements or a threat to the population.

In the process of rethinking the strategic guiding line in the sector of health it is critical to have in mind that:

- The reorganisation of health services and its subsequent closure, maintenance or opening should take into account a population-based planning, assuming the actual knowledge of the users, their needs, support structures (including informal networks of family or neighbourhood caretakers, the transport network, accessibility and access), thereby ensuring their suitability to increasingly differentiated demands of people and places.
- Given the expected increase of disabling pathologies, the existing rehabilitation units in the country are sufficient. Rather than focus on building new units, the answers should focus on the development of the existing structures (e.g. in Health Centres through its home care teams, provided that they have specialised resources).
- Social responses impose a reorganisation of offer, best suited to a locally differentiated profile of the user, changing the paradigm of its model.
- The importance of placing greater emphasis on local studies and planning on the local as tools to support decision making, whose regional analysis allows the adoption of decisions close to local realities

In recognising asymmetries, the future is to integrate diverse solutions that respond simultaneously to several local and regional everyday life realities, communities and individuals.

Finally, taking into account the current national situation, we conclude through the various chapters of this book, that it is urgent to rethink health policies. The focus should be on populations, rather than strictly on the economistic question, in order to maintain the levels of excellence achieved by the end of the first decade of the 2000s.

We believe it is essential to create control mechanisms requiring the effective implementation of the Constitution, the Law on Health and health legislation, in particular with regard to skills and rules of operation of health services, user fees, transport of non-emergency patients, the national network of medical emergency and medicine policies. The implementation of National Health Plans, and plans and programmes arising must not be forgotten, and the measures proposed by the WHO and the EU should be implemented.

It is also important to promote the qualification of human resources, particularly in the academic education and training required to perform the duties, continued training and the functional content of each profession.

A policy designed based on the actual specifics of the population, the characteristics of the territory and the epidemiological profile, the effective legislative implementation, based on transparency and in assuming the responsibilities of institutions and professionals, will positively contribute to economic and financial sustainability of the health system and to achieve standards of excellence in health and quality of life for all Portuguese.

[1]http://www.strategicmanagementinsight.com/tools/pest-pestel-analysis.html