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# **The impact of immigration on health, longevity and dependency of the elderly in the Spanish and European population**

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# **Chapter 1**

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## **Introduction and Motivation**

## **1.1 About this dissertation**

The purpose of this dissertation was to examine trends that impact health, health care services, longevity and long term care of the older population living in Spain and Europe. In general, I studied differences in several dimensions of health by gender and then I studied differences in health and medical services among older immigrants and the native-born populations in a number of European countries, as well as the potential impact of immigrants on changes in life expectancy and dependency in Spain.

Ageing is an important facet of all human societies, and has a significant impact on demography. As we enter the 21<sup>st</sup> century, global ageing will increase economic and social demands on countries all over the world. While ageing is a well known phenomenon across societies, where one can see an increase in the proportion of older people in the population in the last few decades, it especially characterizes Europe, where the percentage of the elderly population is generally higher than that in the rest of the world and the increases of the older population relative to the workforce are greater. The causes of population aging are longer life expectancy, decreased birth rate and, possibly also, migration. This dissertation is focused on two of these topics, especially the role of migration, and the eldest population living in Spain and 11 European countries, as explained in the next paragraph.

This dissertation concerns the following four topics:

(1) The analysis of gender differences in health for the 50+ population in 11 European countries, explaining how health behaviors, the presence of functioning problems, disease prevalence, self-rated health, and health care utilization, differ for men and women in multiple countries;

(2) The analysis of health differences between immigrants and the native-born populations aged 50 years and older in 11 European countries. Differences in functional ability, disability, disease presence and behavioral risk factors are examined;

(3) Immigrants' use of health care relative to the native-born populations aged 50 years and older in multiple European countries, explains, particularly, how the expected number of visits to the doctor, general practitioner (GP) or hospital stays differ between these two groups; and

(4) Effect of foreign-born Spanish residents on the magnitude of change in the calculation of healthy life expectancy and life expectancy with disability.

Four hypotheses relevant to these subjects are tested. In my exploration of gender differences in health for the middle-aged and elderly population, I try to determine whether the differences between men and women in multiple dimensions of health are the same across various countries in Europe. I take advantage of a relatively new survey, the Survey of Health, Ageing and Retirement in Europe (SHARE, 2004) to examine the similarity of gender differences in a sample of 11 European countries which have many similarities in social and economic circumstances but also significant differences in health behaviors and cultural environment. In this work, logistic regression is the method used and the odds ratios from those regressions indicate the link between being female and the likelihood of having health specific behaviors and health problems.

The second hypothesis relates to the relative health of older European immigrants which could be affected by a lack of social support and could place demands on the health systems. If the immigrant populations have poorer health than the native-born populations, then the immigrant population

might use health services more often and with excessive costs for the states, and cause additional problems in the management of the health system. The methodology used in this framework is again logistic regression and the odds ratios from these regressions are used to examine the relative effect of being an immigrant compared to a native-born person on indicators of health and health behaviors.

Then, the hypothesis examined in the fourth chapter of the dissertation could guide policy-makers, in terms of social policies, if one proves that the increment in the number of immigrants can affect the intensity of use of medical care as compared to the native-born population in each country under study. Negative Binomial models under the theoretical approach of Andersen's model are used in this analysis to compare the use of medical care by two populations, the native-born and immigrants.

Finally, the hypothesis examined in the last part of the dissertation is the magnitude of the effect of the recent increase in the immigrant population of Spain. As a consequence of immigration, healthy life expectancy and life expectancy with disability could be modified if the mortality and prevalence of disability differ for the native-born and immigrants. The methodology used in this analysis is the Sullivan method of life table construction, adapted to the case of two populations, the native-born and immigrants. Some possible scenarios were established in order to assess the impact of the percentage of immigrants in the population, the mortality rates and the disability prevalence of immigrants on life-expectancy estimates and the estimates of life-expectancy in disability.

To examine health differences in Spain and Europe, four representative cross-sectional datasets covering different population ages were used to study

the prevalence of health problems by gender and the differences in functional ability, disability, disease presence, behavioral risk factors and the use of health care for immigrants and the native-born populations, as well as the healthy life expectancy and life expectancy with disability. First of all, data for this dissertation was extracted from the first wave of the “*Survey of Health, Ageing and Retirement in Europe (SHARE), 2004*”. This database is used to estimate gender differences in health and the differences in health care usage of older immigrants compared to the native-born populations. Then, as we introduced the analysis for the Spanish population, specifically, data came from the “*Survey on Disabilities, Handicaps and Health Status, 1999*”, which was originally known as the *EDDES (Encuesta de Discapacidades, Deficiencias y Estado de Salud)*. This database is used to estimate healthy life expectancy and life expectancy in disability using the Sullivan’s method. Finally, data from the *Spanish National Statistics Institute* and the *World Health Organization* establishes possible scenarios for the mortality rates of the Spanish native-born and foreign born populations.

Some of the fundamental questions for policy-makers are reported in response to the following questions: How could the magnitude of healthy life expectancy and life expectancy in disability be better for the eldest population?, Could a massive change in the proportion of older people be a problem to our health care and social security systems?, As longevity is increased, how can the quality of life, especially in old age, be improved?, Can the health of older immigrants have important consequences for demands on health systems?. This dissertation tries to address these questions, particularly when concerning gender differences in health and the differences in healthy life expectancy, the use of health care and other health measures presented among the immigrant and native-born populations in Spain and Europe.

In conclusion, the main purpose of this dissertation is to investigate the effects on health and health care usage of the migration movements in the last few decades, and the universality of possible gender differences with a close interest on the elderly. In Europe, particularly, emigrating is now easier than years ago and international borders are no longer restrictive to many individuals. This has resulted in dramatic growth in population movements. Also, immigration can affect the structure of a society, as well as the demographic characteristics, because immigrants tend to have lower socioeconomic status than the populations into which they move (Ringbäck et al., 1999). The present dissertation also tries to discover if a growing number of immigrants may portend more health problems in the population of their destination country in subsequent years and in the use of health care as a result of immigrants' health status and socioeconomic characteristics. Moreover, this dissertation tries to reflect the impact of immigrants in Spain in terms of longevity and dependency in future years.

### ***Organization of the Dissertation***

This dissertation is organized into six chapters that investigate the compression of health into immigrant and native-born populations, gender differences in health, as well as changes in longevity and dependency for the elderly and implications in the use of health care. **Chapter 1** describes the dissertation's motivation and provides a general introduction to the subject. Each of the subsequent four chapters represents different but related topics, which are presented as the following: **Chapter 2** examines the comparison between males and females in different health measures. The chapter is called "*Gender differences in Health in 11 European countries: Results from the Survey of Health, Ageing and Retirement in Europe*"; **Chapter 3** shows the

health differences between immigrants and the native-born population in Europe, with a chapter entitled “*Health of Immigrants in European countries*”; **Chapter 4** examines health care utilization relative to the native-born populations for different measures, entitled “*Health care utilization among immigrants and native-born populations in 11 European countries. Results from the Survey of Health Ageing and Retirement in Europe*”; **Chapter 5** presents a work related to the potential changes in the estimates of healthy life expectancy and life expectancy in disability. This chapter’s title is “*Scenarios for the impact of immigration on longevity and dependency among the elderly in the Spanish population*”. The final section, **Chapter 6**, is the conclusion, which attempts to combine conclusions based on the results obtained in the previous four chapters. Moreover, it includes the future possibilities for investigation, further improvements and extensions.

## **1.2 Gender differences in Health**

Researchers have been studying gender differences in health for decades. An extended life expectancy for individuals is a factor that we don’t have to see as a problem, because it results from higher economic and cultural standards, improvements in medical care, public health and safety, definitely, better conditions in society. As we get older, however, health becomes an increasingly important concern. Females, universally, have a longer life expectancy (Barford et al., 2006), and they also live longer with their disabilities as compared to males. Generally, women have higher levels of health problems than men but lower mortality rates for most causes of death at a given age (Verbrugge, 1984). However, there is less uniformity in reports of morbidity differences. In developed countries, gender differences in mortality generally increased during the mid-twentieth century (Preston, 1976; United Nations, 1988). Particularly, recent studies report that women have



more disability and physical functioning problems than men (Gorman and Read, 2006), but it is less clear, a priori, what differences exist in other dimensions of health.

In Europe, the gap between men and women in terms of health varies across countries, at different phases of the life course, and over time. Individuals' health characteristics differ by gender, age and dimensions in health. Men are more likely to be involved in risky health behaviors such as smoking, heavy drinking and being overweight (Galuska et al., 1996; Barbeau et al., 2004; Denton et al., 2004). However, these patterns among both men and women have varied historically, and changes in these differences may be responsible for the change in the life expectancy in recent years (Preston and Wang, 2006).

According to the above review of gender differences in health, it is obvious that there is a need to clarify differences across cultures and economic circumstances, specifically in those dimensions of health in which sex differences are not so evident.

### **1.3 Immigrants, a brief history in Spain and Europe**

The movement of people in the world is an old phenomenon. International migration contributes significantly to the growth of population in many countries. Over the last two centuries, significant changes have taken place in the world at the political, social, economic and demographic level, and immigration has become an important topic. The main reasons for individuals' movements are cycles of economic expansion and recession and social changes, such as, consequences of wars, colonization of countries or refugee status. Countries may also encourage migration for management of

the labor market and to support economic growth. Individuals may move at certain times of life, e.g. for a job or for retirement. International migration has increased with world-wide globalization. In the past, international migration was dominated by movement between Europe and a few non-European countries. Nowadays, all developed countries receive immigrants from a variety of less developed countries, opening up new horizons and opportunities.

The modern history of international migration has four different periods, as summarized by Massey (1990):

(1) From 1500 to 1800 when international migration was dominated by Europe. Over three centuries Europeans colonized large portions of Africa and Asia, establishing a colonial rule in each area. Additionally, in this period, 9.6 million Africans were imported into the Americas as slaves, transforming the ethnic composition of the new world.

(2) Industrialization of Europe, early 19<sup>th</sup> century, was a period when a large number of people from the agrarian lands left for urbanized nations. From 1800 to 1915, more than 48 million emigrants left Europe and 85 percent of them went to Argentina, Australia, Canada, New Zealand, or the United States. Important sending countries were Britain, Italy, Norway, Portugal, Spain and Sweden. This period of international migration from Europe ended with World War I. During the 1920s, 1930s and 1940s, as a consequence of the Great Depression in 1929 and the checking of the international migration in World War II, the movements of individuals stopped, except for large numbers of refugees, whose movements were not generated for economic development.

(3) In contemporary period, beginning around 1950, immigration became a global phenomenon, as a consequence of the large number of

sending and receiving countries. Since 1950, Europeans have become a minor part of the world flow. The variety of destination countries has also increased, Western Europe (Germany, France, Switzerland, Sweden and the Netherlands) being the attractive new migrants' destination.

(4) By the 1980s, the characteristics of migrants to European countries had changed. Countries in southern Europe - Italy, Spain, and Portugal - which only a decade before had been sending migrants to wealthier countries in the north, began to import workers from Africa, Asia, South America and the Middle East.

After the brief general history of the international immigration movements included above, it is also important to consider the specific case of Spain. Historically, Spaniards have moved to a large numbers of countries in response to economic incentives. It is possible to summarize Spanish migration history in three different periods:

(1) At the beginning of the 20<sup>th</sup> century a significant number of Spaniards moved to South-America. The main destinations for the Spanish population were Argentina, Brazil, Cuba and Uruguay; and also Argelia (North Africa). The main reason for this *en masse* emigration was the crisis in the European agricultural sector (Bover and Velilla, 1999).

(2) From the 1950s to the 1970s, Spain, like other southern European countries, had become an emigration country to northern European countries, especially to France, Germany and Switzerland. The growing importance of agricultural mechanization and the manufacturing sector intensified the flow of migrants in this period.

(3) From the 1980s to 1995, the number of foreign immigrants into Spain was very small. From the mid 1990s to the present, the Spanish population has changed its population structure due to the large number of

immigrants who come to Spain. For instance, according to Spanish National Statistics Institute reports, the number of immigrants in Spain from 1998 to 2002 has increased more than 3 times, indicating the considerable flow and the fastest growth in foreign immigration in recent years. Current changes at the political, social, economic and demographic level in Spain have resulted in greater effort by the government to attract a new type of immigrants.

Following the brief background information about the Spanish and European immigration process presented above, I would like to focus on the socio-demographic characteristics of immigrants studied in my thesis. In the present dissertation, the oldest immigrants from 11 European countries and the impact of the new rush of immigrants living in Spain in subsequent years are analyzed. As I described in section 1.1, the data, mainly, came from two cross-sectional sources, from one European survey and one Spanish survey, SHARE and EDDES, respectively. In SHARE, the individuals are 50 years old and older, and the EDDES provides information for the total population, but I put emphasis on the impact of the elderly individuals.

#### **1.4 A brief history of the Health Care Usage in Europe**

Trends in the use of health care in developed countries have been investigated by researchers in the last few years. However, fundamental reasons for the possible variations by countries are still largely unexplored, and even more so when immigrants and native-born populations are compared.

Multiple forces determine how much health care people use, the types of health care they use, and the timing of that care. For this reason, in 1984, Europe achieved a dialogue and new cooperation between National Medical

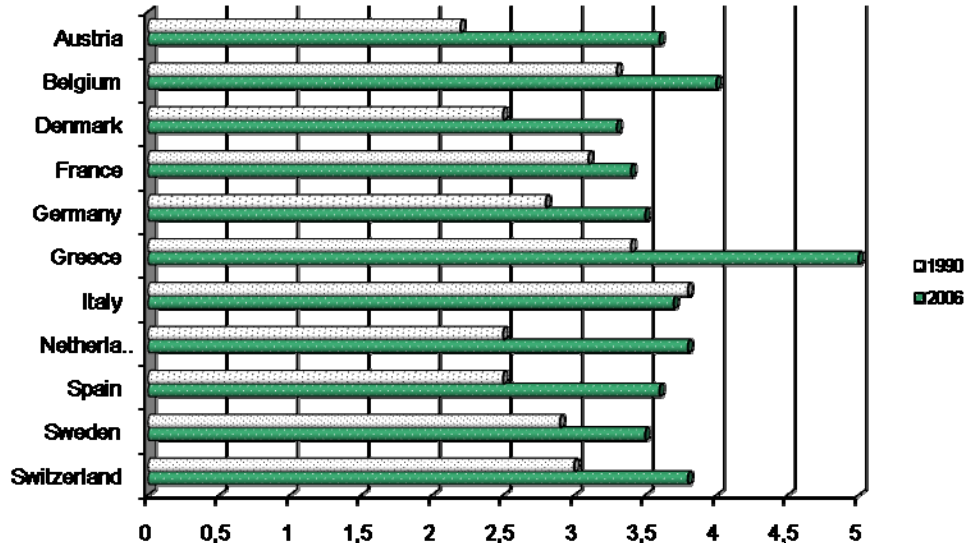
Associations and WHO. The aims of this forum can be summarized in four parts: (1) Improve the quality of health and health care in Europe, (2) Exchange information and ideas between national medical associations, and between the associations and the World Health Organization, (3) Integrate appropriate aspects of policies of Health for all individuals, and (4) Formulate consensus policy statements on health issues<sup>1</sup>.

In order to get a general and recent idea of how the number of physicians per 1,000 people has improved recently, Figure 1.1 shows this particular health care resource comparing the years 1990 and 2006. In only 16 years, the number of physicians per 1,000 persons varies considerably in some countries. In 1990, Austria was the country with the lowest physicians per 1,000 persons and Italy the highest. However, this range has changed during this period, Denmark being the lowest and Greece the highest in 2006. In all countries, except for Italy, the physician per thousand ratios has increased; Greece, Austria and The Netherlands being the countries with the highest increment.

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<sup>1</sup> For more information on the history and cooperation of health care use in Europe: <http://www.euro.who.int/>

**Figure 1.1: Number of physicians per 1,000 persons by country**



Source: OECD Health Data (2008) – Frequently Requested Data

Table 1.1 shows the characteristics of national health care systems in multiple European countries. The total expenditure on health is defined as the sum of expenditures on activities that – through application of medical, paramedical, and nursing knowledge and technology – have the goals of promoting health and preventing disease, reducing mortality, caring for persons, assisting patients and administering public health, as well as health programs, health insurance and other funding arrangements. In 2006 the percentage of GDP comprised of health expenditures ranged from 8.4% in Spain to 11.3% in Switzerland. In 7 out of 11 of these European countries, a general practitioner (GP) acts as gatekeeper and must be seen before a visit to a specialist (SP) can be arranged; in others the patient can visit an SP directly. Finally, the type of payment for a physician’s services also differs across

countries. Almost half of the countries under study have a fee for physician's services required as part of their national health system.

**Table 1.1: Characteristics of national health systems and the distribution of health spending by countries**

Country	Total health expenditure as a percent of GDP (%), 2006	GP <sup>a</sup> gatekeepers	Doctor type of payment <sup>a</sup>
Austria	10.1	YES	Fee for service
Belgium	10.3	NO	Fee for service
Denmark	9.5	YES	Fee for service
France	11.0	YES	Fee for service
Germany	10.6	NO	Fee for service
Greece	9.1	NO	Salary
Italy	9.0	YES	Capitation
Netherlands	9.5*	YES	Capitation
Spain	8.4	YES	Salary
Sweden	9.2	YES	Capitation
Switzerland	11.3	NO	Fee for service

Source: OECD Health Data (2008) – Frequently Requested Data;

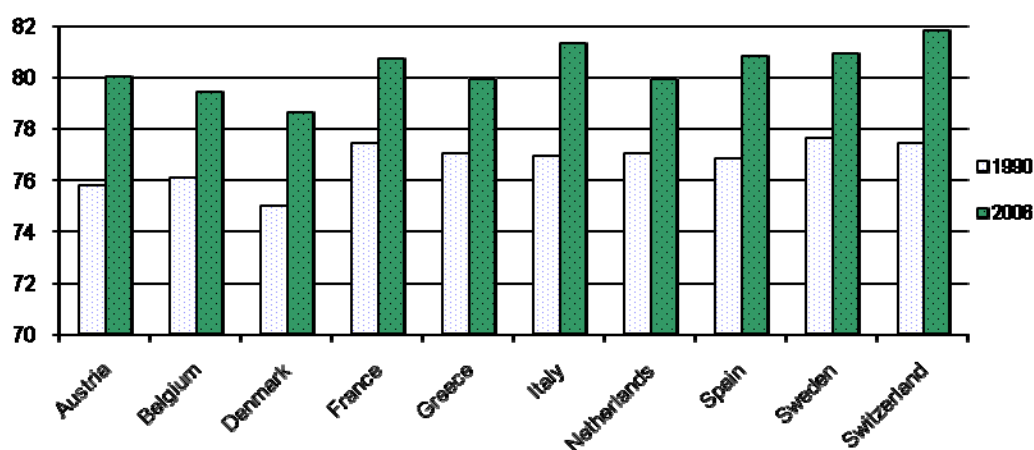
<sup>a</sup> WHO (2004), 2004

## 1.5 Longevity and dependency of the eldest population

Nowadays, the population lives longer and in better conditions than in the past. Longevity, the average human life-span, is studied by many researchers, and studies indicate that females are likely to live longer than males. Improving mortality alone implies increases in both the number of years old dependency and the relative proportion of dependent life, leading to a higher prevalence of dependent individuals in the population life table (Crimmins et al., 1994).

In order to get a general idea of how longevity has improved recently, Figure 1.2 shows the life expectancy at birth in eleven European countries at two periods of time, 1990 and 2006, respectively. In only 16 years, a historically brief period of time, according to the World Health Organization data, life expectancy increased considerably as a result of better medical improvements, social conditions and economic benefits. Each of the eleven developed European countries under study, life expectancy at birth raised in 2006 with respect to life-expectancy in 1990.

**Figure 1.2: Life expectancy at birth by country**



Source: Adapted from the World Health Organization (WHO)

Among these European countries, Spain is fourth out of 11 in 2006 with a life expectancy at birth only exceeded by that in Switzerland, Italy and Sweden. However, in 1990, Spain was in seventh position among the same eleven countries in terms of life expectancy at birth. So Spain gained both in years of life expectancy at birth in within this period and also in relative position within these countries.



### *Dependency in Europe and, especially, Spain*

These days, longevity is related to dependency, especially for the elderly population. The probability of life expectancy with disability increases when an individual becomes older and old-age survival has increased substantially since 1950. Consequently people may live more years with disabilities, increasing in many cases their dependency on others. However, a longer life is not enough - it is the quality of that life that counts.

Governments, in some developed European countries, have recently updated their laws to care for elderly people, who need special help maintaining their daily lives. For instance, dependency is a current issue in Spain because on the 5<sup>th</sup> of October, 2006, the *law of dependence* was passed by the Spanish Government. The law covers the whole population, but the majority of those affected by it are older people (65 years and older), because elderly people are more likely to suffer restrictions in normal activities in their daily lives than young people, so they often need more help.

In accordance with the above review of longevity and dependency, having become aware of the importance of this issue in our society, I have tried to examine different possible scenarios to clarify the possible impact of immigrant population in Spain on life expectancy and life expectancy with disability in subsequent years. Old-age survival in developed countries is directly linked to longevity and dependency, but if a large number of new individuals enter the population with different mortality and disability, as may be the case of Spain, the effects and impact on these concepts could be even stronger.

Once the main topics presented in this dissertation and their framework are described and introduced, each topic will be analyzed in different chapters and to test the hypotheses presented at the beginning of this introductory chapter. First, the next section will be developed into an empirical study about gender differences in health in eleven European countries (**Chapter 2**). This chapter is a recent work which has already been submitted to the “*European Journal of Public Health*”. Second, another empirical study about the health of immigrants and the native-born populations in the same European countries in **Chapter 3** will be presented. This chapter was submitted, accepted and published by “*International Migration Review*” journal. Third, in **Chapter 4** empirical work related to the health care utilization of immigrants as compared to the native-born populations aged 50 years and older in eleven European countries will be exposed. The work presented in **Chapter 4** has not been submitted to any journal, yet. Finally, since longevity and dependency is becoming an important challenge for the older population, as well as for authorities, this issue will also be evaluated, particularly in **Chapter 5**. This last chapter was submitted, accepted and published in “*Revista Española de Geriatria y Gerontología*”.