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Increasing Life Expectancy in Spain and the Disregarded Socioeconomic Costs

Christine Wensink

ABSTRACT

As a human population, life expectancy has continued to increase for the past century. This phenomenon is encouraging, because more time on earth allows for people to witness advancements in technology, experience changes in culture, and most importantly spend time with loved ones. However, life expectancy impacts pensions, benefits, healthcare, and retirement, which are areas that need to be addressed from a business perspective. Spain acts as a real-life example to discuss this topic, as life expectancy is predicted to reach an average of 85.8 years in 2030, surpassing Japan as the country with highest life expectancy in 2018 (Papadopoulos, 2019).

To understand what differentiates Spain and puts the nation in a position to have the highest life expectancy in the world, aspects of their unique culture and way of life will be examined. These factors help paint a picture of life in Spain. Furthermore, the challenges and socio-economic costs involved with increasing life expectancy are often overlooked, but are an important factor in forecasting, not only for individuals, but governments and businesses as well.

As a final consideration, aspects of life in Canada will be drawn for the purpose of comparison. Major factors that differentiate these countries such as diet and climate offer an explanation as to the variances in life expectancy. Some factors influencing life expectancy are out of the control of an individual, but there are elements all Canadians could learn from Spain.

INTRODUCTION

Definitions

Understanding how life expectancy is calculated and the factors that contribute to the numerical findings is crucial when analyzing the impact on a country. First, Ortiz-Ospina (2017) defines life expectancy as "the number of years a person can expect to live…based on an estimate of the average age that members of a particular population group will be when they die" (para. 3). A simple definition yet becomes complicated when comparing cohort life expectancy: "the average life length of a particular cohort – a group of individuals born in a given year" (para. 6) and period life expectancy "estimating the average length of life for a hypothetical cohort… from birth through death, to the mortality rates observed at one particular period – commonly a year" (para. 8). Period life expectancy is used by reliable, unbiased international organizations, such as the United Nations (UN) and the World Bank. For the purpose of this paper, period life expectancy will be the metric used to interpret the economic impact on a nation, unless otherwise indicated.

Often confused with life expectancy, population aging "refers to changes in the age composition of a population such that there is an increase in the proportion of older persons" (Land & Lamb, 2008, para 1). According to the UN "by 2050, one in six people in the world will be over age 65 (16%), up from one in 11 in 2019 (9%)" (Trends in Population Ageing section, n.d., para. 1). This is consistent with Spain, as seen in table 1, the median age in 2015 was 42.5 years. By 2050, this number is expected to increase to 53.2 years (Statista, 2019). Obviously, the increasing median age worldwide will impact commerce across the globe and is a phenomenon companies should consider in their business model strategy, because stakeholders will be heavily impacted.

Another thought-provoking trend that has seen massive changes globally in the past century is fertility rate: "the average number of children per woman" (Roser, 2017, para.1). It is easy to think that since our world population is growing, and has surpassed the seven- billion mark, that fertility rates would have a positive correlation, and would therefore also be increasing. However, this assumption is false and is often misinterpreted. Fertility rates have halved globally since 1950 to 2015, 5.05 children per woman to 2.49, respectively (see table 2). In comparison, the average number of children in Spain per woman is significantly lower than the world average, 1.35 in 2015 (see table 2).

Fertility rates, population aging and life expectancy are terms often associated with each other and are trends that should be researched from a business perspective. First, if the median age of a demographic is increasing, this means the work force is getting older. It is a common understanding that the older people become, the more demanding they are on social services such as healthcare, and prescription drugs. Thus, the workforce will put more pressure on employers to improve workplace benefits. In the twenty-first century, more women are becoming educated and taking on leadership roles in the business world, which were previously dominated by men. The increasing number of women in the workplace could be a factor in explaining the decrease in fertility rates. Another explanation is that mortality rates at birth are decreasing due to improvements in medicine and health services. Decreasing morality rates at birth and increasing life expectancy could be reasons why women are having less children. From a manager's perspective, increasing life expectancy, decreasing fertility rates and an ageing population are critical factors that must be considered when developing workplace policies, because in the near future there will be more demand for extensive benefits.

History of Life Expectancy in Spain

Data documenting life expectancy in Spain dates to 1882, when the average life expectancy rate was 29.5 years (see table 3). It is fascinating to think that in 150 years, life expectancy in this region has nearly tripled, which begs the question how can a population increase their life span by 283%? By researching significant events, and history in Spain, this surge in life span can be better understood. First, by analyzing data from a study by González (2014), as seen in table 4, there was a large plummet of life expectancy in 1918, due to a highly contagious influenza, known as "the Spanish Flu, Grippe, the Spanish Lady, or the Three-Day Fever" (Rosenberg, 2019, Introduction section, para. 4). Spain was not the only country affected by this epidemic, the flu spread across Europe, Asia and parts of North America during the first World War. It is unclear where the flu originated, but took the name 'The Spanish Flu', because Spain was the country most significantly affected, and the government was quick to announce a public epidemic (Flu Spreads and Gets a Name section, para. 3). Evidently, the Spanish flu had a devastating impact on life expectancy in Spain, killing millions and put unimaginable strain on clinics and hospitals.

On a more positive note, by 1922 a steady increase in life expectancy can be observed "due to a drastic reduction in infant mortality… enormous improvement in the reproductive health of women and

postpartum conditions" (González, 2014, p. 43). Once again, there is a significant drop in life expectancy, particularly in men around 1940. This was due to the Spanish civil war that broke out in 1936 and ended in 1939. There were many notable events during this war, such as The Battle of Madrid and the Bombing of Guernica, which resulted in what experts estimate to be more than 500,000 deaths ("The Spanish Civil War," 2012, Other Important Battles section, para. 5). Ultimately, the number of fatal casualties from this war, decreased the average life expectancy among men.

For the next thirty years, life expectancy grows at a stable pace until a period between 1972 and 1982 when these rates skyrocketed 2.5 years for males and a staggering 3.2 years for females (Chenet, McKee, Otero, Ausin, 1997, p. 510). This is a considerable increase in a span of ten years and has drawn a lot of attention from researchers. Some argue this dramatic increase was due to "reduced mortality among infants, while the older ages experienced large gains through reduced mortality from cardiovascular diseases and some malignant neoplasms" (Chenet et al., 1997, pp. 511-512).

As of 2018, Spain has the second highest life expectancy in the world with an average of 82.9 years, second only to Japan at 83.7 years (Papadopoulos, 2019). Clearly, Spain's restless history of war, disease and mortality impacted the country's life expectancy rates, but have since improved drastically. Undoubtedly, Spaniards have a unique history, and a lively culture, but what differentiates them from other nations in terms of longevity?

CULTURE IN SPAIN

Siesta

To understand why Spain has a significantly higher life expectancy than neighboring countries, one must examine what differentiates Spain and makes their nation unique. One custom that is unfamiliar to North America and Asian countries is the 'siesta'. The term 'siesta' is Latin for "hora sexta" or "sixth hour", meaning noon (Jones, 2018, History section, para. 2). Jones states that traditionally the siesta was a nap taken during the hottest part of the day, which allowed farmers to rest and get out of the direct sun (History section, para. 1). Today, the siesta is much less common in Spain, especially in urbanized tourist areas. However, it is still a normal practice for shops and family owned businesses to close from two in the afternoon and reopen at five. This midday break allows workers to return home for lunch, spend time with family, and even nap if so desired. Spaniards are very family orientated, which helps explain the dedication to eating together, even during the middle of the day. Researchers believe the siesta also has extensive health benefits, which "can reduce stress, help cardiovascular functions, and improve alertness and memory" (Govan, 2012, Introduction section, para. 1). Perhaps the Spanish know best, and this short nap is allowing this culture to thrive and live longer.

Stress Levels

An interesting concept previously mentioned regarding Spanish culture and siesta, is the reduction of stress. Zipjet is a company based in the United Kingdom, whose mission is to develop technology to reduce stress in people's lives ("Most and Least Stressful Cities," 2019, Introduction section, para. 1). Zipjet (2019) completed a study ranking cities worldwide on account of how stressful it is to live there. Numerous triggers and factors related to stress were considered, including density, security, mental health, gender equality, unemployment, pollution and debt. Out of 150 cities studied, Madrid was ranked 57th with a stress score of 4.32 out of 10 (one being the least stressful, ten being the most) and Barcelona ranked 85th

with a score of 5.79. The largest factors discouraging Spain's score are high levels of stress due to unemployment and population density. One area to highlight in this report is the correlation between levels of stress and life expectancy. Cities perceived to be the most stressful, such as Baghdad, Kabul, Lagos and Cairo, belong to countries who have some of the lowest life expectancies in the world: Iraq, Afghanistan, Nigeria and Egypt (see table 5). Whereas cities with low levels of perceived stress such as Luxemburg, Bern, Munich, and Bordeaux are a part of countries (Luxemburg, Switzerland, Germany and France) with life expectancy well above the world average (see table 6). This would indicate stress is a factor that impacts life expectancy globally.

Heart Condition

Cardiovascular health is also related to stress, and thus life expectancy. There is no doubt that stress is directly linked to Cardiovascular Disease (CVD) and Ischaemic Heart Disease (IHD). There is:

> A strong body of evidence from prospective studies in Europe and North America shows that stressful work factors, including demands, control, job strain, effort- reward imbalance, job security, and long work hours play a substantial role in the etiology of CVD and contribute to many of the standard CVD risk factors. (Cooper & Quick, 2017, p. 114).

Therefore, the reduction of stress in the workplace and various areas could lead to a healthier heart and better long-term health. To explore this idea, a comparison has been made between number of deaths from CVDs in Spain, compared to Europe and the EU. Data gathered from the European Cardiovascular Disease Statistics Edition (Wilkins et al., 2017), calculates the percentage of deaths from a CVD. In 2014, CVDs accounted for 29.8% of all deaths in Spain, both male and female (see table 7). In comparison, this number was 37.17% for the EU and significantly higher average for all European countries, 44.6%. These calculations indicate that Spain suffers significantly less deaths from heart disease, compared to the European average. If less people are dying from IHD and other CVDs, this means that less stress and better heart health could be a major factor as to why Spain's life expectancy is much higher than similar European countries.

Smoking

Another area of concern outlined by the European Heart Network (EHD) is the trend in smoking, a common social habit for men and women in Spain, starting as early as the age of fifteen. According to Wilkins et al., (2017), smoking rates are decreasing throughout the majority of Europe, but the rate of decline has slowed, especially among women (p.9). On a more positive note, Spain saw decreases in the prevalence of smoking among males and females from 2001 to 2014 (pp.120-121). As a contributor to the European Heart Network (EHD), Wilkins et al. found that in 2001, 39.2% men and 24.6% of females above the age of fifteen smoked. Fast forward thirteen years, and the same study found decreases in smoke rates: 21.8% of men and 18.6% of women (p.23). These findings are encouraging for Spain, because of the adverse health threats smoking and second-hand smoke has on a population.

As outlined by the EHD, "tobacco smoking is an important modifiable risk factor for a number of diseases and the most common cause of premature death in Europe" (p.120), therefore the reduction of smoking decreases cases of CVDs, lung cancer, and improves the overall health of citizens. This could be another factor that is improving life expectancy in Spain.

Climate

Every country on earth experiences a variation in climate due to their geographic location. Not to be confused, NASA describes “the difference between weather and climate is a measure of time. Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time” (NASA, 2005, para. 1). Therefore, by examining Spain’s climate, one may provide another answer as to what makes the country unique. Madrid, the capital of Spain, has a geographic location of 40° 25' N, 3° 42' W, roughly the same latitude as New York for reference. Spain experiences “a Mediterranean climate, characterized by hot, dry summers and mild, rainy winters,” (“Weather Online,” 2019, para.1) making it one of the warmest countries in Europe. A study by Moore (n.d.) of Stanford University explored the relationship between life, death, and climate. By analyzing death rates from 89 counties in the United States, the statistical evidence found “that warmer weather cut death rates, not only in Washington but throughout the country” (Weather Heats Up, Deaths Drop section, para. 1). Moreover, they found an increase of 2.5°C in the United States could decrease morality by 40,000 people annually (Weather Heats Up, Deaths Drop section, para. 6). Likewise, Bentham, a researcher from the United Kingdom, found similar results. His research estimated “that an increase of 3°C would reduce mortality in a population of 50 million by 17,500” (Bentham, 1997, as citied in Moore, n.d, Further Confirmation section, para 1). These remarkable findings indicate that warmer climates reduce morality, and therefore, in the long run would increase life expectancy. Thus, an inference can be made that there is a connection between Spain’s high life expectancy and warm climate.

Education

There is a commonality between increases in education levels and life expectancy. New generations are achieving higher levels of education than their parents, because it is becoming a requirement for more jobs to obtain an education beyond high school. Martin, Domínguez- Rodríguez, & Bacigalupe (2019) conducted a study comparing life expectancy, morality rates and level of education in Spain. Their findings concluded that after the age of sixty-five: “life expectancy increased as the level of education increased, from 18.2 years in men and 22.4 in women with primary education to 20.4 years in men and 24.7 in women with university studies” (Results section, para. 8). These staggering results reaffirm the notion that education and life expectancy are in fact related. To further explore this theory, education among Spaniards since 1970 has been explored. Roser & Oritz- Ospina (2019) found that the percentage of the Spanish population over 25, with a secondary education has increased from 3.55% in 1970 to 41.72% in 2010 (see table 8). Secondary education in Spain is equivalent to high school in Canada, the stage after compulsory education. Moreover, this dramatic increase in education levels in Spain also follows patterns of life expectancy. Therefore, improving education is another factor to explain how Spain will become the country with the highest life expectancy.

Diet

The last factor to mention that makes Spain unique is their diet. Spain is characterized by a Mediterranean diet: “which includes olive oil, vegetables, nuts and fruits; moderate amounts of fish, wine and dairy products; and low consumption of non-fish meat.” (Johnson, 2019, para. 5). Spain is known for dishes such as Paella, Tortilla Espanola, Jamón Ibérico, and of course Tapas. In February of 2019, Bloomberg released its annual ‘Global Health Index’ (see table 9). This index ranks countries primarily on environmental factors and eating habits. Spain came out as the healthiest nation, with a score of 92.8/100, largely due to their healthy diet. In comparison, the United States ranked 35th, due to their high consumption of fast food. In addition, table 10 and table 11 illustrate how on average Spain has higher

consumption of fruits (72-98kg person/year) and vegetables (111-141kg person/year) compared to other European countries (Wilkins et al., 2017, p. 106). In summary, Spain's Mediterranean diet, and high consumption of fruits and vegetables helps to explain the connection between the nation's health and their increasing life span.

SOCIO ECONOMIC COSTS AND COMPLICATIONS

Pensions

As a result of life expectancy increasing globally, governments and businesses have been faced with a challenge regarding pensions and are changing policies and redefining 'pensionable age'. The Organization for Economic Cooperation and Development (OECD) finds that "by 2050, the average pensionable age in OECD countries will reach nearly 65 for both sexes: an increase of nearly 2.5 years for men and 4 years for women on 2010" (OECD, 2017, p. 19). Not only is pensionable age: "the age at which people can first draw full benefits" (p. 20) being reformed, but also the duration of benefits included in the pension. For example, France has recently updated pension policies to increase the number of coverage years from 37.5 years to 40 years in 2008 and 41 years in 2012 (p. 21). Similar legislation has been imposed in Turkey (p.21). However, the problem still exists that legislation and government policies are not keeping up with the changes in life expectancy. In the case of Spain, there have been no significant reforms in pensionable age since 1949 and is not expected to any changes in the foreseeable future for men or women (see table 12 & 13).

Like most European countries, Spain has a public pension system available to citizens who have contributed a minimum of fifteen years of work to receive partial benefits and 38.5 years for full benefits (OECD, 2017, Qualifying Conditions section, para. 1). Pensions are a complicated issue for many individuals, not just in Spain. People spend decades planning and saving for a comfortable retirement, which is why Spain's social security program attempts to support individuals in their decisions by founding the program on "universality, unity, solidarity and equality" (Camino, Raull & González, 2014, p.121). It is considered a 'pay as you go system', which depends on contributions from two separate areas: employees and employers, and from taxes (p. 121). The problem Spain faces in terms of growing life expectancy, is that "the number of pensioners will grow from nine million today to 15 million in 2050" (Doménech & Díaz, 2013, para 1). This is a dramatic increase, which has forced Spain and many countries around the world to link pensions to life expectancy. In the case of Spain, they introduced the 'Sustainability Factor' to public pensions. Commencing in 2019, the Sustainability Factor is an "adjustment tool" that "takes into account the growth of the life expectancy of the new pensioners" (Camino, Raull & González, 2014, p.125). The creation of the Sustainability Factor is an example of how pensions are becoming more complicated and more variables, including life expectancy, need to be considered.

Pensions are a complex, and fraught with risk, due to liability on all parties and because they are considered "long-term contracts" (Whitehouse, 2007, p. 4). For this reason, Whitehouse outlines five types of risks that affect pension systems: myopia, social and labour- market, purchasing- power, policy, and investment (p.4). As life expectancy continues to grow, individuals experience more risk depending on their country of origin and the type of retirement contribution plan. To account for this risk, new types of pension reforms associated with life expectancy have been created: Defined Contribution, Notional Accounts, Benefit Levels, and Qualifying Conditions (pp. 15-16). As of 2007, 13 out of 30 OECD countries (Australia, Hungary, Norway, Poland, Mexico, Slovak Republic, Sweden, Portugal, Italy, Finland Germany, Denmark and France), had implemented at least one of these pension reforms (see table 14). Now that

Spain is in the process of implementing the Sustainability Factor, their pension system will also be linked to life expectancy.

Healthcare

Spain's healthcare system is experiencing more patients and medical cases than ever before, due to the aging population and increasing life expectancy. The pressure on the medical systems is resulting in higher expenditure and usage of resources. It is a common understanding that the older people become, the more dependant they are on health services; such as doctors, hospitals and prescription drugs. The global increase in life expectancy is primarily due to the improvements and developments of medicine, diagnosis, and drugs. Now, the human body is dependent on healthcare systems to outlive previous generations. For instance, in 2017 it was found that in Spain "almost 80% of the consumption of health resources occurs in individuals above 65 years old" (Avanzas, Pascual & Moris, 2017, Demand and Use of Services section, para.1). Spain is known for having one of the best public health systems in the world, as all citizens have access to the Spanish National Health System (SNS). In 1986, the General Healthcare Act was implemented, which "guarantees universal coverage and free healthcare access to all Spanish nationals, regardless of economic situation or participation in the social security network" ("Overview of the Spanish Healthcare System," 2010, para. 1). This is crucial for most Spaniards, because the average cost for a trip to the emergency room is 200 Euros ("Healthcare in Spain," 2017, Quick facts on the Healthcare System in Spain section, para. 1). Similar to Canada, Spain's healthcare system is primarily funded through taxation ("Overview of the Spanish Healthcare System," 2010, Funding the System section, para. 1). To put the impact Spain's healthcare system has on their economy into perspective, the "total healthcare expenditure amounts to 88,828 million euro, which accounts for 8.5 percent of the GDP" (Funding the System section, para. 1). Evidently, the healthcare system in Spain accounts for a large portion of taxes and is a service that is requiring more attention and resources, especially with an aging demographic. To demonstrate the strain on Spain's health care system compared to other countries in Europe, in 2017, Spain had 7.5 visits to the doctor per capita per year, compared to Sweden which had an average of 2.9. (Avanzas, Pascual & Moris, 2017, Demand and Use of Services section, para. 1). This proves that as life expectancy continues to grow, so will the demand and use of the health care system.

GDP and Unemployment Rate

By focusing on Spain's economy, GDP and unemployment rates, it provides insights on the everyday lives of Spanish workers and the setting for commerce in the country. In 2017, Spain accounted for 9.1% of the European Union's (EU) population but only 7.6% of the EU's GDP (Eurostat, 2017, p.1; Eurostat 2018, para. 2). This could be due to Spain's consistent high levels of unemployment for the past decade.

Table 15 shows how Spain's unemployment rate has been significantly higher than the EU average since 2013. In July of 2019, the EU reported an average unemployment rate of 6.3%, where as Spain had 14.02%. Ever since the financial crisis of 2008, Spain's unemployment rate has not been able to reach a level below 13%. At the peak of Spain's economic crisis in 2012, unemployment rates reached an astounding 26% (see table 15). According to Eavis 2016, this is largely to do with the fact that almost one third of Spain's workforce was on temporary contracts prior to the financial crisis, and they were the easiest to lay off following the downturn in the economy (para. 8). In addition, the unemployment rate among Spanish youth (below the age of 25) was 45.5% in 2016 (para. 5). Perhaps a reason behind the astoundingly high youth unemployment rate is that people are living longer and retiring later, resulting in less demand for new hires. In the past, it was a common practice to have one job with one employer for the duration a career. This has drastically changed, and it is becoming more common for people to change careers and

advance their education throughout their lifetime. This concept of changes in the work cycle and a longer career are considerations managers should consider when addressing organizational policies.

COMPARISONS WITH CANADA

History of Life Expectancy

As of 2019, Canada had the 17th highest life expectancy in the world at 82.4 years, compared to Spain with 83.5 years ("Life Expectancy by Country," 2019). It is important to note that 1.1 years is a significant difference in terms of life expectancy. By comparing life expectancy factors between the two nations, a more comprehensive understanding can be made regarding life expectancy determinants and explain a theory behind the difference. For further analysis, table 16 analyzes life expectancy rates between Canada and Spain from 1960 until 2017. From this graph there are three notable time periods. The first from 1960 until 1975. During this fifteen-year span, Canada had a higher life expectancy than Spain by approximately two years. Statistics Canada (2014) attributes life expectancy increases in Canada from 1951 onwards to reduced number of deaths from circulatory diseases (p.6). Then, from approximately 1975 until 2005, Spain and Canada's life expectancy were very consistent with each other and had little differentiation. Lastly, the most recent period from 2005 to 2017 is when Spain's life expectancy surpassed Canada's. The reasoning behind Spain's dramatic increase in life expectancy since 2005 can be attributed to numerous factors such as diet, levels of stress, and climate, as previously discussed.

Climate

Being the second largest country in the world, Canada has a massive spread of land, with different cultures and ways of life throughout the country. This notion of having an immense area of land impacts life expectancy more than one would expect. Nichols (2013) examined life expectancy throughout different regions in Canada, particularly the north versus the south. Canada is organized by 136 health regions, and the "findings paint a gloomy picture of life and death in the North - particularly in areas with large aboriginal populations" (para 2). This is thought to be contributed to high cancer rates, respiratory diseases, and suicide in these areas (paras. 5- 6). Another area to consider is the climate in the north. These northern regions of Canada have short summers, and long, dark, dismal winters with temperatures well below freezing. To compare the climate between Spain and Canada, table 17 illustrates the average day time temperatures in the region's capitals. Although temperatures fluctuate in different areas of the country, this data provides a brief glimpse at the country's capital, where a large portion of the population resides. It is clear Spain has a much warmer climate, and very rarely would see temperatures below freezing. As previously discussed, a warmer climate is linked to longer life expectancy, which could be a factor in the discrepancy between rates in the northern and southern parts of Canada, as well as between Spain and Canada.

Diet

Unlike Spain, Canadians do not have a unique diet, one that is exclusive to the country. Canada's diet is a combination of a European and western diet "with a heavy focus on processed grain and dairy products, farm-grown beef and chicken, certain cooked or fresh fruits and vegetables, and questionable amounts of salt and sugar" (The Canada Guide, 2019, Canadian Foods section, para 1). There is no doubt that high levels of sugar, fats, and processed foods contribute to obesity and other major health issues such as diabetes, cancers, and CVDs, which cause premature death. In 2015, the average of obese adults in OECD countries was 19.5% (OECD, 2017, p. 3). Spain was below the average at 16.7%, and Canada was well

above at 25.8% (p. 3). The higher rates of obesity in Canada can likely be attributed to similarities in diet with the United States: high consumption of fast food and sugary soft drinks.

Overall, it is difficult and nearly impossible to pinpoint one reason behind Canada's lower life expectancy, but climate and diet are two factors that should be weighted heavily. Obviously, climate is not something everyday individuals can control, but diet is. If Canadians want to see an increase in life expectancy, diet is an area with room for improvement.

As seen in table 14, Canada has not incorporated Defined Contribution, Notional Accounts, Benefit Levels, or Qualifying Conditions into their public pension system. These four methods are ways other OECD countries are linking life expectancy to pensions. This is something from a Government's perspective to consider when updating public pension policies, because in the future, life expectancy is likely to increase.

CONCLUSION

From a manager's point of view, increasing life expectancy is an area that should be highlighted, and given more thought. If people are living longer, benefits, retirement age, and pensions will be impacted. There are many factors that contribute to life expectancy forecasts, but by focusing on what makes a country unique, it helps provide insights. For the case of Spain, healthy diet, a public health system, lower levels of stress, and a warmer climate have made a great contribution to high life expectancy. More times than not, governing bodies disregard life expectancy because of the slow incremental changes overtime. Evidently, changes in life expectancy rates have social, political and economic implications on a country's resources, services and commerce. Therefore, nations who adapt and prepare for these changes will be better equipped to cope with the challenges associated with life expectancy and aging population.

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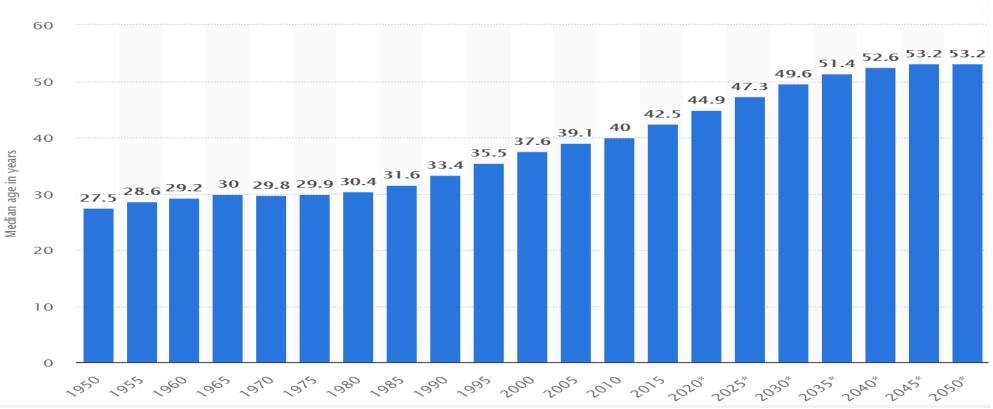
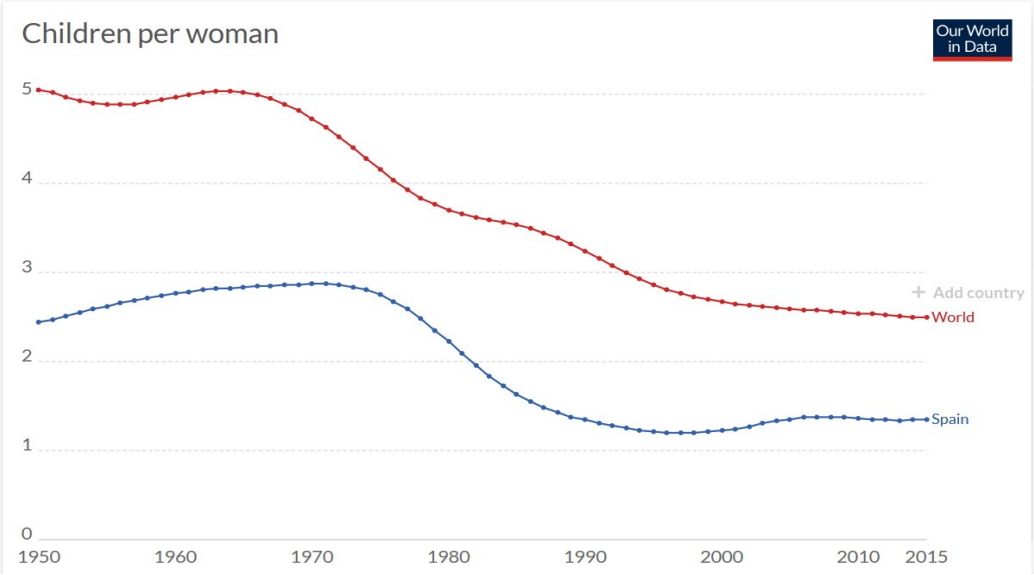
APPENDIX

Table 1: Spain: Median age of the population from 1950 to 2050 *(in years).*



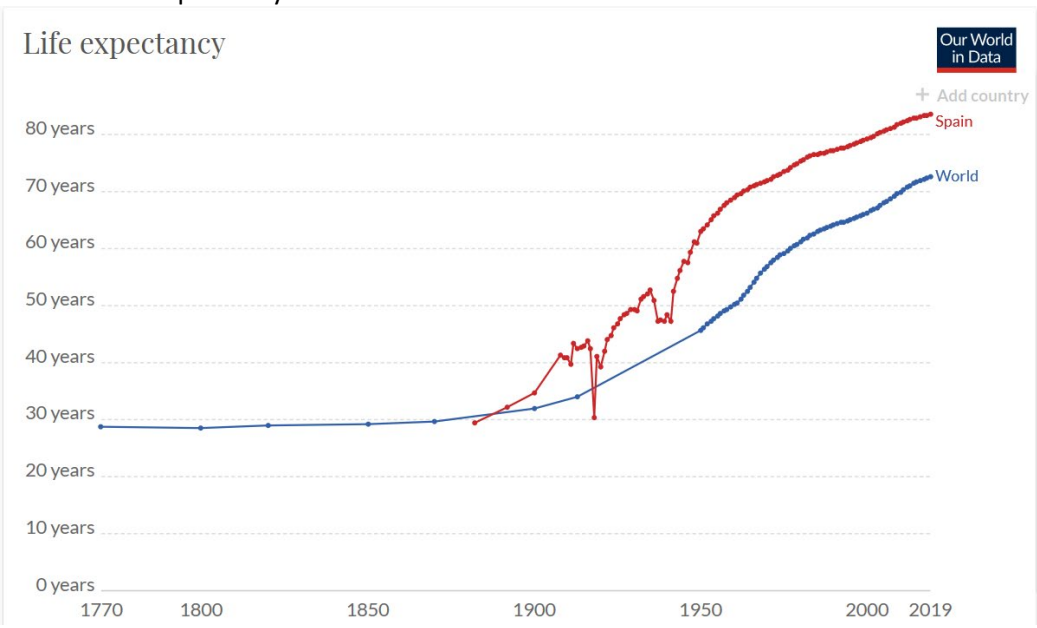
(Statista, 2019)

Table 2: Children per woman.



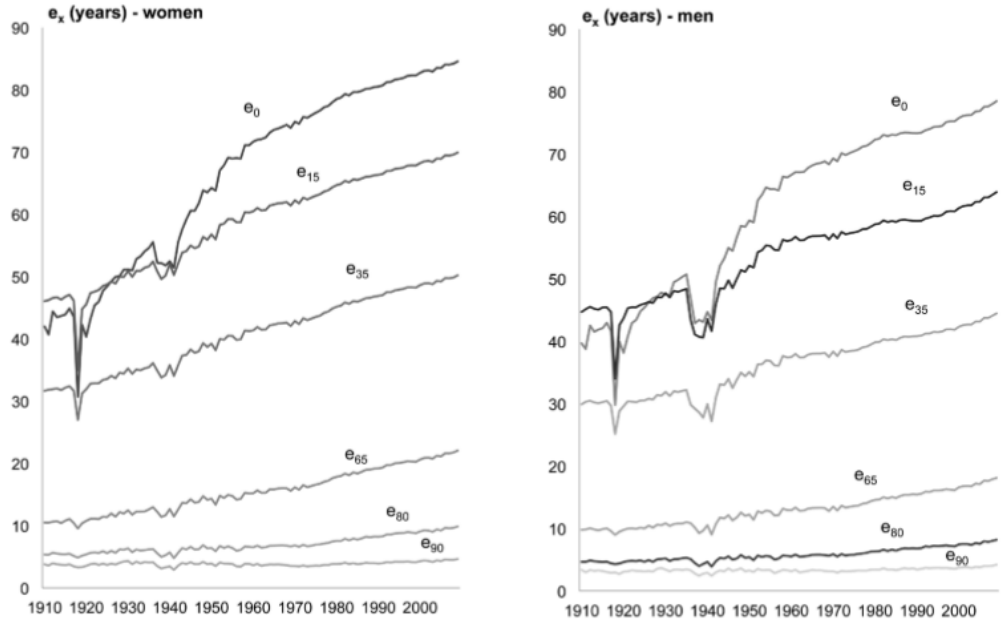
(Roser, 2017)

Table 3: Life Expectancy



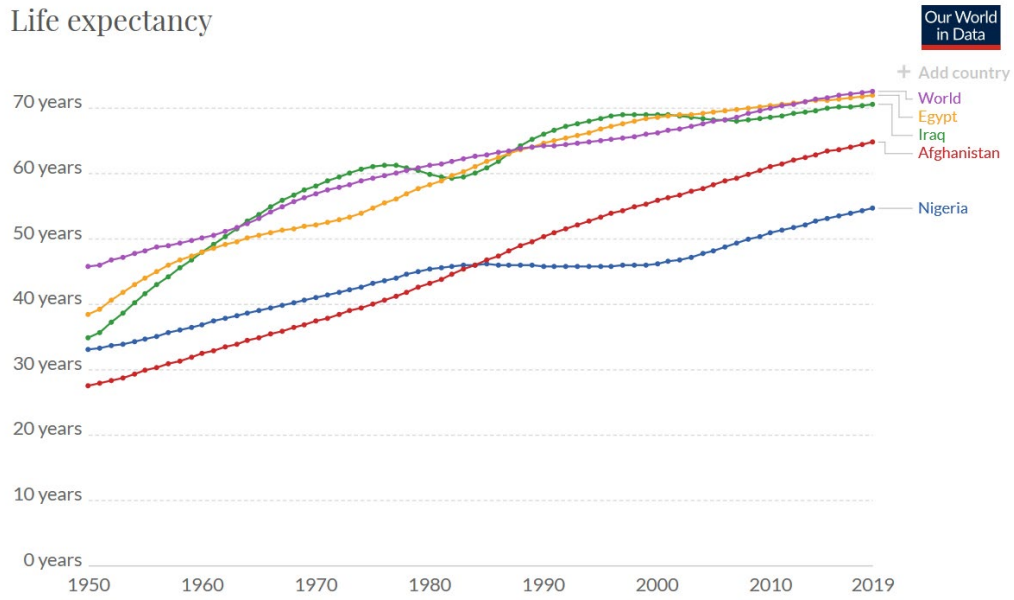
(Roser, 2019)

Table 4: Life expectancy at birth by sex at age 15, 35, 65, 80 and 90. 1910-2009.



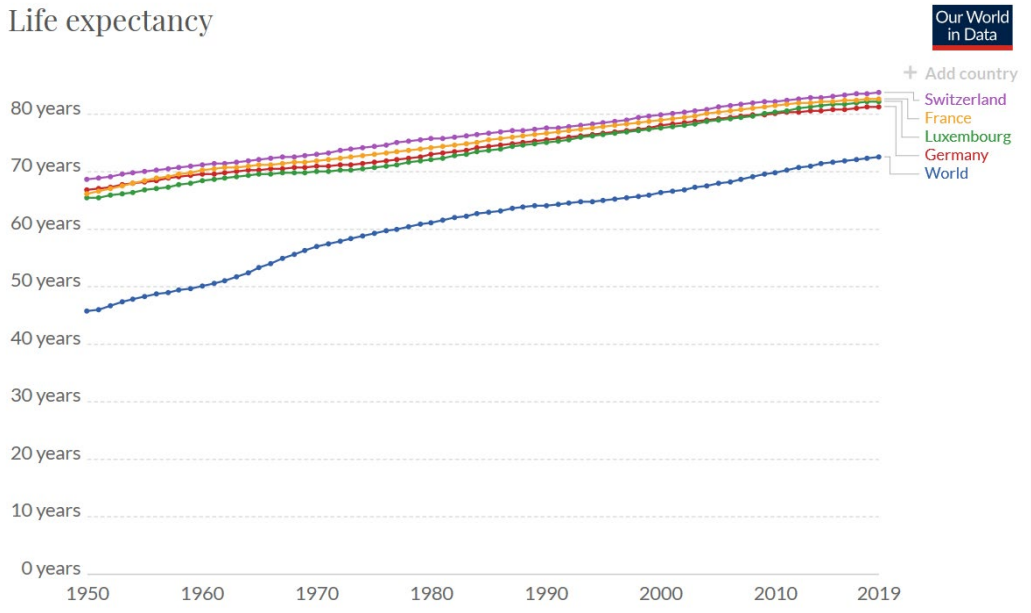
(Human Morality Database, n.d, as cited in González, 2014)

Table 5: Life Expectancy in Egypt, Iraq, Afghanistan, Nigeria



(Riley, 2005; Infra, (2015); UN Population Division, 2019; as cited in Roser, et. al., 2019)

Table 6: Life Expectancy in Switzerland, France, Luxemburg, Germany



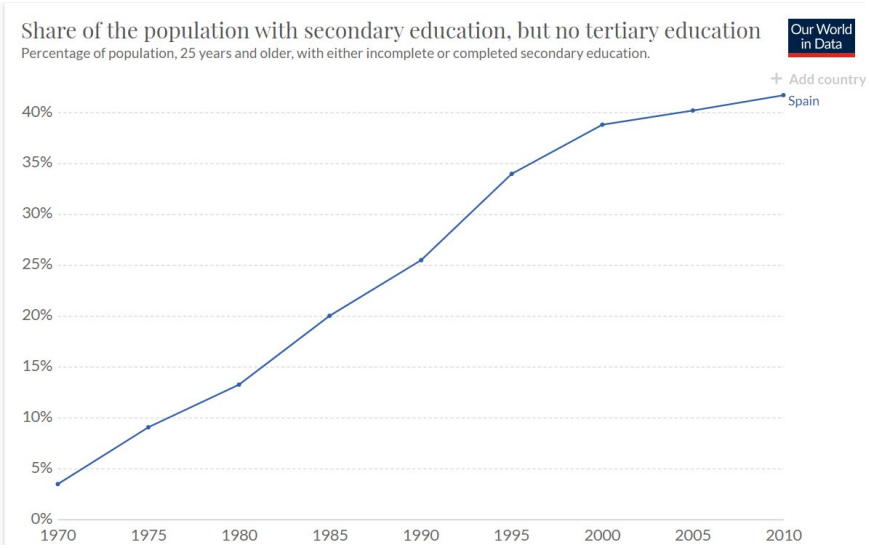
(Riley, 2005; Infra, (2015); UN Population Division, 2019; as cited in Roser, et. al., 2019)

Table 7: Number of deaths from Cardiovascular Diseases

	Spain		EU		Europe	
	Male	Female	Male	Female	Male	Female
# of Deaths by IHD	19,510	13,573	335,517	297,411	862,219	877,216
# of Deaths by Stroke	11,647	16,071	176,504	249,539	405,415	583,158
# of Deaths by other CVD	23,098	34,434	331,854	457,649	535,495	677,162
Total # of Deaths by CVD	54,255	64,078	843,875	1,004,599	1,803,129	2,137,536
Total # of Deaths (All Causes)	203,028	194,898	2,471,355	2,499,396	4,475,990	4,370,306
% of deaths by CVD	26.72%	32.88%	34.15%	40.19%	40.28%	48.91%
Avg % of deaths by CVD (male and female)	29.80%		37.17%		44.60%	

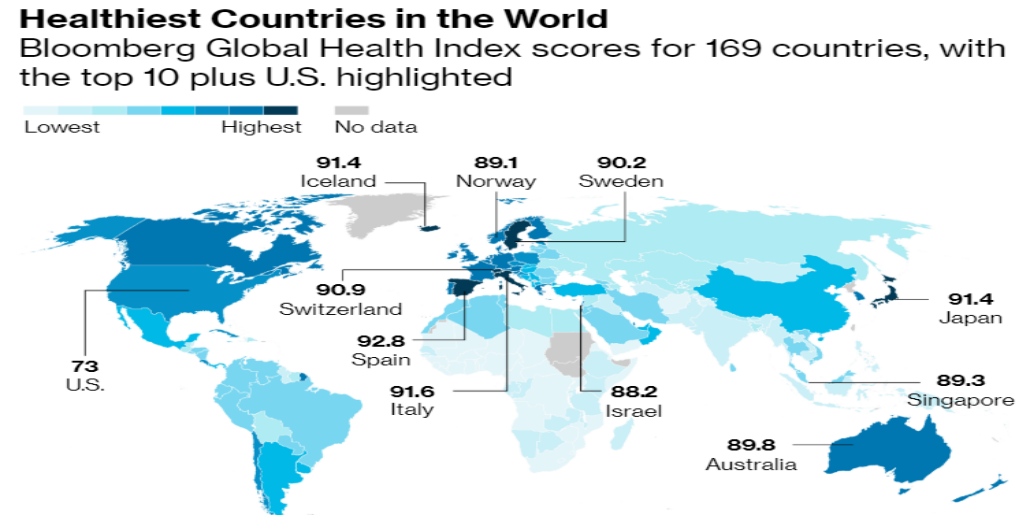
(Adapted from Wilkins et al., 2017)

Table 8



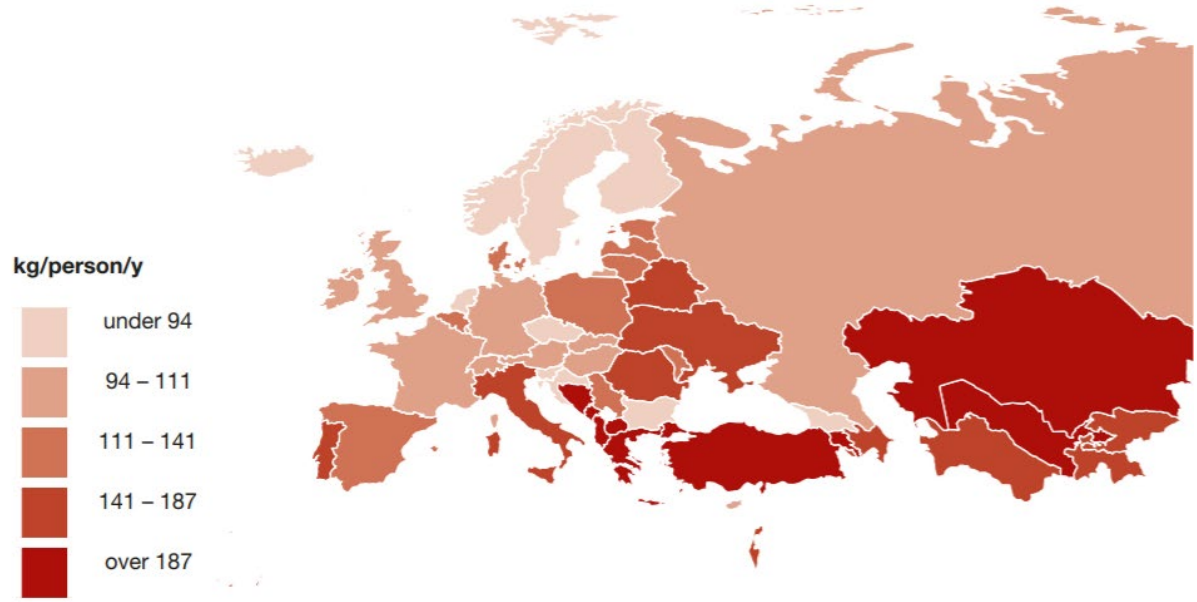
(World Bank, 2017, as cited in Roser & Ortiz-Ospina, 2019)

Table 9



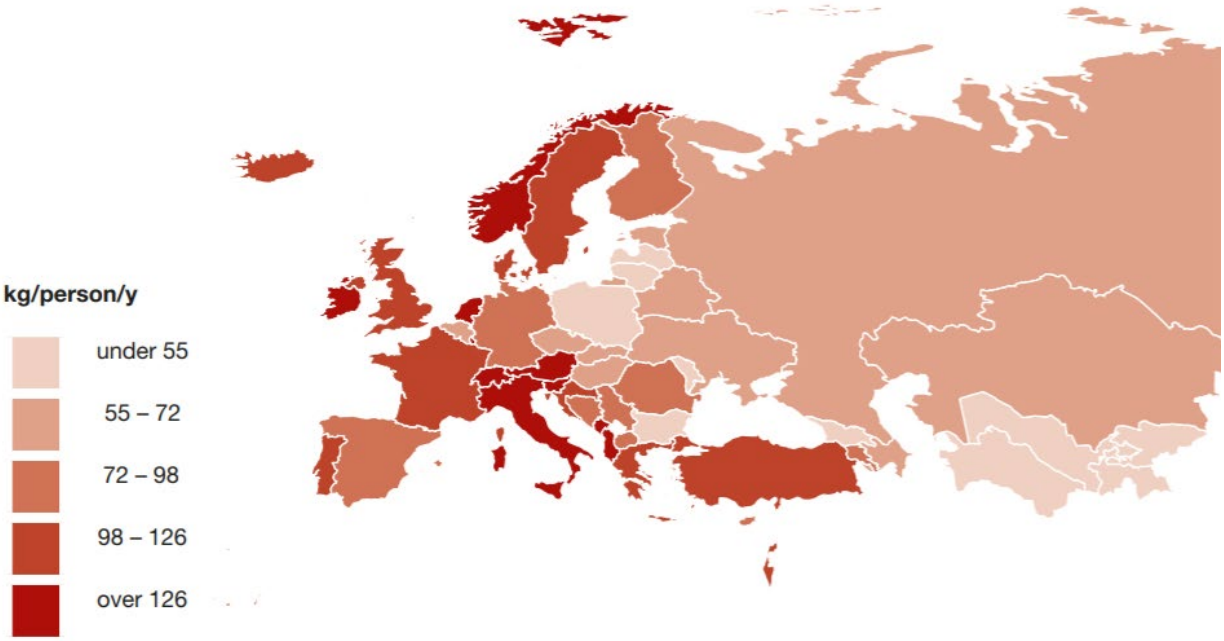
(WHO, 2019, UN Population Division, 2019, World Bank, 2019, as cited in Miller & Lu, 2019)

Table 10: Vegetable consumption kg/person/year, 2011, Europe



(Wilkins et al., 2017)

Table 11: Fruit Consumption kg/person/year, 2011, Europe



(Wilkins et al., 2017)

Table 12: Men's pensionable age in OECD countries, 1949-2050

	1949	1958	1971	1983	1989	1993	1999	2002	2010	2020	2030	2040	2050
Australia	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	67.0	67.0
Austria	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Belgium	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Canada	70.0	69.0	68.0	67.0	66.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Czech Republic		60.0	60.0	60.0	60.0	60.0	60.0	60.5	61.0	62.2	63.5	65.0	65.0
Denmark	65.0	65.0	67.0	67.0	67.0	67.0	67.0	67.0	65.0	65.0	67.0	67.0	67.0
Finland		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
France		65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.5	61.0	61.0	61.0	61.0
Germany	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.5	65.0	65.0	65.0	65.0	65.0
Greece	55.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	60.0	60.0	60.0	60.0
Hungary	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	64.5	65.0	65.0	65.0
Iceland		67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Ireland	70.0	70.0	70.0	70.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Italy	60.0	60.0	60.0	55.0	55.0	55.0	55.0	57.0	59.0	61.0	65.0	65.0	65.0
Japan		60.0	60.0	60.0	60.0	60.0	60.0	61.0	64.0	65.0	65.0	65.0	65.0
Korea						60.0	60.0	60.0	60.0	60.0	62.0	64.0	65.0
Luxembourg	65.0	65.0	65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Mexico		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Netherlands	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
New Zealand	65.0	60.0	60.0	60.0	60.0	60.0	61.1	64.1	65.0	65.0	65.0	65.0	65.0
Norway	70.0	70.0	70.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Poland	60.0	60.0	60.0	60.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Portugal	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Slovak Republic		60.0	60.0	60.0	60.0	60.0	60.0	60.0	62.0	62.0	62.0	62.0	62.0
Spain	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Sweden	67.0	67.0	67.0	67.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Switzerland		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Turkey			60.0	45.0	45.0	45.0	45.0	44.0	44.9	48.6	53.1	57.7	62.3
United Kingdom	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	67.0	68.0
United States	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	66.0	67.0	67.0	67.0
Average	**64.3**	**63.9**	**63.8**	**62.9**	**62.7**	**62.4**	**62.4**	**62.6**	**62.9**	**63.5**	**64.1**	**64.4**	**64.6**

(OECD, 2011)

Table 13: Women's pensionable age in OECD countries, 1949-2050

	1949	1958	1971	1983	1989	1993	1999	2002	2010	2020	2030	2040	2050
Australia	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**61.0**	**62.0**	**64.0**	66.0	67.0	67.0
Austria	65.0	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**63.0**	65.0	65.0
Belgium	**55.0**	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Canada	70.0	69.0	68.0	67.0	66.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Czech Republic		60.0	**55.0**	**57.0**	**57.0**	**57.0**	**57.0**	**58.0**	**58.7**	**60.7**	**63.3**	65.0	65.0
Denmark	65.0	**60.0**	**62.0**	**62.0**	**62.0**	67.0	67.0	67.0	65.0	65.0	67.0	67.0	67.0
Finland		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
France		65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.5	61.0	61.0	61.0	61.0
Germany	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.5**	65.0	65.0	65.0	65.0	65.0
Greece	55.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	60.0	60.0	60.0	60.0
Hungary	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**59.0**	64.5	65.0	65.0	65.0
Iceland		67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Ireland	70.0	70.0	70.0	70.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Italy	**55.0**	**55.0**	**55.0**	55.0	55.0	55.0	55.0	57.0	59.0	61.0	65.0	65.0	65.0
Japan		**55.0**	**55.0**	**55.0**	**56.0**	**58.0**	**60.0**	**60.0**	**62.0**	65.0	65.0	65.0	65.0
Korea						60.0	60.0	60.0	60.0	60.0	62.0	64.0	65.0
Luxembourg	65.0	65.0	65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Mexico		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Netherlands	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
New Zealand	65.0	60.0	60.0	60.0	60.0	60.0	61.1	64.1	65.0	65.0	65.0	65.0	65.0
Norway	70.0	70.0	70.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Poland	60.0	60.0	60.0	60.0	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**
Portugal	65.0	65.0	65.0	65.0	**62.0**	**62.0**	**62.0**	65.0	65.0	65.0	65.0	65.0	65.0
Slovak Republic		60.0	**55.0**	**57.0**	**57.0**	**57.0**	**57.0**	**57.0**	**57.0**	62.0	62.0	62.0	62.0
Spain	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Sweden	67.0	67.0	67.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Switzerland		**60.0**	**60.0**	**60.0**	**62.0**	**62.0**	**62.0**	**62.0**	**63.0**	**64.0**	**64.0**	**64.0**	**64.0**
Turkey			60.0	45.0	45.0	45.0	45.0	**40.0**	**41.0**	**45.2**	**50.4**	**55.6**	**60.8**
United Kingdom	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	65.0	66.0	67.0	68.0
United States	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	66.0	67.0	67.0	67.0
Average	**62.9**	**62.3**	**61.9**	**61.3**	**61.0**	**61.0**	**61.1**	**61.3**	**61.8**	**62.9**	**63.7**	**64.1**	**64.4**

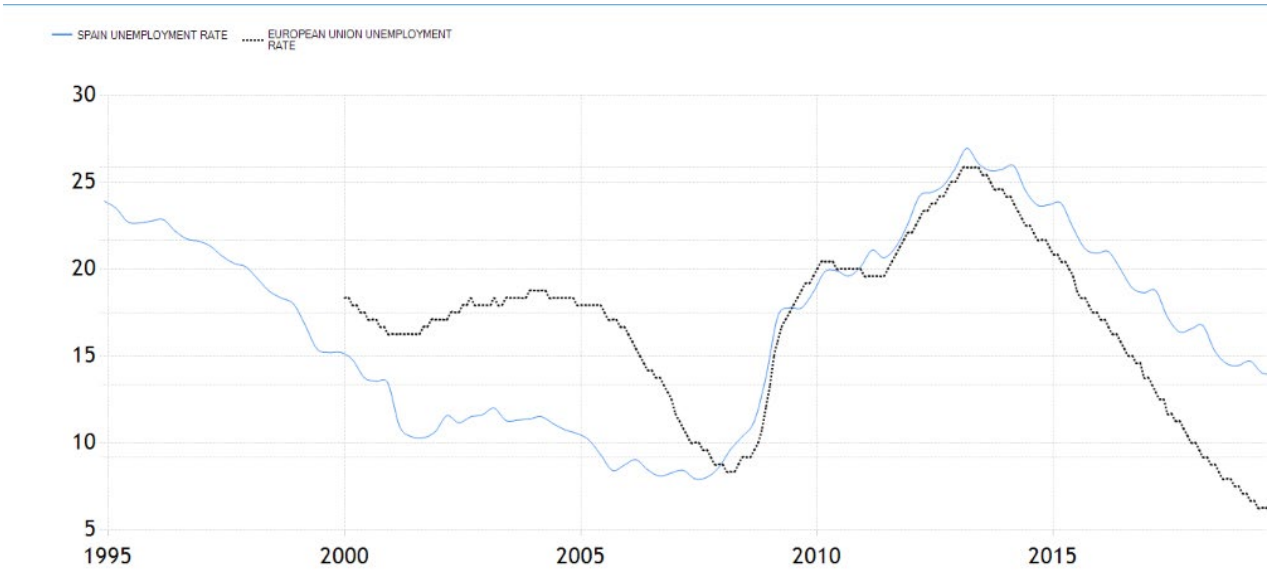
(OECD, 2011)

Table 14: How pensions depend on life expectancy. 17 OECD Countries

	Defined contribution	Notional accounts	Benefit levels	Qualifying conditions
Australia	●			
Canada				
Denmark	●			●
Finland			●	
France				●
Germany			●	
Hungary	●			
Italy		●		
Japan				
Mexico	●			
Norway	●			
Poland	●	●		
Portugal			●	
Slovak Republic	●			
Sweden	●	●		
United Kingdom				
United States				

(OECD, 2007, as cited in Whitehouse, 2007)

Table 15: Unemployment rate % - Spain, European Union



(National Statistics Institute, 2019, as cited in Trading Economics, 2019)

Table 16: Life Expectancy at birth, total (years) – Spain, Canada

(World Bank, 2019)

Table 17: Average daytime temperatures for Madrid, Spain vs Ottawa, Canada

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Ottawa, Canada	-6.1 °C	-4.1 °C	2.2 °C	10.8 °C	19.1 °C	23.8 °C	26.5 °C	24.9 °C	19.5 °C	12.5 °C	4.8 °C	-3.0 °C	10.9 °C
Madrid, Spain	9.8 °C	12.0 °C	16.3 °C	18.2 °C	22.2 °C	28.2 °C	32.1 °C	31.3 °C	26.4 °C	19.4 °C	13.5 °C	10.0 °C	20.0 °C

(World Meteorological Organization, 2019, as cited in Weather Averages, 2019)