THREE DECADES OF MORTALITY AND SURVIVAL RATES OF THE BASQUE POPULATION.

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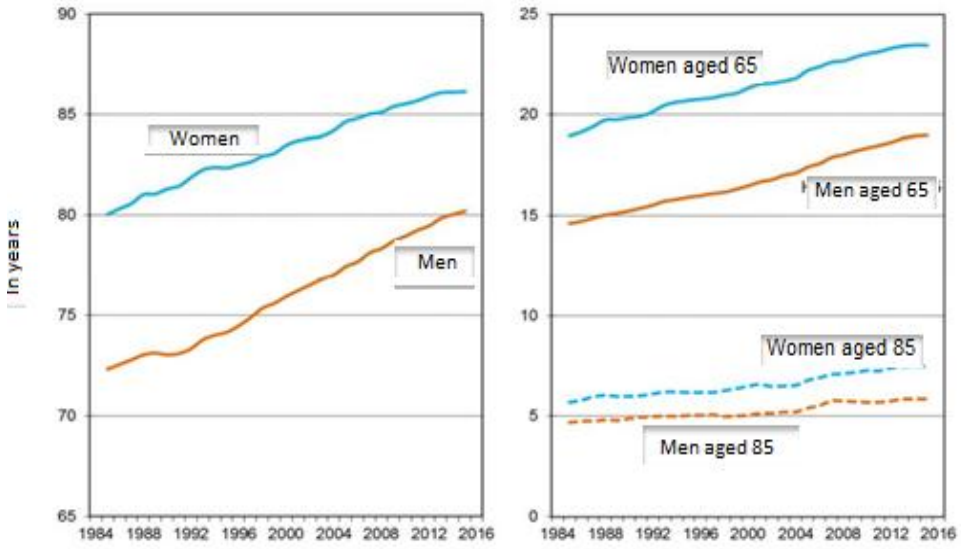
Lower mortality rates and advances in longevity are one of the main achievements of society as the life expectancies of its inhabitants have doubled over the last century. The long-term mortality trend is consistent with the conventional pattern of epidemiological transition, which is characterised by the gradual shift of the force of mortality from childhood and adolescence to mature and older age groups, by substituting an epidemiological pattern dominated by infectious and contagious diseases for another dominated by chronic degenerative diseases, and by shaping a picture of health in which morbidity and limitations replace mortality as the dominant force. Basque society is currently in the fourth phase of epidemiological transition, that of "degenerative diseases and society". Some of the features that characterise this phase are the shift in age at death, the concentration of life expectancy gains in increasingly older age groups, and the growing role of non-cardiovascular degenerative diseases, such as tumours and mental illnesses, as well as the impact of certain causes of death related to lifestyle and other social factors, such as accidents or certain cancers.

In recent decades, between 1984-86 and 2014-16, there have been further advances in the longevity of the Basque population, with an increase of nearly 8 years in life expectancy at birth in men and approximately 6 years in women or, in other words, on average, 0.26 years of life for men and 0.21 years of life for women have been added to each calendar year (Graph 1). More important has been the trend of survival rates among older people, with an increase in remaining life expectancy at age 65 of 30% in men and 24% in women over the same period. These life expectancy gains, although long overdue, have been transferred to older age groups, as can be seen in the increase in remaining life expectancy at age 85 and as we are beginning to see with the turn of the century in life expectancy at age 95. As a result, both expectations of surviving to an older age and the remaining life expectancy from that age have increased. For example, with the risk of dying in the three-year period 1984-86, 42% of women residing in the Basque Country would reach 85 years of age and would still have 5.7 more years to live, while with the mortality rate in the three-year period 2014-16, the survival rate would then stand at 67% and remaining life expectancy at 7.5 years.

Over the last three-year period, life expectancy at birth in the Basque Country was higher than that for Spain as a whole, particularly among women, with an increase in average lifespan of 0.5 years, while the increase among men stood closer to 0.2 years. The high survival rate of the female Basque population can also be seen in comparison to other regions in the European Union, as, according to Eurostat data, the Basque Country ranks as the sixth highest region in terms of life expectancy at birth in women.

Graph 1: Life expectancy trends at birth and in older age groups. Basque Country. At birth In older age groups



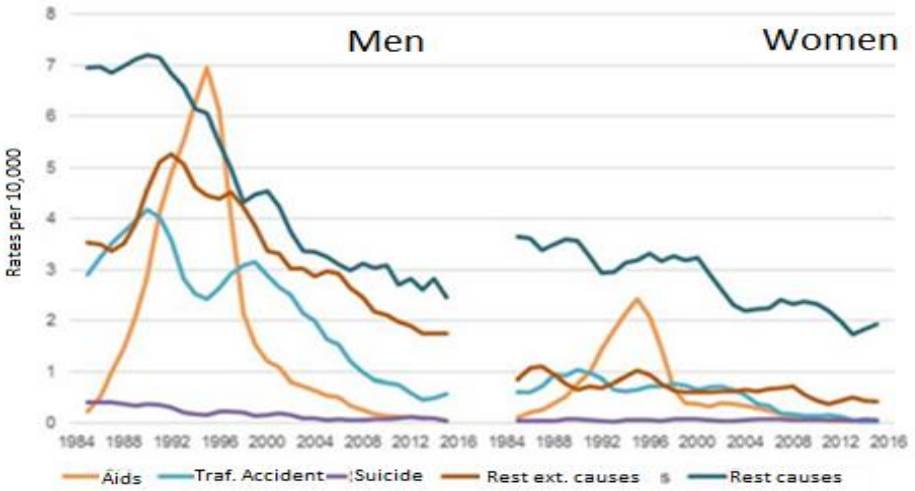
Note: three-year indicators focused on the reference year. Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

The upward trend of the Basque population survival rate has suffered downturns in certain periods and stages of life due to an increased risk of dying from causes of death linked to behaviour and lifestyles. Between the mid-1980s and the late 1990s, there was a rise in the mortality rate of the young adult population, particularly among men, due to traffic accidents, AIDS, causes related to drug consumption and other external causes, such as suicide (Graph 2). Measures aimed at eradicating factors contributing to road accidents, together with prevention campaigns and advances in AIDS treatment, led to the reversal of that trend in the second half of the 1990s, accelerating life expectancy gains as a result of recovering losses from the previous decade. Thus, in the first five-year period of the 1990s, the mortality rate of males aged between 20 and 39 years old exceeded 60 per 10,000 and the female rate exceeded 20 per 10,000, before falling back to the current rate of 10 and 5 per 10,000.

Another negative trend, which also relates to lifestyle, is the recent increase in female mortality due to bronchopulmonary tumours and other diseases associated with smoking, which has cut short the downward trend of the risk of dying in older women (Graph 3). This effect is linked to generation replacement and the arrival of women of that age with lifestyles, roles and life cycles more similar to those of their male peers than those of their previous cohorts. This generational component raises questions about what effect it will have in years to come on the rate of decline in mortality in older age groups. However, unlike what took place in other countries, where the increase in mortality due to these causes happened at an earlier stage, it can be assumed that the later acquisition of harmful habits, together with social awareness and prevention campaigns,

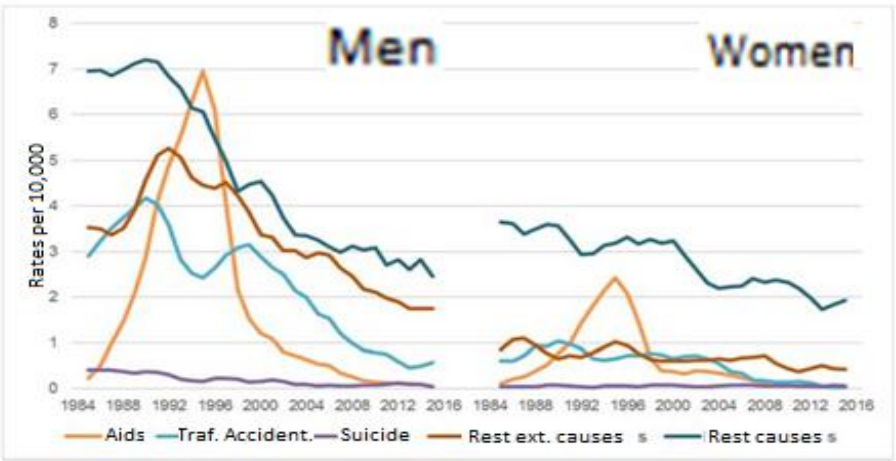
would circumscribe its impact to a smaller number of cohorts. While, at the same time, these people would benefit further from recent advances in diagnosis and medical treatments.

Graph 2: Trends in mortality by cause in the population aged between 20 and 39 years old. Basque Country



Note: three-year indicators focused on the reference year. Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

Graph 3: Trends in mortality by cause in the population aged between 50 and 64 years old. Basque Country.

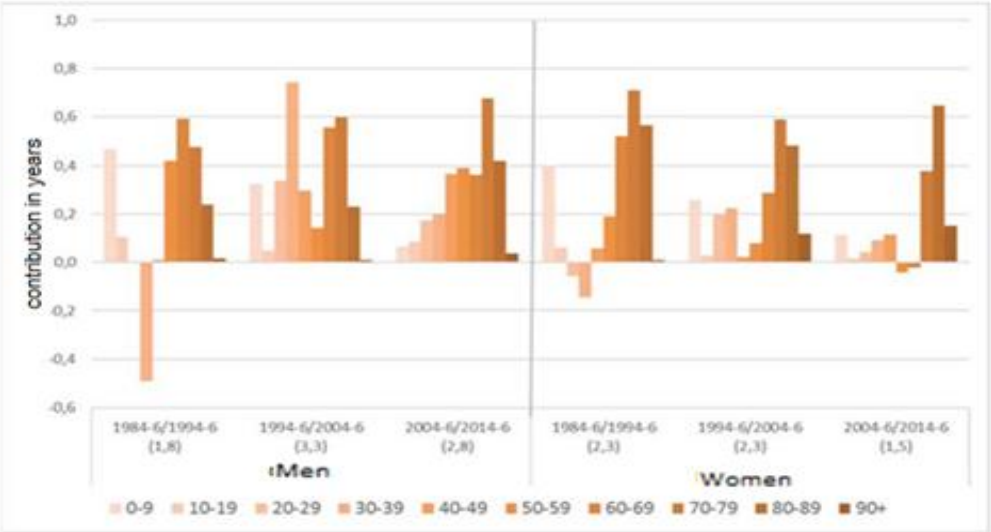


Note: three-year indicators focused on the reference year. Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

Life expectancy gains of the population are currently focused on the end of life as the margins for improvement in earlier ages have been exhausted to the extent that they have reached low levels of mortality (Graph 4). In the last three ten-year periods, the higher survival rate from 65 years old onwards has contributed 3.5 years to life expectancy at birth in men (44% of the total), while it has contributed 4.1 years to life expectancy at birth in women (68% of the total). The shift in life expectancy gains to increasingly older age groups can be seen in the last decade, when the decline in mortality from age 80 onwards replaced that of 65 to 79 years old as the main contributor to improvements in the average lifespan of the female Basque population, whereas the main contributors in men are still among the younger end of the older age group. A more detailed analysis shows the impact in terms of lifespan during the young adult mortality crisis at the start of the 1990s, particularly among the male population, with a loss of half a year of life between 1984-6 and 1994-6.

Further decreases in the risk of dying at those ages explains the acceleration in gains in life expectancy at birth in men over the following ten years as a result of recovering losses from the previous decade. In the last ten-year period, the negative effect of the increase in female mortality rates in older age groups on the lifespan of the population and the concentration of life expectancy gains in increasingly older age groups can be seen.

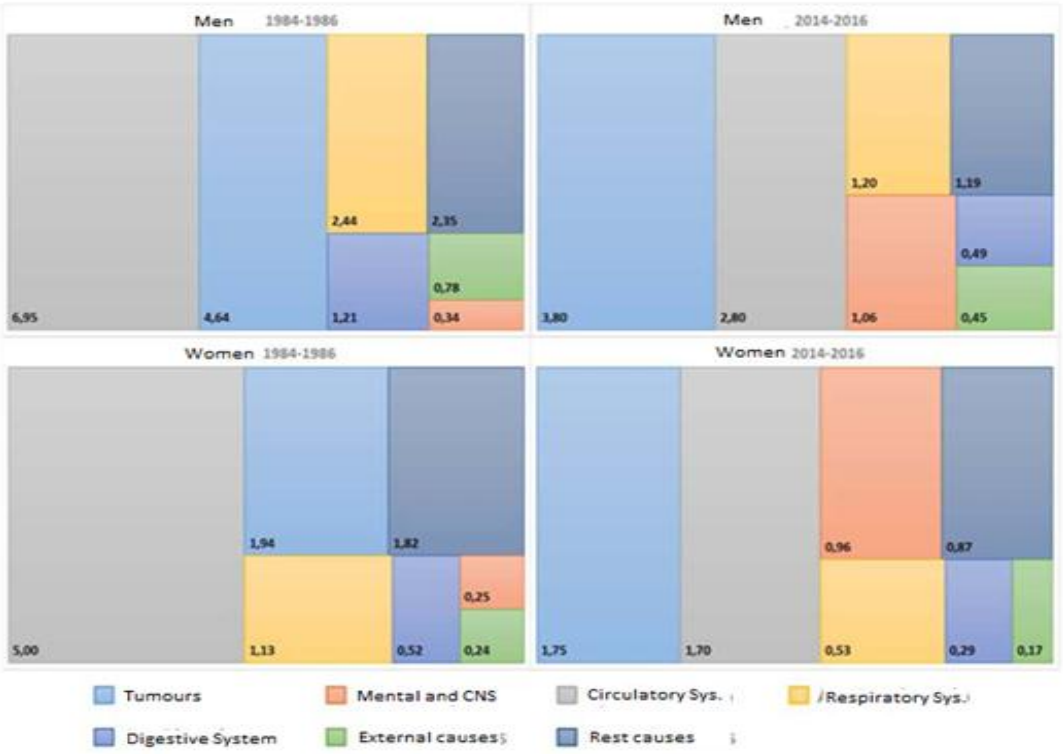
Graph 4: Contribution of age groups to the variation in life expectancy at birth by ten-year period. Basque Country.



Note: the figure in brackets is the gain in life expectancy at birth over the ten-year period. Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

The morbidity and mortality pattern of the population has continued to change as the downward trend of mortality due to diseases of the circulatory system continues, with a decrease in the standardised mortality rate for this group of causes of 60% in men and 66% in women over the last three decades, as a result of the synergy between health and social policies, advances in medical treatments, decreases in certain risk factors and behavioural changes. During this period, falls in mortality rates due to diseases of the digestive system and external causes, to a greater degree in men, and diseases of the respiratory system, to a greater degree in women, have also contributed to the increase in average lifespan. Trends in mortality as a whole due to tumours have been positive, although to a lesser degree, with a decrease of around 20% in men and 10% in women, replacing diseases of the circulatory system as the main cause of death in the population. On the other hand, the decrease in these causes of death and the shift in age at death are the source of the increasing weight on the morbidity and mortality pattern caused by diseases related to mental disorders and the central nervous system, particularly in women, which affect the quality of life of sufferers, their family and social environment, and health and care demand (Graph 5).

Graph 5: Standardised mortality rates by sex and groups of causes of death. Basque Country.

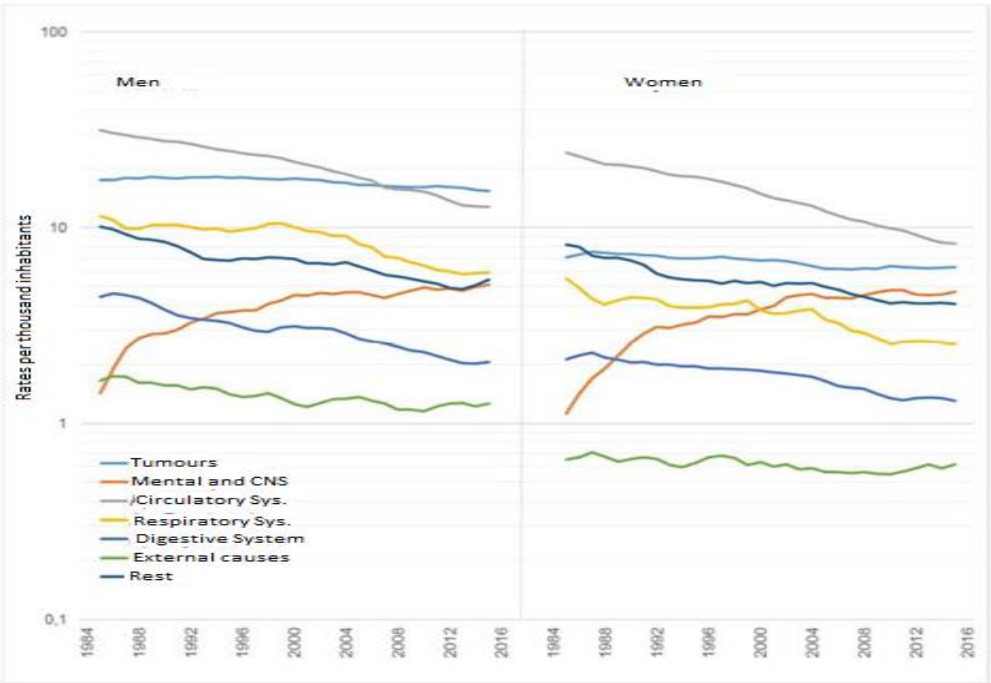


Note: standardised rates per thousand inhabitants using the European Standard Population 2013 as a typical population. Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

Over the coming decades, advances in life expectancies will depend on how certain risk factors such as smoking, obesity and diabetes evolve, which may slow the downward trend of mortality due to tumours and certain diseases of the circulatory and respiratory systems. They will also depend on the ability to deal with emerging causes of death in older age groups, as its evolution will depend on advances both in terms of quantity and quality of life. A decrease in the mortality of young people and adults will have a very modest impact on the longevity of the population, due to low levels of mortality already having been achieved in these age groups. Advances in life expectancy have been the result of successive decreases in the causes of death that dominated the morbidity and mortality pattern in each period. Therefore, as cardiovascular mortality continues to decrease, cancer control and the control of certain diseases of the respiratory system, especially affecting older age groups, will become key in achieving new advances in longevity. As such, the trend of the survival rate of older people in the Basque Country shows that the rate of decline in mortality due to causes linked to the circulatory system has been maintained in all older population groups, with a decrease of 60% in men and 66% in women, while the decrease in mortality rates caused by tumours has occurred to a lesser extent and in younger age groups, as it remains relatively stable among older people aged 85 and above (Graph 6).

In older age groups, diseases of the circulatory system remain the main cause of death, with mental illnesses and diseases of the nervous system becoming increasingly important, as they are now the second main cause of death among Basque women aged 85 and over, above tumours and diseases of the respiratory system.

Graph 6: Mortality rate trends by major groups of causes of death among the population aged 65 and over in recent decades. Basque Country.

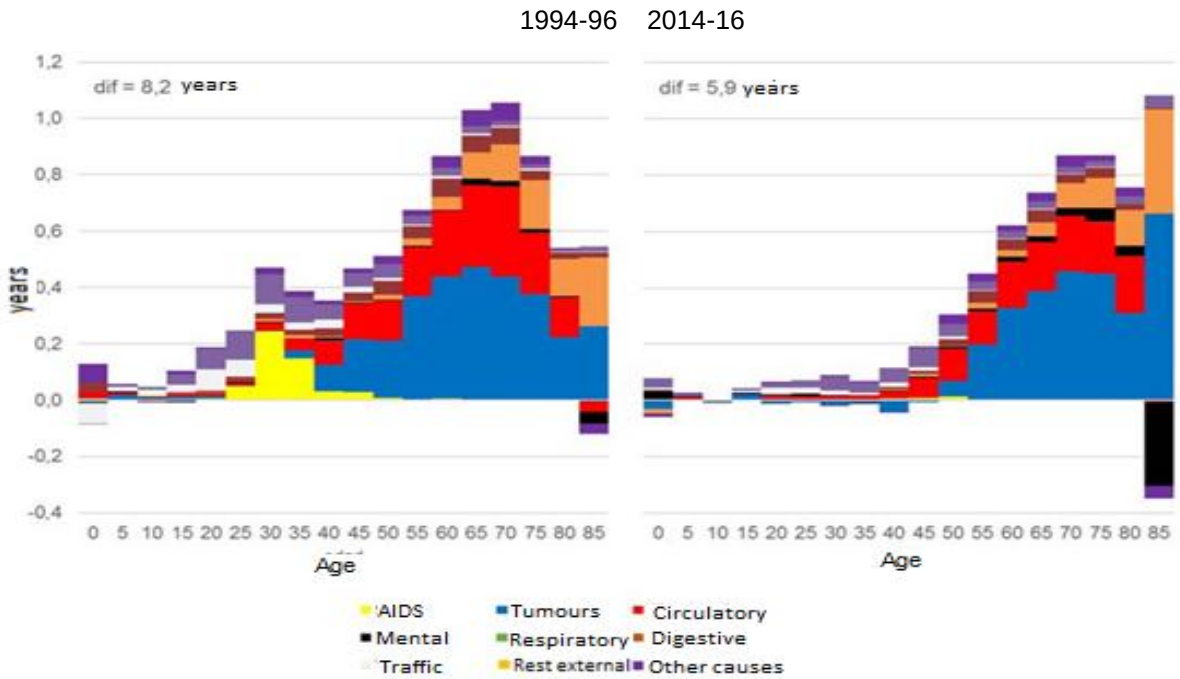


Note: standardised rates per thousand inhabitants using the European Standard Population 2013 as a typical population. Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

The difference in life expectancies between men and women has decreased in the most recent period and is concentrated in older age groups. From the 1960s onwards, inequalities in mortality between men and women intensified, with two forms of male excess mortality appearing: one in young adult age groups and another in mature and older age groups. The 1980s saw the start of an upward trend in life expectancy inequalities between sexes that led to highs of above 8.0-8.5 years in the first half of the 1990s. This period coincided with years of high mortality due to road accidents and AIDS, with the risk of dying for young adult Basque men double that of women. In the mid-1990s, higher mortality in males aged between 20 and 39 years old accounted for 1.3 years of the total difference in the average lifespan between sexes, 0.45 years of which are attributable to higher mortality due to AIDS and 0.56 years to external causes of death (Graph 7). The different rate of decline in the risk of dying in mature and older age groups also contributed to the increase in inequalities in life expectancy at birth, due to a decrease in earlier cardiovascular mortality in women and a higher rate of tumours in men. Higher male mortality due to tumours was responsible for a loss of 3.1 years of life with respect to women, while diseases of the circulatory system were responsible for a loss of 1.8 years.

In recent years, a convergence of life expectancies at birth between both sexes has been seen. The management of risk factors that led to the increase in excess mortality in young adult males resulted in a decrease in mortality differentials between sexes and eliminated the role played by that stage of life in the increase of life expectancy inequalities between men and women. In older age groups, the acceleration in the decrease of cardiovascular mortality in men and the unequal behaviour of certain cancers between sexes, such as bronchopulmonary cancer, which became less common in men and more common in women, reduced the gender gap in the risk of dying and, thereby, reduced the contribution of those age groups to life expectancy inequalities. Two thirds of the current difference in life expectancy at birth between men and women is attributable to the higher survival rate in women aged 65 and over, primarily due to higher cancer mortality rates in men and lower mortality rates due to causes linked to the circulatory system in women. Despite the inequalities of recent years, the break in the upward trend in average lifespan differentials from age 65 onwards can also be seen, stabilising below five years in this century.

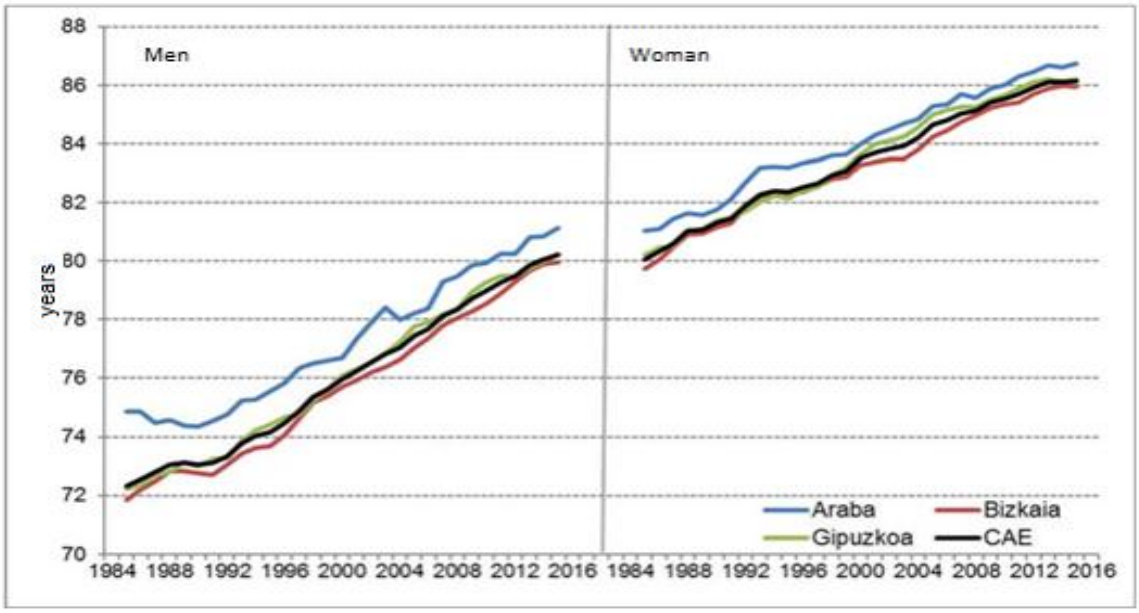
Graph 7: Contribution of age groups and causes of death to the difference in life expectancy at birth between men and women. Basque Country 1994-96 and 2014-16.



Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

Advances in the longevity of the population have been widespread across all the provinces, with Araba remaining the province with the highest life expectancy in both sexes. There has been a clear convergence of other provinces towards the levels seen in the Basque Country as a whole, particularly in men from Bizkaia who are characterised by a slightly less favourable situation (Graph 8).

Graph 8: Trends in life expectancy at birth in the provinces and the Basque Country. .



Note: three-year indicators focused on the reference year. Source: created based on microdata from the Spanish National Statistics Institute (INE) on deaths and EUSTAT population data.

The continuation of recent mortality trends by age would result in significant gains in longevity and a narrowing of differentials between sexes. Thus, the Basque Statistics Institute estimates that life expectancy at birth will reach 83.7 years for men and 88.8 years for women by 2030, which amounts to an increase of 3.5 and 2.7 years respectively compared to the values observed in the three-year period 2014-16. The smallest remaining improvement in mortality can be found in adult and mature female age groups, which is linked to the lesser impact that the decrease in the risk of dying has had on the lifespan of the population as the age at which said decrease occurs goes up. This explains why the absolute gain in women would be less than in men, narrowing the average lifespan differentials between sexes to just over 5.1 years. In older age groups, life expectancies at age 65 of 21.5 years in men and 25.4 years in women are predicted, i.e. 14% and 8% more than today.