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Population projections at national level

Population projections 2018-2068 in Spain

Note by INE-Spain*

Summary

In the same way as in any prediction exercise, the study of the future evolution of the population of Spain faces many uncertainties. The 2018 Population projections are based on the fact that, at least in part, the future of the population is present in its current structure, so the prediction is supported by some factors whose evolution is less unpredictable.

This paper briefly reviews the methodology used in 2018 to obtain the projections and presents some of the main results that will characterize the Spanish population in a 50-year horizon. Following the trend that has been observed in the last years, Spain continues to stand out for a low birth rate and a high level of aging.

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I. Introduction

1. A population projection can be defined as the numerical set of results that show the evolution of the demographic dynamics of a population (both the total figure and its structure by age, sex, etc.) based on a series of hypotheses about the future evolution of the fertility, mortality and migration.
2. It should be made clear that the projections should not be understood as a forecast in the strict sense, but that their objective is to provide a tool to support decision-making based on a statistical simulation of how the resident population would evolve in the coming years, always under the hypotheses mentioned above.
3. In the case of Spain, the hypotheses formulated by the INE are based on maintaining the current demographic trends. In this way, new population projections¹ are published every two years (the last ones on October 10th, 2018) that cover the next 50 years for the national level and the next 15 years for the provincial and regional level.

II. Two great novelties of this edition

4. First of all, in February 2018, a working group formed by a reduced group of experts in demography of several institutions (Higher Centre for Scientific Research, Centre for Demographic Studies of the Autonomous University of Barcelona, Carlos III University of Madrid and Social Security) was established. They have collaborated with INE in the proposal of a set of methodological improvements in the projection model:
 - The hypotheses will make the distinction by place of birth instead of nationality.
 - Fertility: Instead of projecting the specific rates by age, future rates will be adjusted to a known beta function, establishing hypotheses about the evolution of both the total fertility rate (TFR) and the average age at maternity.
 - Mortality: It is proposed to move from one projection by age, to another one based on the general level, synthesized by the life expectancy at birth and establishing hypotheses about the future evolution of this parameter.
 - Migrations: This is the component that has a more volatile behaviour and therefore, the most difficult to project. The new proposal consists, instead of maintaining a constant intensity as in previous years, in dividing the projective period into three different periods in which the trend of the last years will be reflected at a first moment and then will evolve towards levels established as hypotheses to 15 and also to 50 years.
5. The second novelty consisted of, following in the footsteps of other European reference institutions, sending a small survey to a group of demographic experts during May 2018. The objective of this survey was to know the future evolution (in the next 15 and 50 years) of certain necessary parameters as input for the realization of the projections: average number of children per woman, average age at maternity, life expectancy at birth and levels of immigration and emigration.

¹ More details can be found in this web page:

http://www.ine.es/dyngs/INEbase/en/operacion.htm?c=Estadistica_C&cid=1254736176953&menu=ultiDatos&idp=1254735572981

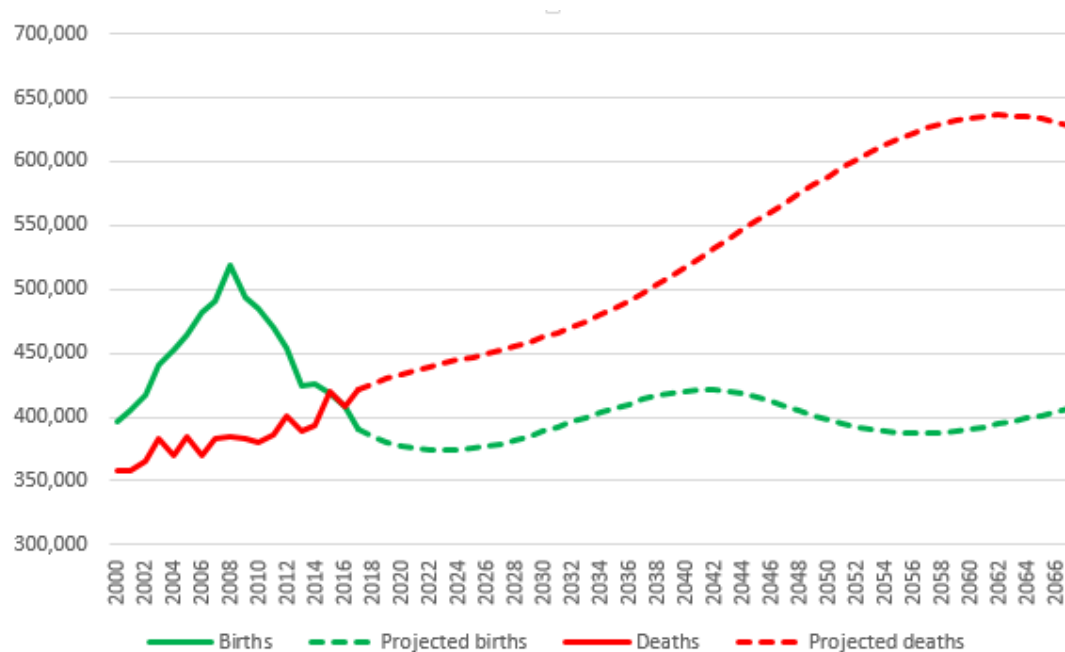
III. Main results

A. Fertility and Mortality

6. The number of births was projected assuming that the fertility of women maintains a slight but progressive upward trend. Thus, the average number of children per woman, which currently is 1.31, would rise to 1.41 in the following 15 years and reach 1.46 in the next 50 years.

Projections indicate that the number of births would fluctuate very little in the next 50 years: the minimum would be 374,000 (year 2023) and the maximum 421,000 (year 2041).

7. With regard to the deaths, the hypothesis about life expectancy at the birth of men that currently stands at 80.4 years, would rise to 82.9 within 15 years and up to 86.4 within 50 years. Women, whose life expectancy is currently 85.8 years, within 15 years would reach 87.7 and 90.8 within 50 years.
8. Thus, the number of deaths would show a mainly ascending behaviour in the coming years, going from the current 426,000 to 475,000 within 15 years and to 627,000 within 50 years.



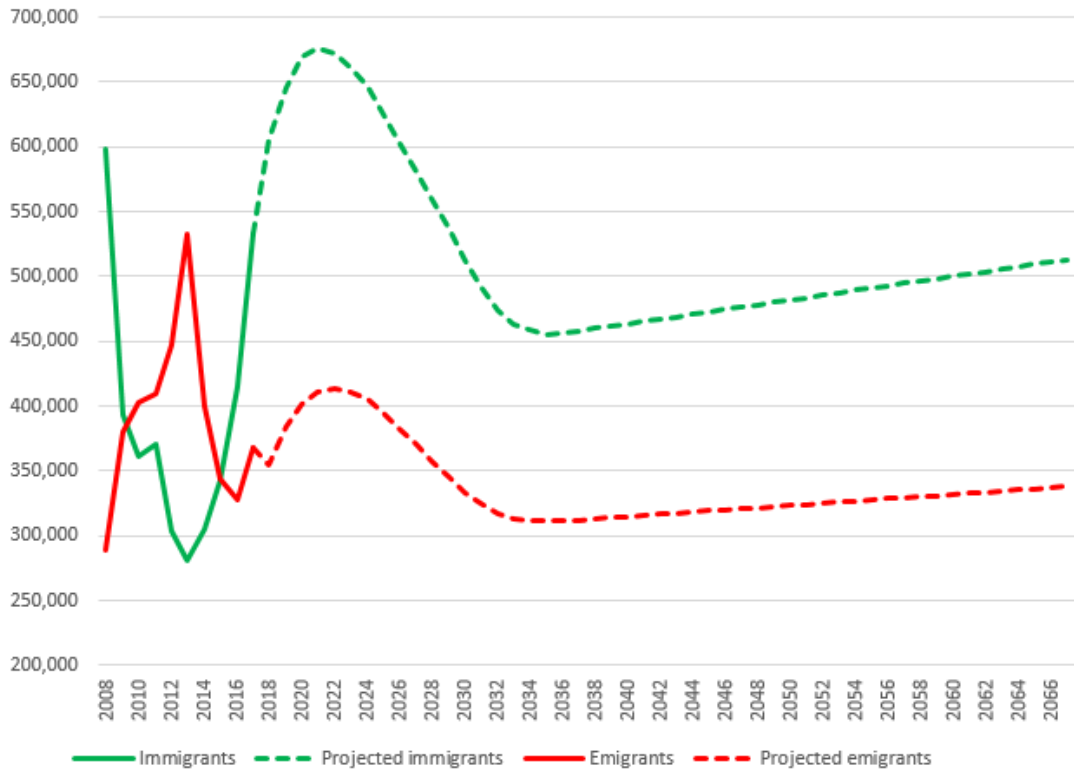
Graph 1.

Births and deaths in Spain: Observed (2000-2017). Projected (2018-2067)

B. Migration

9. Traditionally, the projection of external migratory flows is the most complex part of all, due to their unpredictable behaviour and the difficulty of providing long-term information.
10. Unlike in 2016, this new edition has tried to improve the migration hypotheses by applying a more elaborate projection model:
- The first year a now cast estimate would be made.
 - The next three years, the model would show the observed trend.

- The next 11 years would evolve to a first reference point provided as a hypothesis by the group of experts in the survey.
 - The last 35 years would also evolve to a second point indicated by experts.
11. All this information would result in the issue that Spain would have a positive accumulated migration balance of more than 3.4 million in the next 15 years and almost 9 million in the next 50 years.

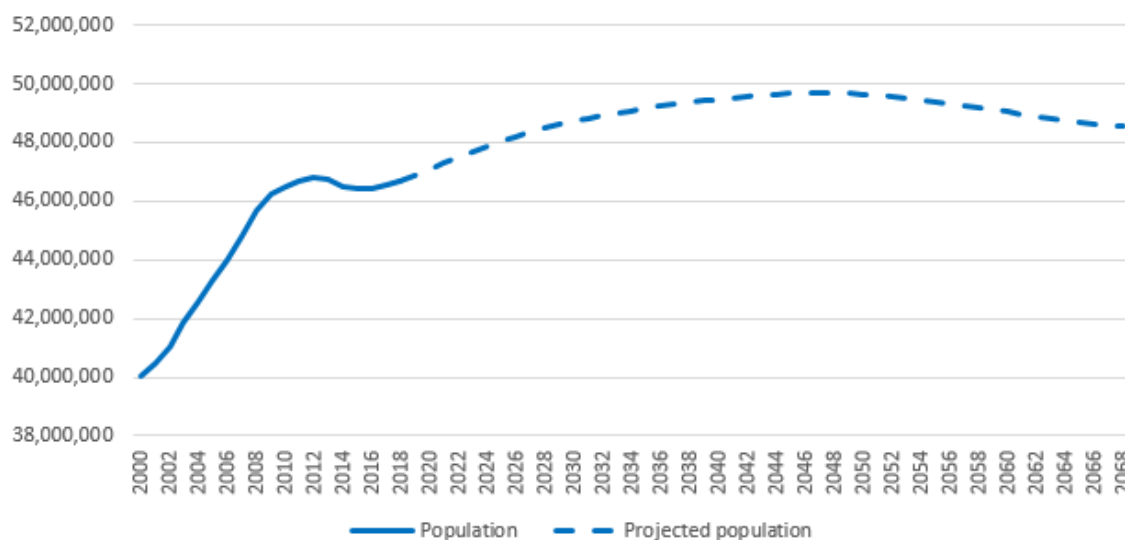


Graph 2.

Immigrants and emigrants in Spain: Observed (2008-2017). Projected (2018-2067)

C. Population figure and structure

12. The evolution of the components mentioned in the previous points would cause that the Spanish population figure would increase to a maximum of 49,682,732 people that would occur in the year 2047 and then descend smoothly.
13. The population figure within 15 years would be 5.1% higher than the current one and would exceed 49 million inhabitants while the figure within 50 years would reach 48 million and a half, which would mean 4.0% more.



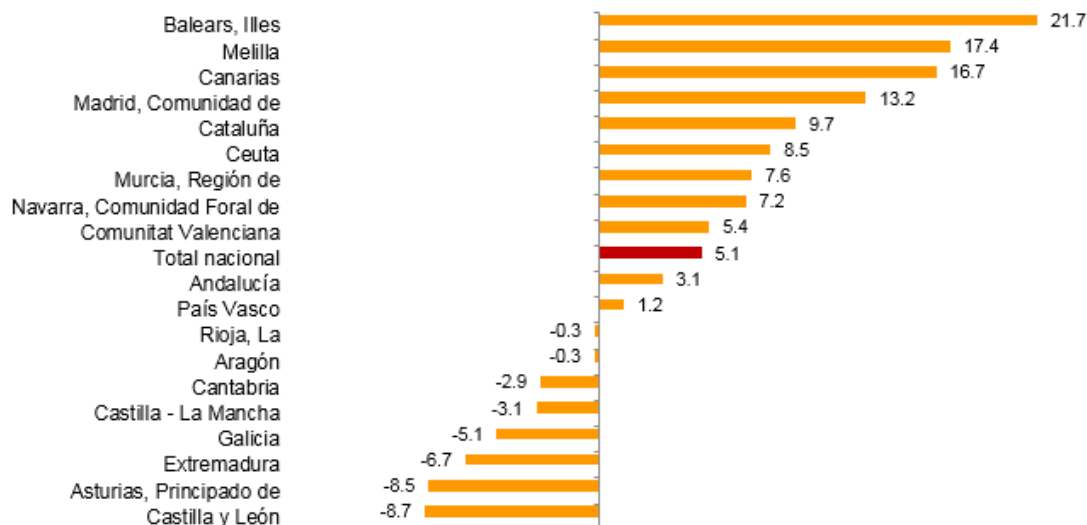
Graph 3.

Population figure in Spain: Observed (2000-2018). Projected (2018-2068)

14. Although in absolute terms the population would not change much in the next 15 and 50 years, the same situation would not happen with its structure. Thus, people under 16 years of age who are currently 7.4 million in 2018 would descend to 6.5 million in 2033 and remain at 6.6 million in 2068. On the other hand, those aged over 64 who represent 9.0 million in 2018, would increase to 12.3 million in 2033 and 14.3 million in 2068.

D. Regional results

15. As we have just seen in the previous sections, population projections indicate that the national population figure in the year 2033 will grow slightly above 5% to just over 49 million people. However, the results obtained at the regional level indicate that this behaviour is not expected to be homogeneous throughout the whole territory.
16. On the one hand, it is expected that eleven regions of Spain will see their population increased and that there will be declines in the remaining eight regions. The greatest relative increases (above 13%) would be registered in the Balearic Islands, Canary Islands and the Community of Madrid, while the greatest decreases (higher than 6%) would occur in Castilla y León, Asturias and Extremadura.



Graph 4.

Relative projected growth by region 2018-2033

IV. Scenarios

17. INE, like other reference institutions along the world, has performed a sensitivity analysis of the results with the intention of helping to a better interpretation by society of the true meaning of the projections. It is important to highlight that the projections do not have as main objective to predict the future, but to make a simulation of what would happen under certain conditions or hypotheses.
18. Therefore, in addition to the central scenario, a series of scenarios are built nationwide. These scenarios are based on the modification of the fertility, emigration and immigration hypotheses:
 - High fertility: A high TFR is established within 15/50 years modifying by twice the standard deviation of the central scenario.
 - Low fertility: A low TFR is established within 15/50 years modifying by twice the standard deviation of the central scenario.
 - High migration balance: Immigrant inflows are increased within 15/50 years by 5%. Likewise, the outflows of emigrants are reduced by 5%.
 - Low migration balance: Immigrant inflows are reduced within 15/50 years by 5%. Likewise, the outflows of emigrants are increased by 5%.
 - Zero migration balance: For the entire projected period the migration balance is considered to be equal to zero.
19. The scenarios show that uncertainty increases in the medium and especially in the long term and, therefore, reinforces the assertion that the results obtained should be interpreted with caution.
20. If we put aside the results of the scenario with zero migration balance, it can be seen that in 15 years (2033) the results of the other scenarios move in a gap of just over a million people around 49 million people.
21. However, by extending the projected period to the next 50 years (2068), the differences between the various scenarios become much broader and grow to almost nine million.

	2018	2023	2028	2033	2048	2068
Central	46,659,302	47,686,892	48,485,661	49,016,091	49,679,284	48,531,614
Low fertility	46,659,302	47,652,119	48,351,234	48,714,465	48,625,001	45,969,029
High fertility	46,659,302	47,719,522	48,614,123	49,306,291	50,712,711	51,173,050
Low net migration	46,659,302	47,671,481	48,388,314	48,753,265	48,757,241	46,677,879
High net migration	46,659,302	47,702,299	48,583,010	49,278,953	50,602,243	50,389,324
Low fertility and net migration	46,659,302	47,636,718	48,254,136	48,453,107	47,717,356	44,172,827
High fertility and net migration	46,659,302	47,734,940	48,711,721	49,570,624	51,650,211	53,090,056
Zero net migration	46,659,302	46,309,155	45,714,627	44,971,932	41,866,789	34,240,674

Table 1.

Population projections 2018-2068. Population as of 1st of January of several years. Different scenarios

V. Conclusion

22. The population projections published by the INE in 2018 presented an important methodological change regarding the previous editions. On the one hand they have picked up the opinion of a high number of professionals in several methodological issues. In this way, most of the algorithms used in previous projections exercises have been improved in order to try to gain consistency. With these performances, INE expects that the new results to be more comprehensive and useful for all the users.