

PENSIONERS LIFE EXPECTANCY: AN ITALIAN PERSPECTIVE

by Italian Actuarial Profession Working Group on Pensioners

Foreword

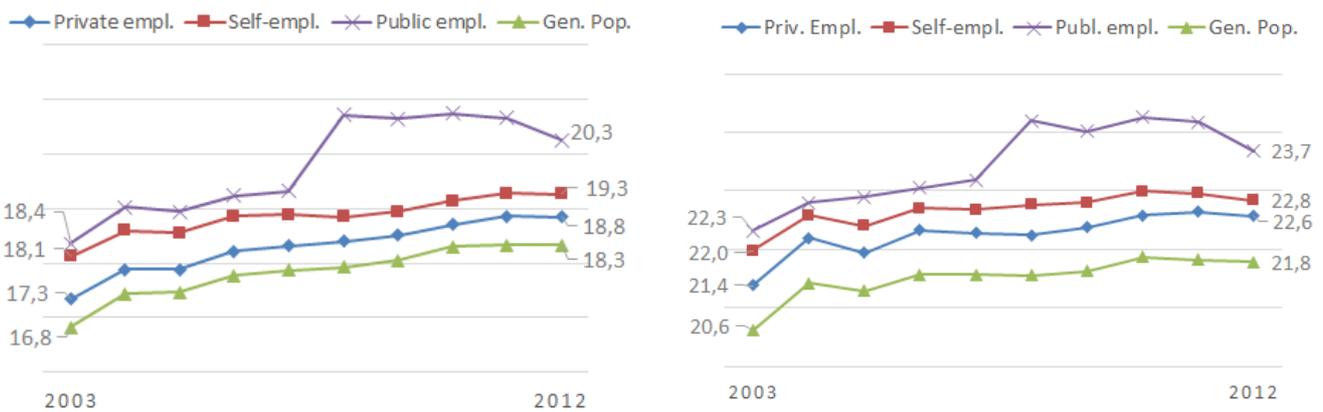
Trends and changes in perspectives about life expectancy of pensioners are huge challenges also in Italy. The Italian Actuarial Profession Working Group on Pensioners - formed by actuaries working in public and private pension funds and insurance companies - processed historical data from 1980 to 2012 provided by public pension providers, including INPS, the main state pension provider, and private funds. As a rough indication, the exposed to risk in terms of old-age, disability and widow pensioners, for 2011 alone, covered almost 15 million lives, with payments totaling over 190 billion. Moreover, the Working Group developed - through different models - scenarios on the life expectancy of old-age pensioners till to 2045.

The report (http://www.ordineattuari.it/media/228482/170404_rapporto_percettori_2016_def.pdf) concretely confirms the contribution actuaries can provide to raise awareness on key issues like pensions.

Italians are living longer...

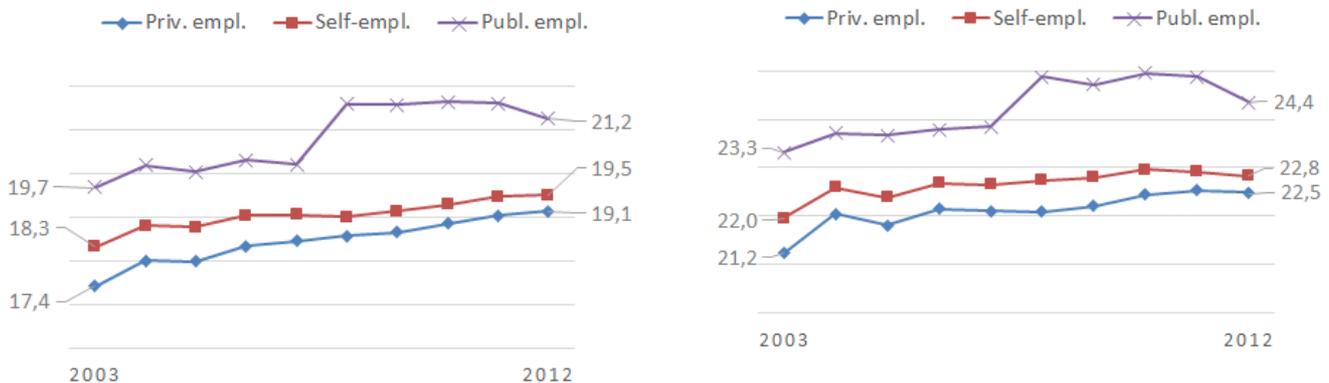
Figure 1 shows the period life expectancy at age 65 for Italian old-age pensioners from 2003 to 2012 by type of employment, compared with the general population. Note that while the general population data includes pensioners receiving disability benefits, the pensioner data examined does not, then the general population data would be expected to exhibit lower life expectancy. Pensioners life expectancy has continued to improve: over the ten-year period, the value for retired public employees has seen an increase of 14% for males and 9% for females, compared with 9% and 6% respectively for the general population. The data shows that there are clear differences in survival prospects by occupation at retirement; self-employed – especially medical doctors and lawyers – and public employees have a longer life expectancy in retirement compared with private employees.

FIGURE 1: OLD-AGE PENSIONERS LIFE EXPECTANCY (LIVES) AT AGE 65 VS. GENERAL POPULATION: MALES (LEFT) AND FEMALES (RIGHT)



Life expectancy based on mortality rates weighted on the amount of pensions show slightly higher values compared to calculation based on lives. Then, there is some positive correlation among amount of pension and longevity, especially for males and public employees, (see Figure 2).

FIGURE 2: OLD-AGE PENSIONERS LIFE EXPECTANCY (AMOUNTS) AT AGE 65: MALES (LEFT) AND FEMALES (RIGHT)



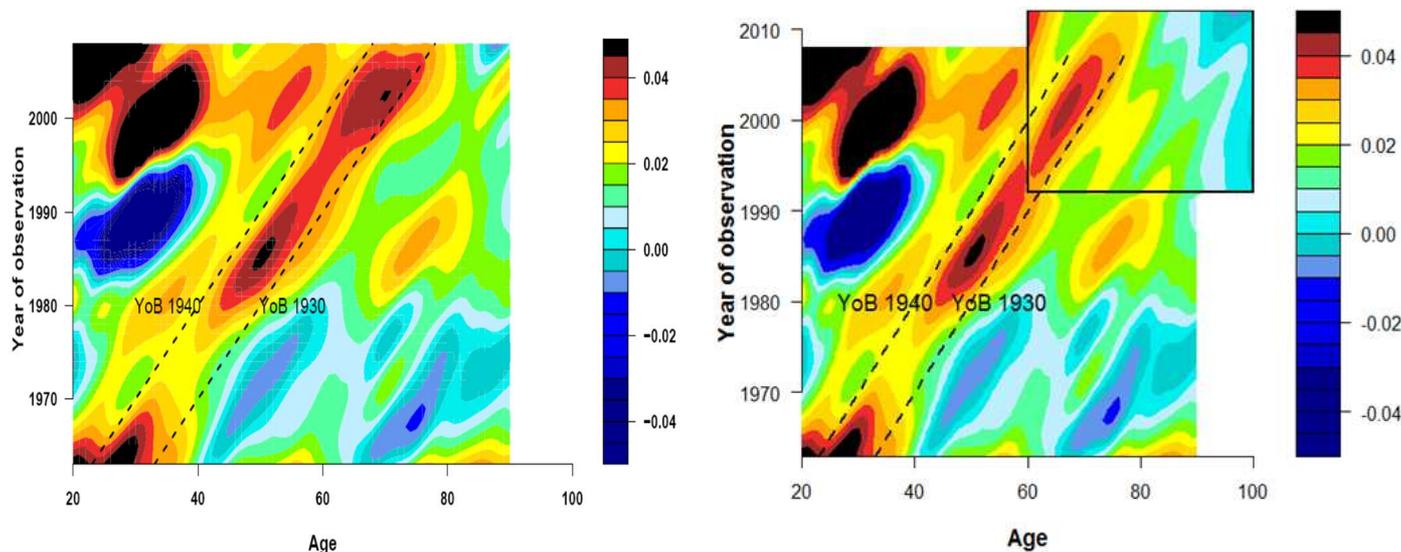
Further analyses confirmed the presence of cohort effects (i.e. significant mortality improvements relevant to certain generations), in particular in the male population. This is shown in the heat map of mortality

improvements in the left-hand side of Figure 3 – where the mortality improvements have been smoothed using the p-spline method (areas in red and yellow indicate an improvement in mortality, a worsening the blue ones).

FIGURE 3 –HEAT MAP OF MORTALITY IMPROVEMENTS (*) IN THE ITALIAN POPULATION AND FOR PENSIONERS-- MALES

Left: mortality improvements - Italian population – males- 1962-2012 - ages 20-90

Right: same as left except top-right box showing improvements for pensioners (priv. empl.) in 1991-2012 - ages 60-100



$$(*) : r(x, t) = 1 - \frac{q_x^T}{q_x^{T-1}}$$

The data showed a similarity between cohort effect for pensioners (private employees pensioners) and the general population; that is what can be reasonably be expected considering that a significant proportion of the general population at those ages are private employees pensioners.

... and are expected to continue to live longer

Finally, the study covers normal retirement pensioners mortality scenarios until 2045. The forecast was carried out on different data sets (private employees, self-employed and the sum of the two dataset, using lives data). Elaboration have been performed through Lee-Carter Poisson log-bilinear model and the Renshaw-Haberman model with a cohort effect, and multiple scenarios associated with a probability distribution, namely including a central scenario, and high and a low scenarios (respectively the 5th and 95th percentile) have been developed.

FIGURE 4 – CENTRAL SCENARIOS OF LIFE EXPECTANCY AT YEAR 2045 - TOTAL (PRIVATE EMPLOYEES AND SELF-EMPLOYED)

Lives, males (left) and females (right) - age 65 – Lee-Carter (LC) and Renshaw-Haberman (RH) model

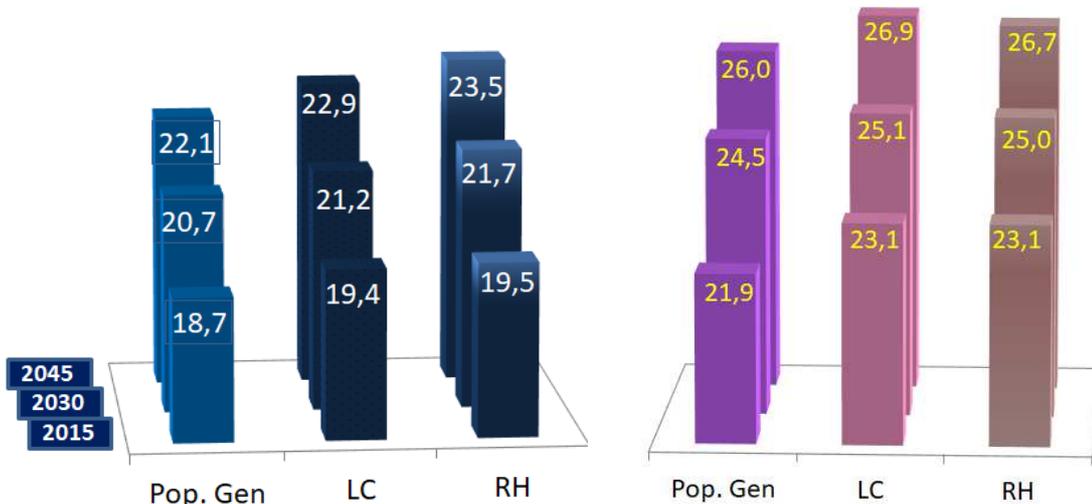


Figure 4 outline a synthesis of the results in terms of life expectancy scenarios at age 65 until 2045, compared with projections for the general population made by ISTAT, the National Institute of Statistics.

The historically observed difference persists also in the forecast period, with values for pensioners remaining higher than those projected for the general population. For males, general life expectancy in 2045 is expected to reach 22,1 years, while old-age pensioners should arrive at 22,9-23,5 years depending on the model. Similarly, general female population in 2045 should have 26 years to live, compared to 26-7-26,9 years for old-age pensioners.