ORDINE NAZIONALE DEGLI ATTUARI

CONSIGLIO NAZIONALE DEGLI ATTUARI

Pensioners and annuitants Working Group

Pensioners and annuitants in Italy: mortality from 1980 to 2009 and projections to 2040

17.07.2012

This study has been prepared by the Pensioners and annuitants Working Group, a working party set up with the help of the Italian Actuarial profession.

The Group is composed by experts working for the institutions and the organizations that joined the initiative or that have been directly designated by the Italian Actuarial Profession.

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ANNEXES

INTRODUCTION

Changes to life expectancy of the beneficiaries of public and private pension schemes can have an impact on the economy and the welfare system. It is desirable to monitor closely these trends and increase awareness in the management of longevity risk. This information can help improve risk management processes and contribute to the transparency and balance of provisions.

For mandatory public funded pensions analysing the mortality of specific pensioners' groups is important both to help the long-term balance of social security schemes and to understand the real cost of benefits paid out, supporting the information already available on general population data and the forecasts from public institutions.

The private sector in Italy over the next decades should see a gradual increase in demand for annuities. Due to the lack of specific data, the mortality tables used by life office annuities in Italy are based on general population forecasts adjusted with selection factors derived from other countries to take into account of the potential difference among general population and the specific group of annuitants as required by the regulator.

To respond to these challenges, the Italian Actuarial Profession decided to set up a Working Group starting from the group who carried out the first investigation into the pensioner data in 2008 (see ANIA-INPS-Ordine degli Attuari, [2]), widening participation and scope. The study prepared by the Working Group performs and updates analyses on changes in public pensioner and private annuitants' mortality rates in Italy and forecasts in life expectancy, with the aim to support the actuarial community, the pension institutions - including pension funds and insurance companies - and everyone else interested in mortality trends in pension framework.

This document is limited to the 1. *Executive summary*, giving an essential summary of analyses and results.

The report published by the Group includes the other main contents and results of the work that has been carried out, shown in:

2. *The collection data process*, briefly describing the process used to collect the data from the various institutions;

3. M*ortality of pensioners and other annuitants in 1980-2009*, which shows mortality trends over the observed period, split by gender and occupational group, including comparisons with the general population, differential mortality among groups and insights on cohort and income effect;

4. *Old-age pensioners mortality projections to 2040*, that contains results of projections carried out through different projection models (both stochastic and deterministic) on different group of pensioners.

Following that, the *Methodological appendix* describes in more detail, for those who are interested in getting a deeper understanding of the technical issues, the working process, the methods used in data gathering, the choice of the models, the tests done to check goodness of fit of the models and further insights on models features and forecasting process. Certain parts of the appendix have not been translated into English and readers are remanded to the Italian version of the study.

Finally, the section *References* comprise details of publications and data being referenced elsewhere in the study.

The *Annexes* attached to the study provide further data, information, graphics and numerical evidence on the analysis carried out.

OUTCOME OF THE CONSULTATION PROCESS

The final version of this study has been published after a consultation process within the Italian actuarial community. A draft version was published on 2012, April 16th on the website www.ordineattuari.it. The publication was announced in CNA Prot n. 038/2012 Circ. N. 10/2012 and ONA Prot. 064/2012 Circ. No. 11/2012, requesting feedback by 2012, June 1st. A summary of the comments received together with feedback from the Working Group are reported as follows.

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Prof. E. Pitacco (Professor of Actuarial Mathematics at the Department of Applied Mathematics "Bruno de Finetti" - Faculty of Economics - University of Trieste), noting that life expectancy at age 65 is systematically higher than that resulting from ISTAT general population projections, asked to better explain and make clearer the reasons for this difference, as, whilst the study uses a different dataset and model, a vast proportion of the general population is made up by pensioners.

The remark has been acknowledged and a fuller explanation has been provided on the projection in question, as requested.

Prof. E. Pitacco remarked that in Sec. 4.1 the draft consultation document stated that "stochastic models have the advantage of ... and ... give the scenarios considered possible a distribution of probabilities'." Prof. E. Pitacco noted that this is certainly true for the stochastic models more "evolved", but not for most "simple" models, such as the original Lee-Carter, that only takes into account of random fluctuation and not even those systematic.

The remark has been acknowledged and the text has been changed accordingly.

Prof. Pitacco remarked that the mortality analysis of the disabled pensioners is of particular interest, due to the general lack of other sources of data available in the public domain. Prof. Pitacco asked that mortality of disabled pensioners to be expressed on the same base as the general population mortality.

The remark has been acknowledged and the analysis and data on mortality of disabled pensioners have been adjusted accordingly.

Prof Pitacco noted that the general population projections from ISTAT are shown as a benchmark, but it is not clear which model was used by ISTAT.

It was not possible to respond to this request as the quantitative data about 2011-2065 projections on general population published by ISTAT (that is used as in the study for comparison purposes) does not have details on the projection methodology. The only information available are contained in the document "ISTAT: THE FUTURE OF THE LAND POPULATION - Forecasts of regional population living in 2065", December 28, 2011, and they have been included in the study, as requested.

1. EXECUTIVE SUMMARY

This study comprises the following mortality analyses:

‒ mortality of pensioners on normal retirement (i.e. pensioners reaching either the retirement date or the maximum working age), both from first and second pillar institutions, with the first pillar institutions being by far the largest contributors;

‒ mortality for pensioners receiving disability pensions;

‒ widow and widower's pensions.

In the first section, the study includes an analysis of the mortality of pensioners and annuitants in the period 1980-2009: to give an indication of the large volume of available data, in 2009 there were about 10 million pension positions with an annual pension of over 142 billion Euro. The following figures illustrate life expectancy for normal retirement pensioners (males, age 65) by occupation (private employees, self-employed, civil servants, entertainment and sport workers, lawyers, medical doctors) and for pension funds / life office annuitants over the observation period. The top graph of figure 1 shows life expectancy calculated on lives, while in the bottom graph life expectancies are weighted by annuity amounts.

FIG. 1 – LIFE EXPECTANCY AT 65 YEARS IN THE OBSERVATION PERIOD (*) - MALES
lives (top) and amount-weighted (bottom) analyses
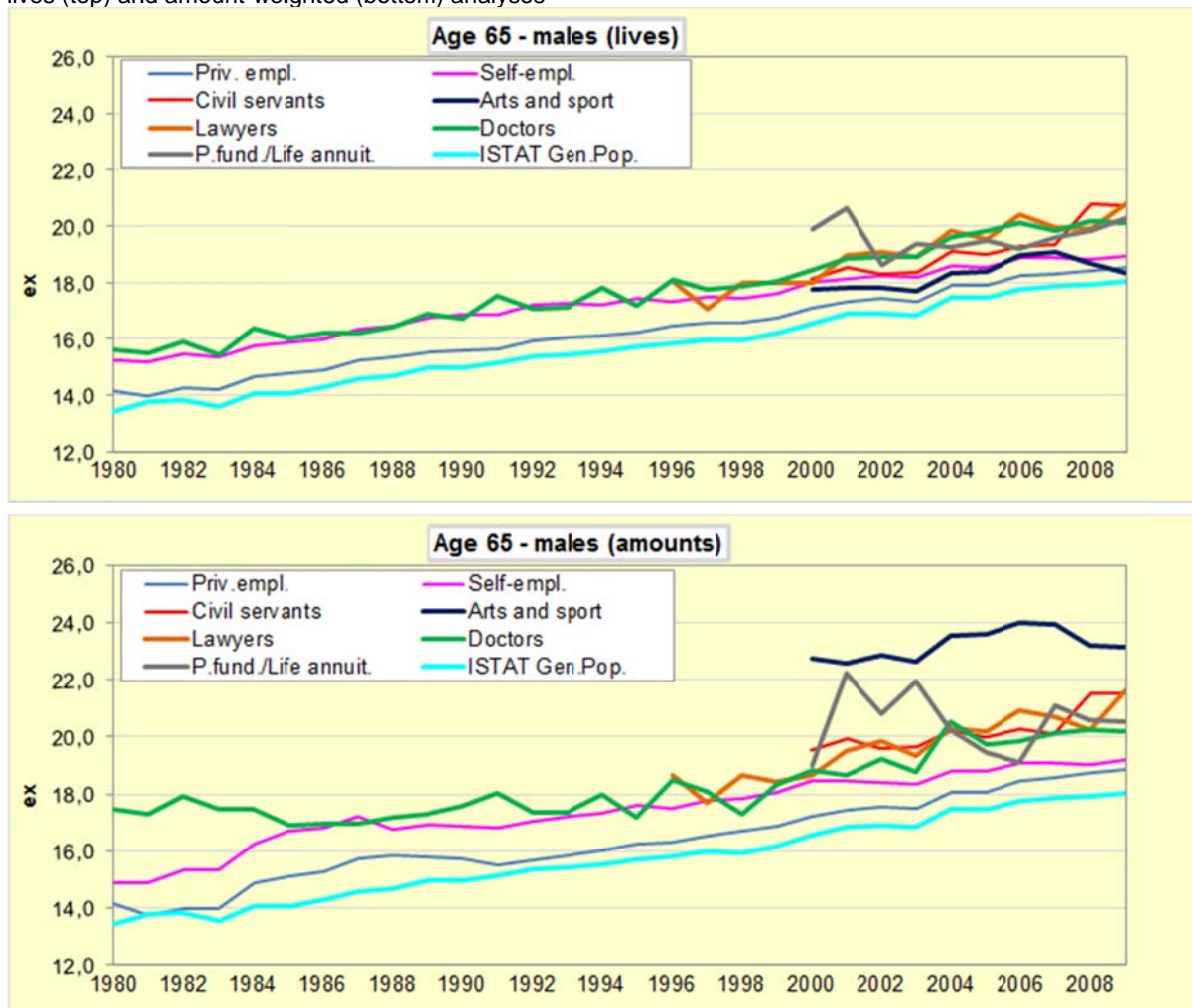
(*) Missing data has been left-truncated.

There are some general trends that should be noticed:

‒ there is a general increase in life expectancy, and that is broadly in line, in relative terms, with the general population;

‒ life expectancy of pensioners, regardless of their occupation, is higher than life expectancy in the general population;

– life expectancy weighted by amounts is always higher than life expectancy that is not weighed by amounts.

There are the following comments in relation to trends observed for different occupational categories of pensioners:

– civil servants, doctors, lawyers and pension fund / life office annuitants have life expectancy that is significantly higher than the general population, 2 years or more in 2009;

– self-employed have higher life expectancy than the general population, but lower than the other afore-mentioned pensioners groups; the difference in life expectancy with general population was still positive in 2009, being less than 1 year;

– private employees show a lower level of life expectancy than the other groups, but still higher than the general population;

– there is a strong correlation between survival and pension income for workers in the arts and sports: life expectancy in the amount-weighted analysis is considerably higher than values according to life expectancy calculated by lives (in 2009 about 5 years more than general population); the values are slightly higher than for the private employees and there is a convergence to the data observed for the general population in more recent years.

For females (see Fig. 2), trends are similar to that observed for males (life expectancy is higher than for general population and it increases substantially in line with the latter in relative terms) but with less significant differences due to amount effects, except for workers in arts and sports where, as seen for males, amount-weighted life expectancies are about 5 years higher than those of the general population.

FIG. 2 – LIFE EXPECTANCY AT 65 YEARS IN THE OBSERVATION PERIOD (*) – FEMALES
lives (1st graph) and amounts (2nd graph)
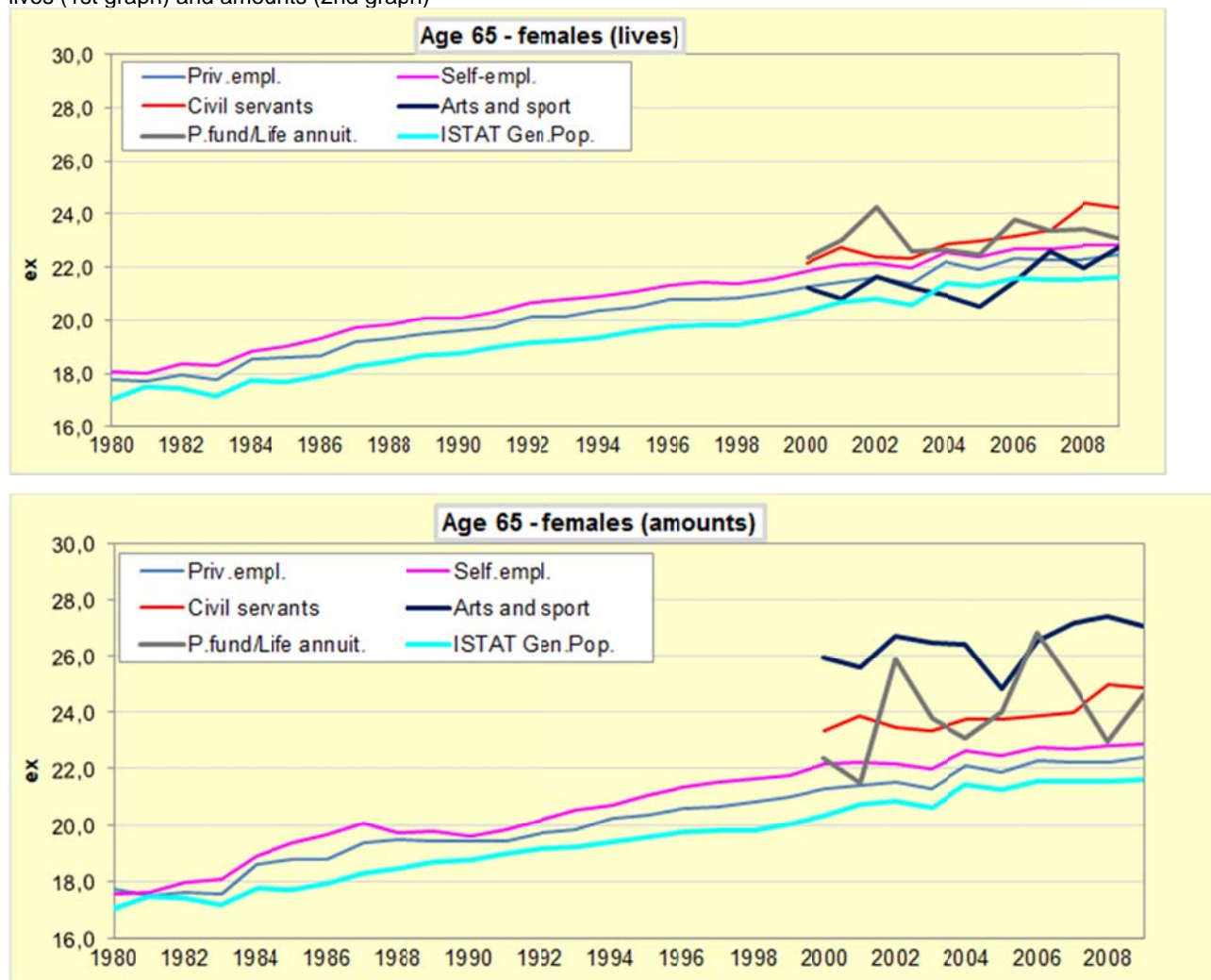
(*) Missing data has been left-truncated.

As seen for males, female civil servants have a higher life expectancy – by about 2 years – than the general population for the whole period of observation; the same spread is registered for pension funds and life office annuitants. Female self-employed and private employees have lower values of life expectancy, however still higher than the general population.

Further analyses of historic data have revealed interesting trends. Previous mortality studies [9] on the general population had already reported 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 Fig. 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).

FIG. 3 – HEAT MAP OF MORTALITY IMPROVEMENTS IN THE ITALIAN POPULATION AND FOR PENSIONERS– MALES

Left: mortality improvements - Italian population – males- 1962-2008 - ages 20-90

Right: same as left except top-right box showing improvements for pensioners (priv. empl.) in 1991-2009 - ages 60-100
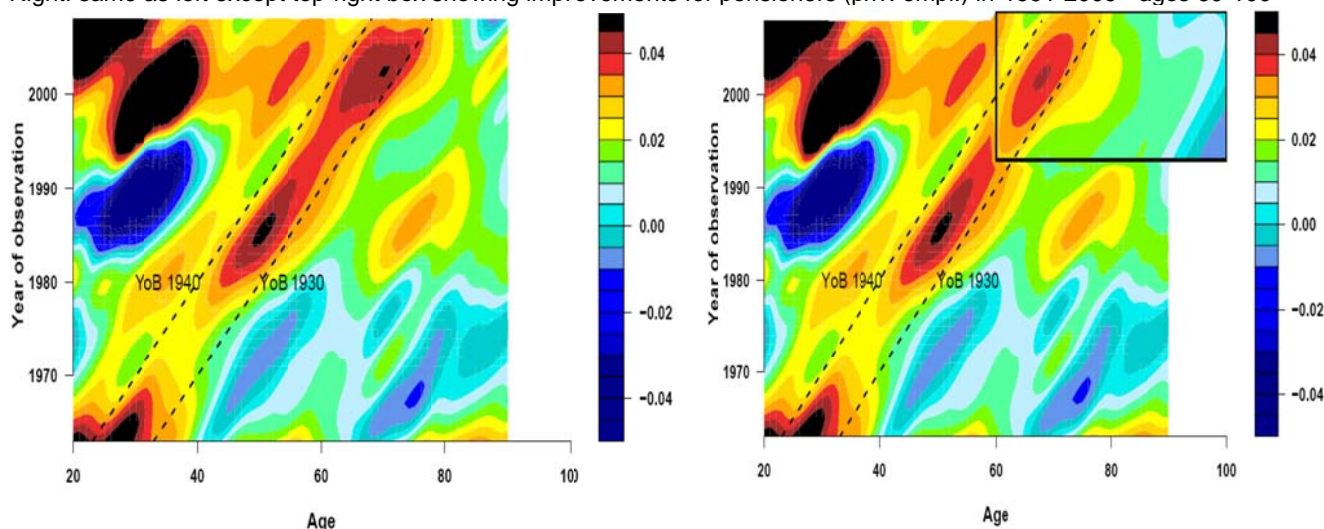
Source: Elaboration on HMD – Human mortality database data.

The data examined in this study showed a similarity between cohort effect for pensioners and the general population (the heat map in the box at the top right of the right graph in Fig. 3 relate to mortality improvements for private employees pensioners); that is what can be reasonably be expected considering that a significant proportion of the general population at those ages are private employees pensioners. A further insight comes by stratifying the data: it is evident that cohort effect improvements are more pronounced for those pensioners receiving a higher amount of pension (see Fig. 4 – box at the top right in the right-hand graph) than for those receiving lower incomes (see Fig. 4 – box at the top right in the left-hand graph).

FIG. 4 – MORTALITY IMPROVEMENTS HEAT MAP FOR PENSIONERS EARNING DIFFERENT PENSION AMOUNT - MALES

Left: like Fig. 3 except top-right box showing improvements for priv. empl. with a pension lower than 1,200 € monthly

Right: like Fig. 3 except top-right box showing improvements for priv. empl. with a pension higher than 1,200 € monthly
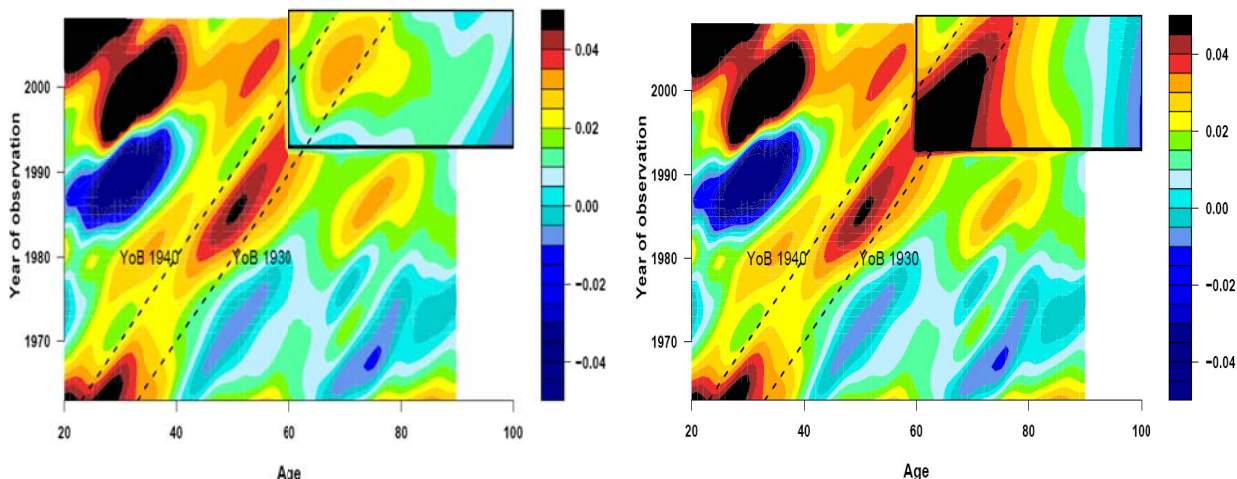
Source: Elaboration on HMD – Human mortality database data, private employees pensioners data.

Such evidences have supported the decision to investigate the impact on mortality for Italian pensioners and life office annuitants considering effects of cohorts and size of pension and the choice of projections models that are able to capture such effects. Data volumes for widows and disability pensions are less numerous (in 2009 almost 1.5 million positions for less than 14.5 euro billions), as data is missing from the most important pension institution and as the information is available for a shorter time. Fig. 5 shows life expectancy at age 65 for these groups (INAIL data are considered separately due the specific nature of workers compensation, while other widows and disability pensioners data sets have been grouped to increase statistical numerousness).

FIG. 5 – WIDOW'S AND DISABILITY PENSIONERS: 65 YEARS OLD LIFE EXPECTANCY IN THE PERIOD 2001-2009 (*)
lives - males (left graph) and female (right graph)
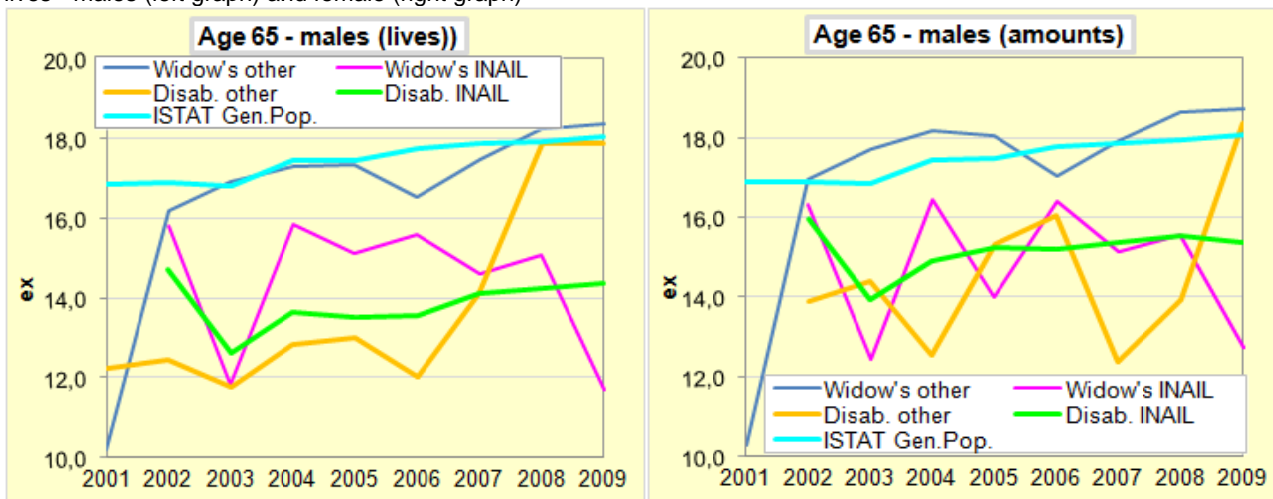
(*) Due to not statistically s data, for some institution values are shown only starting from a certain year onward.

The results show some irregularities due to scarcity of data. At any rate, some general trend can be noted. For widows and widowers pensioners, it can be seen that life expectancy for INAIL male pensioners is always lower than the general population, while life expectancy for the other groups is closer to the population; for females, there is the opposite trend: life expectancy for INAIL pensioners is slightly lower than population, for the other groups the expectation is still lower.

For disability pensioners, instead, life expectancy for both male and females INAIL pensioners is always lower than general population, while for the other groups it gradually approaches population values for both genders. The study also includes analyses on mortality differentials ("selection"), showing ratios of mortality rates for different groups. In particular, three main group of pensioners have been set as benchmarks (private employees, self-employed and the group given by sum of the two) and ratios have been calculated in respect with such benchmark groups and population.

FIG. 6 – COMPARISON OF SELECTED DATA SETS (YEARS 2002-2009) WITH CORRESPONDING "BENCHMARK" COLLECTIVES
ratio between mortality rates (amount-weighted) for each group and rates (lives) of benchmark collectives - males, %
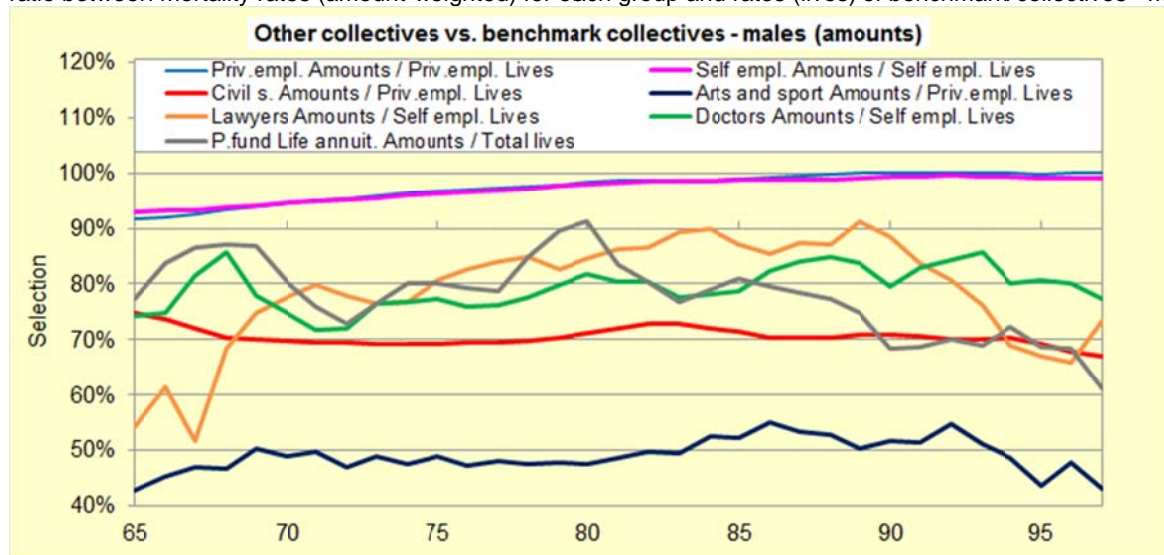
Fig. 6 illustrates the average selection in amount-weighted mortality of pensioners (male) compared to lives in the period 2002-2009. It has to be noted that:

- for private employees and self-employed the impact of the pension amount is low on mortality, with differentials within 10%, mostly at younger ages;
- lawyers, doctors and pension funds / life office pensioners and annuitants mortality data exhibits a greater selection effect compared with that of the benchmark collective (total private employee and self-employed pensioners), with a ratio that, despite fluctuations, is between 80% and 90%;
- for civil servants there is a clear selection effect compared to private employees, with a ratio close to 70%;
- for workers in arts and sports there is a greater differential, with a mortality rate equal to half that of private employees.

Fig. 7 shows the average selection (lives) in the same period 2002-2009 for all normal retirement pensioners data (males and females) compared to the general population.

FIG. 7 – COMPARISON OF NORMAL RETIREMENT PENSIONERS DATA (YEARS 2002-2009) WITH GENERAL POPULATION
ratio between corresponding mortality rates (lives) – males and females, %
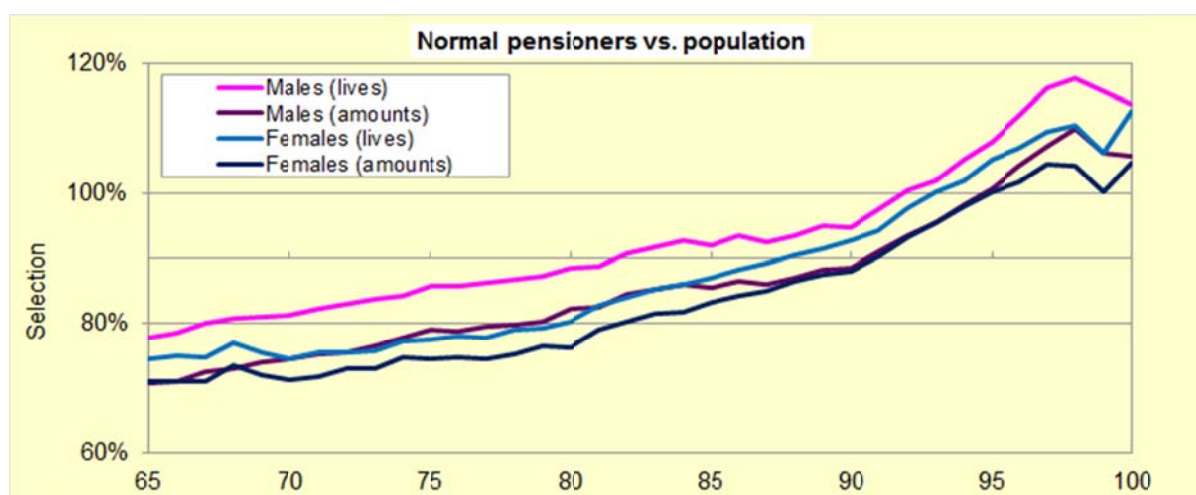
It can be seen that there is a considerable selection effect at younger ages, for both genders, gradually disappearing at older ages (where it can be seen a higher mortality rate than the general population that may be attributed to the small volumes of data). Selection effect for amount-weighted mortality rates is higher for both genders.

Similar analyses have been carried out on widows and disability pensioners. Fig 8 shows a comparison of widow's pensioners mortality with the general population.

FIG. 8 – COMPARISON OF WIDOW'S PENSIONERS (YEARS 2002-2009) TO GENERAL POPULATION
ratio between corresponding mortality rates (lives and amount-weighted) - males and females, %
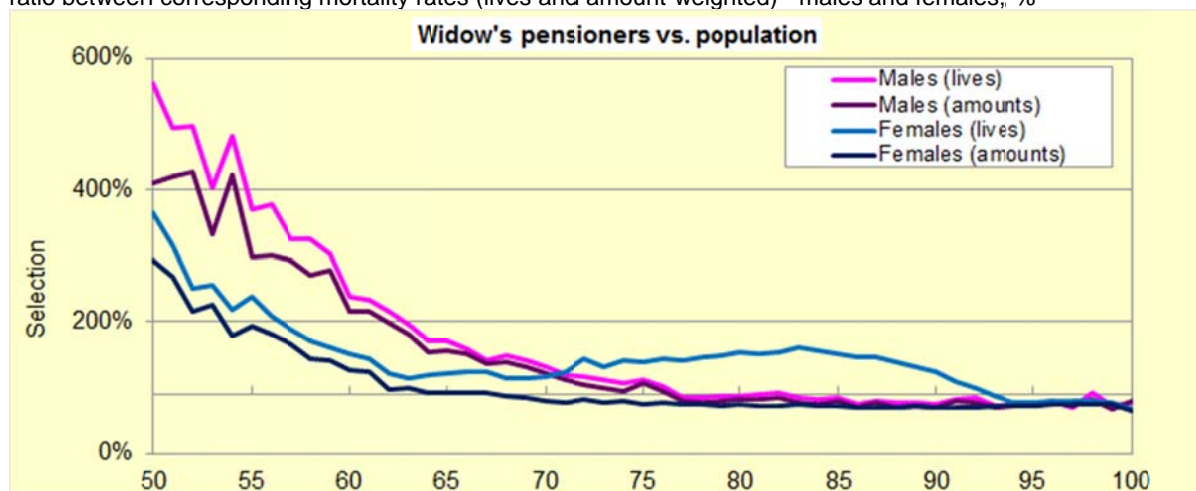
The differential is very high at the younger ages, where widow's (and widower's) pensioners mortality is equal to several multiples that of the general population, in particular for males. Amount-weighted mortality experience is generally close to lives. At older ages the differentials decline significantly converging to a ratio close to 100%.

Figure 9 shows the average selection of disability pensioners compared with general population.

FIG. 9 – COMPARISON OF DISABILITY PENSIONERS MORTALITY (YEAR 2002-2009) TO GENERAL POPULATION

ratio between corresponding mortality rates (lives and amount-weighted) - males and females, %
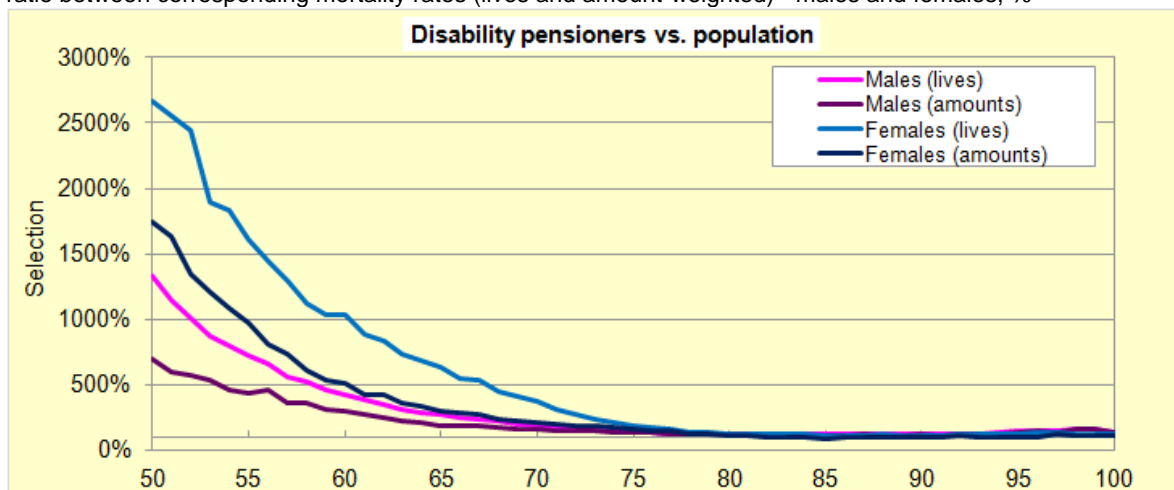
Extra-mortality is very considerable at the younger ages until age 65-70 especially for females. Amount-weighted mortality rates are significantly lighter. At very old ages the differential is substantially nihil.

It should be stressed that the results (see also Fig. 5) for widow's and disability pensioners have been obtained by aggregating data form different institutions so to increase statistical significance. As a consequence, the results after the aggregation can differ from those submitted by each data contributor.

From the results presented it can be seen that pensioners have a higher life expectancy than the general population while disability and widow's pensioners, even if with a differential depending on age, have a lower life expectancy compared to general population. This result seems to be consistent with the life expectancy of the general population being driven by a large proportion of pensioners with higher life expectancy (normal retirement pensioners data) and a small proportion of pensioners with a lower life expectancy (such widow's and disability pensioners); it should be noted that the study does not incude all pensioners in Italy.

The last part of the study covers normal retirement pensioners mortality projections for the period 2010-2040. The forecast was carried out on different data sets (private employees, self-employed and the sum of the two dataset, using lives data), selected because of the volume and accuracy of the data collected. Projections have been performed through different models, both stochastic and deterministic.

The stochastic models selected were the 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.

The deterministic model selected in the study was the Age-Period-Cohort (APC) model first developed by the Continuous Mortality Investigation (CMI) Bureau in the United Kingdom where it is widely used by pension funds and insurance companies. As a consequence of analysis on historical data, the APC model has been applied with different long-term mortality improvement rate assumptions: 2% as a "central best-estimate" scenario, 1,25% as a low scenario and 2,75% as a high scenario.

FIG. 10 – PROJECTION OF LIFE EXPECTANCY AT AGE 65 PERIOD 2010-2040 - PRIVATE EMPLOYEES
Lives, males and females. Values to 2009 are historic data.
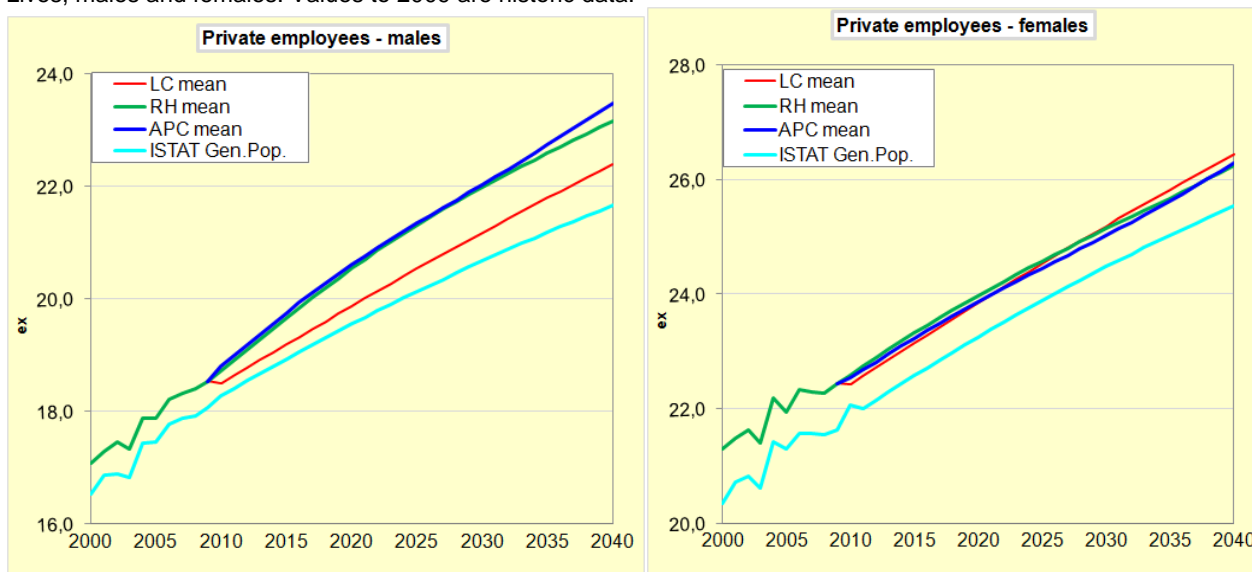
FIG. 11 – PROJECTION OF LIFE EXPECTANCY AT 65 YEARS FOR 2010-2040 - SELF-EMPLOYED
Lives, males and females. Values up to 2009 are historic data.
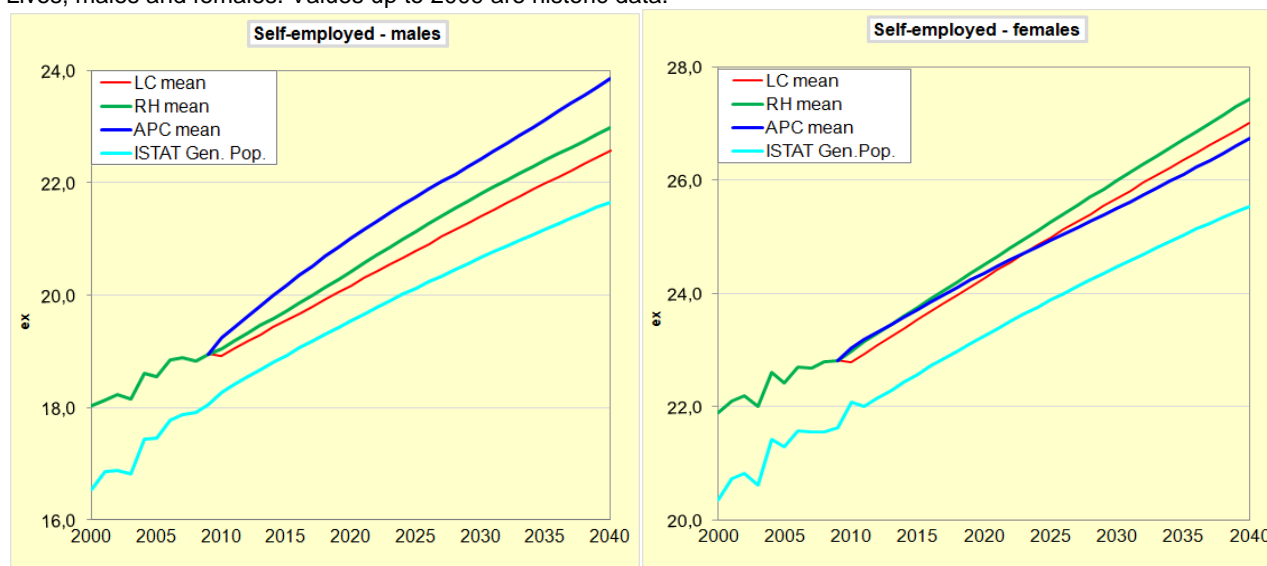
Fig. 10 and 11 outline the results of the projections for a life expectancy of age 65 in central scenarios until 2040, compared with projections for the general population made by ISTAT for 2011-2065. It can be noted that:

- it is confirmed that the historically observed higher life expectancy for these groups persists also in the forecast period, with values remaining higher than those projected for the general population;
- for males, life expectancy calculated by the Lee-Carter model are the lowest of the three models (less than 22.5 years in 2040 for private employees, just over 22.5 years for the self-employed), followed by the Renshaw-Haberman (23 years) and the APC model (about 23.5 for private employees, almost 24 for the self-employed) that give higher values;
- for females, the results and differentials in life expectancy among the different models are closer: between 26 and 26.5 years for private employees, while for the self-employed the APC model had projected life expectancy at 26.7 years, the Lee-Carter at 27 years while the Renshaw-Haberman at almost 27.5 years.

The ISTAT projections on the general population that had been considered as benchmark for this study have published at the end of 2011 ("The demographic future of the country", ISTAT

2011) and they have been calculated through a "cohort component model" that estimates the evolution of the population with an iterative process making assumptions on the balance (births and deaths) and migration of the population and using a specific model appropriate for forecasts on general population.

In addition, projections for the aggregated data (private employees and self-employed) have been carried out, using the Lee-Carter and APC models, and a special projection with APC model that used amount-weighted mortality of pensioners with monthly incomes al least equal to 1,200 euro.

FIG. 12 – PROJECTION OF LIFE EXPECTANCY AT 65 YEARS FOR 2010-2040 - NORMAL RETIREMENT PENSIONER DATA (PRIV. EMPL. AND SELF-EMPLOYED)
Males and females. Data up to 2009 are historical data.
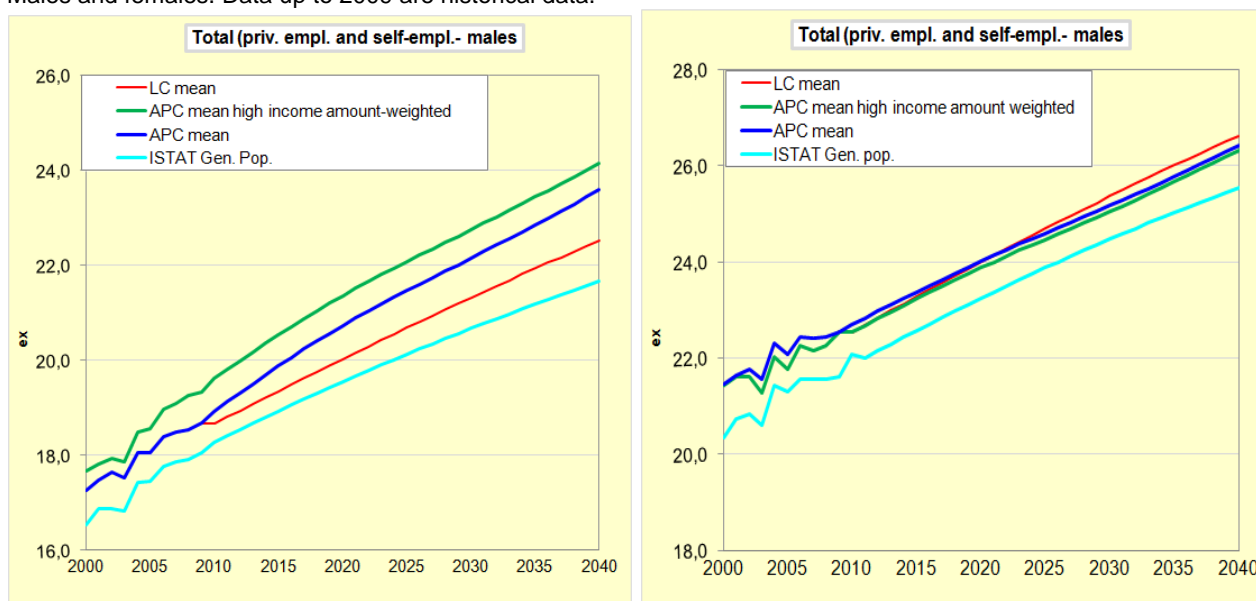
In addition to the trends that have been already commented on, it can be observed that:

– for males, the lowest life expectancy at age 65 is calculated by the Lee-Carter model (around 22.5 years in 2040), while highest is the amount-weighted projection through the APC for the pensioners earning at least 1,200 euro per month (more than 24 years compared to 23.5 years for normal retirement pensioners without amount effect);

– for females, values of life expectancy are closer among different models and similar to those of private employees, with substantially no incidence for the amount effect.

Overall, all the forecasts lead to expectations of a further growth in longevity of pensioners, although trends are different depending on the characteristics of the collective or the models that have been adopted. The projected life expectancy of all-pensioner data is consistently higher, for all the groups been considered, than the general population values calculated by ISTAT, in line with historically observed trends. Despite the projections are performed using different models and datasets, it is plausible to assume that the projections reflects a continuation of historic trends, that is, that pensioners have a higher life expectancy compared to general population and that disability and widow's pensioners have a lower expectation.

There are several factors to be taken into account in the projections reflecting the uncertainty that is inevitably embedded in longevity estimates. However, the extrapolation of trends conducted in this study responds to a principle of *best estimate*, i.e. an attempt to estimate with best efforts, through a scientific approach accompanied by analysis and data support, a phenomenon whose future outcome remains uncertain. In this regard, it is believed that the application of the projections just described to other collectives (e.g. civil servants, lawyers, doctors or other categories that are not treated in this study) should made with care considering whether and to what extent historic trends in mortality for such collectives (see Fig. 6) could recur in the future and taking into account of the other indications given in Section 4 par. 4.3 *Information on the use of projections, uncertainties and limitations of the study*.

2. THE DATA COLLECTION PROCESS

The study dealt with the pensioners and the other annuitants receiving an income from institutions and organizations participating to this study; it was examined in particular data on lives, deaths and corresponding annuity amounts over the period 1980-2009, for the following types of pension:

– normal retirement pensions, paid by compulsory social security schemes, pension funds and insurance companies consequent to the achievement of certain requirements such an age limit or length of service;
– disability pensions;
– widow's pensions paid to survivors.

The following tables show the data collected in 2009 by different type of pension institution and period of observation. More details regarding data collection process are included in the Methodological appendix, sections I and II.

TAB. 1 –NORMAL RETIREMENT pensioners data - year 2009

unit, euro millions

Pensioner	Period	Year 2009					
		Exposed to risk			Deaths		
		Number	Amounts		Number	Amounts	
			Total	Average		Total	Average
Priv. empl. and self-empl	1980-2009	8.023.945	99.659.101.706	12.420	188.705	2.434.817.927	12.903
Civil servants	2000-2009	1.824.758	41.395.157.874	22.685	35.975	758.959.427	21.097
Entertain. and sport	2000-2009	20.157	326.722.822	16.209	673	5.041.939	7.492
Medical doctors	1980-2009	47.651	619.219.027	12.995	1.909	28.587.793	14.975
Lawyers	1992-2009	14.000	421.903.198	30.136	486	10.880.147	22.387
P.fund - Ins. Comp. Annuitants	vari-2010	38.439	232.101.189	6.038	829	4.961.002	5.984
Total		**9.968.949**	**142.654.205.816**	**14.310**	**228.577**	**3.243.248.235**	**14.189**

TAB. 2 – DISABILITY pensioners data - year 2009

unit, euro millions

Pensioner	Period	Year 2009					
		Exposed to risk			Deaths		
		Number	Amounts		Number	Amounts	
			Total	Average		Total	Average
Civil servants	2008-2009	200.997	3.875.350.565	19.281	7.092	126.222.441	17.798
Entertain. and sport	2000-2009	1.635	14.067.134	8.603	110	432.146	3.929
Medical doctors	1980-2009	1.876	33.462.784	17.837	112	1.792.047	16.000
Workers' compens.	2002-2009	790.088	3.122.809.868	3.952	47.836	166.884.418	3.489
Lawyers	1992-2009	903	14.060.194	15.571	59	921.252	15.614
Total		**995.499**	**7.059.750.544**	**7.092**	**55.209**	**296.252.304**	**5.366**

TAB. 3 –WIDOW'S pensioners data - year 2009

unit, euro millions

Pensioner	Period	Year 2009					
		Exposed to risk			Deaths		
		Number	Amounts		Number	Amounts	
			Total	Average		Total	Average
Civil servants	2000-2009	286.128	5.675.562.066	19.836	19.338	231.273.204	11.960
Entertain. and sport	2000-2009	17.779	138.538.263	7.792	802	2.842.675	3.544
Medical doctors	1980-2009	39.252	351.941.533	8.966	1.156	10.267.124	8.882
Workers' compens.	2002-2009	118.892	1.182.684.510	9.948	5.251	50.121.386	9.545
Total		**462.051**	**7.348.726.372**	**15.905**	**26.547**	**294.504.389**	**11.094**

3. MORTALITY OF PENSIONERS AND OTHER ANNUITANTS IN THE YEARS 1980-2009

3.1 The mortality of normal retirement pensioners and annuitants

An analysis of the results (tables and graphs) of mortality rates of normal retirement pensioners during the observation period are shown in Annexes 1-22. A summary of main results are reported as follows.

For private employees, males (see Annex 1), life expectancy has grown significantly during the observation period, increasing by about 30% at ages 60-65 and even by a greater extent at ages 70-75. The differential due to the effect of the pension amount is limited.

Compared to the general population, pensioners show higher increases, however that is reduced in recent years, especially at ages closer to retirement; at older ages instead the increase is lower, with values of life expectancy in 2009 even lower than the general population. In particular, in 2009, life expectancy at age 65 is 18.53 (lives) and 18.84 (amounts), compared to 18.16 of the general population. At age 85, life expectancy of the pensioners is 5.68 (lives) and 5.69 (amounts), compared to 5.98 years in the general population.

Among female private employees (see Annex 2), life expectancy has increased significantly during the observation period, in line with what observed for the general population, especially at older ages. There is substantially no effect due the amount weight on mortality. In recent years the data show a reduction in the differential with the general population, especially at older ages, with values of life expectancy in 2009 even lower than the general population: in particular, in 2009 life expectancy at age 65 is 22.44 (lives) and 22.39 (amounts), compared with 21.94 years in the general population. At age 85, life expectancy of pensioners is 7.02 (lives) and 7.01 (amounts), compared to 7.11 years in the general population.

Fig 13 shows the trend of mortality rates for private employees from age 60 to 100 during the observation period 1980-2009.

FIG. 13 – MORTALITY RATE (YEARS 1980-2009) – PRIVATE EMPLOYEES
absolute values, males and females
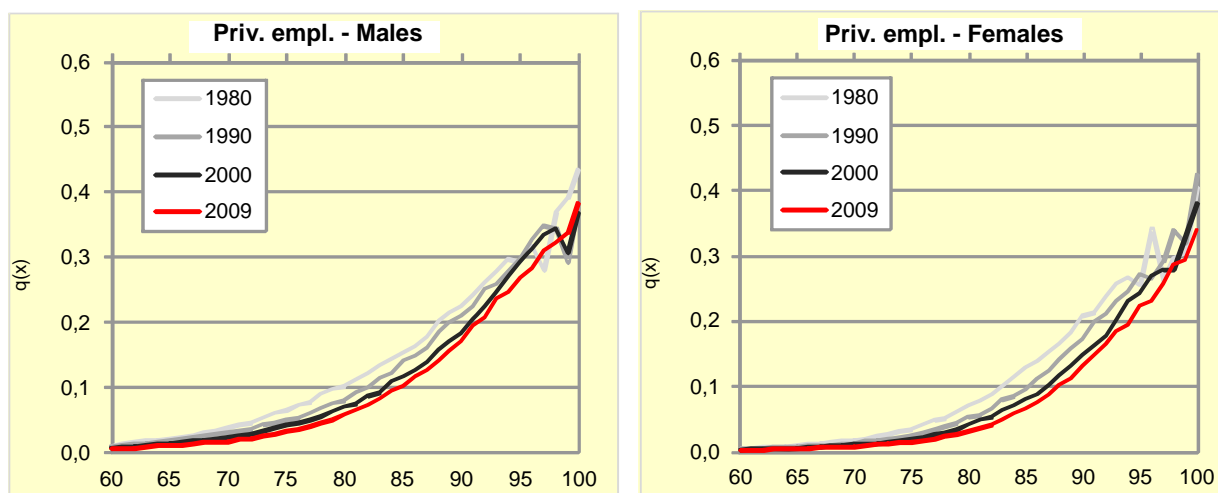
Annex 19 also shows the development of mortality rates in the period of observation expressed in relative terms (1 = basic mortality rate in the first year of observation, i.e. 1980).

For males self-employed, trends are similar to those observed for private employees, albeit with higher values in life expectancy (see Annex 3). In 2009, life expectancy at age 65 is 18.95 (lives) and 19.18 (amounts) and at 85 years is 5.78 (lives) and 5.83 (amounts). Likewise for females self-employed, trends are similar to private employees, but with values of life expectancy being significantly higher than the general population, even at older ages (see Annex 4). In 2009, life expectancy at age 65 is 22.82 (lives) and 22.86 (amounts), at age 85 is 7.24 (lives) and 7.26 (amounts). Fig. 14 shows mortality rates from ages 60 to 100 for self-employed (males and females) in selected years of the observation period.

FIG. 14 – MORTALITY RATE YEARS 1980-2009 – SELF-EMPLOYED
absolute values, males and females
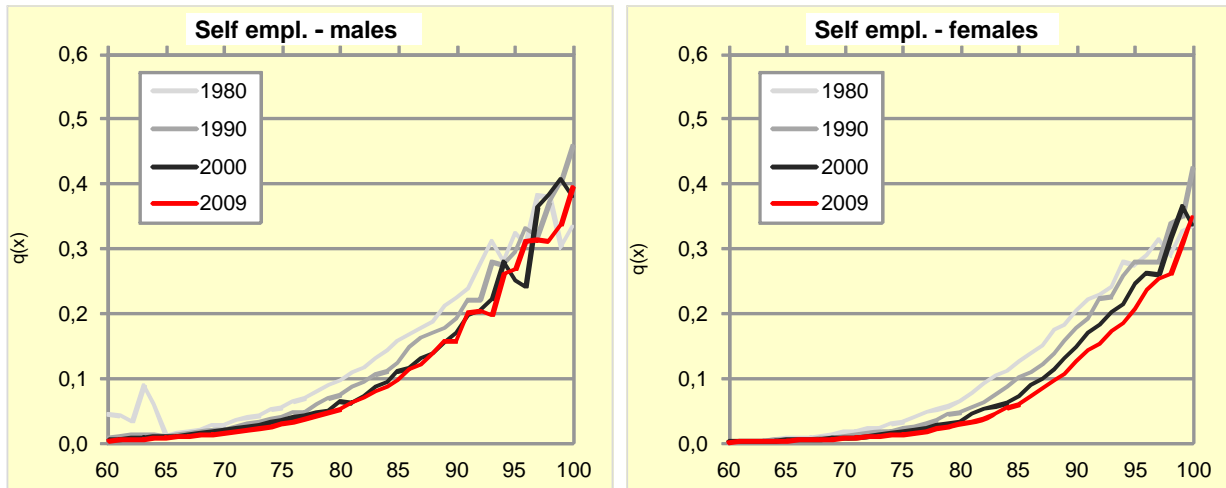
In Annex 19 it is also shown the development of mortality rates at various ages expressed in relative terms during the period of observation (1 = basic mortality rate in the first year of observation, i.e. 1980). For <u>total pensioners</u> (i.e. the aggregated dataset for private employees and self-employed), the overall trends in life expectancy at various ages are shown in Annexes 5-6. The Annexes 17 and 19 show the development of the mortality rate during the observation period for the same groups, both in absolute terms and in relative terms, expressed as a multiple of the first year of observation (1980).

For <u>civil servants</u> data for males are available since 2000 and are detailed in Annex 7. The following comparisons can be made with the private employees dataset:

– in absolute value, life expectancy is consistently higher during the period of observation, with values also considerably higher than the general population, especially at older ages;
– the effect of pension amount is significant, with a differential in life expectancy from about 3% to 5% compared to life expectancy based on lives.

In 2009, life expectancy at age 65 is 20.71 (lives) and 21.52 (amounts), at age 85 is 6.79 (lives) and 7.20 (amounts). Civil servants data for females exhibit trends similar to those seen for males (see Annex 8). In 2009, life expectancy at age 65 is 24.26 (lives) and 24.85 (amounts), at age 85 is 8.27 (lives) and 8.63 (amounts). Fig.15 shows mortality rates from ages 60 to 100 during the observation period.

FIG. 15 – MORTALITY RATES IN SELECTED YEARS – CIVIL SERVANTS
absolute values, males and females
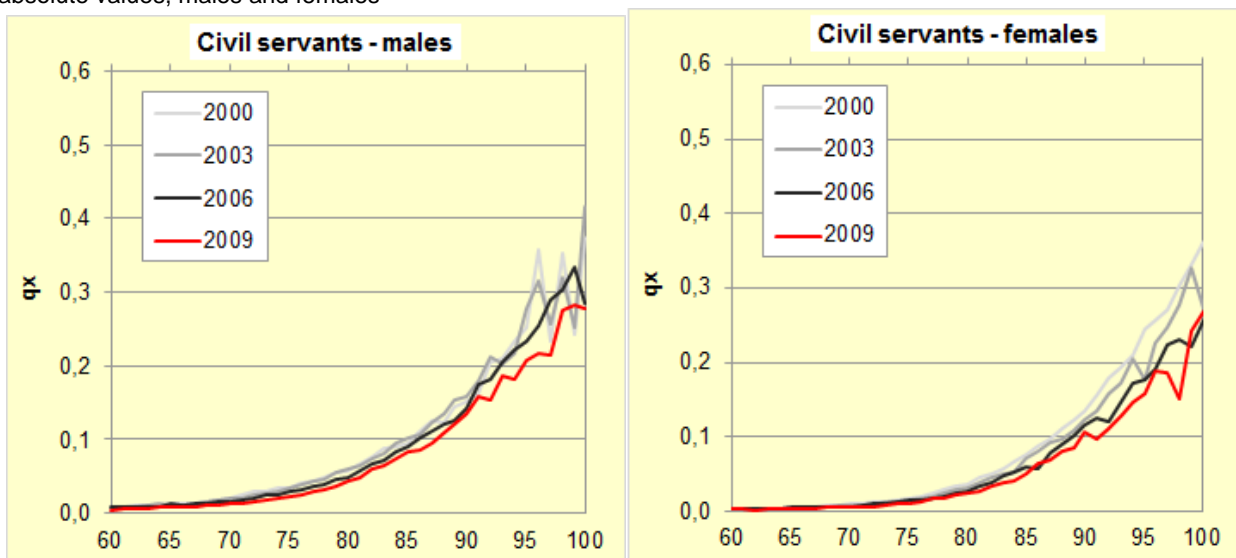
Annex 20 shows the development of the mortality rates in relative terms (Year 2000=1.

For <u>workers in arts and sport (males)</u>, data are available since 2000 and are detailed in Annex 9. Life expectancy is higher than the general population and the differentials due to the amount effect are very high (life expectancy is more than 20% higher than the value calculated on a lives basis). In 2009, life expectancy at 65 years is 18.35 (lives) and 23.13 (amount-weighted), at 85 years is 5.82 (lives) and 8.51 (amount-weighted). For females, trends are similar to those seen for males (see Annex 10), with differentials in life expectancy even more pronounced for amount effect: in 2009 life expectancy at 65 years is 22.71 (lives) and 27.05 (amounts), at 85 years is 8.21 (lives) and 10.92 (amounts). The following figure shows mortality rates from ages 65 to 90 in selected years.

FIG. 16 - MORTALITY RATES IN SELECTED YEARS– ARTS AND SPORT PENSIONERS
absolute values, males and females
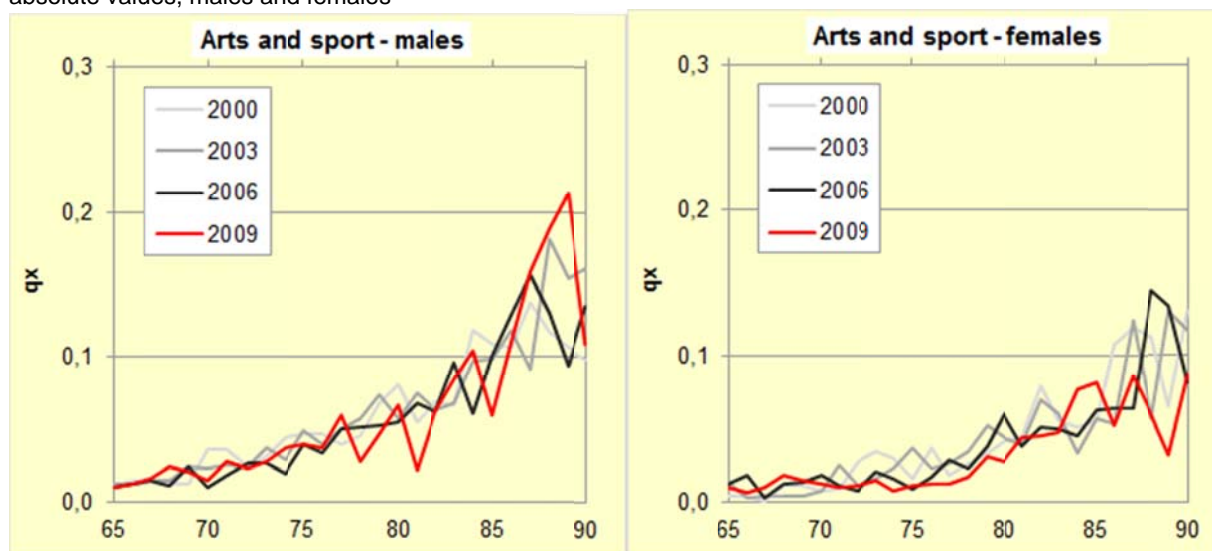
Annex 20 shows mortality trends in relative terms (year 2000=1)).

For <u>lawyers</u> (males), data are available from 1995 (although it should be noted that data for the year 1995 itself show some anomalies compared with subsequent years) and are reported in Annex 11. Life expectancy values are significantly higher than the general population - in 2009 on average by around 10% (lives analysis); - the amount effect is also evident, with differentials of around 5%. In particular, in 2009 life expectancy at 65 years is 20.79 (lives) and 21.66 (amounts), at 85 years is 6.74 (lives) and 7.07 (amounts).

For lawyers (females) trends are even more remarkable (see Annex 12), although they may be due to scarce data volumes, which could explain odd results in particular in the amount analysis, In 2009 life expectancy at 65 years is 24.99 (lives) and 24.65 (amounts), at 85 years is 9.34 (lives) and 8.87 (amounts).

For <u>doctors</u> (males), data are available from 1980 and are shown in Annex 13. Life expectancy of male doctors is always higher than the life expectancy in the general population, particularly at the older ages, but it stays slightly lower than for the lawyers. The amount effect is significant, especially at the older ages. In 2009 life expectancy at 65 years is 20.14 (lives) and 20.20 (amounts), at 85 years is 6.34 (lives) and 6.83 (amounts).

For doctors (females), data volumes are limited (see Annex 14); however it can be seen that life expectancy for this group is higher than the general population, especially at the older ages. In 2009 life expectancy at 65 years is 23.41 (lives) and 23.33 (amounts), at 85 years is 8.17 (lives) and 7.82 (amounts).

Figure 17 shows, for lawyers and doctors (males), trend in mortality rates in ages from 65 to 90 and selected years (starting from 2000 for lawyers and1980 for doctors). For females data volumes are too small and for this reason have not been shown.

FIG. 17 - MORTALITY RATES TRENDS DURING THE PERIOD OF OBSERVATION – LAWYERS AND DOCTORS
absolute values, males
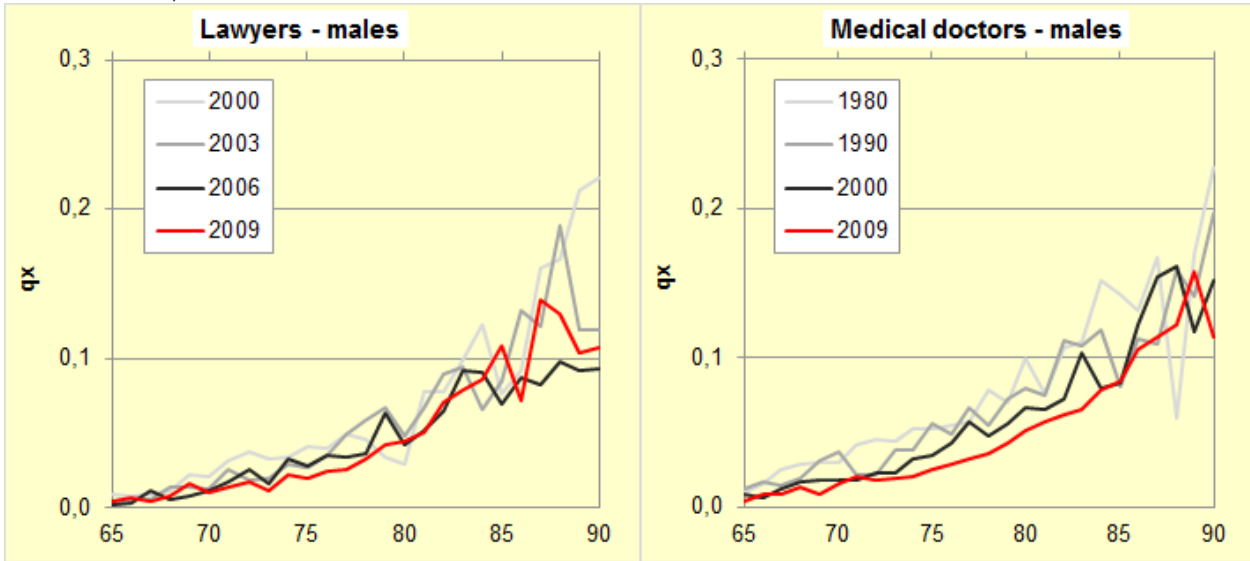
Annex 20 shows mortality trends in relative terms (year 2000=1).

For pension fund and life office annuitants (males), there is a sufficient data only from year 2000 - even though some offices submitted data in earlier years – which are shown in Annex 15. Life expectancy for this group is always higher than for the general population, with differentials of up to 10%. The amount effect is significant, especially in recent years. In 2009 life expectancy at 65 years is 20.28 (lives) and 20.55 (amounts), at 85 years is 6.63 (lives) and 7.14 (amounts). For females (see Annex 16) while trends are volatile due to small volumes of data, it can still be seen higher levels of life expectancy compared to the general population and even higher differentials in the analysis by amount. In 2009 life expectancy at 65 years is 23.08 (lives) and 24.68 (amounts), at 85 years is 6.71 (lives) and 8.32 (amounts). Figure 18 shows mortality rates for males for age 65 to 90 for selected years in the observation period.

FIG. 18 - MORTALITY RATE FOR SELECTED YEARS – PENSION FUND AND LIFE OFFICE ANNUITANTS
absolute values, males
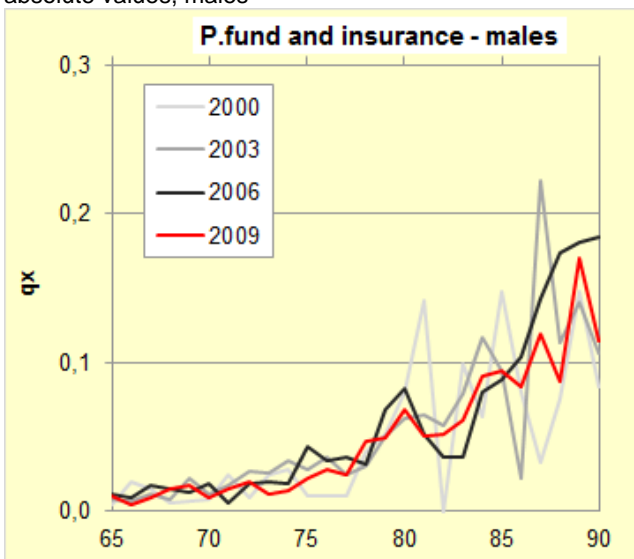
Annexes 21 to 22 include charts related to life expectancy trends that have already been illustrated in the Executive summary.

3.2 Focus on cohort trends in normal retirement pensioners data

In recent decades medical advances have led to a substantial reduction in mortality at the older ages and, as a result, to a progressive lengthening of life expectancy in the population. For example, life expectancy at birth for males in the Italian population men increased from 70.7 years in 1978 to 79.3 years in 2008 (source: HMD - Human Mortality Database); on the overall increase of 8.6 years, 6.5 years are due to improvements in mortality after age 60.

FIG. 19 - MORTALITY RATE - ITALIAN POPULATION (MALES - AGE 56-65)
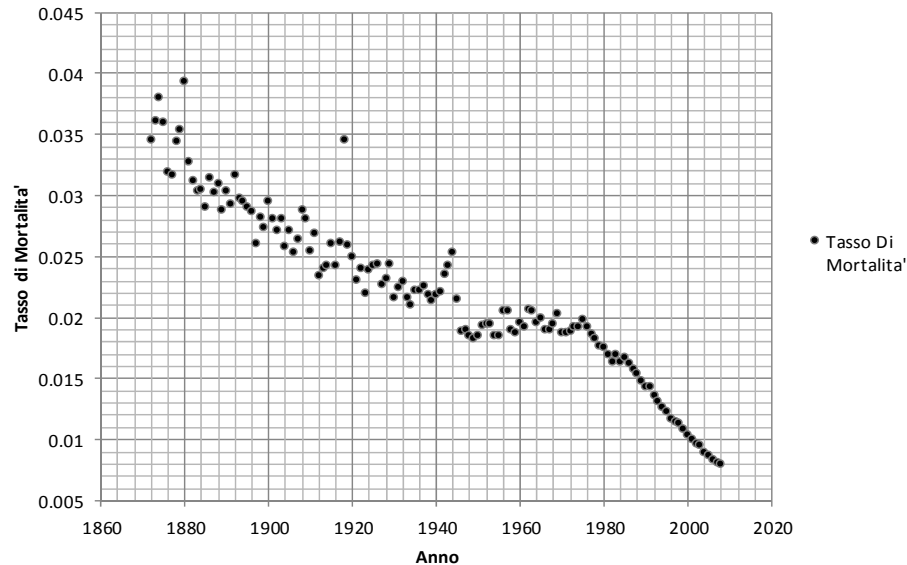
Figure 19 shows the trend of mortality rates for the Italian male population (ages from 56 to 65, from 1872 up to 2008, source: HMD): the reduction in mortality in the last thirty years is comparable to that observed in the previous century.

The analysis of mortality improvements defined here as r(x,t) (where r (x, t) = 1 - q (x, t) / q (x, t-1) and where q(x,t) is the probability of death for an individual of age x in the calendar year t) is of particular interest in the estimation of future trends in mortality. Mortality improvements even at population level show erratic trends and it is difficult to detect long-term trends. Even when aggregated into large age classes, improvements are highly volatile because of short-term effects, such as influenza epidemics (see in Fig. 20 the effect of 1918 epidemic) or possible measurement errors.

FIG. 20 - ANNUAL RATE OF MORTALITY IMPROVEMENT OF ITALIAN POPULATION (MALE - AGE 56-65)
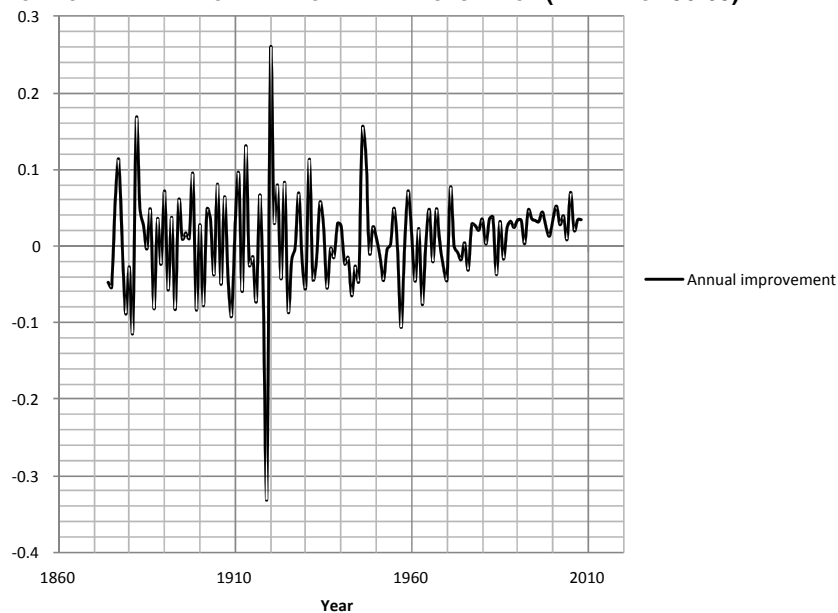
To remove random short-term factors and to study long-term trends in mortality data, a statistical model commonly used method is P-spline regression (see Eilers and Marx [14] and Andreev and Vaupel; a detailed description of the P-spline method is reported in CMI, [8] and Currie et al. [11].[1]). This method has been proposed in 2007 by the Continuous Mortality Investigation Bureau to calculate and project historical trends in insurance portfolios data.

To graphically evaluate any particular effect in mortality trends the heat maps of the mortality improvements after the smoothing process are reported in Fig. 21. The graphs helps to identify any systematic effects by age (vertical lines) calendar year (horizontal lines) or by birth cohort (diagonal lines) with yellow or red areas indicating a reduction in mortality (positive mortality improvements) while blue areas an increase in mortality (negative mortality improvements). Patterns developing on diagonal lines indicate the presence of a cohort effect, that is, the presence of a particular pattern in mortality improvements in a specific generation. These effects are of great interest because they provide keys to understand the historical evolution of mortality and help choosing mortality projections models.

Fig. 21 shows, respectively for males and females, the heat map of the mortality improvement for the Italian population (years from 1962 to 2008 for ages 20-90, source: HMD) after the application of the P-spline method.

FIG. 21 - "HEAT MAP" OF ANNUAL MORTALITY IMPROVEMENTS - ITALIAN POPULATION
males (left) and females (right graph)
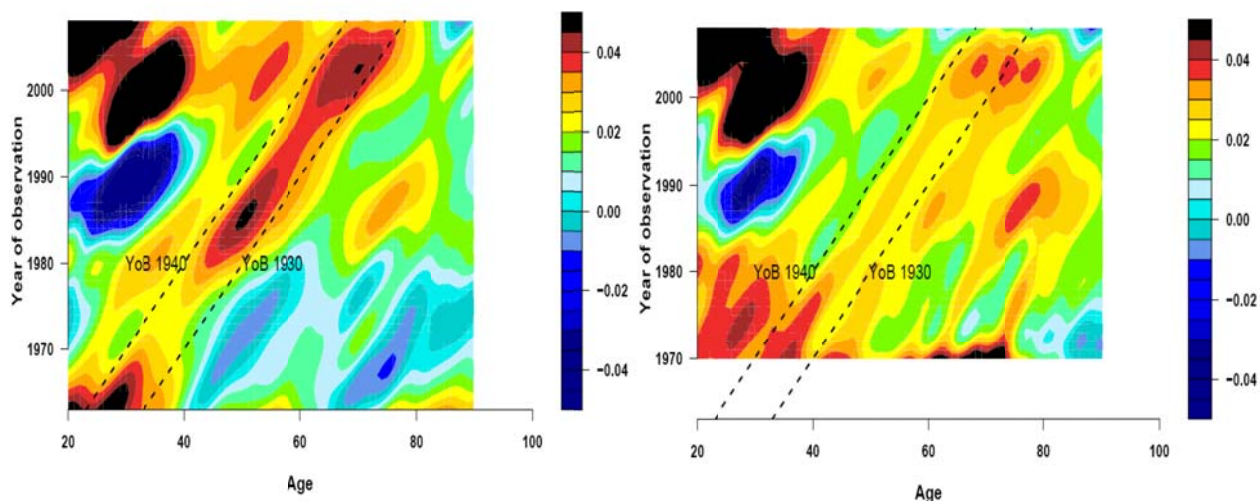
It is worth noting the cohort effect for males in generations born between the years 1930 and 1940 - highlighted by the dashed lines – that has also been observed in other European populations, in particular in the UK (see e.g. Richards et al. [22]). Such effects may be attributed to changes in smoking prevalence in the population, improvements in the treatment of lung cancer and cardiovascular diseases (a more detailed description of cohort effects in the Italian population can be found in Cocevar, [9]).

The correlation between income and cohort effect has been investigated by segmenting normal retirement pensioner data by amount. Whilst patterns of mortality improvements for private employees pensioners (top right box in Fig. 22) show similar trends to those observed in the Italian population - as it may be expected since they represent a significant proportion of the total population – Fig. 23 and Fig. 24 show that the cohort effect is different among pensioners with different amount of income and, in particular, is higher correspondingly to higher amount of pensions.

It may be reasonable to conclude that historic cohort effects patterns had been more pronounced in the for those receiving higher pensions, probably because the proportion of the males smokers in the higher income classes has declined in recent decades much more rapidly than in the lower income classes. The data for females in general show lower cohort effects compared to males.

FIG. 22 – SAME DATA AS IN FIG. 21 EXCEPT TOP RIGHT BOX: PRIVATE EMPLOYEES (YEARS 1991-2009, AGE 60-100)
Italian population and private employees (top right box) - male (left) and female (right)
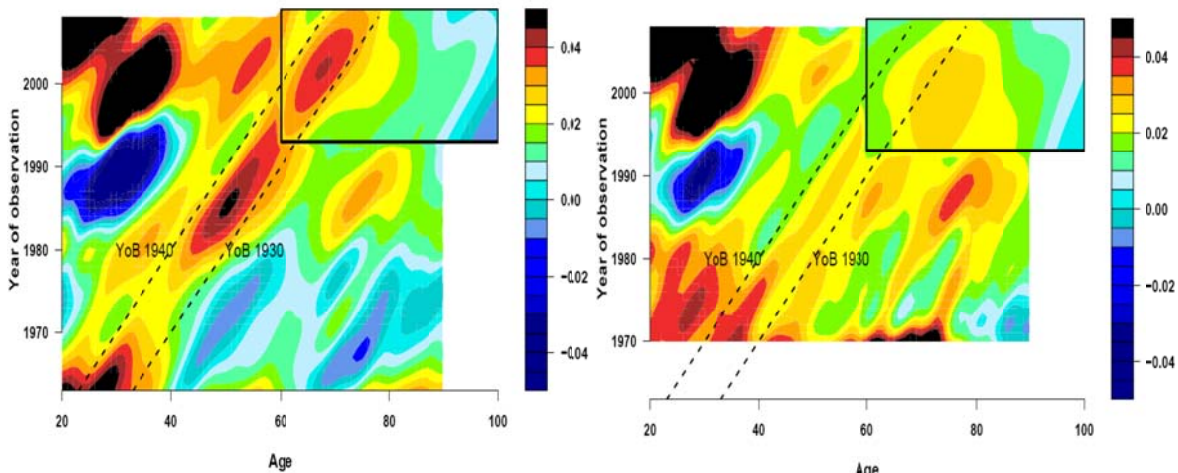
FIG. 23 – SAME DATA AS IN FIG. 21 EXCEPT TOP RIGHT BOX: PRIVATE EMPLOYEES (YEARS 1991-2009, AGE 60-100) RECEIVING A PENSION LOWER THAN 1,200 EURO PER MONTH
Italian population and private employees (top right box) - male (left) and female (right)
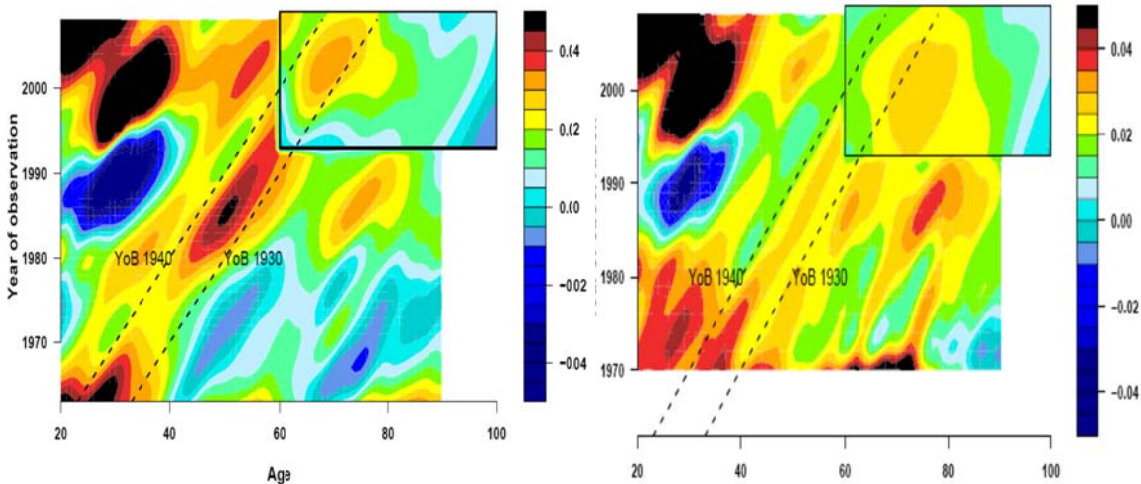
FIG. 24 – SAME DATA AS IN FIG. 21 EXCEPT TOP RIGHT BOX: PRIVATE EMPLOYEES (YEARS 1991-2009, AGE 60-100) RECEIVING A PENSION HIGHER THAN 1,200 EURO PER MONTH
Italian population and private employees (top right box) - male (left) and female (right)
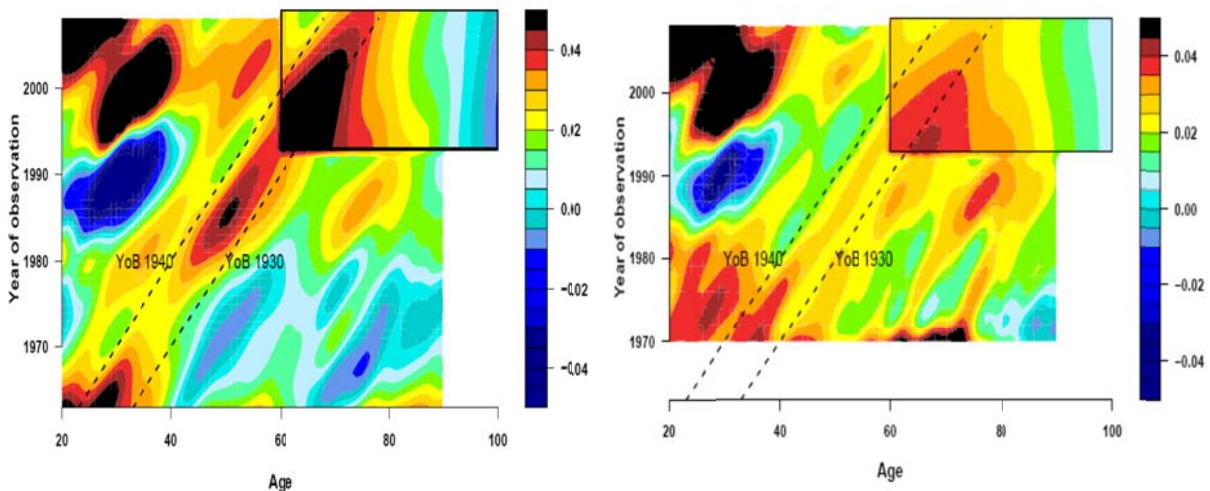
These trends support the decision to evaluate, for projection purposes, the amount effect ([21] Richards, SJ, Jones, G. shows that socio-economic characteristics are the factors with greater impact on mortality, after age and gender) and models able to consider the cohort effect. More

details on the trend of mortality rates and changes are in the Methodological Appendix (see section III.).

3.3 The mortality of widow's and disability pensioners

Life expectancy for <u>widow's (and widowers's) pensioners</u> (males and females, lives) other than receiving pension from INAIL (workers compensation authority) – namely civil servants, arts and sport workers and medical doctors - are detailed in the Annex 24, starting from year 2002 (data for 2001 has not been included). For males, life expectancy is higher than the general population at the older ages, while for females there is the opposite trend and at the older ages life expectancy for males is higher than for females. In 2009, life expectancy at age 65 for males is 18.35 (compared to18.16 in the population) and for females is 19.85 (compared to 21.94 in the population). At 85 years for males life expectancy is 6.77 (5.98 in the population), for females 6.01 (7.11 in the population). Fig. 25 shows mortality rates from age 60 to 100 in selected years from 2001 to 2009.

FIG. 25 – MORTALITY RATES (SELECTED YEARS) – WIDOW'S PENSIONERS OTHER THAN WORKERS COMPENSATION
absolute values, males and females
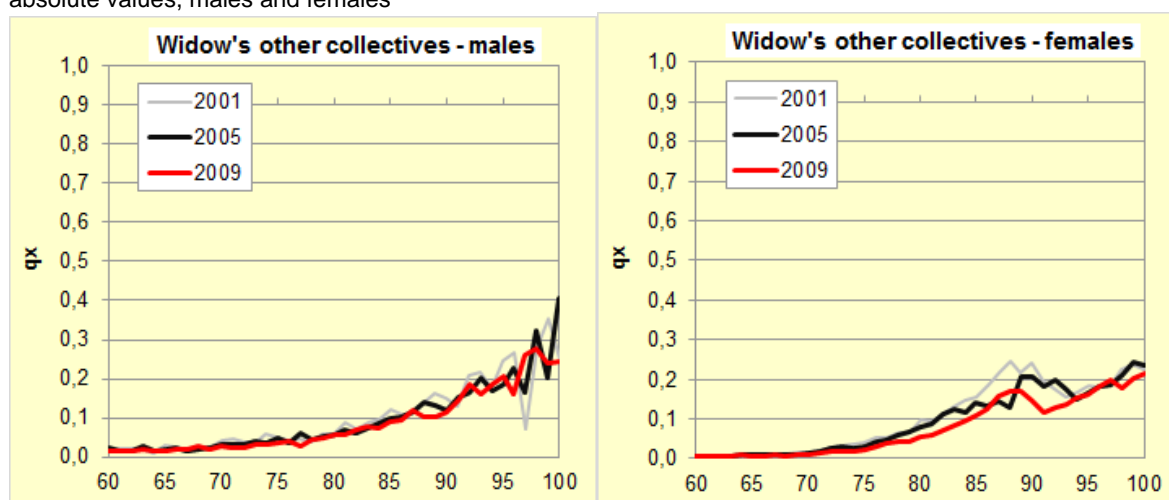
Life expectancy for widow's pensioners receiving pension from INAIL (workers compensation authority), are shown in Annex 25 starting from year 2002. For males, life expectancy decrease over the period of observation and by 2009 is lower compared to the general population, in particular around ages 60-65. For females, life expectancy is higher compared to the general population, with a differential growing to about 10%. In 2009 life expectancy at age 65 for males is 11.70, 20.84 for females. At age 85 for males expectancy is 4.56 and for females 6.50. Fig. 26 shows mortality rates from age 60 to 100 for selected years from 2002 to 2009.

FIG. 26 – MORTALITY RATES (Selected Years) – WIDOW'S PENSIONERS (WORKERS COMPENSATION)
absolute values, males and females
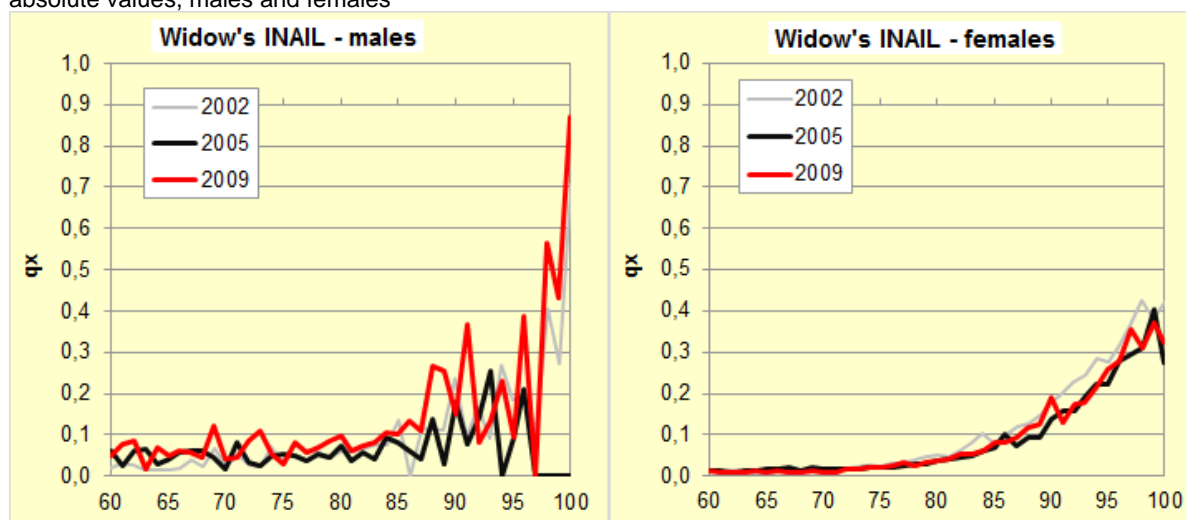
For <u>disability pensioners</u> (males and females) receiving pension from INAIL (workers compensation authority), life expectancy trends from 2002 are illustrated in Annex 26. For males, the life expectancy is higher compared to the general population in recent years and at older ages, while for females it is always higher than the general population, in particular at older ages. In 2009, life expectancy at age 65 for males is 17.87 and for females 22.60; at age 85 life expectancy for males is 6.93 and for females is 8.44. Fig. 27 shows mortality rates from age 60 to 100 for selected years from 2001 to 2009.

FIG. 27 – MORTALITY RATES (SELECTED YEARS) – DISABILITY PENSIONERS (OTHER COLLECTIVES) absolute values, males and females
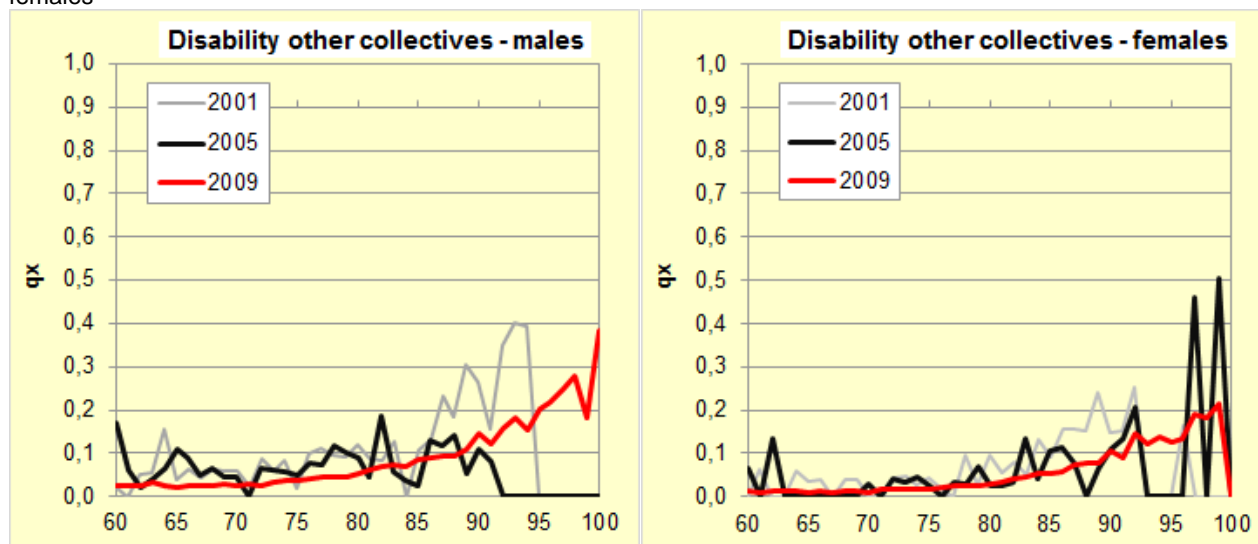
For workers compensation disability pensioners (males and females), detailed results on life expectancy are shown in Annex 27 starting from 2002.

For males, life expectancy in recent years has been considerably lower than the general population, while for females it has been higher than the population, with the exception of ages 60 to 65. In 2009, life expectancy at age 65 for males is 14.39 and for females 16.91; at 85 years life expectancy for males is 4.26 and for females is 6.15. Fig. 28 shows mortality rates from age 60 to 100 for selected years in the period 2001-2009.

FIG. 28 – MORTALITY RATES (SELECTED YEARS) – WORKERS COMPENSATION DISABILITY PENSIONERS absolute values, males and females
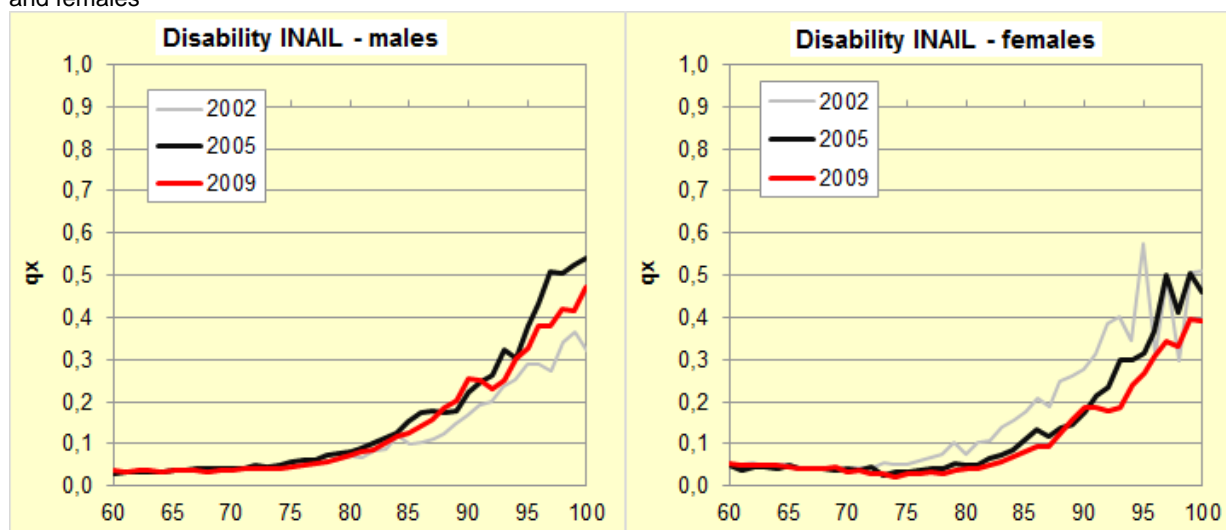
Detailed results (tables and graphs) for the mortality of widow's and disability pensioners during the period of observation are summarised in Annexes 24-30.

3.4 Mortality differentials in pensioners groups

In certain applications it may be useful to measure the mortality differential for different groups of pensioners, that is calculated as the ratio of the mortality rate of a given collective over a benchmark collective appropriately chosen. The three collectives that have been selected as benchmark are those used for mortality projections (see Section 4), namely:

– private employees, lives;
– self-employed, lives;
– total (sum of private employees and self-employed), lives.

The mortality differentials have been calculated by taking the ratio of the average mortality rate in the period 2000-2009, at each age, for a given group over a certain benchmark collective as described in the following table:

Reference group	Benchmark
Civil servants (lives)	Private employees (lives)
Arts and sport workers (lives)	Private employees (lives)
Lawyers (lives)	Self-employed (lives)
Doctors (lives)	Self-employed (lives)
Pension fund and life office annuitants (lives)	Sum of private employees and self-employed (lives)
Private employees (amounts)	Private employees (lives)
Self-employed (amounts)	Self-employed (lives)
Civil servants (amounts)	Private employees (lives)
Lawyers (amounts)	Self-employed (lives)
Doctors (amounts)	Self-employed (lives)
Pension fund and life office annuitants (amounts)	Sum of priv. employees and self-employed (amounts)

To the extent that the users of this report considers that is reasonable that historically observed differentials will continue into the future, then the above differentials could be used in conjunction with the projections of the mortality rates for the benchmarks collectives presented in the following section of the report. Further detail of the methodology the ratios have been calculated are shown in the Methodological Appendix (see section IV.)

FIG. 29 – NORMAL RETIREMENT PENSIONERS: MORTALITY DIFFERENTIALS AMONG PENSIONERS GROUPS
%, males, lives
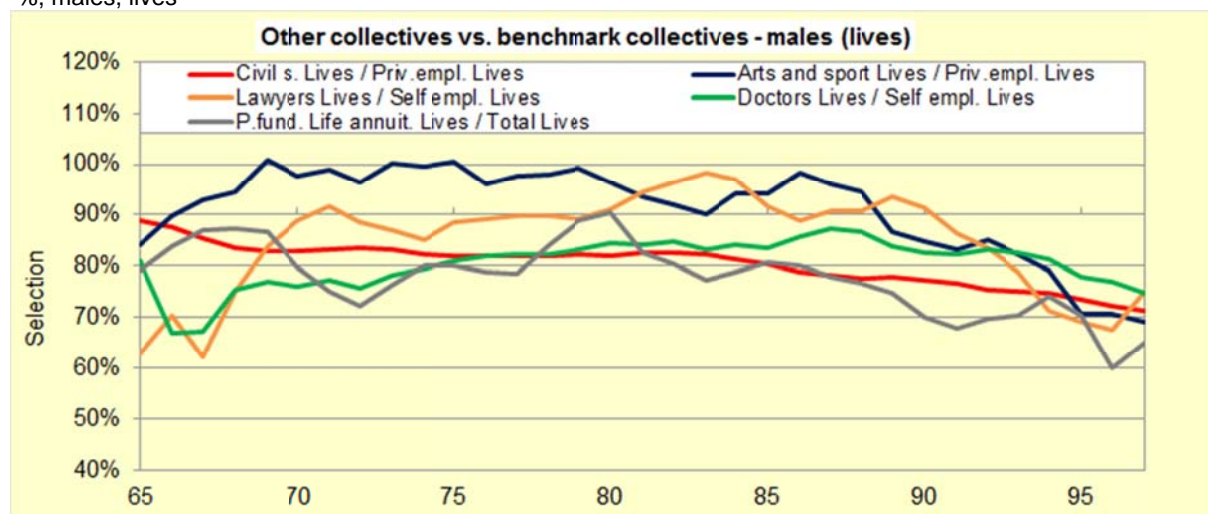
Fig. 29 shows the mortality differentials for male pensioners for various groups compared to a certain benchmark group, calculated on a lives basis. Civil servants show clear mortality differentials (a ration of between 80% and 90%) compared to private employees, while for workers

in the arts and sport differentials are smaller. Data for lawyers, albeit with fluctuations, show significant differentials, equal to a ratio of about 80% at age 70-80 compared to the self-employed group. Doctors also have mortality rates that are below their benchmark collective, at around 80%. Similar trends can be seen for pension fund and life office annuitant mortality (that are compared to total pensioners, notwithstanding significant fluctuations. Mortality differentials for private employees, self-employed and the total of the two collectives are not reported, as in the next section projections of mortality rates have been prepared for those groups.

The amount-weighted analysis reveals interesting mortality differentials (as outlined in the *Executive summary* and Figure 6) with mortality for self-employed and private employees being lighter when weighted by amount, with this differential decreasing with age, starting from 90% at around age 65 and converging to 100% over age 85. Civil servants show a more considerable selection (ratios in general around 70%), while for workers in the arts and sport the differential due to the amount effect is very high (the mortality is between 40% and 50% of the benchmark collective). Similar trends or more remarked trends can be seen for lawyers, doctors and pension fund and life office annuitants.

FIG. 30 – NORMAL RETIREMENT PENSIONERS: MORTALITY DIFFERENTIALS

%, females, lives (first graph) and amount (second graph)
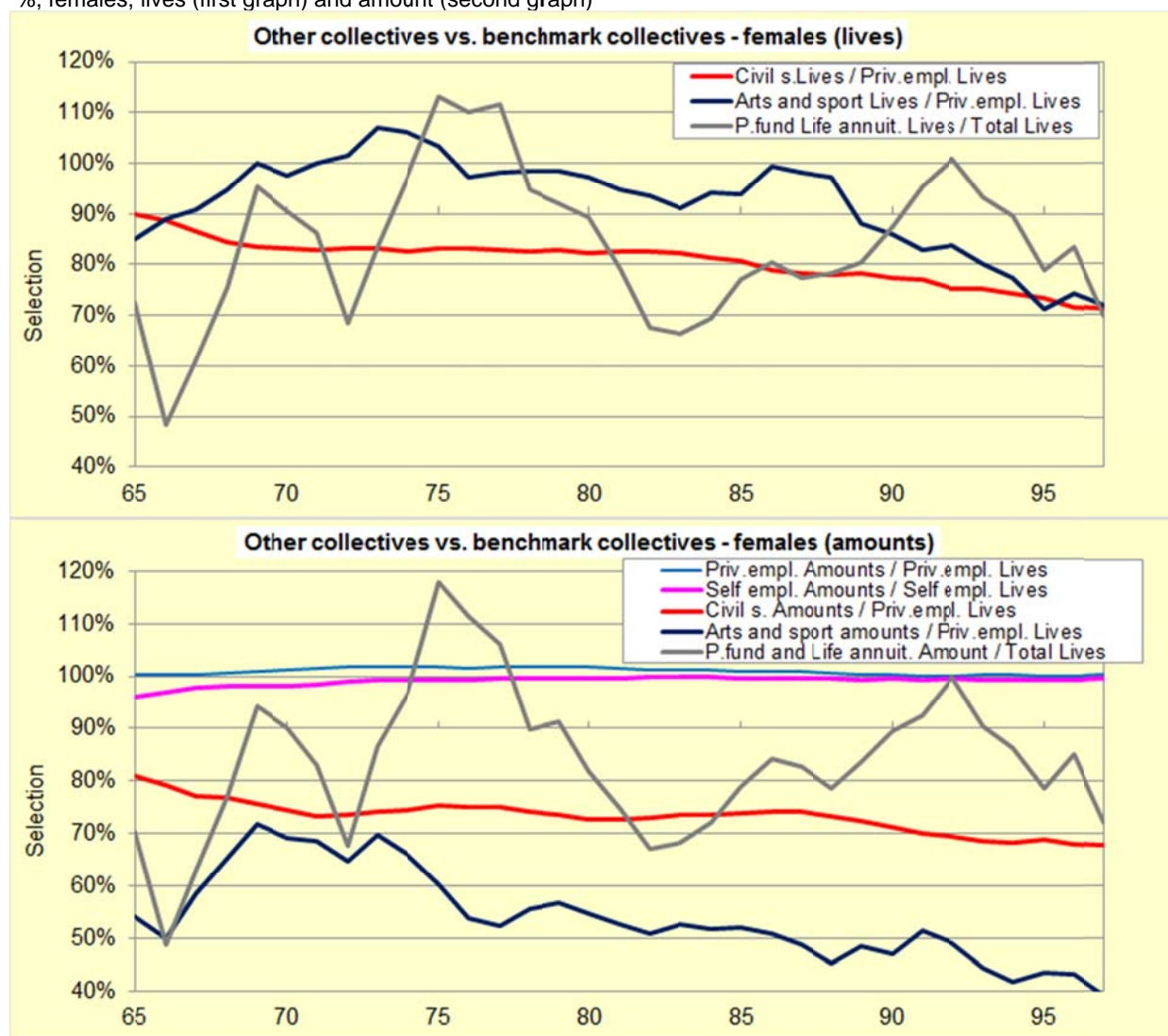
The first graph of Fig. 30 illustrates differentials for female pensioners: civil servants show a significant selection (with the ratio being between 80% and 90%) with respect to their benchmark collective, while for workers in the arts and sport the differential is more volatile. For pension fund and life office annuitants it is not possible to identify a clear trend. Differentials for lawyers and doctors are not shown due to small volumes of data.

The second graph of Fig. 30 illustrates the selection for female pensioners in the amount-weighted analysis. Private employees do not show any amount effect and that is minimal also for the self-employed. Civil servants, however, confirm a significant selection (with the ratio being between 70% and 80%), while for workers in the arts and sport the differential is even higher.

Mortality differentials have been also calculated for widow's and disability pensioners, both with comparison to the general population (see *Executive Summary*) and with normal retirement pensioners. The results are shown in Annex 31.

4. MORTALITY PROJECTIONS TO YEAR 2040 FOR NORMAL RETIREMENT PENSIONERS

4.1 The choice of the models and the data sets for the mortality projections

The models commonly used for mortality projections are extrapolative models, that is, models that are based on the extrapolation of past mortality data into the future. Extrapolative models may be either deterministic or stochastic (see Fig 31).

FIG. 31 - EXTRAPOLATIVE MODELS: DETERMINISTIC (a) AND STOCHASTIC (b)

(a)   (b)
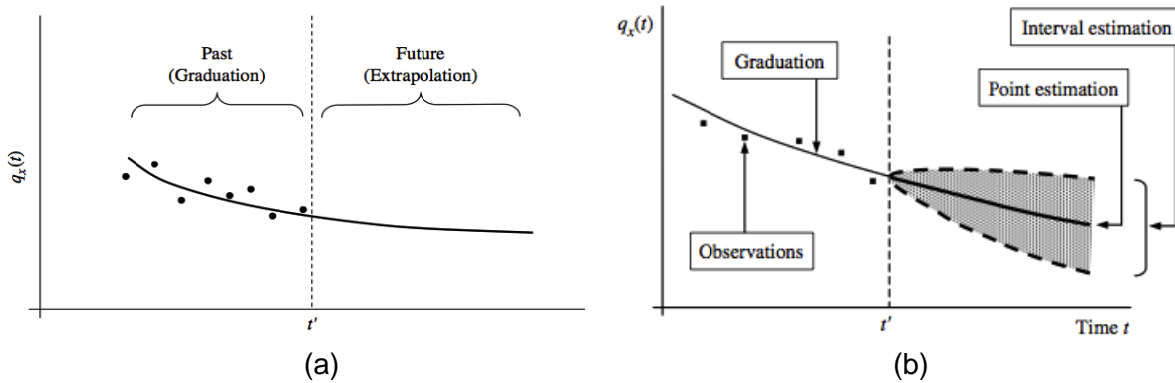
Source: Pitacco - Denuit - Haberman - Olivieri (2009)

All stochastic models - from the most complex to the simpler model like the Lee-Carter model - as exemplified in Fig 31 (b) - have the advantage that they provide a probability distribution on possible future outcomes helping describing uncertainty in future mortality. However it should be noted that the parameters of stochastic models are calibrated to historic data so if is not appropriate to assume that past trends will recur in the future, then the use of stochastic models for long-term projections should be considered with caution.

Deterministic models on the other hand are not purely extrapolating historical trends; for example in those proposed recently in the UK a long-term mortality improvement is set by "expert opinion" to which recently observed improvements are made to converge; the expert opinion is formed using views on the developments of future mortality considering medical, pharmacological, epidemiological aspects. However these models are not able to produce a range of scenarios with an associated probability distribution that could be used for risk management or stress-testing evaluations.

In any case, whatever type of model is adopted, future longevity trends remain uncertain and their predictability is linked to factors, such as the development of the most important causes of death, that are difficult to model.

FIG. 32 - LIFE EXPECTANCY AT BIRTH (ACTUAL VS. EXPECTED IN PROJECTIONS) IN THE UNITED KINGDOM
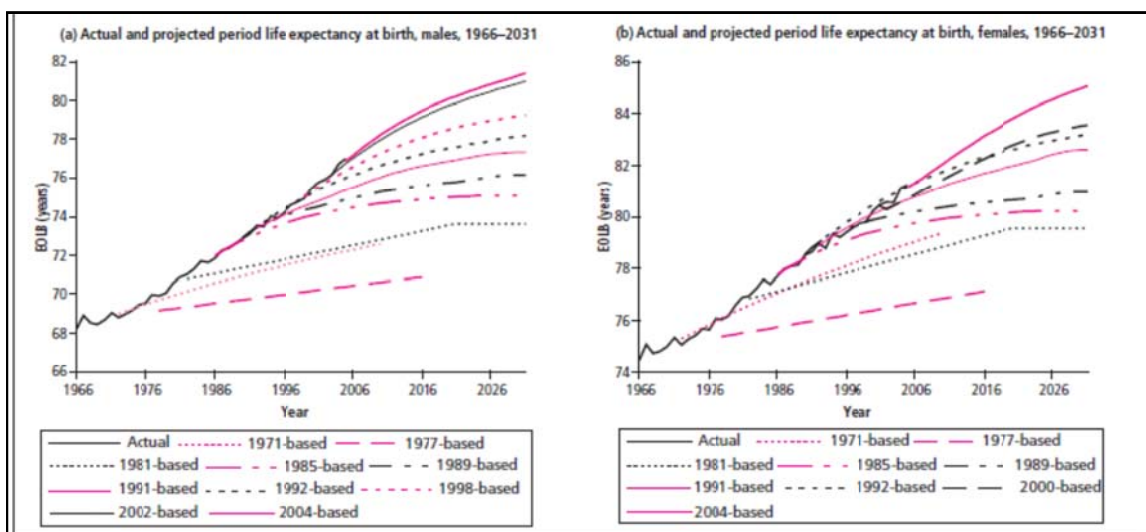
To exemplify the challenge related to estimating future longevity trends, Fig. 32 (source: Shaw, C. [24]) shows actual life expectancy at birth for the English population compared with various projections that had been carried out starting from 1971 by the Office of National Statistics in the United Kingdom. It can be seen that actual life expectancy has been systematically higher than projected, and that the oldest projections underestimated life expectancy the most.

Another source of risk that should be considered in mortality projection models is the so called "model risk", that is the risk that the projection model does not represent adequately the real evolution of mortality in the future. In this study, we have tested models with thorough checks on goodness of fit to historical data before adopting any model. To reduce the reliance on a single model and help put the results in a wider context, it was decided to perform projections using the following models:

- the Lee-Carter stochastic model (1992), integrated using a Poisson log-bilinear model;
- the Renshaw-Haberman stochastic model (2006) with cohort effect;
- the APC (Age-Period-Cohort) deterministic model (CMI, 2009).

Further details on the models, the assumptions and methodology can be found in the Methodological Appendix (see Section V., VI., VII. and VIII.).

The data available to the working party on which to base the mortality projections consisted of several heterogeneous collectives over different observation periods. The option to group all collectives together as a base for the projection was examined first, but in the end the view taken was that that option had more drawbacks than advantages: primarily the risk that aggregating collectives with different historical trends could introduce distortions in projections of future mortality.

Then the option of projecting each collective was considered, however certain data sets had not sufficient data in the observation period. Ultimately, the working party decided to apply the projection models to data sets that were sufficiently large, extending over several years and with proven reliability. The following collectives of normal retirement pensioners were therefore chosen:

- private employees, year 1980 to 2009, ages 60 to 95;
- self-employed, year 1980 to 2009, ages 65 to 95 (males) and 60-95 (females);
- total (sum of private employees and self-employed), year 1980 to 2009, ages 60 to 95.

The working party choose to project data on lives rather than amounts, given amount data showed some irregular trend from the early 1980s till the early 1990s.

For the other groups (civil servants, workers in the arts and sport, lawyers, doctors, pension fund and life office annuitants) specific projections had not been prepared, however users of this report may consider adjusting in some way the projections obtained for the main collectives (the benchmark groups) using other information included in the study e.g. the mortality differentials for these groups with the general population or the benchmark collectives.

4.2 The results of the projections

The detailed results (tables and graphs) on the projections of the mortality of normal retirement pensioners in the period 2010-2040 are in Annexes 33-57.

For male private employees (Annex 33), life expectancy in the central scenarios of the stochastic models increases by around 20% at age 60 to 65 over the period 2010-2040, with life expectancy for this group remaining constantly higher than the general population projection (the proprietary mortality projection model used by ISTAT, the Italian Statistical Office) , reaching increases of around 30% at the older ages over the same period.

Life expectancies calculated with the Renshaw-Haberman model in 2040 are the highest: at age 65 life expectancy is 23.15 years compared to 22.39 years calculated with the Lee-Carter model and 21.66 years as calculated by the ISTAT general population projection). Annexes 34 and

36 show the projection obtained by the stochastic models in the high scenario and in the low scenario (respectively the 95th and 5th probability percentiles).

Annex 47 shows projected life expectancy based on the APC model using a central scenario - where mortality improvement are assumed to converge to a long-term rate of 2% per annum; it should be noted that the life expectancy calculated by the APC model are higher than those obtained by the stochastic models: for example at age 65 in year 2040 life expectancy is 23.46 years, increasing by around 25% from 2010).

The results for the projections of private employees are shown in Fig. 33 (males, life expectancy at age 65) for each model and scenario, with a comparison with the central scenario from the ISTAT projection model for the general population (years 2010 to 2040).

FIG. 13 – PROJECTIONS OF LIFE EXPECTANCY AT AGE 65 - PRIVATE EMPLOYEES (MALES) – ALL MODELS
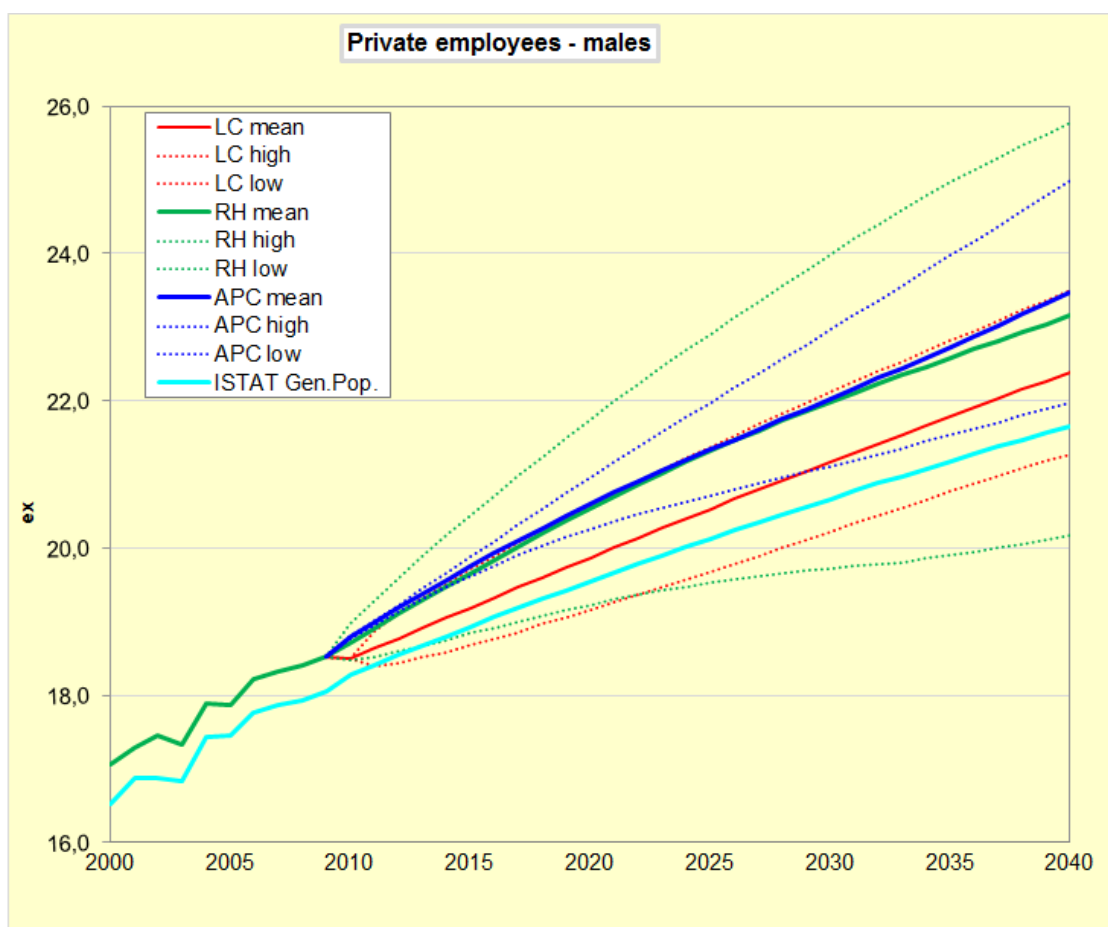
For female private employees (Annex 34), it can be seen that the stochastic models show similar trends compared to those observed for males.

Increases in life expectancy during the period 2010-2040 are below 20% at ages 60-65 and up to 30% at older ages, with values in year 2040 that are higher than the general population by 3-5% in each age class.

The results are relatively similar between the two models (e.g., in 2040 at age 65 26.43 years with the Lee-Carter model, 26.24 with the Renshaw-Haberman model, compared to 25.54 years for the general population).

Annexes 35 and 37 show the projections calculated by the stochastic models in the high and low scenarios.

Annex 47 shows that the values of the life expectancy as projected by the APC model in the central scenario are similar to stochastic models (for example, in year 2040 at age 65 it is 26.27 years, with an increase of about 17% from 2010).

A summary of the projections for life expectancy at age 65 for female private employees from all the models is shown in Figure 34 including a comparison with the central scenario of the ISTAT projection on the general population, with results to year 2040.

FIG. 32 PROJECTIONS OF LIFE EXPECTANCY AT AGE 65 - PRIVATE EMPLOYEES (FEMALES)
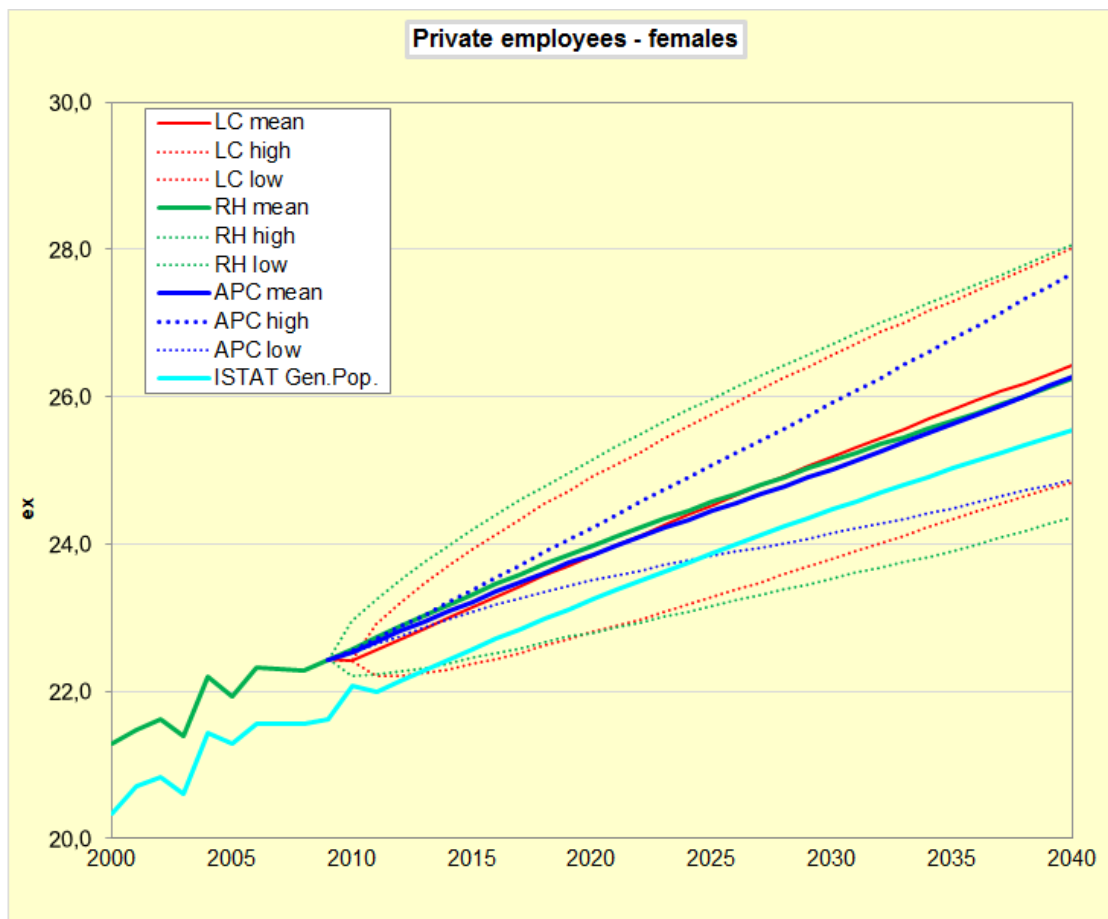
For male self-employed (Annex 39), life expectancy calculated by the main projection produced by the stochastic models grows in the period 2010-2040 by around 20% at age 65 years. The values are constantly higher than the general population projection, and differentials reach or exceed 30% at the older ages.

Similarly to what seen for the private employees, the projected values calculated by the Renshaw-Haberman model in 2040 are the highest (at age 65 life expectancy is 22.98 years compared to 22.57 with the Lee-Carter model).

Annexes 41 and 43 include the results of the projections of the stochastic models in high and low scenarios.

Annex 49 shows the values of life expectancy for self-employed males projected by the APC model; in the "central" scenario the model again produces higher values than those calculated by the stochastic models.

A summary of the projections for life expectancy at age 65 for self-employed (males) from all the models is shown in Figure 35 including a comparison with the central scenario of the ISTAT projection on the general population, with results to year 2040. Figure 36 shows the same results for females.

FIG. 35 – PROJECTIONS OF LIFE EXPECTANCY AT AGE 65 - – **SELF-EMPLOYED (MALES)**
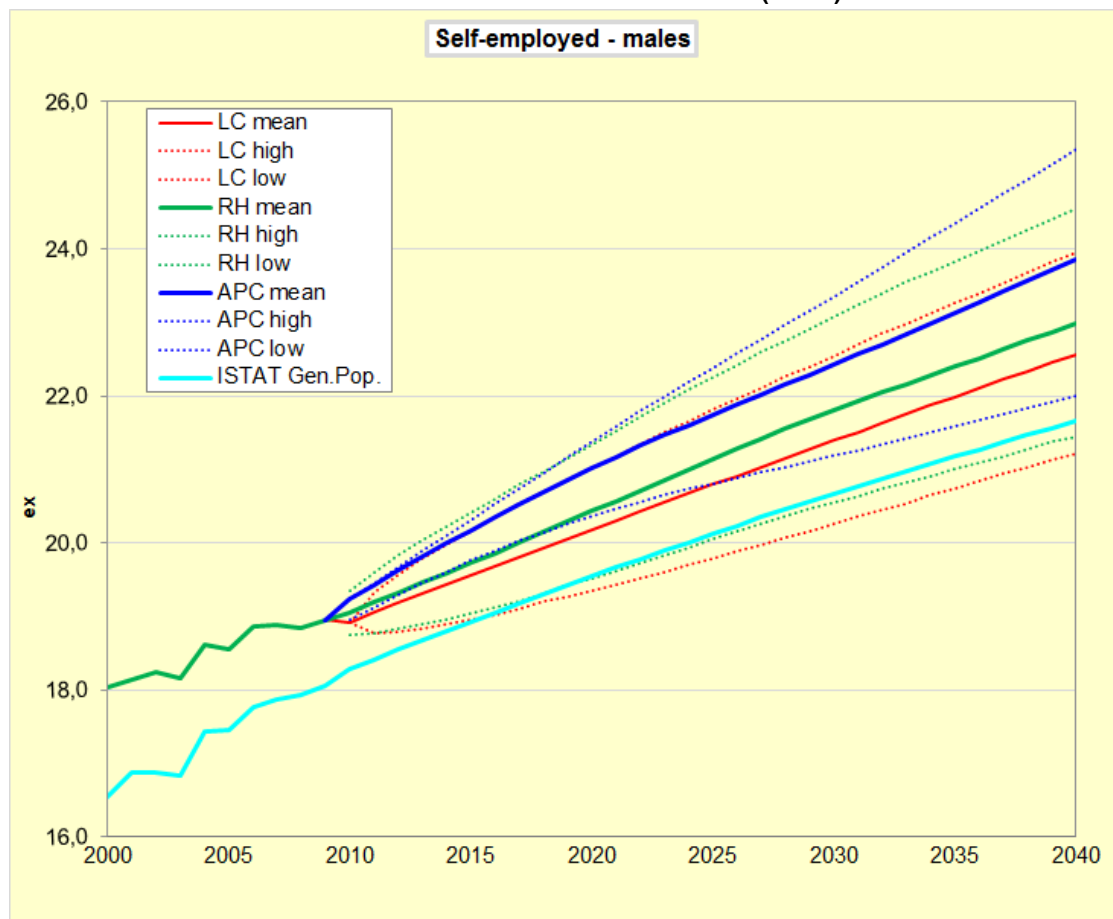
FIG. 36 – PROJECTIONS OF LIFE EXPECTANCY AT AGE 65 – **SELF-EMPLOYED (FEMALES)**
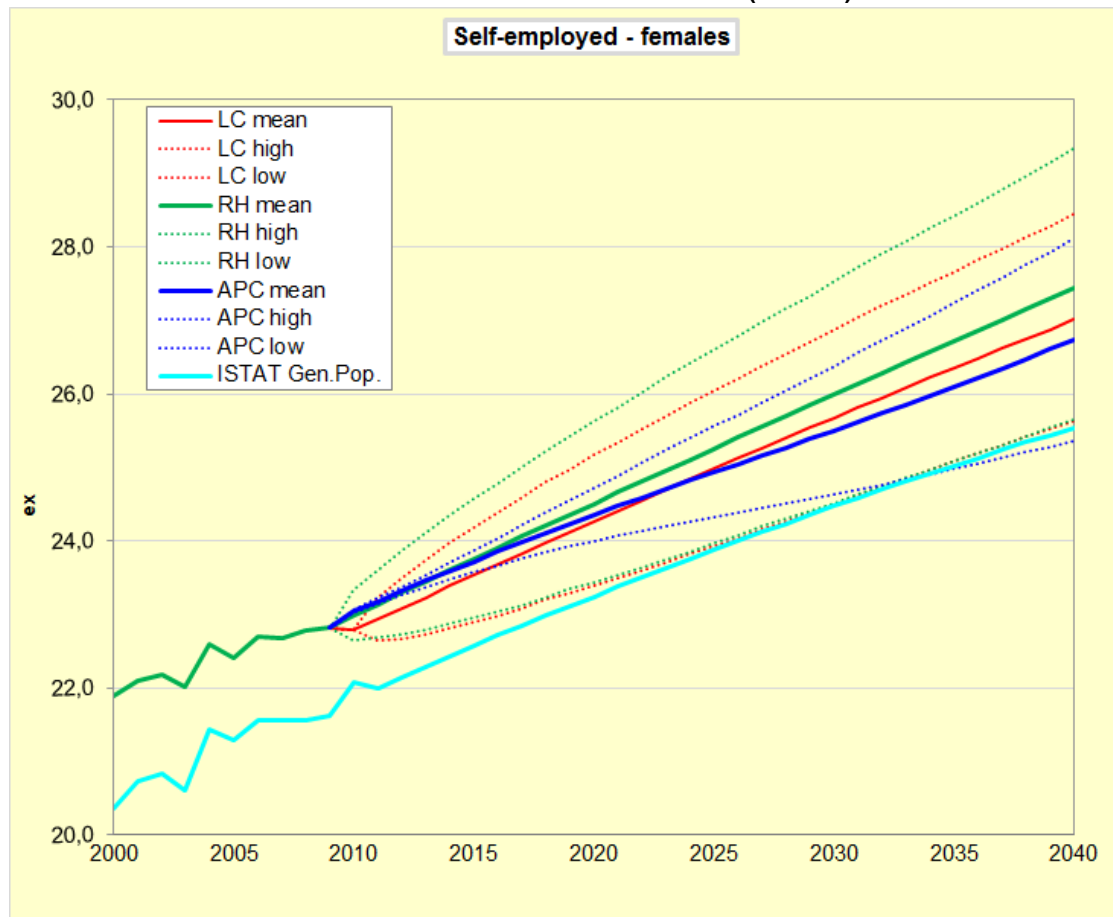
For females self-employed (Annex 40), life expectancy increases in the period 2010-2040 remaining constantly above the general population, with differentials below 20% at ages 60-65 increasing to more than 30% at the older ages. Again, values projected with the Renshaw-Haberman model in 2040 are higher than those calculated by the Lee-Carter (e.g. at age 65, the former gives a life expectancy of 27.43 while it is 27.01 in the latter). Annexes 42 and 44 show the results from the projections calculated by the stochastic models in the high and low scenarios. Annex 50 shows of life expectancy for females self-employed projected with the APC model in the "central" scenario, and that gives lower values than those calculated by the stochastic models (in year 2040, age 65, life expectancy is 26.73 years); this trend is in contrast with the results that have been obtained for self-employed males and private employees.

The Renshaw-Haberman model, when applied to the data set of private employees and self-employed, gave poor goodness of fit; therefore for that collective it was decided to include projections obtained with the Lee-Carter and the APC model only. Furthermore, to help quantify the impact of the correlation that has been observed in the data between income and mortality, a projection was developed with the APC model on the sub-group of pensioners receiving a monthly income higher than (or equal to) euro 1,200.

For the data set comprising male private employees and self employed the Lee-Carter model (Annex 45) projects life expectancy increasing from around 20% at ages 60-65 to 25% at the older ages in the central scenario for the period 2010-2040; the expectation of life remains constantly higher than that estimated by the ISTAT general population projection. In year 2040 life expectancy at age 65 is 22.52 years. Annex 45 reports also the values of life expectancy in the high and low scenarios.

Annex 51 reports the values of life expectancy calculated by the APC model on lives: under the central scenario life expectancy in year 2040 is higher than that calculated by the Lee-Carter model (e.g. at age 65 in 2040 that is 23.58 years with an increase of around 25% since 2010).

FIG. 37 PROJECTIONS OF LIFE EXPECTANCY AT AGE 65 – **TOTAL (PRIVATE EMPLOYEES AND SELF-EMPLOYED), MALES**
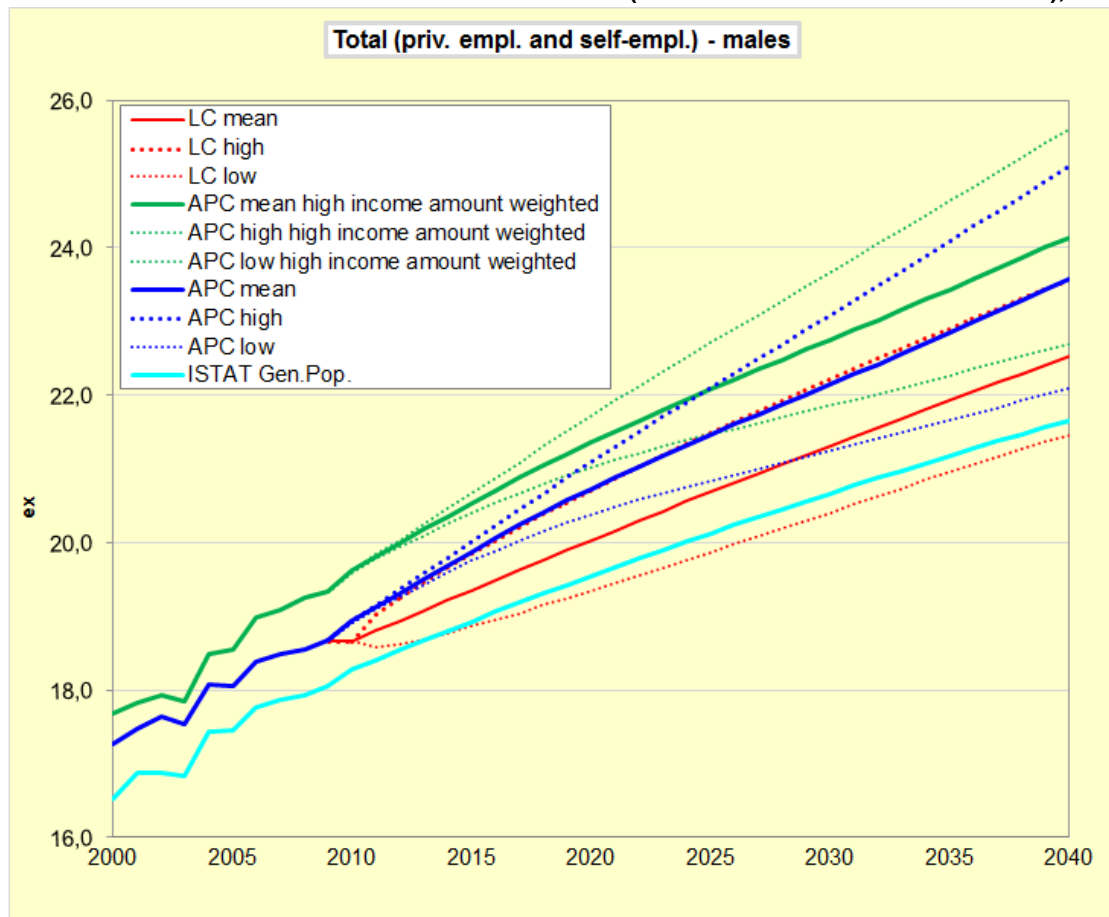
Annex 53 includes the values of the projected life expectancy based on the APC model applied to the "high-income" sub-group (pensioners with an income of over 1,200 euro per month): it can be seen that in the central scenario the resulting values are considerably higher than those estimated by both the Lee-Carter and the APC model when applied on the total collective (life expectancy at age 65 in year 2040 is equal to 24.14 years). In Fig. 37 the projections of life expectancy at age 65 for male total pensioners calculated by all models and for all scenarios have been summarised and then compared with the forecast by ISTAT for the general population in a central scenario.

For the data set comprising female private employees and self employed the Lee-Carter model (Annex 46) projects life expectancy increasing from around 20% at ages 60-65 to 30% at the older ages in the central scenario for the period 2010-2040. In year 2040 life expectancy at age 65 is 26.62 years. Annex 46 reports also the values of life expectancy in the high and low scenarios.

Annex 52 reports the values of life expectancy calculated by the APC model on lives: under the central scenario life expectancy in year 2040 is higher than that calculated by the Lee-Carter model (e.g. at age 65 in 2040 that is 26.41 years with an increase of around 16% since 2010).

Annex 54 includes the values of the projected life expectancy based on the APC model applied to the "high-income" sub-group (female pensioners with an income of over 1,200 euro per month): it can be seen that, unlike for the males, life expectancy in the central scenario are not the higher that those obtained with other models (life expectancy at age 65 in year 2040 is equal to 26.31 years), confirming the indications that for females the amount effect is much less noticeable, with this being due in part to a greater homogeneity of the pension amounts.

In Fig. 38 the projections of life expectancy at age 65 for female total pensioners calculated by all models and for all scenarios have been summarised and then compared with the forecast by ISTAT for the general population in a central scenario.

FIG. 38 PROJECTIONS OF LIFE EXPECTANCY AT AGE 65 – **TOTAL (PRIVATE EMPLOYEES AND SELF-EMPLOYED), FEMALES**
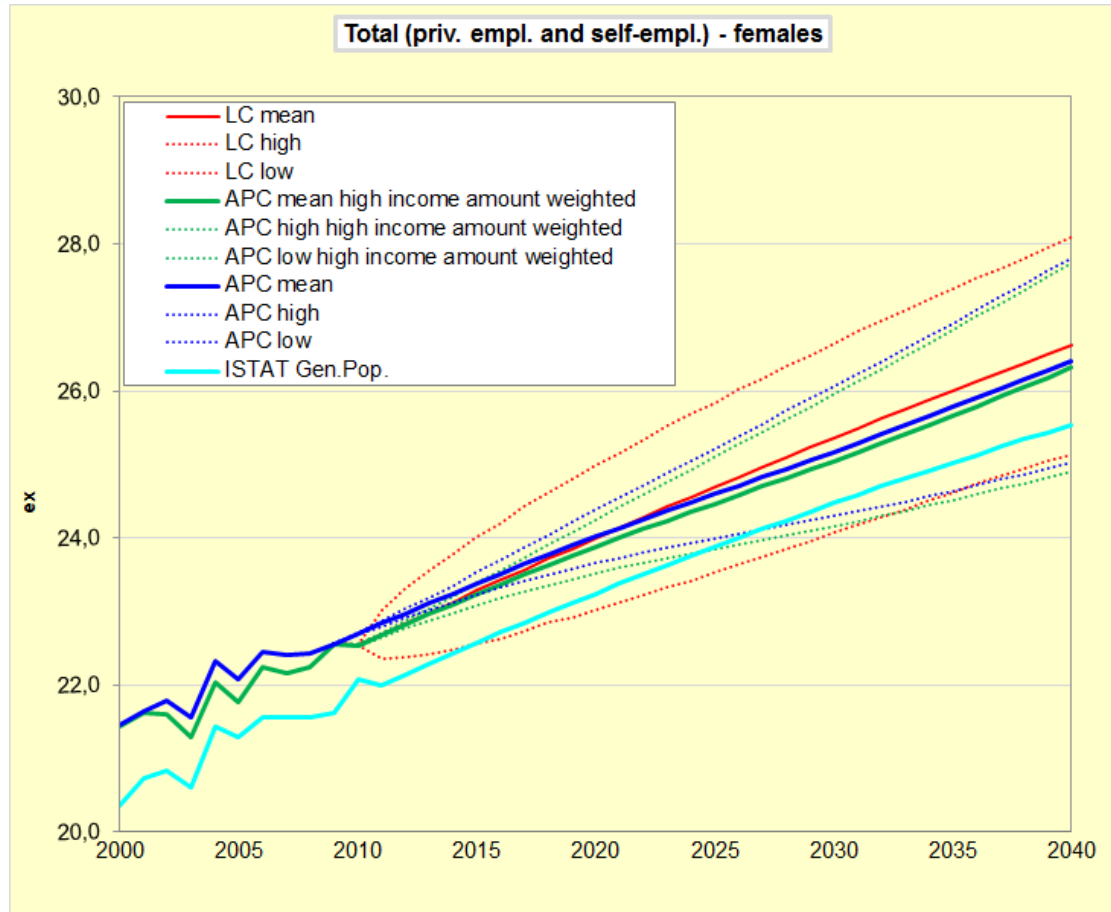
Further details on the results of stochastic models are reported in the Methodological Appendix (see section IX.).

4.3 Comments on the use of projections, overall uncertainty and limitations of the study

It should be remarked, as previously observed, that longevity is an inherently uncertain process that no model is able to forecast with accuracy. Furthermore, the results of the projections included in this study may suffer from possible inaccuracy in the data that have been collected.

Another source of uncertainty is model risk: the reason models are used is that they attempt to provide a simplified mathematical view of a complex process; however because of the simplifications made different models may give different results both in terms of goodness of fit and of projected trends in mortality. In this respect, in this study comparisons have been made between different models applied on the same data; to provide an alternative view, the results from an external benchmark (the general population projections from ISTAT) have been used for comparisons.

In this study, forecasts have been produced to year 2040, despite ISTAT projections on general population are available until year 2065; in this respect consideration has been paid to the limited historicity of the data (thirty years, 1980-2009) and that unless past trends will continue to recur indefinitely - long-term projections carries a risk of lack in reliability, even when stress scenarios are considered. In this regard, the results that have been calculated do not eliminate the risk that the actual longevity trends may in future being higher or lower than what has been projected; it can be seen that this has already happened in the past (see Fig. 32, for example). Therefore it would be appropriate to use the results from the projections in this study with due caution given the overall uncertainty.

Practical applications of the results presented in this study may need to take into account the specific collective to which the projections are applied. For example, the use of projections for self-employed pensioners for a different collective (e.g. doctors or lawyers, who recorded in the observation period significant differences in mortality compared to the self-employed), should consider whether or not it is realistic that the differential observed in the past will recur, in whole or in part, into the future. If one considers that differentials will persist, as it could be reasonably assumed looking at the historical data, it may then be appropriate to introduce some consistent adjustment. The analysis of differential in mortality (selection) shown in the study may help to support these assessments.

Likewise, it may be necessary to consider the impact of amounts paid in future projections, given the evidence presented that improvements in mortality had been more rapid for the richer pensioners. As the commitment to provide an annuity is obviously set on a monetary amount, it might be appropriate to consider factors, such as the amount effect, that may have an impact on the financial solvency and profitability of the annuity provider.

This study, for convenience, provides detailed data on the projections for age, sex and calendar year. In order to use the forecasts, however, the working group consider important to follow an approach "for generation" in the analysis of trends in mortality as such approach better represents improvements in mortality over time.

Finally while the working party is aware that the Italian life insurance market use an uni-dimensional demographic table for simplicity (e.g. IPS55), it is also believed that for the purpose of presenting the results of this study, given the model used, the different collectives and the scenarios considered, they would not be best presented in the format of a uni-dimensional life table. At any rate, we hope that, in light of future developments in the context of pensioners and other annuitants, results and analyses presented in this study may be of use to practitioners.

METHODOLOGY APPENDIX

I. Data collection process

The study covers the following pensions:

– direct pension annuities at normal retirement (that is, excluding those pensions arising from disability and then converting into old-age pension), both from first and second pillar institutions (with the first pillar institutions being by far the largest data contributiors);
– disability pensions (allowances or pensions for inability and disability pensions set up before approval of the law n. 222/1984);
– widow's (indirect) pensions, excluding those already receiving an old-age or retirement benefit from the same institution.

The observation period was set to 1980-2009. Each institution, at its discretion, has decided whether to provide aggregated data– i.e. aggregating pensioners with same characteristics - or disaggregated data (i.e. each single position). The risk[2] exposure has been calculated on annual basis for each pensioner until elimination due to death[3], also according to the amount of the annuity (see example below).

Example

Given the following information in the year 2004 for 3 pensioners:

– Position A): Male, Date of birth: 01/03/1943, annuity commencement: 01/10/2000, annual amount: € 20,000, amount class of the annuity: 3.
– Position B): Male Date of birth: 01/10/1944, annuity commencement: 01/07/2004, annual amount: € 15,000; amount class of the annuity: 3.
– Position C): Male Date of birth: 01/01/1944, annuity commencement: 01/09/2004, annual amount: € 21,000, the amount of the annuity class: 3, date of death: 31/12/2004 .

The number of days at age x are calculated as following:

– Position A) the pensioner is at risk in the year for 60 days having age 60 and for 306 days with age 61. The amount of the annuity is allocated for 60/366 at age 60 and for 306/366 at age 61.
– Position B) the pensioner is at risk for 92 days at age 59 and 274 days at age 60. The amount is allocated for 92/366 at age 59 and 274/366 at age 60.
– Position C) the pensioner is at risk for 122 days having age 60, since he died on 31/12/2004. The amount is allocated for 122/366 at age 60.

In case of more than one pension provided by the same institution to the same pensioner, the positions have been treated as a single position. Any annuity certain (paid by a pension fund or by an insurance company) has been removed from the investigation. Regarding widow's pensions, pensions (or proportion of pensions) paid to beneficiaries different from the spouse (then typically to children/orphans) have also been excluded. Finally, it has been agreed to refer pension amounts paid in the different calendar years to the value of money in year 2007, in order to uniform the monetary amounts. Reference to the record format used to collect the data from the pension institutions and other organizations can be found in the Italian version of the study.

[2] The exposed to risk in year t having the same characteristics are the pensioners at each age x at the start of the year t, weighted by the fraction of the year in which they remain alive at age x, and adding to these new entries having age x also weighed by the fraction of the year they remain alive in age x. Similarly for the sums (amount of the annuity) at risk.

[3] The number of deaths in year t with the same characteristics are the pensioners at each age x died in year t. Similarly for the eliminate amounts due to the death of the pensioner in year t.

II. Details on pensioners categories

Each pension institution has autonomously decided what data should be sent to the working party and considered whether there were any data to be excluded from the analysis. For a summary of the criteria assumed by each institution please refer to the Italian version of the study.

III. Further analyses on pensioners mortality improvements

The following graphs and figures illustrate details on mortality improvement rates for the pensioner collectives used for the projections (private employees, self-employed and the total of the two).The rates are shown both raw and smoothed with P-spline functions. The crude rates show a clear annual variability, even when the number of deaths and exposed to risk are high.

FIG. 39 – MORTALITY IMPROVEMENT RATES IN THE PERIOD OF OBSERVATION - PRIVATE EMPLOYEES (MALES)
Age 60-95, 1980-2009, raw data (left graph), smoothed data (middle graph), heat map smoothed data (right graph)
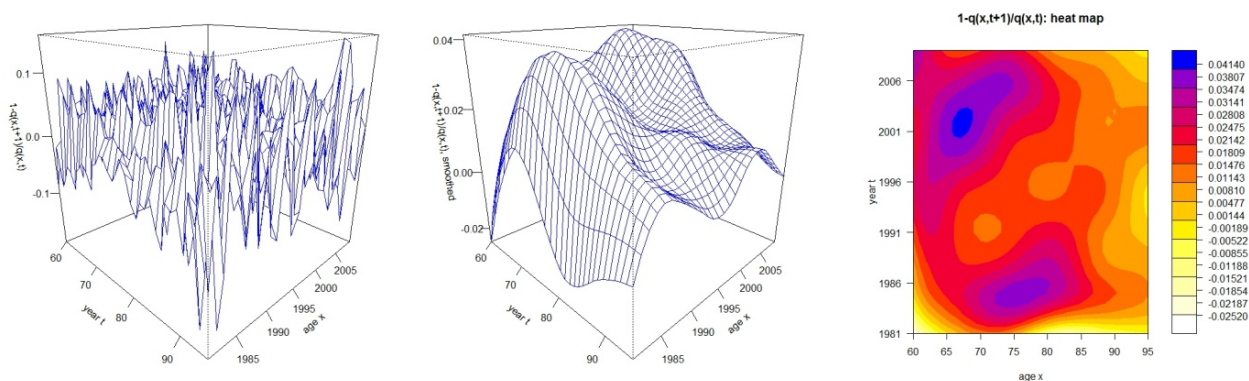
FIG. 40 – MORTALITY IMPROVEMENT RATES IN THE PERIOD OF OBSERVATION - PRIVATE EMPLOYEES (FEMALES)
Age 60-95, 1980-2009, raw data (left graph), smoothed data (middle graph), heat map smoothed data (right graph)
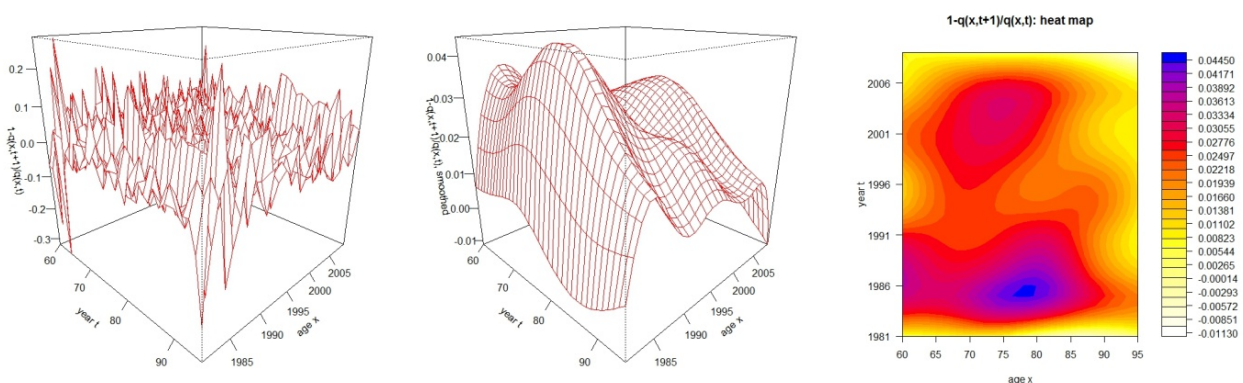
FIG. 41 – MORTALITY IMPROVEMENT RATES IN THE PERIOD OF OBSERVATION – SELF-EMPLOYED (MALES)
Age 65-95, 1980-2009, raw data (left graph), smoothed data (middle graph), heat map smoothed data (right graph)
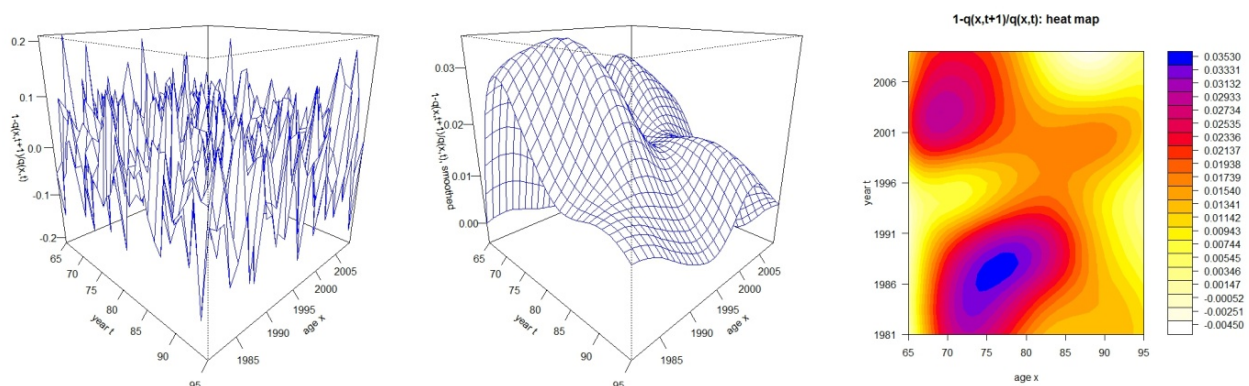
FIG. 42 – MORTALITY IMPROVEMENTS RATES IN THE PERIOD OF OBSERVATION – SELF-EMPLOYED (FEMALES)

Age 60-95, 1980-2009, raw data (left graph), smoothed data (middle graph), heat map smoothed data (right graph)
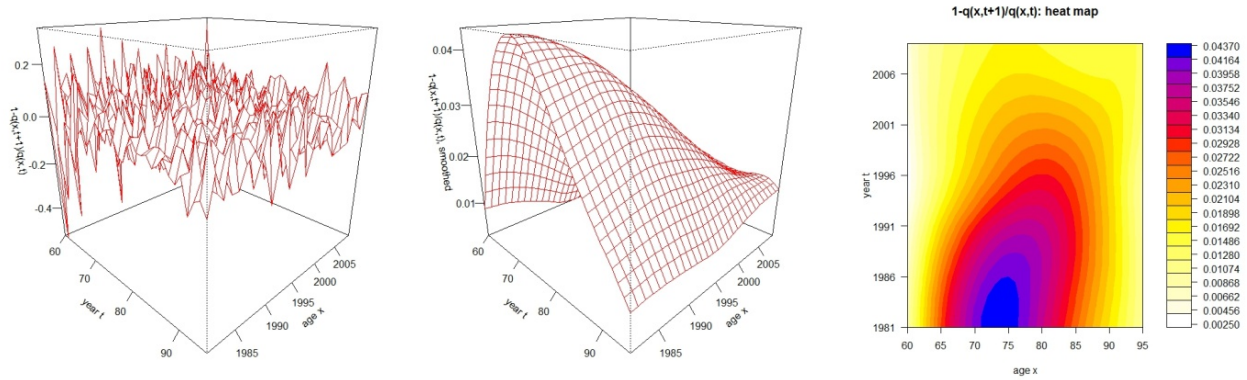
FIG. 43 – MORTALITY IMPROVEMENT RATES IN THE PERIOD OF OBSERVATION - TOTAL (PRIVATE EMPLOYEES AND SELF-EMPLOYED), MALES

Age 60-95, 1980-2009, raw data (left graph), smoothed data (middle graph), heat map smoothed data (right graph)
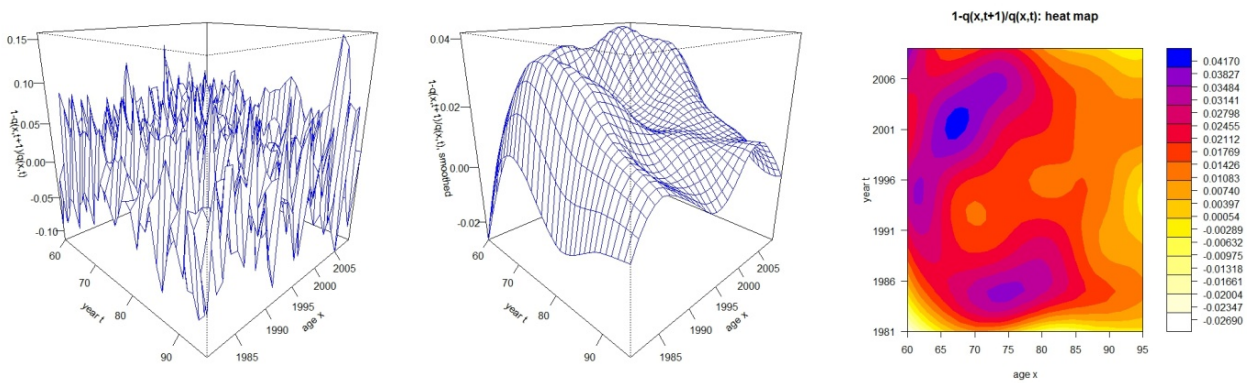
FIG. 44 – MORTALITY IMPROVEMENT RATES IN THE PERIOD OF OBSERVATION - TOTAL (PRIVATE EMPLOYEES AND SELF-EMPLOYED), FEMALES

Age 60-95, 1980-2009, raw data (left graph), smoothed data (middle graph), heat map smoothed data (right graph)

..
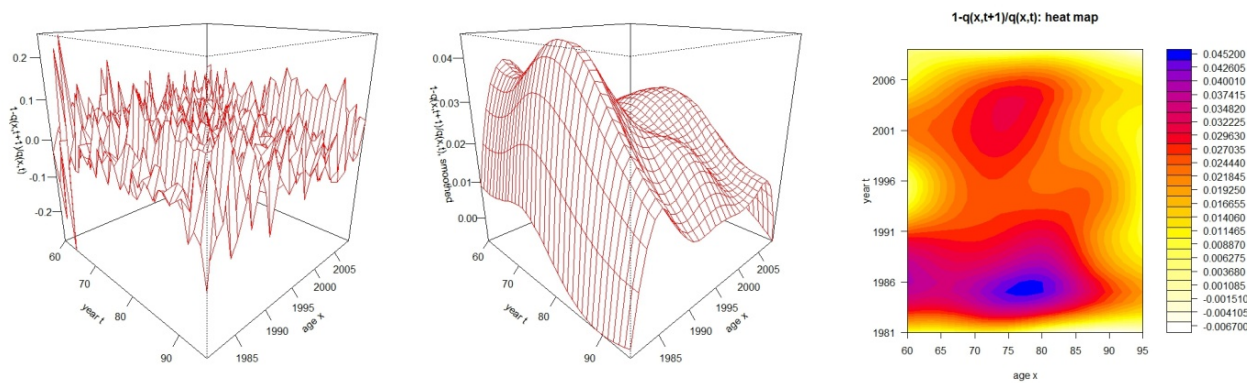
IV.   The calculation of mortality differentials for pensioners collectives

Starting from the probability of dying by age and calendar year of each pension institution, we calculated the mortality differential ${}_x^t S_{ente\,i}$ rate in respect to a "benchmark" collective:

$$
{}_x^t S_{ente\,i} = \frac{{}_x^t q_{ente\,i}}{{}_x^t q_{benchmark}} \qquad (1)
$$

where ${}_x^t S_{ente\,i}$ is the mortality differential ratio for age x at time t of the institution i, calculated with respect to the benchmark collective, ${}_x^t q_{ente\,i}$ is the probability of dying at age x and at time t

for the institution i, and $_x^t q_{benchmark}$ is the probability of dying at age x and at time t of the benchmark collective selected for institution i.

Then, in order to obtain more regular patterns for the mortality differential rates at each different age we applied some smoothing and considered the 5 following terms as described in (2):

$$_x^t \hat{S}_{ente\ i} = \frac{(7*_x^t S_{ente\ i} + 5*(_{x-1}^t S_{ente\ i} + _{x+1}^t S_{ente\ i}) + 3*(_{x-2}^t S_{ente\ i} + _{x+2}^t S_{ente\ i}) - (_{x-3}^t S_{ente\ i} + _{x+3}^t S_{ente\ i})}{21} \qquad (2)$$

After having calculated mortality differential ratios at each age and year of observation, an average mortality differential rate was calculated at each age over the whole period of observation using formula (3):

$$_x^{ente\ i} \bar{S} = \frac{\sum_t {}_x^t \hat{S}_{ente\ i} * {}_x^t E_{ente\ i}}{\sum_t {}_x^t E_{ente\ i}} \qquad (3)$$

where $_x^{ente\ i} \bar{S}$ is the average mortality differential ratio for age x and institution i, calculated with respect to the collective benchmark and $_x^t E_{ente\ i}$ is the number (or annuity amounts) of exposed to risk at age x and at time t for institution i.

V. The stochastic models selected for the study

For the each selected data set, information was provided on deaths $D_{x,t}$ and on the exposed to risk $E_{x,t}$ at age x and calendar year t. This leads to the calculation of the raw central rate of mortality $m_{x,t}$:

$$m_{x,t} = \frac{D_{x,t}}{E_{x,t}}$$

While some projection method models directly central rates of the mortality, other methods model $q_{x,t}$ mortality rates, namely the probability that an individual aged x at time t dies between t and t+1 (i.e. in the year t).

A third measure for the development of projection methods is the force of mortality, $\mu_{x,t}$, or the instantaneous intensity of mortality at time t for an individual who has age x at time t.

The following assumptions have been adopted:

− that the force of mortality is constant for each calendar year t and age x ($\mu_{x+u,t+s} = \mu_{x,t}$ for all s, u included between 0 and 1);

− that the population is stationary, i.e. the population in all age groups remains constant over time (Cairns et al., 2009).

These assumptions are equivalent to assuming that the central rate of mortality is identical to the instantaneous intensity of mortality. Using central rates of mortality, it is possible to derive the corresponding probabilities of death using the approximation formula:

$$q_{x,t} \approx 1 - \exp[-m_{x,t}]$$

The choice of the projection model must be based on criteria, both qualitative and quantitative, as objective as possible. Cairns et al. (2008) suggest a list of criteria for such a choice:

− the model must be consistent with historical data;
− the future long-term dynamics of the model should be biologically reasonable;
− estimates of model parameters and predictions to which it leads must be robust both in respect to the period of time and the ages to which historical data are referred to;
− the prediction of the level of uncertainty and central scenarios produced by the model should be plausible and consistent with historical trends and variability of mortality data;

- the model must be simple to apply by means of analytical methods or efficient numerical algorithms;
- the model must be relatively parsimonious;
- the model must allow to integrate the uncertainty of the parameter or parameters in the simulations and allow the calculation of confidence intervals for the forecast.

In the present study, before choosing the stochastic models to be used, the four following models were tested and they all satisfied the above mentioned criteria:

- Lee-Carter model (1992) integrated by Poisson log-bilinear model;
- Renshaw-Haberman model with cohort effect (2006);
- Cairns-Blake-Dowd original model (Cairns et al., 2006);
- Cairns-Blake-Dowd model with cohort effect (Cairns et al., 2009).

<u>The Lee-Carter model integrated by Poisson log-bilinear model</u>

In the model proposed by Lee and Carter the natural logarithm of the central rate of mortality is modeled as follows:

$$\log(m_{x,t}) = \beta_x^{(1)} + \beta_x^{(2)} k_x^{(2)} + \epsilon_{x,t}$$

where:

- $\beta_x^{(1)}$: parameter that describes the behavior of mortality by age;
- $\beta_x^{(2)}$: parameter describing for all ages how mortality reacts to changes in the time parameter, namely the rapidity of mortality change at every age;
- $k_t^{(2)}$: index of the overall level of variation in mortality over time;
- $\epsilon_{x,t}$: error term, with errors that are independent and identically distributed with a Gaussian distribution with mean 0 and variance σ_ϵ^2. The error term reflects the variability of the mortality that is not captured by the model.

The model parameters can be identified using the least squares method once the following constraints are defined:

$$\sum_x \beta_x^{(2)} = 1 \quad ; \quad \sum_t k_t^{(2)} = 0$$

The normalization of the parameters obtained through the constraints imposed to $\beta_x^{(2)}$ and $k_t^{(2)}$ implies that the parameter $\beta_x^{(1)}$ is an average of the logarithm of the central rate of mortality in different calendar years. Once the estimation of the model parameters is completed, the projection of mortality rates is obtained by projecting the temporal parameter $k_t^{(2)}$ through a stochastic temporal series using ARIMA (Autoregressive Integrated Moving Average) models. The Lee-Carter model implicitly assumes that random errors are homoskedastic (i.e. they have the same variability), which may be an unrealistic assumption in correspondence with older ages where there is greater variability in mortality due to the small number exposed to risk of death. A solution to that problem has been proposed by Brouhns et al. (2002): they introduced a Poisson random variation for the number of deaths instead of the additive $\epsilon_{x,t}$ error term. In this model, known as the Poisson log-bilinear model, the natural logarithm of the central rate of mortality continues to be modeled using the Lee-Carter model without the error term:

$$\log(m_{x,t}) = \beta_x^{(1)} + \beta_x^{(2)} k_x^{(2)}$$

while deaths are distributed according to a Poisson distribution:

$$D_{x,t} \sim \text{Poisson}(E_{x,t} \cdot m_{x,t})$$

where $E_{x,t}$ is the number of exposed to risk of death. In this case it is necessary to set constraints on the parameters $\beta_x^{(2)}$ and $k_t^{(2)}$ in order to be able to identify the parameters themselves.

The Renshaw-Haberman model

Renshaw and Haberman (2006), starting from the Lee-Carter model, introduced a parameter that captures the cohort effect. According to this model, the natural logarithm of the central rate of mortality is represented as follows:

$$\log(m_{x,t}) = \beta_x^{(1)} + \beta_x^{(2)} k_x^{(2)} + \beta_x^{(3)} \gamma_{t-x}^{(3)}$$

Compared to the original Lee-Carter parameters, $\beta_x^{(1)}$, $\beta_x^{(2)}$ and $k_x^{(2)}$ have the same meaning as the parameters $\beta_x^{(3)}$ and $\gamma_{t-x}^{(3)}$ represents the correction to the general mortality cohort born during the calendar (t-x):

- $\gamma_{t-x}^{(3)}$: parameter that represents the cohort effect, with t-x = year of birth
- $\beta_x^{(3)}$: parameter describing for all ages how the mortality reacts to a change in cohort.

This model represents an age-period-cohort version of the Lee-Carter model. The parameters are identified through the introduction of the following constraints:

$$\sum_x \beta_x^{(2)} = 1 \; ; \; \sum_x \beta_x^{(3)} = 1 \; ; \; \sum_t k_t^{(2)} = 0 \; ; \; \sum_x \gamma_{t-x}^{(3)} = 0$$

The Cairns-Blake-Dowd models

These models are characterized by age-period multifactorial parameters. They are relatively simple and can lead to good predictions at older ages (from 60 to 90). Instead of modeling the natural logarithm of the central rate of mortality, the logistic transformation of the odds is considered $\left(\frac{q_{x.t}}{1-q_{x.t}}\right)$:

$$\text{logit } q_{x.t} = \log\left(\frac{q_{x.t}}{1-q_{x.t}}\right) = k_t^{(1)} + k_t^{(2)}(x - \bar{x})$$

$$\text{logit } q_{x.t} = \log\left(\frac{q_{x.t}}{1-q_{x.t}}\right) = k_t^{(1)} + k_t^{(2)}(x - \bar{x}) + \gamma_{t-x}^{(3)}$$

where the second version includes the a modification to consider cohort effects and where

- $k_t^{(1)}$: index of the overall level of variation in mortality over time;
- $k_t^{(2)}$: parameter indicating the steepness of the mortality curve;
- $\gamma_{t-x}^{(3)}$: parameter that represents the cohort effect, with t-x = year of birth
- $\bar{x}$ mean age of the sample.

VI. Model selection and goodness of fit testing

The models were selected by testing procedures of the goodness of fit (fitting) to the data. The testing was carried based both on qualitative and quantitative criteria, on the study of the residuals, the temporal parameters and by means of objective indicators of goodness of fit of the model to historical data. We report the criteria and results of the testing process as follows.

Indicators of goodness of fit of the model: Bayesian Information Criterion (BIC) and Maximum Log-Likelihood (MLL)

The BIC is a criterion of fitting that is well known in the literature and is considered as a balanced instrument for the selection of a mortality projection model, as it is based on the statistical quality of the fitting procedure. Another indicator that is commonly used is the estimate of maximum log likelihood (MLL) of the estimated parameters, which however does not provide information on possible overfitting or "over-parameterization". The BIC from this point of view is particularly effective, as it introduces a penalty term related to the number of parameters that characterize the model. The function of log-likelihood of the model used is defined as following:

$$l(\rho; D_{x,t}; E_{x,t}) = \sum_{x,t} \left\{ D_{x,t} \log[E_{x,t} m_{x,t}(\rho)] - E_{x,t} m_{x,t}(\rho) - \log(D_{x,t}!) \right\}$$

The BIC is calculated as:

$$BIC = l(\hat{\rho}) - 0.5\,K \log(N)$$

where:

- $l(\hat{\rho})$: maximum log-likelihood function of parameters;
- ρ: set of parameters to be estimated with the likelihood function;
- $\hat{\rho}$: vector with the maximum likelihood estimate of the parameters;
- N: vector of the number of observations;
- K: the actual number of estimated parameters.

The tables below show the results of the fitting procedure for the models that has been considered, where the columns "Rank (BIC)" and "Rank (MLL)" show the ranking of the models according respectively to BIC and MLL:

TAB. 6 - RESULTS OF THE FITTING PROCEDURE - PRIVATE EMPLOYEES
males (left table), females (right table), age 60-95, years 1980-2009

Model	BIC	MLL	Rank(BIC)	Rank(MLL)
LC	-6539	-6190	3	3
RH	-6238	-5545	1	1
CBD1	-6670	-6461	4	4
CBD2	-6351	-5923	2	2

Model	BIC	MLL	Rank(BIC)	Rank(MLL)
LC	-5782	-5433	1	2
RH	-5948	-5255	2	1
CBD1	-7042	-6833	4	4
CBD2	-6135	-5707	3	3

TAB. 7 - RESULTS OF THE FITTING PROCEDURE – SELF-EMPLOYED
males (left table) age 65-95, females (right table) age 60-95, years 1980-2009

Model	BIC	MLL	Rank(BIC)	Rank(MLL)
LC	-4613	-4306	1	3
RH	-4739	-4129	3	1
CBD1	-4798	-4593	4	4
CBD2	-4660	-4258	2	2

Model	BIC	MLL	Rank(BIC)	Rank(MLL)
LC	-5100	-4752	1	2
RH	-5328	-4634	3	1
CBD1	-5881	-5672	4	4
CBD2	-5222	-4794	2	3

TAB. 8 - RESULTS OF THE FITTING PROCEDURE – TOTAL (PRIVATE EMPL. AND SELF-EMPL.) PENSIONERS
males (left table) age 65-95, female (right table) age 60-95, years 1980-2009

Model	BIC	MLL	Rank(BIC)	Rank(MLL)
LC	-6739	-6391	3	3
RH	-6364	-5671	1	1
CBD1	-6835	-6626	4	4
CBD2	-6446	-6017	2	2

Model	BIC	MLL	Rank(BIC)	Rank(MLL)
LC	-5939	-5591	1	2
RH	-6145	-5452	2	1
CBD1	-7817	-7608	4	4
CBD2	-6377	-5948	3	3

The models have been chosen considering the results of the goodness of fit of to historic data and the analysis of the historic data.

In the end, the Lee-Carter model (in the "modified" version proposed by Brouhns et al., 2002) and the Renshaw-Haberman model were selected.

Analysis of standardized residuals of the models

In addition to the BIC, a graphical analysis of standardized residuals of the Lee-Carter and Renshaw-Haberman models has been carried out:

$$\varepsilon_{x,t} = \frac{D_{x,t} - \widehat{D}_{x,t}}{\sqrt{\widehat{D}_{x,t}}}, \varepsilon_{x,t} = \frac{D_{x,t} - \widehat{D}_{x,t}}{\sqrt{\widehat{D}_{x,t}}}$$

per calendar year and age, in order to assess the quality of the fitting.

By construction, these residuals should be independent and identically distributed according to a normal distribution with mean 0 and variance 1.

The residuals we obtained for the three collectives at each age and calendar year satisfy that condition and show positive and negative values randomly distributed.

For more detail, the graphs and heat maps of standardized residuals for each model and pensioner data set please refer to Italian version of the study, (in particular **FIGURES 45 TO 58).**

Selection of an ARIMA model to represent the temporal parameters and estimation of model parameters

The selection of an ARIMA (Autoregressive Integrated Moving Average) model for projecting mortality rates was made by using performance indicators that are usually adopted in the literature (such as the Akaike Information Criterion - AIC) and by performing a check test of stationarity of the series based on the auto-correlation.

For the projection of the time parameter $k_t^{(2)}$ for both the Lee-Carter and Renshaw-Haberman models an ARIMA (0,1,0) model was used as, according to an analysis of the observed data, there is a substantially linear and flat tendency in annual improvements in mortality.

For the projection of the parameter $\gamma_{t-x}^{(3)}$ for the cohort effect (Renshaw-Haberman model) the model ARIMA (1,1,0) has proved to be a good choice, according to the indicators and the AIC criterion.

VII. The estimation of the parameters

A section reporting the values of the parameters of the mortality projection models for the three collectives, by gender, as well as the surface of the natural logarithm of the central rates of mortality, $m_{x,t}$, crude and fitted, both for Lee-Carter and Renshaw–Haberman models can be found in the Italian language version of the study, (in particular **FIGURES 59 TO 74).**

VIII. The APC (Age-Period-Cohort) model

Age-Period-Cohort analysis is a statistical technique that allows to study mortality rate observations under three different perspectives: the age in the year of death, the year of birth and the year of death.

This technique is the basis of the APC projection model elaborated by CMI (Continuous Mortality Investigation) Bureau and proposed to actuarial community in the United Kingdom in 2009 (CMI, 2009).

Since then, the model has had a wide and rapid diffusion, and by the end of year 2011 it was used by most insurance companies and pension funds in the UK to model mortality projections for annuities and pensions products.

The model is based on the projection of the mortality improvements and is deterministic.

The idea behind the model is that the improvements observed in the most recent data provide a reliable guide to the projected rates in the short term (0-10 years); but their reliability decreases over time.

The use of historical data for long-term projections is an assumption that should be considered with caution.

It is reasonable to assume that in the long-term mortality rates are not necessarily influenced by the same factors that have characterized changes in mortality in the past; or in any case that the trends observed in the past will not be necessarily replicated in the future.

The model approach is that the choice of a long-term rate mortality improvement rate is obtained by "expert opinion", rather than being derived from historical data through a statistical process.

The selection of an appropriate long-term rate could be made for example by considering the factors believed to influence the mortality in the future and, in particular, taking into account how these factors will influence the evolution of the causes of mortality.

In this perspective, the model is built with the ultimate aim of projecting the most recent mortality improvements for short-term periods and to make them converging to a long-term rate subjectively chosen by the user.

The model assumes that the variation in mortality is influenced by components related to age, period (calendar year) and cohort. In the historical data the presence of some of these factors could be detected, for example:

- age: the impact on mortality of the introduction of compulsory seat belts could be considered, as that led to a significant reduction in deaths from road accidents with a proportionally higher impact at younger ages;

- period: the reduction of mortality in recent decades due to developments in surgical techniques and medical drugs for the prevention and treatment of cardiovascular diseases could be considered, and how these changes have had a positive effect on a very broad spectrum of ages;

- cohort: the effect of participation in the Second World War could be considered, and how this has affected the mortality of particular generations (e.g. 1930-1940) that had not been involved directly with the conflict.

The APC model is built in two phases.

A first phase in which the APC components are estimated and a second phase in which the improvements are projected and made to converge (through an algorithm) to a long-term rate predetermined by the user (possibly on the basis of expert opinion or other supportive studies). The components of the model are estimated based on historical data.

At first, the mortality improvements are obtained by smoothing the raw data of the population (source: HMD data) with the P-spline method.

The components are then calculated by splitting, in fact, the annual improvement rate through an iterative procedure which requires that the sum of the components for all ages and calendar years is equivalent to the annual improvement, plus a residual component that is minimised.

Once estimated, the components derived from historical data can be examined.

Figure 75 shows the age, period, cohort components for the Italian population (males and females), estimated on historical data over the years 1962-2008 and 1968-2008 (for females it has not been possible to apply the smoothing method between 1962 and 1967).

FIG. 75 - AGE / PERIOD / COHORT COMPONENTS ESTIMATED IN **1962-2008** – ITALIAN POPULATION

%, males (left graph), females (right graph)
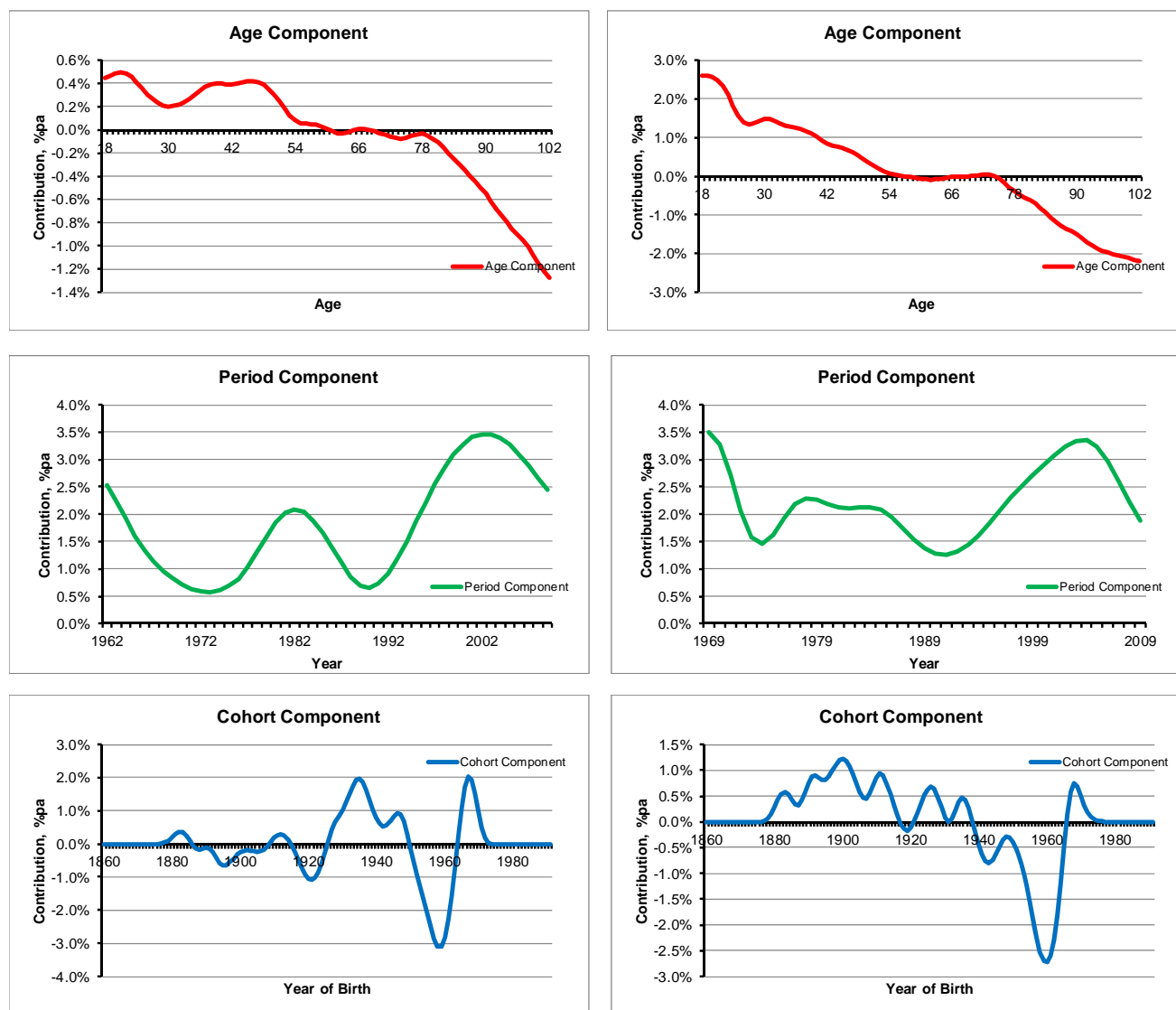
For the male population an analysis of the cohort component easily identifies high improvements for the generations born between 1930 and 1940, as also shown in the Executive summary. In the period component a rapid acceleration can be seen from 1990, in coincidence with rapid advances in mortality due to cardiovascular causes, both for males and females. The age component appears to be positive at younger ages and negative for older ages, but this must be considered together with the other components of period and cohort. It is also of great interest the comparison with the male population of England and Wales, shown in Figure 76.

FIG. 76 - AGE / PERIOD / COHORT COMPONENT ESTIMATES IN **1962-2008** ENGLAND AND WALES POPULATION

%, males (left graph), female (right graph) – ONS data
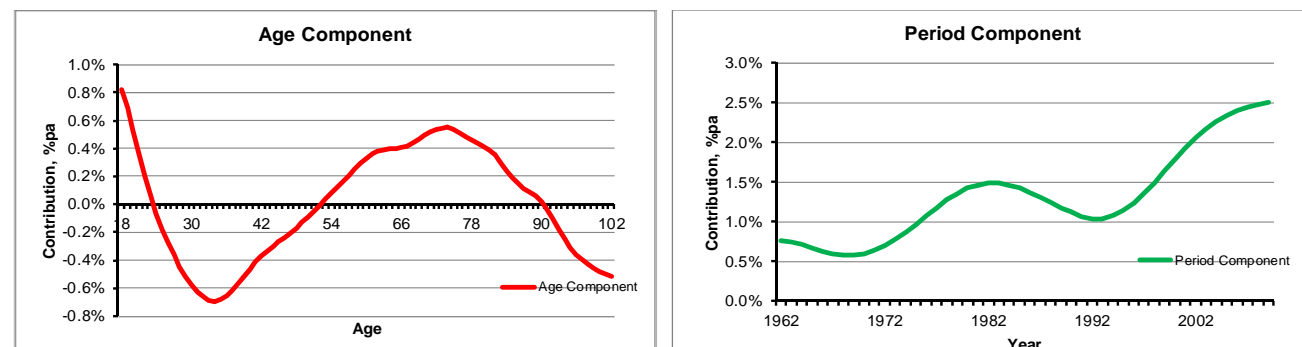
Indicatively, the Long Term Rate ("LTR") in the UK market is based on period component estimate of the population, similar to but slightly lower than that observed in the Italian population. As shown by Fig. 76, in the English population (males) the period component ranged between 0.5% and 1.5% in the period 1960 to 1980, then the trend has been further increased, moving from 1.0% to 2.5% as achieved more recently.

Currently in the UK market in general LTR are set to be between 1% and 2%, according on the approach used in the valuation (whether more conservative or more realistic). In Italy, for males the average value of the component period estimate between 1962 and 1991 is about 1.2%, while between 1992 and 2008 is around 2.8%. For females, the value was around 2% between 1969 and 1991 and about 2.5% between 1992 and 2008.
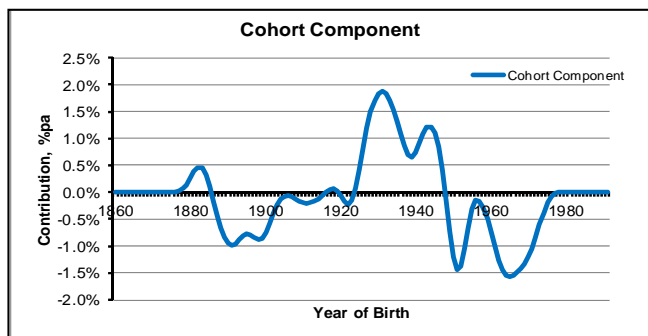
The values of the period component estimates over time in the Italian population may support a long term rate of improvement equal or even higher than that used in the UK. In particular, taking into account the results produced by the stochastic models in three scenarios, it was decided to calculate projections with APC model under three different LTR:

– a long term rate of 2% to be considered a "best estimate" or central scenario; this is set considering historical values in the period component registered in the Italian population;

– a long term rate of 1.25% and 2.75%, for "low" and "high" stress scenarios; the choice being made considering a assumption that is symmetrical to the 2% best estimate rate and considering minimum and maximum value observed along the historical data (as mentioned above, the average period component is 1.2% between 1962 and 1991 and 2.8% between 1992 and 2008).

Once calculated the APC components, the model deterministically produces a convergence of factors to the long-term rate, separately for the three components.

The assumptions for the convergence of the APC components to LTR are the same set in the basic model ("Core" model) proposed by CMI and reported in the tables below.

TAB. 9 - AGE / PERIOD / COHORT COMPONENTS AND THEIR CONVERGENCE TO LTR AS PROPOSED IN CMI "CORE" APC MODEL

Age/Period components		Cohort component	
Age	Convergence to LTR (years)	Cohort (t)	Convergence to LTR (years)
x<=50	10	t<=1911	5
50 <x<=60	10+(x-50)	1911<t<=1946	5+ (t-1911)
60<x<=80	20	t>1946	40
80 < x<=95	20-(80-x)		
x>95	5		

It should be noted that the CMI has proposed the above reported assumptions as a "working basis", not certifying them as correct but only as "reasonable", leaving to the users the option to change them. For this study, however, these assumptions have been retained.

The following figure illustrates how the model operates the convergence of mortality improvements to the best estimate 2% long-term rate for males for selected age groups.

FIG. 77 - MORTALITY IMPROVEMENTS AND THEIR CONVERGENCE TO THE 2% LTR FOR THE APC MODEL
%, Italian population (males)
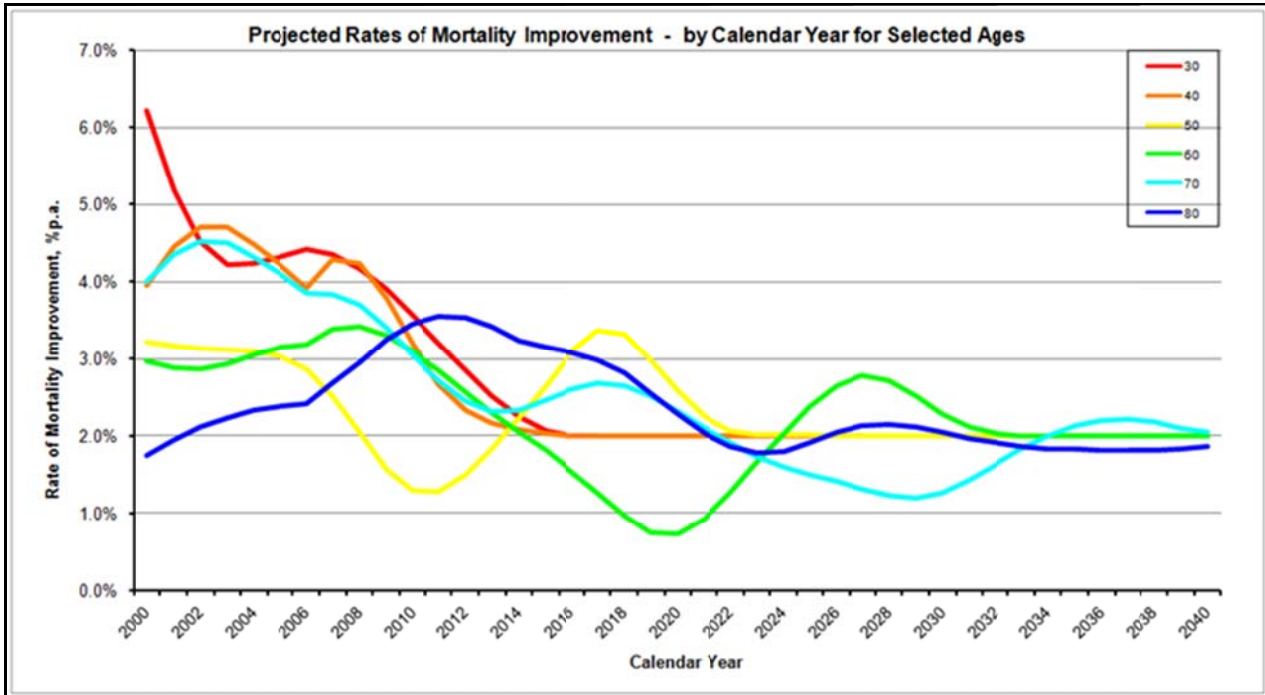
Fig. 78 shows the "heat map" of the mortality improvements from 1991 projected to 2070 with mortality improvements for males obtained from the APC model using the assumption of 2% LTR. The dark red areas represent the higher reduction in mortality rates.

FIG. 78 - HEAT MAP OF MORTALITY IMPROVEMENT RATES AND THEIR CONVERGENCE TO 2% LTR - ITALIAN POPULATION (MALES)
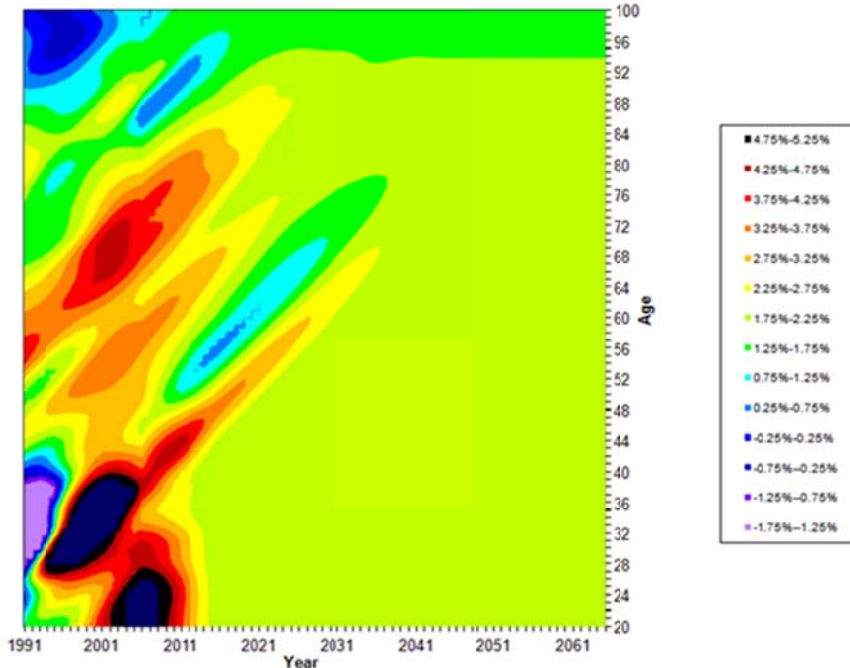
In both the APC model and the stochastic models, at ages between 96 and 120 (the oldest age in the life table) mortality rates have been graduated for ages 60-95 in each calendar year (2010-2040) with P-spline functions; the application of this procedure had allowed to simultaneously obtain smoothing and an extrapolation of mortality rates up to age 120 (see Currie et al., 2004 and Currie-Richards, 2011).

IX.   Insights on the results from the stochastic models scenarios

The central scenario results calculated by the stochastic models

A detailed summary can be found in the Italian version of the study (in particular see Figures 79-88) showing the results of the central scenarios of stochastic models, including:

– the values of the natural logarithm of the central rates of mortality, $\log(m_{x,t})$, historical and projected, for the age range 60-95 years;

– the projected probabilities of death $q_{x,t}$ for ages 60-120 years.

The projection of the parameters for the stochastic models

A detailed summary can be found in the Italian version of the study (in particular see Figures 89-93) showing the fitted parameters on historical and projected values up to 2040 for the Lee-Carter (parameter $k_t^{(2)}$) the Renshaw-Haberman model (parameters $k_t^{(2)}$ and $\gamma_{t-x}^{(3)}$), and for the three main scenarios (mean, low and high).

The projection of mortality by generations

Further analysis can be found in the Italian version of the study (Figures 94-98), that shows for example mortality rates for the generation born in 1945 (i.e. age 65 in 2010), for the three main scenarios (main, high and low) produced by Lee-Carter and Renshaw-Haberman models.

REFERENCES

[1] Andreev, K., Vaupel, J., (2005): "Patterns of Mortality Improvement over Age and Time in Developed Countries: Estimation, Presentation and Implications for Mortality Forecasting", Paper presented PAA annual meeting, Philadelphia, May, 2005

[2] ANIA-INPS-Italian actuarial profession (Pensioners and annuitants working group), (2008) - "Le tendenze demografiche dei percettori di rendite in Italia - 1980-2004 e proiezione 2005-2035", http://www.ordineattuari.it/pubblicazioni/2010/12/studio-tendenze-demografiche-percettori-rendite

[3] Brouhns, N., Denuit, M. and Vermunt, J. K. (2002). A Poisson Log-Bilinear Approach to the Construction of Projected Life Tables. Insurance: Mathematics and Economics 31: 373-393.

[4] Cairns, A.J.G., Blake, D., and Dowd, K. (2006). A Two-Factor Model for Stochastic Mortality with Parameter Uncertainty: Theory and Calibration. Journal of Risk and Insurance 73: 687-718.

[5] Cairns, A. J. G., Blake, D., Dowd, K., (2008). Modelling and Management of Mortality Risk: a Review. Scandinavian Actuarial Journal 2-3: 79-113.

[6] Cairns, A.J.G., Blake, D., Dowd, K., Coughlan, G.D., Epstein, D., Ong, A., Balevich, I. (2009). A Quantitative Comparison of Stochastic Mortality Models Using Data from England & Wales and the United States. North American Actuarial Journal 13: 1-35.

[7] Cairns, A. J. G., Blake, D., Dowd, K., Coughlan, G. D., Epstein, D., Khalaf-Allah, M. (2011): Mortality Density Forecasts: An Analysis of six Stochastic Mortality Models, Insurance: Mathematics and Economics, 48, 355–367.

[8] CMI, Working paper 41 http://www.actuaries.org.uk/research-and-resources/pages/cmi-working-paper-41

[9] Cocevar, P., An Analysis of Recent Mortality Trends in the Italian Population Using Penalised B-Spline Regression (2007). Giornale dell'Istituto Italiano degli Attuari, Vol. 70, pp. 21-43, 2007. Disponibile su SSRN: http://ssrn.com/abstract=1511125

[10] Coughlan et al. (2007). LifeMetrics: A Toolkit for Measuring and Managing Longevity and Mortality Risk . Technical Document. JP Morgan, London.

[11] Currie I. D., Durban, M. and Eilers, P. H. C. (2004): Smoothing and Forecasting Mortality Rates, Statistical Modelling, 4, 279-298.

[12] Dowd, K., Cairns, A. J. G., Blake, D., Coughlan, G. D., Epstein, D., Khalaf-Allah, M. (2010): Evaluating the Goodness of Fit of Stochastic Mortality Models, Insurance: Mathematics and Economics, 47: 255–265.

[13] Dowd, K., Cairns, A. J. G., Blake, D., Coughlan, G. D., Epstein, D., Khalaf-Allah, M. (2010): Backtesting Stochastic Mortality Models: An ex-post Evaluation of Multi-Period-Ahead Density Forecasts, North American Actuarial Journal, 14: 281–298.

[14] Eilers, P. H. C., Marx , B. D.,(2009) "Flexible smoothing with b-splines and penalties". Statist. Sci., 11:89{121, 1996.

[15] HMD (2012): "Human mortality database", University of California, Berkeley (U.S.A.) and Max Planck Institute for Demographic Research (Germany) URL: www.mortality.org.

[16] Lee, R.D., Carter, L.R. (1992). "Modelling and Forecasting U.S. Mortality". Journal of the American Statistical Association 87: 659-675.

[17] Olivieri A., Pitacco E. (2006): "Life Annuities and Longevity Dynamics". Working Paper n. 36, CERAP.

[18] Pitacco E., Denuit M., Haberman S., Olivieri A. (2009): "Modelling Longevity Dynamics for Pensions and Annuity Business". Oxford University Press.

[19] Renshaw, A.E., Haberman, S. (2003). „On the Forecasting of Mortality Reduction Factors". Insurance: Mathematics and Economics 32: 379-401.

[20] Renshaw, A.E., Haberman, S. (2006)." A Cohort-Based Extension to the Lee-Carter Model for Mortality Reduction Factors". Insurance: Mathematics and Economics 38: 556–570.

[21] Richards, S. J., Jones, G. (2004). "Financial aspects of longevity risk", The Staple Inn Actuarial Society.

[22] Richards, S. J., Ellam J. R., Hubbard, J., Lu, J. L. C., Makin, S. J., Miller, K. A. (2007): "Two-dimensional mortality data: Patterns and projections", Presented to the Faculty of Actuaries 19 March 2007.

[23] Richards, S. J., Currie, I. D. (2011). "Extrapolating Mortality Projections by Age", Life and Pensions Risk magazine.

[24] Shaw, C. (2007) "Fifty years of United Kingdom national population projections: how accurate have they been?"

Ann. 1   **Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Private employees (INPS) - lives and amount-weighted analysis - males

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	17,95	18,54	19,43	20,15	21,11	21,97	22,71	27%	0,9%
65	14,15	14,77	15,61	16,23	17,07	17,87	18,53	31%	1,1%
70	10,89	11,46	12,23	12,78	13,41	14,02	14,65	35%	1,2%
75	8,17	8,57	9,27	9,73	10,19	10,65	11,11	36%	1,2%
80	6,09	6,29	6,76	7,17	7,48	7,76	8,09	33%	1,1%
85	4,47	4,60	4,78	5,08	5,31	5,45	5,68	27%	0,9%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	17,86	18,88	19,52	20,21	21,34	22,26	23,09	29%	1,0%
65	14,15	15,14	15,74	16,26	17,22	18,09	18,84	33%	1,1%
70	10,94	11,79	12,36	12,80	13,50	14,17	14,87	36%	1,2%
75	8,24	8,85	9,38	9,76	10,25	10,74	11,24	36%	1,3%
80	6,14	6,50	6,87	7,21	7,51	7,81	8,15	33%	1,1%
85	4,52	4,77	4,86	5,11	5,33	5,48	5,69	26%	0,9%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	16,77	17,52	18,56	19,43	20,43	21,43	22,10	32%	1,1%
65	13,42	14,06	14,99	15,71	16,54	17,46	18,05	35%	1,2%
70	10,42	11,01	11,79	12,42	13,03	13,75	14,31	37%	1,3%
75	7,84	8,33	9,06	9,50	9,96	10,47	10,86	38%	1,3%
80	5,77	6,13	6,72	7,08	7,34	7,70	7,93	37%	1,3%
85	4,15	4,42	4,83	5,12	5,28	5,43	5,61	35%	1,2%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	6,6%	5,5%	4,5%	3,6%	3,2%	2,5%	2,7%	4,1%
65	5,1%	4,8%	4,0%	3,2%	3,1%	2,3%	2,6%	3,6%
70	4,3%	4,0%	3,6%	2,8%	2,9%	2,0%	2,3%	3,1%
75	4,0%	2,8%	2,3%	2,3%	2,2%	1,7%	2,2%	2,5%
80	5,2%	2,6%	0,7%	1,2%	1,9%	0,9%	2,0%	2,1%
85	7,2%	4,0%	-1,0%	-0,8%	0,7%	0,3%	1,3%	1,7%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	6,1%	7,2%	5,0%	3,9%	4,2%	3,7%	4,3%	4,9%
65	5,2%	7,2%	4,7%	3,4%	4,0%	3,5%	4,2%	4,6%
70	4,7%	6,6%	4,6%	3,0%	3,5%	3,0%	3,8%	4,2%
75	4,8%	5,9%	3,5%	2,6%	2,8%	2,5%	3,4%	3,6%
80	6,1%	5,8%	2,3%	1,8%	2,3%	1,4%	2,7%	3,2%
85	8,1%	7,3%	0,6%	-0,1%	1,1%	0,9%	1,5%	2,8%

Ann. 2　　　　**Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Private employees (INPS) - lives and amount-weighted analysis - females

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	22,08	22,96	24,01	24,94	25,77	26,45	26,96	22%	0,8%
65	17,77	18,61	19,61	20,48	21,29	21,94	22,44	26%	0,9%
70	13,76	14,55	15,47	16,27	17,01	17,59	18,06	31%	1,1%
75	10,18	10,86	11,66	12,40	13,01	13,48	13,93	37%	1,3%
80	7,24	7,77	8,36	9,03	9,47	9,81	10,17	40%	1,4%
85	5,05	5,42	5,76	6,27	6,60	6,79	7,02	39%	1,3%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	21,97	23,09	23,81	24,77	25,77	26,41	26,94	23%	0,8%
65	17,72	18,77	19,45	20,33	21,28	21,89	22,39	26%	0,9%
70	13,75	14,75	15,35	16,15	17,00	17,53	18,02	31%	1,1%
75	10,19	11,07	11,59	12,33	13,01	13,43	13,90	36%	1,3%
80	7,25	7,96	8,34	9,01	9,48	9,78	10,14	40%	1,4%
85	5,05	5,54	5,75	6,26	6,63	6,77	7,01	39%	1,3%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	21,12	21,85	22,98	23,90	24,71	25,69	26,04	23%	0,8%
65	17,04	17,68	18,75	19,59	20,35	21,29	21,62	27%	0,9%
70	13,23	13,83	14,76	15,55	16,21	17,06	17,38	31%	1,1%
75	9,88	10,33	11,19	11,83	12,39	13,11	13,38	35%	1,2%
80	7,11	7,35	8,09	8,65	9,02	9,58	9,80	38%	1,3%
85	4,92	4,99	5,62	6,03	6,33	6,65	6,82	39%	1,3%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	4,3%	4,8%	4,3%	4,2%	4,1%	2,9%	3,4%	4,0%
65	4,1%	5,0%	4,4%	4,3%	4,4%	3,0%	3,6%	4,1%
70	3,8%	5,0%	4,5%	4,5%	4,7%	3,0%	3,8%	4,2%
75	2,9%	4,9%	4,1%	4,6%	4,8%	2,8%	4,0%	4,0%
80	1,8%	5,4%	3,3%	4,2%	4,8%	2,4%	3,7%	3,7%
85	2,6%	7,8%	2,4%	3,9%	4,0%	2,0%	2,9%	3,7%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	3,9%	5,4%	3,5%	3,5%	4,1%	2,7%	3,3%	3,8%
65	3,8%	5,8%	3,6%	3,6%	4,4%	2,7%	3,4%	3,9%
70	3,8%	6,3%	3,8%	3,7%	4,6%	2,7%	3,5%	4,1%
75	3,1%	6,7%	3,5%	4,1%	4,7%	2,4%	3,7%	4,0%
80	1,9%	7,7%	3,1%	4,0%	4,9%	2,0%	3,4%	3,8%
85	2,7%	9,9%	2,2%	3,7%	4,5%	1,8%	2,8%	4,0%

Ann. 3   **Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Self-employed (INPS) - lives and amount-weighted analysis - males

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	15,95	18,69	20,61	21,49	22,17	22,75	23,24	46%	1,6%
65	15,23	15,88	16,84	17,42	18,03	18,55	18,95	24%	0,8%
70	11,48	12,15	13,07	13,71	14,23	14,66	14,99	31%	1,1%
75	8,49	8,96	9,76	10,38	10,89	11,16	11,38	34%	1,2%
80	6,16	6,52	7,03	7,53	7,99	8,17	8,27	34%	1,2%
85	4,45	4,66	4,98	5,34	5,60	5,77	5,78	30%	1,0%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	16,26	19,82	21,01	21,77	22,67	23,06	23,49	44%	1,5%
65	14,88	16,71	16,88	17,62	18,46	18,80	19,18	29%	1,0%
70	11,16	12,79	12,96	13,82	14,59	14,84	15,16	36%	1,2%
75	8,23	9,47	9,57	10,42	11,15	11,28	11,51	40%	1,4%
80	5,98	6,91	6,85	7,52	8,18	8,26	8,34	39%	1,4%
85	4,36	4,96	4,85	5,31	5,73	5,85	5,83	34%	1,2%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	16,77	17,52	18,56	19,43	20,43	21,43	22,10	32%	1,1%
65	13,42	14,06	14,99	15,71	16,54	17,46	18,05	35%	1,2%
70	10,42	11,01	11,79	12,42	13,03	13,75	14,31	37%	1,3%
75	7,84	8,33	9,06	9,50	9,96	10,47	10,86	38%	1,5%
80	5,77	6,13	6,72	7,08	7,34	7,70	7,93	37%	1,5%
85	4,15	4,42	4,83	5,12	5,28	5,43	5,61	35%	1,5%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	-5,1%	6,2%	10,0%	9,6%	7,8%	5,8%	4,9%	5,6%
65	11,9%	11,5%	11,0%	9,8%	8,3%	5,9%	4,7%	9,0%
70	9,2%	9,4%	9,8%	9,4%	8,5%	6,2%	4,5%	8,2%
75	7,6%	7,1%	7,2%	8,5%	8,5%	6,2%	4,6%	7,1%
80	6,3%	6,1%	4,4%	6,0%	8,1%	5,8%	4,1%	5,8%
85	6,8%	5,3%	3,0%	4,1%	5,8%	5,9%	3,1%	4,9%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	-3,1%	11,6%	11,7%	10,8%	9,9%	7,1%	5,9%	7,7%
65	9,8%	15,9%	11,2%	10,8%	10,4%	7,1%	5,9%	10,2%
70	6,6%	14,0%	9,1%	10,1%	10,7%	7,4%	5,6%	9,1%
75	4,7%	12,1%	5,4%	8,8%	10,7%	7,2%	5,6%	7,8%
80	3,5%	11,4%	1,9%	5,8%	10,2%	6,8%	4,9%	6,4%
85	4,8%	10,9%	0,4%	3,6%	7,9%	7,2%	3,8%	5,5%

Ann. 4   **Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Self-employed (INPS) - lives and amount-weighted analysisi- females

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60	22,64	23,58	24,63	25,64	26,47	26,99	27,41	21%	0,7%
65	18,06	19,02	20,06	21,09	21,89	22,41	22,82	26%	0,9%
70	13,87	14,76	15,73	16,75	17,52	18,04	18,41	33%	1,1%
75	10,22	10,90	11,79	12,73	13,40	13,86	14,26	39%	1,4%
80	7,25	7,70	8,38	9,15	9,73	10,08	10,46	44%	1,5%
85	5,06	5,30	5,71	6,22	6,68	6,92	7,24	43%	1,5%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60	22,08	23,95	24,16	25,63	26,75	27,04	27,46	24%	0,8%
65	17,54	19,36	19,59	21,06	22,15	22,44	22,86	30%	1,0%
70	13,43	15,08	15,25	16,72	17,75	18,06	18,45	37%	1,3%
75	9,87	11,22	11,37	12,69	13,61	13,87	14,27	45%	1,5%
80	6,98	8,00	8,03	9,09	9,92	10,10	10,47	50%	1,7%
85	4,85	5,54	5,46	6,16	6,84	6,93	7,26	49%	1,7%

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60	21,12	21,85	22,98	23,90	24,71	25,69	26,04	23%	0,9%
65	17,04	17,68	18,75	19,59	20,35	21,29	21,62	27%	1,0%
70	13,23	13,83	14,76	15,55	16,21	17,06	17,38	31%	1,2%
75	9,88	10,33	11,19	11,83	12,39	13,11	13,38	35%	1,3%
80	7,11	7,35	8,09	8,65	9,02	9,58	9,80	38%	1,4%
85	4,92	4,99	5,62	6,03	6,33	6,65	6,82	39%	1,5%

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	6,7%	7,3%	6,7%	6,8%	6,6%	4,8%	5,0%	6,3%
65	5,6%	7,1%	6,6%	7,1%	7,0%	5,0%	5,2%	6,2%
70	4,6%	6,3%	6,1%	7,2%	7,5%	5,4%	5,6%	6,1%
75	3,4%	5,3%	5,1%	7,1%	7,5%	5,5%	6,1%	5,7%
80	2,0%	4,6%	3,5%	5,5%	7,4%	4,9%	6,3%	4,9%
85	2,8%	5,9%	1,5%	3,1%	5,2%	3,8%	5,9%	4,0%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	4,4%	8,8%	4,9%	6,8%	7,6%	5,0%	5,2%	6,1%
65	2,8%	8,7%	4,3%	7,0%	8,1%	5,1%	5,4%	5,9%
70	1,5%	8,3%	3,2%	7,0%	8,7%	5,5%	5,8%	5,7%
75	-0,1%	8,0%	1,6%	6,8%	9,0%	5,5%	6,3%	5,3%
80	-1,8%	8,1%	-0,7%	4,9%	9,1%	5,1%	6,5%	4,4%
85	-1,3%	9,9%	-3,0%	2,2%	7,4%	4,0%	6,1%	3,6%

Ann. 5   **Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Total private employees and self-employed (INPS) - lives and amount-weighted analysis - males

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

| age | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 | change | |
								Total	annual average
60	18,11	18,69	19,61	20,40	21,36	22,19	22,90	26%	0,9%
65	14,32	14,94	15,81	16,45	17,27	18,05	18,67	30%	1,0%
70	11,01	11,57	12,36	12,93	13,56	14,17	14,75	34%	1,2%
75	8,26	8,66	9,35	9,83	10,31	10,75	11,18	35%	1,2%
80	6,11	6,35	6,82	7,23	7,56	7,83	8,13	33%	1,1%
85	4,47	4,62	4,84	5,13	5,36	5,50	5,70	28%	1,0%

Life expectancy per calendar year at certain ages - amount-weighted analysis

| age | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 | change | |
								Total	annual average
60	17,90	19,00	19,62	20,38	21,53	22,41	23,18	30%	1,0%
65	14,19	15,28	15,83	16,41	17,38	18,20	18,91	33%	1,1%
70	10,95	11,89	12,40	12,89	13,61	14,27	14,92	36%	1,3%
75	8,23	8,93	9,40	9,81	10,33	10,80	11,29	37%	1,3%
80	6,11	6,58	6,87	7,24	7,57	7,85	8,17	34%	1,2%
85	4,48	4,81	4,85	5,13	5,36	5,51	5,70	27%	0,9%

Italian general population

Life expectancy per calendar year at certain ages

| age | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 | change | |
								Total	annual average
60	16,77	17,52	18,56	19,43	20,43	21,43	22,10	32%	1,1%
65	13,42	14,06	14,99	15,71	16,54	17,46	18,05	35%	1,2%
70	10,42	11,01	11,79	12,42	13,03	13,75	14,31	37%	1,3%
75	7,84	8,33	9,06	9,50	9,96	10,47	10,86	38%	1,3%
80	5,77	6,13	6,72	7,08	7,34	7,70	7,93	37%	1,3%
85	4,15	4,42	4,83	5,12	5,28	5,43	5,61	35%	1,2%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	7,4%	6,3%	5,4%	4,8%	4,3%	3,4%	3,5%	5,0%
65	6,3%	5,9%	5,2%	4,5%	4,2%	3,2%	3,3%	4,7%
70	5,4%	4,9%	4,6%	4,0%	3,9%	3,0%	3,0%	4,1%
75	5,0%	3,8%	3,2%	3,3%	3,3%	2,6%	2,8%	3,4%
80	5,5%	3,6%	1,6%	2,0%	2,9%	1,8%	2,5%	2,8%
85	7,1%	4,4%	0,3%	0,2%	1,5%	1,2%	1,7%	2,3%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2004	2009	Media
60	6,3%	7,8%	5,4%	4,7%	5,1%	4,4%	4,7%	5,5%
65	5,4%	8,0%	5,3%	4,2%	4,8%	4,1%	4,5%	5,2%
70	4,8%	7,4%	4,9%	3,7%	4,3%	3,7%	4,1%	4,7%
75	4,7%	6,8%	3,6%	3,2%	3,6%	3,0%	3,8%	4,1%
80	5,5%	6,9%	2,2%	2,1%	3,0%	2,0%	3,0%	3,5%
85	7,3%	8,2%	0,6%	0,2%	1,6%	1,5%	1,7%	3,0%

Life expectancy and comparison with the Italian general population
Total private employees and self-employed (INPS) - lives and amount-weighted analysis - females

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60	22,20	23,09	24,16	25,12	25,97	26,62	27,11	22%	0,8%
65	17,84	18,69	19,71	20,63	21,45	22,08	22,55	26%	0,9%
70	13,79	14,59	15,52	16,38	17,15	17,72	18,17	32%	1,1%
75	10,19	10,86	11,69	12,47	13,11	13,59	14,03	38%	1,3%
80	7,24	7,73	8,37	9,05	9,52	9,88	10,25	42%	1,4%
85	5,05	5,36	5,74	6,26	6,62	6,82	7,08	40%	1,4%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60	21,94	23,24	23,88	24,95	25,99	26,57	27,07	23%	0,8%
65	17,64	18,87	19,46	20,47	21,46	22,02	22,51	28%	1,0%
70	13,65	14,81	15,31	16,25	17,15	17,66	18,12	33%	1,1%
75	10,08	11,10	11,53	12,39	13,12	13,53	13,99	39%	1,3%
80	7,14	7,97	8,26	9,02	9,55	9,84	10,21	43%	1,5%
85	4,95	5,54	5,67	6,24	6,67	6,80	7,06	43%	1,5%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60	21,12	21,85	22,98	23,90	24,71	25,69	26,04	23%	0,8%
65	17,04	17,68	18,75	19,59	20,35	21,29	21,62	27%	0,9%
70	13,23	13,83	14,76	15,55	16,21	17,06	17,38	31%	1,1%
75	9,88	10,33	11,19	11,83	12,39	13,11	13,38	35%	1,2%
80	7,11	7,35	8,09	8,65	9,02	9,58	9,80	38%	1,3%
85	4,92	4,99	5,62	6,03	6,33	6,65	6,82	39%	1,3%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	4,9%	5,3%	4,9%	4,9%	4,8%	3,5%	3,9%	4,6%
65	4,5%	5,4%	4,9%	5,0%	5,1%	3,6%	4,1%	4,7%
70	4,0%	5,2%	4,9%	5,1%	5,5%	3,7%	4,3%	4,7%
75	3,0%	4,9%	4,3%	5,2%	5,5%	3,6%	4,6%	4,4%
80	1,8%	5,0%	3,3%	4,4%	5,4%	3,1%	4,4%	3,9%
85	2,7%	6,9%	2,0%	3,6%	4,3%	2,4%	3,7%	3,7%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	3,7%	6,0%	3,7%	4,2%	4,9%	3,3%	3,8%	4,2%
65	3,4%	6,3%	3,7%	4,3%	5,2%	3,3%	4,0%	4,3%
70	3,0%	6,6%	3,6%	4,3%	5,5%	3,4%	4,1%	4,4%
75	2,0%	7,0%	3,0%	4,5%	5,5%	3,1%	4,3%	4,2%
80	0,4%	7,7%	2,1%	4,1%	5,6%	2,7%	4,1%	3,8%
85	0,7%	9,8%	0,9%	3,4%	5,0%	2,2%	3,5%	3,6%

Life expectancy and comparison with the Italian general population
Civil servants (ex INPDAP) - lives and amount-weighted analysis - males

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60					22,11	23,04	25,00	13%	1,5%
65					18,11	18,98	20,71	14%	1,6%
70					14,34	15,13	16,62	16%	1,8%
75					11,08	11,66	12,77	15%	1,7%
80					8,23	8,70	9,41	14%	1,6%
85					5,99	6,29	6,79	13%	1,5%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60					23,71	24,13	25,85	9%	1,0%
65					19,54	19,98	21,52	10%	1,1%
70					15,57	16,05	17,35	11%	1,3%
75					12,04	12,41	13,44	12%	1,3%
80					8,95	9,29	9,95	11%	1,2%
85					6,46	6,73	7,20	12%	1,3%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60					20,43	21,43	22,10	8%	0,9%
65					16,54	17,46	18,05	9%	1,0%
70					13,03	13,75	14,31	10%	1,1%
75					9,96	10,47	10,86	9%	1,0%
80					7,34	7,70	7,93	8%	0,9%
85					5,28	5,43	5,61	6%	0,7%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					7,6%	7,0%	11,6%	8,7%
65					8,7%	8,0%	12,8%	9,8%
70					9,2%	9,2%	13,9%	10,7%
75					10,1%	10,2%	14,9%	11,7%
80					10,9%	11,6%	15,8%	12,7%
85					11,9%	13,7%	17,4%	14,3%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					13,8%	11,2%	14,5%	13,2%
65					15,4%	12,6%	16,1%	14,7%
70					16,3%	14,4%	17,5%	16,1%
75					17,3%	15,6%	19,2%	17,3%
80					18,0%	17,1%	20,3%	18,5%
85					18,3%	19,3%	22,2%	19,9%

Ann. 8   **Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Civil servants (ex INPDAP) - lives and amount-weighted analysis - females

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60					26,58	27,46	28,84	8%	0,9%
65					22,18	23,01	24,26	9%	1,0%
70					17,89	18,65	19,80	11%	1,2%
75					13,84	14,53	15,49	12%	1,3%
80					10,30	10,76	11,61	13%	1,4%
85					7,32	7,59	8,27	13%	1,4%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60					27,89	28,25	29,45	6%	0,6%
65					23,37	23,75	24,85	6%	0,7%
70					18,97	19,33	20,35	7%	0,8%
75					14,76	15,15	16,01	8%	0,9%
80					11,03	11,28	12,04	9%	1,0%
85					7,85	7,99	8,63	10%	1,1%

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60					24,71	25,69	26,04	5%	0,6%
65					20,35	21,29	21,62	6%	0,7%
70					16,21	17,06	17,38	7%	0,8%
75					12,39	13,11	13,38	8%	0,9%
80					9,02	9,58	9,80	9%	1,0%
85					6,33	6,65	6,82	8%	0,8%

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					7,0%	6,4%	9,7%	7,7%
65					8,2%	7,5%	10,9%	8,9%
70					9,4%	8,6%	12,2%	10,1%
75					10,4%	9,8%	13,6%	11,3%
80					12,5%	10,9%	15,6%	13,0%
85					13,5%	12,3%	17,6%	14,5%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					11,4%	9,1%	11,6%	10,7%
65					12,9%	10,4%	13,0%	12,1%
70					14,5%	11,8%	14,6%	13,6%
75					16,1%	13,5%	16,4%	15,3%
80					18,3%	15,0%	18,7%	17,3%
85					19,3%	16,7%	21,0%	19,0%

Life expectancy and comparison with the Italian general population
Arts and sport (ex ENPALS) - lives and amount-weighted analysis - males

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

| age | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 | change | |
								Total	annual average
60					21,96	22,30	22,94	4%	0,5%
65					17,77	18,39	18,35	3%	0,4%
70					13,78	14,46	14,67	6%	0,7%
75					10,88	11,18	11,32	4%	0,5%
80					8,26	8,60	8,43	2%	0,2%
85					6,12	6,29	5,82	-5%	-0,5%

Life expectancy per calendar year at certain ages - amount-weighted analysis

| age | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 | change | |
								Total	annual average
60					27,35	27,91	27,82	2%	0,2%
65					22,72	23,61	23,13	2%	0,2%
70					18,30	19,20	19,02	4%	0,4%
75					14,73	15,31	15,11	3%	0,3%
80					11,40	12,11	11,61	2%	0,2%
85					8,36	8,73	8,51	2%	0,2%

Italian general population

Life expectancy per calendar year at certain ages

| age | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2009 | change | |
								Total	annual average
60					20,43	21,43	22,10	8%	0,9%
65					16,54	17,46	18,05	9%	1,0%
70					13,03	13,75	14,31	10%	1,1%
75					9,96	10,47	10,86	9%	1,0%
80					7,34	7,70	7,93	8%	0,9%
85					5,28	5,43	5,61	6%	0,7%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					6,9%	3,9%	3,7%	4,8%
65					6,9%	5,1%	1,6%	4,5%
70					5,5%	4,9%	2,5%	4,3%
75					8,5%	6,3%	4,1%	6,3%
80					11,2%	10,5%	5,9%	9,2%
85					13,8%	13,7%	3,7%	10,4%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					25,3%	23,2%	20,6%	23,0%
65					27,2%	26,1%	21,9%	25,1%
70					28,8%	28,4%	24,8%	27,3%
75					32,4%	31,6%	28,1%	30,7%
80					35,6%	36,4%	31,7%	34,6%
85					36,9%	37,8%	34,1%	36,3%

Life expectancy and comparison with the Italian general population

Arts and sport (ex ENPALS) - lives and amount-weighted analysis - females

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	annual average
60					25,83	25,13	27,30	6%	0,6%
65					21,24	20,50	22,71	7%	0,8%
70					16,76	16,47	18,94	13%	1,4%
75					13,31	12,61	14,89	12%	1,3%
80					9,80	9,13	10,93	11%	1,3%
85					7,16	6,70	8,21	15%	1,6%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	annual average
60					30,67	29,77	31,89	4%	0,4%
65					25,92	24,86	27,05	4%	0,5%
70					21,26	20,45	23,00	8%	0,9%
75					17,33	16,13	18,94	9%	1,0%
80					13,79	12,08	14,52	5%	0,6%
85					10,10	8,90	10,92	8%	0,9%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change Total	annual average
60					24,71	25,69	26,04	5%	0,6%
65					20,35	21,29	21,62	6%	0,7%
70					16,21	17,06	17,38	7%	0,8%
75					12,39	13,11	13,38	8%	0,9%
80					9,02	9,58	9,80	9%	1,0%
85					6,33	6,65	6,82	8%	0,8%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					4,3%	-2,2%	4,6%	2,2%
65					4,2%	-3,8%	4,8%	1,7%
70					3,3%	-3,5%	8,2%	2,6%
75					6,9%	-3,9%	10,1%	4,4%
80					8,1%	-4,9%	10,4%	4,5%
85					11,6%	0,7%	17,0%	9,8%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					19,4%	13,7%	18,4%	17,2%
65					21,5%	14,4%	20,1%	18,6%
70					23,8%	16,6%	24,4%	21,6%
75					28,5%	18,8%	29,4%	25,5%
80					34,6%	20,7%	32,5%	29,3%
85					37,3%	25,3%	37,6%	33,4%

Ann. 11   **Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Lawyers (Cassa Forense) - lives and amount-weighted analysis - males

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60				23,55	22,96	24,52	24,66	5%	0,3%
65				20,85	17,96	19,52	20,79	0%	0,0%
70				17,11	13,90	15,24	16,50	-4%	-0,3%
75				13,85	10,86	11,50	12,58	-9%	-0,7%
80				11,29	7,89	8,45	9,13	-19%	-1,4%
85				9,34	5,54	6,44	6,74	-28%	-2,0%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60				29,70	23,67	25,17	26,42	-11%	-0,8%
65				25,80	18,67	20,17	21,66	-16%	-1,1%
70				21,73	14,50	15,82	17,21	-21%	-1,5%
75				17,70	11,21	12,10	13,16	-26%	-1,8%
80				14,35	8,20	9,01	9,67	-33%	-2,3%
85				11,56	5,60	6,72	7,07	-39%	-2,8%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60				19,43	20,43	21,43	22,10	8%	0,9%
65				15,71	16,54	17,46	18,05	9%	1,0%
70				12,42	13,03	13,75	14,31	10%	1,1%
75				9,50	9,96	10,47	10,86	9%	1,0%
80				7,08	7,34	7,70	7,93	8%	0,9%
85				5,12	5,28	5,43	5,61	6%	0,7%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60				17,5%	11,0%	12,6%	10,4%	12,9%
65				24,7%	7,9%	10,6%	13,2%	14,1%
70				27,4%	6,2%	9,8%	13,3%	14,2%
75				31,4%	8,3%	8,9%	13,7%	15,6%
80				37,2%	7,0%	9,0%	13,2%	16,6%
85				45,2%	4,8%	15,8%	16,9%	20,6%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60				34,6%	13,7%	14,8%	16,3%	19,9%
65				39,1%	11,4%	13,4%	16,6%	20,1%
70				42,8%	10,2%	13,1%	16,9%	20,7%
75				46,3%	11,1%	13,4%	17,4%	22,1%
80				50,6%	10,5%	14,6%	18,0%	23,4%
85				55,7%	5,8%	19,2%	20,7%	25,4%

Life expectancy and comparison with the Italian general population
Lawyers (Cassa Forense) - lives and amount-weighted analysis - females

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60				37,36	32,53	30,08	29,99	-20%	-1,4%
65				32,36	27,53	25,08	24,99	-23%	-1,6%
70				27,36	22,53	20,49	20,52	-25%	-1,8%
75				22,36	17,53	16,99	16,23	-27%	-2,0%
80				17,36	13,66	13,35	13,07	-25%	-1,8%
85				12,36	8,66	9,13	9,34	-24%	-1,7%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60				39,17	32,95	30,02	29,65	-24%	-1,7%
65				34,17	27,95	25,02	24,65	-28%	-2,0%
70				29,17	22,95	20,73	19,74	-32%	-2,3%
75				24,17	17,95	17,20	15,23	-37%	-2,6%
80				19,17	13,74	12,83	12,39	-35%	-2,5%
85				14,17	8,74	8,57	8,87	-37%	-2,7%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change Total	change annual average
60				23,90	24,71	25,69	26,04	5%	0,6%
65				19,59	20,35	21,29	21,62	6%	0,7%
70				15,55	16,21	17,06	17,38	7%	0,8%
75				11,83	12,39	13,11	13,38	8%	0,9%
80				8,65	9,02	9,58	9,80	9%	1,0%
85				6,03	6,33	6,65	6,82	8%	0,8%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60				36,0%	24,0%	14,6%	13,2%	22,0%
65				39,4%	26,1%	15,1%	13,5%	23,5%
70				43,2%	28,1%	16,8%	15,3%	25,8%
75				47,1%	29,3%	22,9%	17,6%	29,2%
80				50,2%	34,0%	28,2%	25,1%	34,4%
85				51,2%	26,9%	27,2%	27,1%	33,1%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60				39,0%	25,0%	14,4%	12,2%	22,7%
65				42,7%	27,2%	14,9%	12,3%	24,3%
70				46,7%	29,4%	17,7%	12,0%	26,4%
75				51,1%	31,0%	23,8%	12,1%	29,5%
80				54,9%	34,4%	25,3%	20,9%	33,9%
85				57,5%	27,5%	22,3%	23,1%	32,6%

Ann. 13   Normal retirement pensioners and annuitants - Observation period
Life expectancy and comparison with the Italian general population
Medical doctors (ENPAM) - lives and amount-weighted analysis - males

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	11,35	19,38	20,68	21,23	22,84	24,85	23,66	109%	3,7%
65	15,62	16,01	16,73	17,17	18,43	19,85	20,14	29%	1,0%
70	12,09	12,55	13,10	13,33	14,38	15,71	15,88	31%	1,1%
75	9,39	9,51	9,90	10,27	10,79	12,09	12,19	30%	1,0%
80	6,99	6,98	7,56	7,92	8,05	9,02	8,93	28%	1,0%
85	5,47	5,19	5,97	5,90	5,80	6,63	6,34	16%	0,5%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	18,93	20,60	20,77	21,16	23,46	24,73	24,16	22%	0,8%
65	17,44	16,90	17,58	17,18	18,80	19,73	20,20	15%	0,5%
70	13,63	13,18	13,80	13,43	15,03	15,94	16,12	17%	0,6%
75	10,68	9,94	10,46	10,04	11,33	12,40	12,51	16%	0,6%
80	8,06	7,20	7,64	8,19	8,31	9,07	9,31	15%	0,5%
85	6,30	5,47	6,51	6,35	5,67	6,86	6,83	9%	0,3%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	16,77	17,52	18,56	19,43	20,43	21,43	22,10	8%	0,9%
65	13,42	14,06	14,99	15,71	16,54	17,46	18,05	9%	1,0%
70	10,42	11,01	11,79	12,42	13,03	13,75	14,31	10%	1,1%
75	7,84	8,33	9,06	9,50	9,96	10,47	10,86	9%	1,0%
80	5,77	6,13	6,72	7,08	7,34	7,70	7,93	8%	0,9%
85	4,15	4,42	4,83	5,12	5,28	5,43	5,61	6%	0,7%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	-47,7%	9,6%	10,3%	8,5%	10,5%	13,8%	6,6%	1,6%
65	14,1%	12,2%	10,4%	8,5%	10,3%	12,0%	10,3%	11,1%
70	13,8%	12,3%	10,0%	6,9%	9,4%	12,5%	9,9%	10,7%
75	16,5%	12,4%	8,5%	7,5%	7,7%	13,4%	10,9%	11,0%
80	17,4%	12,3%	11,2%	10,6%	8,8%	14,7%	11,2%	12,3%
85	24,2%	15,0%	19,2%	13,2%	9,0%	18,2%	11,6%	15,7%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	11,4%	15,0%	10,7%	8,2%	12,9%	13,3%	8,5%	11,4%
65	23,0%	16,8%	14,8%	8,6%	12,1%	11,5%	10,6%	13,9%
70	23,5%	16,5%	14,6%	7,5%	13,3%	13,8%	11,3%	14,3%
75	26,6%	16,2%	13,4%	5,4%	12,1%	15,6%	13,2%	14,6%
80	28,4%	14,9%	12,0%	13,5%	11,7%	15,1%	14,8%	15,8%
85	34,1%	19,3%	25,9%	19,3%	7,0%	20,9%	17,9%	20,6%

Life expectancy and comparison with the Italian general population
Medical doctors (ENPAM) - lives and amount-weighted analysis - females

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	24,76	23,76	27,22	28,41	26,43	27,46	26,41	7%	0,2%
65	19,76	18,76	22,22	23,41	21,43	22,46	23,41	18%	0,6%
70	15,15	15,03	17,77	19,31	17,49	18,53	18,97	25%	0,9%
75	11,96	11,84	14,23	16,03	13,13	14,44	15,22	27%	0,9%
80	9,92	8,12	12,07	12,74	9,82	10,60	10,99	11%	0,4%
85	7,63	7,13	10,64	11,18	7,50	7,01	8,17	7%	0,2%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	26,45	24,88	29,48	29,80	28,08	30,11	25,72	-3%	-0,1%
65	21,45	19,88	24,48	24,80	23,08	25,11	23,33	9%	0,3%
70	16,74	15,81	19,86	20,46	18,80	21,13	19,25	15%	0,5%
75	13,33	12,09	15,56	17,02	14,19	16,34	15,86	19%	0,7%
80	10,87	8,24	12,40	12,97	10,51	12,54	11,52	6%	0,2%
85	8,28	7,13	10,69	10,72	8,79	9,28	7,82	-6%	-0,2%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60	21,12	21,85	22,98	23,90	24,71	25,69	26,04	5%	0,6%
65	17,04	17,68	18,75	19,59	20,35	21,29	21,62	6%	0,7%
70	13,23	13,83	14,76	15,55	16,21	17,06	17,38	7%	0,8%
75	9,88	10,33	11,19	11,83	12,39	13,11	13,38	8%	0,9%
80	7,11	7,35	8,09	8,65	9,02	9,58	9,80	9%	1,0%
85	4,92	4,99	5,62	6,03	6,33	6,65	6,82	8%	0,8%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	14,7%	8,0%	15,6%	15,9%	6,5%	6,5%	1,4%	9,8%
65	13,8%	5,8%	15,6%	16,3%	5,1%	5,2%	7,6%	9,9%
70	12,6%	8,0%	16,9%	19,5%	7,3%	8,0%	8,4%	11,5%
75	17,4%	12,8%	21,4%	26,2%	5,6%	9,3%	12,1%	15,0%
80	28,3%	9,5%	33,0%	32,1%	8,2%	9,6%	10,9%	18,8%
85	35,5%	30,0%	47,2%	46,1%	15,5%	5,1%	16,6%	28,0%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60	20,2%	12,2%	22,0%	19,8%	12,0%	14,7%	-1,2%	14,2%
65	20,5%	11,1%	23,4%	21,0%	11,8%	15,2%	7,3%	15,8%
70	20,9%	12,6%	25,7%	24,0%	13,8%	19,3%	9,7%	18,0%
75	25,9%	14,6%	28,1%	30,5%	12,7%	19,8%	15,6%	21,0%
80	34,6%	10,8%	34,8%	33,3%	14,2%	23,6%	14,9%	23,8%
85	40,6%	30,0%	47,4%	43,8%	28,0%	28,3%	12,8%	33,0%

Ann. 15   **Normal retirement pensioners and annuitants - Observation period**
Life expectancy and comparison with the Italian general population
Pension fund and life office annuitants - lives and amount-weighted analysis - males

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60					23,97	23,00	24,45	2%	0,2%
65					19,88	19,46	20,28	2%	0,2%
70					15,84	15,68	16,27	3%	0,3%
75					12,12	12,23	12,26	1%	0,1%
80					8,27	9,29	9,05	9%	1,1%
85					6,33	6,94	6,63	5%	0,5%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60					23,16	23,33	24,77	7%	0,8%
65					19,02	19,43	20,55	8%	0,9%
70					14,59	15,77	16,65	14%	1,6%
75					11,25	12,75	12,69	13%	1,4%
80					7,29	9,77	9,75	34%	3,7%
85					6,06	7,19	7,14	18%	2,0%

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change	
								Total	annual average
60					20,43	21,43	22,10	8%	0,9%
65					16,54	17,46	18,05	9%	1,0%
70					13,03	13,75	14,31	10%	1,1%
75					9,96	10,47	10,86	9%	1,0%
80					7,34	7,70	7,93	8%	0,9%
85					5,28	5,43	5,61	6%	0,7%

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					14,7%	6,8%	9,6%	10,4%
65					16,8%	10,3%	11,0%	12,7%
70					17,8%	12,3%	12,1%	14,1%
75					17,8%	14,4%	11,4%	14,5%
80					11,2%	17,1%	12,4%	13,6%
85					16,7%	21,7%	15,4%	17,9%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					11,8%	8,2%	10,8%	10,2%
65					13,0%	10,1%	12,1%	11,8%
70					10,7%	12,9%	14,1%	12,5%
75					11,5%	17,9%	14,4%	14,6%
80					-0,7%	21,3%	18,7%	13,1%
85					13,0%	24,5%	21,5%	19,7%

Life expectancy and comparison with the Italian general population
Pension fund and life office annuitants - lives and amount-weighted analysis - females

Pensioners and annuitants

Life expectancy per calendar year at certain ages - lives analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	annual average
60					26,27	26,68	27,69	5%	0,6%
65					22,39	22,49	23,08	3%	0,3%
70					19,28	17,82	18,74	-3%	-0,3%
75					14,28	13,95	14,68	3%	0,3%
80					10,51	10,66	10,51	0%	0,0%
85					5,51	6,98	6,71	22%	2,4%

Life expectancy per calendar year at certain ages - amount-weighted analysis

age	1980	1985	1990	1995	2000	2005	2009	change Total	annual average
60					26,68	28,09	29,17	9%	1,0%
65					22,35	23,99	24,68	10%	1,2%
70					19,04	19,44	20,75	9%	1,0%
75					14,04	15,50	16,86	20%	2,2%
80					10,26	12,00	12,78	25%	2,7%
85					5,26	8,09	8,32	58%	6,5%

Italian general population

Life expectancy per calendar year at certain ages

age	1980	1985	1990	1995	2000	2005	2009	change Total	annual average
60	21,12	21,85	22,98	23,90	24,71	25,69	26,04	5%	0,6%
65	17,04	17,68	18,75	19,59	20,35	21,29	21,62	6%	0,7%
70	13,23	13,83	14,76	15,55	16,21	17,06	17,38	7%	0,8%
75	9,88	10,33	11,19	11,83	12,39	13,11	13,38	8%	0,9%
80	7,11	7,35	8,09	8,65	9,02	9,58	9,80	9%	1,0%
85	4,92	4,99	5,62	6,03	6,33	6,65	6,82	8%	0,8%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (lives analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					5,9%	3,7%	6,0%	5,2%
65					9,1%	5,3%	6,3%	6,9%
70					15,9%	4,3%	7,2%	9,1%
75					13,2%	6,1%	8,9%	9,4%
80					14,2%	10,1%	6,8%	10,4%
85					-15,0%	4,7%	-1,6%	-4,0%

pensioners and annuitants (amount-weighted analysis) - General population

age	1980	1985	1990	1995	2000	2005	2009	Media
60					7,4%	8,6%	10,7%	8,9%
65					8,9%	11,3%	12,4%	10,9%
70					14,9%	12,3%	16,2%	14,5%
75					11,7%	15,4%	20,6%	15,9%
80					12,1%	20,1%	23,4%	18,5%
85					-20,4%	17,8%	18,1%	5,2%

Ann. 17   **Normal retirement pensioners and annuitants - Observation period**

Mortality rates at certain ages (absolute values)

Private empl. and self-empl. 1980-2009, civil servants 2000-2009 - lives analysis
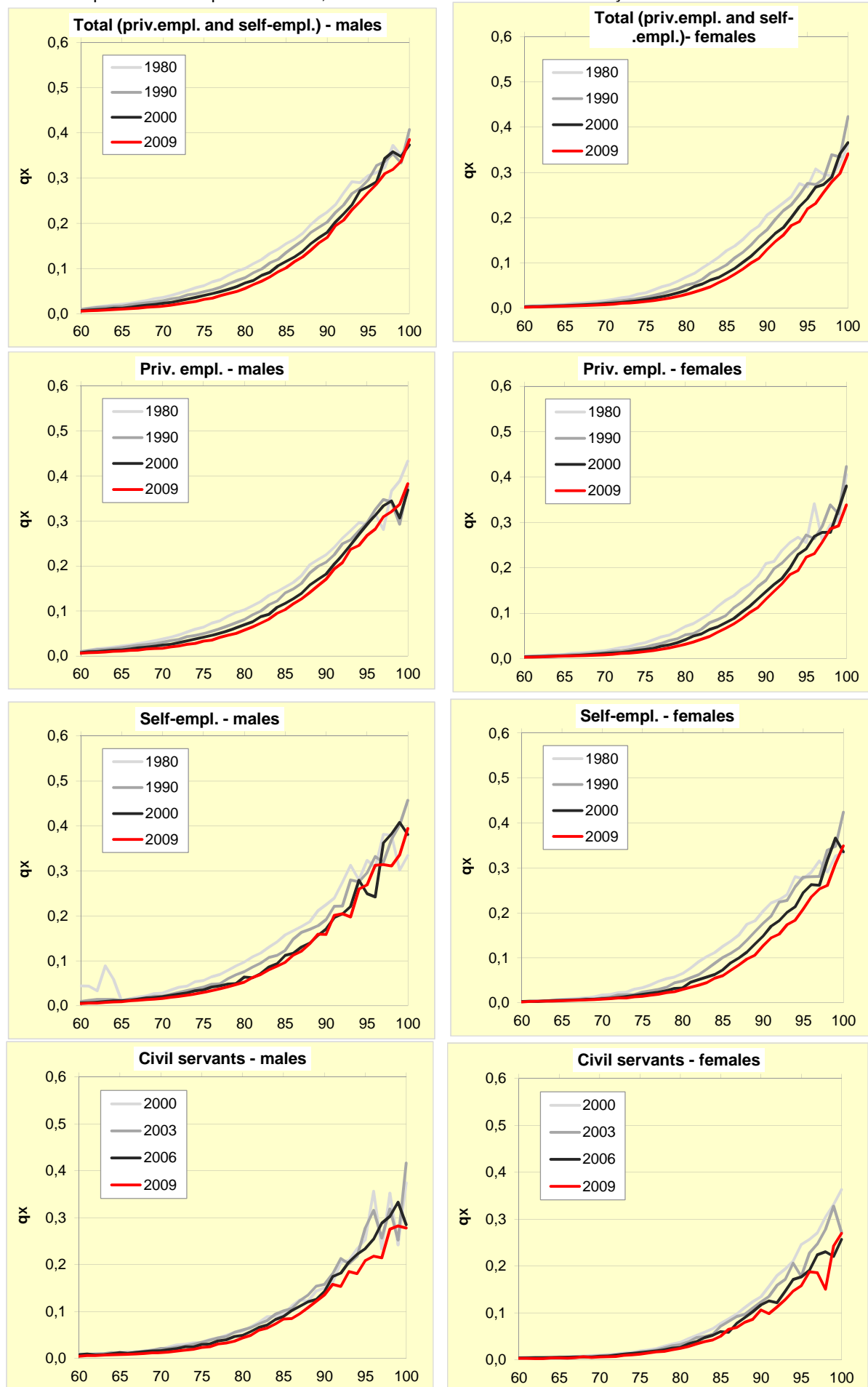
Ann. 18   **Normal retirement pensioners and annuitants - Observation period**

Mortality rates at certain ages (absolute values)

Arts and sport, lawyers, p. fund and life office annuitants 2000-2009, medical doctors 1980-2009 - lives analysis
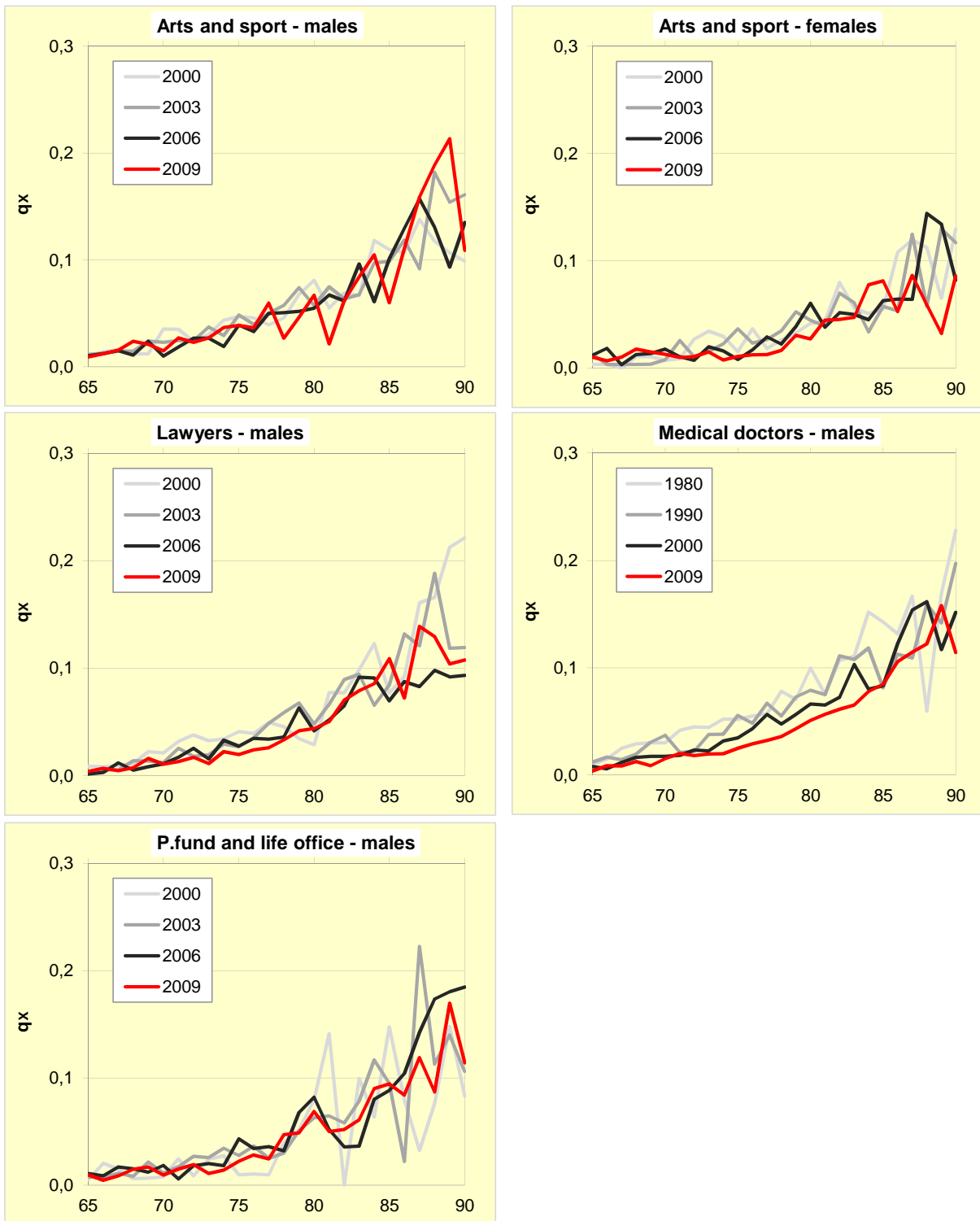
The above illustrated data are limited to age range 65-90 due to scarce numerousness of data in the other ages. For the same reasons, for some collective only data about males are illustrated.

Mortality rates trend (relative terms - base 1 = 1st year of observation)
Private empl., self-empl. and total - lives analysis

Total (priv. empl. and self-empl.- males

Total (priv.empl. and self.empl. - females

Priv. empl. - males

Priv. empl. - females

Self-empl. - males

Self-empl. - females
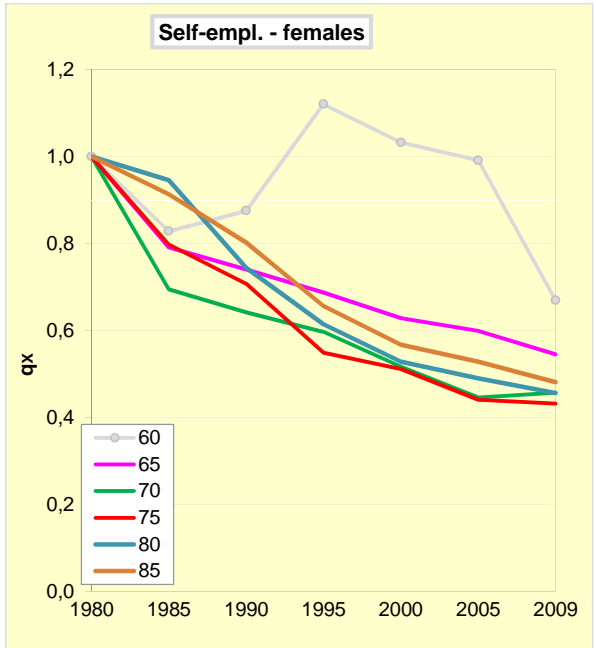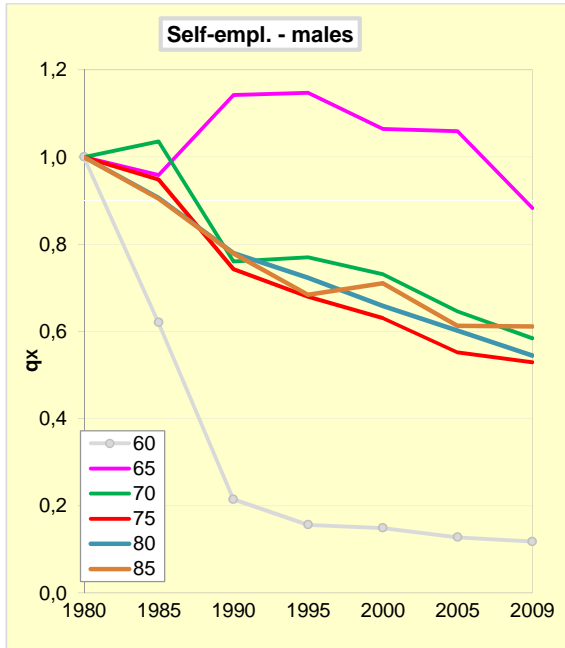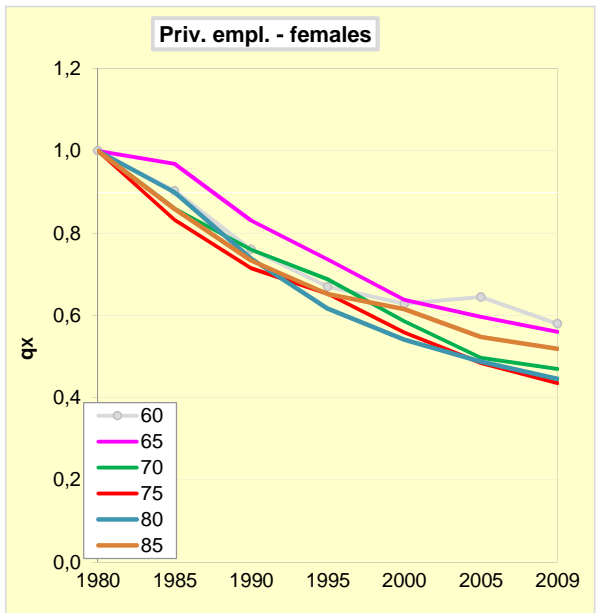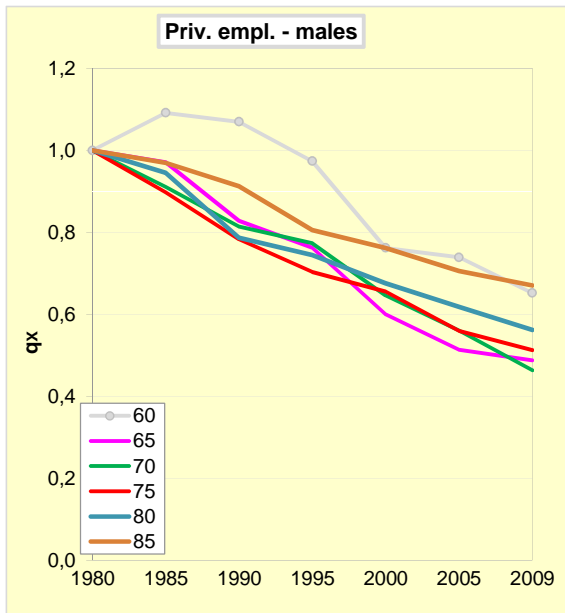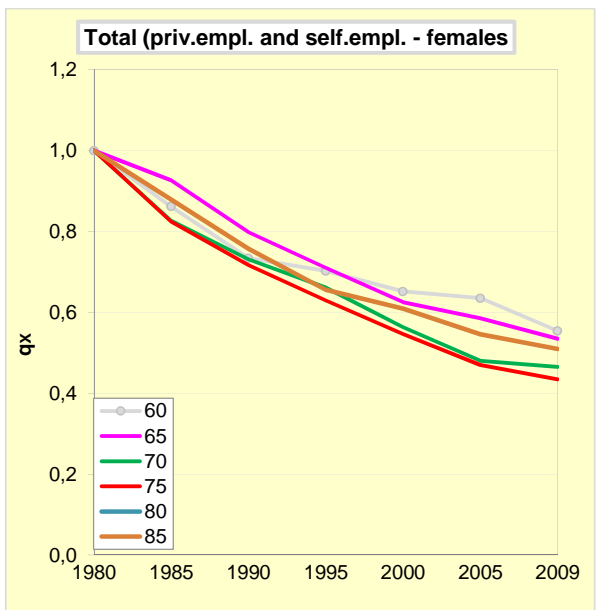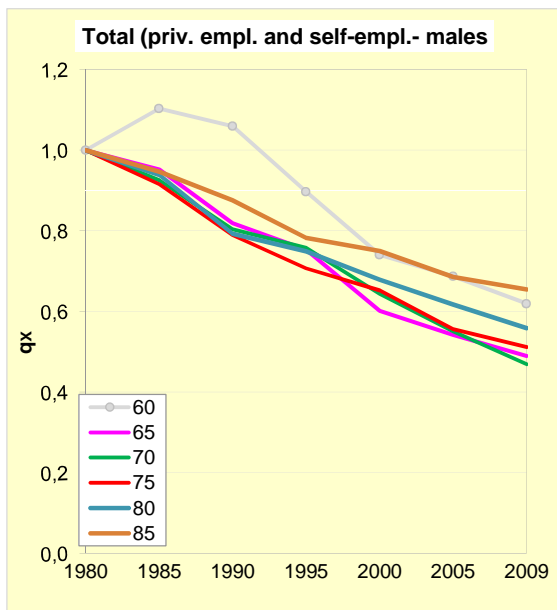
Ann. 20   **Normal retirement pensioners and annuitants - Observation period**
Mortality rates trend (relative terms - base 1 = 1st year of observation)
Civil servants, arts and sport, lawyers - lives analysis
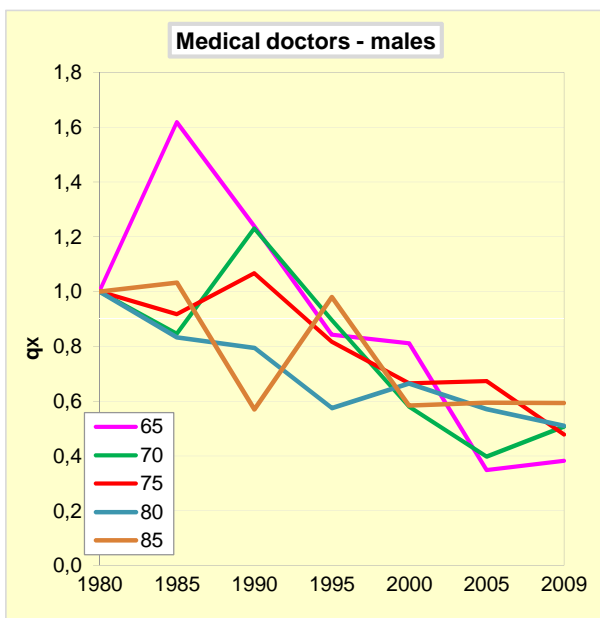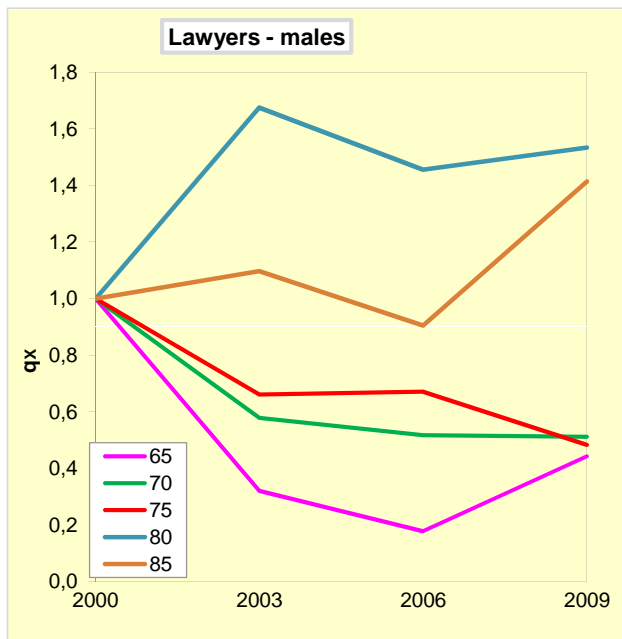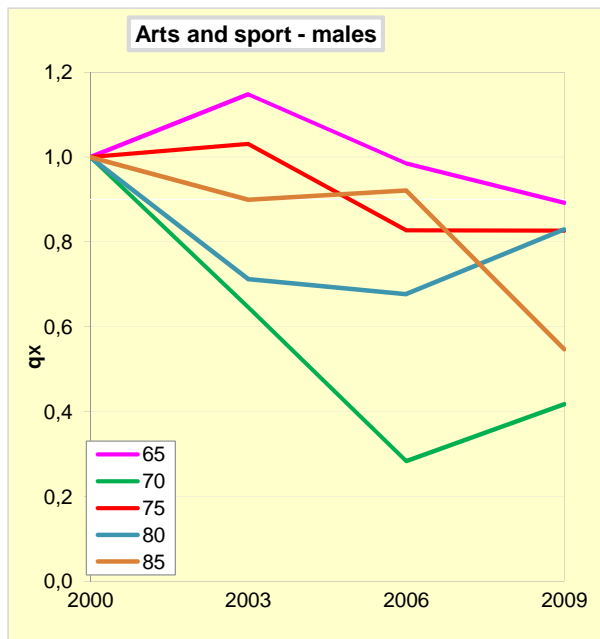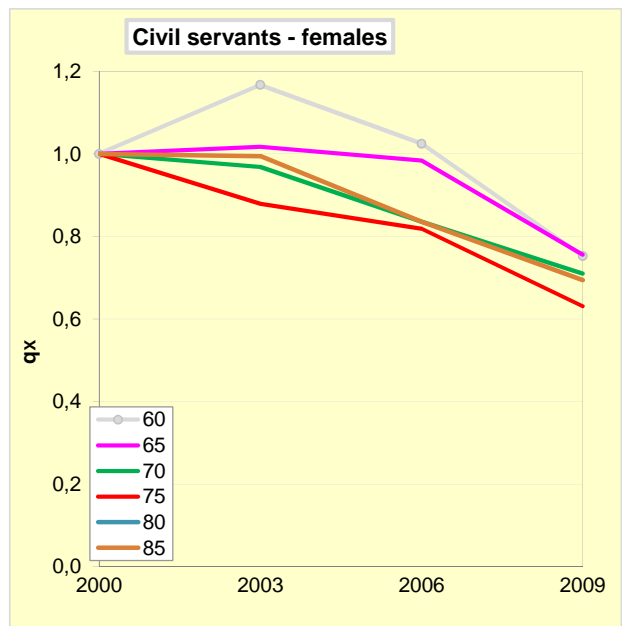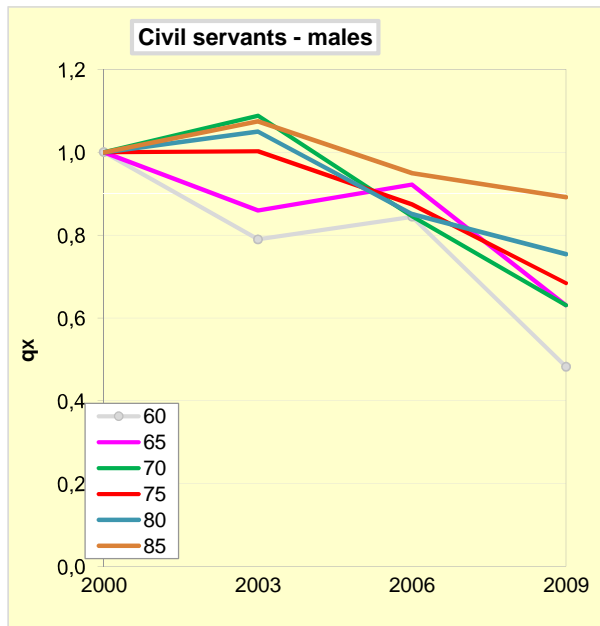
Civil servants - males

Civil servants - females

Arts and sport - males

Lawyers - males

Medical doctors - males

I dati relativi a Civil servants, lavoratori dello spettacoloandsport (ex ENPALS)andlawyers sono limitati al periodo 2000-2009. I dati relativi a Civil servants, lavoratori dello spettacoloandsport (ex ENPALS)andlawyers sono limitati al periodo 2000-2009. Per i lavoratori dello spettacoloandsport, per gli lawyersandper i medical doctors sono illustrati solo i dati relativi ai maschiandper le age da 65 anni in poi, data la scarsa rappresentatività statistica degli altri dati disponibili.
Per le stesse ragioni, non sono riportati i dati relativi alle rendite integrative.

Ann. 21   **Normal retirement pensioners and annuitants - Observation period**
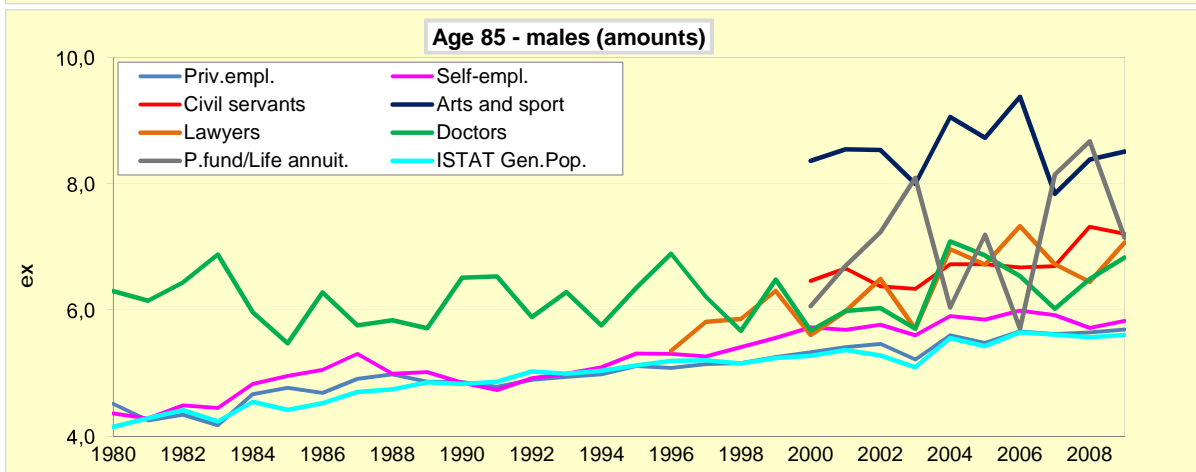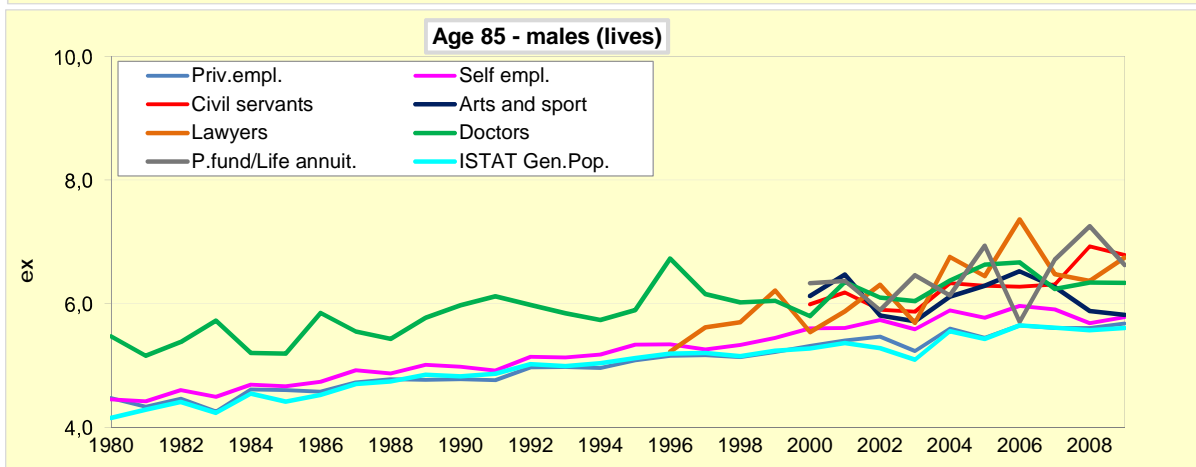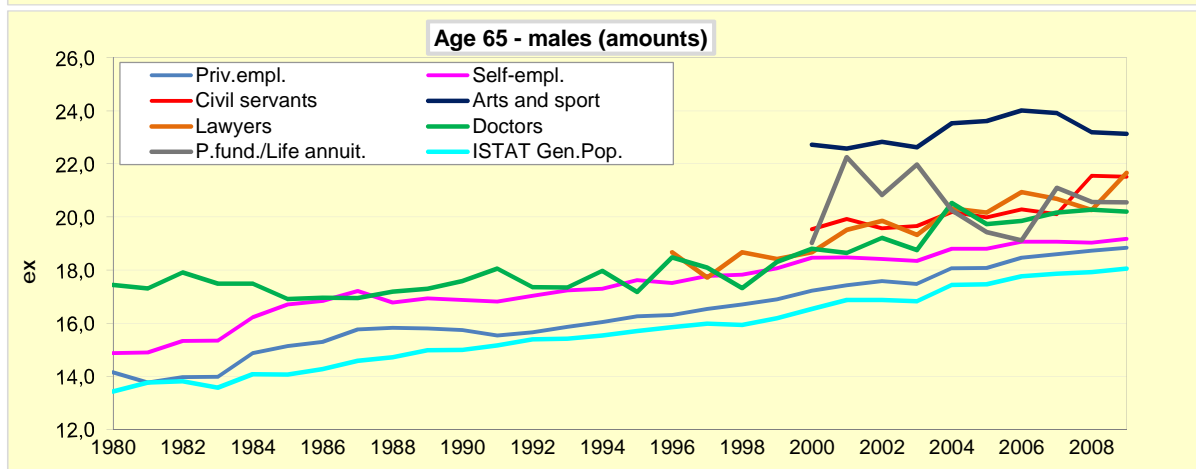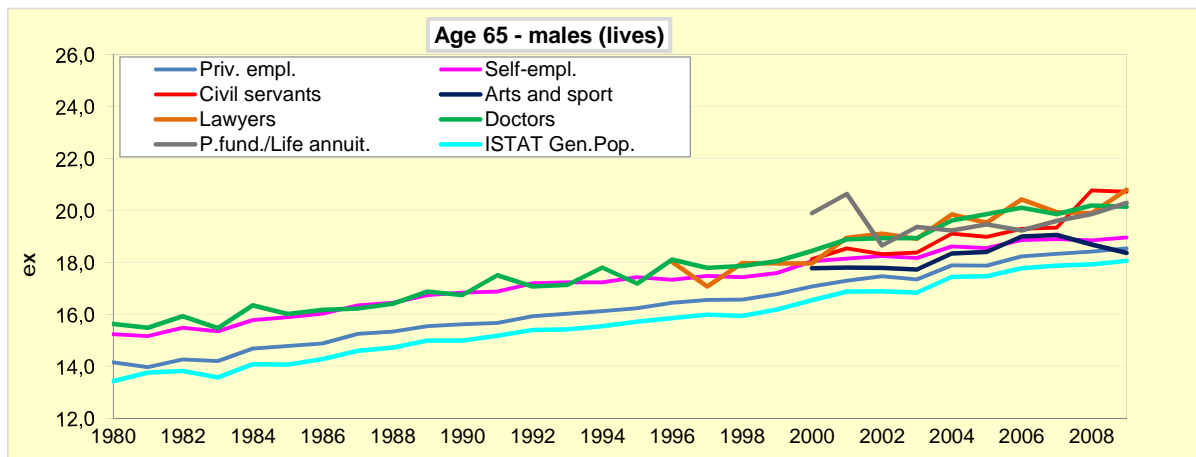
Life expectancy trend (absolute values)

Males

Life expectancy trend (absolute values)

Females
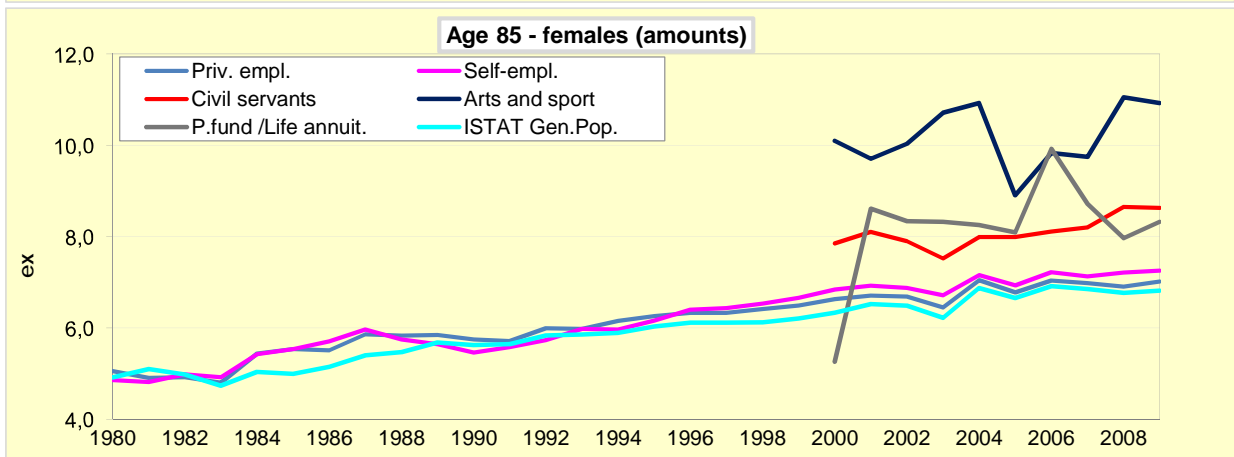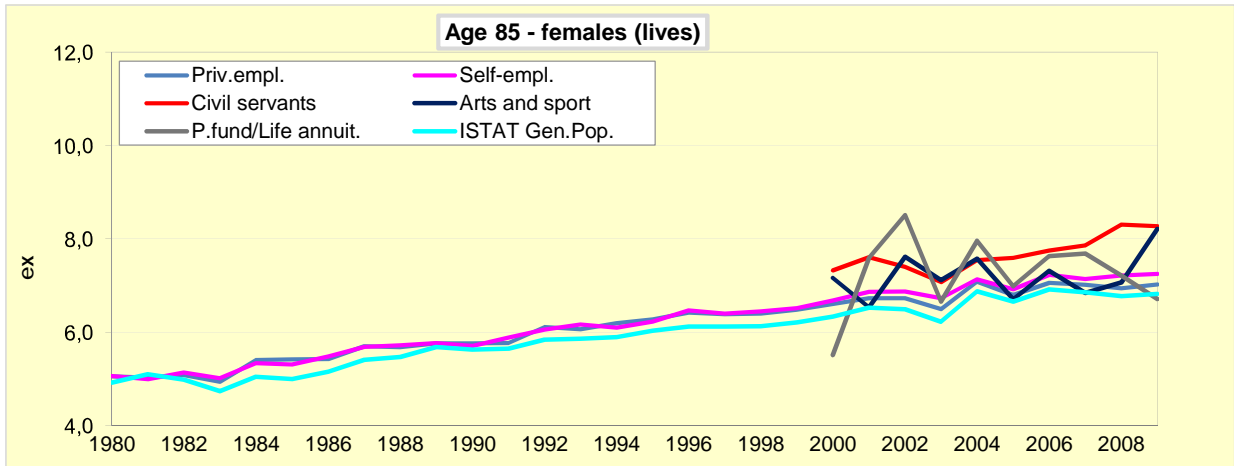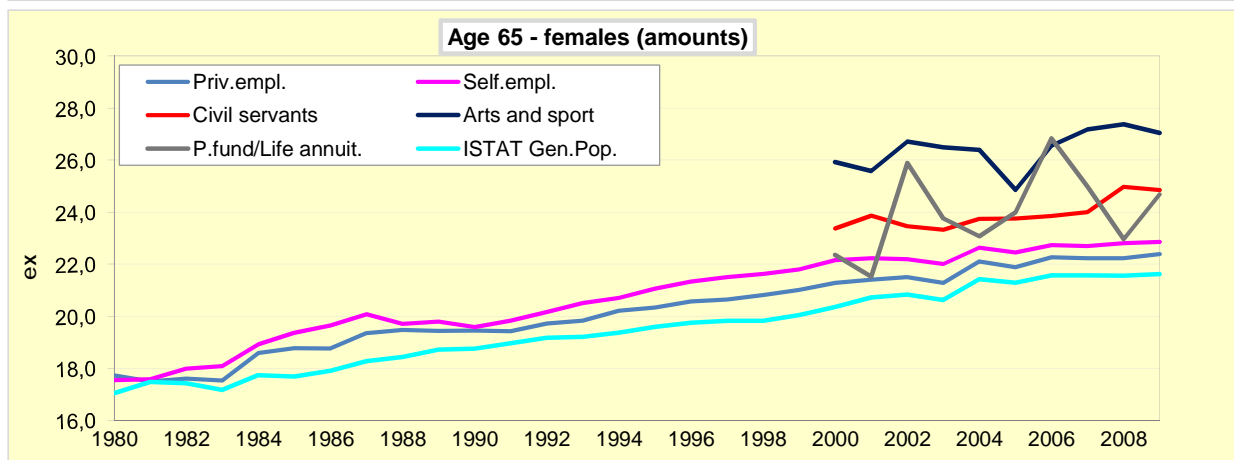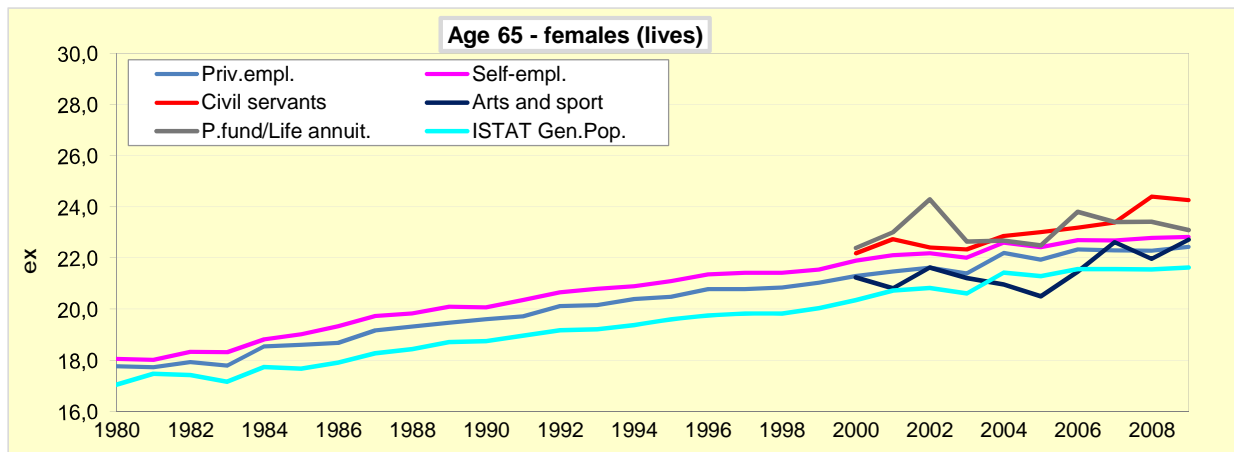
For lawyers and medical doctors females data are not reported due to scarce numerousness and irregular trends.

Ann. 23   Normal retirement pensioners and annuitants - Observation period

Other collectives vs. benchmark collectives - males (lives)

- Civil s. Lives / Priv.empl. Lives
- Arts and sport Lives / Priv.empl. Lives
- Lawyers Lives / Self empl. Lives
- Doctors Lives / Self empl. Lives
- P.fund. Life annuit. Lives / Total Lives

Other collectives vs. benchmark collectives - males (amounts)

- Priv.empl. Amounts / Priv.empl. Lives
- Self empl. Amounts / Self empl. Lives
- Civil s. Amounts / Priv.empl. Lives
- Arts and sport Amounts / Priv.empl. Lives
- Lawyers Amounts / Self empl. Lives
- Doctors Amounts / Self empl. Lives
- P.fund Life annuit. Amounts / Total lives

Other collectives vs. benchmark collectives - females (lives)

- Civil s.Lives / Priv.empl. Lives
- Arts and sport Lives / Priv.empl. Lives
- P.fund Life annuit. Lives / Total Lives

Other collectives vs. benchmark collectives - females (amounts)

- Priv.empl. Amounts / Priv.empl. Lives
- Self empl. Amounts / Self empl. Lives
- Civil s. Amounts / Priv.empl. Lives
- Arts and sport amounts / Priv.empl. Lives

Ann. 24   Widow's pensioners - Observation period
Life expectancy and comparison with the Italian general population
Civil servants, arts and sport, medical doctors - lives analysis

Pensioners and annuitants

Life expectancy per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					19,62	20,38	21,63	10%	1,5%
65					16,17	17,33	18,35	13%	1,9%
70					13,06	14,00	15,02	15%	2,2%
75					10,75	11,19	11,92	11%	1,5%
80					8,07	8,67	9,05	12%	1,7%
85					5,96	6,36	6,77	14%	1,9%

females

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					21,36	22,29	24,24	14%	1,9%
65					16,86	17,94	19,85	18%	2,5%
70					12,71	13,66	15,57	23%	3,2%
75					9,16	9,99	11,61	27%	3,8%
80					6,29	7,08	8,37	33%	4,7%
85					4,50	5,42	6,01	34%	4,8%

Italian general population

Life expectancy per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					20,81	21,43	22,10	7%	1,0%
65					16,88	17,46	18,05	8%	1,1%
70					13,29	13,75	14,31	9%	1,3%
75					10,15	10,47	10,86	10%	1,4%
80					7,51	7,70	7,93	11%	1,5%
85					5,28	5,43	5,61	13%	1,9%

females

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					25,21	25,69	26,04	5%	0,7%
65					20,83	21,29	21,62	5%	0,8%
70					16,66	17,06	17,38	6%	0,9%
75					12,77	13,11	13,38	7%	1,0%
80					9,37	9,58	9,80	8%	1,1%
85					6,49	6,65	6,82	10%	1,4%

Spread pensioners and annuitants vs. general population

pensioners and annuitants - General population

males

age	1980	1985	1990	1995	2002	2005	2009	Media
60					-6,1%	-5,1%	-2,2%	-4,6%
65					-4,4%	-0,8%	1,6%	-1,4%
70					-1,8%	1,8%	4,8%	1,3%
75					5,6%	6,4%	8,8%	6,1%
80					6,9%	11,2%	12,4%	8,7%
85					11,4%	14,6%	17,2%	12,6%

females

age	1980	1985	1990	1995	2002	2005	2009	Media
60					2,6%	3,9%	8,8%	5,0%
65					-0,1%	2,7%	9,0%	3,7%
70					-4,6%	-0,6%	8,1%	0,7%
75					-10,8%	-4,8%	6,4%	-3,9%
80					-19,4%	-8,7%	5,3%	-9,2%
85					-17,4%	-0,1%	6,7%	-5,7%

Ann. 25   **Widow's pensioners - Observation period**
Life expectancy and comparison with the Italian general population
INAIL (workers compensation) - lives analysis

Pensioners and annuitants

Life expectancy per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					18,84	16,09	12,73	-32%	-4,6%
65					15,81	15,11	11,70	-26%	-3,7%
70					13,20	14,19	10,63	-19%	-2,8%
75					10,64	12,09	9,11	-14%	-2,1%
80					8,51	9,89	6,86	-19%	-2,8%
85					6,18	7,72	4,56	-26%	-3,7%

females

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					22,72	24,12	24,69	9%	1,2%
65					18,78	20,55	20,84	11%	1,6%
70					14,91	17,18	16,84	13%	1,8%
75					11,33	13,49	12,95	14%	2,0%
80					8,31	9,97	9,49	14%	2,0%
85					5,83	6,91	6,50	11%	1,6%

Italian general population

Speranze di vita per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					20,81	21,43	22,10	6%	0,9%
65					16,88	17,46	18,05	7%	1,0%
70					13,29	13,75	14,31	8%	1,1%
75					10,15	10,47	10,86	7%	1,0%
80					7,51	7,70	7,93	6%	0,8%
85					5,28	5,43	5,61	6%	0,9%

females

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					25,21	25,69	26,04	3%	0,5%
65					20,83	21,29	21,62	4%	0,5%
70					16,66	17,06	17,38	4%	0,6%
75					12,77	13,11	13,38	5%	0,7%
80					9,37	9,58	9,80	5%	0,7%
85					6,49	6,65	6,82	5%	0,7%

Spread pensioners and annuitants vs. general population

pensioners and annuitants - General population

males

age	1980	1985	1990	1995	2002	2005	2009	Media
60					-10,5%	-33,2%	-73,6%	-39,1%
65					-6,7%	-15,6%	-54,3%	-25,5%
70					-0,7%	3,1%	-34,6%	-10,7%
75					4,6%	13,4%	-19,3%	-0,5%
80					11,7%	22,2%	-15,6%	6,1%
85					14,5%	29,7%	-22,9%	7,1%

females

age	1980	1985	1990	1995	2002	2005	2009	Media
60					8,4%	11,2%	10,5%	10,0%
65					10,1%	15,0%	13,4%	12,8%
70					10,9%	20,0%	15,0%	15,3%
75					10,4%	22,4%	16,1%	16,3%
80					9,6%	22,8%	16,5%	16,3%
85					9,5%	21,5%	13,7%	14,9%

Disability pensioners - Observation period
Life expectancy and comparison with the Italian general population
Civil servants (2008-2009), arts and sport, medical doctors (2002-2009) - lives analysis

Pensioners and annuitants

Life expectancy per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					13,87	12,81	20,34	47%	6,7%
65					12,46	13,02	17,87	43%	6,2%
70					10,60	13,09	14,90	41%	5,8%
75					8,61	10,79	11,96	39%	5,6%
80					6,85	10,26	9,22	35%	5,0%
85					4,60	9,81	6,93	50%	7,2%

females

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					20,07	21,94	26,19	30%	4,4%
65					17,31	21,69	22,60	31%	4,4%
70					14,87	16,69	18,73	26%	3,7%
75					11,39	13,92	14,90	31%	4,4%
80					8,21	10,79	11,45	39%	5,6%
85					6,31	8,23	8,44	34%	4,8%

Italian general population

Speranze di vita per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					20,81	21,43	22,10	6%	0,9%
65					16,88	17,46	18,05	7%	1,0%
70					13,29	13,75	14,31	8%	1,1%
75					10,15	10,47	10,86	7%	1,0%
80					7,51	7,70	7,93	6%	0,8%
85					5,28	5,43	5,61	6%	0,9%

females

age	1980	1985	1990	1995	2002	2005	2009	change	
								Total	annual average
60					25,21	25,69	26,04	3%	0,5%
65					20,83	21,29	21,62	4%	0,5%
70					16,66	17,06	17,38	4%	0,6%
75					12,77	13,11	13,38	5%	0,7%
80					9,37	9,58	9,80	5%	0,7%
85					6,49	6,65	6,82	5%	0,7%

Spread pensioners and annuitants vs. general population

pensioners and annuitants - General population

males

age	1980	1985	1990	1995	2002	2005	2009	Media
60					-50,0%	-67,2%	-8,7%	-42,0%
65					-35,4%	-34,1%	-1,0%	-23,5%
70					-25,4%	-5,0%	4,0%	-8,8%
75					-18,0%	3,0%	9,2%	-1,9%
80					-9,7%	25,0%	14,1%	9,8%
85					-14,7%	44,7%	19,1%	16,4%

females

age	1980	1985	1990	1995	2002	2005	2009	Media
60					-3,7%	2,3%	15,6%	4,8%
65					2,5%	19,5%	20,1%	14,0%
70					10,7%	17,6%	23,6%	17,3%
75					10,9%	24,8%	27,1%	20,9%
80					8,6%	28,6%	30,7%	22,6%
85					16,3%	34,0%	33,6%	28,0%

Ann. 27   **Disability pensioners - Observation period**
Life expectancy and comparison with the Italian general population
INAIL (workers compensation) - lives analysis

Pensioners and annuitants

Life expectancy per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change Total	change annual average
60					16,83	15,99	16,44	-2%	-0,3%
65					14,70	13,53	14,39	-2%	-0,3%
70					12,40	11,09	11,91	-4%	-0,6%
75					9,85	8,46	9,21	-6%	-0,9%
80					7,38	6,07	6,51	-12%	-1,7%
85					5,41	3,99	4,26	-21%	-3,0%

age	1980	1985	1990	1995	2002	2005	2009	change Total	change annual average
60					15,87	16,99	17,53	10%	1,5%
65					14,94	15,71	16,91	13%	1,9%
70					13,89	13,91	15,41	11%	1,6%
75					11,92	11,26	12,53	5%	0,7%
80					9,24	8,22	9,18	-1%	-0,1%
85					6,75	5,40	6,15	-9%	-1,3%

Italian general population

Speranze di vita per calendar year at certain ages

males

age	1980	1985	1990	1995	2002	2005	2009	change Total	change annual average
60					20,81	21,43	22,10	6%	0,9%
65					16,88	17,46	18,05	7%	1,0%
70					13,29	13,75	14,31	8%	1,1%
75					10,15	10,47	10,86	7%	1,0%
80					7,51	7,70	7,93	6%	0,8%
85					5,28	5,43	5,61	6%	0,9%

females

age	1980	1985	1990	1995	2002	2005	2009	change Total	change annual average
60					25,21	25,69	26,04	3%	0,5%
65					20,83	21,29	21,62	4%	0,5%
70					16,66	17,06	17,38	4%	0,6%
75					12,77	13,11	13,38	5%	0,7%
80					9,37	9,58	9,80	5%	0,7%
85					6,49	6,65	6,82	5%	0,7%

Spread pensioners and annuitants vs. general population

pensioners and annuitants - General population

males

age	1980	1985	1990	1995	2002	2005	2009	Media
60					-23,7%	-34,0%	-34,4%	-30,7%
65					-14,9%	-29,1%	-25,4%	-23,1%
70					-7,2%	-23,9%	-20,1%	-17,1%
75					-3,1%	-23,8%	-17,9%	-14,9%
80					-1,8%	-26,7%	-21,7%	-16,7%
85					2,4%	-36,0%	-31,6%	-21,7%

females

age	1980	1985	1990	1995	2002	2005	2009	Media
60					-31,1%	-26,1%	-26,1%	-27,8%
65					-13,0%	-11,1%	-6,8%	-10,3%
70					4,3%	1,2%	7,2%	4,2%
75					14,8%	7,0%	13,3%	11,7%
80					18,7%	6,4%	13,6%	12,9%
85					21,7%	-0,5%	8,8%	10,0%

Ann. 28   **Disability and widow's pensioners - Observation period**

Mortality rates at certain ages (absolute values)

Widow's: INAIL (workers compensation), civil servants, arts and sport, medical doctors - Disability: civil servants (2009 only), arts and sport, lawyers and medical doctors - lives analysis
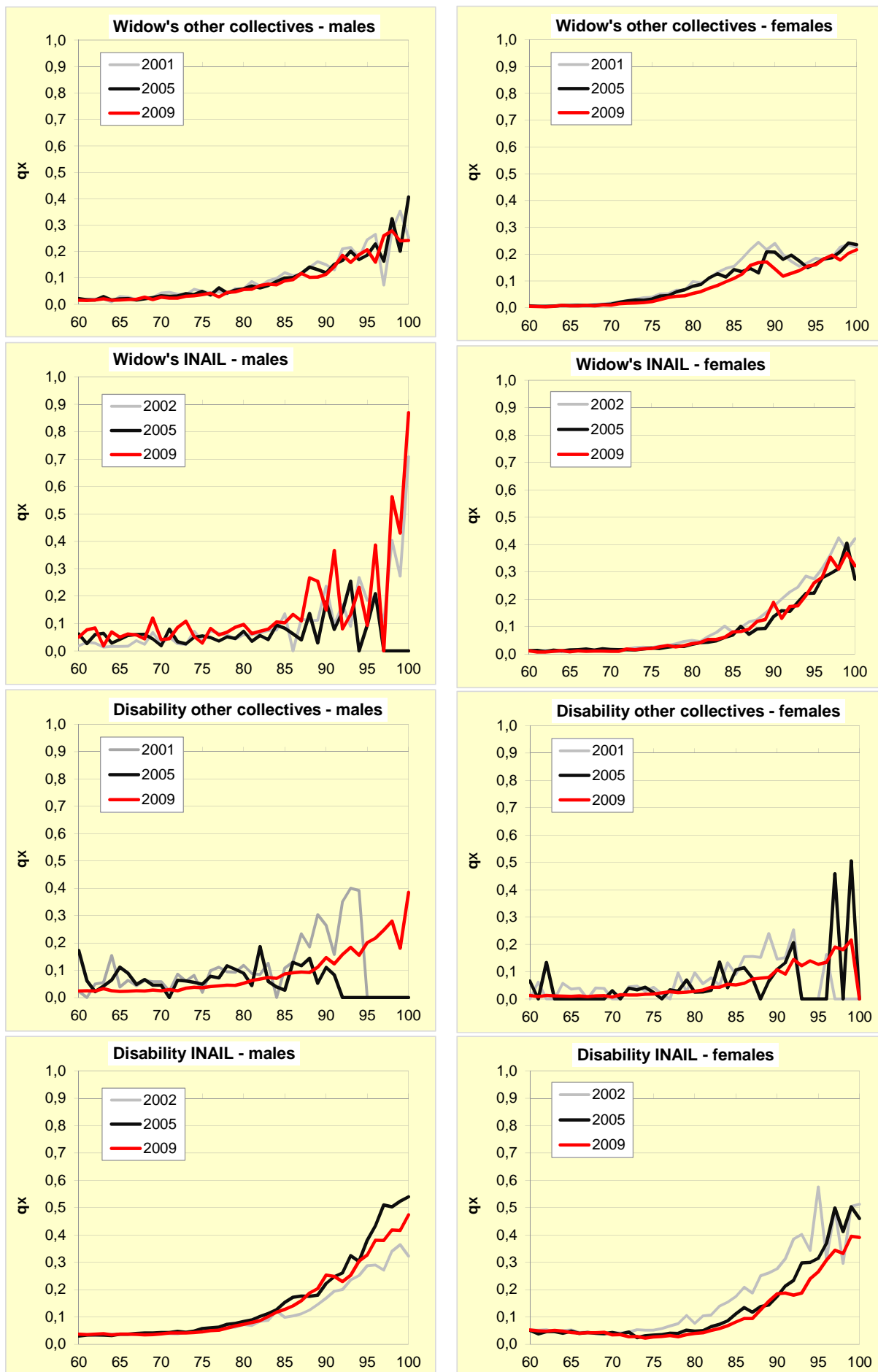
Ann. 29   **Disability and widow's pensioners - Observation period**
Mortality rates trend (relative terms - base 1 = 1st year of observation)
Widow's: INAIL (workers compensation), civil servants, arts and sport, medical doctors - Disability: civil servants
(2008-2009 only), arts and sport, lawyers and medical doctors - lives analysis
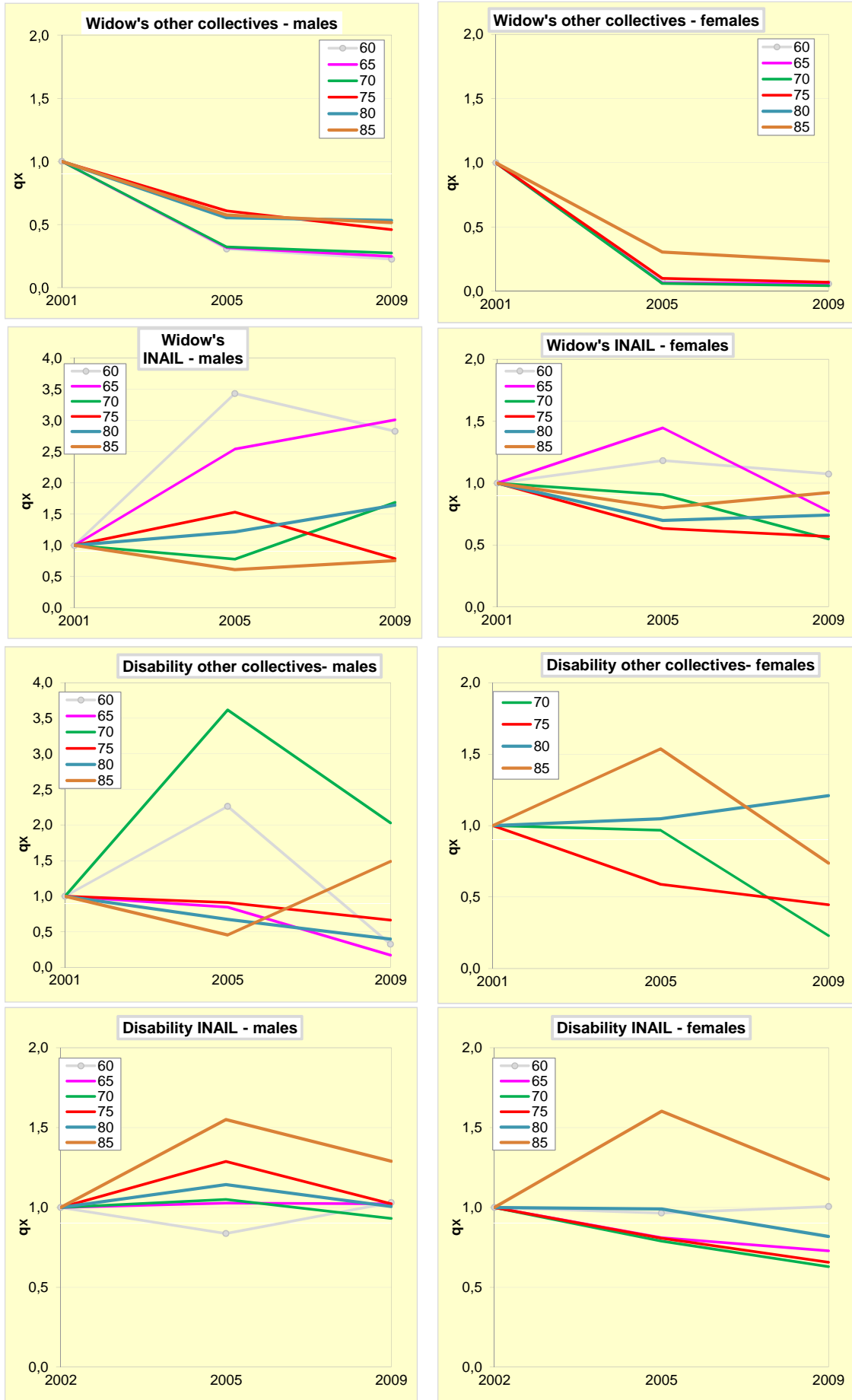
Ann. 30   **Disability and widow's pensioners - Observation period**

Mortality rates at certain ages (absolute values)

Widow's: INAIL (workers compensation), civil servants, arts and sport, medical doctors - Disability: civil servants (2008-2009 only), arts and sport, lawyers and medical doctors - lives analysis
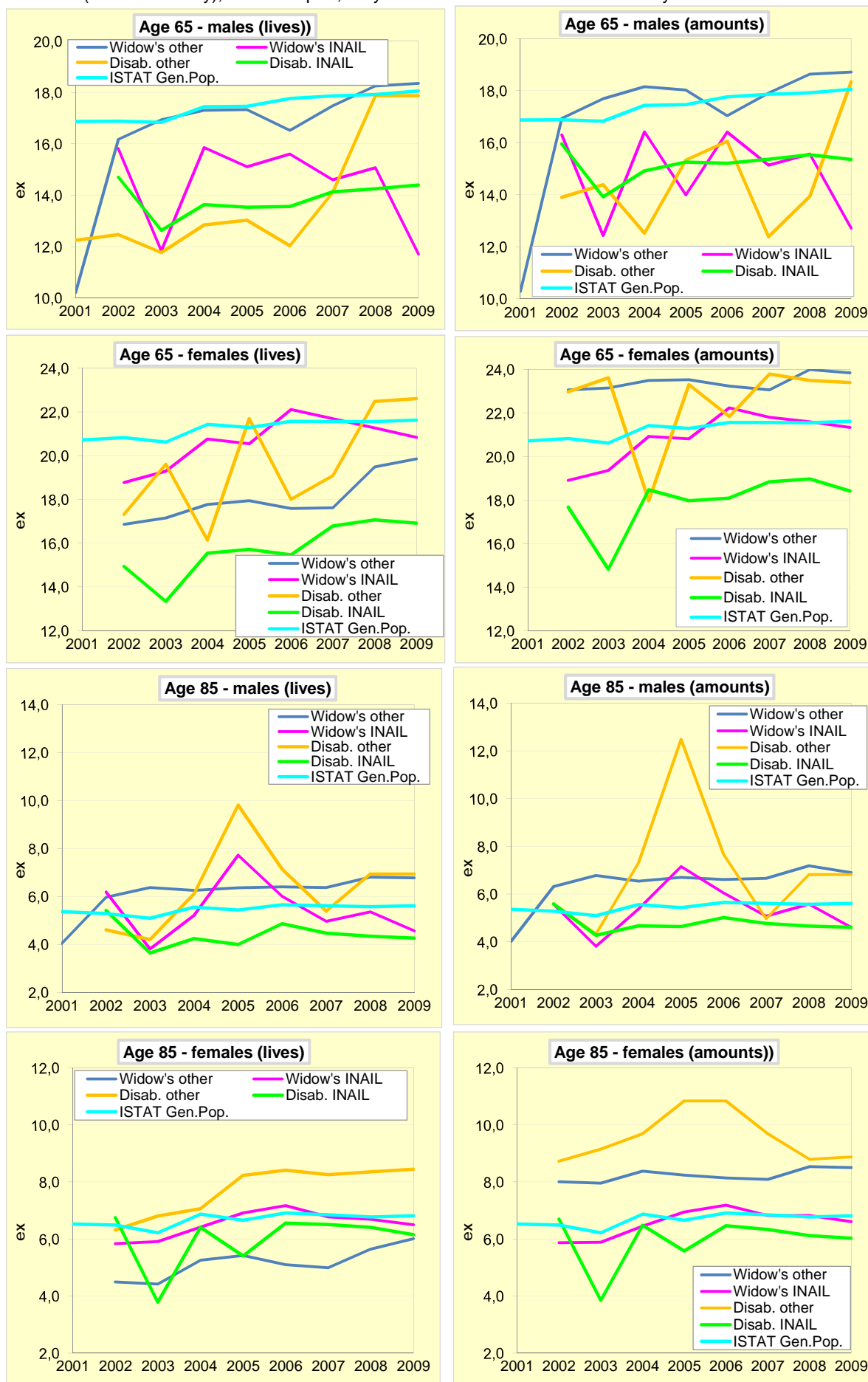
Ann. 31   **Disability and widow's pensioners - Observation period**
Average mortality spread (selection) of certain collective versus benchmark collective
Widow's: INAIL (workers compensation), civil servants, arts and sport, medical doctors - Disability: civil servants
(2008-2009 only), arts and sport, lawyers and medical doctors - lives analysis

Widow's vs. total normal ret. pensioners - males

Legend:
- INAIL lives
- INAIL amounts
- Other collectives (lives)
- Other collectives (amounts)

Widow's vs. total normal ret. pensioners - females

Legend:
- INAIL lives
- INAIL amounts
- Other collectives (lives)
- Other collectives (amounts)

Disability vs. total normal ret. pensioners - males

Legend:
- INAIL lives
- INAIL amounts
- Other collectives (lives)
- Othe collectives (amounts)

Disability vs. total normal ret. pensioners - females

Legend:
- INAIL lives
- INAIL amounts
- Other collectives (lives)
- Other collectives (amounts)

Ann. 32   **Normal retirement, disability and widow's pensioners - Observation period**
Average mortality spread (selection) of certain collective versus general population

All pensioners
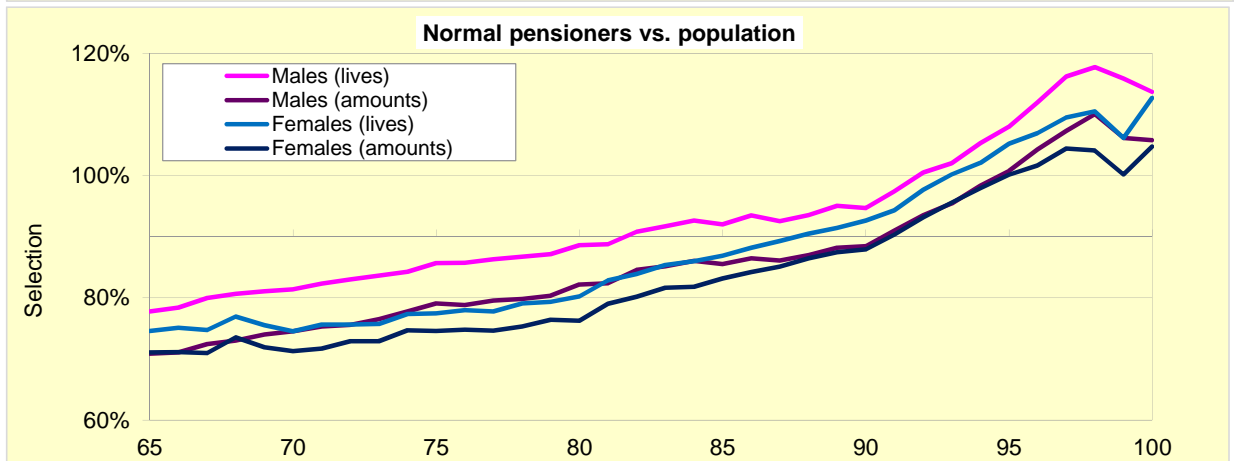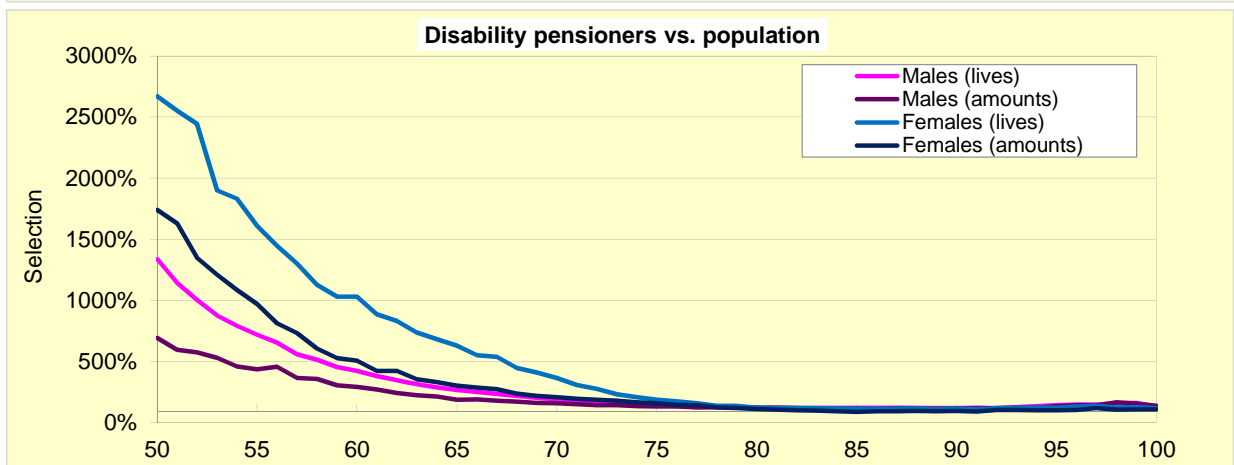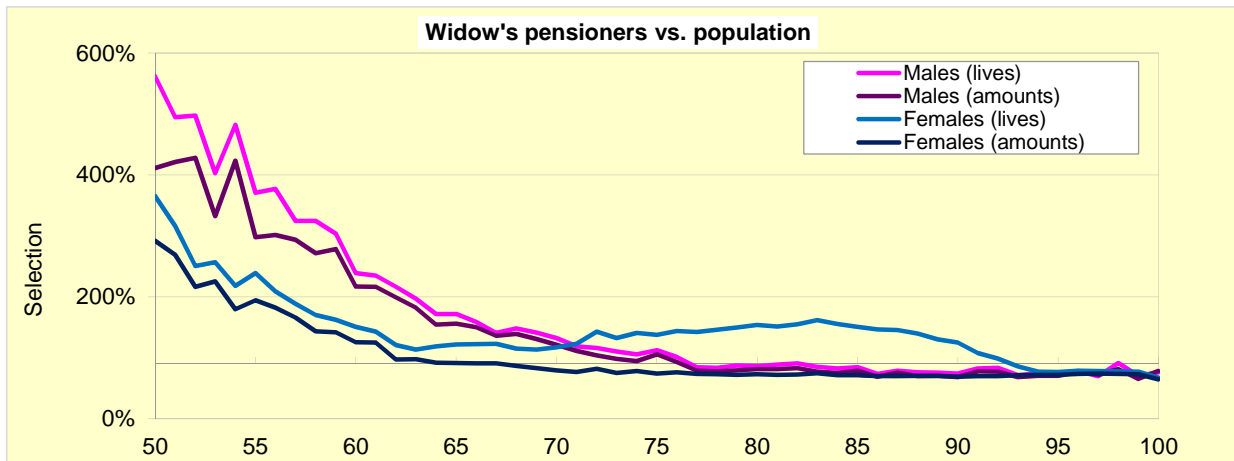
Life expectancy and comparison with the Italian general population - stochastic models - mean scenario
private employees - males

Pensioners and annuitants

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	22,63	23,38	24,12	24,84	25,53	26,20	26,84	18,6%	0,62%
65	18,50	19,19	19,87	20,53	21,17	21,79	22,39	21,0%	0,70%
70	14,63	15,23	15,82	16,40	16,96	17,51	18,04	23,3%	0,78%
75	11,16	11,65	12,13	12,61	13,08	13,54	13,98	25,3%	0,84%
80	8,17	8,53	8,89	9,24	9,60	9,95	10,30	26,1%	0,87%
85	5,72	5,95	6,18	6,41	6,65	6,88	7,12	24,5%	0,82%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	22,82	23,76	24,64	25,42	26,10	26,71	27,30	19,6%	0,65%
65	18,72	19,66	20,54	21,31	21,99	22,58	23,15	23,7%	0,79%
70	14,81	15,68	16,51	17,24	17,86	18,41	18,92	27,8%	0,93%
75	11,23	11,98	12,72	13,37	13,91	14,38	14,83	32,0%	1,07%
80	8,15	8,67	9,26	9,80	10,24	10,62	10,97	34,6%	1,15%
85	5,69	5,95	6,30	6,67	6,98	7,24	7,49	31,6%	1,05%

projections ISTAT Italian general population 2011-2065

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	annual average
60	22,33	23,08	23,76	24,40	25,00	25,56	26,08	16,8%	0,56%
65	18,28	18,93	19,55	20,13	20,67	21,18	21,66	18,5%	0,62%
70	14,55	15,07	15,60	16,10	16,58	17,02	17,45	19,9%	0,66%
75	11,25	11,59	12,03	12,45	12,84	13,21	13,57	20,6%	0,69%
80	8,39	8,57	8,91	9,24	9,55	9,85	10,13	20,8%	0,69%
85	6,03	6,12	6,36	6,60	6,83	7,05	7,26	20,4%	0,68%

(*) Proiezione 2007-2051

Spread pensioners and annuitants vs. general population

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	1,3%	1,3%	1,5%	1,7%	2,0%	2,4%	2,8%	1,9%
65	1,2%	1,3%	1,6%	2,0%	2,4%	2,8%	3,3%	2,1%
70	0,5%	1,1%	1,4%	1,8%	2,3%	2,8%	3,3%	1,9%
75	-0,8%	0,5%	0,9%	1,3%	1,8%	2,4%	3,0%	1,3%
80	-2,7%	-0,6%	-0,3%	0,0%	0,5%	1,0%	1,6%	-0,1%
85	-5,4%	-2,9%	-2,9%	-2,9%	-2,7%	-2,4%	-2,0%	-3,0%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	2,2%	2,9%	3,6%	4,0%	4,2%	4,3%	4,4%	3,6%
65	2,4%	3,7%	4,8%	5,6%	6,0%	6,2%	6,5%	5,0%
70	1,7%	3,9%	5,5%	6,6%	7,2%	7,5%	7,8%	5,7%
75	-0,1%	3,3%	5,4%	6,9%	7,7%	8,1%	8,5%	5,7%
80	-2,9%	1,1%	3,8%	5,7%	6,7%	7,3%	7,7%	4,2%
85	-5,8%	-2,7%	-0,9%	1,1%	2,2%	2,7%	3,1%	0,0%

Ann. 34   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - mean scenario
private employees - females

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Pensioners and annuitants

</div>

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	26,96	27,71	28,45	29,17	29,85	30,52	31,15	15,6%	0,52%
65	22,41	23,14	23,84	24,53	25,18	25,82	26,43	17,9%	0,60%
70	18,05	18,73	19,38	20,03	20,64	21,23	21,80	20,8%	0,69%
75	13,93	14,53	15,11	15,69	16,24	16,78	17,29	24,1%	0,80%
80	10,20	10,69	11,17	11,64	12,11	12,56	13,00	27,5%	0,92%
85	7,07	7,42	7,77	8,12	8,46	8,80	9,14	29,3%	0,98%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	27,10	27,87	28,56	29,18	29,78	30,34	30,93	14,1%	0,47%
65	22,58	23,32	23,97	24,57	25,14	25,67	26,24	16,2%	0,54%
70	18,21	18,95	19,57	20,12	20,65	21,15	21,68	19,1%	0,64%
75	14,05	14,74	15,36	15,86	16,32	16,77	17,26	22,8%	0,76%
80	10,26	10,82	11,37	11,86	12,25	12,61	13,02	26,9%	0,90%
85	7,09	7,47	7,87	8,27	8,61	8,87	9,18	29,5%	0,98%

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projections ISTAT Italian general population 2011-2065

</div>

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	26,53	27,06	27,77	28,44	29,06	29,64	30,18	13,8%	0,46%
65	22,07	22,57	23,25	23,88	24,47	25,03	25,54	15,7%	0,52%
70	17,80	18,25	18,87	19,46	20,01	20,52	21,00	18,0%	0,60%
75	13,79	14,16	14,72	15,24	15,73	16,19	16,63	20,6%	0,69%
80	10,18	10,46	10,92	11,36	11,77	12,16	12,53	23,1%	0,77%
85	7,17	7,37	7,71	8,06	8,39	8,70	9,00	25,4%	0,85%

(*) ISTAT Projection 2007-2051

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Spread pensioners and annuitants vs. general population

</div>

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	1,6%	2,4%	2,4%	2,5%	2,7%	2,9%	3,1%	2,5%
65	1,5%	2,5%	2,5%	2,7%	2,8%	3,1%	3,4%	2,6%
70	1,4%	2,6%	2,6%	2,8%	3,1%	3,4%	3,7%	2,8%
75	1,0%	2,5%	2,6%	2,9%	3,1%	3,5%	3,9%	2,8%
80	0,2%	2,1%	2,3%	2,5%	2,8%	3,2%	3,6%	2,4%
85	-1,5%	0,7%	0,7%	0,7%	0,9%	1,2%	1,6%	0,6%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	2,1%	2,9%	2,8%	2,5%	2,4%	2,3%	2,4%	2,5%
65	2,2%	3,2%	3,0%	2,8%	2,6%	2,5%	2,7%	2,7%
70	2,3%	3,7%	3,6%	3,3%	3,1%	3,0%	3,1%	3,1%
75	1,9%	3,9%	4,2%	3,9%	3,6%	3,4%	3,6%	3,5%
80	0,8%	3,4%	4,0%	4,2%	3,9%	3,6%	3,8%	3,4%
85	-1,2%	1,4%	2,0%	2,6%	2,6%	2,0%	2,0%	1,6%

Life expectancy and comparison with the Italian general population - stochastic models - high scenario
private employees - males

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	22,63	23,95	24,90	25,75	26,55	27,30	28,02	23,9%	0,80%
65	18,50	19,71	20,59	21,37	22,12	22,82	23,49	27,0%	0,90%
70	14,63	15,68	16,45	17,14	17,79	18,42	19,03	30,0%	1,00%
75	11,16	12,02	12,65	13,22	13,78	14,30	14,82	32,8%	1,09%
80	8,17	8,80	9,28	9,71	10,13	10,54	10,95	34,1%	1,14%
85	5,72	6,13	6,43	6,72	7,01	7,29	7,57	32,3%	1,08%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	23,36	24,93	26,29	27,50	28,62	29,65	30,49	30,5%	1,02%
65	18,97	20,45	21,75	22,91	23,98	24,97	25,77	35,8%	1,19%
70	15,04	16,21	17,38	18,45	19,45	20,37	21,11	40,4%	1,35%
75	11,42	12,42	13,31	14,22	15,11	15,94	16,60	45,3%	1,51%
80	8,29	9,01	9,72	10,32	11,03	11,73	12,28	48,0%	1,60%
85	5,78	6,17	6,60	7,01	7,36	7,86	8,24	42,5%	1,42%

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	22,71	23,53	24,44	25,26	26,01	26,70	27,33	20,3%	0,68%
65	18,61	19,33	20,15	20,90	21,58	22,22	22,80	22,5%	0,75%
70	14,84	15,39	16,11	16,77	17,37	17,94	18,47	24,4%	0,81%
75	11,48	11,84	12,44	12,99	13,50	13,98	14,43	25,7%	0,86%
80	8,56	8,75	9,22	9,65	10,06	10,45	10,82	26,4%	0,88%
85	6,14	6,22	6,56	6,88	7,19	7,49	7,77	26,5%	0,88%

(*) ISTAT Projection 2007-2051

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	-0,4%	1,8%	1,8%	1,9%	2,0%	2,2%	2,5%	1,7%
65	-0,6%	2,0%	2,1%	2,2%	2,4%	2,6%	2,9%	2,0%
70	-1,4%	1,8%	2,0%	2,1%	2,4%	2,6%	2,9%	1,8%
75	-2,8%	1,5%	1,7%	1,8%	2,0%	2,3%	2,6%	1,3%
80	-4,8%	0,6%	0,6%	0,6%	0,7%	0,9%	1,2%	0,0%
85	-7,4%	-1,5%	-1,9%	-2,4%	-2,6%	-2,7%	-2,6%	-3,0%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	2,8%	5,6%	7,0%	8,1%	9,1%	10,0%	10,4%	7,6%
65	1,9%	5,5%	7,3%	8,8%	10,0%	11,0%	11,5%	8,0%
70	1,3%	5,0%	7,3%	9,1%	10,7%	11,9%	12,5%	8,3%
75	-0,5%	4,7%	6,5%	8,7%	10,7%	12,3%	13,1%	7,9%
80	-3,2%	2,9%	5,1%	6,5%	8,8%	10,9%	11,9%	6,1%
85	-6,2%	-0,7%	0,6%	1,9%	2,4%	4,7%	5,8%	1,2%

Ann. 36   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - high scenario
private employees - females

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	26,96	28,53	29,57	30,46	31,29	32,06	32,79	21,7%	0,72%
65	22,41	23,92	24,91	25,76	26,56	27,30	28,01	25,0%	0,83%
70	18,05	19,45	20,38	21,18	21,93	22,63	23,29	29,0%	0,97%
75	13,93	15,18	16,00	16,73	17,41	18,04	18,66	33,9%	1,13%
80	10,20	11,22	11,91	12,51	13,09	13,64	14,18	39,0%	1,30%
85	7,07	7,80	8,31	8,76	9,20	9,63	10,05	42,2%	1,41%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,49	28,79	29,79	30,65	31,42	32,13	32,83	19,4%	0,65%
65	22,95	24,19	25,15	25,98	26,72	27,40	28,07	22,3%	0,74%
70	18,56	19,75	20,66	21,43	22,12	22,76	23,39	26,0%	0,87%
75	14,36	15,46	16,32	17,01	17,63	18,21	18,79	30,8%	1,03%
80	10,52	11,43	12,17	12,81	13,33	13,81	14,32	36,1%	1,20%
85	7,28	7,91	8,46	8,98	9,42	9,77	10,17	39,7%	1,32%

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	annual average
60	26,90	27,61	28,61	29,50	30,32	31,06	31,75	18,0%	0,60%
65	22,42	23,09	24,04	24,89	25,67	26,38	27,04	20,6%	0,69%
70	18,11	18,72	19,60	20,39	21,12	21,79	22,41	23,7%	0,79%
75	14,06	14,57	15,35	16,07	16,73	17,34	17,91	27,3%	0,91%
80	10,40	10,77	11,43	12,04	12,61	13,14	13,64	31,2%	1,04%
85	7,34	7,59	8,10	8,58	9,04	9,48	9,89	34,9%	1,16%

(*) ISTAT Projection 2007-2051

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	0,2%	3,3%	3,2%	3,1%	3,1%	3,1%	3,2%	2,7%
65	0,0%	3,5%	3,5%	3,4%	3,4%	3,4%	3,5%	2,9%
70	-0,3%	3,8%	3,8%	3,7%	3,7%	3,7%	3,8%	3,2%
75	-0,9%	4,0%	4,1%	3,9%	3,9%	3,9%	4,0%	3,3%
80	-2,0%	4,0%	4,0%	3,8%	3,7%	3,7%	3,8%	3,0%
85	-3,8%	2,8%	2,5%	2,0%	1,7%	1,6%	1,6%	1,2%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	2,2%	4,1%	4,0%	3,7%	3,5%	3,3%	3,3%	3,4%
65	2,3%	4,6%	4,4%	4,2%	3,9%	3,7%	3,7%	3,8%
70	2,4%	5,2%	5,1%	4,8%	4,5%	4,3%	4,2%	4,4%
75	2,1%	5,8%	5,9%	5,5%	5,1%	4,8%	4,7%	4,8%
80	1,1%	5,7%	6,1%	6,0%	5,4%	4,9%	4,7%	4,8%
85	-0,8%	4,1%	4,3%	4,4%	4,0%	3,0%	2,7%	3,1%

Ann. 37   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - low scenario
private employees - males

life expectancy per calendar year at certain ages - Lee-Carter model

| age | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | change | |
								Total	annual average
60	22,63	22,82	23,36	23,92	24,50	25,09	25,65	13,3%	0,44%
65	18,50	18,68	19,17	19,68	20,22	20,76	21,28	15,0%	0,50%
70	14,64	14,79	15,21	15,66	16,12	16,60	17,05	16,5%	0,55%
75	11,17	11,29	11,64	12,00	12,38	12,78	13,15	17,8%	0,59%
80	8,17	8,26	8,52	8,79	9,07	9,37	9,65	18,1%	0,60%
85	5,73	5,78	5,94	6,12	6,30	6,49	6,67	16,6%	0,55%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

| age | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | change | |
								Total	annual average
60	22,23	22,45	22,73	22,95	23,09	23,21	23,44	5,5%	0,18%
65	18,48	18,84	19,23	19,53	19,72	19,91	20,17	9,2%	0,31%
70	14,59	15,17	15,62	15,93	16,10	16,26	16,49	13,0%	0,43%
75	11,05	11,55	12,14	12,47	12,61	12,71	12,89	16,6%	0,55%
80	8,02	8,35	8,83	9,27	9,40	9,45	9,57	19,4%	0,65%
85	5,62	5,76	6,02	6,32	6,57	6,62	6,71	19,4%	0,65%

life expectancy per calendar year at certain ages

| age | 2010 (*) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | change | |
								Total	annual average
60	21,94	22,62	23,06	23,51	23,95	24,37	24,76	12,9%	0,43%
65	17,93	18,53	18,93	19,33	19,72	20,10	20,46	14,1%	0,47%
70	14,27	14,74	15,08	15,42	15,76	16,08	16,40	14,9%	0,50%
75	11,02	11,33	11,61	11,90	12,17	12,44	12,69	15,2%	0,51%
80	8,22	8,40	8,61	8,83	9,04	9,25	9,44	14,9%	0,50%
85	5,93	6,01	6,16	6,32	6,47	6,62	6,76	14,1%	0,47%

(*) ISTAT Projection 2007-2051

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	3,1%	0,9%	1,3%	1,7%	2,2%	2,9%	3,4%	2,2%
65	3,1%	0,8%	1,3%	1,8%	2,5%	3,2%	3,9%	2,4%
70	2,5%	0,3%	0,9%	1,5%	2,3%	3,1%	3,8%	2,1%
75	1,3%	-0,4%	0,2%	0,9%	1,7%	2,7%	3,5%	1,4%
80	-0,6%	-1,6%	-1,1%	-0,5%	0,3%	1,3%	2,1%	0,0%
85	-3,5%	-4,0%	-3,6%	-3,3%	-2,7%	-2,0%	-1,3%	-2,9%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	1,3%	-0,7%	-1,4%	-2,5%	-3,7%	-5,0%	-5,6%	-2,5%
65	2,9%	1,6%	1,6%	1,0%	0,0%	-1,0%	-1,4%	0,7%
70	2,2%	2,9%	3,5%	3,2%	2,2%	1,1%	0,6%	2,2%
75	0,3%	1,9%	4,3%	4,6%	3,5%	2,2%	1,5%	2,6%
80	-2,6%	-0,6%	2,4%	4,8%	3,8%	2,1%	1,3%	1,6%
85	-5,4%	-4,3%	-2,3%	0,1%	1,5%	0,0%	-0,7%	-1,6%

Ann. 38   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - low scenario
private employees - females

Pensioners and annuitants

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	26,96	26,90	27,36	27,86	28,40	28,96	29,48	9,4%	0,31%
65	22,41	22,37	22,80	23,28	23,80	24,33	24,83	10,8%	0,36%
70	18,05	18,01	18,41	18,86	19,34	19,84	20,30	12,5%	0,42%
75	13,93	13,89	14,25	14,64	15,07	15,52	15,94	14,4%	0,48%
80	10,20	10,17	10,46	10,78	11,13	11,50	11,85	16,2%	0,54%
85	7,07	7,05	7,25	7,48	7,74	8,01	8,26	16,9%	0,56%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	26,71	26,96	27,32	27,70	28,10	28,51	28,98	8,5%	0,28%
65	22,21	22,45	22,79	23,15	23,53	23,91	24,36	9,7%	0,32%
70	17,87	18,15	18,48	18,81	19,16	19,52	19,93	11,6%	0,39%
75	13,74	14,03	14,40	14,71	15,01	15,33	15,71	14,3%	0,48%
80	10,01	10,23	10,58	10,93	11,18	11,43	11,74	17,3%	0,58%
85	6,91	7,04	7,29	7,58	7,84	8,00	8,24	19,2%	0,64%

projections ISTAT Italian general population 2011-2065

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	26,16	26,49	26,90	27,33	27,74	28,14	28,52	9,0%	0,30%
65	21,72	22,04	22,43	22,83	23,22	23,60	23,96	10,3%	0,34%
70	17,48	17,77	18,12	18,49	18,85	19,20	19,53	11,7%	0,39%
75	13,51	13,75	14,07	14,39	14,71	15,01	15,30	13,2%	0,44%
80	9,97	10,14	10,40	10,66	10,93	11,18	11,42	14,6%	0,49%
85	7,02	7,15	7,33	7,54	7,74	7,94	8,12	15,6%	0,52%

(*) ISTAT Projection 2007-2051

Spread pensioners and annuitants vs. general population

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	3,0%	1,5%	1,7%	1,9%	2,3%	2,8%	3,3%	2,4%
65	3,1%	1,4%	1,6%	1,9%	2,4%	3,0%	3,5%	2,4%
70	3,2%	1,3%	1,6%	1,9%	2,5%	3,2%	3,8%	2,5%
75	3,0%	1,0%	1,3%	1,7%	2,4%	3,3%	4,0%	2,4%
80	2,3%	0,2%	0,6%	1,1%	1,9%	2,8%	3,6%	1,8%
85	0,7%	-1,4%	-1,1%	-0,7%	0,0%	0,9%	1,7%	0,0%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	2,1%	1,7%	1,5%	1,4%	1,3%	1,3%	1,6%	1,6%
65	2,2%	1,8%	1,6%	1,4%	1,3%	1,3%	1,7%	1,6%
70	2,2%	2,1%	1,9%	1,7%	1,6%	1,6%	2,0%	1,9%
75	1,7%	1,9%	2,3%	2,2%	2,0%	2,1%	2,6%	2,1%
80	0,4%	0,9%	1,8%	2,4%	2,3%	2,2%	2,8%	1,8%
85	-1,6%	-1,5%	-0,6%	0,6%	1,2%	0,9%	1,4%	0,0%

Ann. 39   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - mean scenario
self-employed - males

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60									
65	18,93	19,55	20,18	20,79	21,39	21,99	22,57	19,2%	0,64%
70	15,04	15,63	16,22	16,80	17,36	17,92	18,47	22,8%	0,76%
75	11,48	11,98	12,48	12,98	13,46	13,95	14,42	25,6%	0,85%
80	8,39	8,77	9,16	9,54	9,92	10,30	10,68	27,3%	0,91%
85	5,88	6,14	6,40	6,66	6,93	7,19	7,46	26,9%	0,90%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60									
65	19,05	19,72	20,43	21,14	21,81	22,40	22,98	20,6%	0,69%
70	15,14	15,79	16,47	17,17	17,81	18,38	18,93	25,1%	0,84%
75	11,50	12,05	12,67	13,29	13,86	14,36	14,84	29,1%	0,97%
80	8,36	8,73	9,23	9,77	10,24	10,64	11,03	31,9%	1,06%
85	5,88	6,03	6,33	6,77	7,16	7,45	7,73	31,5%	1,05%

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	22,33	23,08	23,76	24,40	25,00	25,56	26,08	16,8%	0,56%
65	18,28	18,93	19,55	20,13	20,67	21,18	21,66	18,5%	0,62%
70	14,55	15,07	15,60	16,10	16,58	17,02	17,45	19,9%	0,66%
75	11,25	11,59	12,03	12,45	12,84	13,21	13,57	20,6%	0,69%
80	8,39	8,57	8,91	9,24	9,55	9,85	10,13	20,8%	0,69%
85	6,03	6,12	6,36	6,60	6,83	7,05	7,26	20,4%	0,68%

(*) ISTAT Projection 2007-2051

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60								
65	3,4%	3,2%	3,1%	3,2%	3,4%	3,7%	4,0%	3,4%
70	3,2%	3,6%	3,8%	4,1%	4,5%	5,0%	5,5%	4,3%
75	2,0%	3,3%	3,6%	4,1%	4,6%	5,3%	5,9%	4,1%
80	0,1%	2,3%	2,7%	3,1%	3,7%	4,4%	5,2%	3,1%
85	-2,5%	0,3%	0,6%	1,0%	1,4%	2,0%	2,8%	0,8%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60								
65	4,1%	4,0%	4,3%	4,8%	5,2%	5,5%	5,8%	4,8%
70	3,8%	4,6%	5,3%	6,2%	7,0%	7,4%	7,9%	6,0%
75	2,2%	3,9%	5,0%	6,4%	7,4%	8,0%	8,6%	5,9%
80	-0,3%	1,8%	3,4%	5,4%	6,8%	7,5%	8,2%	4,7%
85	-2,5%	-1,5%	-0,4%	2,6%	4,6%	5,4%	6,2%	2,1%

Ann. 40 **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - mean scenario
self-employed - females

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,36	28,11	28,85	29,57	30,27	30,96	31,62	15,6%	0,52%
65	22,78	23,53	24,26	24,98	25,67	26,35	27,01	18,6%	0,62%
70	18,37	19,09	19,79	20,47	21,13	21,78	22,41	22,0%	0,73%
75	14,18	14,82	15,45	16,08	16,68	17,28	17,86	26,0%	0,87%
80	10,36	10,90	11,43	11,96	12,47	12,99	13,50	30,3%	1,01%
85	7,14	7,53	7,92	8,32	8,71	9,12	9,52	33,5%	1,12%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,55	28,33	29,08	29,83	30,58	31,30	32,03	16,2%	0,54%
65	22,98	23,75	24,51	25,25	25,99	26,71	27,43	19,4%	0,65%
70	18,57	19,31	20,04	20,76	21,47	22,17	22,86	23,1%	0,77%
75	14,38	15,06	15,73	16,40	17,07	17,72	18,37	27,8%	0,93%
80	10,56	11,14	11,73	12,32	12,91	13,50	14,09	33,4%	1,11%
85	7,34	7,79	8,25	8,73	9,22	9,71	10,21	39,1%	1,30%

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	annual average
60	26,53	27,06	27,77	28,44	29,06	29,64	30,18	13,8%	0,46%
65	22,07	22,57	23,25	23,88	24,47	25,03	25,54	15,7%	0,52%
70	17,80	18,25	18,87	19,46	20,01	20,52	21,00	18,0%	0,60%
75	13,79	14,16	14,72	15,24	15,73	16,19	16,63	20,6%	0,69%
80	10,18	10,46	10,92	11,36	11,77	12,16	12,53	23,1%	0,77%
85	7,17	7,37	7,71	8,06	8,39	8,70	9,00	25,4%	0,85%

(*) ISTAT Projection 2007-2051

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	3,0%	3,8%	3,7%	3,8%	4,0%	4,2%	4,5%	3,9%
65	3,1%	4,1%	4,2%	4,4%	4,7%	5,0%	5,4%	4,4%
70	3,1%	4,4%	4,6%	5,0%	5,3%	5,8%	6,3%	4,9%
75	2,7%	4,4%	4,8%	5,2%	5,7%	6,3%	6,9%	5,2%
80	1,8%	4,0%	4,5%	5,0%	5,6%	6,4%	7,1%	4,9%
85	-0,5%	2,1%	2,6%	3,1%	3,8%	4,6%	5,5%	3,0%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	3,7%	4,5%	4,5%	4,7%	4,9%	5,3%	5,7%	4,8%
65	4,0%	5,0%	5,1%	5,4%	5,8%	6,3%	6,9%	5,5%
70	4,2%	5,5%	5,8%	6,3%	6,8%	7,4%	8,1%	6,3%
75	4,1%	5,9%	6,4%	7,1%	7,8%	8,6%	9,5%	7,1%
80	3,6%	6,1%	6,9%	7,8%	8,9%	9,9%	11,0%	7,7%
85	2,3%	5,4%	6,5%	7,7%	9,0%	10,4%	11,9%	7,6%

Ann. 41   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - high scenario
self-employed - males

Pensioners and annuitants

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60									
65	18,93	20,17	21,03	21,80	22,55	23,26	23,96	26,6%	0,89%
70	15,04	16,21	17,02	17,75	18,45	19,12	19,77	31,5%	1,05%
75	11,48	12,47	13,17	13,80	14,40	14,99	15,56	35,5%	1,18%
80	8,39	9,15	9,69	10,18	10,66	11,13	11,60	38,3%	1,28%
85	5,88	6,39	6,76	7,10	7,45	7,78	8,13	38,3%	1,28%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60									
65	19,36	20,41	21,35	22,25	23,08	23,83	24,54	26,8%	0,89%
70	15,40	16,41	17,31	18,18	18,97	19,69	20,37	32,3%	1,08%
75	11,72	12,58	13,37	14,15	14,86	15,50	16,10	37,3%	1,24%
80	8,53	9,13	9,77	10,43	11,03	11,56	12,06	41,4%	1,38%
85	5,99	6,30	6,70	7,23	7,71	8,11	8,50	41,9%	1,40%

projections ISTAT Italian general population 2011-2065

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	annual average
60	22,71	23,53	24,44	25,26	26,01	26,70	27,33	20,3%	0,68%
65	18,61	19,33	20,15	20,90	21,58	22,22	22,80	22,5%	0,75%
70	14,84	15,39	16,11	16,77	17,37	17,94	18,47	24,4%	0,81%
75	11,48	11,84	12,44	12,99	13,50	13,98	14,43	25,7%	0,86%
80	8,56	8,75	9,22	9,65	10,06	10,45	10,82	26,4%	0,88%
85	6,14	6,22	6,56	6,88	7,19	7,49	7,77	26,5%	0,88%

(*) ISTAT Projection 2007-2051

Spread pensioners and annuitants vs. general population

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60								
65	1,6%	4,2%	4,2%	4,2%	4,3%	4,5%	4,8%	4,0%
70	1,3%	5,0%	5,3%	5,5%	5,8%	6,2%	6,6%	5,1%
75	0,0%	5,1%	5,5%	5,9%	6,3%	6,7%	7,3%	5,2%
80	-2,0%	4,4%	4,9%	5,2%	5,6%	6,1%	6,8%	4,4%
85	-4,4%	2,7%	3,0%	3,1%	3,4%	3,9%	4,5%	2,3%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60								
65	3,9%	5,3%	5,6%	6,1%	6,5%	6,8%	7,1%	5,9%
70	3,6%	6,2%	6,9%	7,7%	8,4%	8,9%	9,3%	7,3%
75	2,1%	5,9%	7,0%	8,2%	9,1%	9,8%	10,3%	7,5%
80	-0,3%	4,2%	5,7%	7,4%	8,8%	9,6%	10,3%	6,5%
85	-2,5%	1,2%	2,1%	4,7%	6,7%	7,7%	8,6%	4,1%

Life expectancy and comparison with the Italian general population - stochastic models - high scenario
self-employed - females

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,36	28,77	29,76	30,64	31,48	32,28	33,07	20,9%	0,70%
65	22,78	24,19	25,16	26,04	26,87	27,66	28,44	24,8%	0,83%
70	18,37	19,71	20,65	21,48	22,28	23,03	23,78	29,4%	0,98%
75	14,18	15,39	16,24	17,00	17,73	18,44	19,13	35,0%	1,17%
80	10,36	11,37	12,09	12,75	13,38	14,00	14,63	41,2%	1,37%
85	7,14	7,87	8,42	8,92	9,43	9,93	10,45	46,4%	1,55%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,90	29,16	30,22	31,20	32,14	33,05	33,96	21,7%	0,72%
65	23,32	24,57	25,62	26,59	27,52	28,43	29,33	25,8%	0,86%
70	18,89	20,08	21,08	22,02	22,92	23,80	24,67	30,6%	1,02%
75	14,67	15,76	16,69	17,56	18,40	19,22	20,05	36,7%	1,22%
80	10,81	11,75	12,56	13,34	14,09	14,84	15,60	44,4%	1,48%
85	7,53	8,27	8,92	9,56	10,20	10,84	11,50	52,6%	1,75%

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	annual average
60	26,90	27,61	28,61	29,50	30,32	31,06	31,75	18,0%	0,60%
65	22,42	23,09	24,04	24,89	25,67	26,38	27,04	20,6%	0,69%
70	18,11	18,72	19,60	20,39	21,12	21,79	22,41	23,7%	0,79%
75	14,06	14,57	15,35	16,07	16,73	17,34	17,91	27,3%	0,91%
80	10,40	10,77	11,43	12,04	12,61	13,14	13,64	31,2%	1,04%
85	7,34	7,59	8,10	8,58	9,04	9,48	9,89	34,9%	1,16%

(*) ISTAT Projection 2007-2051

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	1,7%	4,1%	3,9%	3,7%	3,7%	3,8%	4,0%	3,5%
65	1,6%	4,5%	4,5%	4,4%	4,5%	4,6%	4,9%	4,2%
70	1,4%	5,0%	5,1%	5,1%	5,2%	5,4%	5,8%	4,7%
75	0,8%	5,3%	5,4%	5,5%	5,7%	6,0%	6,4%	5,0%
80	-0,4%	5,2%	5,4%	5,5%	5,8%	6,2%	6,7%	4,9%
85	-2,8%	3,7%	3,8%	3,8%	4,1%	4,6%	5,3%	3,2%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	3,6%	5,3%	5,3%	5,4%	5,7%	6,0%	6,5%	5,4%
65	3,9%	6,0%	6,2%	6,4%	6,8%	7,2%	7,8%	6,3%
70	4,1%	6,8%	7,1%	7,4%	7,9%	8,4%	9,2%	7,3%
75	4,1%	7,6%	8,0%	8,5%	9,1%	9,8%	10,7%	8,3%
80	3,8%	8,3%	9,0%	9,7%	10,5%	11,5%	12,6%	9,3%
85	2,6%	8,3%	9,2%	10,2%	11,3%	12,5%	14,0%	9,7%

Life expectancy and comparison with the Italian general population - stochastic models - low scenario
self-employed - males

Pensioners and annuitants

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	23,93	23,95	24,35	24,79	25,26	25,75	26,21	9,6%	0,32%
65	18,93	18,95	19,35	19,79	20,26	20,75	21,21	12,1%	0,40%
70	15,04	15,07	15,44	15,85	16,29	16,75	17,19	14,3%	0,48%
75	11,48	11,50	11,82	12,17	12,55	12,94	13,31	16,0%	0,53%
80	8,39	8,41	8,65	8,92	9,21	9,51	9,80	16,8%	0,56%
85	5,88	5,89	6,05	6,23	6,43	6,64	6,84	16,3%	0,54%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	23,75	24,04	24,51	25,05	25,55	26,00	26,45	11,4%	0,38%
65	18,75	19,04	19,51	20,05	20,55	21,00	21,45	14,4%	0,48%
70	14,88	15,17	15,64	16,18	16,67	17,11	17,53	17,9%	0,60%
75	11,28	11,54	11,97	12,45	12,89	13,27	13,63	20,9%	0,70%
80	8,19	8,34	8,70	9,13	9,49	9,78	10,06	22,7%	0,76%
85	5,77	5,76	5,97	6,34	6,64	6,84	7,02	21,7%	0,72%

projections ISTAT Italian general population 2011-2065

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	21,94	22,62	23,06	23,51	23,95	24,37	24,76	12,9%	0,43%
65	17,93	18,53	18,93	19,33	19,72	20,10	20,46	14,1%	0,47%
70	14,27	14,74	15,08	15,42	15,76	16,08	16,40	14,9%	0,50%
75	11,02	11,33	11,61	11,90	12,17	12,44	12,69	15,2%	0,51%
80	8,22	8,40	8,61	8,83	9,04	9,25	9,44	14,9%	0,50%
85	5,93	6,01	6,16	6,32	6,47	6,62	6,76	14,1%	0,47%

(*) ISTAT Projection 2007-2051

Spread pensioners and annuitants vs. general population

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	8,3%	5,6%	5,3%	5,1%	5,2%	5,4%	5,5%	5,8%
65	5,2%	2,2%	2,2%	2,3%	2,7%	3,1%	3,6%	3,0%
70	5,1%	2,2%	2,4%	2,7%	3,3%	4,0%	4,6%	3,5%
75	4,0%	1,5%	1,8%	2,3%	3,0%	3,9%	4,7%	3,0%
80	2,0%	0,1%	0,5%	0,9%	1,8%	2,8%	3,7%	1,7%
85	-0,8%	-2,1%	-1,8%	-1,4%	-0,7%	0,3%	1,2%	-0,7%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	7,6%	5,9%	5,9%	6,1%	6,3%	6,3%	6,4%	6,4%
65	4,3%	2,7%	3,0%	3,6%	4,0%	4,3%	4,6%	3,8%
70	4,1%	2,9%	3,6%	4,7%	5,5%	6,0%	6,5%	4,7%
75	2,3%	1,8%	3,0%	4,5%	5,6%	6,3%	6,9%	4,3%
80	-0,3%	-0,7%	1,0%	3,2%	4,7%	5,4%	6,1%	2,8%
85	-2,7%	-4,4%	-3,1%	0,4%	2,4%	3,2%	3,7%	-0,1%

Ann. 44   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - stochastic models - low scenario
self-employed - females

life expectancy per calendar year at certain ages - Lee-Carter model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,36	27,46	27,97	28,51	29,08	29,66	30,22	10,4%	0,35%
65	22,78	22,89	23,39	23,93	24,50	25,08	25,63	12,5%	0,42%
70	18,37	18,47	18,95	19,47	20,01	20,57	21,09	14,8%	0,49%
75	14,18	14,27	14,70	15,16	15,66	16,16	16,64	17,4%	0,58%
80	10,36	10,44	10,80	11,18	11,60	12,03	12,44	20,0%	0,67%
85	7,14	7,19	7,45	7,73	8,04	8,37	8,68	21,7%	0,72%

life expectancy per calendar year at certain ages - Renshaw-Haberman model

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,21	27,52	27,98	28,52	29,08	29,64	30,21	11,0%	0,37%
65	22,65	22,96	23,42	23,96	24,52	25,08	25,65	13,2%	0,44%
70	18,26	18,57	19,02	19,55	20,09	20,64	21,19	16,1%	0,54%
75	14,09	14,38	14,80	15,30	15,81	16,32	16,84	19,5%	0,65%
80	10,31	10,56	10,93	11,36	11,82	12,27	12,74	23,5%	0,78%
85	7,15	7,34	7,62	7,97	8,34	8,71	9,09	27,1%	0,90%

life expectancy per calendar year at certain ages

age	2010 (*)	2015	2020	2025	2030	2035	2040	change Total	annual average
60	26,16	26,49	26,90	27,33	27,74	28,14	28,52	9,0%	0,30%
65	21,72	22,04	22,43	22,83	23,22	23,60	23,96	10,3%	0,34%
70	17,48	17,77	18,12	18,49	18,85	19,20	19,53	11,7%	0,39%
75	13,51	13,75	14,07	14,39	14,71	15,01	15,30	13,2%	0,44%
80	9,97	10,14	10,40	10,66	10,93	11,18	11,42	14,6%	0,49%
85	7,02	7,15	7,33	7,54	7,74	7,94	8,12	15,6%	0,52%

(*) ISTAT Projection 2007-2051

pensioners and annuitants (Lee-Carter model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	4,4%	3,5%	3,8%	4,1%	4,6%	5,1%	5,6%	4,5%
65	4,7%	3,7%	4,1%	4,6%	5,2%	5,9%	6,5%	5,0%
70	4,9%	3,8%	4,4%	5,0%	5,8%	6,6%	7,4%	5,4%
75	4,7%	3,6%	4,3%	5,1%	6,1%	7,1%	8,0%	5,6%
80	3,8%	2,8%	3,7%	4,6%	5,8%	7,1%	8,2%	5,1%
85	1,6%	0,6%	1,6%	2,5%	3,7%	5,2%	6,5%	3,1%

pensioners and annuitants (Renshaw-Haberman model) - General population

age	2010	2015	2020	2025	2030	2035	2040	Media
60	3,9%	3,7%	3,9%	4,2%	4,6%	5,1%	5,6%	4,4%
65	4,1%	4,0%	4,3%	4,7%	5,3%	5,9%	6,6%	5,0%
70	4,3%	4,3%	4,7%	5,4%	6,2%	7,0%	7,8%	5,7%
75	4,1%	4,4%	5,0%	5,9%	7,0%	8,0%	9,1%	6,2%
80	3,4%	3,9%	4,9%	6,2%	7,6%	8,9%	10,3%	6,5%
85	1,8%	2,6%	3,8%	5,4%	7,2%	8,9%	10,7%	5,8%

Life expectancy and comparison with the Italian general population - Lee-Carter model - all scenarios
Total (private employees and self-employed) - males

<mark>**Pensioners and annuitants**</mark>

life expectancy per calendar year at certain ages - Lee-Carter model - mean scenario

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	22,87	23,63	24,36	25,08	25,77	26,44	27,07	18,4%	0,61%
65	18,67	19,36	20,03	20,69	21,32	21,93	22,52	20,7%	0,69%
70	14,75	15,35	15,94	16,51	17,07	17,61	18,14	22,9%	0,76%
75	11,24	11,72	12,20	12,68	13,14	13,59	14,03	24,9%	0,83%
80	8,21	8,57	8,92	9,28	9,63	9,97	10,32	25,6%	0,85%
85	5,75	5,97	6,20	6,44	6,67	6,90	7,13	24,1%	0,80%

life expectancy per calendar year at certain ages - Lee-Carter model - high scenario

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	22,87	24,18	25,12	25,96	26,75	27,49	28,20	23,3%	0,78%
65	18,67	19,86	20,72	21,49	22,22	22,91	23,57	26,3%	0,88%
70	14,75	15,79	16,54	17,22	17,87	18,48	19,08	29,3%	0,98%
75	11,24	12,08	12,70	13,26	13,81	14,33	14,83	32,0%	1,07%
80	8,21	8,83	9,29	9,72	10,14	10,54	10,94	33,2%	1,11%
85	5,75	6,15	6,45	6,73	7,01	7,28	7,56	31,5%	1,05%

life expectancy per calendar year at certain ages - Lee-Carter model - low scenario

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	22,87	23,08	23,63	24,19	24,78	25,37	25,93	13,4%	0,45%
65	18,67	18,86	19,36	19,87	20,41	20,95	21,46	15,0%	0,50%
70	14,76	14,92	15,35	15,80	16,27	16,74	17,20	16,5%	0,55%
75	11,24	11,38	11,72	12,09	12,47	12,87	13,24	17,8%	0,59%
80	8,22	8,31	8,57	8,84	9,13	9,42	9,70	18,1%	0,60%
85	5,75	5,82	5,98	6,15	6,34	6,53	6,71	16,6%	0,55%

<mark>**Spread pensioners and annuitants vs. general population**</mark>

pensioners and annuitants (Lee-Carter model) mean scenario - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	2,4%	2,4%	2,5%	2,8%	3,1%	3,4%	3,8%	2,9%
65	2,1%	2,2%	2,5%	2,8%	3,1%	3,6%	4,0%	2,9%
70	1,4%	1,9%	2,2%	2,5%	3,0%	3,5%	4,0%	2,6%
75	-0,1%	1,2%	1,4%	1,9%	2,3%	2,9%	3,4%	1,9%
80	-2,1%	-0,1%	0,1%	0,4%	0,8%	1,3%	1,9%	0,3%
85	-4,6%	-2,3%	-2,4%	-2,4%	-2,4%	-2,1%	-1,7%	-2,6%

pensioners and annuitants (Lee-Carter model) high scenario - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	-15,0%	-12,4%	-12,2%	-12,0%	-11,8%	-11,5%	-11,2%	-12,3%
65	-16,7%	-14,0%	-13,8%	-13,7%	-13,4%	-13,2%	-12,8%	-13,9%
70	-18,5%	-15,7%	-15,6%	-15,5%	-15,4%	-15,2%	-14,9%	-15,8%
75	-20,1%	-17,1%	-17,3%	-17,5%	-17,5%	-17,4%	-17,2%	-17,7%
80	-21,0%	-18,0%	-18,7%	-19,3%	-19,6%	-19,8%	-19,8%	-19,5%
85	-21,6%	-19,0%	-20,4%	-21,6%	-22,5%	-23,2%	-23,6%	-21,7%

pensioners and annuitants (Lee-Carter model) low scenario - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	4,2%	2,0%	2,5%	2,9%	3,5%	4,1%	4,7%	3,4%
65	4,1%	1,8%	2,3%	2,8%	3,5%	4,3%	4,9%	3,4%
70	3,4%	1,3%	1,8%	2,5%	3,2%	4,1%	4,9%	3,0%
75	2,0%	0,4%	1,0%	1,6%	2,5%	3,5%	4,3%	2,2%
80	-0,1%	-1,0%	-0,5%	0,1%	0,9%	1,9%	2,7%	0,6%
85	-2,9%	-3,3%	-3,0%	-2,6%	-2,1%	-1,4%	-0,7%	-2,3%

Ann. 46   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - Lee-Carter model - all scenarios
Total (private employees and self-employed) - females

Pensioners and annuitants

life expectancy per calendar year at certain ages - Lee-Carter model - mean scenario

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	27,10	27,87	28,62	29,35	30,04	30,71	31,35	15,7%	0,52%
65	22,54	23,28	24,00	24,70	25,36	26,01	26,62	18,1%	0,60%
70	18,16	18,85	19,52	20,17	20,80	21,41	21,99	21,1%	0,70%
75	14,01	14,62	15,22	15,81	16,38	16,93	17,46	24,6%	0,82%
80	10,25	10,75	11,25	11,74	12,22	12,68	13,14	28,2%	0,94%
85	7,10	7,46	7,82	8,18	8,54	8,89	9,24	30,2%	1,01%

life expectancy per calendar year at certain ages - Lee-Carter model - high scenario

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	27,10	28,63	29,65	30,54	31,37	32,14	32,87	21,3%	0,71%
65	22,54	24,01	24,99	25,85	26,64	27,38	28,10	24,6%	0,82%
70	18,16	19,53	20,45	21,25	22,01	22,71	23,38	28,8%	0,96%
75	14,01	15,23	16,06	16,79	17,47	18,11	18,73	33,7%	1,12%
80	10,25	11,26	11,95	12,56	13,15	13,70	14,24	38,9%	1,30%
85	7,10	7,82	8,33	8,79	9,24	9,67	10,10	42,4%	1,41%

life expectancy per calendar year at certain ages - Lee-Carter model - low scenario

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	27,10	27,12	27,61	28,13	28,69	29,27	29,81	10,0%	0,33%
65	22,54	22,56	23,02	23,53	24,07	24,62	25,14	11,5%	0,38%
70	18,16	18,17	18,61	19,08	19,59	20,10	20,59	13,4%	0,45%
75	14,01	14,02	14,41	14,83	15,28	15,75	16,18	15,5%	0,52%
80	10,25	10,26	10,58	10,92	11,30	11,69	12,05	17,5%	0,58%
85	7,10	7,10	7,33	7,58	7,85	8,14	8,41	18,5%	0,62%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (Lee-Carter model) mean scenario - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	2,1%	3,0%	3,1%	3,2%	3,4%	3,6%	3,9%	3,2%
65	2,1%	3,1%	3,2%	3,4%	3,6%	3,9%	4,2%	3,4%
70	2,0%	3,3%	3,4%	3,7%	4,0%	4,3%	4,7%	3,6%
75	1,6%	3,2%	3,4%	3,8%	4,1%	4,5%	5,0%	3,7%
80	0,7%	2,8%	3,1%	3,4%	3,8%	4,3%	4,8%	3,3%
85	-1,1%	1,2%	1,4%	1,5%	1,8%	2,2%	2,7%	1,4%

pensioners and annuitants (Lee-Carter model) high scenario - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	0,8%	3,7%	3,7%	3,5%	3,5%	3,5%	3,5%	3,2%
65	0,6%	4,0%	4,0%	3,8%	3,8%	3,8%	3,9%	3,4%
70	0,3%	4,3%	4,3%	4,2%	4,2%	4,2%	4,3%	3,7%
75	-0,4%	4,6%	4,6%	4,5%	4,5%	4,5%	4,6%	3,8%
80	-1,4%	4,5%	4,5%	4,3%	4,3%	4,3%	4,4%	3,5%
85	-3,3%	3,1%	2,9%	2,4%	2,2%	2,1%	2,1%	1,6%

pensioners and annuitants (Lee-Carter model) low scenario - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	3,6%	2,4%	2,6%	2,9%	3,4%	4,0%	4,5%	3,4%
65	3,8%	2,3%	2,7%	3,1%	3,6%	4,3%	4,9%	3,5%
70	3,9%	2,3%	2,7%	3,2%	3,9%	4,7%	5,4%	3,7%
75	3,7%	2,0%	2,5%	3,1%	3,9%	4,9%	5,7%	3,7%
80	2,9%	1,2%	1,8%	2,4%	3,4%	4,6%	5,5%	3,1%
85	1,0%	-0,6%	0,0%	0,6%	1,4%	2,6%	3,6%	1,2%

Life expectancy and comparison with the Italian general population - APC model (Age-Period-Cohort) - all scenarios
private employees - males - lives analysis

Pensioners and annuitants

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	23,01	24,03	24,91	25,66	26,40	27,16	27,93	21,4%	0,71%
65	18,79	19,75	20,60	21,34	22,02	22,73	23,46	24,9%	0,83%
70	14,87	15,73	16,52	17,22	17,88	18,53	19,20	29,2%	0,97%
75	11,29	12,04	12,74	13,38	14,00	14,60	15,21	34,7%	1,16%
80	8,18	8,75	9,35	9,91	10,45	10,99	11,53	40,9%	1,36%
85	5,70	6,03	6,47	6,95	7,40	7,85	8,31	45,8%	1,53%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	23,02	24,17	25,28	26,33	27,38	28,45	29,52	28,2%	0,94%
65	18,81	19,88	20,96	21,98	22,96	23,97	24,99	32,9%	1,10%
70	14,88	15,86	16,86	17,83	18,76	19,69	20,64	38,7%	1,29%
75	11,30	12,17	13,07	13,95	14,82	15,68	16,54	46,4%	1,55%
80	8,20	8,87	9,66	10,43	11,20	11,97	12,74	55,4%	1,85%
85	5,72	6,15	6,76	7,42	8,06	8,71	9,37	63,9%	2,13%

life expectancy per calendar year at certain ages - low scenario (long-term rate 1,25%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	22,99	23,89	24,54	25,01	25,45	25,90	26,38	14,7%	0,49%
65	18,78	19,62	20,25	20,71	21,11	21,53	21,98	17,1%	0,57%
70	14,85	15,61	16,19	16,64	17,03	17,40	17,81	19,9%	0,66%
75	11,27	11,92	12,43	12,84	13,21	13,57	13,92	23,5%	0,78%
80	8,17	8,63	9,06	9,41	9,73	10,06	10,38	27,0%	0,90%
85	5,68	5,90	6,19	6,49	6,76	7,03	7,30	28,6%	0,95%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	4,9%	6,2%	8,0%	9,1%	10,2%	11,5%	12,8%	9,0%
65	4,8%	6,6%	8,9%	10,4%	11,7%	13,1%	14,7%	10,0%
70	4,2%	6,7%	9,6%	11,7%	13,5%	15,2%	17,1%	11,1%
75	2,4%	6,3%	9,7%	12,5%	15,0%	17,4%	19,8%	11,9%
80	-0,5%	4,2%	8,6%	12,2%	15,5%	18,8%	22,1%	11,6%
85	-3,8%	0,2%	5,0%	10,0%	14,3%	18,5%	22,9%	9,6%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	4,9%	6,9%	9,6%	12,0%	14,3%	16,7%	19,2%	12,0%
65	4,9%	7,3%	10,7%	13,7%	16,4%	19,3%	22,2%	13,5%
70	4,3%	7,6%	11,8%	15,6%	19,1%	22,4%	25,9%	15,3%
75	2,5%	7,4%	12,5%	17,3%	21,8%	26,1%	30,3%	16,8%
80	-0,3%	5,7%	12,2%	18,1%	23,8%	29,4%	34,9%	17,7%
85	-3,5%	2,3%	9,8%	17,5%	24,6%	31,6%	38,6%	17,3%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	4,8%	5,6%	6,4%	6,4%	6,2%	6,3%	6,5%	6,0%
65	4,7%	5,9%	7,0%	7,2%	7,1%	7,1%	7,4%	6,6%
70	4,1%	5,9%	7,4%	7,9%	8,1%	8,2%	8,6%	7,2%
75	2,3%	5,2%	7,1%	7,9%	8,6%	9,1%	9,7%	7,1%
80	-0,7%	2,7%	5,2%	6,5%	7,6%	8,7%	9,9%	5,7%
85	-4,1%	-1,9%	0,5%	2,8%	4,5%	6,2%	8,0%	2,3%

Life expectancy and comparison with the Italian general population - APC model (Age-Period-Cohort) - all scenarios
private employees - females - lives analysis

Pensioners and annuitants

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	27,07	27,79	28,45	29,04	29,64	30,28	30,95	14,3%	0,48%
65	22,54	23,22	23,86	24,45	25,02	25,63	26,27	16,6%	0,55%
70	18,16	18,82	19,42	19,98	20,54	21,11	21,72	19,6%	0,65%
75	14,00	14,61	15,18	15,71	16,23	16,77	17,34	23,8%	0,79%
80	10,23	10,74	11,27	11,77	12,24	12,73	13,25	29,4%	0,98%
85	7,06	7,46	7,90	8,35	8,77	9,19	9,63	36,3%	1,21%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	27,09	27,94	28,82	29,69	30,56	31,47	32,40	19,6%	0,65%
65	22,56	23,37	24,23	25,07	25,91	26,78	27,68	22,7%	0,76%
70	18,18	18,96	19,78	20,59	21,40	22,22	23,07	26,9%	0,90%
75	14,02	14,75	15,52	16,28	17,05	17,82	18,62	32,8%	1,09%
80	10,25	10,89	11,60	12,31	13,00	13,71	14,43	40,7%	1,36%
85	7,08	7,61	8,22	8,84	9,45	10,05	10,68	50,7%	1,69%

life expectancy per calendar year at certain ages - low scenario (long-term rate 1,25%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	27,05	27,64	28,08	28,41	28,74	29,11	29,51	9,1%	0,30%
65	22,52	23,08	23,51	23,83	24,14	24,49	24,88	10,5%	0,35%
70	18,14	18,67	19,07	19,40	19,70	20,03	20,39	12,4%	0,41%
75	13,98	14,47	14,85	15,15	15,44	15,75	16,08	15,0%	0,50%
80	10,21	10,60	10,95	11,24	11,51	11,79	12,09	18,4%	0,61%
85	7,04	7,32	7,60	7,87	8,11	8,35	8,61	22,3%	0,74%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	23,4%	22,9%	23,4%	23,5%	23,8%	24,3%	25,0%	23,7%
65	25,7%	25,3%	26,1%	26,5%	26,9%	27,5%	28,4%	26,6%
70	27,3%	27,7%	28,8%	29,6%	30,3%	31,3%	32,5%	29,6%
75	27,0%	28,9%	30,7%	32,0%	33,4%	34,9%	36,6%	31,9%
80	24,5%	27,9%	30,9%	33,3%	35,3%	37,7%	40,3%	32,8%
85	19,2%	24,1%	28,3%	32,1%	35,5%	38,8%	42,4%	31,5%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	23,5%	23,6%	25,0%	26,3%	27,6%	29,1%	30,8%	26,6%
65	25,8%	26,1%	28,0%	29,7%	31,4%	33,3%	35,3%	29,9%
70	27,4%	28,7%	31,2%	33,5%	35,8%	38,2%	40,7%	33,6%
75	27,2%	30,1%	33,7%	36,9%	40,1%	43,3%	46,7%	36,9%
80	24,7%	29,6%	34,8%	39,4%	43,7%	48,2%	52,8%	39,0%
85	19,6%	26,5%	33,4%	40,0%	45,9%	51,8%	57,9%	39,3%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	23,3%	22,2%	21,8%	20,8%	20,0%	19,4%	19,2%	21,0%
65	25,6%	24,5%	24,2%	23,3%	22,4%	21,9%	21,6%	23,4%
70	27,1%	26,7%	26,5%	25,8%	25,0%	24,5%	24,4%	25,7%
75	26,9%	27,6%	27,9%	27,3%	26,9%	26,6%	26,7%	27,1%
80	24,2%	26,3%	27,2%	27,3%	27,2%	27,5%	28,1%	26,8%
85	18,8%	21,8%	23,4%	24,6%	25,4%	26,1%	27,4%	23,9%

Life expectancy and comparison with the Italian general population - APC model - all scenarios
self-employed - males - lives analysis

Pensioners and annuitants

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

								change	
age	2010	2015	2020	2025	2030	2035	2040	Total	annual average
60	23,52	24,52	25,38	26,13	26,86	27,61	28,36	20,6%	0,69%
65	19,24	20,17	21,02	21,75	22,42	23,13	23,85	24,0%	0,80%
70	15,25	16,10	16,88	17,58	18,23	18,87	19,54	28,1%	0,94%
75	11,60	12,35	13,04	13,67	14,29	14,88	15,48	33,5%	1,12%
80	8,40	8,96	9,56	10,11	10,65	11,19	11,73	39,6%	1,32%
85	5,82	6,15	6,59	7,07	7,52	7,97	8,43	44,8%	1,49%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

								change	
age	2010	2015	2020	2025	2030	2035	2040	Total	annual average
60	23,53	24,66	25,75	26,79	27,83	28,88	29,93	27,2%	0,91%
65	19,25	20,31	21,38	22,38	23,36	24,35	25,35	31,7%	1,06%
70	15,27	16,23	17,22	18,19	19,11	20,03	20,97	37,3%	1,24%
75	11,62	12,47	13,36	14,24	15,10	15,95	16,81	44,7%	1,49%
80	8,42	9,09	9,87	10,64	11,40	12,17	12,94	53,7%	1,79%
85	5,84	6,28	6,89	7,54	8,18	8,83	9,49	62,5%	2,08%

life expectancy per calendar year at certain ages - low scenario (long-term rate 1,25%)

								change	
age	2010	2015	2020	2025	2030	2035	2040	Total	annual average
60	23,25	24,11	24,74	25,18	25,60	26,03	26,48	13,9%	0,46%
65	18,95	19,76	20,37	20,81	21,19	21,59	22,01	16,1%	0,54%
70	14,95	15,67	16,23	16,66	17,03	17,39	17,77	18,9%	0,63%
75	11,29	11,92	12,41	12,79	13,15	13,48	13,82	22,4%	0,75%
80	8,10	8,54	8,94	9,28	9,58	9,89	10,19	25,8%	0,86%
85	5,48	5,69	5,96	6,25	6,50	6,75	7,01	27,8%	0,93%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	7,2%	8,4%	10,1%	11,1%	12,1%	13,3%	14,5%	11,0%
65	7,3%	8,9%	11,0%	12,5%	13,7%	15,1%	16,6%	12,2%
70	6,9%	9,3%	12,0%	14,0%	15,7%	17,4%	19,2%	13,5%
75	5,3%	8,9%	12,3%	15,0%	17,4%	19,7%	22,0%	14,4%
80	2,2%	6,7%	11,0%	14,5%	17,8%	21,0%	24,2%	13,9%
85	-1,8%	2,2%	7,0%	11,9%	16,1%	20,4%	24,7%	11,5%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	7,3%	9,0%	11,7%	14,0%	16,2%	18,5%	20,9%	13,9%
65	7,4%	9,6%	12,9%	15,8%	18,4%	21,1%	23,9%	15,6%
70	7,0%	10,2%	14,2%	17,9%	21,3%	24,5%	27,9%	17,6%
75	5,4%	10,1%	15,1%	19,7%	24,1%	28,3%	32,4%	19,3%
80	2,4%	8,2%	14,6%	20,5%	26,1%	31,6%	37,0%	20,0%
85	-1,5%	4,3%	11,8%	19,4%	26,4%	33,4%	40,3%	19,2%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	6,0%	6,6%	7,3%	7,1%	6,9%	6,8%	6,9%	6,8%
65	5,7%	6,6%	7,6%	7,7%	7,4%	7,4%	7,6%	7,1%
70	4,7%	6,3%	7,6%	8,0%	8,1%	8,1%	8,4%	7,3%
75	2,5%	5,2%	6,8%	7,6%	8,0%	8,4%	8,9%	6,8%
80	-1,5%	1,6%	3,8%	5,0%	6,0%	6,9%	7,9%	4,3%
85	-7,5%	-5,4%	-3,2%	-1,1%	0,4%	2,0%	3,6%	-1,6%

Ann. 50   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - APC model - all scenarios
self-employed - females - lives analysis

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,64	28,35	28,99	29,58	30,17	30,80	31,45	13,8%	0,46%
65	23,05	23,72	24,36	24,93	25,50	26,10	26,73	16,0%	0,53%
70	18,61	19,26	19,86	20,43	20,97	21,54	22,14	18,9%	0,63%
75	14,40	15,00	15,58	16,10	16,62	17,15	17,71	23,0%	0,77%
80	10,58	11,08	11,61	12,11	12,58	13,06	13,57	28,3%	0,94%
85	7,33	7,73	8,17	8,62	9,03	9,45	9,89	34,8%	1,16%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,66	28,50	29,37	30,22	31,08	31,96	32,87	18,8%	0,63%
65	23,07	23,87	24,72	25,56	26,38	27,24	28,11	21,9%	0,73%
70	18,63	19,41	20,22	21,03	21,82	22,63	23,47	25,9%	0,86%
75	14,42	15,15	15,92	16,67	17,43	18,19	18,97	31,6%	1,05%
80	10,60	11,23	11,94	12,65	13,33	14,03	14,74	39,1%	1,30%
85	7,35	7,88	8,49	9,11	9,71	10,31	10,92	48,5%	1,62%

life expectancy per calendar year at certain ages - scenario bass (long-term rate 1,25%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,62	28,19	28,63	28,95	29,28	29,64	30,04	8,8%	0,29%
65	23,03	23,57	24,00	24,33	24,63	24,98	25,36	10,1%	0,34%
70	18,59	19,12	19,52	19,84	20,14	20,46	20,82	12,0%	0,40%
75	14,38	14,86	15,24	15,54	15,83	16,14	16,47	14,5%	0,48%
80	10,56	10,94	11,29	11,58	11,84	12,13	12,43	17,7%	0,59%
85	7,31	7,59	7,87	8,14	8,38	8,62	8,88	21,4%	0,71%

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	26,0%	25,3%	25,7%	25,8%	26,0%	26,4%	27,0%	26,0%
65	28,5%	28,0%	28,7%	29,0%	29,3%	29,9%	30,7%	29,2%
70	30,5%	30,7%	31,8%	32,5%	33,1%	33,9%	35,0%	32,5%
75	30,7%	32,4%	34,1%	35,3%	36,6%	38,0%	39,6%	35,2%
80	28,6%	32,0%	34,9%	37,1%	39,1%	41,3%	43,7%	36,7%
85	23,7%	28,6%	32,7%	36,4%	39,6%	42,7%	46,3%	35,7%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	26,1%	26,0%	27,3%	28,5%	29,8%	31,2%	32,7%	28,8%
65	28,6%	28,8%	30,6%	32,2%	33,8%	35,5%	37,4%	32,4%
70	30,6%	31,7%	34,1%	36,3%	38,5%	40,7%	43,1%	36,4%
75	30,9%	33,7%	37,1%	40,2%	43,2%	46,3%	49,5%	40,1%
80	28,9%	33,7%	38,7%	43,2%	47,4%	51,7%	56,1%	42,8%
85	24,1%	31,0%	37,8%	44,2%	50,0%	55,7%	61,6%	43,5%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	25,9%	24,7%	24,1%	23,2%	22,3%	21,6%	21,3%	23,3%
65	28,4%	27,2%	26,8%	25,9%	24,9%	24,3%	24,0%	25,9%
70	30,3%	29,7%	29,4%	28,7%	27,8%	27,2%	27,0%	28,6%
75	30,5%	31,1%	31,2%	30,7%	30,1%	29,8%	29,8%	30,5%
80	28,4%	30,3%	31,1%	31,1%	31,0%	31,1%	31,6%	30,7%
85	23,4%	26,2%	27,7%	28,8%	29,5%	30,2%	31,3%	28,2%

Life expectancy and comparison with the Italian general population - APC model - all scenarios
Total (private employees and self-employed) - males - lives analysis

Pensioners and annuitants

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	23,17	24,19	25,06	25,81	26,55	27,30	28,07	21,1%	0,70%
65	18,93	19,88	20,73	21,46	22,15	22,85	23,58	24,6%	0,82%
70	14,98	15,84	16,62	17,33	17,98	18,63	19,30	28,8%	0,96%
75	11,36	12,12	12,82	13,45	14,07	14,67	15,28	34,4%	1,15%
80	8,23	8,79	9,39	9,95	10,49	11,03	11,57	40,7%	1,36%
85	5,72	6,05	6,49	6,97	7,42	7,87	8,33	45,7%	1,52%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	23,19	24,32	25,43	26,48	27,53	28,59	29,65	27,9%	0,93%
65	18,95	20,02	21,09	22,10	23,08	24,09	25,10	32,5%	1,08%
70	14,99	15,97	16,96	17,93	18,86	19,79	20,74	38,3%	1,28%
75	11,38	12,24	13,14	14,02	14,89	15,75	16,61	46,0%	1,53%
80	8,25	8,92	9,70	10,48	11,24	12,02	12,79	55,1%	1,84%
85	5,74	6,18	6,79	7,45	8,09	8,74	9,40	63,8%	2,13%

life expectancy per calendar year at certain ages - low scenario (long-term rate 1,25%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	23,16	24,05	24,70	25,16	25,60	26,05	26,52	14,5%	0,48%
65	18,92	19,75	20,38	20,84	21,24	21,66	22,10	16,8%	0,56%
70	14,96	15,71	16,29	16,74	17,13	17,50	17,91	19,7%	0,66%
75	11,35	12,00	12,50	12,91	13,28	13,64	13,99	23,3%	0,78%
80	8,21	8,67	9,10	9,45	9,78	10,10	10,42	26,9%	0,90%
85	5,70	5,92	6,21	6,52	6,79	7,06	7,33	28,5%	0,95%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	5,6%	6,9%	8,7%	9,8%	10,8%	12,0%	13,4%	9,6%
65	5,6%	7,3%	9,5%	11,0%	12,3%	13,7%	15,3%	10,7%
70	5,0%	7,5%	10,2%	12,4%	14,1%	15,8%	17,7%	11,8%
75	3,1%	6,9%	10,4%	13,1%	15,6%	18,0%	20,4%	12,5%
80	0,1%	4,7%	9,1%	12,7%	16,0%	19,3%	22,6%	12,1%
85	-3,4%	0,6%	5,4%	10,3%	14,7%	18,9%	23,3%	10,0%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	5,7%	7,6%	10,3%	12,6%	14,9%	17,3%	19,7%	12,6%
65	5,7%	8,0%	11,4%	14,4%	17,1%	19,8%	22,7%	14,2%
70	5,1%	8,4%	12,5%	16,3%	19,7%	23,0%	26,5%	15,9%
75	3,2%	8,0%	13,1%	17,9%	22,4%	26,6%	30,9%	17,5%
80	0,3%	6,2%	12,7%	18,6%	24,3%	29,9%	35,4%	18,2%
85	-3,1%	2,7%	10,2%	17,9%	25,0%	32,0%	39,0%	17,7%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	5,6%	6,3%	7,1%	7,0%	6,9%	6,9%	7,1%	6,7%
65	5,5%	6,6%	7,7%	7,8%	7,7%	7,8%	8,0%	7,3%
70	4,9%	6,6%	8,0%	8,6%	8,7%	8,8%	9,2%	7,8%
75	3,0%	5,8%	7,7%	8,5%	9,2%	9,7%	10,3%	7,7%
80	-0,1%	3,3%	5,7%	7,0%	8,1%	9,2%	10,3%	6,2%
85	-3,7%	-1,5%	0,8%	3,2%	4,9%	6,6%	8,4%	2,7%

Life expectancy and comparison with the Italian general population - APC model - all scenarios

Total (private employees and self-employed) - females - lives analysis

Pensioners and annuitants

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	27,25	27,97	28,62	29,21	29,81	30,44	31,11	14,1%	0,47%
65	22,70	23,38	24,02	24,60	25,17	25,77	26,41	16,4%	0,55%
70	18,30	18,95	19,55	20,12	20,67	21,24	21,85	19,4%	0,65%
75	14,11	14,72	15,29	15,82	16,34	16,88	17,44	23,6%	0,79%
80	10,32	10,83	11,36	11,86	12,33	12,82	13,33	29,2%	0,97%
85	7,13	7,53	7,97	8,41	8,84	9,25	9,69	36,0%	1,20%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	27,27	28,12	28,99	29,85	30,73	31,63	32,55	19,3%	0,64%
65	22,72	23,53	24,38	25,22	26,06	26,92	27,81	22,4%	0,75%
70	18,32	19,10	19,91	20,72	21,52	22,34	23,19	26,6%	0,89%
75	14,13	14,86	15,64	16,39	17,15	17,93	18,72	32,4%	1,08%
80	10,34	10,98	11,69	12,40	13,09	13,79	14,52	40,3%	1,34%
85	7,15	7,67	8,29	8,91	9,51	10,12	10,74	50,2%	1,67%

life expectancy per calendar year at certain ages - low scenario (long-term rate 1,25%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	change annual average
60	27,23	27,82	28,25	28,58	28,91	29,28	29,68	9,0%	0,30%
65	22,68	23,23	23,66	23,99	24,30	24,64	25,03	10,4%	0,35%
70	18,28	18,81	19,21	19,53	19,83	20,16	20,52	12,3%	0,41%
75	14,09	14,58	14,96	15,26	15,55	15,86	16,19	14,9%	0,50%
80	10,30	10,69	11,04	11,33	11,60	11,88	12,18	18,2%	0,61%
85	7,11	7,39	7,67	7,94	8,18	8,42	8,68	22,1%	0,74%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	24,2%	23,7%	24,1%	24,2%	24,5%	24,9%	25,6%	24,5%
65	26,6%	26,2%	26,9%	27,3%	27,6%	28,2%	29,1%	27,4%
70	28,2%	28,6%	29,7%	30,4%	31,2%	32,1%	33,2%	30,5%
75	28,1%	29,9%	31,7%	33,0%	34,3%	35,7%	37,4%	32,9%
80	25,5%	29,0%	32,0%	34,3%	36,3%	38,6%	41,2%	33,8%
85	20,3%	25,2%	29,4%	33,2%	36,5%	39,8%	43,4%	32,5%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	24,3%	24,3%	25,7%	27,0%	28,3%	29,8%	31,4%	27,3%
65	26,7%	27,0%	28,8%	30,5%	32,1%	34,0%	36,0%	30,7%
70	28,4%	29,6%	32,0%	34,4%	36,6%	38,9%	41,4%	34,5%
75	28,2%	31,1%	34,6%	37,8%	41,0%	44,2%	47,5%	37,8%
80	25,8%	30,7%	35,8%	40,4%	44,7%	49,1%	53,7%	40,0%
85	20,7%	27,6%	34,5%	41,0%	47,0%	52,8%	58,9%	40,4%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	24,1%	23,0%	22,5%	21,6%	20,7%	20,1%	19,9%	21,7%
65	26,4%	25,4%	25,0%	24,1%	23,2%	22,6%	22,4%	24,2%
70	28,1%	27,6%	27,4%	26,6%	25,9%	25,3%	25,2%	26,6%
75	27,9%	28,6%	28,8%	28,3%	27,8%	27,5%	27,6%	28,1%
80	25,3%	27,3%	28,2%	28,3%	28,2%	28,4%	29,0%	27,8%
85	20,0%	22,9%	24,5%	25,6%	26,4%	27,2%	28,4%	25,0%

Life expectancy and comparison with the Italian general population - APC model - all scenarios
Total (private employees and self-employed) - males - amount-weighted analysis

Pensioners and annuitants

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	23,93	24,91	25,76	26,49	27,21	27,94	28,68	19,9%	0,66%
65	19,62	20,53	21,36	22,08	22,75	23,44	24,14	23,1%	0,77%
70	15,55	16,39	17,15	17,84	18,49	19,12	19,77	27,2%	0,91%
75	11,79	12,53	13,22	13,85	14,45	15,04	15,64	32,6%	1,09%
80	8,54	9,09	9,69	10,24	10,77	11,31	11,84	38,7%	1,29%
85	5,93	6,25	6,69	7,16	7,61	8,05	8,50	43,5%	1,45%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	23,94	25,05	26,13	27,15	28,17	29,19	30,21	26,2%	0,87%
65	19,63	20,67	21,72	22,71	23,66	24,63	25,61	30,5%	1,02%
70	15,56	16,52	17,49	18,44	19,35	20,25	21,17	36,0%	1,20%
75	11,81	12,66	13,54	14,41	15,26	16,10	16,94	43,5%	1,45%
80	8,55	9,22	10,00	10,76	11,51	12,27	13,02	52,3%	1,74%
85	5,94	6,38	6,98	7,63	8,26	8,90	9,54	60,5%	2,02%

life expectancy per calendar year at certain ages - low scenario (long-term rate 1,25%)

age	2010	2015	2020	2025	2030	2035	2040	change	
								Total	annual average
60	23,91	24,77	25,40	25,85	26,28	26,72	27,18	13,7%	0,46%
65	19,60	20,40	21,02	21,47	21,86	22,27	22,70	15,8%	0,53%
70	15,53	16,26	16,82	17,27	17,65	18,02	18,41	18,5%	0,62%
75	11,78	12,41	12,91	13,31	13,68	14,03	14,38	22,1%	0,74%
80	8,52	8,97	9,39	9,74	10,06	10,38	10,70	25,6%	0,85%
85	5,91	6,12	6,41	6,71	6,98	7,24	7,51	27,2%	0,91%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	9,1%	10,1%	11,7%	12,7%	13,6%	14,7%	15,8%	12,5%
65	9,4%	10,8%	12,9%	14,2%	15,4%	16,6%	18,0%	13,9%
70	9,0%	11,2%	13,8%	15,7%	17,3%	18,9%	20,6%	15,2%
75	7,0%	10,6%	13,8%	16,4%	18,8%	21,0%	23,2%	15,8%
80	3,8%	8,3%	12,5%	15,9%	19,1%	22,2%	25,3%	15,3%
85	0,0%	3,9%	8,6%	13,4%	17,5%	21,6%	25,8%	13,0%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	9,1%	10,7%	13,3%	15,5%	17,6%	19,8%	22,0%	15,4%
65	9,5%	11,5%	14,7%	17,5%	20,0%	22,6%	25,2%	17,3%
70	9,1%	12,1%	16,0%	19,6%	22,8%	25,9%	29,1%	19,2%
75	7,1%	11,7%	16,6%	21,1%	25,4%	29,5%	33,5%	20,7%
80	4,0%	9,8%	16,1%	21,8%	27,3%	32,7%	37,9%	21,4%
85	0,3%	6,1%	13,4%	20,8%	27,7%	34,4%	41,1%	20,5%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	9,0%	9,5%	10,1%	10,0%	9,7%	9,7%	9,8%	9,7%
65	9,3%	10,1%	11,0%	11,1%	10,9%	10,8%	11,0%	10,6%
70	8,9%	10,3%	11,6%	12,0%	12,0%	12,0%	12,3%	11,3%
75	6,8%	9,5%	11,1%	11,9%	12,4%	12,8%	13,3%	11,1%
80	3,6%	6,8%	9,0%	10,3%	11,3%	12,3%	13,3%	9,5%
85	-0,3%	1,8%	4,0%	6,2%	7,8%	9,4%	11,2%	5,7%

Ann. 54   **Normal retirement pensioners and annuitants - projections**
Life expectancy and comparison with the Italian general population - APC model - all scenarios
Total (private employees and self-employed) - females - amount-weighted analysis

Pensioners and annuitants

life expectancy per calendar year at certain ages - mean scenario (long-term rate 2,00%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,07	27,79	28,45	29,05	29,66	30,31	30,99	14,5%	0,48%
65	22,54	23,23	23,88	24,47	25,05	25,66	26,31	16,7%	0,56%
70	18,16	18,82	19,44	20,01	20,57	21,15	21,76	19,8%	0,66%
75	13,95	14,56	15,15	15,68	16,22	16,77	17,34	24,3%	0,81%
80	10,17	10,69	11,23	11,74	12,22	12,72	13,25	30,3%	1,01%
85	7,07	7,48	7,93	8,38	8,81	9,24	9,69	37,1%	1,24%

life expectancy per calendar year at certain ages - high scenario (long-term rate 2,75%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,09	27,95	28,84	29,71	30,60	31,51	32,45	19,8%	0,66%
65	22,56	23,38	24,25	25,10	25,95	26,83	27,73	22,9%	0,76%
70	18,18	18,97	19,80	20,62	21,43	22,27	23,13	27,2%	0,91%
75	13,97	14,71	15,50	16,27	17,04	17,83	18,64	33,4%	1,11%
80	10,19	10,84	11,57	12,29	12,99	13,71	14,45	41,8%	1,39%
85	7,09	7,62	8,25	8,89	9,50	10,12	10,75	51,7%	1,72%

life expectancy per calendar year at certain ages - low scenario (long-term rate 1,25%)

age	2010	2015	2020	2025	2030	2035	2040	change Total	annual average
60	27,05	27,64	28,08	28,42	28,75	29,12	29,53	9,2%	0,31%
65	22,52	23,08	23,52	23,85	24,16	24,52	24,91	10,6%	0,35%
70	18,14	18,68	19,09	19,41	19,72	20,05	20,42	12,5%	0,42%
75	13,93	14,42	14,81	15,12	15,41	15,73	16,07	15,3%	0,51%
80	10,15	10,55	10,91	11,20	11,47	11,76	12,07	18,9%	0,63%
85	7,05	7,33	7,62	7,89	8,14	8,38	8,65	22,8%	0,76%

Spread pensioners and annuitants vs. general population

pensioners and annuitants (APC model Long-term rate 2,00%) - General population (mean scenario)

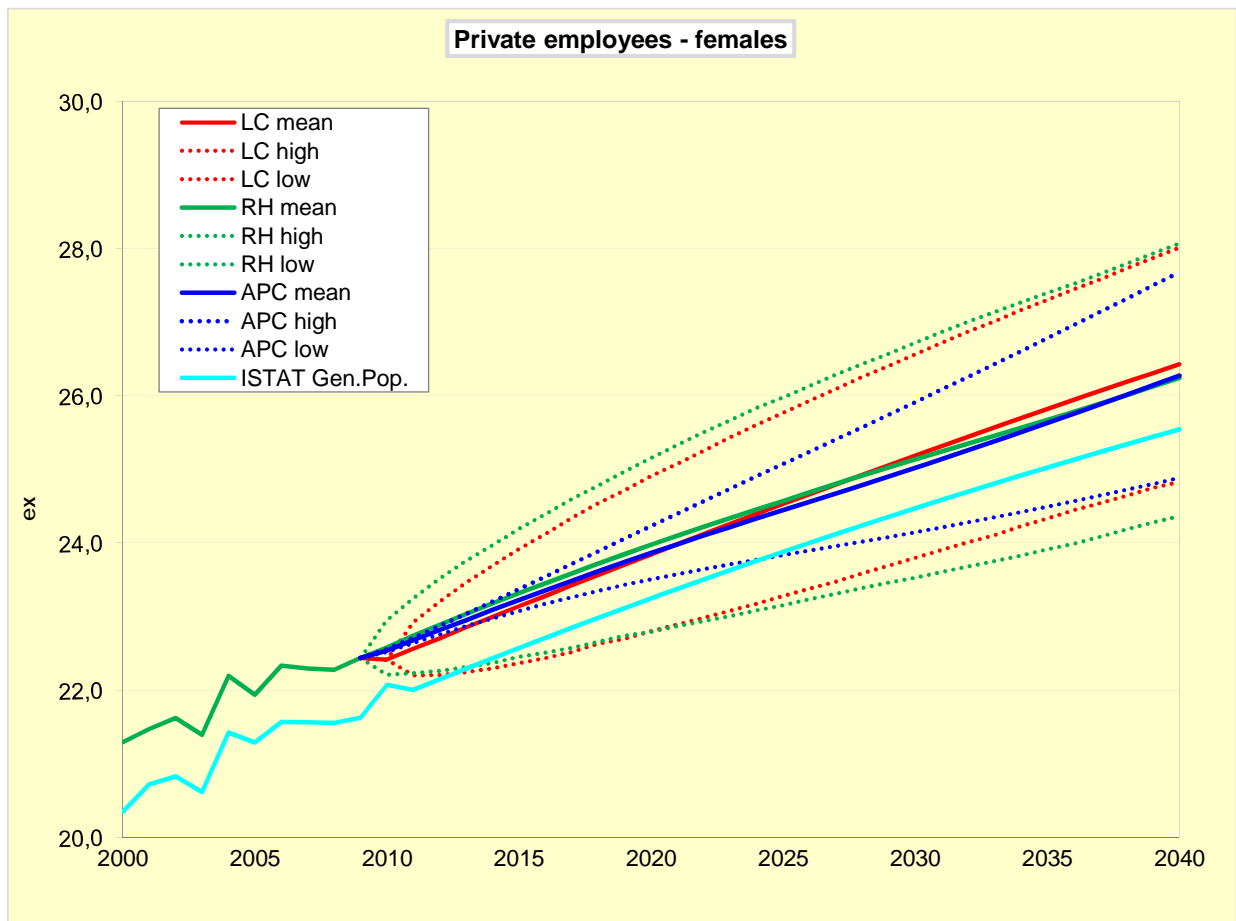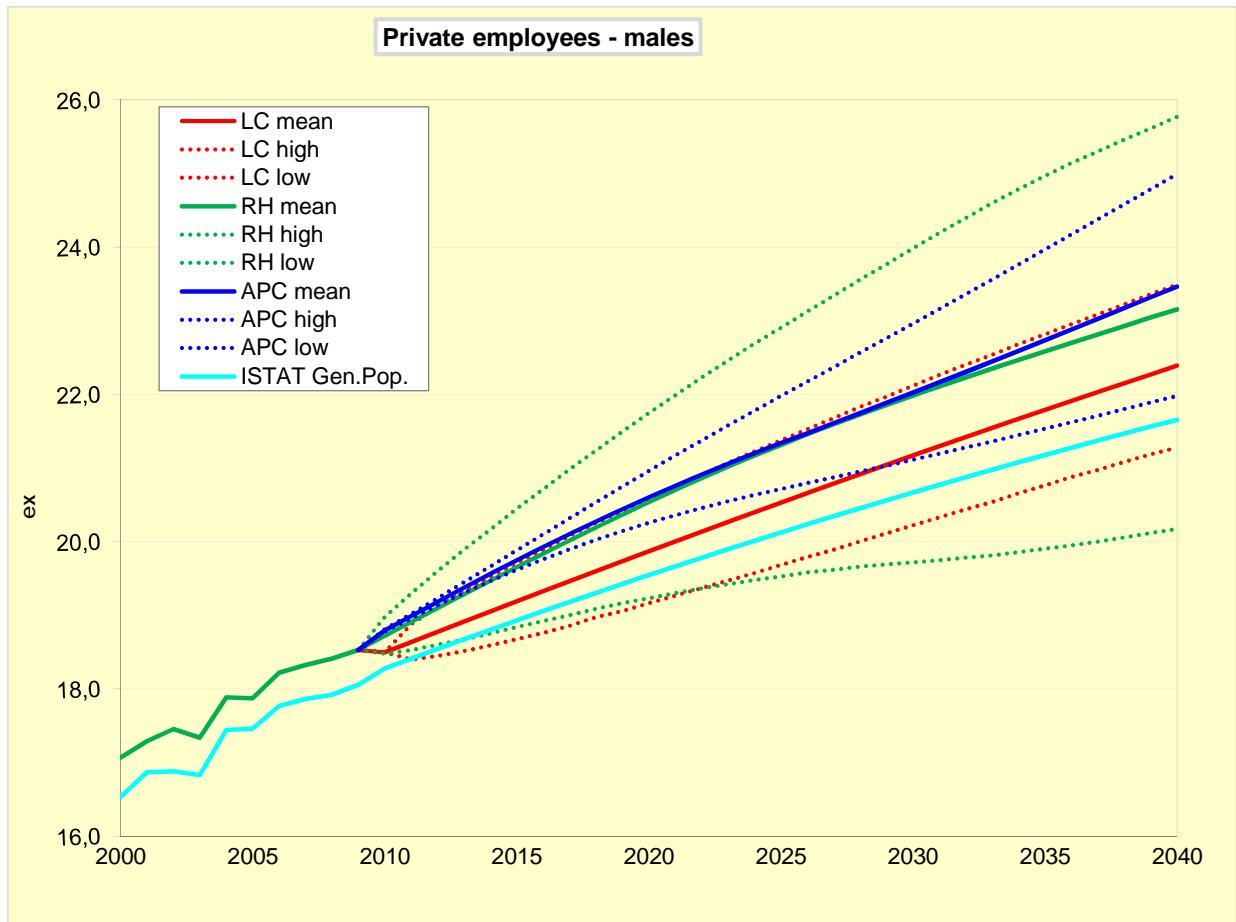| age	2010	2015	2020	2025	2030	2035	2040	Media
60	23,4%	22,9%	23,4%	23,6%	23,9%	24,4%	25,1%	23,8%
65	25,7%	25,4%	26,2%	26,6%	27,0%	27,7%	28,6%	26,7%
70	27,3%	27,7%	28,9%	29,7%	30,5%	31,5%	32,7%	29,8%
75	26,6%	28,5%	30,5%	31,9%	33,3%	34,8%	36,6%	31,7%
80	23,7%	27,3%	30,5%	32,9%	35,1%	37,6%	40,3%	32,5%
85	19,3%	24,3%	28,7%	32,7%	36,1%	39,5%	43,3%	32,0%

pensioners and annuitants (APC model Long-term rate 2,75%) - General population (high scenario)

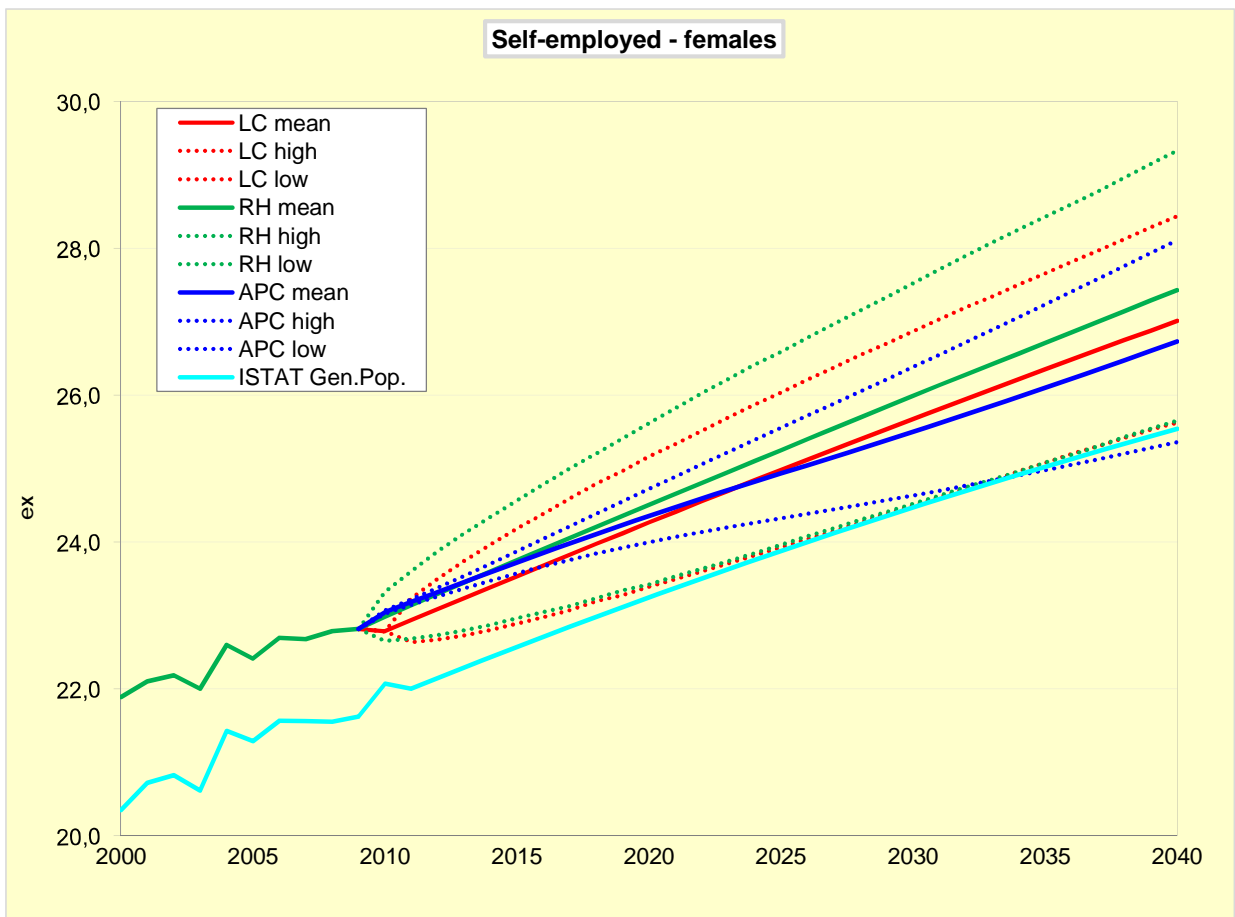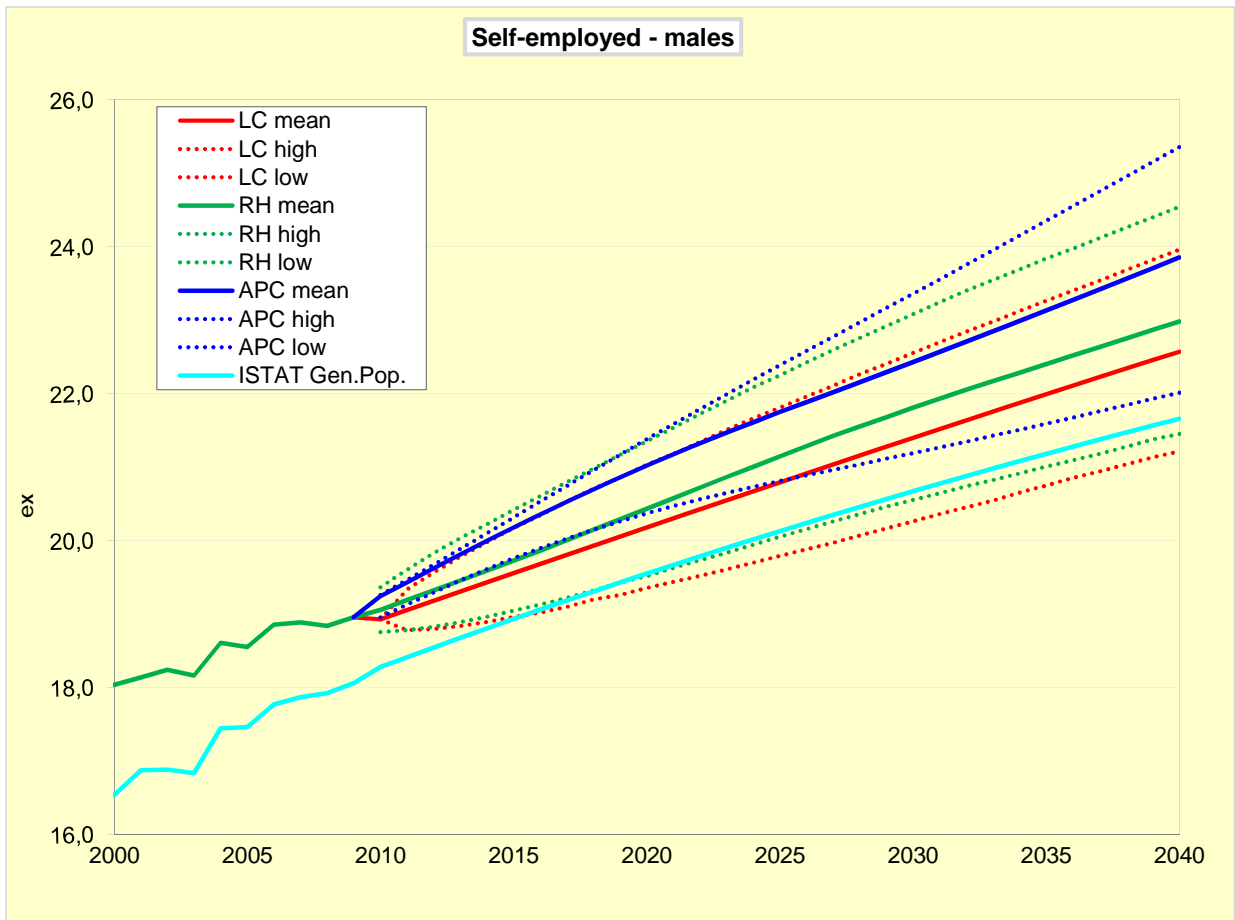| age	2010	2015	2020	2025	2030	2035	2040	Media
60	23,5%	23,6%	25,0%	26,4%	27,7%	29,3%	31,0%	26,6%
65	25,8%	26,2%	28,1%	29,9%	31,6%	33,5%	35,6%	30,1%
70	27,4%	28,7%	31,3%	33,7%	36,0%	38,4%	41,1%	33,8%
75	26,8%	29,8%	33,5%	36,8%	40,0%	43,4%	46,9%	36,7%
80	23,9%	29,0%	34,4%	39,2%	43,6%	48,3%	53,0%	38,8%
85	19,6%	26,8%	33,9%	40,7%	46,8%	52,8%	59,0%	39,9%

pensioners and annuitants (APC model Long-term rate 1,25%) - General population (low scenario)

age	2010	2015	2020	2025	2030	2035	2040	Media
60	23,3%	22,2%	21,8%	20,9%	20,0%	19,5%	19,3%	21,0%
65	25,6%	24,6%	24,3%	23,4%	22,5%	22,0%	21,8%	23,4%
70	27,1%	26,7%	26,6%	25,9%	25,2%	24,7%	24,5%	25,8%
75	26,4%	27,3%	27,5%	27,1%	26,7%	26,5%	26,6%	26,9%
80	23,4%	25,6%	26,7%	26,9%	26,8%	27,2%	27,8%	26,3%
85	18,9%	22,0%	23,7%	25,0%	25,8%	26,7%	28,0%	24,3%

Life expectancy (at age 65) trend
private employees

Life expectancy (at age 65) trend
self-employed

Self-employed - males

- LC mean
- LC high
- LC low
- RH mean
- RH high
- RH low
- APC mean
- APC high
- APC low
- ISTAT Gen.Pop.

Self-employed - females

- LC mean
- LC high
- LC low
- RH mean
- RH high
- RH low
- APC mean
- APC high
- APC low
- ISTAT Gen.Pop.

Life expectancy (at age 65) trend
Total (private employees and self-employed)

Total (priv. empl. and self-empl.) - males

Legend:
- LC mean
- LC high
- LC low
- APC mean high income amount weighted
- APC high high income amount weighted
- APC low high income amount weighted
- APC mean
- APC high
- APC low
- ISTAT Gen.Pop.

Total (priv. empl. and self-empl.) - females

Legend:
- LC mean
- LC high
- LC low
- APC mean high income amount weighted
- APC high high income amount weighted
- APC low high income amount weighted
- APC mean
- APC high
- APC low
- ISTAT Gen.Pop.