



TITLE: Construction of a prospective life table based on the Algerian retired population mortality experience
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Key words: mortality forecasting, Experience mortality, reference mortality, retirees, Algeria.

Purpose of your paper: The aim of the present paper is to construct a prospective life table adapted to the retired population mortality experience. Mortality data for retired population are only available for the age range [45-95] and for the period [2004-2013]. The use of the conventional stochastic mortality models is not supposed to provide a robust mortality forecast given the shortness of the historical data series. To ensure a robust forecasting, we use the global population mortality as a reference mortality. This last is projected by considering a constrained evolution of the age specific mortality ratio to avoid incoherence in the resulted projection.

Synopsis: Life expectancy is still improving in developing countries. This improvement is almost different by sub-populations. Mortality of the retired population is often lower compared to the global population. The use of dynamic life-tables based on the global population data might distort all calculations when used for pension plan reserving. The use of life tables adapted to the retired population mortality experience is more suitable for this issue. Usually, the data of the insured population is not available for a long period allowing to do a robust forecast. Also, this data is issued from reduced samples of population compared to the global population which leads to important irregularities related to the reduced population at risk. In such a case, the direct use of the prospective mortality models such Lee-Carter (Lee and Carter, 1992) or Cairns-Blake-Dowd models (Cairns et al., 2006) to predict the future mortality trend is not practical at all. For that, some methods were proposed to consider the particularities of the insured population mortality while ensuring a good fitting quality and a strong forecasting capacity. These methods aim to position the experience life tables to an external reference (Planchet, 2005; 2006). The main idea was to define a regression relationship between the experience death rates and the reference death rates. This process is principally based on the Brass Logit system (Brass, 1971). The use of the reference life table to estimate mortality schemes starting from incomplete or imperfect mortality data has become a common practice for experience life-tables construction both in developed and developing countries. Kamega (2011) used the same approach to estimate actuarial life tables for some sub-Saharan African countries with taking the French life tables as an external reference (TGH05 and TGF05). The main objective for the present work is to construct a prospective life table based on the mortality data of the Algerian retired population. The data is available for ten years (2004 to 2013) and for the ages [45 - 95] arranged in five-age intervals. This data concerns the observed number of deaths and the numbers of survivors by the end of each year of the observation period. In a previous work (Flici, 2016), we constructed a prospective life-table based on the global population mortality data. The length of the observed data allows doing a strong forecast. However, the forecasting results lack some coherence regarding the male-female coherence. For this, we suggested the use of coherent mortality models. In the present work, the global population mortality will be used as a reference to position and forecast the mortality experienced by the retired population.



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