Comparing strategies for matching mortality forecasts to the most recently observed data. What is the best trade-off between short-term accuracy and long-term robustness?

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Abstract

Mortality forecasting is highly relevant. Ideally, mortality forecasts should be accurate, plausible and robust.

A problem with most mortality forecasting methods however, is that in robustly forecasted life expectancy, the forecasted life expectancy in the first years does not necessarily align perfectly with either the most recently observed life expectancy or with new observations. This is not an ideal situation for users of the mortality forecasts who are interested in the short-term (e.g. 5-year horizon). On the other hand, adjusting the life expectancy, for instance by a complete shift of the forecasts to either the most recently observed values or new observations, assuring accurate and plausible forecast in the short-term, could damage the long-term robustness, which is again not ideal for other users of the mortality forecasts. Adjusting the first years of the forecast to the new observations, whereas keeping the later years unadjusted, would perhaps be preferred to ensure accuracy, plausibility and robustness.

There are various options for incorporating adjustment to recently observed and new values in the forecasting methodology and thus ensuring accurate and plausible short-term mortality forecasts. These options however would lead to different outcomes and could differently damage the long-term robustness.

Our objective is to evaluate different options to adjust the forecasted values to recently observed and newly observed value, in order to determine the best method to preserve both short-term accuracy, long-term robustness and plausibility.

We shall investigate the options of no adjustment, a complete shift, and weighting of the previous two options to find the optimal combination. Using the Lee-Carter method, we shall compare pseudo-forecasts with actual outcomes. We will do so for several European countries using HMD data and different fitting periods.

The best method for the data will depend on factors such as the presence of structural breaks in the mortality trend and the amount of noise in the data. Additional analysis will be performed to validate the best method (e.g. remove or include noise in the data), given characteristics of the data.