Smoothing trends and seasonality in short-term mortality forecasting

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Thursday 7 Mar 2024 | 2.30 p.m.
Room Benvenuti
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Excess mortality is a useful measure to quantify the death toll of various health shocks, from the impact of seasonal influenza to the effects of heatwaves, and pandemics of infectious diseases. We propose a forecasting strategy for forecasting baseline seasonal mortality, starting from modulation models for seasonal death counts (Eilers et al., 2008) and combining them with the P-splines forecasting approach (Currie et al., 2004). We use a penalized generalized linear model (PGLM) with Poisson errors, and forecasting is a natural consequence of the smoothing process. Two specifications of the model are considered 1) smooth trends and 2) smooth trends and smooth seasonal components. An illustration is shown for Sweden using data from Statistics Sweden to forecast mortality during the COVID-19 pandemic by age groups.

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