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# Regression Analysis of Mortality with Respect to Seasonal Influenza in Sweden 1993-2010

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## Abstract

Influenza is widely considered as a cause of substantial morbidity and mortality nearly every year. Apart from influenza, several studies account also Respiratory Syncytial Virus (RSV) and Norovirus (NoV) as responsible for the amount of excess deaths and hospitalizations every year. Poisson regression models were constructed to predict the excess mortality, caused by these three infections and to quantify the burden of each infection to excess mortality. The data are weekly number of reported deaths and laboratory confirmed cases of the viruses in Sweden for the period 1993-2010. Generalized linear models and generalized additive models were used, with number of deaths as response variable and reported cases, along with week and season number as explanatory variables to capture the seasonal variability of mortality. Baseline mortality was proposed, by setting the infections effects to zero and excess mortality was calculated. The amount of excess mortality varies according to the different approaches for each infection. All three viruses contributed to excess mortality. Week was a good predictor to capture the seasonal variation of the data and GLM provided more accurate predictions than GAM. In summary, every year in Sweden there are approximately 1400 excess deaths attributed to influenza, 200 attributed to RSV and 300 attributed to NoV on average. These numbers change slightly if they refer only to elderly people.

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