

Publication

A Bayesian generalized age-period-cohort power model for cancer projections

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 2730122**Author(s)** Juergens, Verena; Ess, Silvia; Cerny, Thomas; Vounatsou, Penelope**Author(s) at UniBasel** [Vounatsou, Penelope](#) ;**Year** 2014**Title** A Bayesian generalized age-period-cohort power model for cancer projections**Journal** Statistics in medicine**Volume** 33**Number** 26**Pages / Article-Number** 4627-4636**Keywords** cancer projection, Bayesian inference, power model, Nordpred, lung cancer mortality

Age-period-cohort (APC) models are the state of art in cancer projections, assessing past and recent trends and extrapolating mortality or incidence data into the future. Nordpred is a well-established software, assuming a Poisson distribution for the counts and a log-link or power-link function with fixed power; however, its predictive performance is poor for sparse data. Bayesian models with log-link function have been applied, but they can lead to extreme estimates. In this paper, we address criticisms of the aforementioned models by providing Bayesian formulations based on a power-link and develop a generalized APC power-link model, which assumes a random rather than fixed power parameter. In addition, a power model with a fixed power parameter of five was formulated in the Bayesian framework. The predictive performance of the new models was evaluated on Swiss lung cancer mortality data using model-based estimates of observed periods. Results indicated that the generalized APC power-link model provides best estimates for male and female lung cancer mortality. The gender-specific models were further applied to project lung cancer mortality in Switzerland during the periods 2009-2013 and 2014-2018. Copyright © 2014 John Wiley & Sons, Ltd.

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