BAYESIAN SEMIPARAMETRIC SURVIVAL MODEL OF THE BSE EPIDEMIC AND SURVEILLANCE

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A lot of uncertainties are intertwined with surveillance and risk management of BSE and the associated costs. The uncertainties and difficulties associated with quantitative assessments stem from the basic epidemiological process of the unknown true BSE prevalence in the animal population and the dynamics of this process. Survival modelling techniques with explicit conditioning to event history (including unobserved events) together with modern Bayesian inference methods provide a flexible framework to such multifactorial problem with complicated dynamics and uncertainties, with only partial or indirect observations. The approach combines the epidemio-biological process and the observational process. The former is based on semiparametric survival modelling within the age-period-cohort structure. The latter links the available observations to the underlying unknown biological process, and this facilitates probabilistic (Bayesian) inference using MCMC simulation techniques. The model will be used to make predictions of the development of the epidemic and to compare alternative surveillance and risk management strategies.