# Abstract

The hazard function, also called the risk function or intensity function, is usually used to model survival data or other waiting times, such as unemployment times. In contrast to the proportional hazard model, the additive risk model assumes that the hazard function is the sum of, rather than the product of, the baseline hazard function and a non-negative function of covariates. We propose to introduce the covariates into the model through a Gamma hazard function, while the baseline hazard function is left unspecified. Following the Bayesian paradigm, we obtain an approximation to the posterior distribution using Markov Chain Monte Carlo techniques. The subject-specific survival estimation is also studied. A real example using unemployment data is provided.



**Key words**: Additive risk models, Hierarchical models, MCMC methods, Non-proportional hazards, Predictive distributions, Survival data, Unemployment data.
**AMS Classification**: 62E25, 62F15, 62M20.