Survival of lung cancer patients in the HALLUCA study: An analysis with frailty models

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Between April 1996 and September 1999 a prospective population-based multi-centre study was performed to evaluate patterns of care in patients with lung cancer. This so called HALLUCA Study recruited all newly diagnosed lung cancer patients in the districts of Halle and Dessau, a region of about 1.5 million inhabitants in the eastern part of Germany. 1,696 lung cancer patients were included, minimal follow-up time was 12 months, median follow-up time 33 months (Bollmann et al. 2004). 1349 patients (79.5%) died until the end of follow-up, median survival in the study population was 9.3 months.

We reanalysed the data with two different types of frailty models focussing on relevant predictors of survival. In a first step univariate gamma and log-normal frailty models are used and compared with a conventional Cox regression analysis (without random effect) to assess the effect of unobserved heterogeneity in the study population. In a second step multivariate shared gamma and log-normal frailty models are applied to additionally judge on a potential cluster effect (diagnostic units, Kuss et al. 2008).

To this task, recently proposed (Liu et al. 2007a,b) powerful and flexible programming tools for mixture models are used. In the discussion advantages and limitations of different frailty approaches are discussed and an outlook to further research is given.

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