Karin Fremling: Mathematical properties of epidemiological case-cohort designs

Handledare: Juni Palmgren och Samuli Ripatti

Sammanfattning

In this thesis, I describe, and relate to each other, central concepts in event history analysis, including Cox proportional hazards model, the log-linear model and the illness-death model. We are interested in the difference in bias and precision when including, or excluding, the baseline prevalent cases in an analysis of effects of genotype on the hazard using a case-cohort design. I generate populations, according to two models, where the cases, myocardial infarction, depend on the genotype. In one of the models there is a differential selection due to death prior to baseline, expected to distort the genotype-disease association. The case-cohort design is then used in the simulations to define prevalent and incident cases of myocardial infarction, depending on whether the event happened before or after the simulated start of the study. The results do not indicate any strong selection bias from including prevalent cases in the case-cohort analysis.