

Covariates and prevalent cohort survival data: is there more than meets the eye?

Pierre-Jérôme Bergeron
pierrejerome.bergeronmcgill.ca
Department of mathematics and statistics
McGill University
Montréal, Québec, H3A 2K6

Abstract

In standard linear regression, though one samples from the joint distribution of the variable of interest and covariates, the analysis is carried out conditionally because the marginal distribution of the covariates is considered ancillary to the parameters of interest. In prevalent cohort data, individuals are sampled preferentially with respect to their lifetimes and their covariates are therefore also sampled with a bias. The question is whether the marginal distribution holds any information about the parameters and, if so, should one adjust the usual methods to account for it? We present an adjusted (joint) likelihood approach and compare it with the conditional approach. It is shown that under some regularity conditions, maximum likelihood estimates under the correct and incorrect likelihoods are the same. Our simulations illustrate that the point estimates are the same, though the asymptotic distributions may be different.