

Doubly robust inference procedures for analyzing the cancer registry data

Sho Komukai, skomukai@biostat.med.osaka-u.ac.jp

Satoshi Hattori, hattoris@biostat.med.osaka-u.ac.jp

Division of Biomedical statistics, Department of Integrated Medicine,
Graduate School of Medicine, Osaka University

Cancer registries are useful to various research questions for cancer populations, such as the comparisons for the cancer prognosis among nations. Since the cancer registry data has no information about cause of death, one of the measures for cancer prognosis based on the cancer registry data is a net survival, defined as a survival probability if a patient would not die due to reasons other than the cancer. For net survival, a doubly robust estimator was proposed in the presence of the covariate-dependent censoring (Komukai and Hattori, 2017). A relative survival ratio is also used as alternative to the net survival, and it is defined as the ratio between the survival probability of the cancer population and that of the general population. In this research, we propose a doubly robust estimator for the relative survival ratio. Although the inference for the net survival by Komukai and Hattori (2017) relies on untestable assumptions on dependence among time-to-events and censoring, it is possible to verify the underlying assumption in the inference for the relative survival ratio. We also propose a doubly robust test to assess the underlying assumption for relative survival ratio.