Estimation of Cause-Specific Invasive Breast Cancer Cumulative Incidence in the Presence of Competing Risks

Sharareh Taghipour[*], University of Toronto
Bart Harvey, University of Toronto
Joanne Fernandes, University of Toronto

Abstract

In many clinical studies, participants may experience events other than the event of interest over the follow-up period. Competing risks alter the probability of the occurrence of an event, so they should be taken into account in predictive modeling. Standard Cox proportional hazards models may overestimate the risk of disease by ignoring the competing risks. Cause-specific hazard and Fine-Gray models are two methods commonly used to estimate the cause-specific cumulative incidence function in a competing risks setting. In this paper, we use data from the Canadian National Breast Screening Study (CNBSS) and estimate cumulative incidence curves for invasive breast cancer incidence and deaths due to competing risks. The CNBSS data consist of two randomized controlled trials designed to evaluate the effect of mammography screening for women aged 40-59. We consider prognostic factors collected at the time of enrolment including demographic, life style, family history of breast cancer, and personal history of breast disease and investigate their association with the event of interest (cancer incidence) and with deaths from competing risks which preclude the occurrence of breast cancer incident. Cause-specific hazard functions for cancer incidence and competing risks are also modeled.

Keywords: Invasive breast cancer; Cox PHM; Cause-specific hazards; Cancer incidence; Competing risks; Fine-Gray model.

---

[*] Presenting author