



The University of Chicago
Department of Statistics

MASTER'S THESIS PRESENTATION

BO PENG

Department of Statistics
The University of Chicago

Investigating the Effect of Estrogen and Progesterone Hormone Receptors on Survival Times of Women with Two Incidents of Primary Breast Cancer: A Comparison of Results Using Kaplan-Meier, Cox Proportional Hazards, and Discrete Person-Time Logistic Regression

WEDNESDAY, July 25, 2012, at 2:00 PM
110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

In breast cancer patients, the expression levels of hormone receptors (HR) are routinely tested; the most commonly tested biomarkers are Estrogen Receptor (ER) and Progesterone Receptor (PR). Testing positive (“ER+” or “PR+”) indicates over-expression, and is typically associated with a more favorable prognosis in the short- to mid-term (<15 years). For women with two cases of primary breast cancer, HR readings can be taken for each cancer, and they can differ. The biological relationship of the ER and PR statuses between the first and second cancers is currently unknown, and their combined effect on survival rates has not previously been studied. Various survival analysis methods are used to gain insight into the effects of ER and PR statuses for both cancers on survival. I separated the observations into two groups by patient lag time, which I define as the time in months between diagnosis dates of the first and second cancers for a patient. The primary covariates of interest are the ER and PR statuses from both cancers plus any interactions, and the survival time for each patient is counted in years beginning at the time of diagnosis of the second cancer. Kaplan-Meier curves are drawn to illustrate general trends of survival among patients with each combination of HR status in a non-parametric format. From these curves it is clear that there are non-proportional hazards for patients with different groups. To circumvent this issue, two variations of the discrete person-time logistic model were fit: first using total survival, i.e. wherein the event of interest is death by any cause, and finally using a competing risks model, wherein the event of interest is death by breast cancer, and death by other causes is considered a competing risk.

For information about building access for persons with disabilities, please contact Matt Johnston at 773.702-0541 or send an email to mhj@galton.uchicago.edu. If you wish to subscribe to our email list, please visit the following web site: <https://lists.uchicago.edu/web/arc/statseminars>.