

Bayesian Inference for the Lead Time in Periodic Cancer Screening

Dr. Dongfeng Wu

Department of Mathematics and Statistics

Mississippi State University

ABSTRACT: This project develops a probability distribution for the lead time in periodic cancer screening examinations. The general aim is to provide statistical inferences for the lead time, the length of time the diagnosis is advanced by screening. The lead time is distributed as a mixture of a point mass and a piecewise continuous distribution. Simulation studies are carried out, using the HIP data, to estimate under different screening time intervals, the proportion of breast cancer patients who truly benefit from the periodic screening exams and the proportion that do not. The mean, the mode, the variance and the density curve of the lead time are also provided. This provides important information to policy makers regarding the screening period and the long-term benefit for women who take part in the periodic screening exams. Though the study is focused on breast cancer screening, it is also applicable to other kinds of chronic disease.