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Inference of long term effects and over-diagnosis in periodic cancer screening

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Abstract

This project develops a probability model for evaluating long-term effects due to regular screening. Initially asymptomatic people who take part in cancer screening were categorized into four mutually exclusive groups: True-early-detection, No-early-detection, Over-diagnosis, and Symptom-free-life. For each case, probability formulae were derived rigorously. Simulation studies using the HIP (Health Insurance Plan for Greater New York) breast cancer study's data provide estimates for these probabilities and corresponding credible intervals. These probabilities change with a person's age at study entry, screening frequency, screening sensitivity, and other parameters. We also allow human lifetime to be subject to a competing risk of death from other causes by using the actuarial life table from Social Security Administration. The model can provide policy makers with important information regarding the distribution of individuals participating in a screening program who eventually fall into one of the four categories.

Biography

Dongfeng Wu is an associate professor in the Dept of Bioinformatics and Biostatistics, School of Public Health and Information Sciences, University of Louisville. She has published more than 25 papers in reputed journals and serving as an editorial board member of the *Journal of Biometrics and Biostatistics.* She is the Editor-in-Chief of the journal *Open Access Medical Statistics*.