

Speaker:

Karen Kafadar, PhD

Rudy Professor of Statistics and Physics, Indiana University;
Adjunct Professor, Biostatistics, Univ. of Colorado-Denver

Coauthor:

Philip C. Prorok, PhD

Biometry Research Group, Division of Cancer Prevention, National Cancer Institute

The effect of length biased sampling in randomized cancer screening trials

Friday, April 6, 11A.M. – 12 P.M. SPHIS Room 103

Length biased sampling (LBS) arises when items are sampled in proportion to their values on a random variable of interest. For example, older units may be more likely to be sampled simply because they have been in service for a longer period of time. The effect of this sampling bias on the mean is well known when the length-biased-sampled random variable, say Y , is observable.

A more difficult situation arises when Y is not observed, but the outcome of another random variable, Z , is observed and is known to be correlated with Y . This arises in evaluating screening programs: screening identifies cases during the preclinical phase, the duration of which often is positively correlated with the clinical duration of the disease. Longer preclinical durations are more likely to be screen-detected than shorter ones, but may also have better prognosis, irrespective of screening. This situation arises with any periodic routine inspection program. We demonstrate theoretical implications and illustrate practical aspects of the LBS effect.