



STATISTICS SEMINAR Spring 2019

Friday, May 3rd, 2019
2:30-3:30 pm
Room 132, Townsend Hall

Efficiency of Incorporating Retesting Outcomes for Estimation of Disease Prevalence

Aiyi Liu, Ph.D.

*Senior Investigator and Acting Chief
Biostatistics & Bioinformatics Branch
NICHD, National Institute of Health (NIH)
Fellow of American Statistical Association (ASA)
Fellow of International Statistical Institute (ISI)*

Abstract: Group testing has been widely used as a cost-effective strategy to screen for and estimate the prevalence of a rare disease. While it is well-recognized that retesting is necessary for identifying infected subjects, it is not required for estimating the prevalence. However, one can expect gains in statistical efficiency from incorporating retesting results in the estimation. Research in this context is scarce, particularly for tests with classification errors. For an imperfect test we show that retesting subjects in either positive or negative groups can substantially improve the efficiency of the estimates, and retesting positive groups yields higher efficiency than retesting a same number or proportion of negative groups. Moreover, when the test is subject to no misclassification, performing retesting on positive groups still results in more efficient estimates.

Bio: Dr. Aiyi Liu received his BS in mathematics and MS in statistics, both from the University of Science and Technology of China, and his PhD from the University of Rochester, NY. He is currently a senior investigator in the Biostatistics & Bioinformatics Branch, the National Institute of Child Health and Human Development, NIH. Prior to NIH, Dr. Liu was a faculty at Georgetown University Medical Center. Dr. Liu's research interests in statistical methods development center around sequential methodology and adaptive designs, robust methods for multidimensional outcomes, evaluation of complex diagnostic biomarkers, group testing methods, and methods for semicontinuous outcomes. He has authored/coauthored nearly 100 methods papers on various topics. Dr. Liu is an elected fellow of the American Statistical Association and International Statistical Institute.