Editorial

This issue of *Statistics and Its Interface* is a special issue devoted to *Missing Data and Imputation*. Missing data are frequently encountered in statistics. Simply ignoring the missing data and analyzing complete cases only often leads to serious bias and loss of efficiency while we perform statistical inference. As a result, statistical analysis with missing data is an area of extensive research for the last two decades.

Imputation is a tool for handling missing data. It can be viewed as a way of obtaining Monte Carlo approximation to the conditional expectation of a statistic given observed data. Multiple imputation, pioneered by Donald Rubin, has been a popular choice for imputation which uses the Bayesian framework to generate imputed values. Fractional imputation is a frequentist version of multiple imputation which is more suitable for survey data.

We have assembled several leading experts on the missing data analysis. They contributed articles that cover a broad range of topics related to missing data analysis. Specifically, three theoretically oriented papers are collected: Chen and Ibrahim made a theoretical comparison of several missing data methods in linear regression model, Chen provided a unified treatment on the use of empirical likelihood method for missing data, and Shao and Zhao gave a rigorous theoretical treatment of estimation in longitudinal studies with nonignorable missing. Also, five methodology papers are included: Yang, Kim, and Zhu considered fractional imputation for mixed models with nonignorable missing, Lee, Alam, and Noh considered using the h-likelihood method to estimate treatment effects under selection bias, Shao provided an interesting discussion on estimation and imputation in linear regression problem with arbitrary missingness, Yang, Kim, and Shin considered quantile estimation with missing data using fractional imputation, and Dong and Zhu considered a novel estimation method in single-index model with missing values. Finally, we have two application papers: Liu, Meng, Chen, and Alegria discussed an interesting application of multiple imputation and Helenowski and Demirtas presented an application of semi-parametric approach for imputing mixed data. We wish to thank all authors, the guest editor, and the reviewers for making this stimulating and useful special issue possible.

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