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Department of Statistics

MASTER'S THESIS PRESENTATION

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The Effect of Drop-Out Mechanisms on Three Estimation Methods
for Longitudinal Data

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ABSTRACT

Longitudinal data analysis is widely used in field of clinical trials and health related researches. In such trials, patients are treated over a period of time and observations are taken periodically at a number of time points. Some patients do not complete the scheduled follow-up visits for a variety of reasons and their subsequent measurements are missing. These patients are usually classified as "drop-outs", which made the analysis of longitudinal data more difficult. In this thesis, we consider the drop-outs based on four mechanisms: Drop-out Complete at Random (DCAR), Drop-out at Random (DAR), Drop-out Not at Random (DNAR) and a Mixture of all three. Simulations were carried out to evaluate the performances of three estimation methods: Generalized Estimating Equations (GEE), Generalized Linear Mixed-Effects Model (GLMM) and Pattern-Mixture Model (PMM) under nine different clinical trial situations. From the results, the goodness of estimations varies with different drop-out mechanisms. All three methods behave well in DCAR cases, and GLMM outperforms in DAR cases. For DNAR and Mixture mechanism, the choice of pattern for pattern mixture model and further discussions will be provided.

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