

# ACMS Statistics Seminar

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**Tues, April 11, 2017**  
**154 Hurley Hall**  
**4:00 – 5:00 PM**



## **Using Survival Information in Truncation by Death Problems Without the Monotonicity Assumption**

In some randomized clinical trials, patients may die before the measurements of their outcomes. Even though randomization generates comparable treatment and control groups, the remaining survivors often differ significantly in background variables that are prognostic to the outcomes. This is called the truncation by death problem. Under the potential outcomes framework, the only well defined casual effect on the outcome is within the subgroup of patients who would always survive under both treatment and control. Because the definition of the subgroup depends on the potential values of the survival status that could not be observed jointly, without making strong parametric assumptions, we cannot identify the casual effect of interest and consequently can only obtain bounds of it. Unfortunately, however, many bounds are too wide to be useful. We propose to use detailed survival information before and after the measurements of the outcomes to sharpen the bounds of the subgroup casual effect. Because survival times contain useful information about the final outcome, carefully utilizing them could improve statistical inference without imposing strong parametric assumptions. Moreover, we propose to use a copula model to relax the commonly invoked but often doubtful monotonicity assumption that the treatment extends the survival time for all patients.

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