



# THE UNIVERSITY OF CHICAGO

Department of Statistics

## MASTER'S THESIS PRESENTATION

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Investigations into Cox Hazards Models for Clinical Trial Data

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Jones 304, 5747 S. Ellis Avenue

### ABSTRACT

Prostate cancer represents one of the most common diagnosis in the United States, and although it has a low fatality rate, treatments often come with significant quality of life issues and other hazards. Therefore, although extended androgen deprivation treatment is already in use, there is value in examining the value of the treatment. The data set analyzed here has a collection of demographic covariates as well as a variety of potential endpoints, of which overall survival was chosen. I begin by summarizing the data and examining the marginal one-dimensional distributions. Moving forward, I investigate the univariate Cox proportional hazards model for each of the variables in order to examine the individual impact of the covariates. From there I move into examining different methods of modelling the effect of age at diagnosis before settling on a time-dependent data model. Finally, the complete multivariate model is fit. In brief, the interaction of treatment and intercurrent hypertension is found to be significant is associated with an increase of 29.4% on the hazard rate. The interaction of treatment and initial tumor size is also found to be significant and has a decrease of 1.4% in the hazard rate. Finally, the treatment arm itself is not found to be significant but does have a -2.31% effect on the hazard rate.