

**Department of Epidemiology and Biostatistics  
Biostatistics Seminar**

Thursday, Apr. 17<sup>th</sup>, 2014  
12:00pm - 1:00pm -- WG73

**“Beta Regression and Its Application to European Quality of Life –  
Five Dimensions (EQ-5D)”**

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**Abstract:** European Quality of Life – Five dimensions (EQ-5D) is a patient reported outcome (PRO) measure that is broadly used in clinical and social economical evaluations and population surveys. EQ-5D scores often include spikes at certain values, and are not normally distributed. Recent modeling strategy for EQ-5D emphasized on a two-part model, one fitted a logistic model for the probability of reaching the maximum score 1.0, and another fitted the rest scores by either a least squares or a quantile regression. However, the two-part model is inadequate when the spike corresponding to perfect health is not prominent. It also introduces a discrepancy between the link functions used in the two separated models. As ongoing research, we proposed a modified two-part method. The first part is a logistic model for the probability of perfect health (score 1) or death (0 or below) depending on the prominence. The second part is a Beta regression for the rest scores. The modified two-part model has an interpretable link function between the two parts and can be adapted for other utility or quality of life scores due to the flexibility of Beta function.

In this talk, I will introduce methods for modeling EQ-5D and then discuss the Beta regression for EQ-5D. The talk is based on a joint work with Xiaofeng Wang, PhD (Cleveland Clinic), Irene Katzan, MD (Cleveland Clinic).