

CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES
COLLOQUIUM

Friday, March 3

3:00 – 4:00 PM

Maria Sanford, Room 101

**CONSIDERATIONS FOR REGRESSION
MODELS WITH ORDINAL OUTCOMES
USING A LOG AND IDENTITY LINK**
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Abstract: This is a continuation of our adventure into building models for odds and probabilities, with a focus on methods in health and medical sciences. Logistic regression (LR) allows data analysts to estimate the odds (and odds ratio) of a binary outcome based on covariates using a logit link. LR can be modified to allow ordinal and nominal outcomes. One consideration in using LR is a potential to misinterpret odds as probabilities. This topic has been discussed previously. We now extend the discussion to other regression models.

To bypass the interpretation issue, models such as the Log-Binomial Regression model (LB) and Log-cumulative probability model (LCPM) have been proposed for binary and ordinal outcomes, respectively. Both models use the log link instead of the logit link. A strength of these models is the estimation of probability and risk ratios, but the constraints in these models can make statistical inference difficult in certain settings. We will discuss findings and further expand the discussion to a recent model involving the identity link for ordinal outcomes which allows for the estimation of probability and risk differences.

This talk will start with an introduction to linear models and then bridge to generalized linear models for the estimation of odds and probabilities. The goal is to raise awareness of potential challenges of each regression model. Several results presented are in collaboration with Dr. Gordon H. Fick (Emeritus) from the University of Calgary.

This talk is for an audience with an introductory understanding of probability and linear regression models. Attendance of the previous talks is not required.

To join us online use the following link: <https://ccsu.webex.com/meet/gotchev>

For further information: gotchevi@ccsu.edu; 860-832-2839;

<http://mathcolloquium.sites.ccsu.edu/>