

**Indiana University-Purdue University
Indianapolis**
Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, August 24, 2021
Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: Ingrid Van Keilegom

Research Centre for Operations Research and Statistics (ORSTAT), KU Leuven

Title: Dependent censoring based on copulas

Abstract:

Consider a survival time T that is subject to random right censoring, and suppose that T is stochastically dependent on the censoring time C . We are interested in the marginal distribution of T . This situation is often encountered in practice. Consider for instance the case where T is the time to death of a patient suffering from a certain disease. Then, the censoring time C is for instance the time until the person leaves the study or the time until he/she dies from another disease. If the reason for leaving the study is related to the health condition of the patient or if he/she dies from a disease that has similar risk factors as the disease of interest, then T and C are likely dependent. In this paper we propose a new model that takes this dependence into account. The model is based on a parametric copula for the relationship between T and C , and on parametric marginal distributions for T and C . Unlike most other papers in the literature, we do not assume that the parameter defining the copula function is known. We give sufficient conditions on these parametric copula and marginals under which the bivariate distribution of $(T;C)$ is identified. These sufficient conditions are then checked for a wide range of common copulas and marginal distributions. We also study the estimation of the model, and carry out extensive simulations and the analysis of data on pancreas cancer to illustrate the proposed model and estimation procedure.

Bio:

Dr. Ingrid Van Keilegom is full professor at KU Leuven. She received a Ph.D. in Statistics from Limburgs Universitair Centrum (now : Universiteit Hasselt) in 1998. Dr. Van Keilegom is IMS fellow, ASA fellow and Elected member of the International Statistical Institute. Her

research interests focus on Survival/duration analysis, Measurement error problems, Quantile regression, Non- and semiparametric regression, Mathematical statistics and Instrumental variables, endogeneity, frontier models in econometrics. Dr. Van Keilegom has 164 papers published in many top journals in Statistics and she has served as editor or associate editor for many top journals in Statistics as well. She has received many grants and awards.