UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH

2016 James E. Grizzle Distinguished Alumnus Lecture

BIOSTATISTICS SEMINAR

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Bayesian Threshold Regression for Current Status Data with Informative Censoring

In animal carcinogenicity studies, tumors are observable only at the time of natural death or sacrifice. Thus, the exact timing of a tumor is unknown, only that the time of tumor it is less than or greater than the examination time; this is known as current status data. When the examination time is independent of tumor time, the data can be analyzed using standard approaches for interval censored data. However, it is likely that the presence of a tumor increases the risk of natural death making this assumption questionable in a carcinogenicity study. In this lecture, I will present two methods for current status data with informative censoring motivated by animal carcinogenicity data. Both approaches involve modeling time-to-tumor using a latent Wiener process in which a tumor appears when the process hits a threshold for the first time. In the first method, we account for informative censoring by modeling time-to-censoring using two latent Wiener processes: one independent of the latent tumor process and the other dependent. In the second method, we extend the approach to the case of multivariate current status data (e.g., times to different types of tumors). Time to each type of tumor is modeled using separate Wiener processes with a shared random effect. Time-to-censoring is modeled using a single Wiener process whose time scale is affected by number and type of tumors present. A Bayesian approach is taken for each model which involves sampling interval censored tumor times at each step of a Markov Chain Monte Carlo algorithm. Both methods will be applied to data from National Toxicology Program studies. *(This research is joint work with Tao Xiao from Shenzhen University.)*

Thursday, April 21, 2016 3:30 pm - 4:30 pm Blue Cross Blue Shield Auditorium

The Department of Biostatistics 2016 Awards Ceremony begins at 3:00 pm