Statistical science has come a long way since the early days when the emphasis was on linear models for independent univariate data. With the development of technology, we have to deal with multivariate, dependent and non-linear data nowadays. I am quite interested in the generalizations of these three aspects.

I proposed methodologies and analyzed correlated multivariate binary data in my PhD research with particular applications to the developmental toxicity studies. In my postdoctoral research, I further concentrated on the general correlated data analysis. I studied the random effect and transformation models for clustered data. These results can be applied to the biological and medical studies as well as the survey methodology like the small area estimation. Another aspect of my current research is to extend the class of general linear mixed models to allow for various exponential family forms of non-Gaussian response in the sense that we are dealing with non-linear data.

Selected Publications


Selected Publications


We consider the kernel and penalized smoothing of the saturated model. The plot shows the kernel likelihood, penalized kernel and group-specific penalized likelihood estimates of the probability function constructed from the 2,4,5-T data for a litter of size 21 at 6 different dose levels. The kernel estimate fits one model for all dose levels but is not smooth across dose levels. The group-specific penalized estimate is smooth for each of the dose levels but needs separate fitting. The penalized kernel estimate fit one model for all the dose levels and achieves smoothness across dose levels.