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The Use of Skew-Normal Distribution for Dose-Response Modeling in Toxicological Experiments.

In recent years the family of skew-normal distributions has attracted the attention of many statisticians. Several publications have considred various statistical properties of this family. Here, we discuss the application of skew-normal distributions in dose-response modeling. Specifically, we show how this family of distribution provides useful and flexible models. Attention will be focused on developmental neurotoxicity bioassay experiments with animals. We assume that responses conditional on the litter means have a skew-normal distribution. Using a normal distribution to describe the variation among the litter means, the unconditional distribution of mean responses will be derived and its properties will be discussed. Application of the model will illustrated using some experimental data. (Received September 11, 2009)