On a simple measure of dominance

Abstract:

One way to describe how much better treatment Y is than treatment X is to find a response value such that the probability of Y being better than this value is the same as the probability of X being worse. We consider the size of this probability as a measure $\mathrm{dom}(F_Y, F_X)$ of the dominance of Y over X. Thus we label the central point at which the graph of $F_X(x)$ meets the graph of $1 - F_Y(x)$ as $(\mathrm{xdom}(F_Y, F_X), \mathrm{dom}(F_Y, F_X))$. Conditions are given for the asymptotic normality of $(\mathrm{xdom}(\hat{G}, \hat{F}), \mathrm{dom}(\hat{G}, \hat{F}))$ when $\hat{G}$ and $\hat{F}$ are possibly dependent empirical distributions. A Wilson–type approximate confidence interval for $\mathrm{dom}(G, F)$ is proposed and this interval is shown to perform generally better than a Wald–type interval.