Conditional Ordering and Positive Dependence

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Every univariate random variable is smaller, with respect to the ordinary stochastic order and with respect to the hazard rate order, than a right censored version of it. In this paper we attempt to generalize these facts to the multivariate setting. It turns out that in general such comparisons do not hold in the multivariate case, but they do under some assumptions of positive dependence. First we obtain results that compare the underlying random vectors with respect to the usual multivariate stochastic order. A larger slew of results, that yield comparisons of the underlying random vectors with respect to various multivariate hazard rate orders, is given next. Some comparisons with respect to the orthant orders are also discussed. Finally, some remarks about applications are highlighted.