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Multivariate analogs of classical univariate discrete distributions and their properties. (English) Zbl 1419.60015

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Summary: Some discrete distributions such as Bernoulli, binomial, geometric, negative binomial, Poisson, Polya-Aeppli, and others play an important role in applied problems of probability theory and mathematical statistics. We propose a variant of a multivariate distribution whose components have a given univariate discrete distribution. In fact we consider some very general variant of the so-called reduction method. We find the explicit form of the mass function and generating function of such distribution and study their properties. We prove that our construction is unique in natural exponential families of distributions. Our results are the generalization and unification of many results of other authors.

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