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Extreme values of p ; 2.4 Estimation of p ; 2.4.1 The likelihood function; 2.4.2 The EM estimate; 2.4.3 A Bayesian estimate of p ; 2.5 Programs and Numerical Results; 2.6 Appendix: The Likelihood Kernel; 3 The Maximum Negative Hypergeometric Distribution; 3.1 Introduction; 3.2 The Distribution; 3.3 Properties and Approximations; 3.3.1 Modes of the distribution; 3.3.2 A gamma approximation; 3.3.3 A half-normal approximation; 3.3.4 A normal approximation; 3.4 Estimation; 3.5 Appendix; 3.5.1 The half-normal approximation; 3.5.2 The normal approximate distribution; 4 Univariate Discrete Distributions for Use with Twins; 4.1 Introduction; 4.2 The Univariate Twins Distribution; 4.3 Measures of Association in Twins; 4.4 The Danish Twin Registry; 4.4.1 Estimate of the effect; 4.4.2 Approximations; 4.5 Appendix; 4.5.1 The univariate twins distribution; 4.5.2 Approximating distributions; 4.6 Programs for the Univariate Twins Distribution; 5 Multivariate Distributions for Twins; 5.1 Introduction; 5.2 Conditional Distributions; 5.2.1 Univariate conditional distribution; 5.2.2 Conditional association measure; 5.3 Conditional inference for the Danish twins; 5.4 Simultaneous Multivariate Distributions; 5.5 Multivariate Examination of the Twins; 5.6 Infinitesimal Multivariate Methods; 5.6.1 Models with no dependence; 5.6.2 Models for dependence; 5.6.3 The infinitesimal data; 5.7 Computer Programs; 5.7.1 Conditional distribution and association models in SAS; 5.7.2 Fortran program for multivariate inference; 6 Frequency Models for Family Disease Clusters; 6.1 Introduction; 6.1.1 Examples; 6.1.2 Sampling methods employed; 6.1.3 Incidence and clustering; 6.2 Exact Inference Under Homogeneous Risk; 6.2.1 Enumeration algorithm; 6.2.2 Ascertainment sampling; 6.3 Numerical Examples; 6.3.1 IPF in COPD families; 6.3.2 Childhood cancer syndrome; 6.3.3 Childhood mortality in Brazil; 6.3.4 Household *T. cruzi* infections; 6.4 Conclusions; 6.5 Appendix: Mathematical Details; 6.5.1 The distribution of family frequencies; 6.5.2 A model for covariates; 6.5.3 Ascertainment sampling; 6.6 Program for Exact Test of Homogeneity; 7 Sums of Dependent Bernoulli's and Disease Clusters; 7.1 Introduction

Sommario/riassunto

There have been many advances in the theory and applications of discrete distributions in recent years. They can be applied to a wide range of problems, particularly in the health sciences, although a good understanding of their properties is very important. Discrete Distributions: Applications in the Health Sciences describes a number of new discrete distributions that arise in the statistical examination of real examples. For each example, an understanding of the issues surrounding the data provides the motivation for the subsequent development of the statistical models. Provid