

The class of two-sex branching models with random control on the number of progenitor couples

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Abstract

The class of two-sex branching models where, in each generation, a random control on the number of progenitor couples in the population is considered. We are interested in developing stochastic models to describe the demographic dynamics of populations where females and males coexist and form couples. For such a class, several probabilistic results are established. Also assuming offspring probability distribution belonging to the bivariate power series family, Bayesian estimators for the mean vector and the covariance matrix of the offspring distribution are proposed. Under a nonparametric setting, we also derive Bayesian estimators for the offspring distribution and for its main moments. A computational method to determine highest posterior density credibility sets is stated. By way of illustration, we include a simulated example in population dynamics.

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