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Estimating the Size and Distribution of Networked Populations with Snowball Sampling

A new strategy is introduced for estimating networked population characteristics. Sample selection is based on the one-wave snowball sampling design. A generalized stochastic block model is posited for the population's network topology. Inference is based on a Bayesian data augmentation procedure. This procedure has the advantage over existing methods in that it can be applied to a networked population of unknown size. An application is provided to a study of an empirical population at risk for HIV/AIDS. The results demonstrate that efficient estimates of the size and distribution of the population can be achieved with this novel strategy.