

# Pavel Krivitsky presented a paper at American Statistical Association's 2014 Joint Statistical Meetings

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Dr. Pavel Krivitsky (affiliate of NIASRA and Lecturer, School of Mathematics and Applied Statistics, University of Wollongong) presented a paper titled *Inference for Exponential-Family Random Graph Models based on Egocentrically-Sampled Data* at the [American Statistical Association's 2014 Joint Statistical Meetings](#) in Boston, Massachusetts, USA, on August 2–7.

Modelling of social networks—structured relational data—is used in epidemiology to understand how infectious disease is likely to spread through a heterogeneous population of susceptible individuals, where simpler models represent populations as homogeneous “compartments”. It is often the case, however, that the networks over which disease spread, such as those of sexual partnerships, are difficult or impractical to observe directly, or in the case of sexual partnerships in particular, present severe confidentiality issues.

Egocentric sampling comprises observation of a network of interest from the point of view of a set of sampled actors (egos), who provide information about themselves and their network relations (alters), but who often cannot disambiguate them, and it is often the only practical way to observe networks of sexual partnerships.

Although methods exist for recovering network features from such data, a unifying framework, such as exponential-family random graph (ERG) modelling, is lacking, and, so far, approaches to fitting ERGMs to such data have lacked a rigorous statistical foundation in general and measures of uncertainty in particular.

The work presented identified a subclass of ERGMs amenable to being estimated from such data, develop techniques for doing so, and drawing on the expertise of NIASRA staff, introduced a technique for rigorously evaluating the uncertainty (i.e., standard errors) of these estimates.