

## **G35 – Research Fellows Meeting**

### **Presenter's Abstract**

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#### **Representativeness and Generalisability of Inference for Exponential-Family Random Graph Models from Samples of Networks**

Joint modelling of large samples of networks collected from similar settings---classrooms, households, and similar---has a long history, with a variety of methods available to pool information in model estimation and inference. In the exponential-family random graph modelling framework, these methods range from post-hoc two-stage meta-analyses to sophisticated multilevel approaches. However, relatively little attention has been devoted to the generalisability of this inference, especially when the sample of networks is effectively a convenience sample, and when the population of networks is heterogeneous in size and composition.

We consider two samples of within-household contact networks in the Flanders region of Belgium. These samples used very similar survey instruments but very different sampling designs: 1) a sample of 318 households, selected based on having children 12 years of age and under, for which the dyad census has been observed, and 2) a generally representative sample of 1265 households from the region for which only contacts incident on one respondent were observed. By applying the principles of model-based survey sampling inference, we propose to combine the strengths of the two datasets, while making explicit the assumptions previously left implicit in this type of analysis. Our approach allows us to borrow concepts and diagnostic tools from generalised linear modelling to produce parameter estimates that are meaningful and generalisable to the entire population of networks, while allowing complex within-network dependence to be represented.

This work is joint with Dr Pietro Coletti and Prof Niel Hens from University of Hasselt.