**Many-to-many linkage – finding siblings in birth registration data**

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This presentation provides an overview of the exploratory work on the production of a ‘pregnancy spine’ from birth registrations data, and presents the new challenges experienced when performing many-to-many linkage of multiple siblings to their mother. The resultant sibling dataset will be used for ONS and ADRC-E projects relating to health outcomes, child and maternal health.

Data relating to birth registrations are processed by, and held in ONS. This dataset contains 3.7 million, unencrypted live and still birth registrations for the years 2000-2005. Probabilistic matching techniques were applied to link siblings to their mother based on the mother’s (maiden) name, date of birth, country of birth and address, as mothers’ NHS numbers were not recorded pre-2005).

The birth registrations dataset was linked to itself using probabilistic techniques (Fellegi-Sunter). Traditional methods only allow one-to-one matching and thus focus on finding the best match for each record. Here a new method was needed to identify many-to-many links, corresponding to multiple siblings, and to create familial clusters.

The effectiveness of graph structures and graph-theory methods to extract and analyse linked siblings’ data is explored. Graph clustering metrics are investigated for their potential to optimise linkage quality.

Further work will be done to assess linkage quality. It is hoped, this project may be expanded to create more complete groups of maternal siblings through inclusion of data from earlier years, and to investigate the possibility of linking in other sources of maternity data.

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