Case study: CSE Model

Background

Think Family is Bristol's answer to the government's national Troubled Families programme. It is designed to improve outcome for families whilst reducing cost and demand on the public sector. This is being achieved through a truly effective early intervention strategy, which continues to deliver significant and sustained outcomes for thousands of families across the city of Bristol.

Think Family Database (TFD)

One of the programmes key analytical assets is the Think Family Database. This data warehouse draws together information from 30 data sources, about 54,000 families in the local authority area.

The data captured within the TFD supports a more strategic understanding of the city and the issues and risks experienced by our citizens. It also informs service planning and the more efficient allocation of resources. The TFD enables more effective information sharing, whilst also providing the data to drive improved analysis and predictive analytics.

Why use modelling

Predictive modelling allows us to make better use of data, to understand the known issues affecting the citizens of Bristol now and in turn how these factors may develop in the future. Understanding future trends can inform resource allocation and decision making on both strategic and operational levels.

Predictive analytics should be interpreted intelligently, the results of a model do not replace a lead professional's assessment nor are the outcomes generated guaranteed. Instead the results are meant to be used as a tool to get ahead of the curve, this use of data supports an early intervention approach

Modelling process
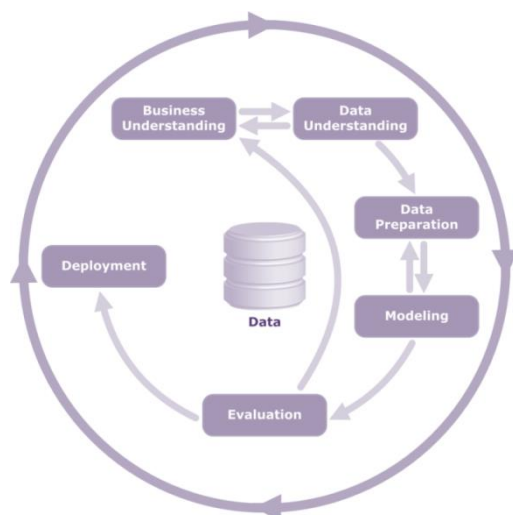
Data modelling is most effective when it is designed closely with the business; this ensures the model is needed, useful and easy to understand.

Crisp DM

The cycle shown in the diagram represents steps in developing a predictive model. It highlights the importance of testing and the cyclical nature of the process following feedback from the business. This ensures the data and the results generated are as accurate and useful as possible.

Co-design

In the case of the Bristol CSE model, partners from the Barnardos project BASE (Barnardo's Against Sexual Exploitation) were consulted while gathering evidence and information on known cases of CSE in Bristol. By defining the common factors/ indicators on the Family Outcome Plan in the lives of known CSE victims, the predictive model was able to search the TFD for individuals who were statistically similar to these known cases. This co-design is key to successfully operationalising models, and it forms the starting point of the CRISP cycle.

Performance figures

We can judge the technical performance of a model by comparing those individuals in our target cohort to those it has flagged. Commonly this is measured using two method, precision and recall.

Precision: 69% - Of those people identified by the model, 69% of these were from our target cohort.

Recall: 94% - Of our target cohort, the model identified 94% of them

Deployment

Making the CSE search tool accessible for lead professionals and staff is vital. Initially the CSE model was available as a separate data sheet. Feedback showed that having to access multiple systems made staff less likely to use the model. As a result we moved the data from Excel to SSRS and developed an embedded front end for staff which is accessed via the TFD.

To ensure new and existing users are kept up to date with how to use the search tool and interpret the results training and awareness sessions are delivered to teams across the city.

Using the model to identify children and young people with the most heightened risk scores, we have allocated 243 cases to key workers over the last year. As a result these families have received targeted support.