

Copenhagen Emergency Medical Services – Reducing patient call backs in 1813

Developing a predictive model – from idea to full scale model

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Copenhagen Emergency Medical Services and medical helpline 1813

- We provide emergency medical help focused on the citizen
- Handling emergency 1-1-2 calls, medical helpline 1813 calls and dispatching ambulances
- Close dialogue between administration and the dispatch central
- Why patient call backs?



Why predictive modeling?

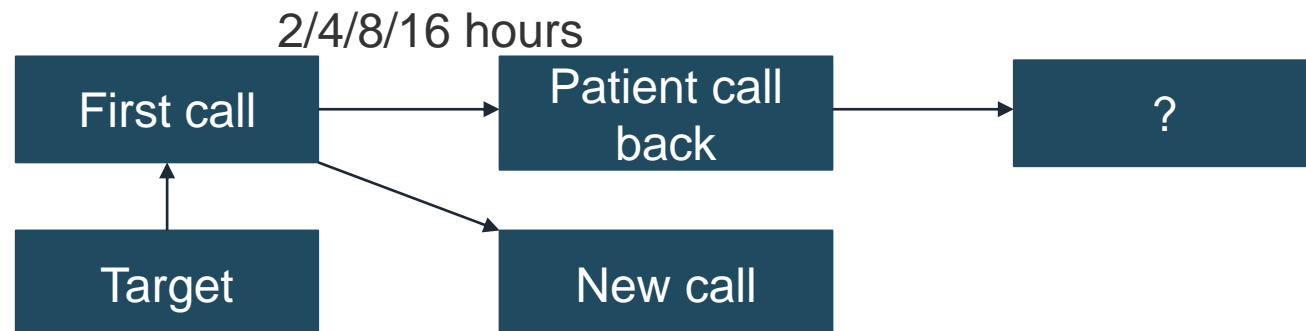
- Optimizing of the visitation and ressource utilisation
- Political demands and performance
- Utilising all of our data for analytical purposes

Project process

- Define target variable
- Which data sources?
- Developing ABT (analytic base table)
- Text analytics
- Uploading to VIYA and running our models

Target variable

- Collaboration between us and nurses and doctors
- Focus on a live data setting
- ID on CPR



Developing ABT

- Call data or journal data?
- 1 year's data
- Focus on live setting
- Patient data and journal data
- **Back and forth progress**

Text analytics

- Caller worried?– binary (yes, no)
- Caller – classification (mother, father, son, daughter etc.)
- Temperature – intervals

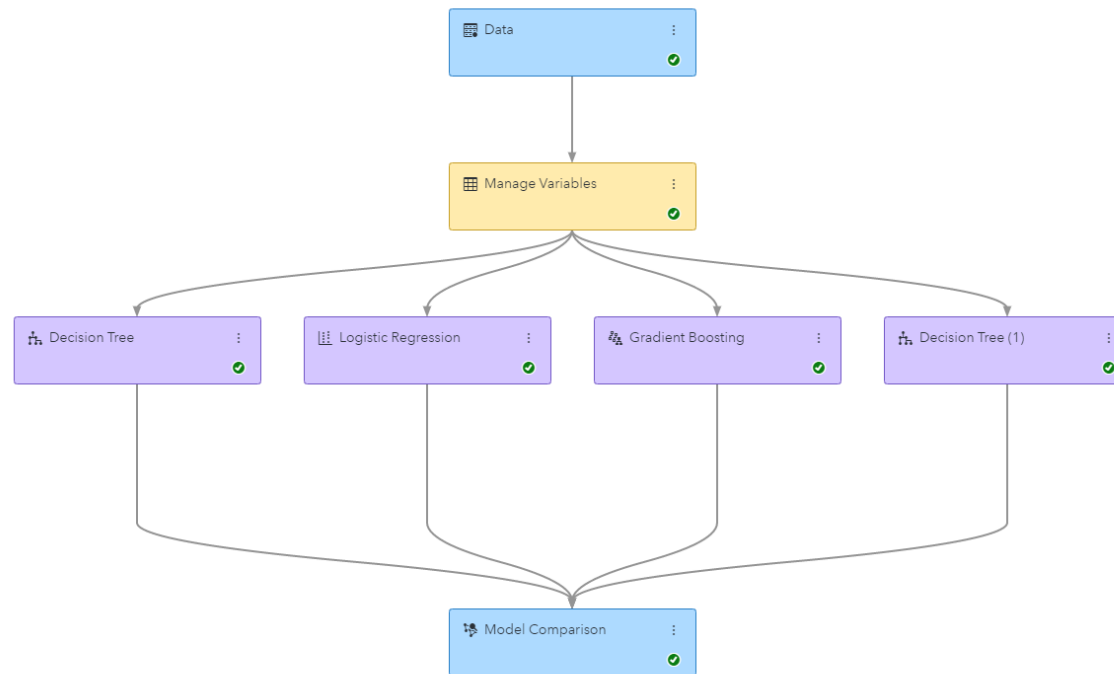
Final ABT

- 83 variable including 4 target variables
- 47 input variables in the model
- Black box model vs. transparent model?

Results

- Population – 922.264 incidents
- Tree diagram splitting:
 - **Caller handled on the phone or referred to other health services**
 - **F response or psychiatry**
 - Worrie grade is 4,1%
 - Caller cancels hospitals appointment
 - Caller:
 - Mother 69%, father 31% in the caller group (136.184 incident)

Model from VIYA



Tree Diagram



Model Comparison

Champion	Name	Algorithm Name	KS (Youden)	Misclassification Rate
	Logistic Regression	Logistic Regression	0,2156	0,0564
	Decision Tree	Decision Tree	0,1866	0,0564
	Decision Tree (1)	Decision Tree	0,1866	0,0563
	Gradient Boosting	Gradient Boosting	0	0,0564