

# Using simple screening models to improve patient care

## Predicting age of onset for chronic diseases



### Goal

Healthcare costs represent the largest category of GDP and are continuing to rise. Early detection of chronic diseases have been proved to slow the growth of healthcare costs. However, an independent organisation in primary care and prevention realised that, under increased scrutiny, the efficacy of screening programmes appears questionable.

The goal was to better predict the age of onset for chronic diseases.

### Insight and Action

Rich, fine-grained data sets that may enable more targeted policies are increasingly available. Personalised, data-driven screening recommendations offer a potential mechanism for improving the efficiency of healthcare delivery.

QuantumBlack developed age-of-onset models for a number of chronic conditions (hypertension, prostate cancer, breast cancer, stroke) using margin-based, censored-regression ensembles. The models incorporated about 900 covariates (mostly patient biomarkers and socio-economic covariates) on about 20,000 patients tracked longitudinally over nearly 15 years.

### Results

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# 98.9%

Hypertension and stroke were caught 98.9% of the time by a simple screening using the model

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# 11%

Reduction in unnecessary interventions for patients 65 years and older through the prostate age-of-onset model's screening filter

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# <2.7 years

Average error achieved for hypertension and stroke models for the onset