

Institute of Health & Wellbeing

## Developing a Scottish T2DM Policy Model and a web-based decision aid “dashboard”

Jim Lewsey, Claudia Geue, Robert Lindsay,  
David McAllister, Houra Haghpanahan,  
Sarah Wild (U of Edinburgh)

[jim.lewsey@glasgow.ac.uk](mailto:jim.lewsey@glasgow.ac.uk)

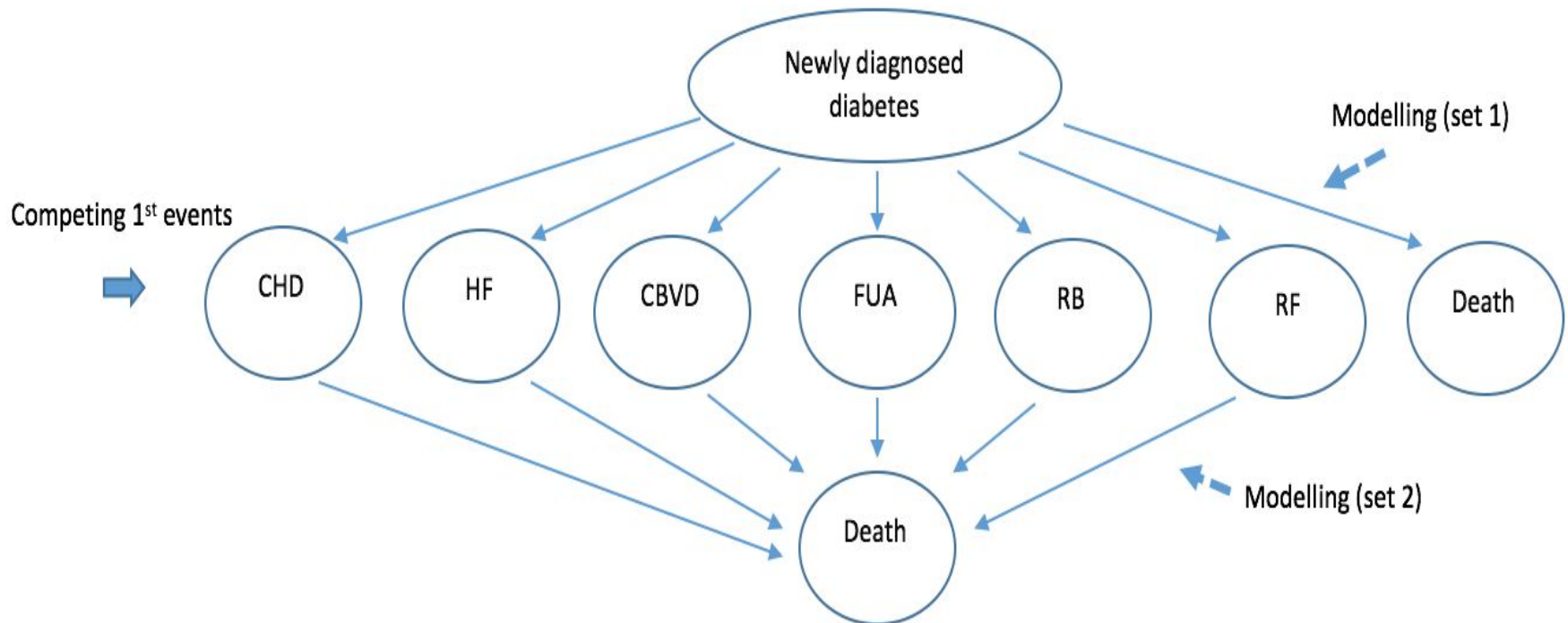


- Overall aim of this research is to develop, validate and assess the performance of a Type 2 diabetes (T2DM) policy model
- NICE in UK exploring use of real-time models for use in technology appraisal processes
- Difficulties in running simulation models in real-time
- Alternative – state transition cohort modelling

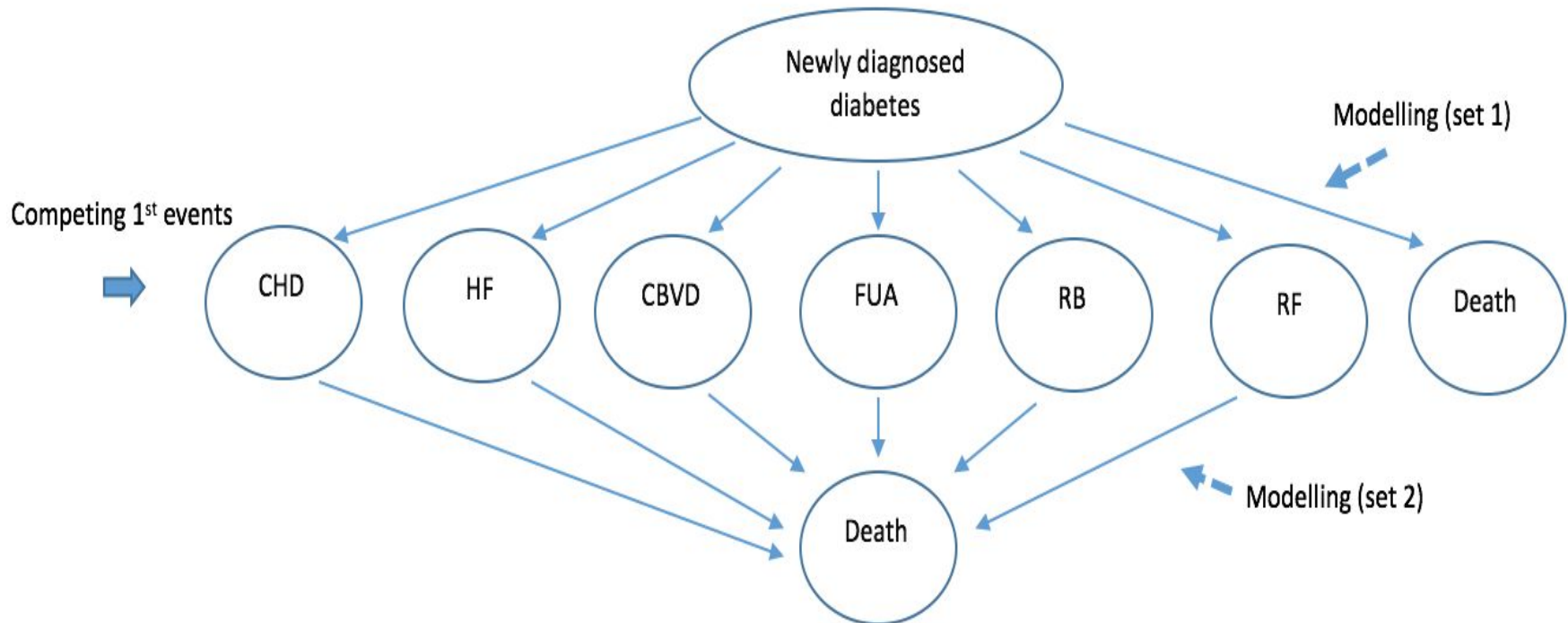
1. To develop, validate and illustrate the utility of a T2DM policy model using a cohort modelling approach.
2. To develop and validate a meta-model for an already existing discrete event simulation model.
3. To carry out a three-way comparison of the performance of the cohort model, the meta-model, and the discrete event simulation model.
4. to develop a front-end for the model to make it easy to use in policymaking (and to act as a pilot front-end for clinical and patient contexts).



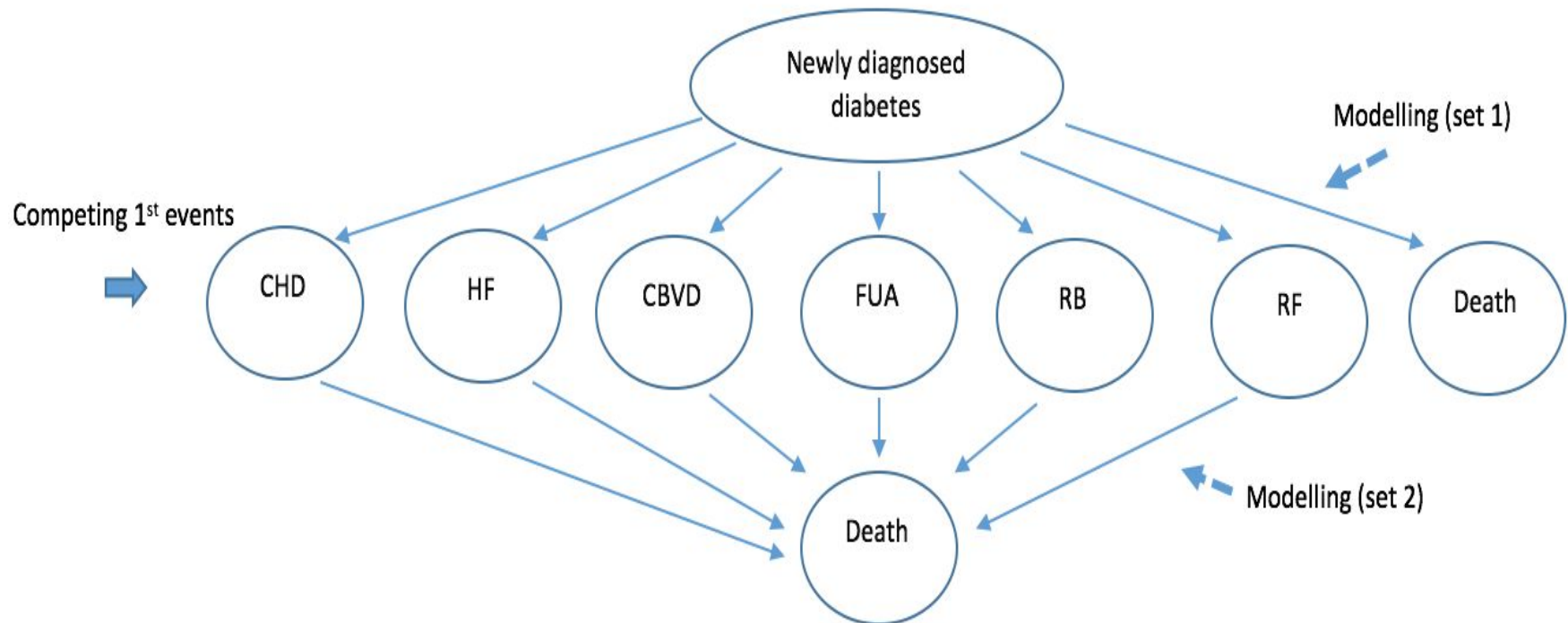
# Cohort model structure



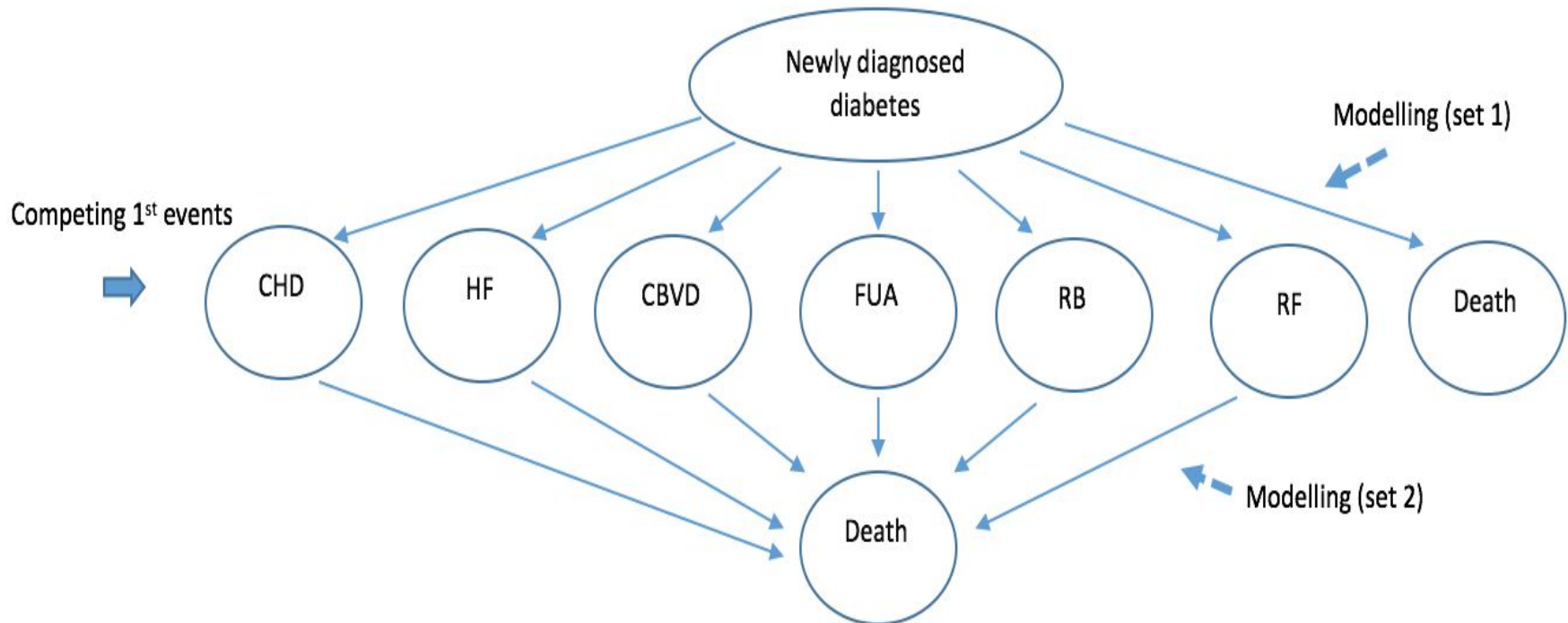
SCI-Diabetes Scotland – 99% coverage since 2004;  
socio-demographic & clinical measures (repeatedly)  
recorded; linked to hospital, death and prescribing data



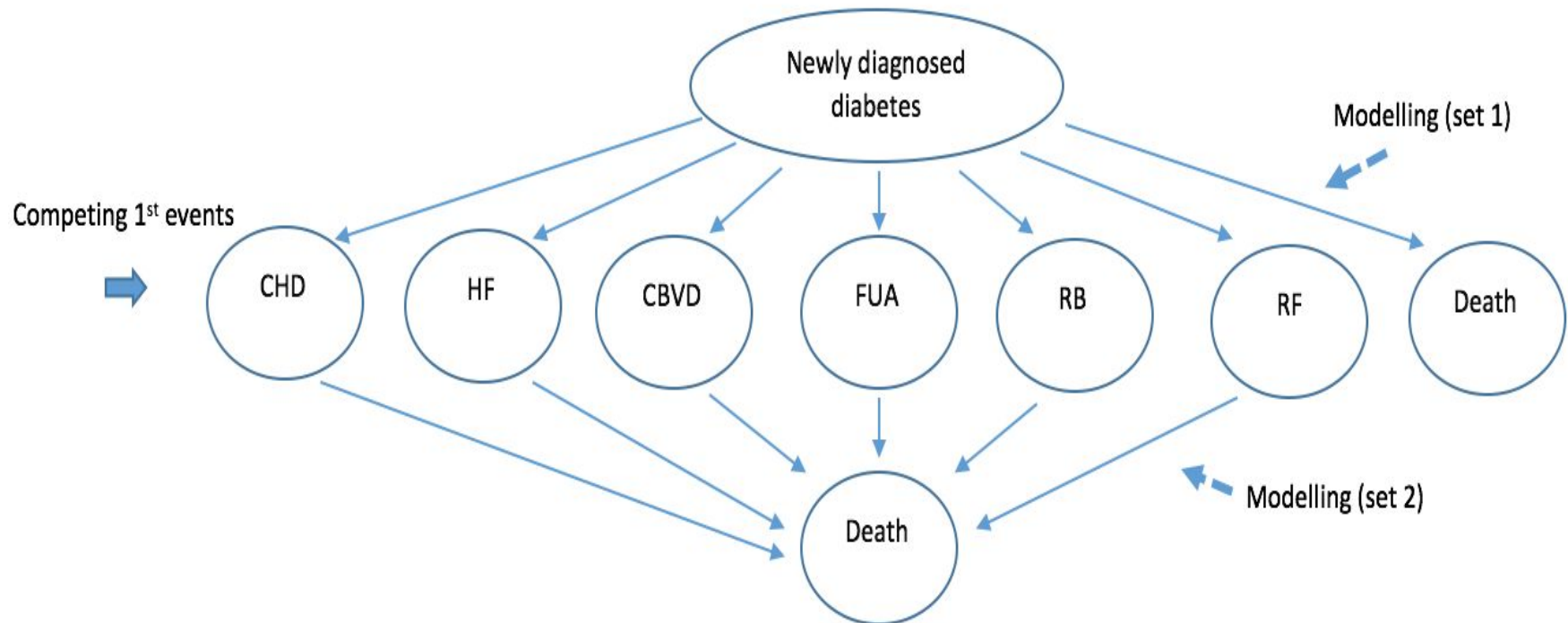
Parametric cause specific hazard survival modelling;  
covariates measured at baseline: HbA1c, SBP, TC, BMI,  
smoking status, age, sex and socio-economic deprivation



Parametric cause specific hazard survival modelling;  
covariates (actual/*predicted* value at baseline/*time of 1<sup>st</sup> event*): **HbA1c**, **SBP**, **TC**, **BMI**, smoking status, age, sex and socio-economic deprivation



Prediction accuracy and computational speed will be compared between this cohort model and a discrete event simulation model





## Cardiovascular risk predictor

Length of follow-up:

Age in years:

Deprivation score:

Diabetes  
 Family history

Smoking, cigarettes per day:

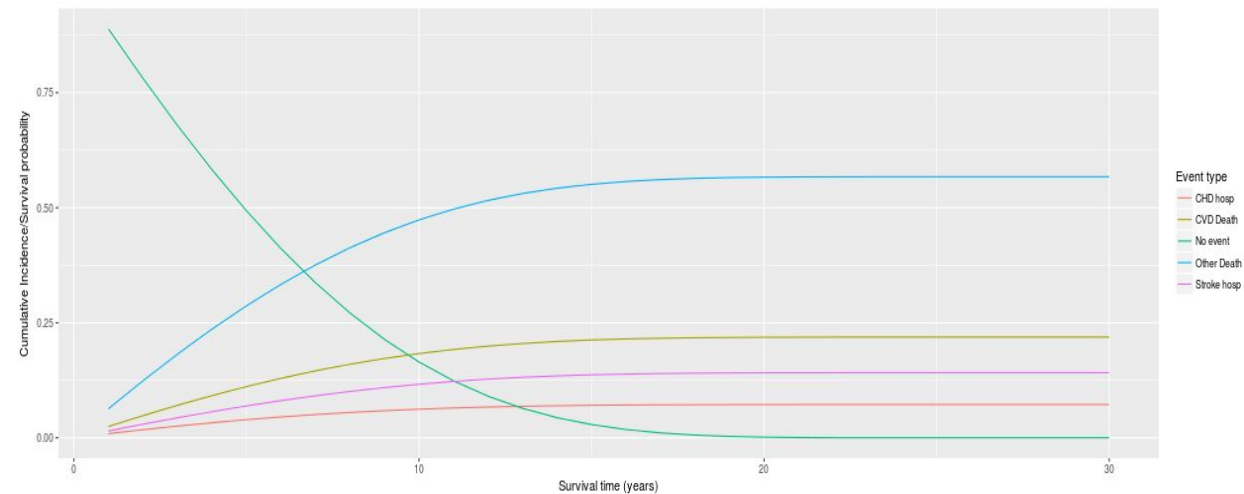
Systolic blood pressure:

Cholesterol:

HDL Cholesterol:

[https://ihwph-hehta.shinyapps.io/cardiovascular\\_risk/](https://ihwph-hehta.shinyapps.io/cardiovascular_risk/)

## Cumulative incidence and survival probabilities



## Interpretation of model

This plot can be read in the following way. For 100 people who are similar to you, we would expect the following number of people to experience an event within the next 5-years.

## Number of people expected to experience an event within 5-years

Event type	Number
CHD hosp	4
Stroke hosp	7
CVD Death	11
Other Death	29
No event	49

- Quality adjustment
- Extrapolation
- Validation
- Timelines (report back to funder in Feb 2020) – hope to report back at 10<sup>th</sup> Mount Hood Challenge?!