School for Public Health Research

A POLICY ANALYSIS MODEL TO EVALUATE POLICIES AND INTERVENTIONS TO PREVENT TYPE 2 DIABETES

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PROJECT RATIONALE & AIM

Rationale: To support decision making on, and enable the design of, type 2 diabetes preventive strategies. To develop a tool to enable rational allocation of resources between population and community level interventions, which aim to alter the distribution of risk factors for diabetes, and targeted interventions, which aim to provide management for individuals at high risk.

Project aim: Develop a new integrated modelling framework for type 2 diabetes prevention

METHODOLOGY

Health economic models are computer models that are designed to predict the likely effect of different health interventions, in order to help health professionals make decisions about treatments and health policy. We involved doctors, diabetes researchers and lay members in the model design, in order to ensure that we had accurately represented the causes of diabetes, the care of patients and the outcomes of having the disease.
The majority of data in the model was sourced from published literature. A new analysis of the Whitehall II data was used to describe changes in metabolic risk factors.

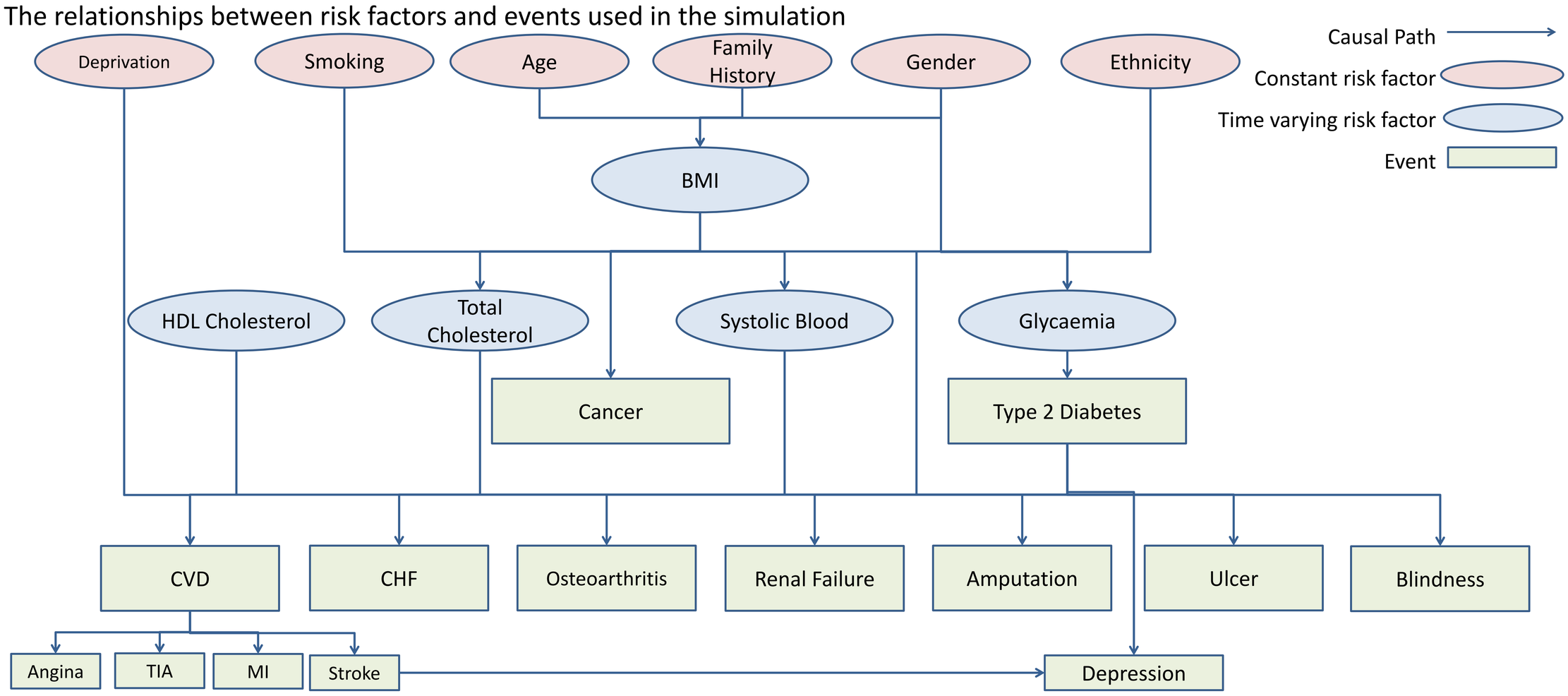
WHAT WE CAN DO

We can predict health economic consequences of type 2 diabetes prevention intervention for a UK population. The model can evaluate interventions targeting a broad range of population sub-groups to identify the interventions which generate the greatest net benefit to society over the short and long term.

MODEL DESCRIPTION

Our model allowed us to develop individual people and follow their health journeys over time. For each person, their weight, cholesterol levels, systolic blood pressure and HbA1c (a measure of diabetes) fluctuate from year to year, representing natural changes as people age. These rate of change over time was determined by fixed risk factors such as gender, ethnicity, family history and deprivation. Individuals can develop diabetes, cardiovascular disease (e.g. heart disease or stroke), diabetes-related complications, cancer, depression or osteoarthritis over the course of their lifetime. Each disease results in a particular cost to society and a reduction in quality of life for the individual. All individuals are at risk of mortality at any time in the model, however mortality risk is increased for individuals with diabetes, cancer, or cardiovascular disease.

Figure 1: The relationships between risk factors and events used in the simulation



RESULTS

The Interventions
A: 20% tax on sugar-sweetened soft drinks
B: New supermarket in a deprived urban area
C: Healthy eating promotion in workplace canteen
D: Men only weight loss programme and cooking skills programme for deprived communities
E: Individuals attending vascular checks with a Leicester risk score >4.75 HbA1c screening diabetes (HbA1c>6.5)and IGR (HbA1c>6). Individuals with IGR offered lifestyle education programme.

5 million individuals adult general population	**A** Soft drinks tax	**B** Retail policy	**C** Workplace	**D** Community	**E** High risk IGR
Diabetes diagnosis	-980	-181	41	-303	5262
Cardiovascular disease	-2177	-1768	-774	-603	-5455
Life years	24495	16663	6288	6091	37244
QALYs per person	0.0027	0.0019	0.0008	0.0007	0.0046
Healthcare costs per person	-£38.02	-£27.70	-£10.45	-£7.94	-£73.32
Net Benefit (5 yrs) per person	£1.62	£2.72	£0.06	-£0.51	-£9.31
Net Benefit (10 yrs) per person	£4.42	£9.06	£1.81	£1.11	£13.01
Net Benefit (Lifetime) per person	**£92.67**	**£65.66**	**£26.22**	**£21.48**	**£166.20**

The National Institute for Health Research's School for Public Health Research (NIHR SPHR) is a partnership between the Universities of Sheffield, Bristol, Cambridge, UCL; The London School for Hygiene and Tropical Medicine; The University of Exeter Medical School; the LiLaC collaboration between the Universities of Liverpool and Lancaster and Fuse; The Centre for Translational Research in Public Health, a collaboration between Newcastle, Durham, Northumbria, Sunderland and Teesside Universities.

This is an outline of independent research funded by the NIHR SPHR. The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health.

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