NIHR SPHR is working with Doncaster, adapting its diabetes prevention model locally, in order to help provide evidence for the next round of decision-making on public health commissioning.
Public health specialists within Doncaster Council plan to use a new tool in their commissioning process to compare the cost-effectiveness of different obesity and diabetes prevention programmes.

"It’s very useful to know what the various cost savings might be against, for example, a do-nothing approach, especially in this economic climate. We could not do this without the support of our academic partners."

Rachel Manners, Public Health Specialist, Doncaster Council

This deteriorating picture explains why NIHR SPHR has developed a diabetes prevention model so that the cost-effectiveness of national and local diabetes prevention programmes, such as the one in Doncaster, can be tested. It could help prioritise public health spending. The model is internationally unique in being the first with the capacity to compare a wide range of interventions within a single framework. It has been developed by the University of Sheffield, in collaboration with UCL and the universities of Cambridge, Exeter, Lancaster and Liverpool. Other stakeholders have been closely involved, including patients and clinicians, in conceptualising and planning the research as well as examining its findings.

Potential gains from successful interventions can be huge – the model can track costs for every year of a person’s expected life, to make a cumulative total. For example, the cost of diabetes management ranges from around £80 to £1,500 per year depending upon which medications someone is taking. However, those figures don’t cover the costs of complications of diabetes, such as kidney failure (around £30,000) and amputation (around £11,000 in the first year). It has been estimated that a 50 year old with diabetes will die, on average, six years earlier than someone of the same age without the disease.

The number of people with diabetes in the UK rose in 2013-14 by 125,000 adults, rising to an all-time high of 3.9 million, most of the cases being of type 2 diabetes, which is largely preventable. Failure to reduce the surge in cases is resulting in devastating health complications, including amputation, blindness, heart attack and stroke. The cost to the NHS is nearly £10 billion a year.
NIHR SPHR’s diabetes prevention model, which is adaptable to local circumstances and local policies, can look at a broad range of interventions to compare their cost-effectiveness. The School has examined the potential effects of implementing a soft drink tax (20 per cent on sugary drinks); promoting a new supermarket opening in a deprived area and therefore increasing the supply of fruit and vegetables; promoting healthy choices in a workplace canteen; community-based interventions, such as weight loss and cooking classes aimed at disadvantaged groups; and screening people for high blood sugar who are therefore at greater risk of diabetes, in order to focus support for healthy living, exercise and diet on the most vulnerable to disease.

The model, which can track the impact of interventions on people right through until death, has found that all these policies to prevent diabetes are likely to be cost-saving in the long run and are effective in improving health. Screening for type 2 diabetes with intensive lifestyle education for high risk individuals is particularly cost-saving and gives the largest health gains over a lifetime. However, this approach is also the most expensive and the payback is longer term, because the health benefits don’t outweigh the costs of the intervention for several years. Alternatively, sugary drink taxation is also highly cost-effective. Because there are no local implementation costs, it has the benefit of being cost-saving within the first year of implementation. The policy seems particularly to benefit people with low socio-economic status.

“We also used the model to look at the costs and outcomes from targeting different high diabetes risk subgroups with an intensive lifestyle intervention,” explains Chloe Thomas, one of the NIHR SPHR researchers. “This included people with high blood sugar (“pre-diabetes”), people of south Asian backgrounds, people aged between 40 and 65, people thought to be at high risk using a common diabetes risk score, people from low socio-economic backgrounds and people with a high body mass index score. We found that targeting people of south Asian ethnicity or those with high blood sugar counts was most cost-effective but for different reasons. Whereas diabetes incidence was reduced when those with high blood sugar were targeted, the primary reasons for cost-effectiveness when those of south Asian ethnicity were targeted was a reduction in cardiovascular disease and a delay in diabetes diagnosis.”

As with all models, the issue, once the maths is sorted out, is inputting the right data and creating a tool that displays the results in an accessible user interface. Rachel Manners explains: “It’s really important to understand how to use the tool and how it can support commissioning decisions. People like me, public health practitioners from an NHS background, may be more accustomed to this type of approach than perhaps colleagues from a local government background. In public health we are bringing new approaches to evidence in local government.”

“The model is internationally unique in being the first to have the ability to compare a wide range of interventions within a single framework.”
The support that the collaboration offers is, says Ms Manners, also helpful, given the current financial climate: “It is really valuable that academics can develop this in partnership with commissioners. With limited time, resources or analytical expertise to develop something like this, the support of academics is invaluable.”

Chloe Thomas sums up the hopes of the research team: “We don’t want to dictate which public health interventions policymakers should implement. But we would like policymakers to use a version of the model adapted to suit their situation to help them evaluate what is cost-effective and support their decision-making. We are now adapting the model and making a financial planning tool for NHS England to help them to evaluate the National Diabetes Prevention Programme.”

| PROJECT: | Estimating the impact of diabetes prevention on public health: using modelling to aid translation of knowledge into action |
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