Screening for type 2 diabetes—where are we now?

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Refers to: **Age at initiation and frequency of screening to detect type 2 diabetes: a cost-effectiveness analysis**
The Lancet, *Volume 375, Issue 9723*, *17 April 2010-23 April 2010*, *Pages 1365-1374*,
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Article Outline

The American Diabetes Association states that screening for type 2 diabetes should be considered in asymptomatic adults of any age who are overweight or obese, and who have one or more additional risk factors for diabetes.[1] In individuals without these risk factors, testing should begin at age 45 years. If tests are normal, they should be repeated at least every 3 years. The effectiveness of early identification of diabetes through mass screening of asymptomatic individuals compared with no screening has yet to be clearly shown. Nevertheless, diabetes meets established criteria for conditions in which early detection is appropriate.[1] Screening should be sequential, not a one-time event.[2]

The cost-effectiveness analysis presented by Richard Kahn and colleagues in *The Lancet* today, is distinct from other such analyses in that it addresses sequential screening.[3] These researchers compared the cost-effectiveness of eight different strategies for testing asymptomatic individuals with the strategy of testing people only after symptoms of diabetes or cardiovascular disease have developed. An assumption was made that people diagnosed with diabetes will be treated thereafter to the same level that those with diabetes are presently being treated in the USA to prevent cardiovascular and microvascular events.

Six of the simulated strategies are population-based and not targeted to high-risk populations. That approach is surprising because targeted screening is widely accepted as the preferred method for detection of diabetes in asymptomatic individuals.[1], [4], [5], [6] and [7] However, today's analysis included the option of repeated opportunistic screening during consultations for the management of hypertension. The study showed that strategies in which screening is done opportunistically in combination with blood pressure measurement and lipid testing have the lowest cost per quality-adjusted life-year. As Kahn and colleagues suggest, the use of a risk assessment method before the formal screening might improve cost-effectiveness.

The results of today's analysis were not compared with other cost-effectiveness studies. The differences, however, between the mathematical models and the Archimedes model (as used by Kahn and colleagues) are discussed in this analysis. The Archimedes model includes biological variables and outcomes relevant to diabetes and its complications. Every variable in the model is estimated from one or more empirical sources.[8] The outcomes of each individual are calculated and transformed into simulated population outcomes.

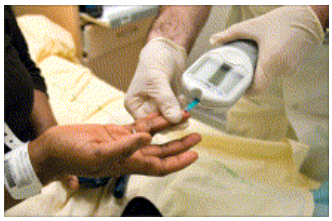
The population used in Kahn and colleagues' study was representative of the US population, and differences in race or ethnic origin or differences in behaviours between northern American and European or Asian people might make the results less

generalisable. Additionally, costs were obtained from US health-care sources. Against that background, the analysis from the perspective of a health service or delivery system that is responsible for all medical costs, such as the UK system (societal perspective), seems illogical to do. This ambiguity is even more important because use and costs of health services differ greatly between the USA and UK—eg, in today's analysis, the cost of a fasting plasma glucose test is assumed to be US$4·40 per person, whereas the 2006 National Health Service cost was £0·40.[9]

The Archimedes model predicted well in a wide variety of populations in 18 different trials.[10] The accuracy of the model to predict an individual's risk of diabetes has been established in a Hispanic population.[11] However, there are no clinical trials of diabetes screening and subsequent treatment to validate the model.

The results of the ADDITION study,[12] a pragmatic randomised trial of the effectiveness of intensified multifactorial treatment on 5-year cardiovascular morbidity and mortality rates in people with screen-detected type 2 diabetes in Denmark, the UK, and the Netherlands will be presented this year. ADDITION has been designed to show whether the effects of combined treatment for hyperglycaemia, blood pressure, and lipids in screen-detected patients are synergistic or not—a factor that could greatly affect the overall cost-effectiveness ratio.[13]

Kahn and colleagues' analysis proved to be very sensitive to the quality-of-life disadvantage assigned to symptomatic but uncomplicated diabetes. The base-case assumptions were made from a few studies. The quality of life in Dutch patients with screen-detected diabetes, at diagnosis, and after 1 year's follow-up differed greatly from the population that formed the basis for the Archimedes model.[14] This difference in quality of life in people screened with diabetes in two different populations shows the need for careful consideration of the model's results.



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Today's paper provides further evidence that screening for diabetes should be combined with screening for hypertension and lipid tests. This recommendation is also in line with the current guideline for screening from the American Diabetes Association.[1] Further input into the model of information on screen-detected people with type 2 diabetes, and separate analyses of different populations or health-care systems, might strengthen the role of the Archimedes model to provide further useful information for future guidelines about screening for diabetes.

I declare that I have no conflicts of interest.

References

1 American Diabetes Association, Executive summary: standards of medical care in diabetes—2010, *Diabetes Care* **33** (suppl 1) (2010), pp. S4–S10.