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Why use Markov simulation models for estimating the effect of cancer screening policies when randomised controlled trials provide better evidence?

Alain Braillon[1] and Susan Bewley[2]

Uhry et al.'s call for the use of Markov decision analysis to provide estimates for the effect of cancer screening is inappropriate.[1]

Randomised controlled trials and adequate case-control studies are feasible, already exist and are preferable to *post hoc* analysis of uncertain data using complex processes. International, multicentre randomised trials for prostate cancer screening allowed a rigorous evaluation of the benefits and the harms of overdiagnosis. Women deserve the same rigor to be applied to breast cancer screening.[2]

Markov decision processes model problems of sequential decision making and need to be supplied with robust data. Garbage In inevitably leads to Garbage Out, however sophisticated the method. There is a trade-off of quality and quantity with registry data as it is rare that data is collected meticulously enough with validation to overcome bias.

Uhry et al. limited their test to three very specific districts, out of 100 in France, which had the pilot screening programme plus a cancer registry versus only one control district. Moreover, the Bas-Rhin district is one of the very few in France to have a mandatory complementary health insurance scheme. Several biases are likely, such as quality of data collection and difference in risk factors or in quality of care. The Markov decision analysis could, and should, have been validated by a comparison with a gold standard: another statistical method or rigorous results from a validated screening programme. Indeed, breast cancer screening is undergoing increasing scrutiny.[1,3] In France, there may be doubts about the true benefit of the implementation of the screening programme: the decrease in mortality for breast cancer is maximal in 35- to 39-year olds (18.2%, falling from 10.3 to 8.6/100 000 during 1998–2002 vs. 2003–2007) and is less marked as age increased (e.g. 9.8% in 50- to 54-year olds) despite screening.[4] In Denmark, an evaluation by a case-control study showed similar or lower reductions in breast cancer mortality in screening regions compared to non-screened areas and in age groups too young to benefit from screening.[5]

The general public deserves the best possible advice from its public health practitioners who should use strong evidence from robust tools and avoid flawed estimates from complicated simulations.

[1]Gres 27 rue Voiture, Amiens, France.
[2]Guy's and St. Thomas' Hospital NHS Foundation Trust, London, UK.

Corresponding author:
Alain Braillon, Gres 27 rue Voiture, Amiens, France
Email: braillon.alain@gmail.com

Editor-in-chief's note

The authors of the paper were offered the opportunity to respond but declined.

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