EDITORIAL

The cost of cardiovascular disease: rising, declining or staying still?

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Epidemiological, demographic and health technology factors combined are likely to inflate future healthcare CVD costs, with an older and healthier population consuming higher levels of resources required for treatment

The publication of the Treasury-commissioned Wanless I report in 2002¹ has renewed interest in studies of healthcare expenditure relating to disease burden. The Wanless Committee's approach to estimating future treatment costs however (with its famous three scenarios or future healthcare spent) remained methodologically obscure. The study by Luengo-Fernandes *et al*² published in this issue of *Heart* therefore provides a useful example of cost-of-illness studies methodologies. The study is also a brave attempt in estimating the annual current societal UK expenditure on the treatment of cardiovascular disease.

Health economics studies can only be as valid and timely as the epidemiological evidence and healthcare utilisation data that support them. Given the well known limitations of existing cardiovascular disease (CVD) datasets,³ Luengo-Fernandes *et al*² had to resort to a multiplicity of sources to obtain healthcare activity estimates. These included inter-governmental reports, peer-reviewed studies, routine datasets, as well as assumptions based on key informers. While this heuristic approach is commendable, it should be noted that both the timeliness and validity of the information is not without its problems and limitations. Moreover, the employed methodology does not sufficiently allow for mapping of important entities of CVD and its main component, coronary heart disease (CHD) (such as acute coronary syndromes, heart failure, CHD-related arrhythmia, etc), which in the "real world" are treated by substantially different sectors of the healthcare system.

SENSITIVITY ANALYSIS

Given the imperfection of the evidence and information sources, the author's approach to sensitivity analysis has been disappointingly simplistic. Although advanced approaches, such as probabilistic sensitivity analysis,⁴ would have perhaps been unnecessary in the context of this study, informing the sensitivity analysis by the variability in estimates observed in alternative sources or assumptions⁵ would have been preferable. Instead the authors opted to arbitrarily vary all estimates uniformly, using a (rather limited) "blanket" variability range of $\pm 20\%$. It

should, however, be hoped that in the future similar studies will require less robust approaches to sensitivity analysis, by using much more accurate and timely information sources. Such sources may include the enhanced primary care datasets supporting the implementation of the 2003 GP (General Medical Services) contract,⁶ or the "secondary user" data interface of the Connecting for Health National Programme for IT.⁷

FUTURE TRENDS IN EPIDEMIOLOGY, DEMOGRAPHY AND NEW HEALTH TECHNOLOGY

While the cost estimates of Luengo-Fernandes *et al*² may be an accurate and timely (~ 2005) cross-sectional estimate of CVD healthcare costs, an important question remains about future expenditure trends—the very question that the Wanless Committee attempted to answer. The answer to this question largely depends on three factors: epidemiology, demography, and healthcare technology.

Thankfully, CVD morbidity and mortality have been decreasing in the UK, along with most other industrialised countries since at least the 1980s.^{8,9} However, some uncertainty exists about the possible projection (or not, as the case might be) of such downward linear trends in the future. Although major CVD risk factors such as smoking, high blood lipid values, and hypertension are increasingly better prevented, detected and treated, risk factor trends in obesity and associated type 2 diabetes mellitus are both likely to at least decelerate the historically observed decreasing trends.

Even if age-standardised morbidity and mortality might continue to decrease, demographic factors, both in relation to ageing of the general UK population, and the relatively faster ageing of ethnic subgroups with a higher CVD disease burden,¹⁰ may inflate "crude" healthcare expenditure, in a way analogous to similar trends described for end-stage kidney disease.¹¹

Furthermore, as demand for services and interventions is a major determinant of healthcare costs, the advent of new and more expensive healthcare technology (including new drugs, devices, and procedures, or any combinations of the above) may negate the potential for any savings. For example, a recent US study suggests that between 1993 and 2001, in spite of a stable incidence of acute myocardial infarction (MI)

Abbreviations: CVD, cardiovascular disease; CHD, coronary heart disease; MI, myocardial infarction; PCI, percutaneous coronary intervention

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Figure 1 Trends in population-based rates of hospitalisation for acute myocardial infarction (AMI), diagnostic testing, and revascularisation, adjusted for age, sex and race, Medicare, 1993 to 2001. Reproduced with permission from Lucas *et al.*¹²

there has been a near doubling in the rate of coronary angiography and percutaneous coronary intervention (PCI) procedures (fig 1).¹² Primary PCI for ST elevation MI, biventricular pacing for heart failure, and implantable cardiac defibrillators to prevent sudden cardiac death, are all good examples of the potential for cost escalation relating to existing (let alone future) health technologies. Furthermore, the lowering of risk thresholds for prescription of medical therapies, even if such treatments are low cost, community-based and out-of-patient, may have considerable impact on the finances of National Health Service organisations and society as a whole. For example, the UK's National Institute for Health and Clinical Excellence has recently calculated that the cost of lowering the prescription threshold for statins to individuals with a 20% 10-year CVD risk would be about £80 million per annum.¹³

FUTURE HEALTHCARE CVD COSTS

Ironically therefore, epidemiological, demographic and health technology factors combined are likely to inflate future healthcare CVD costs, with an older and healthier (at least in relation to CVD disease burden) population consuming increasingly higher levels of resources required for treatment, unlike Wanless's optimistic assertion to the contrary.

To whom are the estimates presented by Luengo-Fernandes *et al.*² useful? Research funding bodies may wish to take note; however the interpretation of such studies by research and development policymakers is bound to be variable, and may include investment in a diverse spectrum of areas, from basic research to pharmacological development, as well as "closer-to-patient" health services research.

A second, and perhaps more important, group to whom such studies may be of use are public finances and public health policymakers. Inevitably, whenever costs are involved, questions are asked about what expenditure buys and whether it represents value for money. In this sense, it is worth remembering that primary prevention of CHD has been shown to be responsible for at least half of the reduction in deaths, and at least two thirds of the total benefit in life years gained, compared with cardiological treatments.^{5, 14} Therefore more investment in prevention policies and interventions may intuitively be much more cost-effective in terms of enabling greater population health benefit.

However, the evidence base about the cost-effectiveness of primary preventive strategies and policies is overall poor, not least because of the serious methodological complexities of such studies. Hopefully such obstacles could be addressed, at least in part, by future "cost of prevention" (as opposed to "cost of treatment") studies.

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