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Cost-Effectiveness Thresholds in Global Health: Taking a Multisectoral Perspective

Michelle Remme, MSc, Melisa Martinez-Alvarez, PhD, Anna Vassall, PhD*

Social and Mathematical Epidemiology (SaME) Group, Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, UK

ABSTRACT

Good health is a function of a range of biological, environmental, behavioral, and social factors. The consumption of quality health care services is therefore only a part of how good health is produced. Although few would argue with this, the economic framework used to allocate resources to optimize population health is applied in a way that constrains the analyst and the decision maker to health care services. This approach risks missing two critical issues: 1) multiple sectors contribute to health gain and 2) the goods and services produced by the health sector can have multiple benefits besides health. We illustrate how present cost-effectiveness thresholds could result in health losses, particularly when considering health-producing interventions in other sectors or public health interventions with multisectoral outcomes. We then propose a potentially more optimal second best approach, the so-called cofinancing approach, in which the health payer could redistribute part of its budget to other sectors, where specific nonhealth interventions achieved a health gain more efficiently than the health sector's marginal productivity (opportunity cost). Likewise, other sectors would determine how much to contribute toward such an intervention, given the current marginal productivity of their budgets. Further research is certainly required to test and validate different measurement approaches and to assess the efficiency gains from cofinancing after deducting the transaction costs that would come with such cross-sectoral coordination.

Keywords: cofinancing, cost-effectiveness threshold, economic evaluation, multisectoral, public health interventions, social determinants of health.

Introduction

Health policymakers across the globe are facing difficult financing decisions having to balance a large unmet and rising demand for health services, costly new drugs and technologies, ambitious international guidelines, and severely constrained health budgets [1]. To aid these decisions, a threshold is sometimes used to determine which interventions are cost-effective and should therefore be included in a prioritized package of health interventions [2]. For more than a decade, the Commission for Macroeconomics and Health and the World Health Organization's suggested threshold of 1 to 3 times a country's gross domestic product per capita per disability-adjusted life-year (DALY) averted was accepted without much debate, or theoretical basis [3,4]. Nevertheless, there is now a general consensus that this suggested threshold may not reflect the real opportunity costs of investing in an intervention and that its application may cost lives [5–8].

Recently, there have been efforts to provide clarification on what the threshold should represent, rooted in different economic traditions [6,9,10]. In a welfarist framework that accepts that the individual knows what is best and when aggregate individual utility is the maximand of public policy, a threshold could be derived from the marginal utility gained from the consumption of goods or services that produce health [7,11]. This demand-side concept may be used, alongside other criteria, to set the "health" budget, in relation to other uses of public resources. Decisions of how to then spend a constrained health budget can be better guided by an extrawelfarist framework, in which health in itself is intrinsically valued and health maximization is the decision maker's objective [12,13]. The decision rule to allocate resources to a specific intervention is then based on a supply-side threshold that reflects the marginal productivity of the health system [9,14,15].

This conventional approach that underpins many health economic evaluations often focuses on a single-sectoral payer that seeks to maximize health, typically through interventions delivered by the health care system. This approach risks missing two critical issues: first, multiple "sectors" contribute to the

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* *Address correspondence to*: Michelle Remme, Social and Mathematical Epidemiology (SaME) Group, Department of Global Health and Development, London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London WC1H 9SH, UK.

E-mail: michelle.remme@lshtm.ac.uk.

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production of health, and second, some of the goods and services produced by the "health sector," or the healthcare system, have multiple benefits besides health [16,17]. There is a solid and growing body of evidence on the social determinants of health, which include poverty, education, gender inequity, housing, and transport, among many others [18–21]. In fact, some argue that population health is largely or even primarily impacted by interventions in other sectors with other payers, which are arguably not aiming to maximize health [22,23]. In the new global development agenda, these structural determinants have come to the forefront, with 17 sustainable development goals that explicitly seek to tackle socioeconomic inequalities and environmental factors hampering human development [24,25]. Global health programs will increasingly have to compete for resources with these upstream nonhealth programs, but could also stand to greatly benefit from their spillover health outcomes. Similarly, public health interventions targeting populations or communities, rather than individuals, typically have wide-ranging cross-sectoral impacts and cost implications. The spillover benefits of these interventions have gained prominence and helped to make the case for greater investments [17,26,27].

There are at present a number of ways to deal with the economic evaluation of interventions with multisectoral outcomes [17,28–30]. The first is the adoption of a welfarist cost-benefit approach that monetizes outcomes. Analysts grappling with this in the fields of social care and environmental economics are leaning toward this option [29,31]. Yet the contentious step of attaching a monetary value to life, health, and other social outcomes is part of what led to the development of and health decision makers' preference for an extrawelfarist framework [14]. Within the extrawelfarist evaluation perspective, two approaches exist that allow those in the health sector to incorporate nonhealth consequences into their decision space. Most commonly, costs are weighed against 1) composite outcome measures that incorporate broader capabilities, or 2) multiple consecutive outcome measures, with cost-consequence approaches [28,32].

Several current guidance documents also stipulate a variation of the latter approach, whereby the nonhealth costs and effects of interventions are to be reported and disaggregated by sector of the economy or by payer, including the Gates Reference Case for economic evaluation in global health, the National Institute for Health and Care Excellence's guidance for local government decisions in England and Wales, and the second US panel's recommendations on cost-effectiveness analysis in health and medicine [33–36]. The latter has even recommended the standard reporting of two reference cases for every economic evaluation: one from a health care sector perspective and the other from a broader societal perspective, with the use of an impact inventory to comprehensively report consequences beyond the formal health care sector [36]. Following the same logic, evaluations of nonhealth interventions should similarly consider non-negligible health consequences. Nevertheless, even with impact inventories for interventions across sectors, current guidance remains silent on how a health payer should value consequences outside the sector to decide on the most judicious allocation of its resources.

Although the second US panel "recommends that analysts should attempt to quantify and value non-health consequences," it also acknowledges that "there are no widely agreed upon methods" for this and it remains unclear as to how to apply a threshold based on opportunity cost to nonhealth impacts to support investment decisions [36]. In the United Kingdom, the National Institute for Health and Care Excellence's guidance further points out the lack of a standard method to apportion costs when more than one government department or local government is involved in delivering an intervention or is reaping its benefits [34,37].

In this article, we examine how efficient current cost-effectiveness thresholds are in dealing with interventions with multisectoral outcomes, implemented within and outside the health sector, and how this could be improved. We propose an approach that retains the extrawelfarist perspective (that may also apply to payers in other social sectors) and the principle of opportunity cost to maximize each sector's objectives, recognizing that each sector has its own budget constraint and real opportunity cost. We start by illustrating how the current thresholds could result in health losses, before proposing a potentially more optimal second best approach. We then discuss some of the associated measurement and application challenges and highlight areas for future research.

Approaches to Resource Allocation: What Are the Consequences of a Unisectoral Approach?

Culyer [38] has recently proposed a bookshelf metaphor to resource allocation in health, whereby each book represents a health care intervention (see Fig. 1). The height of the book indicates its effectiveness in terms of health benefit, and its thickness captures its total cost. These books can be ranked in order of their height, from left to right, and included in a national health care package up to the point at which the health budget is exhausted, similar to the league table approach [3,5]. The last intervention to be included therefore represents a threshold of health productivity per unit of expenditure (t_h), or the inverse of the common cost-effectiveness ratio. It is the least productive intervention provided, and any intervention that would be considered to be added to the package would have to be at least as productive to avoid a loss of population health. The threshold is a direct function of the productivity of health interventions and the size of the health budget.

If such a unisectoral approach is to achieve health maximization, one must make a number of assumptions, including 1) that the health budget reflects the allocation of public resources to health care rather than to health; 2) that the cost of any health-producing intervention under consideration is fully borne by the health budget; and 3) that the merit of any intervention is solely determined by its impact on population health. A health-producing intervention delivered outside the health sector (or a public health intervention) is, however, likely to have other nonhealth benefits, and thus other payers that are willing to allocate part of their budgets to it. We suggest and illustrate how, in such cases, these underlying assumptions may result in health losses. From here on, we refer to "nonhealth interventions" as interventions with nonhealth primary objectives and spillover health outcomes, whereas "public health interventions" will have public health as a primary objective and spillover nonhealth outcomes.

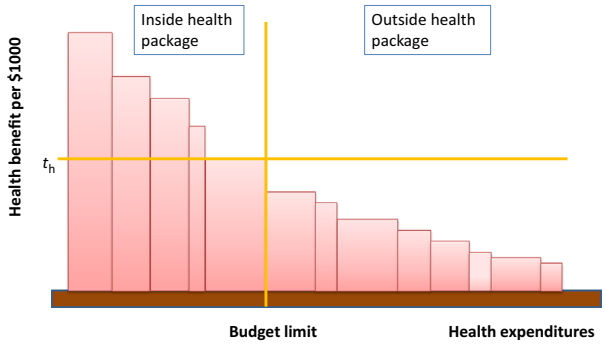

Fig. 1 – The bookshelf of health care resource allocation [38].