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Editorial

Drug Pricing, Patient Welfare, and Cost-Effectiveness Analysis

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Cost-effectiveness analysis (CEA) is becoming more important in shaping healthcare benefit packages worldwide. The area in which CEA is applied most is in the context of new and often expensive medicines. The incremental cost-effectiveness of a new medicine is usually compared with a single threshold to determine whether it is eligible for reimbursement. Given that new medicines are often prescribed for multiple indications, the cost-effectiveness of a medicine can vary widely between indications for many reasons. In addition to the fact that health benefits and healthcare use depend on patient and disease characteristics, differences in drug pricing depending on indication can also contribute to such differences in cost-effectiveness from a payer's perspective. Although some theoretical models suggest that different prices for different indications might be welfare improving,[1] the article by Jiang et al[2] suggests that this is not necessarily the case. They argue that indication-specific pricing could lower patient welfare, which, if true, raises several important questions for health policy. Here, we will focus on some implications that are relevant for applying CEA in practice that are closely related to the theoretical underpinnings of CEA.

The theoretical origins of CEA are 2-fold.[3] One of them is in decision theoretic models in which decision makers have the objective to maximize population health given an exogenously determined budget and have to choose what to fund among many possible healthcare interventions. Another origin of CEA is in economic models of representative consumers that try to maximize lifetime utility considering the impact of health on their income that is more closely linked to welfare economics and cost benefit analysis. These different origins are still noticeable in current practice of CEA in health policy as exemplified by the differences in perspective (payer vs societal) that countries have adopted. From both these different theoretical models, one can derive simple decision rules as applied in practice in which an intervention is eligible for reimbursement if its cost-effectiveness is below a certain threshold. This threshold represents the shadow price of the budget constraint (which equals the cost-effectiveness of the least cost-effective intervention still funded) or consumption value of health at the margin (often measured using willingness to pay). However, a simple application of these decision rules does not automatically maximize patient welfare (usually measured using quality-adjusted life-years) given that not all assumptions underlying the theoretical models are met in practice.[4] First, these decision rules only hold if the healthcare budget is already allocated efficiently. This assumption is usually violated because (1) many interventions in healthcare benefits packages are probably not cost-effective and (2) healthcare decision makers only have limited discretion on guiding displacement of funded healthcare interventions. Second, theoretical models underlying CEA assume that costs of interventions are exogenously determined. However, new pharmacological products are protected by patents and the relation between prices and costs is often unclear. Therefore, it is not surprising that results of CEA have become an element in price setting strategies by pharmaceutical companies. It is exactly this point that makes the article by Jiang et al[2] relevant for applying CEA in practice.

Currently, CEA is most often used for assessing new products brought to the market by pharmaceutical companies. The combination of simple CEA decision rules and the gaining popularity of value-based healthcare has led to value-based pricing in which companies look for prices of similar products for different indications up to the threshold. Such practice can be supported by some economic models given that indication-specific pricing can be seen as a form of price discrimination with which companies with (temporary) monopoly power can maximize their profits.[1] This practice means that new products can absorb all consumer surplus in a therapeutic area but still can be considered welfare improving if producer surplus is valued similarly as consumer surplus. Although there is a large theoretical economic literature on pricing strategies and strategic behavior of manufacturers,[5] the implications for CEA are not always clear cut given the complexities of healthcare systems and the role of healthcare insurance. Therefore, the article by Jiang et al[2] published in this issue is a nice addition to the literature in terms of its findings and its attempts to bridge the gap between theoretical economic literature and the practice of CEA. However, the findings from Jiang et al[2] should be interpreted with caution given that their model and its assumptions do not translate easily to some healthcare systems. The article uses a very particular setting and a very particular welfare measure given that it only considers consumers' surplus and ignores the costs associated with insurance payments (which will have to be somehow financed by society, by insurance premia, contributions to sickness funds, or taxes). The other element determining their key result is that regulated prices in Jiang et al[2] are fixed equal to average effectiveness by indication and that the uniform pricing is the patient numbers–based average of each indication-based price. This means that in some indications the indication-based price will be higher than in others and the uniform price will be somewhere in between. Jiang et al[2] show that under this structure it is possible that indication-based pricing yields lower welfare than uniform pricing (assuming that all indications are available at the uniform price). Their article is a

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caution note that indication-based prices may not always lead to optimal patient welfare under certain types of regulation.

We think the article by Jiang et al[2] raises important questions about the use of simple CEA decision rules given that crucial assumptions underlying those decision rules are not met in practice. For instance, should decision makers reward all new products maximally up to the threshold? In some disease areas, initial breakthrough innovations are followed by a series of follow-up innovations that often produce only marginal health benefits. Applying simple CEA decision rules in these cases could lead to long sustained periods of paying high prices to producers and offer strong incentives for more "me-too" innovations. More fundamentally, some authors have even argued that the use of thresholds in itself could lower social welfare.[6,7] We argue that more theory is needed that facilitates using CEA as a tool to promote competition between healthcare technologies rather than competing against a fixed threshold. The article by Jiang et al[2] offers important initial insights for health policy but more theoretical models bridging the gap between consumer and producer perspective are needed. The key issues for further advance in our knowledge would have to be based on robust general results, or in their absence on the definition of conditions for context, that may provide robust presumptions about the results from using particular regulations and price determination mechanisms. Theory can provide stronger guidance than examples, whereas examples of contexts help to build intuition and guide further theory advances.

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