Artículo Científico

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Estimating cost-effectiveness thresholds under a managed healthcare system: experiences from Colombia

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Abstract

Like most of the world, low- and middle-income countries have faced a growing demand for new health technologies and higher budget constraints. It is necessary to have technical instruments to make decisions based on real-world evidence that allows maximization of the population's health with a limited budget. We estimated the supply-based cost-effectiveness elasticity, which was then used to determine the cost-effectiveness threshold for the healthcare system of Colombia, a middle-income country where multiple insurers, paid under capitation rules, manage the compulsory contributions of the citizens and government subsidies. Using administrative data, we explored the variation of health expenditures and outcomes at the insurer, geographical region, diagnosis group and year levels. To deal with endogeneity in a two-way fixed-effects model, we instrumented health expenditures using characteristics of the health system such as drug-price regulation. We estimated the threshold to be US$4487.5 per years of life lost avoided [14.7 million Colombian pesos (COP) at 2019 prices] and US$5180.8 per quality-adjusted life-years gained (17 million COP at 2019 prices), around one times the gross domestic product GDP per capita. To the best of our knowledge, this is the first estimation of the cost-effectiveness threshold elasticity supply-based in a middle-income country with a managed healthcare system.

Keywords: Cost-effectiveness, healthcare spending, QALY, threshold, Colombia

Introduction

For middle-income countries, optimizing the use of resources devoted to healthcare is essential to ensure that governments fulfil their promise of universal coverage while assuring the quality of health services. One of the main tools for prioritization is the economic evaluation of health technologies that will be covered by public funds according to a health benefits plan (HBP). The results of these assessments are summarized by the incremental cost-effectiveness ratio (ICER).

The ICER is estimated from the cost-effectiveness elasticity, typically the amount of money required to increase one quality-adjusted life-year (QALY) with the technology under consideration relative to the usual treatment (Cleemput *et al.*, 2011; Drummond *et al.*, 2015). However, these cost-effectiveness measures cannot be interpreted beyond the comparison of alternatives in a narrow therapeutic area unless there is a common standard for determining whether a technology is cost-effective or not.

The cost-effectiveness threshold (CET) is such a standard. It represents the health opportunity cost of marginal increases in health expenditures in each society (Culyer, 2016; Paulden *et al.*, 2016).[1]

CET adoption with the purpose of public health policy design or decision-making is often conditioned by the epidemiological profile, by the institutional and development characteristics of a country and by public policy changes in the healthcare systems. The CET has been used mainly to define coverage, financing and reimbursement policies for health technologies, linked to the definition and scope of HBP, and the regulation of prices, usually prescription drugs. These policies are often not explicit and involve different authorities, both in the healthcare sector and outside it, that enjoy broad discretion regarding decision-making.

Given that few countries have an estimated CET, the convention is to adopt the rule of thumb of one to three times GDP per capita (Robinson *et al.*, 2017). While estimated CETs currently tend to be within such range, there is no appropriate theoretical or empirical support for its use (Leech *et al.*, 2018). Therefore, its use could potentially exacerbate inequalities and lead to a reduction in population health