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EDITORIAL

# International differential pricing: easy in theory but hard in practice

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How countries pay for patented pharmaceuticals varies widely in terms of complexity of rules and processes. A pharmaceutical pricing scheme should ideally provide affordable drug access to those in need while allowing the manufacturers to receive enough profits to sustain continued technological innovation. Profit-seeking pharmaceutical companies are incentivized to set prices in a way that would maximize their revenues and sustain long term dominance of specific market segments and they understandably attempt to justify these practices as a necessity to cover their R&D investments. Health authorities, on the other hand, typically have a current budget constraint under which they have to work and have some incentive to discount the value of future innovation. While some countries have allowed "free pricing", others have introduced concepts such as "value-based pricing" or enforced rigid price controls. As one looks across various country markets, there is a range of practices that fall somewhere along this continuum.

For the current discussion, our focus is on the practice of value-based pricing – focusing on the diversity between evidence-based pricing and reference pricing approaches. We are, in particular, seeing emerging new pressures that are beginning to have an impact on some of these long-standing practices. For all practical purposes, we might remove the so-called "free pricing" countries from this thought exercise as this as a concept is a dying breed outside of the US. Similarly, we have not attempted to consider countries that are under some form of price control. In evidence-based pricing, countries may establish health technology assessment (HTA) organizations in hopes of creating a systematic and transparent framework for evaluating the prices of drugs in terms of their outcomes. At the other end of the spectrum, reference pricing countries scan prices in other health systems (and in cases where a domestic referencing is applied, scan prices in the basket of products) and base the price in their own country on those observations. For example, Slovakia takes the second lowest price in the EU and makes price revisions twice a year. The tradeoffs between the two pricing schemes is clear: evidence-based pricing requires exploring the value of a drug while in some way attempting to establish a price based on a society's willingness-to-pay for the drug, and reference pricing is a system that tends to drive prices to a common minimum – the logic often being that such a determination is a fair value as companies are selling at these prices in other countries. This provides an opportunity for the countries to bypass socio-economic development factors altogether; research suggests that drug prices do not vary based on the macroeconomic development factors of each market, which suggests reference pricing is the more common system [1].

International reference pricing mechanisms have largely stayed within the realm of list prices and as a result, list prices tend to show a downward trend in these countries over time. The discounts and rebates offered at national, regional, or local levels by pharmaceutical manufacturers have largely stayed "invisible" and therefore, did not enter into reference calculations. However, recent trends are making some of these off-list prices more transparent. Germany has been able to implement a system where a mandatory rebate will be enforced in a way that it is there for everyone to see. Such off-list price arrangements are, however, becoming increasingly difficult to maintain as countries and HTA agencies are requiring more rigorous reporting on how net prices are determined. More and more countries are expected to go beyond list prices and begin to look at net prices as a better proxy of the real prices in their referenced markets. Considering these trends, it is becoming increasingly difficult for manufacturers to maintain differential prices across countries. The evolving nature of re-

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ference pricing combined with other issues such as transparency to net prices is likely to eventually push prices down towards marginal costs, which will reduce profits available to the manufacturers.

It is not surprising that manufacturers are now exploring concepts of differential pricing as an alternative to the current regime that are driven largely by reference pricing mechanisms. The differential pricing scheme could be viewed as a way to maintain the flexibility of evidence-based pricing but adjusted to reflect local realities [2]. In differential pricing, countries (or individuals) pay an amount according to their willingness to pay, which may differ based on factors such as income and wealth. To provide an analogy, movie tickets are an example of differential pricing in everyday life: children and seniors receive discounts because their fixed incomes typically result in a lower ability and willingness to pay. The theoretical foundations of differential pricing can be found in Ramsey pricing concepts applied to a segmented global market place and suggests higher profits for monopolistic producers who can price discriminate [3].

The differential pricing idea is, however, beset with a number of technical and practical difficulties. Even though the scheme facilitates creation of a relative score that can be used to adjust prices to local conditions, there should still be a consensus "benchmark price," which could prove to be problematic. Will countries be willing to set aside national autonomy on setting prices and agree on a benchmark country? Countries under reference pricing schemes may see prices for drugs increase when shifting to a differential pricing system. As an example, if the differential price matrix is tied to GDP per capita, some countries such as Luxembourg may end up with higher prices than their neighbors. Currently, Luxembourg references prices from Belgium, France, and Germany, but if the differential price rules are correlated with GDP per capita, Luxembourg could pay over double its neighbors [4].

Going beyond the technical issues, it is unclear as to how such a pricing scheme can be applied to a country keeping in mind income distribution and regional disparities. First, how is the willingness-to-pay or marginal benefit determined for each country? The common answer is that prices could be a multiple of the relative GDP per capita between the country in question and the benchmarked country. Such a rule would assume that the sole determinant of willingness to pay is the income level of an individual without any regard to fairness. To account for fairness or equality, perhaps the rule would need to include some measure of income dispersion, such as the Gini coefficient. While using GDP per capita as the rule may be implementable, there is no clear means of incorporating dispersion measures into differential pricing rules, and the profit-maximizing rule from the producer might not necessarily be aligned with the optimal fairness rule. Other factors in determining willingness to pay could include the burden of disease for the indication of the drug or even conspicuous consumption, where individuals want to spend money to publically display economic power, i.e., conspicuous consumption [5]. The theory underlying differential pricing does not answer how these factors might be relevant in the case of patented medicines.

A *sine qua non* for an effective differential pricing scheme for patented medicines is the absence of cross border sales. In fact, differential pricing, by its very nature, opens up arbitrage opportunities. For example, if children could resell discounted movie tickets to adults, theaters may abandon the discounted tickets program, which will prevent the children with lower willingness to pay thresholds from enjoying the movie. Free trade and free movement of goods across borders are sanctioned by law in many parts of the world and therefore, are key features that any differential pricing scheme will have to account for.

Most health economists would probably agree that reference pricing of patented medicines would be not efficient in the long-run, largely because it is likely to end up stifling innovation. The practical difficulties of a differential pricing regime replacing current model make it nothing more than an academic concept at this time. However, at the periphery, differential pricing and similar approaches can provide meaningful relief to marginalized countries such as those in sub-Saharan Africa, at least in the foreseeable future, as has been demonstrated by HIV medicines and tiered pricing for vaccines. Although the differential pricing theory is appealing, key technical and policy challenges remain, and the path towards full-scale implementation appears murky at best.

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