



Drug Pricing and Its Discontents: At Home and Abroad

By Roger Bate and Kathryn Boateng

This Health Policy Outlook assesses the market for chronic disease medications such as antiretroviral drugs (ARVs) to treat HIV/AIDS. A tiered, or differential, pricing structure serves public health by ensuring the greatest affordability of patented drugs as well as maximizing profits to the innovator. Ending differential pricing could increase access for some patients in the short run, but would pose a severe threat to global drug innovation in the long run, and probably lower access for some patients. Differential pricing appears haphazard, often because negotiations among drug companies, insurers, government providers, pharmacies, and other retailers are opaque. There is no doubt the pricing system could be improved. Many companies differentiate prices according to socioeconomic indicators to make them equally affordable to people with different incomes and to countries with varying disease burdens. Ideally, this approach simultaneously yields prices affordable to both low- and middle-income countries and maintains incentives for research and development (R&D). Concerns within pharmaceutical companies about pricing approaches, however, prevent sensible collaboration on the correct approach to differential pricing.

Differential pricing (also known as “price discrimination”¹) of branded pharmaceuticals has several opponents. Many Americans are upset that they pay more for medicines than people in other countries do, but many activists are annoyed that the poor in countries like Thailand pay more than the cost of production for HIV/AIDS medicines. Both groups believe the pharmaceutical industry is accruing excess profits at their expense.

In the late 1990s, ARVs were not widely available, and certainly not at prices that most HIV-infected patients in the poorest countries could afford. Following litigation and media pressure, several “originator” pharmaceutical companies—those that develop new drugs rather than merely produce existing ones—that owned patents on various ARVs responded by lowering their prices for residents of poor countries through the Accelerated

Access Initiative (AAI). This public-private partnership, consisting of five pharmaceutical companies² and several United Nations (UN) organizations, aims to provide developing countries with access to medicines at the lowest possible prices and technical support for national access programs for ARV treatment.³

Using UN Human Development Index (HDI) measures to determine eligibility, drug companies in the AAI offered several discounts for their drugs to low-income countries. This price reduction program soon extended to middle-income countries such as Brazil and India, which have proportionately less HIV/AIDS prevalence. Companies like Merck and F. Hoffmann-La Roche were among the first originator companies to publicize their lower prices for middle-income countries.⁴

In recent years, the practice of price discrimination by the pharmaceutical industry has been affected by several initiatives. In 2001, the World Trade Organization (WTO) issued the Doha

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declaration on its Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement, allowing low-income countries to ignore intellectual property rights in case of a public health emergency and acquire patented drugs at less than market value.⁵ Given that few, if any, profits came from these countries, there was little concerted opposition by the pharmaceutical industry to the agreement, although the industry was slow to lower prices in the poorest nations and initially opposed the Doha declaration. After several thoughtful negotiations, however, it was persuaded to support tiered prices in poor countries. Initially, the agreement was limited to the poorest nations, but middle-income countries—particularly those with generic “copy”⁶ drug industries⁷—took this as an opportunity to demand that originator companies offer them prices similar to those enjoyed by poor countries. Lest its inaction permit drug copies to be widely introduced into the market, the research-based industry lowered its prices in middle-income countries as well.

For example, competition from generic producers in India and Brazil forced the average branded price of an AIDS triple-combination therapy down from \$10,439 per year per person to less than \$1,000 per year in 2000.⁸ In February 2001, Cipla, an Indian generics manufacturer, announced that it would sell a cocktail of three anti-HIV drugs—stavudine, lamivudine, and nevirapine—for \$350 per patient per year.⁹ The price of this triple combination was as high as \$15,000 in the United States.¹⁰

Since 2001, the research-based industry has become more willing to tier prices. That year, Bristol-Myers Squibb became the first pharmaceutical company to allow other companies to produce generic versions of an HIV/AIDS drug for which it had exclusive production rights.¹¹ There are innovator companies willing to take steps to increase the supply of medicines—particularly the ARVs essential to the successful treatment of HIV/AIDS—even if it means partnering with generic producers.

Meanwhile, activists and copy producers have continued to push for lower prices. Keeping HIV/AIDS treatment affordable is important, but developments like Cipla’s cheap cocktail are not without repercussions. Lowering the price of drugs in middle-income countries in the short run may undermine new-drug R&D in the long run.

Who Pays the Piper

The reality is that U.S. patients bear the greatest burden for R&D costs even when middle-income countries

contribute their share. Americans would certainly like to see reduced drug prices. Senator Byron L. Dorgan (D-N.D.), sponsor of a Senate bill¹² that would allow Americans to reimport cheaper drugs from Canada, said that “[I]f lifesaving prescription drugs save no lives if you cannot afford to purchase them.”¹³ Dorgan makes an important point: even wealthy countries like the United States have to deal with pricing pressures of their own, and their citizens may be getting fed up with paying the lion’s share of global R&D costs. Although the correct price of a pharmaceutical is a debatable topic, middle-income countries have some responsibility to contribute to R&D, yet they do not generally acknowledge that role.

Many nongovernmental organizations (NGOs) argue that all people ought to have equal access (that is, access on the same terms and at the same prices) to pharmaceuticals. Médecins Sans Frontières (MSF, known as Doctors Without Borders) has been the most vocal critic of differential pharmaceutical pricing. It prefers an artificial pricing system that would either have prices mandated by UN agencies or NGOs such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, or allow UN aid groups to purchase generics and break pharmaceutical companies’ patents: “MSF is advocating for a combination of policies to lower drug prices on a sustainable basis; these strategies include encouraging generic competition, voluntary discounts on branded drugs, global procurement, and local production.”¹⁴ The activists’ next best solution is simply to push for lower prices wherever and whenever they can. Each price cut is viewed as a victory, regardless of its negative consequences.

Several studies, however, have defended the market-driven price discrimination model, arguing that price discrimination is economically efficient and welfare-maximizing.¹⁵

Why Companies Must Price Discriminate: A Theoretical Excursion

There is a considerable scholarly literature¹⁶ comparing the price discrimination model to a single-price model, and it reveals that price discrimination in the pharmaceutical industry is better for society. Orthodox economic theory is based on a utilitarian philosophy that decisions should be made with the end goal of maximizing societal welfare. Under certain circumstances, price discrimination is a classic economic model that typifies this philosophy, as it allows price-sensitive individuals to

consume a good they otherwise would not have been able to consume under a single-price structure.

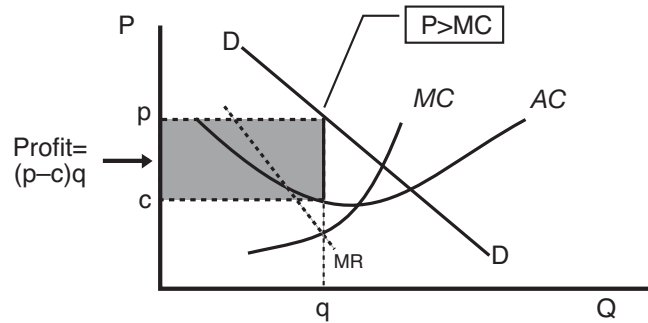
Prices need to be higher in industrialized countries in order for pharmaceutical companies to recoup the costs of production, as well as to provide an incentive for further innovation. Drug R&D is vastly expensive. Every year, R&D amounts to almost 20 percent of the U.S. research-based pharmaceutical industry's total global sales. By the time a drug receives Food and Drug Administration approval, an average of \$802 million has been spent on R&D.¹⁷ Researching a new drug involves high fixed costs because "it is largely invariant to the number of patients or countries that ultimately use the drug and cannot be attributed to specific countries."¹⁸ Consequently, the costs of R&D must be shared across the myriad drug markets, with the richer paying significantly more than the poor, and those in the middle contributing more than the poorest. The goal of distinguishing between markets is ultimately to reconcile patents—which are necessary for innovation—with the affordability and accessibility of these drugs in poor countries.

Figure 1 illustrates a situation in which a firm with some market power (facing the downward-sloping demand curve DD) is trying to find the one price that will maximize profits. Given the market demand and cost conditions in that market, the firm will maximize profits at that output (q) where marginal costs equal marginal revenue ($MC=MR$). At this output, profits (the solid rectangle) will be as large as possible, but p will be greater than MC .

While it costs hundreds of millions of dollars to produce the first pill of a new drug, the marginal cost (MC) of producing additional pills is very low. Therefore, a traditional pricing system that charges consumers the marginal cost of the drug would not take into account the high R&D costs that the firm incurred. But when producers in such industries can charge different prices to different people, they can expand production and reach a wider section of the market.

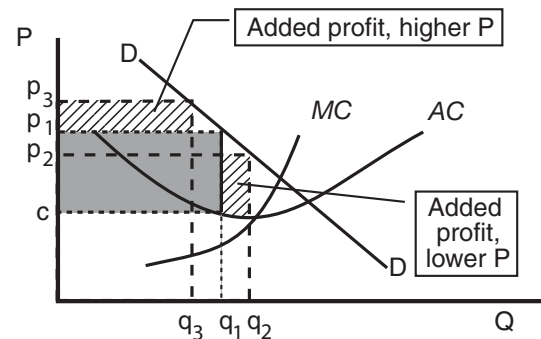
Figure 2 illustrates this differential pricing system (by assuming that companies can isolate and keep separate different groups of buyers, represented by the demand curve DD). Simply put, those who are able and willing to pay more (i.e., the wealthier) are charged p_3 , while those who can or will only pay less (i.e., the poorer) are charged p_2 . If this strategy is successful, and those receiving the lower prices cannot resell to those willing to pay more, then the company will get higher profits than it would by setting a single price.¹⁹

FIGURE 1
SINGLE-PRICE MARKET



SOURCE: Robert B. Helms, "Pharmaceutical Industry Economics: Pricing and Investment Incentives" (presentation, AEI-Brookings Joint Center for Regulatory Studies, Washington, DC, May 17, 2007).

FIGURE 2
MULTIMARKET PRICE DISCRIMINATION



SOURCE: Robert B. Helms, "Pharmaceutical Industry Economics: Pricing and Investment Incentives" (presentation, AEI-Brookings Joint Center for Regulatory Studies, Washington, DC, May 17, 2007).

Figure 2 is an oversimplification of the real market, but studies show that this form of differential pricing leads to a more socially efficient outcome.²⁰ In the context of the pharmaceutical market, differential pricing allows pharmaceutical companies to produce more drugs than would be possible in a single-price system, thus giving patients in developing countries greater access to life-saving drugs.²¹

Profits in the pharmaceutical context do not merely serve to fill wallets for shareholders: they allow R&D to be sustained and even expand. The price discrimination model allows middle- to high-income countries to bear most of the R&D costs, while affording low-income countries greater access than otherwise to the safe, effective drugs they need.

When the Price Is (Not) Right

A pharmaceutical company must meet several criteria before it is able to practice price discrimination. First, the company must be a price-searcher, not a price-taker. This means it must have enough market power²² to search for a profit-maximizing set of prices rather than accept a market price as, say, a wheat farmer would do. In the pharmaceutical market, such market power is often the result of a government-granted patent. Second, there can be no secondary markets; that is, a consumer cannot buy a drug at a low price in one country and sell it at a higher price in a different country. This defeats the purpose of segmenting markets. In reality, the ability to practice price discrimination is often impeded by external factors in the market.

While pharmaceutical companies selling branded products are not like wheat farmers, they still do not have unlimited power to price discriminate or set prices in any market. A Federal Trade Commission report explains some of the reasons for this phenomenon from a domestic perspective, and, in doing so, captures the international scene as well: “Over the last 15 years, the pricing and other competitive strategies of pharmaceutical companies have been altered by revolutionary developments in information technology, new state drug substitution laws. . . . The industry has also undergone significant structural changes that include growth of the generic drug segment.”²³

The effect of price controls is a key factor influencing a firm’s motivation to discriminate on the basis of price. When a government decides to set the price for a particular product, the firm may have little choice except to refuse to supply consumers if it thinks the regulated price is below the marginal cost of serving the market. Another important factor limiting or reducing a company’s opportunity to discriminate successfully on price is market competition. This comes from the entry of new branded products from rival industries, new copies (licensed or not), and all the products that consumers (and their buying agents) seek out for better bargains.

The boom in the generics industry generally and the ambiguity of compulsory licensing under the TRIPS agreement in particular have weakened the standing of patented drugs. Under TRIPS, countries can choose to break patents without seeking the approval of any multilateral agency or the drug company in question. The only condition is that countries be in “national emergencies”—a broadly defined concept that includes public health

crises like those related to HIV/AIDS, tuberculosis, and malaria. But without clear criteria to define which drugs, countries, and populations are eligible, many countries have enjoyed *carte blanche* to secure higher outputs for their generics industries. As a result, brand-holder profits—and funding for R&D—are undermined.

As patents are broken and the production of copies increases, drug prices are forced down closer to their marginal costs. Marginal cost pricing would suffice to cover the expenses of copy products, whose manufacturers incur only production and distribution costs. As Patricia Danzon and Adrian Towse point out, however, “marginal cost pricing cannot generate sufficient revenue to cover R&D costs of [the] innovator. Hence, free entry and the resulting marginal cost pricing are incompatible with sustained incentives for R&D.”²⁴

The development of secondary markets, or reimportation (also known as “parallel trading”), is another hurdle that discourages price discrimination. The most notorious case of parallel trading of ARVs occurred in 2002, when

schemes in which deeply discounted HIV and AIDS drugs meant for poor and dying patients in Africa were resold in Europe at huge profits. . . . Around one-fifth of GlaxoSmithKline’s marked-down AIDS medication destined for impoverished patients in five African countries wound up instead in the hands of profiteers.²⁵

To avoid price leakage and patent abuse, it might be tempting for drug companies to try to set a unique worldwide price, cutting many low-income countries out of the market. The combined forces of market incentives and concerns about public health have worked together to trump this approach, which is favored by industry critics. One study has found that price discrimination *increases* access by a factor of four to seven.²⁶

Differential Pricing in Action

In our research collecting data from several drug companies, we found that many companies use a three-tiered pricing structure in which countries are placed into certain groups. In order to increase access to ARVs, many companies offer them at marginal cost to those countries hardest hit by the AIDS pandemic, while setting higher prices for middle-income countries. Companies consider the size of a country’s economy (a proxy for quality of life), adult HIV prevalence rates, the amount of medicine

needed, political commitment to fight the disease, and price controls.²⁷

For reasons of competition, many originator pharmaceutical firms do not disclose their cross-country pricing or production costs. But in March 2001, Merck established a precedent-setting differential pricing policy, publicly disclosing its product prices for ARVs in developing-country markets and providing significant discounts for them in more than 130 countries.²⁸ Merck established its differential pricing policy using independent criteria: the UN Development Programme's HDI²⁹ (as a measure of a country's level of development) and the Joint United Nations Programme on HIV and AIDS (UNAIDS) adult HIV prevalence rate³⁰ (to establish burden of disease). In seventy-two³¹ countries with the greatest burdens of disease and lowest levels of economic development, Merck offers its ARVs Stocrin and Crixivan at profitless prices. Since its announcement in 2001, Merck has further discounted its prices, sometimes under pressure from countries threatening compulsory licensing, but on several occasions when it was able to attain manufacturing efficiencies. For example, the not-for-profit price for Merck's once-daily Stocrin is 65¢³² in all low-HDI countries as well as in medium-HDI countries with 1 percent or greater adult HIV prevalence.³³ In August 2006, in the ninety-four countries in which Merck has marketing rights,³⁴ it extended its pricing to Atripla, a once-daily, single-tablet regimen produced with Gilead for the treatment of HIV-1 infection in adults.³⁵

There are, of course, incentive problems with preferential pricing based on both low income and high prevalence rates—especially the latter. One might foresee a situation in which, because of good public health policies, a country lowers its HIV rate from 1 percent to, say, 0.9 percent and ends up paying far more for drugs because of the arbitrary pricing cutoff. Although national health departments are highly unlikely to actually increase the incidence of the disease above 1 percent, Merck's discount program theoretically offers an incentive to overreport disease rates. It is worthwhile to note, however, that for those countries whose country classifications have changed—that is, for those that progressed from having a medium to a high HDI classification or reduced their prevalence rate—Merck has grandfathered them in at their previous

lower price in recognition of the countries' commitments to tackle the disease.³⁶ But even this position has its problems, since if a country lowers its HIV rate and grows rapidly, it should expect to pay more in the future.

Abbott, another research-based pharmaceutical company, also uses this tiered pricing structure for its HIV/AIDS medication. In April 2007, Abbott announced that it would cut the price of Kaletra (lopinavir/ritonavir) in forty lower-middle-income countries in Asia, Central America, and Eastern Europe to \$1,000 per year.³⁷ Some of the countries benefiting from this new price are India, Thailand, Sri Lanka, Jordan, and Honduras. The drug was previously offered at \$2,200 per year in these countries. In sub-Saharan Africa and low-income countries in Asia, Kaletra has been offered at \$500 per year. Abbott issued a statement saying, "This price is lower than any generic price available in the world today for this medicine and is approximately 55 percent less than the average current price for these countries."³⁸

Another brand-holder, Gilead, explained that in ninety-seven less-developed countries (LDCs), thirty tablets of its HIV/AIDS medication—the equivalent of one month of treatment—are available for \$17, essentially at cost. In lower-middle-income countries, such as China, India, and Thailand, the company prices it slightly higher, at \$30.³⁹

Overall, maintaining a broad three-tiered pricing schedule—with room for negotiation at each level—makes a lot of sense. Delivering essential medicines to those who need them at prices they can afford is crucial. But for the poorest, it is not just important that companies lower their prices, but that poor nations' governments increase their spending on health and commit to future purchases. One of the complaints made against Thailand was that the government actually cut its health budget in the past year while at the same time demanding lower prices from pharmaceutical companies.⁴⁰ It is the responsibility of developing countries' governments to ensure their people have access to drugs. Pharmaceutical companies have a duty to price those drugs equitably and efficiently—which means differential pricing. This is especially true considering that the costs of continuous drug development are significant and can only be undertaken by companies with deep reserves of expertise and cash, which hinges on their ability to

The costs of continuous drug development are significant and can only be undertaken by companies with deep reserves of expertise and cash, which hinges on their ability to generate profits.

TABLE 1
SELECTED COUNTRIES WITH RELEVANT SOCIOECONOMIC INDICATORS

Country	Income status	2005 GDP per capita (in dollars)	Total expenditure on health as a percent of GDP (2004)	HIV prevalence rate (percent of population aged 15–49 infected)
Brazil	Upper-middle-income	7475.27	8.8	0.50
Thailand	Lower-middle-income	7719.97	3.5	1.45
Uganda	Low-income	1293.13	7.6	6.40
Nigeria	Low-income	1003.11	4.6	3.90

SOURCES: World Health Organization, *World Health Report 2006*, Annex Table 2, “Selected Indicators of Health Expenditure Ratios, 1999–2003” (Geneva: WHO, 2006), available at www.who.int/whr/2006/annex/06_annex2_en.pdf (accessed August 1, 2007); and World Bank, *World Development Indicators 2007*, “Key Development Data and Statistics” (Washington, DC: World Bank, 2007).

generate profits. Market segmentation and patent protection help companies reconcile these competing realities.

Discontented Middle-Income Countries

A three-tiered pricing structure only works if each country in each tier accepts its status. Some middle-income countries envy drug prices in low-income countries, and, backed by anti-intellectual property activists, have demanded similar pricing for themselves. Many middle-income countries already have large, well-developed pharmaceutical industries, some of which (such as India’s) are extremely influential. Lobbying by and for national flag-bearers is a major reason that middle-income nations are getting lower drug prices and more domestic employment. Several countries in this category therefore continue to push for further price reductions, even when concessions have been granted by several brand holders. Brazil, for example, wants to buy Efavirenz for the 65¢ per day currently charged in Thailand (Thailand is allowed the same price as several African countries because its HIV rate is above 1 percent).⁴¹ Brazil currently pays \$1.57. In April 2007, Brazilian officials ordered Merck to lower the price to the Thai level or face a compulsory license, which requires a manufacturer to license a generic version of its patented drug. Merck offered a 30 percent reduction to \$1.10, but Brazil rejected the offer.⁴² Now Brazilian president Luiz Inácio Lula da Silva says the country will import Indian copies at 45¢.⁴³

While actions such as these are lauded by anti-pharma activists and anticapitalist donor agencies, they are not good news for patients with HIV. Aside from the quality risks of copied drugs,⁴⁴ the repeated undermining of the drug companies’ commercial position can only reduce

their incentives for continued involvement in developing-country markets. This is particularly serious with respect to HIV, because it is a chronic condition for which new drugs will be essential when the existing drugs inevitably become ineffective.

Both Thailand and Brazil have significant HIV-positive populations, and the commitment of their governments to improve access to needed drugs is commendable. But they both appear to be putting industrial policy ahead of human health. Both have small but influential drug industries, and both governments heavily subsidize—or even own—the main drug corporations.⁴⁵ For example, earlier this year, Thailand’s Ministry of Public Health (MOPH) announced that it would make three patented medicines—Stocrin, Kaletra, and Plavix⁴⁶—available to the Governmental Pharmaceutical Organization (GPO), its state-owned drug-manufacturing group of companies, which will then provide copies of the drugs at low prices (and low quality). Available accounts show, however, that the GPO is merely in the business to make profits for corrupt Thai leaders. In 2002, Thai auditor-general Jaruvan Maintaka said, “The purchase of drugs through GPO . . . gives officials the chance to reap personal benefits. . . . The drug purchasing process becomes untransparent, inefficient and wastes money.”⁴⁷ By demanding prices at which foreign corporations can make no profit and then issuing compulsory licenses for patent-protected products, agencies such as MOPH promote their own corporations.

Brazil and Thailand are middle-income countries. They should not expect to pay the same prices that Uganda—with a much lower GDP and higher HIV prevalence rate (see table 1)—pays for its HIV/AIDS medications. Yet so far, there has been no support from the international community for significant tiered pricing

in these countries, which will delay investment by the research-based industry, and probably lower investigation into resistant strains of diseases. It will also harm patients worldwide, as cuts in drug company revenues mean less funding for new-drug R&D and fewer incentives to introduce new drugs in the developing world.⁴⁸ Dissolving the tiered pricing structure would be senseless. It would undermine brands and endanger public health.

The motivations of those promoting such practices may be commercial, but many allege that they are actually motivated by a belief that the patent system is dysfunctional and needs to be replaced by open access and government-funded R&D and drug delivery.⁴⁹

Burton A. Weisbrod of Northwestern University argues that one way to harmonize the two conflicting social goals of making drugs affordable and advancing medical technology is to establish two prices: one for R&D, another for the resulting pills.⁵⁰ Under this system, governments would purchase drug patents and reward developers of successful new drugs for their R&D investments. The use of the patents would then be freely offered to any firms wishing to produce the pills. This would ensure both active competition among generic producers and low prices. James Love, director of the Consumer Project on Technology, supports this proposal, arguing that “if exclusive marketing rights were eliminated for pharmaceutical drugs, prices would be far lower, and governments could re-direct significant resources to . . . non-profit drug or vaccine development entities.”⁵¹

The current drug development environment has yielded tremendous success and has led to the production of drugs that have saved millions of lives. It would be unwise to overhaul the current system and replace it with an untested, command-and-control regime. Such a change would be disastrous for the future of R&D. A government-run system would ignore basic free-market principles in favor of arbitrary price controls. Ultimately, such a system would undermine pharmaceutical R&D in the United States, which undertakes most of the world’s drug R&D and is therefore vital for the health and well-being of future generations.

Part of the Solution

In the pharmaceutical context, it is not hyperbole to say that multimarket price discrimination is a matter of life and death. Companies can simultaneously charge prices that are affordable to both low- and middle-income countries and preserve incentives for R&D. Drug

companies need to better explain their reasons for price discrimination and the differences in pricing across similar drug classes in the same country. Companies developing medicines like ARVs incur a wide range of development and even manufacturing costs. Therefore, pricing of very similar products varies, a fact that often mystifies consumers and commentators. These facts need to be made clearer to the public.

Anti-pharma activists may choose to find fault with the individual prices that companies set for their patented drugs—certainly a topic for legitimate debate. They are correct that competition from generics producers will lower prices, which, after all, is why competition is such a boon to consumers. But competition must rest on intellectual-property protection. The use of compulsory licenses, therefore, is arguably not legitimate competition, but rather theft. What many activists seem not to accept, however, is that patents are not a hurdle to improving access to drugs. Patents are *necessary* for innovation and access. As long as middle-income countries continue to demand lower prices, drug companies may be increasingly unwilling to provide cheap drugs to the poorest of countries, like they do today.

The current approach favored by the international community and large NGOs is to buy most of the drugs from brand-name suppliers and promote competition by directing some funds (20 percent by transaction volume at the Global Fund to Fight AIDS, Tuberculosis and Malaria) to governments that purchase drugs made by manufacturers of copy products. But nearly all the purchased drugs are of uncertain quality, compromising quality and undermining profits in the middle-income markets for companies actually investing in R&D.

The global pharmaceutical sector *and* its critics need a dose of reality. Even if prices are set at marginal cost, the neediest patients—from the United States to Thailand and African nations—will still require subsidies for treatment, especially for chronic conditions, which is a legitimate role for governments to undertake. A stable, tiered pricing system can go a long way to mitigate these challenges.

With rapidly proliferating and drug-resistant strains of diseases, the promise of new treatments to tackle them is greater than ever. Differential pricing for branded pharmaceuticals is part of the solution to the challenge of increasing affordability and accessibility for existing drugs, not part of the problem.

AEI editorial assistant Evan Sparks worked with Mr. Bate and Ms. Boateng to edit and produce this Health Policy Outlook.

Notes

1. The term “price discrimination” refers to the practice of charging different prices for the same goods in different segments of the market (or, in the case of pharmaceutical companies, in different countries). Price discrimination goes by a number of different names: multipart pricing, multimarket pricing, and Ramsey pricing (a name now used in many technical articles).

2. The companies are Boehringer Ingelheim, Bristol-Myers Squibb, Glaxo Wellcome (now GlaxoSmithKline), Merck, and F. Hoffmann-La Roche. Later, Abbott and Pfizer also joined the initiative.

3. Joint United Nations Programme on HIV/AIDS (UNAIDS), “New Public/Private Sector Effort Initiated to Accelerate Access to HIV/AIDS Care and Treatment in Developing Countries,” news release, May 11, 2000, available at www.essentialdrugs.org/edrug/archive/200005/msg00027.php (accessed June 28, 2007).

4. Rebecca Hellerstein, “Do Pharmaceutical Firms Price Discriminate across Rich and Poor Countries? Evidence from Antiretroviral Drug Prices” (paper, Federal Reserve Bank of New York, August 2004), available at www.ny.frb.org/research/economists/hellerstein/JDE2.pdf (accessed June 28, 2007).

5. Roger Bate and Richard Tren, “The WTO and Access to Essential Medicines: Recent Agreements, New Assignments,” *Health Policy Outlook* no. 4 (February 2006), available at www.aei.org/publication23900/.

6. A generic drug is bioequivalent—that is, it operates as a perfect copy of a branded drug. The term “copy” is used to denote a drug that may be bioequivalent but is of uncertain quality.

7. See Roger Bate, “India and the Drug Patent Wars,” *Health Policy Outlook* no. 3 (February 2007), available at www.aei.org/publication25566/.

8. Rebecca Hellerstein, “Do Pharmaceutical Firms Price Discriminate across Rich and Poor Countries?”

9. Ibid.

10. Seema Kamdar, “Drug-Maker Pricks MNC Arrogance,” *Statesman* (India), April 20, 2001, available at www.cid.harvard.edu/cidinthenews/articles/statesman042007.html (accessed June 28, 2007).

11. Sahm Adrangi, “Patent on Yale’s AIDS Drug Relaxed,” *Yale Daily News*, March 19, 2001.

12. *Pharmaceutical Market Access and Drug Safety Act of 2007*, S 242, 110th Cong., 1st sess., available at <http://thomas.loc.gov/cgi-bin/query/z?c110:S.242>: (accessed August 1, 2007).

13. Robert Pear, “Plan to Import Drugs from Canada Passes in Senate, but Bush Declines to Carry It Out,” *New York Times*, July 18, 2002.

14. Médecins Sans Frontières (Doctors Without Borders), Campaign for Access to Essential Medicines, “The Campaign: What Is the Campaign?” available at www.accessmed-msf.org/campaign/campaign.shtml (accessed August 1, 2007).

15. See Michael Kremer, “Pharmaceuticals and the Developing World,” *The Journal of Economic Perspectives* 16, no. 4 (Fall 2002): 67–90; Patricia Danzon and Adrian Towse, “Differential Pricing for Pharmaceuticals: Reconciling Access, R&D and Patents,” *International Journal of Health Care Finance and Economics* 3 (2003): 183–205; Robert B. Helms, “The Economics of Price Regulation and Innovation,” *Managed Care*, June 1, 2004, available at www.aei.org/publication20803/; and Henry G. Grabowski, John Vernon, and Joseph A. DiMasi, “Returns on Research and Development for 1990s New Drug Introductions,” *PharmacoEconomics* 20, no. 3 (2002): S11–29.

16. Ibid.

17. Tufts Center for the Study of Drug Development, “Tufts Center for the Study of Drug Development Pegs Cost of a New Prescription Medicine at \$802 Million,” news release, November 30, 2001, available at <http://csdd.tufts.edu/NewsEvents/RecentNews.asp?newsid=6> (accessed July 24, 2007).

18. Patricia Danzon and Adrian Towse, “Differential Pricing for Pharmaceuticals: Reconciling Access, R&D and Patents.”

19. Being able to charge different prices in different markets depends on the conditions in each market, not on the ability to charge higher prices in one market as a condition for giving a discount in another market—the “cost-shifting” that is often alleged. See Michael A. Morrisey, *Cost Shifting in Health Care: Separating Evidence from Rhetoric* (Washington, DC: AEI Press, 1994).

20. Patricia Danzon and Adrian Towse, “Differential Pricing for Pharmaceuticals: Reconciling Access, R&D and Patents.”

21. See Robert B. Helms, “The Economics of Price Regulation and Innovation”; and Henry G. Grabowski, John Vernon, and Joseph A. DiMasi, “Returns on Research and Development for 1990s New Drug Introductions.”

22. Market power exists when there are no readily available, equally satisfactory substitutes for the good or service that the seller is offering. See Terry Fisher, “Price Discrimination—with Respect to Entertainment and Drugs,” *Lessig 2.0*, October 30, 2004, available at www.lessig.org/blog/archives/002267.shtml (accessed May 10, 2007).

23. Federal Trade Commission, “The Pharmaceutical Industry: A Discussion of Competitive and Antitrust Issues in an Environment of Change,” executive summary, June 25, 2007, available at www.ftc.gov/reports/pharmaceutical/drugexsum.shtml (accessed June 28, 2007).

24. Patricia Danzon and Adrian Towse, “Differential Pricing for Pharmaceuticals: Reconciling Access, R&D and Patents.”

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