Local Pharmaceutical Production in Developing Countries

How economic protectionism undermines access to quality medicines

Dr Roger Bate

Campaign for Fighting Diseases discussion paper no. 1

Local Pharmaceutical Production in Developing Countries

By Dr Roger Bate

January 2008

International Policy Network
Third Floor, Bedford Chambers
The Piazza
London WC2E 8HA UK
t: +4420 7836 0750
f: +4420 7836 0756
e: info@policynetwork.net
w: www.policynetwork.net

Designed and typeset in Latin 725 by MacGuru Ltd
info@macguru.org.uk

First published by International Policy Press
a division of International Policy Network

A version of this paper was first released by the American Enterprise Institute.

The Campaign for Fighting Diseases

www.fightingdiseases.org

The Campaign for Fighting Diseases seeks to raise awareness of the realities of diseases suffered in the poorest regions of the world, and the need for pragmatic solutions to these diseases. Members of the CFD, including academics, NGOs and think tanks, argue for prioritisation of action at local, national and international levels, to ensure that time and money are used most effectively to save lives and achieve the best results with limited resources.

About the author

Roger Bate PhD (rbate@aei.org) is a resident fellow at AEI and director of Africa Fighting Malaria, a non-profit health advocacy group.

Local Pharmaceutical Production in Developing Countries

How economic protectionism undermines access to quality medicines

Analysts debate and activists agonise about how to improve access to drugs in developing countries. According to recent figures from the World Health Organisation (WHO), 30 percent of the world's population lacks access to life-saving medicines. In some countries in Asia and Africa, the number may be as high as 50 percent.[1]

In recent years, the international community has attempted to solve the problem by encouraging generic competition and the wide adoption of tiered pricing.[2] Patent-breaking generic competition would drive prices down, proponents hoped, and where copy products were not available, tiered pricing would create a system in which higher prices in developed countries effectively subsidised drugs for the world's poor. But both practices have met difficulties. In some instances, generic manufacturers have shown insufficient regard for industry-standard Good Manufacturing Practices (GMP). With little or no regulatory control, substandard drugs are manufactured and distributed widely. Such low-quality drugs pose an immediate threat to public health and a potentially more serious challenge to the long-term viability of many first-line drugs by encouraging drug-resistant strains of pathogens. Tiered pricing, too, has been hampered by poor regulatory structures and perverse incentives for drug markets. Some governments have acted abusively by demanding that companies lower prices to marginal cost, thus eliminating the opportunity to recoup the costs of any research and development (R&D) investment. Some pharmaceutical companies have only adopted tiered prices for high-profile HIV drugs, neglecting other medicines. Even when manufacturers have lowered their prices, patients still pay far too much because of taxes, duties, and markups by middlemen – including government procurement agencies – which enable corruption but raise little revenue.[3]

> *"The international health community is now entertaining another idea to improve access: local production of pharmaceuticals."*

The international health community is now entertaining another idea to improve access: local production of pharmaceuticals. Emboldened by an increased willingness to act on the flexibility – critics would say loopholes – written into the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)[4] and cheered by a prominent activist lobby,[5] countries are not only increasingly willing to break patents,[6] but they are also creating their own local pharmaceutical industries as well.

Growing support for local production

Proponents of local production, including activist organisations such as Médecins Sans Frontières (Doctors without Borders) and organisations within the United Nations (UN),[7] say local production of pharmaceuticals would decrease transport costs, provide local jobs, increase expertise, and cut dependence on foreign suppliers. Many leaders in developing countries in Africa and Asia appear to believe it will also help their nations achieve economic autonomy and sustainable development as well. The African Union has cited the need to "formulate a plan of action … to facilitate increased drug manufacturing in the region and to bolster research and development (R&D)."[8] In early 2008, Uganda's *New Vision* newspaper urged Tanzania, Nigeria, and Ghana to impose a 10 percent tariff on imported drugs to create a "level playing field" with subsidised importers from China and India.[9] In

Indonesia, an alliance of twenty health organisations argued that a recently passed "cheaper medicines bill" – which relaxed their intellectual property code and permitted parallel importation of patented medicines – was not enough: "only the nationalisation of [the Indonesian] drug industry can resolve the problem and ensure low medicine prices in the long term."[10]

The international donor community has offered similar, if more qualified, support. At its 2007 summit, the G8 recommitted its members to support "those African countries that indicate that they require technical assistance and capacity building programmes for advancing their access to affordable, safe, effective and high quality generic and innovative medicines … including those produced locally."[11] The German government's development agency recently gave the nod to a local production initiative in Tanzania.[12] A World Bank report affirmed "pride in a national industry and political pressure to make it work" as "significant assets in achieving … ultimate treatment goals – more important than potentially slightly higher costs per unit."[13] And the United Nations Industrial Development Organization (UNIDO) is currently in the middle of a thirty-month initiative to explore ways of encouraging nascent pharmaceutical manufacturers in the least-developed countries.[14]

There is also support for local production among the board and staff of the Global Fund to Fight AIDS, Tuberculosis and Malaria, a public-private partnership that has allocated $10 billion to fight these diseases in poor and middle-income countries, mostly through the donations of Western governments and financed by taxpayers. The Global Fund publishes a list of drugs that poor countries can procure with the funds it provides. This compliance list is designed to highlight manufacturers that consistently produce high-quality drugs. In practice, however, the list has changed several times,[15] often featuring drugs from companies with weak or questionable quality records. For example, this past October the Fund withdrew twenty-two anti-malaria medicine formulations, citing the fact that they were not listed in then-current "national or WHO standard treatment guidelines or in essential medicines lists." But the Fund failed to explain why these drugs had been listed in the first place, given that they had not been approved by a stringent agency (like the U.S. Food and Drug Administration) or even by WHO's less rigorous prequalification program.[16] One possible explanation is that certain staff and some board members at the Global Fund see it as their role to increase the number of drug manufacturers, perhaps even in disregard for quality control.[17]

Troubling, too, is the fact that the Global Fund, along with WHO, seems to deliberately confuse GMP standards with actual drug quality.[18] GMP shows that a manufacturing facility is capable of making products properly and consistently; it does not demonstrate that the drugs produced contain the correct active ingredient in the right proportions and that they work as intended. The Global Fund gives many companies' products the green light for receiving its funding after they pass GMP but before they pass tests for quality.

Theoretical problems with local production: comparative advantage and public choice

Political support aside, does local production make economic sense? Local production that is supported by foreign aid but owned by local governments is worrisome because it rigs the market by protecting a local producer – all too often a political crony – against a more efficient and competent importer. Long-established economic theories have proven that such interventions are detrimental to the groups they are supposed to help, and frequently put more money in the pockets of the rich and powerful.[19]

"Local production that is supported by foreign aid but owned by local governments is worrisome because it rigs the market by protecting a local producer – all too often a political crony"

Furthermore, where domestic capacity is lacking, local production will inevitably increase the supply of substandard drugs in the market (as will be discussed in greater detail). Substandard drugs immediately affect patient health – especially for diseases like malaria, which can kill in a matter of days – and over time promote resistance, raising costs by requiring new and more costly treatments. In an effort

to bring aid-supported drug production to Africa, two fundamental economic theories have been ignored: comparative advantage and public choice.

Nearly two hundred years ago, economist David Ricardo formulated the theory of comparative advantage to illustrate the mutual benefits of trade. By extending Adam Smith's theory of specialisation to apply to entire countries, Ricardo showed that any two countries would derive greater benefit from trade with each other than either could gain by trying to produce all that it required domestically (even if one country was superior at producing everything).[20]

About 150 years after Ricardo set out his theories – during which time free-trading nations enjoyed unprecedented and unsurpassed economic growth – James Buchanan and Gordon Tullock laid out the principles of public choice economics, demonstrating how incentives and personal gain were the bases of both political and private decisions. Building on the earlier observations of Charles Darwin on biology and Adam Smith on markets, public choice economics asserts that there is no altruism among politicians, public servants, or nongovernmental organisations.[21] Every individual within a group acts in its own particular interest and according to the incentives it faces.

"While such local production may provide legitimate, if not inefficient, local benefits, it is riddled with pitfalls."

Politicians, for example, traditionally use their power over the public purse to reward local allies. In rich countries, such cronyism is hugely wasteful (think Alaska's "Bridge to Nowhere"), bolstering the politically connected rather than the most efficient and productive. But in the poorest nations, it can be deadly. In Nigeria, for example, most of the $1.3 billion allocated to one state in 2006 was "siphoned off before reaching the people" – who remain some of Africa's poorest and sickest--because of the "avarice of local politicians."[22]

In many developing countries, politicians note the attention Western countries give to diseases within their borders, especially HIV and, more recently, malaria. They also note the amount of money at stake. As a quid pro quo for allowing Western agencies to "help," the developing-world politicians want support for local production.[23] While such local production may provide legitimate, if not inefficient, local benefits, it is riddled with public choice pitfalls. Compared with the potential payoff, no actor is taking a risk commensurate with his own time or capital. Politicians may use aid dollars earmarked for local production enterprises merely to reward political allies with production contracts. They may use markups on imported pharmaceuticals (designed to product nascent local industries) to line their own pockets. This is especially true in countries with weak civil societies, where political accountability is nonexistent and recourse through democratic elections unlikely. Public actors provide – and other public actors spend – money for which no one is adequately held accountable.[24] Even in democratic donor countries, public funds are often subject to political priorities, such as whether a recipient country supports the donor's policy on any number of unrelated issues, such as the war on terror, nuclear proliferation in North Korea, or climate change, to name a few.

Aid agencies themselves often operate in moral grey areas: while they lobby governments to take certain actions, they must also get government approval to allow them to continue operations. Some, such as the World Bank, are especially eager to continue the flow of funds from their own organisations to recipient governments – which keeps up the appearance of supporting development initiatives and keeps member nations happy – and are reluctant to expose corrupt practices. In 2005, for example, the World Bank's institutional integrity unit unearthed startling graft in the procurement of pharmaceuticals by the organisation's Reproductive and Child Health I Project. Such graft had created "substantial losses" into the tens of millions of dollars – and possibly much more.[25] Even so, the World Bank unit's findings were never made public – and indeed, no punitive measures were pursued until a year later, when the bank half-heartedly barred two offending Indian pharmaceutical companies involved from further future activity. The bank acted languidly, the *Wall Street Journal* editorialised, because the public criticism would have touched on several "bank taboos": it would have represented an affront to the Indian government, which is one of the bank's biggest borrowers; humiliated certain bank

officials; and embarrassed Britain's Labour government, which had provided money for the project.[26] An opportunity to clean house at the bank was lost – with dangerous implications for public health.

Of course, both comparative advantage and public choice have had critics. Some economists have raised concerns about poor – particularly African – nations being unable to produce anything competitively, most recently Paul Collier.[27] Others, such as Jeffrey Sachs, claim the poor are in a poverty trap and must be assisted.[28] All domestic businesses at this level, they argue, require some level of international protection and encouragement. But, as stated earlier, in the case of complex pharmaceuticals, the argument for local production is hard to sustain. Many developing countries simply lack the technical capacity and regulatory structures to efficiently and consistently produce high quality pharmaceutical drugs. At the same time, international supply, whether from India, China, or Western countries, is generally easy to obtain and relatively cheap, thanks to tiered pricing – that is, assuming that countries adopt efficient tariff structures.[29]

"Many developing countries lack the technical capacity and regulatory structures to efficiently and consistently produce high quality pharmaceutical drugs. At the same time, international supply, whether from India, China, or Western countries, is generally easy to obtain and relatively cheap"

Pitfalls to local production

Supporting local production – without strengthening regulation and enforcement to ensure quality products – can have severe consequences for public health. Currently, only 20 percent of WHO's 191 member states have well-developed regulation. Fifty percent operate at varying levels of regulation and capacity, and 30 percent have weak regulation or none at all.[30]

"exposure to substandard drugs builds pathogen resistance within patient populations and can therefore doom an entire class of active pharmaceutical ingredients."

What happens when production goes ahead without safeguards? Look no farther than India and China, where thousands of unregulated laboratories have churned out counterfeit and substandard drugs. These products have flooded domestic markets – in 2001, 192,000 Chinese died from substandard products[31] – and have infiltrated supply chains worldwide with ineffectual or downright dangerous products.[32] The problem is particularly acute in Africa and Asia. A 2002 study in Senegal found that twenty-one out of twenty-two samples of ampicillin (a common antibiotic) contained only flour.[33] *The Lancet* has projected that close to 40 percent of products in Thailand and Nigeria labeled as containing artesunate (an effective antimalarial) contain no active ingredients.[34] In 2002, WHO estimated the total percentage of fake or adulterated drugs in Nigeria much higher, at 70 percent.[35]

Local production, if it results in substandard drugs, can also decrease consumer trust in authentic combinations, with serious implications for public health. In Ghana, for example, adverse drug reactions from a locally-produced version of artesunate-amodiaquine (a common anti-malarial combination drug) that contained too much of one active ingredient made doctors and patients less willing to use the authentic ACT that was distributed by the Global Fund shortly thereafter.[36]

Aside from harming individuals, exposure to substandard drugs builds pathogen resistance within patient populations and can therefore doom an entire class of active pharmaceutical ingredients. This is a pressing concern for current malaria control efforts, which hinge on potent artemisinin-based combination therapies (ACTs). Combination therapies help forestall the development of drug resistant strains of the parasite: if the parasite has developed resistance to one drug, the other drug will tend to eliminate it, particularly if the biologic mechanism for each drug is different. This will prevent strains resistant to one drug from thriving.[37] Even though this is widely known, Africa remains awash with cheaper artemisinin monotherapies, which, if poorly formulated, lead to increased parasite resistance.[38] The Global Fund

exacerbated the problem by including artemisinin monotherapies as an acceptable alternative to ACTs on its procurement compliance list long after WHO had demanded the end of monotherapy production.[39]

Not only is local production susceptible to quality control issues, it also creates efficiency losses that may never be recouped. The home market must pay on three separate counts: the start-up costs of establishing the industry, the costs of subsidising production, and the higher price of the finished product. In its analysis of a hypothetical local production plant in Nigeria, the National Academies of Science found that it would have cost initially 15 percent more to grow, extract, purify, and derive local artemisinin derivatives than to import them directly.[40]

A real-world project of this kind was tried. Advanced Bio-Extracts (ABE), based in Kenya, is a local venture that grows *Artemisia annua* and extracts artemisimin. When it was launched three years ago, ABE quickly won praise from international observers as a venture that combined "patient capital, talent and innovation"[41] to promote development in Africa. It also had good biological diversity reasons for receiving support – reliance on just one country's (China's) crop production would risk calamity if disease or weather related events were to strike artemesia annua growing in China. It boasted an impressive list of backers: Acumen Fund, Novartis, International Finance Corporation, Action Medeor, GTZ, Cordaid, the UK Department for International Development, the U.S. Agency for International Development, TechnoServe and the Centre pour le Developpement de l'Entreprise. The initial start-up cost for the venture was $25 million;[42] in addition, WHO and the Global Fund pledged to purchase ABE products.[43]

So far, regardless of positive rhetoric from all participants, progress does not look good. While the artemesinin produced by ABE appears to be of good quality,[44] the company has failed to deliver it in sufficient quantity. According to the Swiss pharmaceutical company Novartis, ABE was initially supposed to supply 25 million tons annually but as of March 2007, only 10.3 million tons had actually been delivered.[45] A lack of technological know-how among inexperienced farmers,[46] possibly compounded by poor management decisions, appeared to be to blame for the failure to deliver on agreed contracts. Of course delays in a new venture can be forgiven, and ABE may yet prove highly successful. But sources in Kenya[47] worryingly say that donors, desperate for aid success stories, want to make sure that success is certain and may have even suggested to ABE that Novartis should pay above-market rates for ABE's artemisimin and charge more for its drugs. Novartis says it will not raise its prices;[48] if it did, it would inevitably prompt the ire of the international aid community, for such action would reduce access to life-saving malaria drugs and probably lead to more deaths.

Investment in training for East African farmers to diversify crop selection does have benefits. I am not for one moment arguing that Kenyan farmers should only grow tea. I welcome diversity into higher value crops, perhaps even artemesia annua – but only if the crop can not only be grown successfully, which has been demonstrated, but economically too. Any premium to Chinese prices should only be accepted as the price for diversity of supply, not to make donors feel happy. After all, the precise amount of money donors would have saved by buying the cheaper ingredients from overseas (expertise to grow the crop exists in several places in Asia, not just in China) rather than growing their own is hard to calculate, and therefore so is how many ACT treatments could have been provided with the funds. As Ricardo would point out, Kenya should produce whatever it has a comparative advantage in, and in turn, use its extra foreign exchange earnings to increase its bargaining power in the developing country pharmaceutical market, especially since this market is capital intensive and volatile..

After all relatively small local production companies like ABE may be particularly ill-equipped to shoulder the significant risk inherent in forecasting effective demand for given drugs, especially when they are dependent on changing political priorities in donor countries. Even large companies with decades of demand-forecasting experience have guessed wrong; in 2005, for example, Novartis and Sanofi predicted, in line with the assertions of WHO and other aid organisations,[49] that the supply of the artesunate precursor for its ACT Coartem would not be able to keep up with demand.[50] In 2006 and 2007,

however, demand was actually far less than supply, and the companies were forced to shoulder the losses from excess production.[51]

In order to support inefficient and substandard home industries, a government bureaucracy may also protect it from foreign competition by imposing high tariffs on imported pharmaceuticals. At the same time, the government offers tax incentives and subsidies to local companies. This constricts the supply of imported drugs, which are often of superior quality, without necessarily increasing local supply appreciably. In Nigeria, for example, the untaxed status of locally produced ARVs (compared to a tariff rate of up to 20 percent for pharmaceuticals, excluding additional tax markups and unofficial payments[52]) helped enable the success of local production plant Archy Pharmaceuticals, which opened its first plant in the country in 2004.[53] A rapid scale-up of ARV production ensued, and the government implemented a policy of free treatment for people living with AIDS. But according to a recent report by the International Treatment Preparedness Coalition, access remains limited because "treatment sites are not easily accessible in many parts of the country, and CD4 and other tests [for HIV] are still being offered at a fee in several locations."[54] The quality of the drugs is uncertain, as the company has not submitted drugs to WHO or a stringent agency for testing.

"Aside from their direct economic disadvantages, the taxes and tariffs needed to protect infant drug industries also create portals for corruption, smuggling, and the proliferation of counterfeit drugs in the market. These factors have been observed in India and Nigeria."

Revenues extracted from tariffs on imported drugs also tend to have little impact on consumer welfare. Consumers may see prices increase by up to 100 percent with no appreciable impact on government health care spending.[55] Aside from their direct economic disadvantages, the taxes and tariffs needed to protect infant drug industries also create portals for corruption, smuggling, and the proliferation of counterfeit drugs in the market. These factors have been observed in India and Nigeria.[56] The historical record suggests, moreover, that tariffs, while perhaps politically defensible in the short run, are rarely lifted. This tends to make local companies complacent and unlikely ever to become internationally competitive.

Tariffs and taxes also provide a convenient pathway for graft. As Thai auditor-general Jaruvan Maintaka pointed out in 2002, "The purchase of drugs through GPO [the Government Pharmaceutical Organization]" in the country effectively gave officials "the chance to reap personal benefits," leading to inefficiency and wasted money.[57] Furthermore, procurement through public agencies will also permit the selective distribution of resources. In countries where enforcement is weak, members of the "social, economic, or political elite" will be the first to benefit from life-saving treatment, as *The Lancet* reported in 2004.[58]

The case of Thailand provides a microcosm of the potential pitfalls to local production. Thailand's HIV program was supplied with the government-produced GPO-Vir, which was cheap ($24 per patient per month) but substandard. Activist organizations such as Médecins Sans Frontières supplied GPO-Vir to Thailand, Cambodia, and Burma – even after resistance was documented – pointing to its low price and "local production" label.[59] By the time the Global Fund withdrew funding, indirectly forcing the factory to shut down in order to improve its production facilities in July 2007, resistance among users of GPO-Vir had already reached a rate of perhaps 50 percent.[60] Scientists from Thailand's Mahidol University concluded that more patients would have to be put on more expensive second-line therapies at a cost of $249 per patient per month.[61] By trying to supply its drugs program on the cheap – and at a profit to its own members – the Thai government landed its country with a far greater public health problem and a far higher bill.

"By trying to supply its drugs program on the cheap – and at a profit to its own members – the Thai government landed its country with a far greater public health problem and a far higher bill."

Aid agencies have not flexed their muscles in challenging developing country governments to tackle major systematic and infrastructure problems, or to

lower tariffs.[62] Finance ministries have often held on to Global Fund grants for a long time without procuring the drugs the funds were intended for, as with Tanzania in 2006, which saw a six-month delay in procuring antimalarials.[63]

In short, aid-supported and government-owned local production too often produces low-quality, economically unsustainable drugs.

Private-sector solutions

Should all forms of local production be rejected as economically inefficient and ill-advised? In addition to public calls for aid-supported local production, some private companies are quietly moving investment to poor countries. In Uganda, a partnership between Uganda's Quality Chemicals and India's Cipla led to the construction of a new $38 million plant in Kampala. The plant opened in October 2007 and is set to begin producing ARVs and antimalarials in January 2008, the first such drugs to be manufactured domestically.[64] The joint venture builds on the Indian company's earlier and ongoing partnership with Ugandan company Afro Alpine Pharma, which opened a $4 million factory to produce artemisinin for malaria drugs in Kabale in April.[65] In similar fashion, Indian firm Cadila Pharmaceuticals partnered with Ethiopia's Almeta Impex to build a facility to produce antibiotics, malarial and tuberculosis treatments, multivitamins, and ARVs domestically. The Indian company invested $11 million and aims to begin exporting drugs to neighboring markets in Uganda, Djibouti, Kenya, and Sudan after it establishes itself in the domestic market.[66]

> *"protectionism will breed domestic complacency and discourage international investment, leading to a supply of scarce, low-quality drugs."*

> *"Market-driven investment, whether in multinational pharmaceutical companies or partnerships with local production enterprises, helps countries realise Ricardian gains from trade. Market-driven investment also helps avoid the pitfalls of public choice economics."*

Will the drugs produced through this partnership be competitively priced and of high quality? The verdict is obviously still out. All local production ventures should be encouraged to submit dossiers to stringent regulatory authorities to ensure high-quality production. For their part, international organisations can best support local production by supporting free, fast-track bioequivalence testing for drugs, as the Food and Drug Administration did for WHO's prequalification list of HIV drugs in 2004.[67]

If locally manufactured drugs can be verified as bioequivalent to originator medicines, they will become eligible for purchase by donor agencies. This will create the foundation for a potentially sustainable industry that represents no threat to health. Of course, the temptation to impose high import tariffs on foreign competitors – especially if the company aims to produce only for the local market – is still great. This could lead to disastrous protectionism: in the short run, drugs will be undoubtedly more costly, whether financed by subsidies or higher prices; over the long run, such protectionism will breed domestic complacency and discourage international investment, leading to a supply of scarce, low-quality drugs.

But for now, the signs are positive. Indian and Western firms capable of producing high-quality drugs are undertaking original R&D and partnering with firms in African countries. Investment by reputable companies provides assurance of GMP and drug quality by furnishing the technical expertise that overcomes capacity constraints. Despite a troubled history of weak regulation, the situation in India and China is changing. Although regulation and quality control are still lacking in India, since the implementation of the TRIPS agreement, private companies have begun to take far greater responsibility for their products. China, too, has taken high-level, draconian action against unregulated manufacturing and corruption.[68]

Local production enterprises in Africa allow international companies to diversify their supply sources, guarding against potentially disastrous shocks (such as, for example, a natural disaster that would destroy an *Artemisia annua* crop) that could send the price of

artemisinin (and malaria drugs by default) skyrocketing. Local production partnerships could encourage trade, especially because the bulk active ingredients needed to produce them still come most efficiently from abroad.[69] Partnerships between foreign pharmaceutical firms and African companies may also provide incentives for foreign companies to invest in the poor-country markets, which is not the case when tariffs are slapped on their products to protect locally produced drugs in which they have no vested interests. At the community level, such partnerships can help train a pool of skilled workers, improving a country's long-term development prospects.

It is important to note that in each case it is an entrepreneur who weighs the risks and decides to invest. One can assume that over time the market will determine the rest. Some local production enterprises will succeed; others will inevitably fail; but ultimately the most effective system of drug production and distribution will be realised. Relying on the market to drive investment (or a lack thereof) in local production is more efficient than using public funds. In the interest of providing the most drugs at the most sustainable prices to the people who most need them, it may be more equitable as well. Market-driven investment, whether in multinational pharmaceutical companies or partnerships with local production enterprises, helps countries realise Ricardian gains from trade. Market-driven investment also helps avoid the pitfalls of public choice economics. Certainly, private funds can be subject to corruption – a fact exacerbated by the inevitably close relationship between private pharmaceutical companies and government regulators and buyers, and driven by the public interest in medicine – but in these cases, the investors and businessmen involved are first and foremost risking their own capital, not the capital of taxpayers.[70]

Local production can promote development – but only when the market prescribes it. The international community is right to desire local development, but it must be far more vigilant to prevent local production from becoming a cover for development-impeding protectionism. The key to development is to allow ineffective projects to fail. Only then can effort be focused on allowing the successes to flourish. Coming years will demonstrate whether the international community accepts this reality or continues to prop up failing enterprises.

Notes

1. World Health Organization (WHO) "Equitable Access to Essential Medicines: A Framework For Collective Action," *WHO Policy Perspectives on Medicines*, March 2004, available at http://whqlibdoc.who.int/hq/2004/WHO_EDM_2004.4.pdf (accessed December 20, 2007).

2. According to its website, the advocacy group Médecins Sans Frontières (MSF, or, in English, Doctors without Borders) "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." (MSF, "Access to Medicines," available at www.doctorswithoutborders.org/news/access/index.cfm (accessed December 20, 2007).

3. See Roger Bate and Kathryn Boateng, "Medicinal Malpractice: Improving Drug Access and Reducing Corruption," *Health Policy Outlook* no. 10 (December 2006), available at www.aei.org/publication25276/. For an example of non-tariff domestic barriers, see a survey that suggested that a 10 percent tariff on imported goods would have "no impact" on the price paid by patients because the retail sector enjoyed more than 100 percent margins. (Nazeem Mohamed, "Support Local Producers by Taxing Imported Drugs," *New Vision* (Kampala), January 1, 2008.

4. World Trade Organization (WTO), General Council, *Amendment of the TRIPS Agreement*, WT/L/641, December 8, 2005, available at www.wto.org/english/tratop_e/trips_e/wt1641_e.htm (accessed January 22, 2008). As of November 2007, fourteen countries – including the United States and China – have signed the amendment. Two-thirds must do so for the agreement to come into force. In June 2002, the WTO council responsible for intellectual property approved a decision that extended the transition period during which least-developed countries (LDCs) did not have to provide patent protection for pharmaceuticals until 2016. Vested with the legal right to produce drugs off-patent, the 2002 decision was a watershed for local production

and prompted a flurry of exploratory activity in developing countries. (WTO, "Council Approves LDC Decision with Additional Waiver," news release, June 28, 2002, available at www.wto.org/english/news_e/pres02_e/pr301_e.htm (accessed January 22, 2007).

5. Commenting on Thailand's decision to issue a compulsory license in early 2007, Paul Cawthorne of MSF in Bangkok told the *Financial Times* that his organisation has been "dreaming of this kind of action for years. They are … putting two fingers up to the drug companies and saying, 'if you won't give us a price that we can begin to afford, we are going to get this stuff from a generic company and use it in our public health services.' It's like World War III." See Roger Bate, "Thailand's Patent Attack," *New York Sun*, February 17, 2007, available at www.aei.org/publication25614/.

6. Roger Bate, "Thailand and the Drug Patent Wars," *Health Policy Outlook* no. 5 (April 2007), available at www.aei.org/publication25890/.

7. The German government, in association with the Untied Nations Conference on Trade and Development, United Nations Industrial Development Organization (UNIDO) and the UK Department for International Development, recently launched a program to improve production capacity in developing countries in Africa and elsewhere. See Frederick Abbott and Jerome Reichman, "The Doha Round's Public Health Legacy: Strategies for the Production and Diffusion of Patented Medicines under the Amended TRIPS Provisions," *Journal of International Economic Law* 10, no. 4 (2007): 921–87.

8. Aparna Krishnan, "Measures to Boost Drug Production, Scientific Research Highlighted in AU Summit," *Global Insight*, October 15, 2007; and African Union, First Meeting of the Technical Committee on the Pharmaceutical Manufacturing Plan for Africa, *Report* (Addis Ababa, October 24–26, 2007), available at www.africa-union.org/root/au/Conferences/2007/october/sa/Pharmaceutical/DOCS/REPORT.doc (accessed December 20, 2007).

9. Nazeem Mohamed, "Support Local Producers by Taxing Imported Drugs."

10. Beverly T. Natividad, "Cheaper Meds Bill May Not Keep Drug Prices Low for Long," *Philippine Daily Inquirer*, December 20, 2007.

11. G8, Summit 2007, *Growth and Responsibility in Africa* (Heiligendamm, Germany, June 8, 2007), available at www.aidsportal.org/repos/G8Communique07.pdf (accessed January 22, 2007).

12. Karen Losse and Christoph Spennemann, *The Viability of Local Pharmaceutical Production in Tanzania* (Eschborn, Germany: GTZ, 2007), available at www2.gtz.de/dokumente/bib/07–0300.pdf (accessed December 20, 2007).

13. Andreas Seiter, "Pharmaceuticals: Local Manufacturing," *HNP Brief* no. 3 (March 2005), available at http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/281627–1109774792596/HNPBrief_3.pdf (accessed January 22, 2007).

14. Inaugurated in September 2007, the project is meant to carry out an "in-depth analysis of global markets" in order to identify "specific market opportunities for pharmaceutical manufacturers in least developed countries that allow for an economically and commercially viable production of one of several essential medicines." (UNIDO, "Strengthening the Local Production of Essential Generic Drugs in Least Developed Countries (LDCs) through the Promotion of SMEs, Business Partnerships, Investment Promotion and South-South Cooperation," July 26, 2007, available at www.unido.org/file-storage/download/?file_id=70230 (December 20, 2007).

15. For changes, see The Global Fund, "List of Malaria Pharmaceutical Products," version 29, December 3, 2007, available at www.theglobalfund.org/pdf/guidelines/List_MALARIA.pdf (accessed January 22, 2008).

16. WHO, "WHO Statement on Removal of Two AIDS Medicines from List of Prequalified Products," news release, June 17, 2004, available at www.who.int/mediacentre/news/statements/2004/statement_

aidsprequal/en/index.html (accessed January 15, 2008).

17. Here the Global Fund defers to WHO's Prequalification Program. See WHO, "Prequalification Programme," available at http://mednet3.who.int/prequal/ (accessed December 18, 2007).

18. WHO's prequalification program, for example, does not include ongoing monitoring of the drugs produced. Rather, as it describes on its website, it evaluates safety "based on information submitted by the manufacturers, and inspection of the corresponding manufacturing and clinical sites." (See ibid.)

19. The literature is replete with examples of politically motivated resource allocation. See Robert Guest, *The Shackled Continent: Power, Corruption, and African Lives* (Washington, DC: Smithsonian, 2004); George B. N. Ayittey, *Africa Unchained: The Blueprint for Africa's Future* (Basingstoke, England: Palgrave Macmillan, 2004); and Martin Meredith, *The Fate of Africa: From the Hopes of Freedom to the Heart of Despair* (New York: PublicAffairs, 2006). The international aid community has often unwittingly enabled such inefficient, inequitable, and occasionally corrupt allocations. See P. T. Bauer, *Reality and Rhetoric: Studies in the Economics of Development* (Cambridge, MA: Harvard University Press, 1984); and, more recently, William Easterly, *The White Man's Burden: Why the West's Efforts to Aid the Rest Have Done So Much Ill and So Little Good* (New York: Penguin, 2006).

20. David Ricardo, "On the Principles of Political Economy and Taxation," London: John Murray, 1821. Two countries would benefit from specialising in what each could produce at the most favorable labour-cost ratio and then trading. The more technologically advanced country switches investment to specialise in producing high-value-added goods, in which it has a comparative advantage in labour costs. The lower-labour-cost country will specialise in lower-value-added goods and be able to produce a surplus for export. It would buy goods from its trading partner for less than the opportunity cost of foregone production of its specialist good. Overall, more goods are produced and made available to both parties. (Paul Samuelson, "The Gains from International Trade," *Canadian Journal of Economics and Political Science* 5 (1939).).

21. For example, new research suggests a fascinating link between charitable giving and sexual selection. It suggests that men tend to indulge in conspicuous consumption on charity to demonstrate fitness to provide financial support for a family, while women tend to sacrifice their time to charity to demonstrate caring and emotional fitness. "Blatant Benevolence and Conspicuous Consumption," *The Economist*, August 2, 2007.

22. "Mission Impossible, Nearly," *The Economist*, August 2, 2007.

23. See Robert Guest, *The Shackled Continent*; George B. N. Ayittey, *Africa Unchained*; Martin Meredith, *The Fate of Africa*; P. T. Bauer, *Reality and Rhetoric*; and William Easterly, *The White Man's Burden*.

24. Roger Bate, "Quality First," The American, November 15, 2007, available at www.aei.org/publication27710/; and "Afro Alpine Pharma Opens Malaria Drug Factory in Kabale, Uganda," Kaiser GlobalHealthReporting.org, April 3, 2007, available at www.kaisernetwork.org/daily_reports/rep_index.cfm?DR_ID=44016 (accessed December 20, 2007).

25. "World Bank Corruption: Bribery in India, and a Test for Bob Zoellick," editorial, *Wall Street Journal*, September 4, 2007.

26. Ibid.

27. Paul Collier, The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It (Oxford: Oxford University Press, 2007).

28. Jeffrey Sachs, The End of Poverty: Economic Possibilities for Our Time (New York: Penguin, 2005).

29. Roger Bate and Kathryn Boateng, "Bad Medicine in the Market," *Health Policy Outlook* no. 8 (June 2007), available at www.aei.org/publication26368/.

30. WHO, "General Information on Counterfeit Medicines," fact sheet, available at www.who.int/medicines/services/counterfeit/overview/en/index.html (accessed July 3, 2007).

31. Robert Cockburn, Paul N. Newton, E. Kyerematen Agyarko, Dora Akunyili, and Nicholas J. White, "The Global Threat of Counterfeit Drugs: Why Industry and Governments Must Communicate the Dangers," *PLoS Medicine* 2, no. 4 (2004), available at http://medicine.plosjournals.org/perlserv?request=get-document&doi=10.1371/journal.pmed.0020100 (accessed January 14, 2008).

32. WHO, "Counterfeit Medicines," fact sheet 275, November 15, 2006, available at www.who.int/mediacentre/factsheets/fs275/en/index.html (accessed December 20, 2007); and Roger Bate, *Making a Killing* (Washington, DC: AEI Press, forthcoming).

33. P. S. Sow et al., "Drugs in the Parallel Market for the Treatment of Urethral Discharge in Dakar: Epidemiologic Investigation and Physiochemical Tests," *International Journal of Infectious Diseases* 6, no. 2 (June 2002): 108–112.

34. Penetration in Nigeria is estimated at 36 percent and in Thailand at 40 percent. See Paul N. Newton, Michael D. Green, Facundo M. Fernández, Nicholas P. J. Day, and Nicholas J. White, "Counterfeit Anti-Infective Drugs," *The Lancet Infectious Diseases* 6, no. 9 (September 2006), 602–613.

35. WHO, "Counterfeit Medicines."

36. Global Fund, "Global Fund Grants for Malaria: Summary of Lessons Learned in the Implementation of ACT Policies in Ghana, Nigeria, and Guinea-Bissau," Arlington, VA: Rational Pharmaceutical Management Plus, June 2007.

37. WHO, Roll Back Malaria, "Facts on ACTs," January 2006, available at www.rbm.who.int/cmc_upload/0/000/015/364/RBMInfosheet_9.htm (accessed January 22, 2008).

38. World Health Organization, "WHO briefing on Malaria Treatment Guidelines and artemisinin monotherapies," Geneva: WHO, April 19, 2006, available at http://www.who.int/malaria/docs/Meeting_briefing19April.pdf, accessed January 23, 2008.

39. Roger Bate, "On the Trail of a Cure: Rhetoric and Reality on Treating Malaria," *Health Policy Outlook* no. 4 (March 2007), available at www.aei.org/publication25834/.

40. National Research Council, Committee on Creation of Science-Based Industries in Developing Countries, *Mobilizing Science-Based Enterprises for Energy, Water, and Medicines in Nigeria* (Washington, DC: National Academies Press, 2007), 110.

41. Thomas L. Friedman, "'Patient' Capital for an Africa That Can't Wait," *New York Times*, April 20, 2007.

42. According to a funding proposal accepted by the International Finance Corporation (IFC), an agency of the World Bank, the initial start-up cost for the venture was $25 million, of which IFC agreed to provide loans of $9 million). See IFC, "Adv Bio-Extracts: Summary of Proposed Investment, available at www.ifc.org/ifcext/spiwebsite1.nsf/0/598e9cf117a1fbed85257178006439f2?OpenDocument (accessed January 22, 2008).

43. "The bulk of production is being channelled to the WHO/Global Fund ACT programme," the company's May 2007 report notes. See Advanced Bio-Extracts, "Project Status Report," May 2007, available at www.abextracts.com/index_files/ABE%20Project%20Status%20Report%20May%202007.pdf (accessed 18 December 2007).

44. Ibid.

45. Lee Wells, Public Affairs, Novartis, personal communication with author, January 10, 2008.

46. Growing *Artemisia annua* is a "tricky affair" in which "myriad ecological and technical odds [are] stacked against the farmers," including prohibitively expensive seeds. (Dan Okoth, "The Seedy Drug Wars," *Standard* (Nairobi), January 8, 2007.) Although some sources suggest that training was (or was supposed to be) provided, a story posted by some of the project's sponsors suggested that actual knowledge remained limited (Marc

Manara, "Advanced Bio-Extracts (ABE): Two-Pronged Social Impact," Acumen Fund, May 2007, available at www.acumenfund.org/investment-story/two-pronged-social-impact-.html (accessed January 22, 2008).

47. Two knowledgeable commentators both of whom wished to remain anonymous questioned whether ABE overreached itself in trying to operate in three countries (Kenya, Tanzania and Uganda), planting over one thousand hectares to produce vast amounts of the crop. Perhaps starting smaller would have made far more sense. (Personal communication with author, December 20, 2007 and January 9, 2008).

48. Lee Wells, Public Affairs, Novartis, personal communication with author, January 10, 2008.

49. WHO, Global Malarial Programme, "Meeting on the Production of Artemisinin and Artemisinin-Based Combination Therapies" (Arusha, Tanzania, June 6–7, 2005), available at www.who.int/malaria/docs/arusha-artemisinin-meeting.pdf (accessed December 20, 2007).

50. Novartis, "Novartis Partners with East African Botanicals to Expand Cultivation and Extraction of Natural Ingredient Used in Anti-Malarial Coartem," news release, June 6, 2007, available at www.malariaandhealth.com/professional/press_release/novartis0605.pdf (accessed December 20, 2007).

51. Roger Bate, "On the Trail of a Cure."

52. Roger Bate, "WTO's Next Target – Tariff Removal" (speech, AIDS Institute Conference, Washington, DC, December 14, 2005), available at www.aei.org/publication23583/.

53. Agha Ibiam, "ARV Production by Local Firms Gives Fresh Hope to People Living with AIDS," *This Day* (Lagos), April 11, 2006.

54. International Treatment Preparedness Coalition, *Missing the Target #5: Improving AIDS Drug Access and Advancing Health Care for All* (San Francisco: Tides Center, December 2007), available at www.aidstreatmentaccess.org/itpc5th.pdf (accessed December 20, 2007).

55. Roger Bate, Richard Tren, and Jasson Urbach, "Still Taxed to Death: An Analysis of Taxes and Tariffs on Medicines, Vaccines and Medical Devices" (related publication 05–04, AEI-Brookings Joint Center for Regulatory Studies, Washington, DC, April 2005), available at www.aei.org/publication23938/.

56. Both countries have extremely high tariff rates, and both have insufficient access to high-quality medicines. See *Civil Society Report on Intellectual Property, Innovation and Health* (London: International Policy Network, 2006), available through www.policynetwork.net/main/content.php?content_id=47 (accessed January 22, 2007).

57. Quoted in Roger Bate, "The Cost of Cheap Drugs," *Economic Affairs* (June 2007), available at www.aei.org/publication26345/.

58. Sydney Rosen, Ian Sanne, Alizanne Collier, Jonathon L. Simon, "Hard Choices: Rationing Antiretroviral Therapy for HIV/AIDS in Africa," *The Lancet*, December 31, 2004, available at http://image.thelancet.com/extras/04art3077web.pdf (accessed January 22, 2008).

59. Roger Bate, "Thailand's Patent Attack."

60. In 2005, a study by Mahidol University researchers found between 39.6 and 58 percent resistance in the three hundred patients investigated – perhaps the worst case of HIV treatment drug resistance in the world. See Roger Bate, "Thailand and the Drug Patent Wars."

61. Jeremiah Norris, "The Unravelling of Compulsory Licenses: Evidence from Thailand and India," International Policy Network, May 2007, available at www.fightingdiseases.org./pdf/unravelling_of_CLs_norris.pdf (accessed January 22, 2008).

62. "Access to Life Saving Medicines for the World's Poorest: Tariff and Non-Tariff Barriers" (panel discussion, Global Health Council, Washington, DC, October 30, 2007), available at www.globalhealth.org/news/article/9246 (accessed December 20, 2007).

63. Roger Bate, "Saving Lives through Honest Accounting," The American, February 12, 2007, available at www.aei.org/publication25607/.

64. Agence France Presse, "Uganda Opens Factory to Manufacture Generic AIDS Drug," October 8, 2007. At the factory's opening ceremony, Ugandan health minister Stephen Malinga praised the plant, saying that it would ensure that Ugandans would have "access to a regular supply of medication." Malinga also said he hoped it would be cheaper, because it would eliminate costs for transportation and manufacturing in foreign countries.

65. "Afro Alpine Pharma Opens Malaria Drug Factory in Kabale, Uganda," Kaiser GlobalHealthReporting.org.

66. Aparna Krishnan, "Cadila Sets Up Drug Manufacturing Facility in Ethiopia," *Global Insight*, June 6, 2007.

67. Roger Bate, "Malaria: Poor Drugs for the Poor," *CFD Bulletin*, June 21, 2007, available at www.aei.org/publication26383/.

68. The head of the food and drug regulatory agency was recently sentenced to death for taking bribes to falsify the quality standards of manufacturers. (Hepeng Jia, "Disgraced Drug Chief Sentenced to Death," *Chemistry World*, May 30, 2007.)

69. National Research Council, *Mobilizing Science-Based Enterprises for Energy, Water, and Medicines in Nigeria*.

70. Rumors of political interference in the Ugandan drug production facility appear more frequently, but sources have yet to provide definitive proof of wrongdoing.

Efforts to increase the poor's access to medicines are nothing new. Buying products from quality manufacturers (innovators and the best generics) and pressuring them to lower prices for the poorest markets has worked best, but other policies have largely failed or are still on the drawing board. The latest strategy – to encourage local pharmaceutical production – may not only fail to increase access but could also be entirely counterproductive. It could lower drug quality and increase incentives for protectionism, and, as a result, ultimately reduce access. Production of drugs in poorer countries can make sense, but it must be driven by entrepreneurs responsive to market incentives. Unsuccessful local businesses must be allowed to fail, not be propped up by aid groups that support local production without considering its longer-term economic consequences. This would encourage better, more profitable businesses, which will be the engines of growth for poor nations. The next few months will be a test of whether the international community encourages quality production or indirect protectionism.

in association with