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Fixes

The Fight Against Fake Drugs

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Fixes looks at solutions to social problems and why they work.

In November 2008, children in Nigeria taking a medicine called My Pikin Baby Teething Mixture began to die. The syrup was counterfeit, the standard glycerin replaced with cheaper diethylene glycol, which looks, smells and tastes the same. But diethylene glycol is an industrial solvent, which attacks the central nervous system, kidneys and liver. The medicine killed 84 children before it was pulled from pharmacy shelves.

Counterfeit medicine sometimes kills outright, as My Pikin did. More frequently, it kills by robbing patients of the real drugs they need. And some counterfeits contain a small amount of active ingredient — not enough to cure an illness, but enough to promote resistance that renders even the real medicine powerless. That might be the most deadly effect of all.

In developed countries, people don't worry about counterfeit drugs — although as online markets become popular, the problem is growing. In many poor countries, counterfeit medicines are an enormous problem. A counterfeit can be identical to a real drug, with the same amount of active ingredient. More often, manufacturers save money by including little or no real medicine. A survey of studies of malaria drugs in various countries found that 30 percent were counterfeit or substandard. A quarter-million malaria deaths each year might be prevented if the patients were treated with real drugs instead of fake ones.

A box of sophisticated fake pills can look exactly like the real thing. There is no way to tell if a pill is fake or real before taking it — or, for that matter, afterward. Malaria treatments are a good example. A study in Western Kenya found that only 38 percent of people who sought treatment for malaria actually had the disease. What people believed to be malaria, then, might have been another fever that resolved on its own — "cured" by a counterfeit drug with no active ingredient. Conversely, a medicine's failure is not proof that it is counterfeit or substandard, as real drugs don't always work. Legal medicines can also be substandard, and they can spoil. And there is always the question of whether patients take them correctly.

Nations with a serious counterfeiting problem can resolve it by acquiring effective regulation, strong institutions, working courts and well-designed liability laws. Rwanda, Africa's positive outlier in so many aspects of health care, seems to be on its way. While the rest are waiting, however, it is fortunate that other strategies exist.

In Uganda, two organizations are working together to improve village health. The giant Bangladeshi nongovernmental organization BRAC — which also works in several African countries — has long equipped its community health workers with a basket of medicines to sell. And a much newer and smaller group, Living Goods, is using a very similar Avon Lady style of micro-franchising: local women get training and buy a bag of medicines and other products to sell to their neighbors in Uganda and now in Kenya.

I wrote about Living Goods' work here. (I should have also included BRAC, which has been doing this work for decades.) There's an interesting side effect of these micro-franchising systems: they seem to reduce other retailers' sale of counterfeit drugs. This is important, as it leverages the Avon Ladies for wider impact.

The Abdul Latif Jameel Poverty Action Lab at M.I.T., which evaluates development projects, studied malaria medicines sold by pharmacies in four districts where BRAC and Living Goods work in Uganda. Before they came in, 37 percent of pharmacies sold counterfeit malaria drugs, and about 20 percent of

drugs sold were fake, said David Yanagizawa-Drott, one of the authors.

After the villages had access to reliable medicines through BRAC/Living Goods, however, the amount of counterfeit or substandard drugs sold in pharmacies fell by 50 percent. “You can get away with selling fake or low quality drugs because villagers have nothing to compare it to,” said Yanagizawa-Drott. “When an NGO comes in and sells a high-quality drug — there is now some ability for consumers to observe quality.”

Community health worker programs can be very big; BRAC has more than 100,000 workers. And the basic idea — to provide a reliable source of genuine drugs that become a reference point — is scalable in other ways. Tanzania, for example, is rolling out a national network of Accredited Drug Dispensing Outlets. This program gives pharmacies training, loans, certification and subsidies for essential medicines. These pharmacies are then tightly regulated and inspected, and the supply chain strictly controlled to cut down on counterfeits.

That’s the high-touch strategy. Cellphone authentication is the high-tech one. While working on a doctorate at Dartmouth, Ashifi Gogo, who was born in Ghana, developed a bar code system that allowed shoppers to verify that produce sold as organic truly was. “Everybody loved it. It won a number of awards — and got zero market traction,” he said. “Nobody wanted to buy it, because they trust Whole Foods.”

Then Gogo started to look for places where that trust is absent. “In emerging markets, customers don’t really trust the shop,” he said. “We switched from 2-D bar codes to scratch-off labels, and from kiosks and high-end scanners to cellphones.” Sproxil makes labels that its clients affix to blister packs inside each box of medicine. Each label has a unique scratch-off ID number. Purchasers text the ID to a number on the box, and instantly get a text back saying whether the medicine is fake or real.

Sproxil made its debut in 2010 when Biofem pharmaceuticals in Nigeria tried the system to authenticate Glucophage, a drug for diabetes that had lost significant market share due to counterfeiting. A three-month pilot had a 10 percent increase in sales.

Today Sproxil works in Ghana, Kenya, Nigeria and India, and is expanding into Latin America and farther into Asia. About half its clients are pharmaceutical companies. The others make auto parts, cables, mattresses, agrochemicals or even underwear.

Sproxil is by far the biggest company in the mobile verification business, with more than 9 million verifications so far. One reason is that in most countries, its verification texts are free. Gogo said that setting up that arrangement with cellphone service providers has been a nightmare. “The phone companies advertise very fast network speeds on their TV spots but they have molasses-grade administration,” Gogo said. “It can take a year for them to provide lifesaving service to their own customers.”

But free is necessary. It encourages more people to send the text, and allows them to borrow someone else’s phone in the store if they don’t have one. India doesn’t allow free texts, which has been a disadvantage for the much smaller PharmaSecure, which began in India in 2009 and is now expanding into Nigeria.

Also, the free-text arrangements with telecom providers keep counterfeiters from faking the verification process. Counterfeiters can — and do — put fake verification labels on products, but they aren't going to sign any deals with phone companies.

Nathan Sigworth, the chief executive of PharmaSecure, said the actual response rate on its verification labels is only a fraction of a percent in India and a few percent in Nigeria. (Gogo said that Sproxil's rates vary between 10 and 30 percent — possibly because they cover more chronic diseases, where brand loyalty matters a lot, and because its codes are number-only, which are easier to type on basic cellphones than alphanumeric codes.) Another important factor is public awareness of counterfeiting as a problem, and of the possibility of mobile verification. In Nigeria, the government publicizes the system with TV spots and posters in pharmacies. Nigeria now requires verification for all malaria medicines — a class of drugs already damaged by the rise of resistance.

The response rate will no doubt grow, and the technology has other potential benefits. Investigators can track counterfeiting hot spots in real time. Companies can text customers reminders about taking their medicines or other health information, survey them by text or phone, connect them to doctors or send them targeted ads. (That's perhaps not a benefit for everyone.) They can better track their supply chain and monitor stockouts. When 3,000 doses of the antimalarial drug Lonart DS were stolen en route to retail stores in Nigeria, the manufacturer set Sproxil's ID numbers on those medicines to respond to texts with "stolen: please call in." Within three days, the company's investigators had enough responses to find the products, recover some of them, and identify the wholesaler and pharmacies involved.

"We began in anti-counterfeiting," said Sigworth. "Then we realized that once you have a unique ID on everything, it opens a world of possibilities."

Mobile verification might be equally important in other areas, like agricultural products. Farmers in Africa could greatly increase yields by buying hybrid seeds instead of replanting their own seeds — hybrids can sometimes give 10 times the yield. One huge obstacle, though, is that many hybrid seeds are counterfeit: grains of corn painted to look like seed. Yanagizawa-Drott is a co-author of a small study

in Uganda that found that 30 percent of seed bags failed to germinate. Farmers are choosing low yields from their own seeds over the chance that "hybrid" seeds won't grow at all. The same is true of fertilizers and pesticides — the risk of buying fakes keeps farmers from investing in products that can lift them out of poverty. This is another way that counterfeits kill.

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