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Smuggled, counterfeit medicines are big business on the streets in Côte d'Ivoire.

Bring order to unregulated health markets

Uncontrolled medical treatment in Asia and Africa costs lives and money. **David Peters** and **Gerald Bloom** call for governments, firms and citizen groups to get involved.

In Nigeria, around half of people who suspect that they have malaria do not see a physician¹. Instead, they purchase drugs directly from medicine vendors. But the malaria parasite is resistant to much of what they buy. In Bangladesh and India, informally trained village doctors provide most outpatient services to the poor. Antibiotics comprise 50% of all prescriptions in developing countries, and more than half are given inappropriately or in insufficient dosages².

The rapid expansion of health markets in Asia and Africa has made medicines, information and primary-care services available in all but the most remote areas. But it

also creates problems with drug safety and effectiveness, equity of treatment and the cost of care. Poorly trained practitioners often prescribe unnecessary pills or injections, with patients bearing the expense and the costs to their health. Counterfeit drugs are rife and drug resistance is growing.

Bringing order to unruly health markets is a major challenge. Yet the problem is largely ignored by governments and international agencies. The World Health Organization (WHO) continues to highlight a shortage of primary health workers as the main barrier to accessing health care in low- and middle-income countries³. It neglects the growing

presence of drug sellers, rural medical practitioners and other informally trained health-care providers.

To find better ways to meet the health and welfare needs of the poor, we need to look beyond ideological debates about public and private sectors and improve how these evolving markets operate. This will not be easy, because health markets are complicated and interventions have unpredictable consequences. But following the example of China — which reached out to village doctors in 2003 to address the SARS epidemic — governments, citizen groups and companies can build partnerships with local providers ►

► to support innovation and improve the delivery of safe, effective and affordable treatments for common conditions.

Many unforeseen factors have contributed to the huge expansion of health markets in Africa and Asia. In countries where government health budgets have been squeezed by economic or social crises, health workers cope by charging patients or selling drugs. Where there has been rapid economic growth, government health services struggle to keep up with demand, and people seek care elsewhere. The projects that train large numbers of community health workers produce numerous graduates who must turn to the market if they are unable to get a government job. The boundary between public and private sectors is often blurred, with many doctors supplementing their income through market activities, legal and illegal.

GROWING MARKETS

In general, the wealthiest people in developing nations tend to use highly regulated services. The poor, by contrast, usually seek care elsewhere, most often from informally trained practitioners or village midwives, who are often highly regarded in their communities¹ (see 'Community care'). Some of these health-care providers will have attended a short training course, whereas others will have learned through working for a physician or in a pharmacy. A variety of clinics, pharmacies, diagnostic centres and hospital chains in these countries also provide services to paying customers.

The markets for health services and pharmaceuticals are closely linked. In Bangladesh and India, for example, employees of drug-distribution companies act as a source of information for health workers while offering financial inducements to promote their products. The media, advertising and mobile telephones are providing other conduits for information about medicines and treatments.

Arrangements to ensure that health

services, products and advice are safe and effective have lagged behind the expansion of these markets. Unqualified health workers may do some good by giving drugs to a child with pneumonia, or oral rehydration fluids to someone with diarrhoea. But most lack formal knowledge of how to diagnose and treat illnesses.

Many patients are given drugs that are inappropriate or not needed. In a study of village doctors in Chakaria, Bangladesh, unnecessary medicines were prescribed in three-quarters of visits¹. Dangerous practices, such as overuse of the hormone oxytocin before delivery of a baby, were also common in the district¹. A similar study in Nigeria found that vendors of patented medicines were stocking and selling products to which the malaria parasite had already developed resistance¹. Such practices diminish the efficacy of treatments, and mean that poor people pay a lot of money for unnecessary drugs.

The separation of informal providers from the rest of the health system also delays the referral of seriously ill people to well-trained physicians or hospitals. The global problem of chronic non-communicable diseases, such as heart disease and cancer, and the effectiveness of inexpensive measures to control high blood pressure and diabetes make it urgent to find ways to better use village doctors.

Other problems of disorganized markets have implications for health around the world. One challenge is the prevalence of fake and substandard drugs — including generics that masquerade as branded products, treatments that contain none of the labelled ingredients, and counterfeit medicines — a major criminal endeavour that reaches almost every country. One study in southeast Asia found that 50% of anti-malarial drugs tested were fake⁴. Sales of these products worldwide bring in billions of dollars — a 2005 projection estimated as much as US\$75 billion in 2010 alone.

A second problem arises from the wide

availability of antibiotics, antiviral products and anti-malarials, which increases the risk that treatment-resistant organisms will emerge. Third, informal health-care providers are disconnected from public-health systems, which diminishes the effectiveness of disease surveillance. When China strengthened its surveillance system after the outbreak of SARS, village doctors were involved because the health ministry had already taken steps to link them to the rest of the system.

BUILDING PARTNERSHIPS

Governments that have limited resources and little success in regulation are not going to legislate their way to an orderly health system, or replace entrenched markets with an expanded public-health service. Replicating US and European health-care institutions, which arose in particular economic and social circumstances during the twentieth century, is not an option for many countries.

To find alternative interventions, we need to improve our understanding of how these markets operate as complex adaptive systems⁵. In particular, we must recognize the importance of local innovations in how health services are provided or financed, and the likelihood of unintended consequences.

Bringing order to unregulated health markets will take broad coalitions that go beyond governments and health professionals. They should include citizen groups, pharmaceutical companies, information-technology and telecommunications companies, and associations of informal health-care providers. Such coalitions might coordinate disease-surveillance systems, information networks for pricing and sourcing quality drugs, and patient-referral mechanisms.

Conflicts of interest will make some partnerships difficult, but commonalities can be found. Most groups share an interest in improving the quality of life of their patients and customers, addressing counterfeit drugs and preventing the emergence of drug resistance, for instance.

Organizations have already emerged to engage with these markets. In Nigeria, vendors of patent medicine have been organized in associations for more than 60 years, largely to protect their members from harassment by local government officials and to monitor the use of counterfeit or expired drugs¹. Rural medical practitioners in the Indian state of Andhra Pradesh have formed an association to protect their practices.

Village doctors and drug retailers should be formally recognized by governments or professional bodies. This would help to clarify their legal status and determine prescription practices, for example. Public-health programmes should include ways for isolated informal providers to contribute, such as by participating in disease-control projects, or by introducing systems for referring patients

COMMUNITY CARE

People in Asia and Africa often seek health care from informally trained practitioners or village midwives rather than professional physicians.

Health providers with scant training (%)

and sharing medical knowledge.

Citizen groups have a growing role in this. In Cambodia, MoPoTsyo, a non-profit organization in Phnom Penh for people with diabetes or high blood pressure, helps members to manage their disease and to negotiate with physicians and pharmacists. Organizations that are trusted by communities, such as faith-based hospitals and social entrepreneurs, are also engaging with health markets.

Mobile telephones are creating new opportunities for linking patients, informal providers and trained physicians. In Bangladesh, for example, mobile phones are being used to relay information about treatments, drug side effects and the management of chronic diseases. The impact of new technologies on health markets is difficult to predict or plan for, but services for vulnerable populations can usually be improved if interventions are tailored to their needs, and the results are shared among patients, providers and policy-makers⁶.

As in other complex systems, a single intervention is unlikely to lead to sustainable change, so players will need to experiment, adapt and learn. Strategies that could be tested by governments and the medical profession include the formal accreditation or licensing of new categories of health workers. Arrangements for public-sector doctors who supplement their income through private practice should be made transparent.

The urgent need is to protect the poor who rely on unregulated health markets. In the longer term, everyone's health depends on rising to this challenge. ■

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Make mentorship matter

John M. Braxton calls for teaching-integrity committees to deal with academics who fail in their responsibilities.

Misconduct is a word that is always on professors' minds. Incidents in the news tend to describe the most serious violations of scientific standards, such as plagiarism or fabricating data. But these high-profile infractions occur relatively rarely. Much more frequent are forms of misconduct that occur as part of the intimate relationship between a faculty member and a student.

Faculty members don't need to commit egregious acts such as sexual harassment or appropriation of students' work to fail in their responsibility to their charges. Being generally negligent as teachers and mentors should also be seen as falling down on the job.

To assess faculty members' attitudes towards these more subtle behaviours, starting a few years ago, my colleagues (Eve Proper, Alan Bayer) and I mailed a questionnaire to more than 3,500 US faculty members in science (biology, chemistry and psychology) and history. Approximately 800 people (23%) responded. (Although the response rate was lower than we had hoped, an analysis of people who responded to a second mailing

of the survey showed that they shared similar demographics and perceptions of the main behaviours with people who responded to the first mailing, suggesting that this first group is likely to be representative of the entire group.)

The questions focused on more than 120 types of behaviour, asking respondents to rate them from 1 to 5, with 1 being appropriate behaviour that should be encouraged, and 5 being totally unacceptable actions requiring formal administrative intervention (J. M. Braxton, E. Proper and A. E. Bayer *Professors Behaving Badly* Johns Hopkins University Press, 2011). Our findings were alarming.

Not surprisingly, respondents generally agreed on the most egregious behaviours, concurring that faculty members should never disrespect students' efforts, misappropriate their work, harass them or encourage misconduct (see 'Measure of a mentor').

What we found most interesting was how respondents had less-vehement reactions to a host of questionable behaviours. In particular, they said that faculty members should avoid — but not necessarily be punished

ILLUSTRATION BY JAY TAYLOR