Commentary

Underpricing the Competition in the Other Drug War: A Novel Strategy for Combatting the Inappropriate Use of Artemisinin Monotherapies

Christopher J Gill^{1,2}, Davidson H Hamer^{1,2,3,4}

¹Center for Global Health & Development, Boston University, Boston MA USA

²Department of International Health, Boston University School of Public Health, Boston, MA, USA

³Zambia Center for Applied Health Research & Development, Lusaka, Zambia

⁴Section of Infectious Diseases, Department of Medicine, Boston University School of Medicine, Boston, MA, USA

Invited Commentary on 'Effect of the Affordable Medicines Facility--malaria (AMFm) on the availability, price, and market share of quality-assured artemisinin-based combination therapies in seven countries: a before-and-after analysis of outlet survey data', Tougher et al., Lancet, 2012.

The war on drugs conjures images of drug enforcement agencies battling to stem the tide of illegal narcotics coming from South American drug cartels. But a second drug war is underway, and the public health stakes are even higher. This is the trade in counterfeit, sub-standard, and inappropriate medications that plague low and middle-income countries. By some estimates, 33% of medications in poor countries are counterfeit or substandard, and the market for these is estimated at an astonishing 40 billion US dollars per year, rivaling revenues from big pharma.¹ The consequences of inappropriate drug use are particularly injurious to public health.

In recent years, artemisinin monotherapy for acute malaria has emerged as a particularly malignant challenge to global malaria control efforts. The sequential introduction and use of antimalarials, including chloroquine, sulfadoxine-pyrimethamine, mefloquine, and others, was quickly followed by the emergence of *Plasmodia* resistant to each of these agents.² Facing a resurgence of malaria in many parts of the world and fewer and fewer effective treatment options remaining, the malaria community adopted the strategy of combining antimalarial drugs. The

most common approach has been to combine a highly potent but short-acting artemisinin with a long acting second agent into 'artemisinin combination therapies' (ACTs). As predicted, ACTs have proven highly effective for treating acute uncomplicated malaria.³ Unfortunately, this strategy is now jeopardized by the inappropriate use of artemisinin monotherapies, which have flooded the market in many parts of the world. These are poorly effective due to the short half-life of artemisinins, need to take a more prolonged 5 to 7 day course (which is often not completed), and high risk of relapse from partially treated cases of malaria.⁴ More importantly, monotherapy increases the risk of artemisinin resistance, which ultimately degrades ACT effectiveness. In short, the inappropriate use of artemisinin by itself undermines a cornerstone of our strategy for malaria case management, and the consequences could be catastrophic. But what to do?

The problem, as with the war on narcotics, is that where there is demand, there is a private sector market eager to supply. Moreover, in the same way that our war on narcotics has largely failed by trying to interfere with the supply side, there is little optimism that trying to combat the problem of inappropriate artemisinin use through regulation will be effective. To address this challenge, the Global Fund to Fight AIDS, Tuberculosis and Malaria approved an innovative initiative in 2008, the Affordable Medicines Facility for malaria (AMFm).⁵ This financing mechanism involved three elements: price reductions of quality-assured ACTs, subsidies for consumers, and interventions to promote rational antimalarial use. The overarching goal of AMFm was to subsidize ACTs in the public and private sectors and thereby drive artemisinin monotherapy and substandard antimalarials out of the marketplace. Rather than trying to block the supply of inappropriate artemisinin monotherapy use, AMFm fought fire with fire, by aggressively subsidizing the ACTs at costs below artemisinin monotherapy, thereby eliminating a competitive market advantage.

Tougher and her colleagues were commissioned to provide an independent, external evaluation of the AMFm strategy. They used before-and-after comparisons of price, availability, and market share in eight national-level pilot programs in seven countries.⁶ Their results were impressive. Overall, the volume of ACT use increased significantly in all but two pilot sites.

Correspondence: Davidson H. Hamer, MD, Zambia Center for Applied Health Research and Development, 4649 Beit Road, Rhodes Park, Lusaka, Zambia, Tel. +260-973-543773, Email: dhamer@bu.edu

Conversely, use of monotherapy fell sharply in Nigeria and Zanzibar, the two pilot sites where monotherapy had exceeded 5% at baseline. Moreover, Tougher *et al* documented a large increase in private drug sellers who elected to start stocking ACTs at the expense of artemisinin monotherapies. In fact, the preferential use or adoption of ACTs was most notable among private drug sellers, whose diversity and financial self-interest previously had posed a significant barrier to reducing inappropriate drug use. It is also relevant that the public sector of four countries purchased AMFm-subsidized ACTs from the private sector in order to avoid stockouts. This innovative financing mechanism stands as a textbook example of the effectiveness of harnessing market forces to promote public health, and should be studied and replicated in other contexts.

Reference

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