



Review of Bate et al.: The AMFm and Medicine Diversion: Good intent enabling corrupt practices

Reviewer: Anonymous

General comments

This short paper draws the attention to the problem of theft and diversion of subsidized and donated antimalarials. It is well-written and concise.

Essential revisions

Abstract line 2 – ‘there’ instead of ‘this is increasing theft...’

The reviewer rightly points out that in the introductory abstract, the paper ought to lay out the situation factually, rather than causally. We have modified the text as follows:

Increased donated and subsidized medicines for malaria are saving countless lives in Africa, but **there** is probably increasing theft and diversion of those medicines.

Background – ‘By reducing the cost of ACTs to compete with chloroquine and SP...’ – this is not self-explanatory – why should there be a competition with those drugs? They are phased out as first-lines. They are often still available over the counter, thus causing problems, but on THAT market AMFm drugs are not intended to compete with.

While it is true that chloroquine and SP are often used and phased-out as first-line malaria treatments, in practice many patients continue to rely on these less effective therapies throughout their sickness since the more effective ACTs are significantly more expensive. Thus in practice, chloroquine and SP do act as substitutes to ACTs, so reducing the price of ACTs should increase use of ACTs vis a vis chloroquine and SP. We have reworded as follows:

Additionally, the program hopes to displace often used, but older and less effective, chloroquine and sulfadoxine-pyrimethamine (SP) treatments by making the more trustworthy ACTs equally affordable for patients.

'...and displace oral artemisinin monotherapies and other poor quality...'
– the intention is clear but the wording can be misunderstood. Oral artemisinin is not necessarily a poor-quality drug, but it is poor practice not to use it in combinations. I would strongly recommend not to mix quality of drugs and practice of use.

The reviewer rightly points out a possible misinterpretation of the original wording. We have modified below to emphasize the difference between inappropriately *used* monotherapies, and poor quality drugs. We have reworded as follows:

The AMFm aims to increase the availability and use of ACTs by reducing their cost and thereby driving oral artemisinin monotherapies, which should only be used as part of combination therapies, or poor-quality antimalarial drugs from the market.

Method – the number and the selection criteria of the nations selected needs to be explained, as well, and more so, how the pharmacies were picked within those cities. As it stands, not doing so invites questions about selection bias.

The selection of countries and cities reflects the lead author's previous research project, in which a variety of AMFm and non-AMFm countries were surveyed to measure drug quality. The selection methodology is explained more fully in the foot-noted papers. (i, ii below) Using the same cities provides this paper with more complete data, as well as allowing for comparison with previous work by the authors and for consistent drug quality comparisons over time.

Regarding selecting pharmacies: the modified text below explains the sampling process. Pharmacies were selected by covert shoppers on the ground in approximately median income parts of the cities. In no cases were pharmacies removed from the data set if they did not fit established the overall trend. We have reworded as follows:

The cities were chosen in conjunction with the lead author's previous research, and reflect a variety of both AMFm and non-AMFm countries for comparison. Drug collection and testing was conducted per previous research methodology, with city dwellers from each city

beginning a random walk in two median income areas of each city and buying from pharmacies they first encounter.^{[i],[ii]} This is convenience covert shopping and not a detailed assessment of pharmacies from which a truly random sampling could be drawn. There was one addition to previous methodology - all pharmacists in countries participating in the AMFm program were asked whether their pharmacy was participating in the scheme - the negatives were recorded as non-participating pharmacies.

Conclusion – strictly speaking, although one would clearly agree that this is most likely the case, the conclusions are not really supported in my view by the data: it was shown that many pharmacies (almost all visited actually) sold diverted (or stolen) products, but as the situation before AMFm marketing set in, but it is not clear whether the situation is worse (or less so) as this ‘experiment’ was not tailored to answer this question. This should be accounted for in the conclusions.

The reviewer correctly points out that the original conclusion shied away from drawing firm conclusions regarding the scale of theft and diversion before and after the AMFm’s implementation. The results of the experiment are, indeed, not tailored to address this question. The results simply demonstrate that drug diversion of AMFm products is widespread – both within AMFm countries and non-AMFm countries which border AMFm countries. Without data on the scale of drug diversion before the AMFm program (which, for most of these countries, is not available), it is impossible to state firmly whether drug diversion as a phenomenon overall has increased.

However, the AMFm subsidy program has created opportunities for individuals to profit by stealing subsidized drugs and selling them at market value – an opportunity which did not exist before the subsidy. This study shows numerous actors have taken advantage of this opportunity: diversion is common within the AMFm program. Increasing the supply of subsidized drugs which are being diverted on a large scale will not only provide even more opportunities for diversion, but will further skew market incentives, potentially in a detrimental way.

The AMFm antimalarial drug subsidy is increasing access to the best medicines, but it also provides opportunities for increased drug theft and diversion. Although such opportunities existed before the subsidy was introduced, these have likely been exacerbated by the subsidy. Indeed, this studies’ data indicate that actors from multiple countries are taking advantage of asymmetrical pricing in the antimalarial

market by selling subsidized ACTs to non-registered pharmacies and across international borders. This is not only illegal, it may undermine the success of the AMFm subsidy. As the subsidy program expands to new countries, opportunities for theft and diversion will continue to grow. This may have detrimental effects on the antimalarial drug market.

ⁱ Bate R, Coticelli P, Tren R, Attaran A: "Antimalarial Drug Quality in the Most Severely Malarious Parts of Africa – A Six Country Study," *PLoS One*. 2008, **3**(5).

ⁱⁱ Bate R, Hess K, Mooney L: "Antimalarial medicine diversion: stock-outs and other public health problems." *Research and Reports in Tropical Medicine*. 2010, **1**. Available at: <http://www.dovepress.com/antimalarial-medicine-diversion-stock-outs-and-other-public-health-pro-peer-reviewed-article-RRTM> (accessed January 23, 2012).