Commentary

Time-and-space limited chemoprophylaxis: intellectual exercises can be translated into effective public health measures, provided that...

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Invited Commentary on 'Estimating the potential public health impact of seasonal malaria chemoprevention in African children', Cairns et al., Nature Communications, 2012

Targeting preventive treatment for malaria to high-risk strata of the population (children under 5 and pregnant women), instead of striving for mass drug administration, was one of the consequences of the shift from the dream of malaria eradication to the apparently more realistic strategy of malaria control.¹ In 2004, the WHO adopted the intermittent preventive treatment (IPT) of pregnant women for combating pregnancy-associated anemia, peri-natal mortality and low birth weight. This decision was supported by the results of studies (see, for example, Greenwood AM *et al.*)² which pioneered an uninterrupted series of investigations which have continued until today (reviewed by Bardaji *et al.*).³ However, even in cases where the attendance of the antenatal care clinics was relatively high, IPT coverage remained insufficient.⁴ Some years ago, the attention of health policy makers was brought to a variation on the theme, consisting in the idea of circumscribing IPT to the season of intense malaria transmission.⁵ Recently, a meta-analysis of seven trials indicated that 'seasonal IPT' may prevent approximately three quarters of clinical malaria and severe malaria episodes in children living in areas of seasonal malaria in Africa.⁶

In the June issue of *Nature Communications*, Cairns and colleagues⁷ published an article on the public health potential of seasonal IPT in African children. By using information retrieval tools, they quantified the population of children under 5 years of age living in the areas of Africa where malaria transmission complies to a definition of 'highly seasonal'. Making estimates of the incidence of malaria episodes and

malaria deaths in these areas, and applying the potential impact obtainable by seasonal IPT, according to the meta-analysis quoted above, the authors hypothesise the impressive figures of 5 million cases and 20 000 deaths that could be averted by a wide deployment of seasonal IPT over the relevant geographical areas.

The paper has the merit of providing probably the first instance of a concept widely accepted in the malaria scientific community: malaria interventions must be tailored to specific epidemiological settings, since a 'one size fits all' model is unlikely to work for malaria control. Here, an algorithm is defined, allowing the epidemiological context(s) where seasonal IPT may effectively and efficiently work to be accurately identified. However, a few remarks cautioning against excessive enthusiasms need to be made.

1) The proposed strategy, in common with all strategies relying upon conventional drugs, has to cope with the problem of drug resistance, not a minor issue. 2) The 'traditional' chemoprophylaxis regimens, as those practiced for decades by expatriates in malaria endemic areas, almost always follow a 'seasonal' pattern, featuring a suspension, the duration of which is empirically related to the concentration of the rainfall. This approach, provided that parasite resistance to the product employed is low or inexistent, proved to be very successful in the 'special' community of expatriates, but evidence of its transferability to those mostly in need, i.e. the rural African communities, is missing. 3) Coverage is an essential variable when making inference about the public health impact of a disease control strategy. There is no reason to expect compliance to seasonal IPT to be higher than the unsatisfactory levels recorded (with a few exceptions) for IPT in pregnant women in Africa; rather, the contrary could be true, in consideration of the expectedly sensitive condition represented by pregnancy. 4) The majority of studies on IPT for malaria focused on technical aspects, while very few took into consideration the plethora of social and cultural factors which dramatically affect, either positively or negatively, the outcome of interventions.⁸

In conclusion, the availability of an algorithm precisely mapping areas where seasonal preventive measures for malaria could be applied with a measurable expected chance of success is very timely and welcome. Perhaps, the idea of shifting from chemoprevention with conventional drugs, whose limitations

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are universally recognised, to remedies already rooted in communities living in areas of intense, seasonal malaria in Africa, should be seriously taken into consideration, once their efficacy is proved.

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