Re-treatment of bednets in Tanzania

Our experience of re-treatment of bednets in Tanzanian villages is quite different from that of Armstrong Schellenberg *et al.* (2002: *Transactions*, **96**, 368–369). In contrast to their disappointingly low rates of net re-treatment with socially marketed packages of insecticide for individual nets, we consistently observe > 90% of the nets in 20 villages being easily and quickly re-treated once a year. The difference is that we do not wait for villagers to take the initiative and come to buy small doses of insecticide. Instead, one of us requests the health workers in a village to make it known to everyone that an insecticide-mix will be freely available on a specified couple of days in a central place in the village. The result is queues of people with arms full of nets and completion of the job in each village in 2–3 d.

Apart from the cost of marketed insecticide, which is not trivial to a subsistence farmer, we know ourselves the temptation to delay making the effort to take the family's nets down, to obtain the insecticide and to make up one's own mix. The news that an insecticidal mix will be available free of charge on a certain couple of days in the year seems to give the incentive to nearly all net owners to go and get the job done. The need for re-treatment is thought to be less with commercially produced long-lasting nets but our trials have not so far found them significantly more wash-resistant than nets conventionally treated with alphacypermethrin.

We found that our team of 10 could, in 1 d, check the number and size of nets required in each house in a village and donate the required 800 nets. We consider that this kind of organized free provision is not only more efficient in ensuring high enough coverage to achieve a 'mass effect'on the village vector population (Curtis *et al.*, 1998: *Tropical Medicine and International Health*, **3**, 619–631), but is also a more cost-effective use for donor funding than subsidizing a slow-moving marketing system. Omitting urban areas, where there is already a market in nets against *Culex* mosquitoes, and considering only all the highly malarious rural areas of tropical Africa, replacements for torn nets could be provided once every 4 years, plus annual re-treatment, for about US$450 million per year, based on the costing per 1000 people of Curtis *et al.* (*loc. cit.*) and the fact that two teams like ours would be needed to carry out net replacement per million people. This sounds like a lot of money, but it could easily be afforded–based on the figures presented at a recent meeting of the Society of Vector Ecology by M. K. Rust (University of California, USA), it is about half what is spent annually on insecticides for cat flea control in the USA.

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Re-treatment of bednets in Tanzania: a reply

Maxwell *et al.* (above) present their experience of the re-treatment of mosquito nets, which differs from that presented in our paper (Armstrong Schellenberg *et al.*, 2002: *Transactions*, **96**, 368–369). Insecticide treatment adds substantially to the health impact of mosquito nets. It doubles the epidemiological impact associated with net use under trial conditions (Lengeler, 2000: *Insecticide-treated bednets and curtains for preventing malaria*. In: *The Cochrane Library*, Issue 1, 2001. Oxford: Update Software), and there is increasing evidence that treated nets have prolonged impact (T. A. Smith, personal communication). Adding insecticide to netting is therefore highly cost-effective (Goodmann *et al.*, 1999: *Lancet*, **354**, 378–385).

The crucial question of how to deliver net treatment reliably to millions of users every 6–12 months is a highly challenging issue. To date, all programmes have been limited in scale and most have been relatively unsuccessful in achieving high re-treatment rates. Undoubtedly, much more experience is required. While we welcome the suggestion by Maxwell *et al.* (above) of free delivery of insecticide as an attractive option, we do not agree that their experience can be taken as a basis for advocating such an approach on a larger scale. Providing insecticide in a small number of villages with a long-standing research presence and having it delivered by a team of well-trained, highly motivated field-workers is unlikely to be a good model on which to plan for upscaling. The world of public health is full of examples of how excellent pilot interventions failed to be successfully upscaled. In the context of a country such as Tanzania it is hard to imagine how an army of publicly funded net treatment agents could be successfully deployed, given the logistical and financial constraints. On the other hand, creating synergies with other key events in public health programmes, for example the intensified vaccination campaigns for some childhood diseases, might be feasible and should certainly be tried. We believe that it is also important to offer alternative treatment strategies for those unwilling to come forward to public events and for those whose motivation is sufficient to treat their own nets. The commercial supply of socially marketed insecticide treatment kits is an attractive option in this regard.

In any case, it is hoped that such strategies would only represent a stopgap solution until nets with a long-lasting insecticide treatment (NELLIT) become the norm, avoiding the need for regular re-treatment. One excellent product is already on the market (the Olyset net) and more are likely to follow in 2003. These nets are capable of delivering good entomological protection after 50 standardized washes, which translates into more than the expected useful life of a net. Given this development it is probably not timely to initiate strategies requiring an enormous human and material investment, which might take years to become fully operational.

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Mechanisms involved in myocardial necrosis and pulmonary oedema after *Tityus serrulatus* scorpion envenomation

We read with interest the report by Benvenuti *et al.* (2002: *Transactions*, **96**, 275–276) on myocardial necrosis and pulmonary oedema after *Tityus serrulatus* scorpion envenomation. The authors proposed that the myocardial necrosis was probably induced by sympathetic storm following the envenomation and stated 'there is no evidence for a direct toxic effect of scorpion venom on the myocardium'. However, there is some experimental evidence for the direct action of *T. serrulatus* scorpion venom on the cardiac muscle (Teixeira Jr *et al.*, 2001: *Toxicon*, **39**, 703–709). Furthermore, we agree that 'the sympathetic storm alone cannot explain all the clinical manifestations and haemodynamic disarrangement that culminates in pulmonary oedema' after envenomation. Indeed, there is much evidence that inflammatory mediators, such as platelet activation