January 2007

Social marketing of insecticide-treated bednets: The case for Pakistan

S Qazi
Aga Khan University

B T. Shaikh
Aga Khan University, babar.shaikh@aku.edu

Report

Social marketing of insecticide-treated bednets: the case for Pakistan

S. Qazi[1] and B.T. Shaikh[1]

التسويق الاجتماعي للناموسيات المعالجة بمبيدات الحشرات: الوضع في باكستان

سليمان قاضي، بابر شيخ

الخلاصة: في ظل وقوع نحو نصف مليون إصابة بالملاريا سنوياً في باكستان، وازدياد الحالات المقاومة للأدوية، أصبح من الضروري اتخاذ تدابير وقائية عملية، مثل الناموسيات المعالجة بمبيدات الحشرات. وأصبح التسويق الاجتماعي، من خلال القنوات التجارية، يمثّل إحدى الوسائل الهامة التي تتميّز بالفعّالية لقاء التكاليف لإيصال المنتوجات والخدمات الصحية إلى الفئات السكانية المنخفضة الدخل، ولحفزهم أيضاً على استخدام هذه الخدمات. وتبيَّن أن التسويق الاجتماعي للناموسيات المعالجة بالمبيدات الحشرية قد أنقذ حياة الملايين من السكان في المناطق الموطونة بالملاريا، لقاء تكلفة زهيدة لم تتجاوز دولارَيْن اثنَيْن لكل شخص. وعلى هذا فإن التسويق الاجتماعي يمكن أن يمثّل استراتيجية فعّالة لإيصال الناموسيات المعالجة بالمبيدات الحشرية إلى التجمّعات السكانية الفقيرة في باكستان، وهي الفئة الأكثر تعرُّضاً للإصابة بالملاريا.

ABSTRACT With an estimated half a million cases of malaria annually in Pakistan, and drug resistant cases on the increase, more practical preventive measures such as insecticide-treated bednets are essential. Social marketing through commercial channels has become an important cost-effective means to deliver health products and services to low income people and to motivate them to use these services. It has been demonstrated that social marketing of insecticide-treated bednets has saved the lives of millions of people in malaria-endemic regions at a cost as low as US$ 2 per person. Social marketing could be an effective strategy for getting insecticide-treated nets to poor communities in Pakistan who are most vulnerable to malaria.

Marketing social des moustiquaires imprégnées d'insecticide : le cas du Pakistan

RÉSUMÉ Avec une incidence annuelle du paludisme estimée à un demi-million de cas et la progression de la résistance aux traitements, le Pakistan se doit de prendre davantage de mesures pratiques à visée préventive comme la distribution de moustiquaires imprégnées d'insecticide. Le marketing social *via* les circuits commerciaux s'impose aujourd'hui comme une solution remarquable et rentable pour permettre aux plus démunis l'accès aux biens et services de santé et les inciter à utiliser ces services. Il a été établi que le marketing social des moustiquaires imprégnées d'insecticide a sauvé la vie de millions d'individus dans les zones d'endémie paludéenne pour un coût n'excédant pas USD 2 par personne. Le marketing social pourrait être une stratégie efficace pour mettre des moustiquaires imprégnées d'insecticide à la disposition des communautés défavorisées du Pakistan, lesquelles sont les plus vulnérables au paludisme.

[1]*Health Systems Division, Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan (Correspondence to B.T. Shaikh: babar.shaikh@aku.edu).*
Received: 01/03/05; accepted: 13/07/05

Introduction

Malaria is found across the tropical and sub-tropical regions of the world and causes more than 300 million acute illnesses and at least 1 million deaths annually. Perinatal mortality, spontaneous abortion, low birth weight and maternal anaemia are among the serious outcomes of malaria in pregnant women. Children with severe malaria can suffer learning impairment or brain damage. Though treatment for malaria exists, it has its own limitations and complications, and prevention has emerged as the most effective strategy. Since 1997, the World Health Organization (WHO) has been recommending a multi-pronged strategy to combat malaria, including development of new medicines and vaccines, improvements of health care systems and promotion of insecticide-treated bednets (ITNs) [*1, 2*].

ITNs decrease exposure to mosquitoes and therefore decrease both the number of malaria cases and malaria death rates in pregnant women and in children who sleep under the net with the mother [*1*]. After successful controlled trials showing the effectiveness of ITNs [*3,4*], the focus is now on the operational issues of distribution and financing of nets [*5*].

Social marketing has been used for promoting the use of ITNs in poor communities that are most affected by malaria. The approach includes subsidization of prices to make nets and insecticides more affordable and available through commercial market channels. It has been demonstrated that social marketing of ITNs has saved millions of people in malaria-affected regions at a cost as low as US$ 2 per person [*6*].

This report gives an account of the social marketing approach for combating malaria through use of ITNs and makes the case for the use of this approach in Pakistan.

The situation in Pakistan

In Pakistan, malaria transmission is seasonal, and 0.5 million cases are recorded annually [*7*]. However, the actual level of malaria may be at least 5 times higher than suggested by official records since data are based on the 20% of clients who use government services [*1*]. Malaria epidemics have occurred at 6–10 year intervals. About 40% of cases are due to the *Plasmodium falciparum* parasite, which has developed resistance to chloroquine [*1*]. The 2 main malaria vectors, mosquitoes *Anopheles culicifacies* and *An. stephensi*, are both resistant to organochlorine compounds and the latter has also developed resistance to an organophosphate (malathion). *P. falciparum* is on the increase in Pakistan, partly due to importation of malaria from Afghanistan [*8*]. Malaria is one of the leading causes of anaemia in pregnancy, abortions and stillbirths [*9*]. Almost 65% of the total population of Pakistan still resides in rural areas with poor sanitation and hygiene, and with a habit of sleeping outdoors [*10*]. Considering the socioeconomic factors and related burden of disease, women and children in the low income communities and residing in malaria-prone areas are the most vulnerable group.

Costs and benefits of ITNs

ITNs are cost-effective tools for the prevention of malaria [*11,12*]. If properly used and maintained they can reduce all-cause mortality in children by an average of 17% and the incidence of severe and mild malaria episodes by 45%–48%. There is substantial evidence now from various regions of the world about the cost-effectiveness of ITNs for reducing malaria morbidity, with figures of around US$ 47 per DALY [disability-

adjusted life year] averted [*13,14*] . The protection from bednets is most pronounced in areas where transmission is low to moderate. The conventional permethrin-coated ITN available in Pakistan costs around US$ 3.2–3.5 and the cost of reimpregnating every 6 months to 1 year is about US$ 0.17 per net [*15*]. An improved net is now available called Permanet™, which is a polyester net coated with polymer resin containing the pyrethroid insecticide deltamethrin. The efficacy of this net is much higher than the conventional ITN: it has been shown that even after 20 washes of this net, the knockdown rate of *Anopheles* spp. is as high as 97% [*16*]. Its lifetime price could be as high as US$ 20. Although there is a willingness to pay for good quality ITNs, a cost subsidy would be desirable for the poorest members of the community.

Barriers to use of ITNs

Despite their low cost and effectiveness, ITNs can be expensive for poor families who are at greatest risk of malaria. The case has been made for free distribution of ITNs to communities that need them, but critics argue that this creates dependency on aid [*17,18*]. Removal of tariffs and taxes on ITNs, netting materials and insecticides is imperative, with a view to cut the retail prices of ITNs and thus increase utilization. However, whether this is feasible depends on the structure of the market in individual countries [*13*]. Moreover, effective distribution strategies are needed for ITNs in order to decrease travel costs for the consumer [*19*]. One way of increasing affordability and people's willingness to pay for nets is to offer payments in easy instalments [*20*]. A subsidy system for ITNs is also possible but this assists the affluent section of the population, and creates inequities [*15,21*]. A discount voucher system for targeted subsidy may be more appropriate, as tried in Tanzania [*2*]. The vouchers have 2 important additional functions: they strengthen the role of public health services in the context of a social marketing programme and they act as an information, education and communication (IEC) tool for the group at greatest risk of severe malaria.

The monetary cost is not the only barrier to use of ITNs. Reduced mobility while sleeping, the risk of getting entangled, the daily rolling and unrolling of bednets and the need for daily checking for mosquitoes and holes are some of the non-monetary costs. ITNs must be re-impregnated regularly, at the user's expense. If users fail to do this, the efficacy of the nets may be compromised. However, the process of re-treating bednets at home with precise quantity of chemicals is messy and tedious and there are potential health hazards to be considered (such as inhaling insecticide, direct skin or eye contact with the chemical on the wet nets and keeping the chemical out of the reach of children). For those involved in net treatment services, collecting and delivering nets from different households is time-consuming and requires planning.

Various approaches have been practised to promote ITN use, reduce their cost and ensure their quality. Social marketing, health education campaigns and the development of a "net culture" through promotion and publicity may all create the necessary demand. The Roll Back Malaria global partnership is working to organize public education campaigns in malaria-endemic areas: lobbying for reduction or waiver of taxes and tariffs on mosquito nets, netting materials and insecticides and stimulating local ITN industries [*1*].

Social marketing of ITNs and the marketing mix

Social marketing is a strategy to promote change in ideas, attitudes and behaviour and is based on the traditional marketing mix: product, place, price and promotion [*22*]. In social marketing philosophy, products are envisioned at 3 different levels: core product, actual product and augmented product [*22*]. In this case, the core product would be the decrease in burden of disease and mortality due to malaria in the vulnerable segments of population. The actual product would be accepting a new behaviour (using ITNs), rejecting a competitive behaviour (sleeping in an open and unprotected environment), modifying the current behaviour (spilling oil on wastewater logged in the closed vicinity to kill the larvae of mosquitoes) and abandoning an old behaviour (such as indoor burning of wood to generate smoke for repelling mosquitoes). The augmented product to be promoted is the ITN itself.

Social marketing has emerged as a promising way of combining public and private resources to enhance the use of ITNs. The fact that malaria hits the most impoverished members of the population creates an imperative for the social marketing of ITNs in Pakistan, following the success of this approach in other low-income countries [*2,13,23*]. A potential outcome would be a behavioural change in the lives of these people who, by adopting the practice of proper use of ITN, can save substantial amounts of money that would otherwise be spent on the treatment of malaria and its complications. Buying the nets at subsidized costs or on instalments gives people a sense of ownership and this may also be a step towards less reliance on foreign aid [*24*]. This approach also carries the potential to foster partnership with the communities for institutionalizing the vertical programmes and facilitating other endeavours in public health.

Exploring the channels of distribution of ITNs in Pakistan—through existing vertical programmes such as the expanded programme of immunization, lady health workers, private sector general practitioners, nongovernment organizations and private vendors—will be another important step. In this regard, collaboration can also be sought with the district health management teams (which are relatively new structures in Pakistan, with administrative and financial authority). Lessons can be learnt from other social marketing campaigns that have been successfully marketing other health-related products during the past years in Pakistan and elsewhere [*14,25*]. A target subsidy approach (such as dual pricing or voucher-based) or offering the product on easy instalments might be necessary to make ITNs affordable to the most impoverished people and to improve the overall uptake [*3*]. ITN financing mechanisms need to ensure that lower socioeconomic groups and those at greater risk of malaria are protected. Social marketing thus promotes ITNs at a price everyone can afford, enhances the coverage of the population and capitalizes on the potential of newly developed long-lasting treated mosquito nets [*1,24*].

Making the product widely available is crucial, and a doorstep delivery mechanism, backed up up by the counselling and advocacy campaign, may ensure the best coverage of the population and increased and sustained usage [*26,27*]. Another approach could be franchising to make the product easily accessible through existing outlets, at low cost, without compromising the quality [*28*]. A community cross-sectional study conducted in Tanzania showed that ITNs have a substantial impact on morbidity when distributed in a public health setting

such as primary care facilities [*3*]. A survey of the evaluation of the use of ITNs and the effectiveness of social marketing for their distribution showed significantly lower use in rural areas than urban areas [*29*]. Nonetheless, the underserved and vulnerable areas should be a priority. Social marketing of ITNs has great potential for effective malaria control in rural settings [*30*]. Research shows that the overall benefits of widespread use of treated nets in the community are sustainable and are not reversed over as long as 3–4 years. It is important to ensure wide enough coverage to realize the full potential of the treated net method [*4*].

In addition to making the product widely available at a suitable cost, strategies are needed to promote the use of ITNs. In Pakistan, a behaviour change communication (BCC) strategy has been designed with the objective of improving the knowledge and decision-making of the general population, and mothers in particular, concerning malaria. This includes the importance of getting treatment within the first 24 hours of onset of fever and the benefits of simple and safe preventive measures such as bednets. The main channels for BCC messages are TV and radio as well as print media and interpersonal communication. This campaign aims at promoting the use of cost-subsidized ITNs, especially for the protection of high-risk groups in highly endemic areas, from an existing zero coverage to about 1.2 million people by 2006. The results of these large-scale trials will give more insight into future expansion of promotion and distribution of ITNs [*31*].

Social marketing: the need for research

Social marketing has become an important strategy to deliver health products and services to low income people and to motivate them to use these services [*11,32*]. However, research is important for the success of any campaign. Social marketing advocates formative research for attractive ways of promotion and an appealing brand and name for the product [*33*].

Research in Burundi indicates that the motivation for buying and using impregnated nets depended on the nuisance level caused by mosquitoes, for example, an abundance of mosquitoes in a low wet area (75 bites/person/night) compared with that observed at a higher altitude (1 bite/person/night) [*34*].

Other research shows that the literacy level of the family and also household income plays a vital role in ownership of ITNs [*35*]. Making people more knowledgeable may enhance the level of preparedness for a change in behaviour in a community.

Understanding people's perceptions of malaria, and the factors which influence these perceptions, must also be a central part of mounting successful interventions. A wide range of information ought to be explored in this regard. Gender issues and the role of women also need to be considered. Without participation of housewives, it would be difficult to promote the use of ITNs [*36*].

Traditional attitudes and practices can sometimes hamper the adoption of a new healthy behaviour. In one study, it was found that local understandings of severe malaria differed from the biomedical concept and were not linked to mosquitoes or malaria *per se* [*37*]. A social marketing strategy to promote ITNs was developed on the basis of these findings, which reinforced public health messages and linked them with use of nets and insecticides. A sharp rise in ownership and use of ITNs by the population from 10% to > 50% is an indicator of the success of the programme.

Next steps

A successful social marketing campaign for ITNs needs unconditional commitment from the international donor community [*38*]. In Pakistan, although ITN promotion is one major component of the disease control programme, the situation on the ground indicates that there is a need for research to identify the most appropriate market mix for the social marketing of ITNs. The World Bank, WHO, and other international agencies, while maintaining that good health is a human right, are also arguing that "investing in health" makes good economic sense, since improved health is a prerequisite for development, especially sustainable development [*39*]. At this crucial juncture, Pakistan needs international partners including WHO, World Bank, United Nations Development Programme, United Nations Children Fund, Organization for Economic Co-operation and Development countries and other international donors and philanthropist organizations to come forward and join in our endeavour to combat the malaria endemic.

References

1. *Insecticide-treated mosquito nets. Roll Back Malaria information sheet.* Geneva, World Health Organization, 2000 (http://www.rbm.who.int/cmc_upload/0/000/015/368/RBMInfosheet_5.htm).
2. *Roll Back Malaria in the WHO Eastern Mediterranean Region.* Cairo, World Health Organization Regional Office for the Eastern Mediterranean, 2002 (WHO-EM/MAL/273/E/G/12.01/3000).
3. Abdulla S et al. Impact on malaria morbidity of a programme supplying insecticide treated nets in children aged under 2 years in Tanzania: community cross sectional study. *British medical journal*, 2001, 322:270–3.
4. Maxwell CA et al. Effect of community-wide use of insecticide-treated nets for 3–4 years on malarial morbidity in Tanzania. *Tropical medicine and international health*, 2002, 7(12):1003–8.
5. Mushi AK et al. Targeted subsidy for malaria control with treated nets using a discount voucher system in Tanzania. *Health policy and planning*, 2003, 18(2):163–71.
6. *Keeping malaria at bay. Profile.* Washington DC, Population Services International, 2003 (http://www.psi.org/resources/pubs/ITNs.pdf).
7. *National health survey of Pakistan.* Islamabad, Pakistan Medical Research Council, 1998.
8. Mills D et al. *Review of national malaria control programme.* Islamabad. Malaria Consortium, 1998.
9. Steketee RW et al. The burden of malaria in pregnancy in malaria endemic areas. *American journal of tropical medicine and hygiene*, 2001, 64(Suppl. 1–2):28–35.
10. *2003 world population data sheet.* Washington DC, Population Reference Bureau, 2003.
11. Goodman CA et al. Comparison of the cost and cost-effectiveness of insecticide-treated bednets and residual housespraying in KwaZulu–Natal, South Africa. *Tropical medicine and international health*, 2001, 6(4):280–95.
12. Hanson K et al. Cost effectiveness of social marketing of insecticide-treated nets for malaria control in the United Republic of Tanzania. *Bulletin of the World Health Organization*, 2003, 81(4):269–76.

13. Simon JL et al. How will the reduction of tariffs and taxes on insecticide-treated bednets affect household purchases? *Bulletin of the World Health Organization*, 2002, 80(11):892–9.

14. Rowland M et al. Prevention of malaria in Afghanistan through social marketing of insecticide-treated nets: evaluation of coverage and effectiveness by cross sectional surveys and passive surveillance. *Tropical medicine and international health*, 2002, 7(10):813–22.

15. Kolaczinski JH et al. Subsidized sales of insecticide-treated nets in Afghan refugee camps demonstrate the feasibility of a transition from humanitarian aid towards sustainability. *Malaria journal*, 2004, 3:15.

16. Graham K et al. Multi-country field trials comparing wash-resistance of PermaNet™ and conventional insecticide-treated nets against anopheline and culicine mosquitoes. *Medical and veterinary entomology*, 2005, 19:72–83.

17. Howard N et al. Socio-economic factors associated with the purchasing of insecticide-treated nets in Afghanistan and their implications for social marketing. *Tropical medicine and international health*, 2003, 8(12):1043–50.

18. D'Alessandro U, Coosemans M. Is it feasible to give insecticide-treated bed nets free to pregnant women? *Lancet*, 2003, 362:1515–6.

19. Onwujekwe O, Hanson K, Fox-Rushby JA. Who buys insecticide-treated nets? Implications for increasing coverage in Nigeria. *Health policy and planning*, 2003, 18(3):279–89.

20. Bhatia MR, Fox-Rushby JA. Willingness to pay for treated mosquito nets in Surat, India: the design and descriptive analysis of a household survey. *Health policy and planning*, 2002, 17(4):402–11.

21. Guyatt HL et al. A comparative cost analysis of insecticide-treated nets and indoor residual spraying in highland Kenya. *Health policy and planning*, 2002, 17(2):144–53.

22. Kotler P, Roberto N, Lee N. *Social marketing: improving the quality of life*. 2nd ed. California, Sage Publications, 2002.

23. Hay SI. Social marketing of insecticide-treated bed nets. *Trends in parasitology*, 2001, 17(5):215.

24. Rowland M et al. Prevention of malaria in Afghanistan through social marketing of insecticide-treated nets: evaluation of coverage and effectiveness by cross sectional surveys and passive surveillance. *Tropical medicine and international health*, 2002, 7(10):813–22.

25. *The Green Star Network: social marketing reproductive health services in Pakistan. Profile*. Washington DC, Population Services International, 2000 (http://www.psi.org/resources/pubs/GreenStar.pdf).

26. Snow RW et al. The effect of delivery mechanisms on the uptake of bed net re-impregnation in Kilifi District, Kenya. *Health policy and planning*, 1999, 14(1):18–25.

27. Kroeger A et al. Community cooperatives and insecticide-treated materials for malaria control: a new experience in Latin America. *Malaria journal*, 2002, 1:15.

28. Montagu D. Franchising of health services in low income countries. *Health policy and planning*, 2002, 17(2):121–30.

29. Holtz TH et al. Insecticide-treated bed net use, anaemia and malaria parasitaemia in Blantyre District, Malawi. *Tropical medicine and international health*, 2002, 7(3):220–30.

30. Schellenberg JR et al. Effect of large-scale social marketing of insecticide-treated nets on child survival in rural Tanzania. *Lancet*, 2001, 357:1241–7.

31. *To enhance the health impact of public and private health services amongst target communities at risk and vulnerable to HIV, pulmonary tuberculosis and malaria-infection.* Grant proposal by Government of Pakistan to Global Fund to Fight AIDS, Tuberculosis and Malaria, 2003 (http://www.theglobalfund.org/programs/countrysite.aspx?countryid=PKS&lang=en, accessed 6 November 2006).

32. Montazeri A. Social marketing: a tool not a solution. *Journal of the Royal Society of Health*, 1997, 117(2):115–8.

33. Stallworthy G. *Social marketing of impregnated mosquito nets in Mashonaland Central, Zimbabwe*. Harare, Population Services International, 1997.

34. Van Bortel W et al. (1996). Motivation to acquire and use impregnated mosquito nets in a stable malaria zone in Burundi. *Tropical medicine and international health*. 1996. 1(1):71–80.

35. McAfee D et al. *Rwanda malaria prevention and impregnated mosquito net survey: report on knowledge, attitudes and practices research.* Kigali, Population Services International, 1997.

36. Heggenhougen HK, Hackethal V, Vivek P. *The behavioral and social aspects of malaria and its control.* Geneva, World Health Organization, Special Programme for Research and Training in Tropical Diseases, 2003.

37. Minja H et al. Introducing insecticide-treated nets in the Kilombero Valley, Tanzania: the relevance of local knowledge and practice for an information, education and communication (IEC) campaign. *Tropical medicine and international health*, 2001, 6(8):614–23.

38. Narasimhan V, Attaran A. Roll Back Malaria? The scarcity of international aid for malaria control. *Malaria journal*, 2003, 2:8.

39. *World development report 1993. Investing in health*. Washington DC, World Bank, 1993.