The price-tag of a malaria mosquito: results from a socio-economic field study in western Kenya

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Men and women from 83 households from a rural village in western Kenya were questioned about, (1) how much money households spend on protection from mosquito bites, (2) how much they spend if a household member becomes ill with malaria (direct costs) and (3) how much labour is lost due to malaria (i.e. indirect costs). Total expenditure on malaria prevention and cost of malaria were estimated at 138 US$ per household per year.

Keywords: malaria, preventive measures, cost of illness, COI, malaria control

In spite of all control measures available, malaria is still a major health problem in tropical countries. In 1994, the incidence of malaria in the world was estimated to be 300-500 million clinical cases annually and an estimated 1.5-2.7 million people die of malaria each year (WHO/CTD, 1997). In the near future even an increase in the risk of malaria is expected as a result of climate and environmental change (Martens, 1998). Besides climatological and environmental factors, it is thought that also socio-economic factors play an important role in determining the risk of malaria. One such factor is malaria control. An increase in the use of preventive and curative measures in the future might reduce the risk of malaria.

In order to have an idea of the current malaria attributable costs incurred at household level (i.e. the sum of: expenditure on malaria preventive measures, direct costs (drugs, transportation and consultation) and indirect costs (labour lost due to illness)), a socio-economic study was executed in western Kenya. Knowledge of the current situation will (1) help us making predictions on the influence of future changes in the socio-economic status of households on the risk of malaria and (2) help designing malaria control programs.

METHODS

A survey was held among 72 mothers and 11 fathers of nursery and primary school children from Miwani, a small rural village in western Kenya. The sample of 83 households covered 9% of the total population of Miwani. The people were asked for:
- their use of and expenditure on the following malaria preventive measures: (1) bednets, (2) mosquito coils, (3) insecticides, (4) medicine, (5) burning dung and leaves and (6) draining of wet areas;
- their direct costs of illness (drugs, consultation and transportation);
- their indirect costs of illness (lost labour due to own illness and due to child’s illness).

RESULTS & DISCUSSION

Preventive measures

The most used commercial preventive measures were mosquito coils (86%), followed by insecticides (37%), bednets (26%) and preventive medicine (21%). Most people (95%) also drain wet areas (potential mosquito breeding sites) around their houses. Burning of dung and leaves is done by 58% of the respondents. The majority of the expenses on preventive measures (7.41 US$ per household per year) is made on mosquito coils, which have low investment costs (0.03 US$ per coil). On the other hand, little money is spent on measures that need a high investment, but are
more durable on the long term. For example, 1 bednet costs 4.67 US$ and can last 2 years, but the total average expenditure on bednets was only 0.41 US$ per household per year. The total average expenditure on malaria preventive measures was 11.99 US$ per household per year.

**Direct cost of illness**

Average direct cost per malaria episode for was 6.20 US$ for adults and 2.60 US$ for children. The majority of the direct cost in adults and children consisted of treatment costs (drugs and consultation). The rest was spent on transportation (0.47 US$ (8.2% of total direct cost) and 0.31 US$ (13.5% of total direct cost) for adults and children respectively). The fact that direct cost was much lower in children than in adults is most probably the result of the fact that 43% of the adults sought treatment in a hospital and 31% bought medication at local shops, while hospital visits for children were less frequent (29%) and medication was bought more in local shops (51%).

**Indirect cost of illness**

Average indirect cost per malaria episode for adults was 15.13 US$ and 5.28 US$ for children. Indirect costs consisted of lost productivity due to the malaria patient’s inability to work, gain in productivity due to intra-household substitution for the ill household member, loss as a result of the substitute labourer that could not perform his/her own duties and household productivity loss if a caretaker missed work while caring for the ill household member. Indirect cost in monetary terms was calculated using a daily wage rate set at 2.0 US$ (150 KES) for adults and 1.0 US$ (75 KES) for children.

An average household consisted of 2 adults and 4 children that had on average 1.7 malaria episodes per person per year. The total cost of illness per year for an average household can now be estimated at 126 US$ (39 US$ direct cost and 87 US$ indirect cost). Similar results in African settings were also obtained in other studies (Asenso-Okyere, 1997; Ettling, 1994). In total 138 US$ is spent when expenditure on malaria preventive measures is included. Results from this study will provide policy makers with more accurate information on the socio-economic status of households and will help them designing more efficient malaria control programs.

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**REFERENCES**


