

Although some studies have applied the WTP approach to some malaria interventions in Nigeria [17-20], no study to the best of our knowledge has applied WTP to measure intangible burden of malaria nor have there been studies with a wide geographical coverage of Nigeria to allow for reasonable level of generalization. The objective of this study is to fill this gap in our knowledge.

To realize this objective, the rest of this report is structured as follows: section 2 describes the methods used and provides the model specification; section 3 gives the empirical results; and concluding remarks are made in section 4.

Methods

The sample unit for this study was households. The selected households were asked questions on their demographic characteristics; on how much they spend in protecting themselves against malaria attacks; how much they spend in treating a single malaria episode; and their choice of health-care provider; among others. The responses of the respondents were collected via a structured pre-tested questionnaire which was administered by a set of trained enumerators during an interview session with each household.

In selecting the households, the country was demarcated into her six geo-political zones, with a state selected from each to represent the major malaria zones, namely, Lagos State (the equatorial forest zones), Kwara and Kogi States (Savanna zone), Katsina State (Grass lands) and two eastern states (Eastern forest zones). However, because the two Eastern states selected are in the forest zone which could be adequately represented by Lagos State – which is also in the forest zone – for economy of resource use, the two Eastern States were dropped. Four hundred (400) households in each of the selected 4 states were then selected for the administration of the questionnaires. Consequently, a total of 1,600 questionnaires were to be administered by the enumerators. Of these, eighteen questionnaires were unusable because they are not fully or improperly completed, leaving a total of 1582 questionnaires for analysis.

Each State was partitioned to urban and rural areas to arrive at cities, towns and villages to be selected for the study. At the city/town/village level, the supervisor partitioned each to clusters of low-density and high-density areas. Households within each selected city/town/village cluster were finally selected randomly. The questionnaires were administered in August 2003. A tentatively selected household is first screened to determine whether it had at least a malaria case within one month of the interview. A confirmation of a malaria case is through the respondent's description of the major symptoms experienced by the victim and through the verification of available docu-

ments, e.g. prescription forms, laboratory reports, payment receipts, etc. When a malaria case is confirmed to have occurred within a month – a period short enough to avoid recall bias – the interview is continued, otherwise, the interview is terminated and the next house selected.

The study asked questions that are typically asked in cost of illness studies that use cost-of-illness approach [21-23] to these were added the WTP questions. The elicitation format for WTP questions was binary-with-follow-up (BWFU) questions (i.e. a bidding process with yes-or-no options). Respondents were first informed of the malaria prevalence rate in the Nigerian society and those that are at the greatest risk as well as the short-term and long-term effects on them. They were further informed of the cost of treating a malaria attack, and going by their own accounts in their responses to earlier questions, they were reminded of their own current expenditures on treatment and prevention, lost work time, as well as of the usual pains and sufferings that are associated with malaria attacks. Thereafter, they were asked to state the amount they are willing to pay per month for an effective treatment whenever any member of the household had a malaria episode, and what their households are willing to pay for the control of malaria, among other questions [for details of these questions, see Additional file 1].

The responses of the respondents are then analyzed using central measures of tendency (specifically, the mean) to determine the value the Nigerian households attach to different malaria prevention methods, malaria treatments and total malaria control.

The excess of the amount people are willing to pay to malaria eradication and control over what it currently costs to treat and prevent it, would be taken as the household valuation of the intangible costs of malaria illness. Furthermore, it is desirable to investigate what determines the amount that households are willing to pay for the eradication of malaria. This is done using a regression analysis. The details of the regression model used are spelt out below.

Model specification

What people are willing to pay for the treatment or eradication of malaria is best conceptualized within the framework of the traditional consumption theory. Consequently, the formulation of the model for this study shall proceed accordingly. In this study, we expect that household with high income will be willing to pay relatively more for the treatment and control of malaria. Similarly, households with high level of education should be more aware of the benefits of malaria control and therefore willing to pay more as well as those who assess themselves as relatively well off in relation to others in the