ACT CONSORTIUM GUIDANCE ON COLLECTING HOUSEHOLD COSTS

CONTENTS

This guidance has prepared for ACT Consortium members. It is intended to provide an introduction to the collection of household costs related to fever and malaria.

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1. INTRODUCTION

1.1 Background

Malaria is a major health problem in many parts of the world especially in Africa but malaria also causes a significant economic burden both at the country level as well as at the household level (Sachs and Malaney 2002, WHO and UNICEF 2005). Households are affected through the out-of-pocket expenditure for treatment-seeking and by the loss of income as a result of compromised capacity and efficiency for performing labour activities when adults are ill themselves or are caring for ill family members. Household costs of malaria may constitute relatively substantial shares of annual household incomes ranging from 6 to 13% depending on epidemiology of the study area (Chuma et al 2006, Morel et al 2008, Konradsen et al 1997). In addition, many studies find that the most important contribution to household costs is the decrease in family income resulting from the loss of productive time (Deressa et al 2007). Long term impacts of malaria may be experienced through increased school absenteeism of children (Brooker et al 2000) and lower levels of attention (Clarke et al 2008) which is likely to lead to an elevated risk of failure during exams and possibly impaired cognitive development and learning ability in children of all ages (Holding and Snow 2001).

Due to the heavy economic burden falling on individual households, it is important to include this aspect in the formulation of health policy specifically when deciding on the combination of malaria interventions to be offered in a country. Different health interventions may place a different economic burden on households and consequently the conclusions made from the relative cost-effectiveness of a range of malaria interventions based on a narrow health sector perspective may very well differ from an analysis where household costs are also incorporated. Ideally household costs should be measured when studying different malaria interventions. However, in reality cost-effectiveness analyses of malaria interventions often exclude household costs (Kolaczinski and Hanson 2006, Walker and Fox-Rushby 2000).

Several ACT Consortium projects have incorporated an economic evaluation component and include the collection of household costs as part of the study activities. The projects incorporating the collection of household costs, for instance alongside the efforts for measuring the effectiveness, may add valuable information and is strongly encouraged.

1.2 Purpose of the guidance note

Achieving data on the economic burden or household costs of malaria following different malaria treatment or prevention activities is a component in a number of ACTC projects. The aim of this note is therefore to describe some important aspects to consider when planning and collecting household costs. These aspects include for instance how broadly costs should be interpreted, what costs categories to incorporate, issues related to questionnaire development and what changes occurring in the household as a result of malaria must be recorded. As an appendix, a data collection instrument in the form of a household costs questionnaire design has been provided that may be used as a starting point for household costs data collection in individual ACTC projects. This instrument will have to be field tested and adapted to the situation in which it is intended to be used.

2. DEFINITION OF HOUSEHOLD COSTS

Household costs and costs in general are interpreted by economists as being broader than just any monetary payment for a good or service. Economists favour as a definition of costs the concept of opportunity costs which are defined as the value of a resource (good or service) in its best alternative use. When a resource is committed to a specific activity, this resource cannot also be used for other beneficial activities. Therefore the costs of using a resource in one activity are the value of the lost opportunities of not being able to use the resource in its best alternative activity. In the case of identifying opportunity costs of a disease spell, these would include the out-of-pocket expenditure of treatment-seeking but also the value of lost time when the patient is not able to perform his/her normal activities which could be work or other productive activities. When bedridden, the patient is not able to utilise his/her time for the best alternative activity which may be going to work and this is therefore an opportunity costs of being ill.

Applying these ideas to the household burden of malaria, household costs of malaria disease may be defined as the extra resources committed resulting from a malaria illness spell of a household member including the value of lost time by the patient and caregivers who both have diverted time from their preferred, normal activities. Or alternatively – if this malaria disease had not been present – what resources would not have been used in this household to take care of the malaria problem and what amount of productive household activities would not have been lost. Following this broad definition, household costs include out-of-pocket expenditure for treatment-seeking such as medicines, diagnostic tests, provider fees, special food to enhance recovery and expenses for travelling to a provider. However, household costs also include the economic loss resulting from the interruption of normal or preferred activities of various household members. The amount of time diverted from normal activities is the result of various causes including the patient being bedridden as well as seeking treatment involving transport time to a health provider and waiting time at the provider. Apart from the ill individual, other family members may divert time from normal activities in order to provide care and accompany the patient to a health provider for treatment. This will particularly be the case when young children are ill.

The above description suggests several thorny issues in the estimation of malaria household costs. There are methodological issues regarding the population from whom data are collected. Following-up patients at home who have been identified in a health facility has the advantage of targeting patients known to have malaria but misses patients in the community with malaria who did not present to the facility. Collecting data on recent fever episodes from household surveys has the advantage that it measures all treatment seeking activity but has the disadvantage that we do not know which fevers were due to malaria.

There is the question on how to value the lost time (diverted time) of patients and family caregivers and related to that is the issue of whose time must be captured: only individuals performing income generating activities or also family members involved in non-salaried work such as children, providers of housework or the elderly. Further, there may be a labour surplus in the household with family members not being fully employed so that reallocation of time towards taking care of a malaria episode may not result in large reductions in household production (the opportunity costs). Also the process of seeking treatment may be an extended process involving several providers. Some of these issues will be described below in some detail.

3. IDENTIFICATION OF HOUSEHOLD COSTS

Categories of household costs are often divided into two main groups termed direct and indirect costs (Russell 2004). Direct costs are defined as the household expenditure related to treatment-seeking including non-medical expenses. Indirect costs are interpreted as the productivity losses occurring in a household following a malaria episode. This involves identifying the amount of time diverted from normal activities (best alternative use of time) by the patient and family members and subsequently valuing this time lost.

The relevant household cost categories with respect to malaria disease are listed below. The treatment-seeking process could involve searching among several providers or buying drugs and a diagnostic test at different providers and it may also be necessary for the patient to go for a repeat visit if the malaria problem does not resolve. In other words, it is important to trace the full treatment-seeking process of the patient and family members since this will have an impact on the household costs (see also Box 1).

3.1 Direct household costs of malaria

Drugs: As well as *antimalarial drugs* and *antipyretics* this should also include *other drugs* such as antibiotics as the expenditure on non-malarial drugs may be influenced by the introduction of rapid diagnostic tests or other interventions. It is important to capture the quantity as well as the price paid and to specify the formulation eg oral or intravenous form. Some projects may wish to attempt to specifically identify the brand of certain antimalarials.

Diagnostic procedures: This includes the type and price of *rapid diagnostic tests (RDTs)* or microscopy on *blood slide* carried out for the diagnosis or malaria. *Other diagnostic procedures* may also be carried out occasionally depending on the patients' symptoms eg Haematocrit.

Transport: If treatment for malaria is sought outside home, there may be costs of travelling to and from the provider of the service. *Transport costs* of both the patient and any accompanying family member must be included. Capturing transport costs may involve determining what mode of transport has been utilised and finding out the price of a return journey from the patient's home and the provider. For instance, in a Ugandan semi urban area the means of transport included walking, bus, car and motorcycle taxi (Mbonye et al 2008). The identification of transport costs may in some cases be complicated. As well as going to several different providers, an additional complication is that the patient or the accompanying family member may take the opportunity to take care of other business while in town so that the purpose of travelling is not exclusively to seek treatment for malaria. Ideally, in this case only a fraction of transport costs should be interpreted as malaria household costs.

Consultation and other fees: If a formal public or private health facility is visited as part of the treatment-seeking process, there will be *consultation fees*, *user fees* or *other fees* charged for the treatment to the patient and the level of these fees must be captured. In the analysis of the data, it will be important to ensure that if user fees are incurred, the costs which they cover are not double counted during estimation of provider costs. In some cases, it may also be necessary for the patient to pay the provider informally by means of *under-the-table payments*.

Food and other costs: The malaria treatment-seeking activities of the patient and accompanying family member may also result in the consumption of *special food*. Strictly, this concept refers to food expenditure that the patient or accompanying family member would not have if they had

been doing their normal activities. So special food could be food especially purchased for travelling long distances or while waiting at the provider. In addition, special food could also include food items believed to improve the health or speed up recovery of the patient.

In some countries with long distances to health providers, it may not be possible to return home within a day so that payment for *accommodation* to stay overnight away from home is required. Expenses for accommodation will be the price of a guesthouse or hostel or if staying with family members the visitors may contribute with some food.

Box 1: Tracing the actual treatment-seeking behaviour.

The treatment-seeking behaviour is likely to differ among patients depending on their location, preferences, socio-economic status, severity of disease and the availability of health providers in the area. In order to capture the total household costs it is therefore necessary to determine the full and actual treatment-seeking activities of a patient and his/her caregiver in their attempts to alleviate the malaria problem. The data collection instrument to be used for collecting household costs must be sufficiently flexible to capture various treatment-seeking behaviours which may range from a single trip to one provider to an extended process over several days involving many providers. Some possible treatment-seeking scenarios are described below.

Scenario A:
The patient self-treats with anti-malarials stored at home in which case there are no transport costs.

Scenario B:
The patient and accompanying family member travel to one health provider and return back home within one day.

Scenario C:
The patient and accompanying family member travel to one health provider and return back home within one day. After three days the fever of the patient has not improved and a repeat visit to the same provider is carried out.

Scenario D:
The patient travels to a public health facility where the patient is diagnosed with malaria and is told to purchase antimalarials elsewhere. At the first drug shop visited, the antimalarials are sold out so the patient continues to another drug shop where the medicine is acquired and the patient returns home.

3.2 Indirect household costs of malaria

Time lost due to a diversion from normal or preferred activities (opportunity costs of time) for the patient will occur if treatment-seeking involves *transport time* when travelling to a health facility and back home. In addition, if there is a queue at the preferred health provider or in waiting for diagnostic results or prescriptions, there will be *waiting time* for the patient as well. For severe cases of malaria, there may be *time as a hospital inpatient* involved. If a patient is accompanied by a family member for travelling to a health provider, the transport time, the waiting time and

hospital inpatient time must be recorded as well. Transport and waiting time need to be collected for each separate visit to health providers (Box 1).

Time will also be lost during the number of *days taken of work or out of school* where the ill person is bedridden or in general not able to perform his/her normal activities. For an adult this may result in a number of days not being able to work or for a school child a period of school absenteeism. In periods of serious illness of a patient, this may require *time for providing care* by one or more family members. While a patient may well be bedridden for a number of days, family members probably do not spend all their time caring for the ill family member. There will be time for their normal duties as well.

Having determined the most important sources of time lost, the key question is subsequently how this lost time should be valued. This is discussed in a section below.

4. MEASUREMENT OF HOUSEHOLD COSTS

The main source for measuring the actual out-of-pocket expenditure for treatment-seeking as well as the number of hours and days lost due to malaria disease will be a questionnaire tool administered to family members involved. It is therefore necessary to rely on family members to remember key information related to household costs such as time for travelling.

5. VALUATION OF TIME LOST

The main inspiration for thinking about the value of time is the human capital approach. According to this approach the value of time lost by an individual is equal to that individual's contribution to the welfare of a society as measured by Gross National Product (GNP) (Zweifel and Breyer 1997). The contribution to GNP by an individual will under a number of conditions correspond to the salary paid so that during a period of illness, GNP will decrease by the salary multiplied with the duration of the illness. One implication of the human capital approach is then that the value of time will differ among income groups. For instance, the value of time of a ministerial civil servant is to be higher than a casual worker in rural areas. Further, unpaid household work and the time of children not working are valued zero since these activities are not measured as part of GNP. These characteristics of the human capital approach lead to policy conclusions that may be seen as problematic: If a choice must be made between two health interventions, it is a better option to choose the intervention that averts health problems in high income groups (other things being equal) since their value of time is higher than low income groups.

Partly due to this problem, many studies use the human capital approach mainly as a starting point for valuing time but will adjust the approach in selected aspects. Typically studies assign the same value of time to all individuals incorporated irrespective of their actual salary (Wiseman et al 2006). Often studies also assign a value to unpaid activities like housework (Deressa et al 2007, Larson et al 2006) thus invoking an opportunity costs argument rather than zero as suggested by the human capital approach. Such adjustments however represent important departures from the human capital approach.

According to the friction cost method, salaries are often not a good approximation to changes in GNP following lost time by individuals (Koopmanschap et al 1995). If there is excess or idle labour supply in a community, this allows the possibility that an individual unable to work may be

quickly replaced to some or full extent. The decrease in GNP or in home production may therefore be minimal and the value of lost time will subsequently also be small and at any rate lower than suggested by the human capital approach. For instance, a study on Nepalese households found that these coped without great difficulty with time lost caused by malaria episode by relying on extra time of adult family members (Mills 1994).

Valuation of time using formally paid salaries is difficult for studies conducted in areas where the main economic activity is subsistence farming. Output-based approaches therefore aim at measuring the value of the farm products forgone during the time where patients and caring family members cannot assist in the farming activities (Morel et al 2008). This type of approach involves acquiring information on the household production of crops and livestock within a period typically a year and then utilise local market prices to calculate the annual value of farm production. Further, the actual number of full days of farm work provided by family members must be estimated so that the average value of farm production per day may be calculated which will subsequently be interpreted as the value of time. This approach assigns zero value to unpaid housework and lost time of young children. The main disadvantage of this approach is that it is cumbersome to get reasonably valid information on the size of farm production probably requiring frequent visits over some time (Audibert et al 2003).

Table 1 summarises how different studies involving the household costs of malaria have estimated the value of time. Most have utilised existing information believed to be reasonable proxies for income lost rather than embarking on extensive data collection. For instance, Wiseman et al (2006) and Onwujekwe et al (2000) used the official minimum wage so that questions on income were not necessary in the household survey. At the other end of the spectrum, Morel et al (2008) employed an output-based approach in Vietnam requiring all survey participants to report the annual household production on a list of crops and livestock. Most studies assigned a value of time of zero to individuals who were not economically active including children and elderly (Deressa et al 2007, Larson et al 2006, Attanayake et al 2000, Asenso-Okyere and Dzator 1997).

Before developing a household cost questionnaire for data collection in the field, it must be decided how to value time lost. The choice of valuation method has important consequences for the design of the household cost questionnaire. For example if it is chosen to value time of individuals according to their actual remuneration, it is necessary to capture from all individuals in a survey their incomes or value of agricultural output. If it is instead decided to assign the same value to time lost by different individuals using for instance GNP per capita or the minimum wage, there will be no reason for recording income information from individuals.

Table 1: Different methods of estimating indirect costs in studies of household costs.

Authors	Country	Method of valuing time	Data collection performed
Onwujekwe et al (2000)	Nigeria	Minimum wage according to law	Information from relevant ministry
Wiseman et al (2006)	Tanzania	Minimum wage according to law	Information from relevant ministry
Larson et al (2006)	Kenya	National income per capita	National statistical office
Konradsen et al (1997)	Sri Lanka	Average agricultural wage	Use of previous survey in same area
Deressa et al (2007)	Ethiopia	Average wage of agricultural labourer	Interviews with key informants in study area
Asenso-Okyere and Dzator (1997)	Ghana	Actual agricultural wage rate by age and sex	Self-reported wage rate by all survey participants
Attanayake et al (2000)	Sri Lanka	Actual wage rate	Self-reported wage rate by all survey participants
Sauerborn et al (1996)	Burkina Faso	Market value of average output per person	Question to all survey participants on the payment of field worker today
Su et al (2007)	Burkina Faso	Daily agricultural production value and cash earning per adult-equivalent	Self-reported harvest value and cash earnings by all survey participants
Morel et al (2008)	Vietnam	Market value of agricultural production per person per workday	Self-reported annual household agricultural production by all survey participants

6. HOUSEHOLD COSTS DATA COLLECTION IN ACTC STUDIES

Several of the ACT Consortium studies have research designs which are very suitable for incorporating an economic evaluation component to it and also for adding household cost data collection. Most importantly, these studies are designed as controlled trials with two or more study arms comparing different interventions to present practice (control arm). One aim of such studies is the measurement of effect in the different arms such as the incidence of malaria and anaemia. With relatively little extra effort, data on household costs of malaria among study members can be

assembled often at the same time as the measurement of effect and using the same data collection system (same interviewers). If one of the interventions included in a study is relatively more effective in reducing malaria, this is likely to result in a lower number of visits to health providers by the study population and also to be reflected in lower household costs.

However, the ACT Consortium studies vary in terms of objectives and detailed design which will also affect how a possible household cost component may be added.

Broadly speaking, household cost data from the ACTC studies can either be collected during cross-sectional surveys or during up exit surveys and follow-up visits. Cross-sectional surveys have the advantage of capturing change at a population level as all treatment seeking behavoiur for recent fevers is captured. Collection of socio-economic data at the same time also enables an equity analysis to be undertaken. However there can be difficulties in interpretation of results because we usually do not know whether fevers were due to malaria or some other cause of fever. The draft questionnaire in the appendix is designed for a cross-sectional survey.

Several ACTC studies identify patients who seek care at selected health care providers and then follow up a cohort of patients at home following malaria diagnosis and/or treatment. Collecting household cost data during the follow up visits has the advantage that accurate information should be available on malaria diagnosis and treatment. However, as patient who do not seek treatment at the selected health care providers are not included in this study design, it is not possible to make conclusions at a population level., unless information on population treatment seeking behaviour is available from elsewhere.

6.1 There are more costs than household costs

If a full economic evaluation such as a cost-effectiveness analysis is planned for a study, there will be additional costs other than household costs as these are described in this guidance note. These additional costs are related to the activities necessary to offer the health interventions in question. Examples of inputs or activities required for a health intervention include staff time, malaria treatment in health centres or hospitals, training materials and laboratory tests. The costing for intervention related activities is the subject of the ACTC Guidance Note on Economic Evaluation.

7. CONCLUDING REMARKS

This guidance note provided an introduction to issues related to collection of household costs with particular reference to the household burden due to malaria. The note included a description of the most important household cost categories and identified some important aspects problematic areas such as the valuation of lost time by patients and caregivers. Nevertheless, data on household costs may add valuable information to economic evaluations and it is strongly encouraged to collect household costs if possible.

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