How should funds for malaria control be spent when there are not enough?

March 2013 – note for MPAC discussion

The MPAC advises WHO on the most effective interventions for malaria control and elimination. However, current funding levels do not allow for full implementation of all interventions globally. Therefore guidance from MPAC is sought on what strategies should be used to allocate limited funds. It is important that decisions on resource allocation are based on transparent, clearly defined criteria rather than being driven by political expediency or by those with the loudest voice. Guidance is needed in two areas: (i) how external finances should be allocated between countries; and (ii) how should funds be allocated within countries.

1. Which countries or populations should be prioritized for malaria control funding?

This question primarily affects international funding for malaria control since there is little scope for reallocating domestic government funds to another country. For international funding the choice of countries that should benefit from a donor’s resources will be influenced by two principal factors:

a) The funds already available or potentially available to a country i.e. the ability of domestic governments to pay for malaria control themselves and commitments made by other donors.

b) The equity and health objectives of international funding i.e. who should benefit and what impact is sought (which is influenced by the epidemiological setting and the capacity of endemic countries to utilize funds).

When considering funds available it is generally accepted that countries with lower levels of available funds should receive priority – a donor is reluctant to provide money to a country that can afford to pay for malaria control itself or is already benefiting substantially from other external resources. In considering equity and health objectives it is helpful to consider five hypothetical ways in which funding for malaria control could be allocated between countries.

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1 Total domestic spending on malaria control was estimated to be US$ 625 million in 2011, while international disbursements were estimated to be US$ 1.67 billion, yielding a total of US$2.3 billion. Global resource requirements for malaria control are estimated to exceed US$ 5.1 billion per year between 2011 and 2020 (1), resulting in a gap of US$ 2.8 billion. Projections indicate that total funding for malaria control will remain at less than US$2.7 billion between 2013 and 2015.

2 Exceptions may be for cross border control initiatives which may prove to be a more beneficial investment than spending money domestically.

i. Allocating equal amounts of money per person at risk of malaria. This scheme allocates external funding in proportion to the number of people at risk in each country. It is ostensibly equitable but does not fully take into account health need (i.e. the degree of risk) or the health impact attainable.

ii. Allocating funds in order to provide equal access to interventions. This scheme assesses how much it would cost to provide universal access to vector control, diagnostic testing and treatment to each person at risk in a country, and allocates resources in proportion to country totals. It takes into account health need in that it considers populations at risk, and the cost of providing services to those that are sick, but does not consider fully the extent to which populations will benefit. The scheme is in line with UN and other declarations of universal access to prevention, diagnostics and treatment. Given that the cost of malaria control in most settings is dominated by vector control, in which the costs are driven by the size of the population at risk, this scheme results in an allocation similar to that of equal funding per capita even though the principles of its derivation are different. Two features of this model are that: (i) the allocation of funds is not influenced by a country’s malaria mortality rates, but funds are allocated simply in proportion to the resources required to achieve universal access to malaria interventions; and (ii) each person at risk is given equal opportunity to receive malaria interventions.

iii. Allocating funds according to disease burden e.g. in proportion to number of deaths or death rates. This scheme is in line with “allocating resources to where they are most needed” but does not take into account the extent to which health status can be improved (and resources are arguably not needed if health status cannot be improved). This scheme is also not explicitly linked to resources needed to deal with the burden.

iv. Allocating funds to maximize lives saved. This scheme takes into account the fact that ITNs or other interventions may have different impacts depending on where they are used e.g. more lives will be saved by deploying 1,000 ITNs in Africa than in Philippines. It is in line with considerations of “value for money” and may be in line with allocating resources to where they are most needed if need is defined as capacity to benefit. In this model funds are first allocated to the country where malaria mortality rates are highest (this is also where the benefit per unit of investment is likely to be greatest or where the cost of saving a life is lowest). After disbursing sufficient funds to achieve universal coverage of interventions in that country, funds are allocated to the country with the second highest mortality rate (and second lowest cost per life saved). This pattern is repeated until all funding for has been exhausted. The effect of this scheme is to maximize the total number of cases averted and lives saved. Other than focusing on countries with the highest initial disease burdens it does not explicitly take into account equity considerations. Thus, populations with the highest disease burdens that benefit from investments first may end up with lower death rates than others they initially ranked behind (e.g. after a certain number of ITNs have been distributed resources would not be going to where the greatest burden is), and inequalities may persist.

v. Allocating funds to equalize health status. This scheme is similar to that of maximizing lives saved in that it assigns funds preferentially to countries with highest disease burdens. As with the maximizing lives saved option it starts by allocating funds to the country with the highest death rates but it only allocates funds to this country until death rates are reduced to the same
level as the country with the next highest death rates. Funds are then allocated to both countries until they are reduced to those of the next country, then funds are allocated to three countries and so on. The effect of this scheme is to reduce and equalize the level of the highest death rates as much as possible within a given budget constraint.

In the first three schemes the proportion of funds allocated to a country remains constant irrespective of the total budget envelope. A feature of the maximizing health gain, and equalizing health status models is that as funds become more constrained, a greater proportion of funds go to countries with the highest mortality rates.

It is instructive to compare each of the models with historical patterns of external funding (2006-2010) in order to assess how closely they correspond. Given that malaria programme funding in most settings is dominated by the cost of vector control (ITNs and IRS), which is driven by population at risk, the schemes (i) and (ii) are similar. Thus only scheme ii is presented and is given the label equal access. Scheme (iii) is only loosely related to resource need and is not explored further (a high number of deaths or a high death rate does not necessarily translate into a specific resource need except for care of the dead). Schemes (iv) and (v) yield similar results for most funding scenarios which are applicable today and are therefore presented as a single option with the label “maximizing health gain”.

With the equal access model it can be seen that funds would flow equally to each WHO Region according to the size of population at risk (Figure 1). With the maximizing lives saved model, funds would flow preferentially to the African and South-East Asia Regions. Historical funding patterns have prioritized the African Region, providing fewer funds to the South-East Asia Region.

**Figure 1. External funding per capita by WHO Region: historical disbursement patterns versus two alternative resource allocation models (equal access and maximizing lives saved)**

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4 The total amount of funds available for the alternative funding models is the same as in the historical patterns of external funding.
In the equal access model funds are assigned equally to countries irrespective of mortality rates (funding allocations are driven by population at risk) (Figure 2). With the maximizing lives saved model, external funds are assigned preferentially to countries with the highest mortality rates, with no resources going to those with the very lowest rates. Historically, external funds have tended to be allocated to countries with the highest mortality rates. However, countries with the very highest mortality rates have not benefited as much as would be expected if funds were being targeted to maximize health gains, while countries with the lowest mortality rates have received a higher than expected proportion.

**Figure 2. External funding per capita by disease burden: historical disbursement patterns versus two alternative resource allocation models (equal access and maximizing lives saved)**

Advice is sought from MPAC on two questions:

- Should external funds be allocated to maximize health gain or some other criteria?
- What external funds should be allocated to containment of drug resistance, malaria elimination?

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5 The total amount of funds available for the alternative funding models is the same as in the historical patterns of external funding.

6 Malaria endemic countries are ranked by malaria mortality rates in 2000 and divided into five quintiles.
2. **How should limited resources be allocated within countries?**

Few countries have sufficient resources to achieve universal coverage of all malaria control interventions (vector control, diagnostic testing, treatment, surveillance, management support etc). As a consequence, they make decisions on what blend of interventions should be used, their scale of deployment and on the populations that should benefit. They make such choices with little guidance.

Two questions are of particular relevance:

a) What interventions should a country invest in if resources are not sufficient to achieve universal coverage of vector control, diagnostic testing and treatment?

b) To which populations should interventions be targeted? There are at least three options.

   i. No targeting – all populations at risk get an equal share of resources
   
   ii. Targeting to highest transmission areas
   
   iii. Targeting to demographically vulnerable groups such as pregnant women and children.

The first two options are analogous to the equal access and maximizing health gain options in the between country resource funding scenarios. Option 2 is likely to result in a larger number of cases and deaths averted than option 1. Option 3 could yield higher health gains than option 2 (although this is sensitive to what assumptions are made) but conflicts with guidance on achieving universal coverage.

Advice is sought from MPAC on two questions:

- Faced with a resource constraint, should malaria programmes prioritize certain interventions e.g. diagnosis and treatment given that they account for a small proportion of the malaria control budget?

- Faced with a resource constraint, should malaria programmes prioritize certain populations e.g. those with highest morbidity and mortality rates?