

## Perspective

# Divergent Goals and Commitments in Global Malaria Intervention

Anthony E. Kiszewski

## Neglecting the Gap

As we ride a wave of renewed awareness of and investment in malaria prevention and treatment, it is tempting to believe that the era of neglect lies behind us. Although malaria's comparatively high profile excludes it from the World Health Organization's list of "neglected tropical diseases" ([http://www.who.int/neglected\\_diseases/diseases/en/](http://www.who.int/neglected_diseases/diseases/en/)), this technicality should not deceive us into thinking that malaria receives sufficient attention. The neglect of malaria persists, as uncovered by an analysis of malaria spending in this month's *PLoS Medicine* [1].

Robert Snow and colleagues detail the alarming gap between the funds needed to meet internationally agreed goals and the resources thus far allocated [1]. Their comprehensive audit of malaria funding shows that the world invests only about \$US1 billion per year, billions short of what several independent estimates suggest is necessary to achieve basic international goals for reducing malaria burdens [2,3]. Because need estimates may undershoot actual needs, the true gap may be far wider.

In a climate rife with calls to revisit the goal of global malaria elimination and eradication, the magnitude of this gap is worrying. Target 8 of Goal 6 of the Millennium Development Goals is to "[h]ave halted by 2015 and begun to reverse the incidence of malaria and other major diseases" (<http://www.mdgmonitor.org/goal6.cfm>). It is unlikely that Target 8 will be met unless malaria resource commitments can be made.

## A Malaria Audit

In a field often informed by glimpses and guesswork, Snow and colleagues [1] provide a comprehensive and

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## Linked Research Article

This Perspective discusses the following new study published in *PLoS Medicine*:

Snow RW, Guerra CA, Mutheu JJ, Hay SI (2008) International funding of malaria control in relation to populations at risk of stable *Plasmodium falciparum* transmission. *PLoS Med* 5(7): e142. doi:10.1371/journal.pmed.0050142

To reach global malaria control goals, Robert Snow and colleagues argue that more international funding is needed but that it must be targeted at specific countries most at risk.

rigorous analysis of global malaria financing. Funds made available for malaria interventions both domestically and internationally were compiled from a diverse array of sources. Missing data were approximated using dummy figures based on conservative, region-specific averages.

These total investments were then applied to a geographic model of populations at risk of "stable" transmission (PfPAR) [4]. This model interpolated clinical observations across a population density map, and then subtracted areas that climatically or topographically fall beyond the biological limits of malaria's distribution. This distribution provided the denominator for calculating investments per person at risk.

The sheer range of per capita investments in malaria control is startling. While the Republic of the Congo, Côte d'Ivoire, and Pakistan apply only \$US0.11 annually per person against malaria, Suriname spends about 1,500 times more: \$US167 per person per annum.

Most countries spend much less than what is necessary. In Nigeria, where more than 100 million people live at risk of malaria, less than \$US1 is invested per person per year, far below the \$US2.43–\$US4.46 per capita estimated necessary to achieve internationally agreed goals [2,3].

Africa overall receives only 10%–20% of what it needs to meet basic, globally recognized intervention targets.

Asia faces similar neglect. Although 47% of the global population exposed to *Plasmodium falciparum* malaria resides there (38% in India, Indonesia, and Myanmar alone), only 17% of funds approved by the Global Fund to Fight AIDS, Tuberculosis and Malaria were designated for Asia.

The authors describe these shortfalls not to assign blame, but to illuminate targets where intensified investment could produce large returns. With a goal as ambitious as halting and beginning to reverse malaria incidence by 2015, the world can't afford to underfund large populations at risk.

## Complications and Limitations

Those who know malaria also know the challenges of collecting reliable and complete data. Thus, any estimates that show inequity deserve closer examination. While the PfPAR model might provide the most accurate depiction yet created of the distribution of malaria's burden, the lack of available data impairs the accuracy of its interpolations. The simple index used to define populations at risk (absent, stable, unstable) discounts heterogeneities that affect the

**Funding:** The author received no specific funding for this article.

**Competing Interests:** The author has declared that no competing interests exist.

**Citation:** Kiszewski AE (2008) Divergent goals and commitments in global malaria intervention. *PLoS Med* 5(7): e159. doi:10.1371/journal.pmed.0050159

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**Abbreviations:** LLIN, long-lasting insecticidal net

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severity of disease and the success of interventions. For example, it may cost more to protect a child in Southern Benin, where pyrethroid resistance hampers the efficacy of long-lasting insecticidal nets (LLINs) [5], or in Niger, where bed-net use among pregnant mothers remains below 50% despite a national campaign to distribute and promote bed-net use among high-risk groups [6]. Similarly, equal per capita investments between countries can disguise inequities.

### Is the True Gap Wider?

In retrospect, prior estimates of need [3,4,7] now seem limited in their choice of intervention methods and optimistic in anticipation of outcomes and challenges. Do their assumptions remain valid? Might the true gap between commitments and allocations be even wider than this study suggests?

Besides pyrethroid resistance and barriers to the use of LLINs mentioned above [5,6], other operational challenges have arisen that could increase costs beyond original estimates. Some places report adaptations by mosquito vectors toward outdoor or early evening feeding, which allows them to evade contact with LLINs or walls treated with indoor residual spraying [8]. Artemisinin-based combination therapies employing mefloquine are failing on the Thailand–Cambodia border [9]. When such complications arise, reaching burden reduction targets becomes even more expensive.

### Are Plans for Elimination Premature?

Despite the inability of the international community to mobilize

resources sufficient to meet basic goals, talk of elimination and eradication has again become fashionable. But until shortfalls in funding are rectified, such plans seem quixotic at best. And more will be needed in the future than merely increased funding. Fully implemented, the current standard suite of intervention methods may suffice to reach burden reduction targets, but elimination requires strategies that can reach above the lowest hanging fruit.

There's no need to wait for a vaccine. Underused technologies exist that could reinforce standard interventions. But these strategies require integration in a manner not currently practiced on a wide scale. Evidence continues to mount for the value of methods such as habitat modification and source reduction [10], simple housing improvements [11], and personal repellents [12]. Each may not be globally scalable, but their situational value is clear, not only for elimination programs, but to achieve burden reduction goals wherever standard approaches prove lacking.

### Summary

Robert Snow and colleagues marshal the best data yet on the finances of global malaria intervention, but their work provides a basis, not an endpoint, for discussion. To achieve Goal 6 of the Millennium Development Goals, the gap between needs and commitments must be filled quickly. Given recent calls for malaria eradication [13], Snow and colleagues' sober assessment should provide an instrument to prod the horse on before the cart disappears too far down the road. ■

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