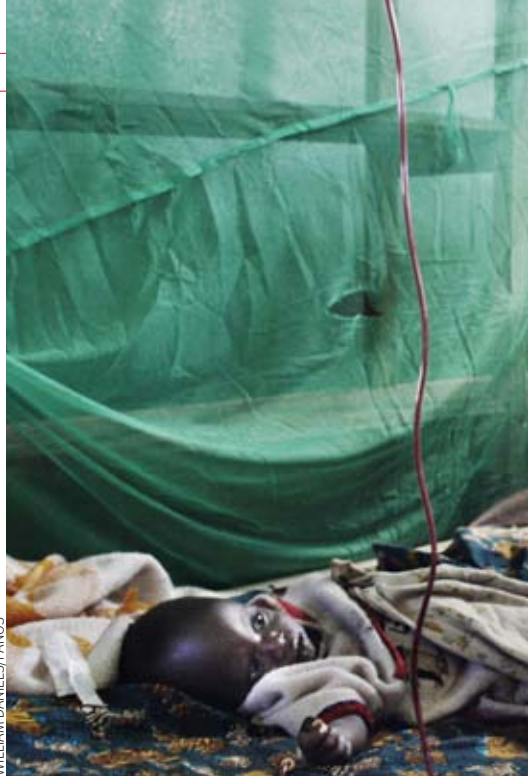
Malaria control beyond 2010

Although substantial progress has been made in controlling malaria, **Robert Newman** says wider investment will be essential for success



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Major efforts are being made to achieve the goals for malaria control set by the World Health Assembly[1] and the Roll Back Malaria partnership,[2] including halving the malaria burden by the end of 2010 compared with 2000. Particularly encouraging is the progress in availability of long lasting insecticide treated mosquito nets. In Africa alone, 140 million nets were distributed between 2006 and 2008.[3]

These efforts, coupled with targeted application of indoor residual spraying and modest increases in access to artemisinin based combination therapy, have begun to produce results. In countries where these malaria control interventions have been scaled up, such as Eritrea, São Tomé and Principe, Rwanda, Zambia, and Zanzibar (Tanzania), rates of malaria cases, hospital admissions, and deaths have dropped by more than 50%.[3] In São Tomé and Principe and Zanzibar, these gains have been mirrored by a greater than 50% fall in all-cause hospital admissions and deaths among children under 5 years old, suggesting that malaria control may be a critical factor in achieving the millennium development goal for child mortality in endemic countries.[3]

These early results are encouraging, and we need to push forward with achieving and then maintaining universal coverage with vector control interventions. However, other facets of malaria control require equally urgent attention in order to ensure long term success:

- Universal access to diagnostic tests for malaria and artemisinin based combination therapy together with routine surveillance systems
- Mitigating threats to success, including drug resistance, insecticide resistance, poor quality or counterfeit medicines and diagnostics, and unstable financing; and
- Fostering community ownership over malaria control and building district capacity to manage programmes.

Diagnostics, treatment, and surveillance

WHO recently recommend diagnostic testing in all cases of suspected malaria before treatment.[4] Given the limited availability of quality microscopy, especially in Africa, the use of rapid diagnostic tests will be essential to achieve this goal. The case for this policy change is clear and compelling. As transmission falls, so does the proportion of fevers that are attributable to malaria.[5] By treating all cases of fever as malaria, we not only overuse artemisinin combinations—our precious first line and currently best weapon against malaria—but we also fail to provide appropriate care for people with other causes of fever.

Expansion of the use of rapid diagnostic tests may allow us to reverse these long entrenched practices.[6] However, malaria tests alone will not be enough. In the absence of rapid tests for other common causes of fever, training and supervision to reinforce the differential diagnosis skills of healthcare workers will be essential. Otherwise, there is a risk that patients with negative test results will still be given antimalarials.[7,8]

The scale-up of universal diagnostic testing presents an unprecedented opportunity to strengthen malaria surveillance systems, which are critical not only for documenting impact but also for identifying residual foci of malaria transmission and areas of resurgence. In areas where malaria transmission has dropped sharply, immunity to malaria will wane, resulting in a high risk of resurgence. Without timely reporting of confirmed cases, it will not be possible to detect or respond to such resurgences promptly. The human toll of outbreaks in countries that have failed to prepare for them is likely to be great. Scaling-up diagnostic testing and surveillance is thus particularly critical in countries that are thinking of reorienting their control programmes towards elimination.

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Mitigating threats to success

Resistance to artemisinins has already been identified in Asia,[9] and if history is any guide, it is likely to eventually spread westward to Africa and beyond.[10] Countries need to redouble global efforts to halt the marketing and use of oral artemisinin alone, which is thought to be the primary contributor to the emergence and spread of artemisinin resistance.[11] Quality assured combination therapies need to be available in both public and private health facilities at an affordable price. To ensure the prompt detection of resistance, we need to ensure the routine conduct of drug efficacy studies, in which patients with malaria are treated with recommended antimalarials and followed for up to 63 days to determine success or failure.

Unfortunately, many countries in Africa have reduced the frequency of such studies since the introduction of artemisinin combinations (Pascal Ringwald, personal communication), leaving the continent ill equipped to mount an early response to the emergence of resistance. The identification of a molecular marker for artemisinin resistance would be a big step forward because it would allow population level screening, with efficacy studies required only in areas where the marker has been identified.

Poor quality and counterfeit medicines are rampant, especially in the private sector.[12,13] Such medicines not only jeopardise the lives of individual patients, who may fail to get appropriate malaria treatment, but also have the potential to fuel antimalarial drug resistance. The global community needs to increase support to national drug regulatory authorities so that they can build their capacity to identify counterfeit and substandard medicines and enforce existing regulations by removing such products from the market. A recent report identified similar quality issues with rapid diagnostic tests,[14] and it is widely recognised that malaria microscopy services are often poor.[15] Countries require further help with pre-marketing quality control of diagnostic tests (through evaluation of both performance and manufacturing quality), routine lot quality testing, as well as quality

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assurance and quality control within national control programmes.

Insecticide resistance, particularly to pyrethroids and DDT (dichlorodiphenyltrichloroethane), is already widespread, especially in west Africa.[16] Although the link between chemical resistance and efficacy of interventions is less certain than it is for antimalarial drugs, the potential consequences are enormous because pyrethroids are the only insecticide class currently used for impregnated mosquito nets and the most frequently used for indoor spraying. We need to invest in research into new classes of insecticides and to build regional and country capacity to monitor insecticide resistance and manage integrated vector control programmes.

To address the cluster of threats to malaria control described above, investment is required to increase drug regulation and enforcement, strengthen routine monitoring capacity, and improve the quality and frequency of supervision. These investments in health systems, while clearly less tangible than those in mosquito nets or drugs, are every bit as critical to the long term success of malaria control.

But perhaps the biggest threat to the success of malaria control is that global financing may be insufficient to sustain and consolidate recent gains. Despite substantial increases in malaria financing—reaching nearly $1.5bn (£1bn; €1.3bn) disbursed in 2009—the resources still fall far short of the estimated $5-6bn needed annually for global malaria control.[17]

Community ownership and district capacity

The third priority for malaria control—to build local capacity to manage programmes and community ownership of malaria control and elimination activities—may be the most difficult to explain to decision makers, programme managers, and donors. It is nevertheless essential because even when malaria control is successful at a national level, there is often local variation. Without local capacity to collect and analyse data on coverage and impact of malaria programmes, consolidating gains in malaria control and moving towards elimination will be challenging if not impossible. We therefore need a network of institutions that can train national staff, who can in turn train district staff, in all aspects of managing integrated malaria programmes.

And although healthcare workers are essential in the fight against malaria, they cannot succeed without community engagement. Ministries of health should view communities as active participants in malaria control and work to get them to take ownership over as many aspects of the programme as possible, including ensuring that every person sleeps under an insecticide impregnated mosquito net every night; providing community management of fever; and gathering data both for local action and for feeding into a national malaria surveillance system. If communities can be empowered to be at the centre stage in the fight against malaria rather than be seen as simply the end-users of commodities and services, the political will to combat malaria will not fade, even if donor funding does.

One theme runs through these three action areas: increasing the capacity of ministries of health to deliver effective malaria control. The gains from increased investment are likely to be ephemeral unless ministries remain the centre of gravity and receive the necessary capacity building and long term human resource investment at all levels of the system (national, provincial, district, and community) to manage increasingly complex programmes. Sustainable control and elimination cannot be achieved when investments remain centred on short term technical help. It is critical that donor contributions are well coordinated with national malaria control programmes and that funding for commodities to control malaria be tightly linked to true capacity building, including the provision of long term technical assistance and extensive training of staff at all levels of the health system. At the same time, governments of countries where malaria is endemic should be urged to provide the necessary investment in human resources to guarantee long term success. In the end, malaria control can both contribute to and benefit from strengthened health systems.

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