Power to the people

Ground work: an aid worker explains the malaria life cycle to villagers.

I. BERRY/MAGNUM PHOTOS

In Africa, where malaria hits hardest, scientists are crying out for countries to take matters into their own hands, says Declan Butler.

Grace Malenga's frustration comes through loud and clear: "Come the first rains, after a week or so, my wards are flooded by sick, convulsing or anaemic kids — a good proportion of whom die, year in, year out. What preventative measures will it take to reverse that?"

As a paediatrician and director of the Malaria Alert Centre in Blantyre, Malawi, Malenga finds that decades of medical progress and international effort have changed little for those in the front line of the war against malaria.

Blantyre is surrounded by tea fields, forested slopes and some of the most striking mountains in Malawi. But during the rains from November to March, malaria turns this region into killing fields. Its sad claim to fame is the international Blantyre Coma Scale, invented here in 1987, which rates the clinical severity of malaria in children.

Malawi, a tiny country at the southern tip of the African Rift Valley, has conquered many other diseases. Its coverage of common childhood vaccines now stands at 80%. Yet malaria is getting worse. Speak to any scientist in Africa and you get the same message: to turn the tide, African doctors and researchers must take matters into their own hands, translating research and control measures into sustainable local campaigns. More needs to be done on the ground, they say. And for this to happen, they need more political will and money, and more local talent.

Drugs and vaccines must also be developed and tested in Africa, experts say. They can't just be shipped in. Their effectiveness can only be assessed on large trial populations in areas where the disease is endemic, and under realistic conditions of use.

"International efforts are positive, but they can drive research in a direction that does not address the nitty-gritty of effective use of research findings for human benefit," says Wilfred Mbacham, a molecular biologist at the University of Yaoundé in Cameroon.

Sweeping decisions by big international programmes can be misguided, says Richard Tren, director of the South African pressure group Africa Fighting Malaria. The move by agencies such as the World Health Organization to focus on insecticide-treated bednets while neglecting insecticide spraying, for example, is widely considered a mistake. Spraying, despite its bad environmental image, has been vital to effective control in many countries, says Tren.

People on the ground are best placed to decide which tools are the most effective in areas plagued by mosquitoes and disease, he argues. Take the Konkola Copper Mine, which in 2000 began a campaign to protect its workers and the community in the Konkola highland copper belt in northern Zambia against infection.

Mine of information

To help design the programme, the mine called in Brian Sharp, head of malaria research at the Medical Research Council in South Africa, who runs a successful control programme covering 20,000 km^2 in Swaziland, Mozambique and South Africa. On Sharp's advice, the mine launched a massive publicity campaign to win public acceptance of spraying and the taking of blood samples. It then taught a team of local workers to spray all the 31,500 houses in a 2,700-km^2 zone. In one year, they halved the number of malaria cases among some 350,000 people.

G. PIROZZI/PANOS

Brian Sharp (left) believes that gaining the support of local people is key to winning wider acceptance of control measures such as spraying and bednets (right).

The South African-born Sharp says that winning the wholehearted enthusiasm of local people is key to successful malaria control.

In contrast, complains one African scientist, too many international efforts involve foreign consultants who "fly in and out, don't understand our problems, dictate and control health policy and strategies, and then blame us when they fail".

The biggest local impact can be made by promoting African research, says Nigerian Solomon Nwaka, a scientific officer of the Medicines for Malaria Venture in Geneva. Progress is being made in training a new generation of African researchers. At an international malaria conference in Tanzania two years ago, half of the thousand delegates were young African PhD students.

Local support

The impetus has come largely from the Multilateral Initiative on Malaria (MIM) — an alliance of research agencies, charities, aid donors and scientists set up in 1997. Its grants are the first substantial international effort to provide support specifically for young African scientists.

Francine Ntoumi, a researcher at Schweitzer Hospital in Lambaréné, Gabon, recalls that as recently as 1998 her laboratory had few staff and no international collaborations. Thanks to MIM grants for research on the genetics of malaria, she now has a team of eight scientists and collaborations with four northern research institutes.

But such grants remain few and small. MIM grants, for example, average just US$2 million annually. "We have come some of the way, but we are far from achieving the critical mass we require to meet needs in endemic countries," says Fred Binka, an epidemiologist at the University of Ghana. Schemes to train staff for the day-to-day running of malaria-control programmes are also lacking, says Mbacham.

The sight of hundreds of young, enthusiastic researchers is awe-inspiring. But not all will contribute significantly to the battle, says Kevin Marsh, director of the Kenya Medical Research Institute (KEMRI) in Nairobi. "If you look at the number who will be internationally competitive scientists, the figure remains low," he says, pointing to the dearth of well-equipped, African-run laboratories as the main cause.

The lack of infrastructure and career ladders in Africa also means that the best students often emigrate, complains Nwaka. Mbacham was only able to stay in Cameroon thanks to funding from the Gates Malaria Partnership run by the London School of Hygiene and Tropical Medicine. Most who stay have to put up with very low salaries. "Paying highly qualified personnel around $300 a month is an invitation to leave," says Kwadwo Koram, a researcher at the Noguchi Memorial Institute for Medical Research in Accra, Ghana.

KEMRI, supported by UK medical charity the Wellcome Trust, is one of the few centres that can compete with international labs for good students, with state-of-the-art equipment and an army of top scientists.

Grass-roots initiative

Another jewel is the Malaria Research Training Centre in Bamako, Mali, supported by the US National Institutes of Health. "From three doctoral-level scientists at its creation in 1992, the centre has now over 30 MDs, PharmDs and PhDs," boasts Abdoulaye Djimde, head of its epidemiology and immunology department. His team discovered the genetic markers for *Plasmodium falciparum* parasites resistant to the drug chloroquine (A. Djimde *et al. N. Engl. J. Med.* **344,** 257–263; 2001).

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In Mozambique, the tin-roofed Manhiça Health Research Centre shows what can be achieved in the face of adversity. Set up in 1996 when the country was still recovering from civil war, the centre is gathering data on 65,000 people, and runs a vaccine trial involving 2,000 children.

Despite such achievements, the research landscape is still largely bare in Africa and basic lab equipment is often non-existent. Nwaka spends much of his holidays teaching in his native Nigeria and he takes picnic coolers loaded with reagents, hoping to restock local labs. But these often don't have the money or a sufficiently reliable electricity supply to run a fridge.

The top centres that do exist all have strong ties to agencies in more developed countries, and this tends to take the power out of African hands, says Binka. "Show me one well-funded centre completely run by Africans," he says. "Collaboration with the north is important, but we need Africans to start taking leadership."

Getting connected

African scientists are increasingly organizing themselves into regional networks. These enable them to exchange ideas and skills, and pool their resources, says Wen Kilama, who heads the African Malaria Network Trust, a body based in Dar es Salaam, Tanzania, that trains scientists and supports vaccine trials.

Getting money for such networks from international programmes is difficult if not impossible, says Binka. Most don't provide explicit funds for research or infrastructure in Africa. But there could be a windfall coming for African scientists — the European and Developing Countries Clinical Trials Partnership launched in 2002. This African-led partnership, funded by the European Union (EU), aims to put Africans in control of developing treatments for HIV/AIDS, tuberculosis and malaria by funding infrastructure and training at five or more sites.

The EU has put €200 million (US$245 million) into the scheme so far, and a further €200 million is expected from EU member states. Industry is expected to contribute a similar amount again. "It is certainly a major initiative, but it is too early to judge its success or failure," says Bojang Kalifa, a clinician at the UK Medical Research Council's laboratory in Banjul, Gambia.

If all that funding comes through, it will be a huge cash injection for African science. But much greater efforts will be needed before Nwaka can be confident of finding a working fridge — and before Malenga no longer needs to dread the storm clouds gathering over Blantyre's peaks. ■

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