

Service Overseas, which consider issues of sustainability and dependency, would align such a programme with the development agenda espoused by the Department for International Development and outlined in the Crisp report.<sup>3</sup> A change in the perception of the UK's health service, from one that poaches staff from poor countries to one like that of Cuba that recognises and responds to their needs, would also make a major difference to the UK's international prestige.

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## Responding to the challenge to end malaria deaths in Africa

With World Malaria Day, April 25, 2008, the international community—led by UN Secretary-General Ban Ki-moon—throws its weight behind an ambitious campaign to expand access to a comprehensive set of malaria-control interventions in sub-Saharan Africa with the aim of ending malaria deaths on the continent in the near future.

The first wave of the effort will be to fund and deliver about 250 million long-lasting insecticide-treated bednets to achieve universal access for malaria-endemic populations by Dec 31, 2010. This goal applies not only to pregnant women and children aged less than 5 years, as previous efforts sometimes have, but to all people at risk of malaria. Although we will lead with bednets, near-zero mortality can only be achieved with a comprehensive approach that includes targeted spraying of insecticides, provision of effective medicines, and expanded delivery through community health workers and other means. We must make these efforts simultaneously.

The world has seen ambitious plans before that have fallen far short of achieving their goals—the 2005 Abuja target of 60% of people in sub-Saharan Africa

using essential malaria control interventions, to name just one.<sup>1</sup> So why is this effort any different? We now have clear instances of country-level success in sub-Saharan Africa, mounting political will, expanded resources, and more effective approaches than ever before. Together, these factors make aggressive new goals achievable.

Last month, WHO reported that cases of malaria in Rwanda decreased by 64% and deaths by 66% between 2005 and 2007 among children aged less than 5 years.<sup>2</sup> Ethiopia, meanwhile, saw reductions of 51% in deaths and 60% in cases in the same age group.<sup>2</sup> These remarkable outcomes were achieved through expanded access to malaria control, primarily long-lasting insecticide-treated bednets and artemisinin-based combination therapies.<sup>2</sup> But how did these programmes work? And why should we expect these successes to translate to a continent-wide scale-up in the next 32 months?

The case of Ethiopia is especially informative, because this is the first time such significant achievements have been recorded over such a large geographical area in sub-Saharan Africa. In the face of widespread scepticism,

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Ethiopia managed to distribute more than 20 million bednets—two for every household in malaria-prone areas—largely through a vast network of community health workers established to strengthen the routine health system.

The achievement of these results in just 3 years proves that malaria control can be quickly and effectively scaled up. Combining bednets with rapidly expanding access to artemisinin-based combinations and diagnostics, Ethiopia's scale-up model deserves careful study and dissemination. Although multiple factors have contributed to success in Ethiopia, there are arguably four main contributing components: a catalytic moment, demand for universal coverage, pragmatic donor response, and innovative problem-solving.

In 2003, Ethiopia experienced its worst malaria epidemic on record. Despite warning signs, the country found itself ill-equipped to deal with the crisis. The number of malaria cases rose from 6 million to about 12 million, with an estimated 100 000 child deaths.

The epidemic spurred the government to rethink its approach. Recognising that successful malaria control needed adequate scale, Ethiopia made a bold proposal in early 2005: it would achieve universal coverage with long-lasting insecticide-treated bednets by distributing 20 million in 3 years in the hope of reducing malaria-related deaths by 50%. Rather than making do with the money available, Ethiopia made a compelling case for the money it needed. The required US\$160 million was almost three times the previous

national malaria-control budget; and some people viewed this request as unrealistic.

Donors responded not just to the urgent need, but also to committed leadership and a sound plan grounded in the technical realities of the disease. Additional resources totalling over \$200 million were made available by a consortium of partners including the Global Fund to Fight AIDS, Tuberculosis and Malaria, the World Bank Booster Program for Malaria Control, the UK Department for International Development, the Dutch Government, the Carter Center, and others.<sup>3</sup> Ethiopia took advantage of flexibility built into both Global Fund and World Bank processes to frontload funding. Rather than disbursing its grants over 5 years, the country drew down on the pledged funds to finance its ambitious bednet-distribution programme in 1–2 years.

Procurement of intervention is often a rate-limiting factor, but Ethiopia negotiated reduced fees with and outsourced much of the purchasing of bednets to UNICEF to increase speed and coordination. Most of the monies flowed directly to UNICEF, so funds did not have to be disbursed first from the Global Fund to the government and then back to a procurement agent. At the same time, significant investments were made by the government and partners to build in-country procurement capacity for the post scale-up phase. These decisions expedited the delivery of bednets by 21 months or more.

Now is the moment to aim for results like those in Ethiopia and Rwanda throughout Africa. With the successful replenishments of the Global Fund and the World Bank's International Development Association, as well as the prospect of increased resources from the US, UK, and other G8 governments, malaria-endemic countries should no longer limit their aspirations to small-scale, incremental progress. Ethiopia proves that large-scale success is achievable in a short time.

Donors must also be willing to assume greater risk by encouraging and funding ambitious programmes while showing increased flexibility in their processes and procedures. And both parties must plan early for the maintenance and eventual elimination phases so that donor support does not flag as malaria deaths are reduced. The pieces are increasingly in place to achieve the Secretary General's vision for universal coverage and make rapid gains toward ending malaria deaths in Africa. With one child dying every 30 s from malaria in Africa, we have not a moment to lose.



Bednet demonstration in Ambowuha, Ethiopia

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## Health-care organisation, hospital-bed occupancy, and MRSA

In December, 2007, the Department of Health for England published a document about hospital organisation, specialty mix, and meticillin-resistant *Staphylococcus aureus* (MRSA).<sup>1</sup> In England, many health-care-associated infections are caused by MRSA. This fact prompted the government, in 2004, to publish the MRSA bacteraemia episode rate per 1000 patient-bed-days (ie, the MRSA rate) of each National Health Service (NHS) hospital. After specific interventions, these rates have now become more similar between hospitals and somewhat lower than before 2004.<sup>1</sup> By contrast, the Netherlands and Scandinavia maintain very low levels of meticillin resistance in *S aureus*, and low levels of antimicrobial resistance in general.<sup>2</sup>

The Department of Health report analysed the natural variation of the MRSA rate between acute hospitals in England, between 2001 and 2004, with the aim of identifying the major drivers of this variation. 14 hospital-based variables were studied, including cleanliness, single rooms, bed spacing, staffing, bed occupancy, hospital type, and region. Only the following variables had a significant correlation with the MRSA rate and a major (>3%) predicted effect of a specified change on this rate: region, specialist hospitals compared with general hospitals (27.7% higher incidence in specialist hospitals), and a bed occupancy of more than 90% compared with less than 85% (10.3% higher incidence for bed occupancy >90%).<sup>1</sup>

Cunningham and colleagues<sup>3,4</sup> previously reported a significant correlation between bed occupancy and the MRSA rate in UK hospitals. When occupancy exceeds 85%, hospital staff have difficulty in admitting patients to the bed needed. Consequently, ward-to-ward transfer of patients increases, aiding the spread of nosocomial pathogens. In the UK, the

House of Commons Committee of Public Accounts has repeatedly noted that high levels of bed occupancy are not consistent with good control of infections. The Committee<sup>5</sup> noted that a high percentage of hospitals in 2005 operated at occupancy levels in excess of the Department of Health's 82% target, which was meant to be achieved by 2004. The 2007 report<sup>1</sup> shows that, from April, 2006, to March, 2007, about 40% of hospitals in the NHS operated at 85% bed occupancy or over, and about 15% at 90% bed occupancy or over. Annual bed occupancy depends on: annual number of admissions leading to overnight stay; average length of stay (days); and annual number of available bed days.

So how does the UK compare with the Netherlands in terms of acute bed occupancy and its determinants? In 2005, the percentage occupancy of acute hospital beds was reported to be 84% in the UK, much higher than in the Netherlands (64%) and also higher than the average occupancy (75%) in the 30 countries from the Organisation for Economic Co-operation and Development.<sup>6</sup> The number of acute beds per 1000 people was 3.1 in both the UK and the Netherlands. However, the discharge rate per 1000 people, which is indicative of the rate of admission, was 245 in the UK and 104 in the Netherlands.<sup>6</sup> A UK admission rate more than twice that in the Netherlands cannot be explained by differences in non-medical determinants of health.

In the Netherlands, health-care decisions are not affected by bed occupancy. Hospital-bed pressures and emergency department waiting targets are largely unknown. The country has a recognised medical specialty to care for the unique needs of nursing-home residents. Consequently, when a resident in a Dutch nursing home develops gastroenteritis or pneumonia, the doctors at the nursing home often manage