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Chance discovery: Unintended consequence of ivermectin highlights potential benefits of integration

By Andrew Jack

When Moses Bockarie was conducting fieldwork in Papua New Guinea in the 1990s, he noticed a striking side effect when he decided he would take ivermectin, the medicine he was giving to local people to protect them against lymphatic filariasis (elephantiasis). [Mosquitoes](#) that bit him in the laboratory died rapidly afterwards.

The chance discovery added a new and more positive twist to a concern that animal researchers had identified a decade earlier when examining an unintended consequence of using the drug on cattle. Their dung did not decompose because the impregnated faeces killed the flies that usually swarmed around it.

It highlighted a broader message that is even more relevant and useful today. Tighter integration of malaria programmes with other still more “neglected tropical diseases” can provide mutual benefit and offer more effective protection against a range of different debilitating illnesses.

“Ivermectin to kill mosquitoes has become a hot topic,” says Prof Bockarie, director of the Centre for Neglected Tropical Diseases at the Liverpool School of Tropical Medicine, who has noticed a surge of recent publications on the matter. While ivermectin’s toxicity may be short-lived and its potency in different types of mosquito vary, its impact is spreading with growing “mass drug administration” programmes in Africa to tackle lymphatic filariasis and onchocerciasis (river blindness).

Even when it no longer proves lethal, residual levels in the blood may be enough to disrupt the parasite. Ivermectin is a well-studied and well-tolerated medicine.

In a number of African countries ivermectin is now distributed twice a year – albeit often in the dry season when transport is easier.

Timing its use, however, with the peak malaria biting period could help reduce the burden of the three diseases simultaneously – as well as that of scabies.

That is not the only advantage of adopting a less “vertical” single disease-focused approach. Long-lasting insecticide impregnated bednets increasingly provided to tackle malaria are also effective in reducing the burden of lymphatic filariasis. Nonetheless, Mr Bockarie says many organisations contracted to provide nets to fight malaria would do well to talk with longer-standing community drug administrators for lymphatic filariasis and onchocerciasis. “Some groups are really not talking to each other,” he says.

A final synergy with malaria comes from another neglected tropical disease: worms. Deworming programmes run in schools in Kenya have allowed researchers to get accurate information from children of the extent to which bednets distributed to their homes are actually being put to use.

Such feedback – which suggests that fewer nets are slept under than are distributed to the public – will prove useful in improving coverage and the accompanying education efforts to boost use. With money increasingly tight, cross fertilisation between disease networks could prove ever more a necessity than an unintended bonus.