

# Priced out

Tropical diseases that aren't poised for eradication are neglected by global agencies, as **Eleni Courea** reports.

When the last vial of FAV-Afrique, a clear liquid costing \$140 (€131) a pop, was administered last year, it signalled the start of yet another public health crisis in sub-Saharan Africa. But the crisis had been brewing long before then.

The French pharmaceutical company Sanofi Pasteur announced its decision to stop producing FAV-Afrique, the last effective antivenom for sub-Saharan African snakes, in 2010. The only alternative, manufactured by German company Behringwerke, now part of Pfizer, had been discontinued two decades earlier.

In December, former UN secretary-general Kofi Annan convened a meeting of snakebite experts in Geneva to discuss how to tackle this "disease of the poor". About 20,000 people die from venomous snakebites in sub-Saharan Africa each year, and four times as many suffer from disfigurement. Most victims are subsistence farmers or labourers in banana, rubber and palm tree plantations, for whom losing a limb can mean losing their livelihood.

"FAV-Afrique was a market failure," says Robert Harrison, a venom researcher at the Liverpool School of Tropical Medicine, who took part in Annan's meeting. "The cost of production was around \$140 a vial, and you needed two to five vials, sometimes more, per treatment. So you can imagine how the figures go up to \$300–700 per treatment. For people living on less than \$1 a day, that's not affordable."

As a result, doctors are having to administer antivenom made from Indian snakes, which is largely ineffective in Africa. "The international health agencies are looking away," Harrison says, "and there has been limited engagement in research to improve treatments of snakebite, whether for repellents, better drugs or diagnostics." Despite the World Health Organization putting snakebite on its list of priority neglected tropical diseases in 2009, it was deprioritised two years later because of a lack of investors, he says, adding that the UK's Department for International Development, the United States' government agency USAID and the Bill and Melinda Gates Foundation have declined to fund research into new treatments.

One reason for this is because the snakebite problem is virtually impossible to wipe out, Harrison suggests. "The more likely a neglected tropical disease can be eradicated, the greater the investment by international health agencies," he says. And the failure of Sanofi and Behringwerke to profit from antivenom means that securing backing for research from pharmaceutical companies is hard.

Though silent on snakebite, some companies disburse

mass-produced drugs to communities at risk of other neglected tropical diseases including schistosomiasis, river blindness and worms. Alan Fenwick, director of the Schistosomiasis Control Initiative at Imperial College London, reels off the names of drugs—albendazole, praziquantel, zithromax—that are donated by some of the biggest firms in the industry.

Most of these drugs were originally intended for a different purpose. For example, praziquantel, which is donated by Merck to treat schistosomiasis, is marketed to treat tapeworms in pets. "I can't think of a drug that's been developed specifically for a neglected tropical disease," says David Molyneux, a researcher on neglected diseases at the Liverpool School of Tropical Medicine.

This lack of investment in researching drugs and improving treatments is a major issue. "Drug donations have been important for some neglected tropical diseases like river blindness, but it is a limited approach," says Michelle Childs, head of policy at the Drugs for Neglected Diseases initiative, a Geneva-based not-for-profit research organisation. "We need a more sustainable solution—new, better treatments and easier access to them."

"The solution to many of these problems is not continuous treatment; it is development of a vaccine," agrees Roy Anderson, director of the London Centre for Neglected Tropical Disease Research. "And the fundamental problem is not science," he says, adding that he can think of four tropical diseases for which vaccines could be readily developed. What is needed is a better funding model to persuade companies to produce the vaccines, he says.

One idea could be to give 'priority review vouchers' to companies investing in neglected disease research—whether to develop a schistosomiasis vaccine or an African snake antivenom, says Anderson. These vouchers would reward companies with faster regulatory approval for other drugs in the pipeline, and give them a period of market exclusivity. The cost for governments would be low, and the returns for companies potentially high.

Such vouchers introduced in the US have, however, been met with legislative hurdles. There are no access provisions attached to the US vouchers, meaning that they can be granted for products that "would never be utilised, or would be too expensive for the people who need them," says Childs. And Molyneux cautions against "bracketing every neglected tropical disease with the need for a new drug, without implementing treatments in the settings where the people can't afford to pay".

But vouchers still "have the potential to be effective if the flaws are addressed", Childs argues, adding that the US experience could provide lessons that would enable a more effective programme in Europe.

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