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## How the world let malaria off the hook

06 October 2007 by [Fred Pearce](#)

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*DDT is back. For more than three decades, the most effective chemical against malarial mosquitoes was virtually banned around the world. The ban, triggered by environmental concerns, torpedoed a campaign begun in the late 1950s to eradicate malaria from the planet. Since then, the disease has returned with a vengeance, killing more than 2 million people a year. Late last year, the World Health Organization took a U-turn and announced that DDT will once again be one of its main tools against malaria. So was the ban a ghastly mistake? Did the world throw away the chance to eliminate a disease that kills almost as many people as AIDS? And if so, should we blame environmentalists?*

IN 1956, American scientists came up with a plan to wipe malaria from the face of the Earth using the pesticide DDT. US troops had sprayed it widely during their jungle operations in the second world war, and the chemical had eliminated the last pockets of malaria in the US and Europe. Prompted by Paul Russell of Harvard School of Public Health, the State Department declared that within five years American science could do the same for the rest of the world.

Congress allocated more than half a billion dollars for the task, and by 1958 thousands of drums of DDT were on their way to Latin America, Africa and tropical Asia. Scientists saw mosquitoes as easy targets. The insects passed on malarial parasites while gorging on human blood as their victims slept. Afterwards, they settled on bedroom walls to digest the blood. Spraying those walls with DDT every six months had been shown to repel or kill most of them.

Confident that the disease would soon be eradicated, Harvard stopped teaching its students about malaria. Early results were impressive enough to warrant such optimism. In India, where spray teams doused hundreds of thousands of villages, by 1961 hospital admissions for malaria had fallen by 90 per cent, and global death rates had fallen by around 95 per cent.

Donald Roberts, who is now a medical entomologist at the Uniformed Services University of the Health Sciences in Bethesda, Maryland, took part in early eradication programmes in Brazil. "Almost miraculous results were achieved," he says. "We quickly eradicated malaria from southern areas where most people live." Even in the Amazon basin its incidence was much reduced.

But then the funds began to dry up. Congress had voted for a five-year programme and in 1963, oblivious to calls for one more heave, it pulled the plug. Many tropical countries, including Brazil, carried on spraying, but the global eradication drive ground to a halt.

In any case, western enthusiasm for the enterprise had evaporated. The previous year had seen the publication of the book that started the modern environment movement. *Silent Spring* by Rachel Carson of the Woods Hole Marine Biological Laboratory in Massachusetts called for the banishment of pesticides in general and DDT in particular. It was killing wildlife and making people sick, Carson said. In fact, her attack was aimed at farmers who sprayed DDT on their fields, but the distinction between that and spraying relatively small amounts inside houses was lost. In 1968, the journal *Science* published a clutch of articles that seemed to confirm that DDT was damaging the environment, and the following year rich countries and their aid agencies started imposing bans.

Supposedly less harmful pesticides were tried, but nothing worked against mosquitoes as well as DDT. A decade later, with the disease creeping back to its old haunts, the WHO switched from fighting the mosquito to fighting the malaria parasite with drugs, and backed efforts to find a vaccine.

Meanwhile, environmentalists were as determined to ban DDT as doctors had once been to banish malaria. In 2001, the pesticide appeared on a list of 12 toxic industrial chemicals that were to be banned worldwide under the [Stockholm Convention on Persistent Organic Pollutants](#). Then the backlash began.

More people were being killed by malaria than ever before. Old hands like Roberts, who had witnessed the early success of DDT, eventually persuaded the negotiators who had drafted the convention to allow DDT's continued use for public health.

In 2006, the WHO - which for much of the previous decade had been headed by the environmentalist Gro Harlem Brundtland - made a dramatic U-turn and began encouraging the use

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of DDT again. Announcing the change, Arata Kochi, director of the WHO's new [Global Malaria Programme](#), said: "Of the dozen insecticides WHO has approved as safe for house spraying, the most effective is DDT." Sprayed indoors, he said, it "poses no harm to wildlife". Fifty years after the launch of the first global campaign to eradicate malaria, DDT was back.

Roberts blames this debacle on the "well-funded advocacy and all-consuming political and economic power of the environmental movement" pitted against the "weak political willpower of the public health establishment".

Environmentalists are unrepentant. The WWF says the insecticide should be "phased out and ultimately banned". But its benefits are hard to dismiss. Virtually all countries that had a high incidence of malaria half a century ago saw a dramatic decline when they used DDT. When spraying stopped, the incidence rose again. Perhaps the best-documented recent case is South Africa, where DDT was banned in the mid-1990s. Malaria then increased tenfold, and since spraying resumed in 2001, rates have begun to fall again.

Meanwhile, many of the fears over human health raised by Carson and the *Science* papers of 1968 have not been realised. Carson suggested that DDT could cause liver and breast cancer, but there is still no evidence of that, whereas the evidence that it saves lives by banishing malaria is irrefutable.

So did the world miss the chance to eradicate the disease? Today's public health scientists are not as gung-ho as their predecessors. "At first the goal of eradication did seem possible," says Roberts. "Yet when we look back, I think it is reasonable to conclude that global eradication was never achievable." It could never have succeeded in the Amazon, for instance, because too many people there did not have bedroom walls to be sprayed. But that didn't make the programme a failure, he insists. "A huge burden of disease and death was lifted from the Brazilian people. The disease hung on only in more remote and isolated rural areas."

In much of the world, he says, rates of malaria in the 1970s were probably as low as was achievable: "What the world failed to do was to sustain and build on the marvellous gains that had been achieved." So today in Brazil, there are hundreds of thousands of new cases each year in the Amazon basin, and the risk of malaria returning to southern Brazil is growing. The situation is far worse in much of Africa, where eradication never got going in the 1960s.

Some say DDT is doomed because mosquitoes will develop resistance: in the 1950s, Russell believed he had less than a decade before resistance took hold. Roberts says resistance is a problem, but mainly in areas where DDT was once widely used in agriculture. Where it was restricted to spraying inside homes there is little resistance, partly because the rates of spraying were orders of magnitude less.

Roberts has also now shown that DDT is uniquely effective in banishing malaria not because it kills mosquitoes but because it repels them. He [published](#) these findings in August this year - but notes that the observations were first made in 1953 by the entomologist Robert Muirhead-Thomson. Many lessons are being relearned.

It seems millions of lives have been lost because health experts threw away their best weapon. Are environmentalists to blame? There is no doubt that DDT was misused as an agricultural pesticide and seriously damaged wildlife. In that sense Carson was right. But regulators did not recognise that spraying indoors was different. And an environmental outcry against DDT helped to ensure that the early fears about its effect on human health became entrenched dogma long after they had been proved unfounded.

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