

IN PRAISE OF DDT

Amir Attaran of Harvard University's Centre for International Development argues the case for the retention of DDT in the battle against malaria as the POPs Convention reaches the signing stage

Following an agreement at Johannesburg in December 2000, more than 100 countries signed the Convention on Persistent Organic Pollutants (POPs) in Stockholm on 22-23 May 2001. This POPs Convention seeks to ban the production and use of 12 chemicals, the so-called "dirty dozen":

- the pesticides aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene
- the industrial chemicals polychlorinated biphenyls (PCBs) and hexachlorobenzene, which is also a pesticide
- the combustion byproducts dioxins and furans

One hard-fought exemption in this Convention was for the continued use of DDT for public-health use, principally against mosquitoes that spread malaria.

Malaria was eradicated from the developed world in the 1950s using DDT, but it still affects more than 300 million people in the developing world, and a million die from it annually. DDT, now produced only in China and India, is one of the best, and certainly the cheapest, antimalarial tools available, even in the face of insecticide resistance in some areas.

DDT started to get a bad press when populations of birds declined because of brittle eggshells, through the large-scale agricultural use of DDT. The public health use of DDT, however, involves the application by trained sprayers of small quantities of DDT on the interior walls and eaves of homes in endemic regions. The quantities involved are minimal (2 g m⁻²) and, unlike agricultural uses which inject tonnes of DDT into the outdoors, indoor house spraying results in little harmful release to the environment. No other cheap insecticide is as effective as DDT against malaria-transmitting mosquitoes, and attempts to stop its public health use under pressure from environmental groups has resulted in an increase in malaria.

The examples of this are striking. South Africa had been almost malaria-free since using DDT in the 1940s. But under pressure from environmentalists it switched to other insecticides in 1996. This allowed a particularly aggressive mosquito species (*Anopheles funestus*) to re-invade South Africa after a 50-year absence, leading to a dramatic resurgence of disease: malaria cases rose from 4117 in 1995 to 27,238 reported cases in 1999 (or possibly as many as 120,000, judging by pharmacy records). Neighbouring Swaziland, which never stopped using DDT, experienced no such resurgence. Faced with this mounting epidemic, South Africa was forced to resume DDT use last year.

These results are not unique. Starting in the 1950s, Sri

Lanka used DDT to lower malaria from 2.8 million cases and 7300 deaths, to 17 cases and no deaths. Progress was reversed after the US government cut funding for the program, and within a decade Sri Lanka rebounded to half a million cases.

Despite these obvious benefits of retaining DDT for public health use, some environmentalists urge that the human health risks of DDT justify its being banned precautionarily. But this argument churns the very notion of "precaution" to nonsense: in the vast epidemiological literature, there is not one adverse human health effect of DDT exposure which has withstood independent experimental replication, while many studies show the consistent health benefit of DDT in malaria control. Banning DDT precautionarily therefore illogically places *speculative* risks, glimpsed only through animal toxicology studies, over the *known* and large human health benefits in malaria control. The health risk and benefit must accordingly be balanced, just as they are when physicians administer highly toxic medicines to obtain a greater therapeutic benefit.

Alternatives to DDT house spraying (for example pyrethroid-impregnated bednets and integrated vector management) can substitute in some, but not all, cases. Research is also being carried out on the development of new safer insecticides and anti-malarial vaccines, but until there is an effective, low-cost alternative, there is a strong case for retaining DDT for antimalarial use in developing countries. While the POPs Convention gives DDT a reprieve in the form of an exemption for public health use, more voices are urgently needed to ensure that poor and politically weak developing countries are allowed to use DDT without fear of retribution from environmentalists and well-meaning aid agencies, whose poorly informed pressures have been so damaging – and fatal – in the past.

Further reading

- Attaran, A.; Maharaj, R. (2000) DDT for malaria control should not be banned. *British Medical Journal*, **321**, 1403–1404.
- Attaran, A.; Roberts, D.; *et al.* (2000) Balancing risks on the backs of the poor. *Nature Medicine* **6**(7), 729–731.
- Curtis, C. F.; Lines, J. D. (2000) Should DDT be banned by international treaty? *Parasitology Today* **16**(3), 119–121.
- Kidd, H (2000) POPs negotiations in Bonn. *Pesticide Outlook*, **11**(3), 123.
- Roberts, D.; *et al.* (2000) DDT house spraying and re-emerging malaria. *Lancet*, **356**, 330–332.
- <http://irptc.unep.ch/pops/>
- <http://www.fightingmalaria.org/>