

Global Resurgence of Malaria: Environmentalism's Death Toll

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Use of dichlorodiphenyltrichloroethane (DDT) enabled much of the world to control most infectious diseases, 80 percent of which are transmitted by arthropod vectors such as mosquitoes, biting flies, fleas, ticks, lice, and mites.^{1,2} Since these vectors account for more than 70 percent of animal species,³ the odds are stacked against avoiding these diseases, especially in the tropics.

Although diseases such as malaria and other parasitic diseases, yellow fever, dengue, plague, and typhus have largely disappeared in developed nations, in poorer countries they continue to cause significant numbers of fatalities. Of these diseases, malaria is currently the leading cause of death globally.⁴

Until widespread DDT use during World War II, there was no single effective weapon against the malaria vector (the *Anopheles* mosquito) and other arthropods. However, tremendous progress had been made by the 1960s in eradicating malaria across the globe, including certain parts of Africa.³ Millions of deaths were being prevented by DDT, but a combination of environmentalist fanaticism and politics halted this progress.

In 1962, the blockbuster work of fiction *Silent Spring* was published. This book was authored by Rachel Carson (a biologist with the U.S. Fish and Wildlife Service) and is credited for launching the environmentalist movement. Her book was loaded with sensational propaganda against the use of pesticides. The subsequent environmentalist campaign against DDT was fierce, and frequently made use of biased, faulty, or even fraudulent research to advance the cause. Some of the widely quoted papers were not peer-reviewed studies, had non-reproducible results, and displayed data inconsistency, extrapolation errors, and lack of evidence of cause and effect.^{2,5-7} Variables and controls were sometimes faulty, such as associating DDT with thinning eggshells in birds that were fed 20 percent less calcium than necessary for healthy shells.⁸

As a result of such publications, an entire mythology developed about the dangers of DDT, subsequently propagated by a well-financed and ideologically driven research community as well as the media. Research findings regarding the non-toxic and relatively inert properties of DDT were ignored or suppressed.

The environmentalists were joined by population-control advocates such as Paul Ehrlich, Jaques Cousteau, and some Sierra Club leaders. As they saw it, DDT was allowing too many people, especially in poor countries, to survive the onslaught of infectious diseases and consume too many resources.

In 1970, President Richard Nixon, himself a population-

control advocate, launched the Environmental Protection Agency (EPA) and appointed William Ruckelshaus as its director. This was immediately followed by intense and lengthy hearings on the safety and environmental impact of DDT, which totally exonerated the compound from harming humans or wildlife. However, two months after the close of these hearings, Ruckelshaus unilaterally banned DDT without having attended any of the hearings, and he reportedly never read the transcripts.⁵

A basic misunderstanding of DDT's mechanism of action against mosquitoes also worked against continued use of the chemical. This issue is discussed at length in *The Excellent Powder: DDT's Political and Scientific History* by Donald Roberts, Ph.D., and Richard Tren.^{6, pp 41-100} Many studies demonstrated that mosquitoes would avoid dwellings sprayed with relatively small amounts of DDT. If the mosquito was thus deprived of a blood meal, its life cycle could not be sustained because the female of the species requires a blood meal to produce eggs. It was nevertheless assumed that the effectiveness of DDT depended on its direct toxicity to mosquitoes rather than its repellent/irritant effects on them. The belief that this toxicity was the only means of malaria control became entrenched dogma that was difficult to refute. Therefore, when reports of mosquito resistance to the insecticidal effects of DDT began to emerge, many countries switched to other insecticides, only to have a disastrous increase in malaria deaths.

Mosquitoes very quickly become resistant to other insecticides such as pyrethroids.⁷ Organophosphates, which have also been substituted for DDT, have known toxicity to animals and humans. Methyl parathion, an organophosphate alternative to DDT first suggested by EPA, had to be removed from use because of exposure deaths in farm workers that were handling the chemical.^{6,9} In contrast, there have been no known deaths or illnesses from DDT exposure.⁶

The resurgence of malaria after abandoning indoor residual spraying with DDT is especially illustrated in the cases of Sri Lanka (formerly Ceylon), and South Africa. In 1946, there were 2.8 million cases of malaria in Sri Lanka, but by 1963 this number had been reduced to an all-time low of 18 after only five years of using DDT. The eradication program was halted under the assumption that DDT resistance would end its efficacy against malaria. Cases immediately began to climb there, as well as globally over the next few decades.^{6, pp 86-87}

In South Africa, malaria had been considered to be nearly eradicated by the 1970s. In 1996, the country's government decided to switch to the pyrethroid insecticides. Almost immediately, this decision became a public health disaster

when the number of cases rose from approximately 6,000 in 1995 to more than 60,000 in 2000, with corresponding increases in deaths. In 2000, the country resumed the DDT spraying programs, and saw nearly an 80 percent reduction in the number of cases in just one year. By 2012, the numbers were similar to those of the earlier DDT years.^{7,9}

With the EPA's banning of DDT in the U.S. in 1972, exports of the compound were halted, and financial support for indoor DDT spraying programs in developing nations was curtailed. The prevention strategy changed to distribution of insecticide-treated bed netting and attempts to develop a vaccine against malaria.^{2,5} These measures have been ineffective, and in 2014 the World Health Organization declared that nearly half of the world's population was at risk for malaria: an estimated 3.3 billion people. There are currently 300–500 million cases and 1.5–2.5 million malaria deaths per year.⁴

We know that political ideologies can have deadly consequences for innocent people, such as in Nazi Germany, Stalinist Russia, and Communist China. The environmentalist agenda with its influence over government is not generally considered to be related to loss of human life. However, this has been the effect of the banning of DDT, whether unintentionally by many, or intentionally by others who have publicly stated that poor nations should reduce their human populations.

In conclusion, DDT has saved millions of lives over the past century because vector control eradicated not only malaria cases but also other infectious diseases in many parts of the

world. The decision to ban DDT was political and not based on valid scientific evidence of harm. In view of the massive surge in malaria deaths worldwide, it is time to take another look at residential indoor spraying with DDT. It has been more than 40 years since this cheap, safe, easily produced compound was banned, and no effective alternative has been discovered.

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