WHO Backs DDT Use To Stop Malaria

by Marjorie Mazel Hecht

The World Health Organization's announcement Sept. 15 that it will back DDT spraying on the inside walls of houses to kill or repel malaria-carrying mosquitoes is very good news. The reversal of WHO's 30-year policy against DDT brings the hope that the relentless disease, which now kills one African child every 30 seconds, can be brought under control. Malaria sickens and debilitates 500 million people a year, killing about 1 million of them; the majority of the dead are women and children on the African continent.

Indoor residual spraying, or IRS, involves spraying minute amounts of insecticides on the inside walls and roof of houses once or twice a year. DDT is the most effective of the approved insecticides. It is also long-lasting (it can be sprayed just once a year) and relatively inexpensive (about $5 per average five-person household). It either kills mosquitoes resting on the walls, or repels them from the dwelling. The malaria-bearing mosquitoes bite mostly at night.

For many African countries now debating the use of DDT, the WHO decision will be a lifesaver. Just days after the WHO announcement, Uganda said that it will go forward with its indoor spraying program in 2007. Uganda's Health Ministry reported on Sept. 20 that spraying with DDT would help reduce infant mortality from the current 88 out of 1,000 births to 10. Opponents had complained that use of DDT will cut into their agricultural exports to the European Union, which is notoriously frightened of pesticides. Meanwhile, 800 Ugandan children die a day from malaria.

Studies have shown that malaria incidence drops dramatically after an indoor spraying campaign. South Africa, for example, resumed the use of DDT in 2003, and within one year, the incidence of malaria in the worst-hit province, KwaZulu Natal, fell by 80%. In two years, the number of malaria cases and deaths dropped by 93%. As the WHO has stressed, there are no environmental effects when small amounts of DDT are sprayed on inside house walls.

WHO's Policy Turnabout

WHO appointed Dr. Arata Kochi as head of its Global Malaria Program in late 2005, with the task of assessing the WHO program and making proposals for its future work. Kochi was blunt in his criticism of WHO's past effort and in what was needed to combat malaria. As he announced at a Washington, D.C. press conference Sept. 15, "We must take a position based on the science and the data." Anticipating a reaction from a public brainwashed into demonizing DDT, he issued an appeal: "Help save African babies, as you help save the environment."

The new WHO malaria campaign has three aims: 1) prompt and effective treatment of the infected; 2) indoor residual spraying, with DDT as the most effective insecticide of those allowed; and 3) the use of bednets treated with a long-lasting insecticide.

Dr. Pierre Guillet, a medical entomologist who coordinates the WHO Vector Control and Prevention Team, acknowledged in an interview with this reporter Sept. 21, that DDT had been out of the picture for many years, under pressure from environmentalists, who wanted an end to all pesticides. But the alternative approaches—such as "case management," "integrated vector control," and more recently, insecticide-treated bednets—did not work to control the spread of malaria.

Guillet has spent 17 years working on malaria control, 10 in Africa, and the past 7 years at WHO headquarters in Geneva. He stressed that WHO's policy now is to focus on areas of high malaria transmission to achieve at least 80% coverage of the population with indoor house spraying and bednets. "We need a very fast scale-up of these efforts," Guillet said.

"The change that has been made by Dr. Kochi is to say that if we want to seriously talk about malaria control, we have to control transmission, and to do that we need high coverage. To reach high coverage, we have to use the interventions that we know are effective, which are IRS and long-lasting bednets. They are not exclusive . . . it is the combination of the the two with the main objective to scale up rapidly coverage, in order to be effective in terms of transmission control."

'It Is Bloody Safe'

Was the motivation for the ban on DDT at the WHO because of Malthusian views? Guillet said that he could not speak for the WHO as an institution. "For me, DDT is a non-issue. The issue is the intervention and the objective. . . . Today, we have to admit that DDT is the most effective and the cheapest insecticide. And when recognizing that, at a time when the genome of the parasite has been sequenced, and the genome of the major vector has been sequenced, still relying on a compound is more than 60 years old, and that has damaging effects when used indiscriminately, is a shame. And I see that, to a certain extent, as a failure of our international community to develop safe alternatives—not that DDT is not safe, but DDT is an emblematic product. . . . You cannot swim against the stream too long."

Guillet noted that the Stockholm Convention on pesticides had put DDT on the phase-out list, but with no time limit imposed. "Fine," he said, "but if we ban DDT right now, it will have more damaging effects on human health

than using it. . . ."

In response to my assertion that there had been no damage to human health from DDT, Guillet said that he wasn't a toxicologist, but he agreed that "There is no direct evidence of toxic effects of DDT on human health." If we haven't found any such evidence after 60 years, "It is bloody safe," he said. However, WHO will conduct studies on the effects of IRS on human health and will monitor potential side effects of DDT and other insecticides.

Guillet strongly recommended that an international partnership work on the development of new insecticides, and said that the Gates Foundation has begun to do this, to improve the formulation of current insecticides and their application in vector control.

A Deadly Ban

While the fine points of previous anti-malaria policies can be endlessly debated, the bottom line is that millions of people have died of malaria as a result of the ban on DDT, most of them in Africa. and hundreds of millions more have severely suffered from the disease.

DDT was banned in the United States in 1972 on the basis of a big lie, not science. In fact, the U.S. Environmental Protection Agency held seven months of hearings on the issue, producing 9,000 pages of testimony. The EPA hearing examiner, Edmund Sweeney, ruled, on the basis of the scientific evidence presented, that DDT should not be banned. "DDT is not carcinogenic, mutagenic, or teratogenic to man [and] these uses of DDT do not have a deleterious effect on fish, birds, wildlife, or estuarine organisms," Sweeney concluded.

But two months later, without even reading the testimony or attending the hearings, EPA administrator William Ruckelshaus overruled the EPA hearing officer and banned DDT. He later admitted that he made the decision for "political" reasons.

Although other nations continued to DDT after 1972, the U.S. State Department mandated that no U.S. aid could go to any foreign program that made use of a pesticide banned in the United States. As a result, malaria rates in tropical countries began to climb, turning around DDT's initial success in either eliminating or lessening the impact of the disease. Former Secretary of State George Shultz reinforced the State Department anti-DDT policy in a 1986 telegram to all U.S. embassies abroad. But in the last year, in response to Congressional hearings on the science, and pressure from constituent groups like the Congress for Racial Equality, the U.S. Agency for International Development did an about-face on DDT, permitting use of DDT.

DDT is not a panacea for malaria. Africa desperately requires economic development, including adequate public health programs and health infrastructure to keep malaria under control. This is not just a question of Africa or other tropical countries: In the rest of the world, including the industrialized West, the takedown of public health infrastructure has begun to leave even privileged populations vulnerable to insect-borne diseases like West Nile. Policy has been determined by the views of those environmentalists who foolishly leave human health out of their schemes to protect a mythical Mother Nature—and mosquitoes are allowed to breed freely.

For background information on DDT, see Dr. J. Gordon Edwards, "The Ugly Truth about Rachel Carson," 21st Century Science & Technology, *Summer 1992, and "Malaria: The Killer That Could Have Been Conquered,"* 21st Century Science & Technology, *Summer 1993, both at www.21stcentury sciencetech.com.*

The Malaria Cycle

There are three types of malaria, all caused by a genus of protozoans called *Plasmodium,* the most lethal being *Plasmodium falciparum.* In brief, the *plasmodium* is picked up by a biting female *Anopheles* mosquito, when she sucks the blood of a person with malaria. The plasmodia in the blood mate in the mosquito's stomach and produce hundreds or thousands of young plasmodia, which travel through the mosquito's body, including to the salivary glands. When the mosquito bites again, it injects young plasmodia (called sporozoites) into the human victim.

These plasmodia reach the human liver where they reproduce, forming a new phase of plasmodia (merozoites), which enter the blood stream, burrow into red blood cells, reproduce, and in 48 hours, burst out to enter new blood cells, repeating the process in 48 hours.

When the number of merozoites reaches about 150 million in a 140-pound person, the victim has a typical malaria attack every 48 hours. As Dr. Gordon Edwards describes it, "When millions of red blood cells are simultaneously destroyed, the victim suffers a chill. As the cells are ruptured, toxins are released, resulting in alternating chills and fevers. If a large number of plasmodia invade the brain, death quickly follows."

The malaria cycle is most effectively stopped, when the *Anopheles* mosquito is prevented from biting people who already have malaria in their blood. This vastly reduces the incidence of new cases of malaria.