

Wrong strategy could worsen dengue epidemics: study

May 3 2011, by Marlowe Hood

The wrong approach to wiping out the mosquitoes that cause dengue infections could lead to worse epidemics in the future, according to a study released Tuesday.

Targeting only [mosquito larvae](#), and not adults, with insecticides may work in the short run, but could result in higher resistance in the insects and less disease immunity among humans, especially in urban settings, the study found.

Dengue is a mosquito-borne infection that causes severe, flu-like symptoms in some 50 million people every year, mainly in developing countries.

Global incidence of the disease, which is rarely fatal but often debilitating, has risen dramatically in recent decades, linked to both rapid urbanisation and the impact of global warming. Some 2.5 billion people are at risk.

There is no treatment, cure or vaccine -- the only way to control the disease is to kill the [mosquitoes](#) that carry it, especially one species: *Aedes aegypti*.

But which insecticides work best, how frequently they should be applied and whether it is more effective to target mosquitoes in their larval or adult stage are still debated among experts.

Researchers led by Paula Luz of the Oswaldo Cruz Foundation in Rio de Janeiro used mathematics and computer models to simulate the impact over five years of dozens of different strategies for reducing the vectors in which the blood-seeking insects breed and live.

The cost of different approaches was also taken into account, using [World Health Organisation](#) (WHO) guidelines as to "cost-effectiveness," that is, the trade off between results and the price tag.

The method prevailing in most countries -- attempting to destroy breeding areas -- is misguided, according to the study, published in [The Lancet](#).

"Year-round larval control can be counterproductive, exacerbating epidemics in later years because of evolution of [insecticide resistance](#) and lost of herd immunity," the researchers said.

"Herd immunity" is the term scientists use to describe immunity that occurs when enough of the population is inoculated from having had the disease to prevent it from spreading easily.

The problem of mosquitoes adapting to insecticide -- as happened with DDT in the 1950s and 1960s -- was common to all the strategies, but not all were as effective in reducing disease outbreak over a longer period.

"The main conclusion is that when you compare all the proposals for controlling dengue, the most cost effective is killing adult mosquitoes," commented Eduardo Massad, a professor at the School of Medicine at the University of Sao Paulo.

"This is the one that has the least problem of evolving resistance, and which is most effective in killing mosquitoes," he said by phone.

Massad said his own modelling research had reached a similar conclusion, showing that targeting adults is many thousands of times more effective.

He has not, however, been able to convince health officials in his country to switch tactics, he added.

"The most applied strategy is to search and destroy breeding places. This has not worked well -- we need a new strategy, one that doesn't exist yet," he said.

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Citation: Wrong strategy could worsen dengue epidemics: study (2011, May 3) retrieved 17 April 2024 from <https://medicalxpress.com/news/2011-05-wrong-strategy-worsen-dengue-epidemics.html>

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