

# Public Health: relief from Dengue in prospect

While the USA has been in the grip of fear over the rise of West Nile Fever (more properly known as West Nile Virus), much of the rest of the world is far more worried about dengue fever which kills vulnerable victims and infects hundreds of thousands of people each year.

The Aedes mosquito is unusual but it is certainly not rare: it flies during the day (most others fly mainly at dusk and dawn) and it flighs high (there are many reports of them in apartments and office far above their theoretical 300 feet "ceiling."

They are readily identifiable - even in flight - because of the white rings on both body and legs which, set against a dark background, are easily visible.

Dengue strikes rapidly: once it is amongst the mosquito population, it spreads to large numbers of people quickly. The mosquitoes lay larvae in pools of standing water: but these "pools" include lavatory bowls, pot plant stands and, of course, simple collections of rain water on, for example, discarded plastic bags.

Those larvae hatch quickly, and the babies are borne as carriers of the disease. For those aedes aegypti mosquitoes that are not born as carriers, they pick it up from infected persons and transmit it as they feed.

The only commonly available remedy for the breeding is "fogging" - the extensive spraying of a powder-like insecticide. But it does not kill all the larvae nor all the mostquitoes.

The speed with which the virus is spread is startling: in Jakarta in March 2005 19,000 people were treated in hospital for the condition - which causes pain and internal bleeding. More than 300 died. But many people do not go to hospital in a country where all services are pay-on-demand. And there is no central collection of data so the full extent of the outbreak, and how many did not seek treatment, even how many died from the virus, will never be known.

Singapore, which is known as a very clean city with excellent public health programmes, has reported that it had several thousand cases in 2008. The Malaysian government spends large amounts on education and protection for both its urban and rural population and periodically has outbreaks in urban centres although generally only several hundred people are affected at any one time.

But now there is some hope: researchers at the University of Queensland in Australia have found that the virus is carried by mosquitoes of a certain age. And, they found, if the mosquitoes don't reach that age, they can't transmit the disease.

So, by introducing into the mosquito population a bacterial disease (which is harmless to other species including humans) they can kill the mosquitoes before they become old enough to transmit dengue.

The bacterium is called Wolbachia. The experiments were bizarre: more than 10,000 mosquito embryos (they are tiny) were injected with Wolbachia. Most of the mosquitoes died within 15 days - half their usual life span. But even more interestingly, the Wolbachia was transmitted to their own offspring.

But the effect of the research is that the threat and spread of the disease may be reduced quickly and cheaply by introducing infected mosquitoes to breed with established colonies.