

In the Literature

Stan Deresinski, Section Editor

Dengue in the Home

Garcia-Rejon J, Loroño-Pino MA, Farfan-Ale JA, et al. Dengue virus-infected *Aedes aegypti* in the home environment. *Am J Trop Med Hyd* 2008;79:940–50.

The resurgence of dengue fever, which continues unabated in nearly 100 tropical and subtropical countries, led to an estimated 19,000 deaths in 2002 [1]. Dengue is most prevalent in high-density urban centers in which easily accessible water supplies are inadequate, causing the population to resort to household water storage. Stored household water provides a breeding site for *Aedes aegypti*, which breed primarily in artificial water containers. In the absence of a vaccine, the major

means of control is targeted environmental and ecosystem management. Unfortunately, the commonly used space spray application of insecticides and general community attempts at eradication of vector breeding sites have often had minimal lasting effect. This may, in part, be the result of the frequent emphasis on ultra-low-volume insecticide space sprays for adult mosquito control, which provide a rapid knock-down and mortality, with little or no residual effect.

To further investigate the role of the indoor home environment in the cycle of transmission, Garcia-Rejon and colleagues set out to determine the abundance of mosquitoes, particularly *Ae. aegypti*, in the homes of patients with confirmed diagnoses of dengue fever in Merida, Yucatan, Mexico. They demonstrated that, contrary to previous suggestions, the abundance of larvae and pupae in outdoor containers was not predictive of the number of indoor female *Ae. aegypti* infected with dengue virus. In the indoor environment, *Ae. aegypti* and *Culex quinquefasciatus* were predominantly found within bedrooms. Finally, dengue virus-infected female *Ae. aegypti* could be detected in the homes of patients with dengue fever for as long as 27 days (range, 4–27 days) after the onset of symptoms. They conclude that indoor control interventions, including insecticide fogging, should emphasize their application in bedrooms and dining rooms. They also conclude that the homes of patients with dengue, as well as surrounding homes, should be special targets of intervention as soon as possible after the diagnosis is made.

These procedures should be part of an integrated program of vector management [2]. Larvicides are often used, but one innovative method that has been explored is biological control by introduction of small crustaceans that feed on mosquito larvae. The placement of netting impregnated with long-acting insecticides over water receptacles has been reported to be

effective, as has the use of impregnated window curtains [3]. A trial from Haiti that was randomized by study site demonstrated a beneficial effect of insecticide-treated bednets [4].

Until a vaccine is available, control of dengue will require aggressive, ongoing, fully funded interventions implemented by well-organized international and national public health programs capable of engaging community members in the task.

References

1. World Health Organization. Better environmental management for control of dengue. Available at: <http://www.who.int/heli/risks/vectors/denguecontrol/en/index.html>. Accessed 2 April 2009.
2. Lloyd LS. Best practices for dengue prevention and control in the Americas. February 2003. Available at: http://www.ehproject.org/PDF/Strategic_papers/SR7-BestPractice.pdf. Accessed 2 April 2009.
3. Kroeger A, Lenhart A, Ochoa M, et al. Effective control of dengue vectors with curtains and water container covers treated with insecticide in Mexico and Venezuela: cluster randomized trials. *BMJ* 2006; 332:1247–52.
4. Lenhart A, Orelus N, Maskill R, et al. Insecticide-treated bednets to control dengue vectors: preliminary evidence from a controlled trial in Haiti. *Trop Med Int Health* 2008; 13:56–67.