

Mathematical assessment of impact of sterile insect technology on abundance of malaria mosquitoes

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In the absence of an effective and safe vaccine for use in humans, malaria control efforts are focused on the widespread use of chemical insecticides (in the form of larvicides, indoor residual spraying and insecticide-treated bednets) to control the immature and adult mosquito population and the treatment of those with symptoms using artemisinin-based therapy. Unfortunately, the widespread use of these insecticides and therapies has resulted in the evolution of vector and parasite resistance to the insecticides and drugs, respectively. This, coupled with the concerted global effort to eradicate malaria by 2030, necessitate the use of other control strategies, notably biological controls. The sterile insect technology (SIT) is one such strategies being widely considered (aimed at reducing the abundance of adult female mosquitoes). The talk will assess, via modeling, the population-level impact of SIT in combatting malaria mosquitoes in an endemic area. This study, which uses relevant data from malaria-endemic areas in sub-Saharan Africa, shows that the release of sterile male mosquitoes may either lead to eventual extinction or increase the long-term average adult mosquito density.

References

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