

## OPTIMIZATION OF PYRETHROID-IMPREGNATED MOSQUITO NETS

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At the edge of tropical cities, urban slum dwellers are prone to the highest levels of mosquito-borne diseases. Using permethrin at target treatment rates of 200-500 mg/m<sup>2</sup> for impregnation of mosquito nets, various degrees of control have been achieved against mosquitoes and malaria. Whether or not people have a house, the use of impregnated mosquito nets (IMN) can provide a high degree of protection against mosquito-borne diseases and haematophagous pests. Field results to date will be reviewed, including the remarkable 63-70% reduction of mortality among children in The Gambia protected by IMN with ICI permethrin against malaria vectors of the *Anopheles gambiae* complex.

Activity cycles of people and mosquitoes interact to influence the efficacy of this control method. Ideally, for protection against malaria transmission, people should use IMN indoors where anophelines are endophilic. In many situations, however, malaria vectors bite people outdoors before they go to bed (eg *Anopheles culicifacies* in India) or when people fail to use IMN efficiently (eg *An.balabacensis* in Sabah). These circumstances require socio-behavioural as well as entomological interventions against malaria transmission.

Because dirty mosquito nets have to be washed, a wash-resistant formulation of permethrin was developed. Field trial results showed this treatment to withstand at least 3 washes, whereas the efficacy of normal permethrin treatment was halved by each wash.

Other pyrethroids are more potent than permethrin. For example, lambda-cyhalothrin withstands repeated washing and is recommended for use at a rate of only 10 mg/m<sup>2</sup>.

The more potent pyrethroids such as lambda-cyhalothrin and deltamethrin may cause skin sensations and sneezing if people become excessively contaminated while treating bednets with standard EC or SC formulations. Therefore a less irritant microencapsulated formulation of lambda-cyhalothrin ('ICON' CS) has been developed. IMN treated with 'ICON' CS have longer residual efficacy without side-effects on people using them.