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Searching for Synergies in Malaria Control through Integrated Vector Management

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Combining malaria vector control tools, in particular insecticide-based tools, requires careful consideration. Responsibility to implement sound strategy extends beyond immediate alleviation of disease burden, to decelerating the diminishing returns of future control efforts through the spread of insecticide resistance. Vincent Corbel and co-authors¹ present a clustered randomised trial examining the combined efficacy of pyrethroid-impregnated bednets with either indoor residual spray (IRS) using carbamates, or a carbamate-impregnated plastic sheeting placed high up on household walls. The authors found no additional benefit (in terms of disease incidence or prevalence) of either combination over a control scenario in which only bednets were used. They suggested the short half-life of carbamate efficacy was responsible for the lack of additional benefit provided by these supplements to bednets. In their comment, published in the same issue of *The Lancet Infectious Diseases*, N'Guessan and Rowland² express disappointment with this explanation for lack of synergy.

More than just a lack of synergy, however, vector control tools restricted to a sub-population of humans within a community might risk exacerbating malaria transmission to the remaining individuals, once the transient community-wide benefits of enhanced mosquito mortality have faded.³ Provided the mosquito survives its encounter with the insecticide, which is increasingly likely with depleted insecticidal potency or increased resistance levels, its bite is deflected onto the more accessible hosts. Because longitudinal incidence data was not collected from all individuals in the community, it is difficult to speculate about the transmission dynamics. However, the 32% increased odds in incidence following 18 months of combining targeted bednets with IRS (compared to bednets alone), may allude to the after-effects of potentiated transmission.

It is important to acknowledge the fact that IRS, or insecticides on sheets placed in houses, combined with bednets can be distributed at the household level in different ways. For example, the tools can be distributed randomly, preferentially together or preferentially apart. Simulating these alternatives, we recently showed⁴ that distributing nets and IRS preferentially together at the household level, as was carried out in the trial of Corbel et al.,¹

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is the worst approach for capitalising upon any synergistic effect that these control tools might have. In the advent of the President's Malaria Initiative advocating the combined use of bednets and IRS,⁵ careful and regular monitoring is particularly crucial to negate any detrimental outcomes of integrated vector management, and to capitalise upon any synergisms.

References

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