ABSTRACT

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Malaria remains a significant public health challenge in the Republic of Ghana, where insecticide-treated nets (ITNs) have been a pivotal intervention in reducing the disease's burden. Previous research analyzing phase III RTS,S/AS01 vaccine trial data in Lilongwe, Malawi, revealed that bed net use was associated with a significant reduction in malaria cases. However, the specific impacts of bed net use in Ghana, particularly during this trial, remain unclear. It is also not clear whether different types of bed net usage, including perfect and imperfect use, had different associations with malaria incidence. This study evaluates whether using bed nets perfectly or imperfectly was associated with a reduction in malaria incidence, compared to not using bed nets at all, among children enrolled in the control group of the phase III RTS,S/AS01 vaccine trial in Kintampo, Ghana. We started with a univariate analysis without adjusting for confounding effects and then conducted a multivariate analysis that adjusted for potential confounders. For both analyses, we employed a mixed-effects Poisson regression model. Our univariate and multivariate analyses did not reveal a significant impact of bed net usage on malaria incidence in either model. Future studies could benefit from data with more consistent measurements of bed net usage in a controlled environment. Our analysis suggests that targeted interventions in Ghana should prioritize resources and support for younger children and households with lower socioeconomic status, as well as for children living in areas with higher estimated background malaria transmission intensity. This will allow us to enhance the overall effectiveness of existing interventions and reduce the burden of this disease among the most vulnerable populations.