



A Comparative Effectiveness Study of Two Insecticide-Treated Net Distribution Campaigns on Malaria Incidence in Children Under Five in Niger's Sahel Region

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Abstract

Malaria is a leading cause of illness and death among children under five in Niger's Sahel region. Insecticide-treated nets (ITNs) are a fundamental preventive tool, but their impact may depend on how they are distributed. While distribution strategies have evolved from routine health service-based approaches to mass community campaigns, direct comparative evidence of their effect on malaria incidence in this vulnerable group is scarce. This protocol describes a study to compare the effectiveness of two ITN distribution strategies—routine health facility-based distribution and a mass community campaign—on malaria incidence in children under five. The primary objective is to determine which strategy is associated with a greater reduction in confirmed malaria cases over a follow-up period. A quasi-experimental, comparative effectiveness study will be conducted in four health districts in Niger's Sahel region. Two districts implementing a mass campaign will be compared with two districts using routine distribution. A cohort of 1,600 children under five will be enrolled and followed prospectively. Malaria incidence, confirmed by rapid diagnostic test, will be collected through monthly active surveillance and health facility records. Household surveys will evaluate ITN ownership, use, and physical condition. Multivariate regression analysis will compare incidence rates, adjusting for potential confounders. This is a study protocol; no empirical findings are available. The anticipated primary outcome is the direction and magnitude of difference in malaria incidence rates between the two study cohorts. A key analysis will assess whether the mass campaign is associated with a pre-specified, clinically significant reduction in incidence compared to routine distribution. The study will produce evidence on the comparative effectiveness of two common ITN distribution strategies in a high-burden setting. This will help to inform malaria control policy and resource allocation in Niger and similar contexts. Findings will be used to formulate evidence-based recommendations for the Niger National Malaria Control Programme regarding optimal ITN distribution models. Results may also guide policy in other Sahelian countries with similar malaria epidemiology and health system constraints. malaria prevention, insecticide-treated nets, distribution campaigns, comparative effectiveness, children under five, Niger, Sahel This protocol outlines a

study designed to address a critical evidence gap in malaria vector control. It will provide practical, field-based data to directly inform strategic decisions on ITN delivery, contributing to more effective malaria prevention programmes in the region.

Keywords: *Malaria prevention, Insecticide-treated nets, Comparative effectiveness research, Paediatric epidemiology, Sahel region*

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