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NUMBER OF PERSONS SHARING A BED NET IS POSITIVELY ASSOCIATED WITH THE RISK OF *PLASMODIUM* INFECTION IN WESTERN KENYA: IMPLICATIONS FOR MALARIA PREVENTION

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Long-lasting insecticidal bed nets (LLINs) are a core tool for preventing malaria. While the World Health Organization (WHO) recommends one LLIN for every two persons in a household, a LLIN is often shared with three or more people. However, little is known about the relationship between number of persons per net and malaria risk. We assessed net sharing and the risk of *Plasmodium falciparum* infection among children in Gembe East, western Kenya. Infection was determined for children under 10 years of age with a rapid diagnostic test (RDT), and caretakers were interviewed about net use and sharing. Of 275 children studied, 233 (84.7%) reportedly slept under LLINs the previous night. The RDT-positive prevalence was 70.8% for net users and 81.0% for non-net users. The number of persons sleeping under a LLIN ranged from 1 to 6 (median=3), with infection prevalence increasing as more people slept (53.8% for one person, 71.0% for two person, 71.4% for three persons and 74.4% for four or more persons). Overall, infection among children who slept alone under a net was significantly lower than those of children sharing a net with two or more other persons (OR=3.92, 95%CI: 1.05-14.22 against two other person; OR=4.40, 95%CI: 1.02-19.97 against three or more other persons) while it was not significantly lower than that of children sharing a net with one other person (OR=2.22, 95%CI: 0.59-8.12). When the number of person per a net increased by one, the risk of infection increased 49% (95%CI: 1.02-2.27). These results suggest that the number of persons sleeping in a net should be fewer than three, and sleeping alone may further reduce the risk.

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ASSOCIATION BETWEEN INDOOR RESIDUAL SPRAYING OF INSECTICIDE AND IMPROVED BIRTH OUTCOMES AMONG HIV-INFECTED PREGNANT WOMEN IN UGANDA

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Despite effective interventions to prevent malaria during pregnancy, the risk of adverse birth outcomes among HIV-infected pregnant women living in sub-Saharan Africa remains high. A recent study demonstrated a reduction in adverse birth outcomes among HIV-uninfected pregnant women protected by indoor residual spraying of insecticide (IRS). Evidence

regarding its impact on HIV-infected pregnant women is lacking. To assess the association between IRS and preterm birth (gestational period < 37 weeks), low birthweight (< 2500 grams), and fetal/neonatal death, data was pooled from two clinical trials conducted before and after a large-scale IRS campaign in Tororo District, Uganda. Participants were HIV-infected pregnant women who received insecticide treated bed nets, daily trimethoprim-sulfamethoxazole, and combination antiretroviral therapy at study enrollment. Exposure was measured as the percentage of IRS protection experienced by the mother during her gestational period. Multivariate Poisson regression with robust standard errors was used to estimate adjusted risk ratios (aRR). Of the 565 women included in our analysis, 380 (68%), 88 (16%), and 97 (17%) women were protected by IRS for 0%, > 0-90%, and > 90% of their pregnancy, respectively. Compared to women with no IRS protection during pregnancy, IRS protection for > 90% of pregnancy was associated with a significantly lower risk of preterm birth (17.1% vs. 6.2%; aRR = 0.37; 95% CI: 0.16-0.84). Preterm birth risk decreased with increasing IRS protection, indicating a dose-dependent effect (p = 0.03). IRS protection for > 90% of pregnancy was also associated with a lower risk of low birthweight (18.5% vs. 9.3%; RR = 0.58; 95% CI: 0.25-1.32) and fetal/neonatal death (5.3% vs. 2.1%; RR = 0.25; 95% CI: 0.05-1.37), although these associations did not reach statistical significance. IRS may further reduce the risk of adverse birth outcomes among HIV-infected pregnant women who are already using currently available interventions to prevent malaria during pregnancy.

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EFFECTIVENESS OF VECTORS CONTROL INTERVENTION ON MALARIA INFECTION AND CLINICAL CASES, BENIN, WEST AFRICA

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The most commonly used methods to prevent mosquito bites are sleeping under the Long lasting insecticide treated net (LLIN) and spraying the inside walls of a house with an insecticide called indoor residual spraying (IRS). The present study aimed to evaluate the effectiveness of post deployment LLIN and IRS on *P. falciparum* infection and clinical cases. A case-control study was carried out among all age groups in the north-west Benin in 2014. Nine villages were included in the commune of Djougou (urban area) and in the commune of Cobly (rural area) respectively. A case of *P. falciparum* infection was defined as positive rapid diagnosis test. A total of 594 cases of infection and 1495 controls were recruited in urban area compared to 1030 cases and 1135 controls in rural area. The malaria clinical case was defined as positive thick blood films plus fever. A total of 112 cases and 1362 controls were recruited in urban compared 90 cases and 1445 controls in rural. The prevalence rate of *P. falciparum* infection was 36.0% and 70.0% among children aged two to nine years old in urban and rural area respectively. The use of LLIN was 38.9% in urban area and 50.9% in rural. The coverage of IRS was 95.8%. In urban area, the LLINs induced 50% significant reduction of infection in only one neighbourhood but any reduction in malaria clinical cases. In the rural area, a significant protection (49%) was obtained among all population only if the LLINs were associated to IRS. Malaria remains a major public health problem in Benin. It is an urgent need to build a strong surveillance system of malaria and evaluated as soon as possible what are working and which intervention need better management and a large behavior change communication.