

**Title:** A comparison of the effectiveness of Behavior Change Communication (BCC) plus repair kits and BCC alone in promoting repair of long-lasting insecticidal nets in Benin

**Authors:** Houtoukpe, A;<sup>1</sup> Benavente, L;<sup>1</sup> Ademikpo L;<sup>1</sup> Alao M; Adjala H;<sup>1</sup> Adjidja J;<sup>1</sup> Thomas P<sup>2</sup>; Smith S;<sup>3</sup> Akogbeto M<sup>4</sup>, Tokponnon F<sup>5</sup>.

### **Author Affiliations**

<sup>1</sup> PADNET (Project to Advance the Durability of Long Lasting Insecticide-treated Nets), Medical Care Development International, Cotonou, Benin

<sup>2</sup> US President's Malaria Initiative, Malaria Branch, Division of Parasitic Diseases and Malaria, US Centers for Disease Control and Prevention, Cotonou, Benin

<sup>3</sup> Entomology Branch, US Centers for Disease Control and Prevention, Atlanta, GA, USA

<sup>4</sup> Centre de Recherche Entomologique de Cotonou, Cotonou, Benin

<sup>5</sup> Programme national de Lutte contre le Paludisme Cotonou, Benin

We compared strategies to increase net durability in 2014. Three groups of 300 households (HH) were randomly assigned to two intervention arms and one control arm. Arm 1 received behavior change communication (BCC) messages; Arm 2 received BCC plus a net repair kit; Arm 3 was the control. Twelve villages in southeastern Benin were enrolled. Community health workers delivered BCC messages about preventing damage to long-lasting insecticidal nets (LLINs) caused by fire or sharp objects, and promoting repair as soon as holes appeared. Data were collected from all HH at 4-5 month intervals for 20 months. Net damage was measured using the WHO Proportional Hole Index (pHI). At 20 months the overall HH dropout rate was 21% (17% for Arm 1, 23% for Arm 2 and 24% for Arm 3). Only one of five control HH (Arm 3) reported hearing messages about net care or repair. Net attrition (LLIN not available to sleep under) was significantly lower in Arms 1 and 2 (9%), than in Arm 3 (16%) ( $p < 0.0001$ ). LLIN use among children under five years was higher among those receiving BCC and repair kits (83%) than those receiving only BCC (73%) ( $p = 0.02$ ). Intervention Arms 1 and 2 reported more net use (73% and 83%, respectively) than the control arm (63%) ( $p < 0.0001$ ). Frequent LLIN washing ( $>1$  wash/3 months) resulted in reduced net integrity in the control group. Reduced insecticide activity was also more common in the control arm (78%) than Arm 1 (69%) and Arm 2 (56%) ( $p < 0.0001$ ). The proportion of nets without holes was significantly higher in Arm 2 (53%) than in Arm 3 (38%) ( $p = 0.019$ ), but no difference was observed in the prevalence of holes between Arm 1 (41%) and the control arm (38%). Nets in Arms 1 and 2 showed more signs of repair (57% and 58%, respectively) than controls (22%) ( $p < 0.0001$ ). The proportion of nets with large and/or numerous holes ( $pHI > 63$ ) was significantly lower in Arm 1 (13%) and Arm 2 (9%) than in Arm 3 (36%) ( $p < 0.0001$ ). All LLINs in all three arms had good insecticide retention measured by x-ray fluorescence and WHO cone test. BCC messaging significantly increased care and repair practices in intervention villages in Benin. Whether these practices can prolong LLIN durability requires further study.