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**Abstract:**

Malaria is associated with more than 216 million episodes and an estimated 655,000 deaths annually worldwide. In Africa, it remains the leading cause of childhood and maternal morbidity and mortality, accounting for more than two-thirds (81%) of reported cases of disease, as well as approximately 91% of the deaths. Out of the five species of Plasmodium (*P. falciparum*, *P. vivax*, *P. ovale*, *P. malariae*, and *P. knowlesi*) that cause malaria in humans, *Plasmodium falciparum* is the most dangerous in Africa. In Kenya, a third of outpatient attendance to health facilities are due to malaria and 26,000 children die annually from it. In recent years following a massive introduction and campaign for the use of insecticide-treated bed nets (ITNs), morbidity and mortality particularly of pregnant women and children has declined significantly. However, many challenges regarding ITN distribution, acceptance, consistent and appropriate use persist, and there has also been lack of follow-up studies on insecticide treated bed nets especially after free mass distribution campaigns. To address this gap, a cross-sectional survey on ITNs was conducted in southern coastal Kenya after the 2006 mass distribution campaign. The study was conducted in Msambweni, Kwale and Kinango districts where malaria is endemic. The objective of this study was to determine insecticide treated bed nets ownership, use and maintenance behavior in Kwale, Msambweni and Kinango districts in Kenya. A total of 1176 households were selected, and quantitative data was collected using a questionnaire and inspection of nets. All data were entered into a database and analyzed for patterns and associations. The results have shown high (80%) coverage of bed nets (treated or untreated) and moderate use (64%). Cost and lack of money were the main barriers to net ownership. Household ownership of any net varied by district ( $\chi^2 = 104.225$ ,  $p=0.001$ ), Kinango District (94%) had the highest proportion of households that own bed nets. Discrepancies in use of nets were also noted among the three districts ( $p=0.001$ ,  $F=37.050$ ). Kinango District had the highest (3.86) mean number of people sleeping under net per household, followed by Msambweni District (3.3) and Kwale District (2.24). Sixty nine percent of the total nets inspected had more than 5 holes of  $\geq 2.7$ cm in diameter and were classified as damaged. Presence of intact (not damaged) nets varied by district ( $p=0.001$ ,  $F=16.000$ ). Kinango District had the highest (1.19) mean number of nets that were still intact per household followed by Kwale District (0.73) and Msambweni District (0.72). Appearance of holes diminished the useful life of 53% of nets by the end of one year of net use ( $\chi^2 = 7.9468$ ,  $p=0.0188$ ). Only a small percentage (21%) of the nets with holes were repaired ( $\chi^2 = 99.7408$ ,  $P=0.001$ ). The owners of a substantial (31%) number of nets did not adhere to the recommended washing frequency and this was not significantly associated with the condition of the net ( $\chi^2 = 1.9097$ ,  $p=3849$ ). Sixty nine (69%) of the retreated nets were LLITNs ( $\chi^2 = 38.0734$ ,  $P=0.001$ ) indicating lack of knowledge as to which nets should be retreated. Eighteen percent of the total households surveyed misused their nets. Presence of net misuse was significantly associated with district of residence ( $\chi^2 = 10.047$ ,  $P=0.018$ ). Majority (42%) of the misused nets were used as chicken shed. This study provides valuable information for the Ministry of Public Health and Sanitation and other Government units, NGO's and community groups in planning, execution and assessment of ITNs programmes. In view of the foregoing, it is recommended that universal distribution of LLITNs should be conducted at much shorter intervals. Evidence from this study demonstrates that physical deterioration of the nets seems to occur at a faster rate.