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Cohort trial reveals community impact of insecticide-treated nets on malariometric indices in urban Ghana

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ABSTRACT

The efficacy of insecticide-treated nets (ITNs) in prevention of malaria and anaemia has been shown in rural settings, but their impact in urban settings is unknown. We carried out an ITN intervention in two communities in urban Accra, Ghana, where local malaria transmission is known to occur. There was evidence for a mass or community effect, despite ITN use by fewer than 35% of households. Children living within 300 m of a household with an ITN had higher haemoglobin concentrations (0.5 g/dl higher, P=0.011) and less anaemia (odds ratio 2.21, 95% CI 1.08–4.52, P=0.031 at month 6), than children living more than 300 m away from a household with an ITN, although malaria parasitaemias were similar. With urban populations growing rapidly across Africa, this study shows that ITNs will be an effective tool to assist African countries to achieve their Millennium Development Goals in urban settings. [Registered trial number ISRCTN42261314; http://www.controlled-trials.com/ISRCTN42261314]

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1. Introduction

All large-scale insecticide-treated bednet (ITN) trials have been conducted in rural areas.^{1–4} The efficacy of ITNs has been proven and an estimated 5.5 lives (95% CI 3.39–7.67) may be saved each year for every 1000 children protected with ITNs.⁵ However, the efficacy of ITNs in the urban setting has not been documented. It has been suggested that urban residents go to bed later than rural residents⁶ and that increased densities of nuisance biting

by *Culex* spp. in cities might increase ITN uptake.⁷ However, since urban areas are warmer than rural areas,^{8,9} ITN use may be lower.^{10–12} One key issue that has yet to be addressed is whether the mass effect, whereby malaria risk is reduced in residents of communities with high bednet use, even if they do not use a net themselves,^{13–17} is also observed in urban areas.

We conducted a prospective, controlled cohort study to assess the impact of ITNs on a community in urban Accra, Ghana. We assessed the effect of ITNs on malaria parasitaemia, anaemia, nutritional status indicators and mosquito vectors. The rationale for using these outcomes was that the WHO is currently exploring the use of anaemia as a measure of the impact of malaria interventions, ¹⁸ and in Kenya ITNs were associated with improved weight-forage score. ^{19,20}

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