Can IRS provide additional protection against clinical malaria over current best practice of LLINS?

a cluster-randomised controlled trial in children in The Gambia

Kalifa BOJANG

MRC LABORATORIES
BACKGROUND

There is much historical data on the efficacy IRS, particularly with DDT, in reducing malaria considerably. However, there is limited data on:

– Efficacy of IRS versus LLINS

– Efficacy of IRS plus LLIN
• Climate typical sub-Saharan with a long dry season (Nov-June) and a shorter rainy season

• Most malaria transmission occurs during the short rainy season (July-Oct)
Clinical

• **Primary objective**: To assess whether IRS with DDT plus LLINs provide added protection against clinical malaria in children compared with LLINs alone.

• **Secondary objectives**: To assess whether IRS with DDT plus LLINs provide added protection against anaemia and parasite prevalence in children compared with LLINs alone.
Study objectives

Entomological

• **Primary objective:** To assess whether IRS with DDT plus LLINs reduces vector density inside houses when compared with LLIN alone.

• **Secondary objective:** To assess whether IRS with DDT plus LLINs reduces the number of infectious bites to which children are exposed compared with LLIN alone.
Study design

- A two armed cluster-randomised controlled trial
- Unit for randomization will be a village or groups of small villages
- Only villages ≥2km from the nearest study village will be selected to reduce any spill-over effect
- All clusters will receive LLINs and half will receive IRS in addition
- 35 villages/village clusters will be recruited in each arm of the study
- An average of 100 children aged 6 months to 13 years will be recruited from each village or cluster of villages.
Follow-up

• Passive surveillance for malaria during malaria transmission season

• Cross-sectional survey at the end of malaria transmission season to estimate the prevalence of *Plasmodium falciparum* infection and prevalence of anaemia.

• Exposure to malaria parasites indoors will be assessed using light and exit traps fortnightly during the rainy season
Study end points

Malaria morbidity.

• **Primary**: Incidence of clinical episodes of malaria

• **Secondary**: Mean haemoglobin and parasite prevalence at the end of the transmission season
Endpoints

Malaria transmission.

• **Primary**: The mean number of female *An. gambiae* s.l./light trap/night inside sleeping rooms.

• **Secondary**: The entomological inoculation rate (EIR) in each study group will be estimated as the mean number of sporozoite infective bites/child/season)
Sub studies

- To assess whether an alternative insecticide could replace DDT in this setting (2011).

- Cost-effectiveness studies (2011)
Collaborators

**MRC**
Margaret Pinder
David Conway
Musa Jawara
David Jeffries

**LSHTM**
Steve Lindsay (PI)

**Gambia Government**
Balla Kandeh
Lamin Jarju