



Preparation of experimental huts for evaluation of IRS and LLIN or other treated products

With contributions from CREC, IHI, and KCMUCo

WHOPES guidelines- Guidelines for testing mosquito adulticides for indoor residual spraying and treatment of mosquito netsⁱ

IRS causes a level of “contamination” to the hut that greatly exceeds that of ITNs, and between trials it will be necessary for experimental huts to be completely cleaned and refurbished before each new trial. Refurbishing should include removing any sprayed surfaces such as plastering on walls, ceiling and doors, and disposing contaminated waste according to local regulations. After replastering the walls and replacing the ceiling the hut should be carefully cleaned, and absence of contamination demonstrated by appropriate bioassay tests.

Newly constructed huts should be allowed for a few weeks before use for seasoning of mud plaster on walls. Mosquito attractiveness and absence of scavengers in the hut is then checked.

Purpose

Verandah-trap experimental huts are used to evaluate IRS or LLIN products under controlled field conditions against free-flying, wild populations of malaria vectors. Huts are made of brick walls plastered with mud or cement-concrete on the inside, with a corrugated iron roof and are built on concrete plinths surrounded by water-filled moats to prevent entry of scavenging ants. Ceilings made of plastic sheeting or woven thatched materials are provided. Prior to each experimental hut trial with an insecticidal product, the huts must be refurbished and thoroughly cleaned to prevent contamination from previous hut trial. This SOP guides the refurbishment and cleaning of experimental huts in preparation for a trial.

1. Refurbishing and cleaning Procedure

- a. Removal of previous insecticide-treated/contaminated surfaces
 - i. Remove all mosquito traps from the huts.
 - ii. Remove mattresses from the huts and lay them under the sun for 4-5 hours.
 - iii. Wash trap netting and metal baffles in soap and water, rinse well and allow to dry in the sun.
 - iv. Remove insecticide treated material from huts if they were used in a previous trial.



- v. Ensure workmen are wearing respirators and goggles.
 - vi. Wet walls with water thoroughly to reduce dispersal of dust and insecticide, if any.
 - vii. Remove surface of concrete or mud from walls using a chisel or other chipping tool.
 - viii. Remove floor lining from the huts and dispose of in the chemical waste store.
 - ix. Sweep the chippings into a biohazard bag and put into the field waste disposal area.
- b. Re-plastering the walls
- i. Walls can be plastered with mud, cement, plywood, or thatch depending on study design
 - ii. Prepare the mud or cement in the appropriate ratio
 - iii. Prepare the ceilings in the same way as the walls. If ceilings are to be left untreated as per protocol, cover with plastic sheeting.
 - iv. Apply the mud or cement to the wall, approximately 3 inches deep.
 - v. Leave any fresh plaster to set and apply water to the concrete surface periodically starting 1 day after plastering and up to about 3 weeks to avoid cracking.
 - vi. The surface should be allowed to set and harden before applying insecticide. Mud walls may need a few weeks to season.
- c. General Cleaning
- i. Put on a pair of nitrile gloves.
 - ii. Label all cleaning equipment according to treatment.
 - iii. Allocate cleaning equipment to each treatment.
 - iv. Sweep the floor using the allocated broom to remove dust.
 - v. Mix the water and detergent into a bucket.
 - vi. Mop the floor thoroughly to remove any insecticide residues remaining from the IRS treatment application. Make sure that you do not splash any of the detergent onto the walls while mopping.

- d. Disposal of wastewater and cleaning material used
 - i. As water used for cleaning huts will contain insecticide residue, wastewater should be disposed of according to procedure in study protocol.
 - ii. All other disposable cleaning equipment such as mops and brushes should be disposed of according to study design.
 - iii. Do not re-use cleaning equipment from one study to the next as this may lead to cross-contamination of huts with insecticides.

- e. pH testing walls and final preparation
 - i. Scrap approximately 5g of surface material into a petri dish.
 - ii. Add 15 mL DI water and mix with a spoon. Take a strip of litmus paper and dip in the solution for 5 seconds. Use the color chart on the litmus paper to determine the pH. The acceptable range for concrete/mud is pH 6-8. If the pH is above this range, test again after 1 week.
 - iii. Search rooms, verandahs, and reinstated cleaned exit traps for ants. If ants are found put down clean petri dishes containing a mixture of boric acid and sugar (50:50 ratio) in four corners for 1-2 days to kill them (See SOP Removal of ant infestations from experimental huts).
 - iv. Search and remove spiders and spider webs.
 - v. Remove and clean any curtains separating room compartments.
 - vi. Check the polyethylene plastic in the verandah for any holes. If holes are present, replace the plastic sheeting.
 - vii. Repair any holes in the screened verandahs and fill any cracks or holes in the walls.
 - viii. Check uniformity of the baffles in the “entry eave gap” and the “exit eave gap.” The gap should measure 5 ± 2 cm when measured from inside of hut.
 - ix. Clean the “sugar bowls” with 10% bleach and rinse with water.
 - x. Drain the water in the moat, clean the moat and then refill with clean water.

ⁱ http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_WHOPES_GCDPP_2006.3_eng.pdf