Insecticide Resistance Work Stream
Thursday 20th Feb. 09.00-12.00
**Insecticide Resistance Work Stream**

Presentations were given outlining insecticide resistance data from Uganda, Cote d’Ivoire and Burkina Faso.

**UGANDA**

Study areas were divided into three groups based on the vector control interventions present: A – LLINs + IRS; B – LLINs only; C – no interventions but LLINs distributed during the survey.

Entomological data were correlated with use of insecticide in agriculture and malaria prevalence.

Insecticide resistance bioassay data showed that pyrethroid resistance was widespread. Carbamate resistance had appeared at two sites.
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COTE D’IVOIRE

High levels of resistance to all classes of insecticides were found in *An. coluzzii* (= *An. gambiae* M form). This is the first time that levels of pyrethroid resistance have been recorded of between 600 – 1000 fold.

Potent CYP6 genes were involved in metabolising the insecticides across the classes.

These genes are spreading across West Africa and have the potential for seriously limiting future options for control.
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**BURKINA FASO**

Four different techniques were investigated:
1. WHO diagnostic dose
2. Varying the time of exposure to the WHO diagnostic dose
3. Exposing wild adults reared from larvae to bed nets using the cone bioassay
4. CDC bottle bioassays using varying concentrations of insecticides

Varying the time of exposure to the WHO diagnostic dose showed that the LT50 times increased 10 fold in one year. Compared with the Kisumu susceptible strain, field populations were 650 fold more resistant. The problem was the length of time needed to get LT50 figures introduced inaccuracies in the data analysis.

Cone bioassays on nets did not kill wild adults reared from larvae at the same level as susceptible mosquitoes.
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CDC bottle bioassay results showed about a 1000 fold increase in resistance on two concentrations of deltamethrin compared to Kisumu strain.

These studies stressed the fact that the WHO diagnostic dose is only the first step in the collection of resistance data and that additional procedures need to be undertaken to get a clear idea of the scale of the resistance problem.
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**COCHRANE REVIEW OF THE IMPACT OF RESISTANCE ON THE EFFICACY OF LLINS**

No data were available to link LLINs with malaria cases in the face of resistance.

Entomological indicators were therefore used to analyse the data. Only 56 published studies out of 1700 could be used for the review.

The conclusions were that the data were too variable to draw statistically valid conclusions.

The review underlines the need for standardized methodologies to be used by all who conduct these kinds of trials.
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Extensive discussion followed.
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Work Stream Priorities – 2014

1. Advocacy for implementing IRM policies
   1. Create a core group of experts who can be contacted when necessary to advise countries on interpretation of data and the way forward. Use the sub-regional networks and ANVR focal points to drive this.
   2. Within 2 months, circulate the Zambian / Equatorial Guinea IRM plans and the process they went through to draw up the plans. As more countries go through the same process, their experiences can also be shared.

2. Monitor how countries handle IRM and keep track of resistance data.

3. Recommend to VCTEG that:
   1. They standardize resistance intensity tests (recommend which tests should be used and how they should be carried out)
   2. Revive the WHO collaborating centres to assist with specialized tests and to assist resource-poor countries in generating baseline data
   3. Draw up guidelines on how to monitor operationally significant resistance
   4. Provide guidance on best practice for carrying out field trials so that the quality of the trials is sufficient for inclusion in a Cochrane Review.