HISTORY OF MALARIA VECTOR CONTROL IN BENIN

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The most beautiful and the most dangerous mosquito so far encountered in under the tropics: *Anopheles gambiae*
1900: Beginning of colonial period

Implementation of the first health facilities

有益 Beginning of chemoprophylaxis (CQ)
有益 Beginning of prevention against mosquito bites

Nets

Destroying of mosquito breeding sites
World Program on Malaria Eradication

Area concerned in Benin: all southern Benin

Method: IRS (DDT, DL) + large-scale CQ chemoprophylaxis

Indoor residual spraying (IRS)

Chemoprophylaxis (CQ)
1960 - 1967:

1. Large-scale CQ chemoprophylaxis
2. Chemotherapy of fever cases
1983 - 1988

**IRS** (DDT, Malathion, Deltamethrin)

**BY:** MOH (NMCP + DHAB)

**Area:** peri-urban area of Cotonou

**Lessons learnt:** communities have appreciated this approach which was stopped.

**In 1988**

large-scale CQ chemoprophylaxis for economic problems
Since 1995

The main malaria vector control approach based on the use of nets, ITNs and LLINs

The approach is based on 3 strategies:

1. Promotion and distribution of ITNs/LLINs
2. Assuring availability of ITNs/LLINs for target groups
3. Assuring uninterrupted supply of ITNs/LLINs
Advantages and Disadvantages of ITNs

**ADVANTAGES**

1. Good in reducing of malaria Transmission.
2. Relatively cheap compare to other control tools.
3. Relatively easy for implementation
4. Good impact on malaria control.

**LIMITATIONS**

1. Low acceptability in some communities.
2. Low Re-impregnation rate
3. Emergence of Resistance to pyrethroids.

*Insecticide treated nets*
ITNs Constraints: The Re-impregnation

Low levels of ITNs re-impregnation rate in most communities
Identifying factors altering the acceptability of ITNs in West African Communities.

The types of beds and the sleeping organisation in most households influence the receptivity to ITNs.

Which type of ITNs can we use to cover such number of kids?

How to erect ITNs under such sleeping conditions?

Source: Burkina Faso
Distribution of $kdr$ mutations in $An.~gambiae$ populations in Africa

- Absence of $kdr$ mutation
- Presence of $kdr$ mutation Leu-Phe
- Presence of $kdr$ mutation Leu-Ser
AN OTHER KEY PROBLEM TO WATCH OUT: The Quality of ITNs

Results from sociological studies: Several complaints from populations

- ITNs are tearing too fast.
- ITNs are burning too fast

Entomological data from the same regions

ITNs newly removed from packaging bags and brought in to contact with susceptible strains of mosquito (Kisumu) could not induce significant mortality rates during bioassay (Less than 20%)

DO ALL ITNs SOLD OR DONATED MEET WHO STANDARDS?

Insecticide treated nets
The necessity to screen the quality of ITNs to be used by communities.

Baseline data on a quality control study conducted on ITNs in the Rep. of Benin

Rational of the study: special Request from the Ministry of Health

Number of ITNs tested: 14 samples of ITNs from shops and for free distribution.

Tests conducted: Efficacy and Durability tests
It is necessary to screen the quality of ITNs to be used by communities.

*Efficacy tests conducted on ITNs*
The necessity to screen the quality of ITNs to be used by communities.

Efficacy tests conducted on ITNs

Tunnel Test
The necessity to screen the quality of ITNs to be used by communities.

Qualitative screening of insecticides in net fibbers
The necessity to screen the quality of ITNs to be used by communities.
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Inflammability Test conducted on ITNs
The necessity to screen the quality of ITNs to be used by communities.
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**From 2008: PMI Plan**

- **Combination of 2 methods:** protection of communities using distribution of LLINs + IRS
- **First site:** Porto-Novo, Águégué, Sème (protection of 350,000 inhabitants)
- **Phase III trial** to assess the protective efficacy of (ITNs) + (IRS) with a non-pyrethroid insecticide in an area where *Anopheles gambiae* s.s. has high levels of pyrethroid resistance.

**Research activity to be done by CREC as support to the first trial**

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**Perspectives**

- Distribution of nets, ITNs, LLINs
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Evaluation of ITNs + IRS (with non-pyrethroid) in Phase II

Objective

- To chose the best non-pyrethroid insecticide for IRS for Benin
- To manage *An. gambiae* s.s. pyrethroid resistance and promote continued efficacy of LLINs.
Sociological and entomological evaluation of P-Nov IR trial

Period of study: before IRS and post IRS

- Data collection on perception of communities on IRS operation
- Entomological data collection (species of Anopheles, density, resistance, mechanism of resistance, infectivity, dynamic, behaviour)
Thank You