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IRS POLICY IN UGANDA AND TECHNICAL UPDATES

Michael Okia,
Senior Entomologist/MCP - MOH
Outline of Presentation

• Introduction

• IRS Policy in Uganda

• Technical updates on IRS in Uganda

• Challenges in IRS Implementation

• Way forward and Recommendations
Introduction: Indoor Residual Insecticide Spraying (IRS)

- IRS is the application of liquid insecticides with a long-lasting residual effect inside human and animal dwellings, in order to kill adult mosquitoes (and other insects) coming to rest on these surfaces.
- A lethal dose of the insecticide is absorbed by mosquitoes and other insects that come into contact with the sprayed surface and they die.
- Used extensively during the Malaria Eradication Era (1950s-1970s).
- Mostly in Europe, the Americas and parts of Asia, very limited use in Africa, in pilot projects.
- IRS again taking prominence in malaria control in Africa since WHO’s pronouncement in support of it in June 2006.
Rationale behind IRS - Advantages

- Rapidly reduce vector numbers
- Reduce vector longevity, i.e. fewer vectors survive long enough to be able to transmit malaria. Thus it interrupts transmission very fast
- Effective for several months on vector mosquitoes as well other household pests
- High coverage can be rapidly achieved through campaign approach
- No risk of fire hazard when used in congested situations like boarding schools and institutions as the case with ITNs
- Cost-effective
- No cost to end-user
IRS in Uganda

• IRS was first used in Uganda from 1959-1963 in Kigezi (Rukungiri and Kanungu Districts) during the Malaria Pilot Eradication Project:
  – Malaria was almost eliminated
  – An. funestus was practically eliminated
  – Populations of An. gambiae s.l. populations were greatly reduced

• From 1997 to May 2006, IRS was conducted in Uganda on an ad hoc manner mainly for the control of malaria epidemics in highland districts of the country

• IRS is effective because the major malaria vectors in Uganda: Anopheles gambiae s.s., An. arabiensis and An. funestus anthropophilic, endophilic and endophagic, with peak of biting activity between 10.00 p.m. and 6.00 a.m.
Indoor Biting Cycle of *An. gambiae s.l.*, *An. funestus* and *An. coustani*, in Apac District, Feb 08

![HLC Biting Behavior Graph](image-url)
Indoor Biting Cycle of *An. gambiae* s.l. and *An. funestus*, the major malaria vectors in Kumi District, Nov 08
Current Areas of IRS Operations

• IRS on a large scale was re-introduced in Uganda in 2006 after more than 40 years – in Kabale District.

• Since then, IRS activities have been conducted in 9 districts

• IRS is being conducted in both epidemic and endemic settings
Recent IRS Achievements in Uganda

- Achieved high spray coverage rates of >85% of targeted houses in 9 districts so far sprayed

- 746,024 structures sprayed in 9 districts during First Round of IRS

- High compliance and acceptance from community members

- More than 2 million people protected in past 2 years in 9 districts

- Rapid decline of malaria:
  - cases (OPD Attendance)
  - parasitaemia
  - Admissions
## Performance of IRS 2006/2008

<table>
<thead>
<tr>
<th>District</th>
<th>HH Sprayed</th>
<th>Pop’n Protected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabale (1st round)</td>
<td>103,329 (96.2%)</td>
<td>488,509</td>
</tr>
<tr>
<td>Kabale (2nd round – Targeted 60%)</td>
<td>76,084 (97.5%)</td>
<td>364,784</td>
</tr>
<tr>
<td>Kanungu (75% of district targeted)</td>
<td>45,321 (100%)</td>
<td>191,399</td>
</tr>
<tr>
<td>Kitgum (IDP Camps) – 1st Round</td>
<td>84,007 (90.5%)</td>
<td>371,846</td>
</tr>
<tr>
<td>Kitgum (2nd round)</td>
<td>83,900 (88.9%)</td>
<td>386,094</td>
</tr>
<tr>
<td>Pader (IDP Camps only - 1st round)</td>
<td>138,458 (97.0%)</td>
<td>538,752</td>
</tr>
<tr>
<td>Pader (2nd round)</td>
<td>162,281 (95.0%)</td>
<td>661,327</td>
</tr>
<tr>
<td>Amuru (1st round)</td>
<td>102,247 (98.5%)</td>
<td>399,175</td>
</tr>
<tr>
<td>Gulu (1st round)</td>
<td>122,607 (99.9%)</td>
<td>497,164</td>
</tr>
<tr>
<td>Oyam (1st round)</td>
<td>96,155 (93.9%)</td>
<td>315,595</td>
</tr>
<tr>
<td>Apac (1st round)</td>
<td>111,534 (92.4%)</td>
<td>322,697</td>
</tr>
<tr>
<td>Katakwi (1st round)</td>
<td>55,916 (85.0%)</td>
<td>172,266</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>981,730 (78.7%)</td>
<td>3,822,767</td>
</tr>
</tbody>
</table>
Proposed IRS Policy in Uganda

Background
• Indoor residual spraying (IRS) is one of the most effective ways of controlling malaria transmission, rapidly achieving large-scale impact at a low cost.
• It involves periodic spraying inside houses with recommended persistent insecticides to reduce the life span and density of mosquitoes.

Policy Statement
• IRS will be applied in both endemic and epidemic prone areas in a systematically phased manner using the WHO Pesticide Evaluation Scheme (WHOPES) approved insecticides.

Policy Goal:
• To contribute to the reduction of transmission and gradual elimination of malaria in Uganda.

Policy Objectives
• To attain and sustain at least 85% coverage of the targeted households.
## WHO Recommended Insecticides for IRS

<table>
<thead>
<tr>
<th>Compound and Formulation</th>
<th>Class</th>
<th>Dosage g/m²</th>
<th>Duration effective (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha-cypermethrin – WP; SC</td>
<td>P</td>
<td>0.02 – 0.03</td>
<td>4-6</td>
</tr>
<tr>
<td>Bendiocarb – WP</td>
<td>C</td>
<td>0.10 – 0.40</td>
<td>2-6</td>
</tr>
<tr>
<td>Bifenthrin – WP</td>
<td>P</td>
<td>0.025 – 0.050</td>
<td>3-6</td>
</tr>
<tr>
<td>Cyfluthrin – WP</td>
<td>P</td>
<td>0.02 – 0.05</td>
<td>3-6</td>
</tr>
<tr>
<td>DDT - WP</td>
<td>OC</td>
<td>1.0 – 2.0</td>
<td>&gt;6</td>
</tr>
<tr>
<td>Deltamethrin – WP &amp; WG</td>
<td>P</td>
<td>0.010 – 0.025</td>
<td>3-6</td>
</tr>
<tr>
<td>Etofenprox – WP</td>
<td>P</td>
<td>0.10 – 0.30</td>
<td>3-6</td>
</tr>
<tr>
<td>Fenitrothion – WP</td>
<td>OP</td>
<td>2.0</td>
<td>3-6</td>
</tr>
<tr>
<td>Lambdacyhalothrin – WP &amp; CS</td>
<td>P</td>
<td>0.02 – 0.03</td>
<td>3-6</td>
</tr>
<tr>
<td>Malathion - WP</td>
<td>OP</td>
<td>2.0</td>
<td>2-3</td>
</tr>
<tr>
<td>Pirimiphos-methyl – WP; EC</td>
<td>OP</td>
<td>1.0 – 2.0</td>
<td>2-3</td>
</tr>
<tr>
<td>Propoxur - WP</td>
<td>C</td>
<td>1.0 – 2.0</td>
<td>3-6</td>
</tr>
</tbody>
</table>

WP = wettable powder, SC = suspension concentrate, EC = emulsifiable concentrate, CS = Capsule suspension, WG = Water dispersible granules
C = carbamate, OC = organochlorine, OP = organophosphate, P = pyrethroid
IRS Strategies (1)

• MOH to establish structures and systems for managing IRS activities from the national to the sub-county level.
• Rigorous advocacy, IEC & community sensitization campaigns to be conducted before and during spraying.
• Insecticides and relevant equipment for IRS shall be registered by the NDA in consultation with the NMCP and the VCD. Registration shall conform to WHO specifications and standards.
• Private companies and NGOs offering IRS to the public shall be registered with the MOH, shall offer these services according to NMCP guidelines, and shall work within the national IRS structures and systems.
IRS Strategies (2)

• Importation and quality of insecticides for IRS and net treatment will be monitored by NDA.

• Adequate regulatory control and enforcement measures will be put in place to prevent unauthorized and un-recommended handling and use of insecticides for IRS.

• There shall be a Multi-sectoral Monitoring and Evaluation Task Force to ensure the safe and correct application of residual insecticides and safe disposal of the by-products.
IRS TECHNICAL UPDATES
Technical updates on IRS in Uganda

• Since WHO’s September 2006 pronouncements, IRS is conducted both in epidemic and endemic areas

• MOH is emphasizing:
  – IRS in endemic areas in order to drastically reduce vector populations, thus reducing malaria transmission
  – Use of longer lasting insecticides (>6 months) to enable spraying once a year only
  – DDT 75% WP, Icon 10% CS and Deltamethrin 25% WG currently fulfill the criteria
  – Other insecticides e.g. Vectron to be tested soon in Uganda
  – Longer acting OPh insecticides soon coming in market
Technical updates on IRS in Uganda

• Mosaic and rotational use of insecticides from different Classes (Py, C, OCh, OPh) are used to manage the development of insecticide resistance

• MOH also implementing IRS in combination with MDA for faster reduction of malaria transmission

• Excellent results achieved in Katakwi District

• Extending the strategy to other districts
Clinical malaria cases reported in Katakwi District (Eastern Uganda) Jan 2008 - Mar 2009
Technical updates on IRS in Uganda

- The following have to be monitored during IRS implementation:
  - Vector susceptibility
  - Insecticide decay rates
  - Species composition
  - Vector density
  - Vector behavior
  - (Sprorozoite rates)

- OPD attendances
- IP admissions and deaths
- Slide positivity rates
- Quality of spraying using bio-assay tests
Challenges in IRS Implementation

• Suspicion of a new programme like IRS – e.g. community concerns raised in various areas of the country

• Economic interests by both local and foreign business community over the health of the *wananchi* – Thus, opposition to DDT use by environmentalist and Organic farmers/processors

• Uncalled for Court Injunction, with resultant delay in program implementation

• Misinformation about DDT - thus, less districts (8 instead of 15) to be sprayed in 2009 and more unnecessary malaria-related deaths

• IRS currently mainly dependant on donor funds
Way Forward and Recommendations (1)

• Scale-up IRS country-wide – need for increased funding to sustain IRS,
  – Govt to increase resource allocation to IRS
  – NGOs should raise funds and implement IRS – Pilgrim is commended for taking initiative
  – Seek for additional funding from GF, USAID, WHO and other partners

• High level advocacy, IEC/BCC to address misconceptions and mis-information about IRS – Clear role for NGOs
Way Forward and Recommendations (2)

• Continue capacity building for IRS, both at national and district level for effective implementation of IRS

• Close supervision and monitoring of to ensure environmental compliance and quality of IRS

• Vector insecticide resistance status to guide IRS implementation

• We cannot talk of Malaria Elimination without vector control!
THANK YOU!
Way Forward

• Scale-up IRS country-wide - Adequate funding to sustain IRS

• High level advocacy and intensive community sensitization to address the mis-information about IRS especially using DDT – a big role for NGOs

• Continue capacity building for IRS, both at national and district level for effective planning, implementation and monitoring of IRS

• Close supervision and monitoring of IRS implementation

• Establish sentinel sites for monitoring insecticide resistance status to commonly used PH insecticides

• We cannot talk of Malaria Elimination without vector control!
Way Forward (2)

• High level advocacy and intensive community sensitization to address the mis-information about IRS especially using DDT and to ensure consistent and correct use of ITNs

• Close supervision and monitoring of VC interventions

• Establish sentinel sites for monitoring insecticide resistance status to commonly used PH insecticides

• We cannot talk of Malaria Elimination without vector control!
Impact of IRS on malaria globally

- IRS eradicated malaria transmission in Europe, USA, the former USSR, and the Caribbean by 1967.

- IRS greatly reduced malaria transmission in several countries in SE Asia, Latin America, & parts of Africa between the late 1950s and 1980s.

- About 700 million people or more than half of the previously exposed populations were no longer at risk.

- In just under two decades, IRS had prevented the deaths of more than 500 million people due to malaria that would otherwise have been inevitable.

- Since then, decreasing use of IRS has been associated with a lack of malaria control and in some cases resurgence of malaria in many countries.
<table>
<thead>
<tr>
<th>Country</th>
<th>Year before DDT use</th>
<th>No. of cases</th>
<th>Year after DDT use</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuba</td>
<td>1962</td>
<td>3,519</td>
<td>1969</td>
<td>3</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1954</td>
<td>4,417</td>
<td>1969</td>
<td>0</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1943</td>
<td>8,171,115</td>
<td>1958</td>
<td>800</td>
</tr>
<tr>
<td>India</td>
<td>1935</td>
<td>&gt;100 million</td>
<td>1969</td>
<td>285,962</td>
</tr>
<tr>
<td>Italy</td>
<td>1945</td>
<td>411,602</td>
<td>1968</td>
<td>37</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>1937</td>
<td>169,545</td>
<td>1969</td>
<td>15</td>
</tr>
<tr>
<td>Taiwan</td>
<td>1945</td>
<td>&gt;1 million</td>
<td>1969</td>
<td>9</td>
</tr>
<tr>
<td>Sri Lanka (Ceylon)</td>
<td>Before 1950</td>
<td>&gt;2 million</td>
<td>1963</td>
<td>17</td>
</tr>
</tbody>
</table>
Impact of reducing House spraying using DDT

House Spray Rates, 1965-92, and Cumulative Malaria Cases, pre- vs. post-1979
(Brazil, Colombia, Ecuador, Peru, Venezuela)