IDI’S Experience on health facility malaria case management.

Presentation at the Fresh Air ‘National Malaria Technical Update and coordination Workshop at Hotel Africana, Kampala.

Dr Ssekabira B Umaru: JUMP Team leader

Date: 31st March 2009
Joint Uganda Malaria Training Programme (JUMP)

Collaboration involving:

Uganda Malaria Surveillance Project (UMSP)
Infectious Diseases Institute (IDI),
National Malaria control program of Ministry of Health

Aim of JUMP:

To build capacity of health facilities for management of patients with fever/Malaria through training.
Rationale for the training

• Malaria case management in Africa is characterized by presumptive treatment and substantial overtreatment [McCombie 1996, Ndyomugenyi 2007].
  treatment without laboratory tests [Hammer et al 2007, Zurovac D 2006].
  Prescription of anti-malarials to negative Bs [Reyburn H 2007].

• Treatment inconsistent with policy [Osterholt DM 2006].

• Malaria Rx policy changed in 2005 from first line treatment with inexpensive CQ/SP to ACTs.
Two types of courses

1. Integrated Management of Malaria (IMM)
   - Diagnosis with microscopy
   - For health units with functional labs
   - Delivered at IDI and within districts.

2. Use of Malaria Rapid Diagnostic Tests (RDT) for fever case management
   - Diagnosis with RDTs
   - For Health units without functional labs
   - Includes nursing aides
   - Delivered on site
IMM Course content

General aspects of Malaria (Module 1)
• Malaria transmission and Disease causation
• Epidemiology of Malaria Control and Policy framework for Malaria
• Record keeping
• Medical Supplies management
• Infection prevention Ethical code of conduct

Clinical management of Malaria (Module 2)
• Evaluation of a patient with a fever
• Making a definitive diagnosis of Malaria
• Management of patient with fever and a negative Blood Slide
• Treatment of uncomplicated Malaria
• Treatment of severe malaria
• Treatment of Malaria in Pregnancy
• Management of fever after malaria treatment
• Monitoring for drug safety

• Malaria and HIV/AIDS co-infection
• Patient education

Medical records management Module 4)
• Medical record keeping
• Data storage
• Data retrieval and updating
• Analyzing data
• Interpretation of data
• Presentation of data
• Disposal of data
• Surveillance and data

Laboratory use in Malaria patient management (Module 3)
• Good Laboratory Practice
• Microscopy
• Preparation and storage of different reagents/stains for Malaria microscopy
• Laboratory diagnosis of Malaria
• Quality Assurance/ Quality Control in Malaria microscopy
IMM package

- Baseline assessment on site
- 6 day training of multidisciplinary teams
- Two follow-up support supervision at six and 12 weeks

Method of assessment

1. Individual health worker performance assessment during site visits.
2. Pre and post tests during training.
3. Surveillance data analysis.
# Target Audience

<table>
<thead>
<tr>
<th>Clinicians</th>
<th>Laboratory staff</th>
<th>Records staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Officers</td>
<td>District Laboratory Coordinator</td>
<td>Records clerks</td>
</tr>
<tr>
<td>Clinical Officers</td>
<td>Lab Technologists</td>
<td>Malaria Focal Persons</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>Lab Technicians</td>
<td>Surveillance focal person</td>
</tr>
<tr>
<td>Registered Midwives</td>
<td>Lab Assistants</td>
<td>Health Management</td>
</tr>
<tr>
<td>Registered Comprehensive Nurses</td>
<td></td>
<td>Information system (HMIS)</td>
</tr>
<tr>
<td>Enrolled Nurses</td>
<td></td>
<td>focal person</td>
</tr>
<tr>
<td>Enrolled Midwives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrolled Comprehensive Nurses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| UMSP | UCSF | ExxonMobil |
### Course Organization

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Days 2, 3, 4</th>
<th>Day 5</th>
<th>Day 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Sessions</strong>&lt;br&gt;1,2,3 &amp; 6 of module 1 for Clinical, Laboratory and records Staff together (Lectures &amp; case discussions)&lt;br&gt;Regional group discussions</td>
<td><strong>Parallel Discipline Specific Sessions</strong>&lt;br&gt;Clinicians Module 2, Laboratory Module 3 Records Module 4 (Lectures and case discussions)&lt;br&gt;Regional group discussions</td>
<td><strong>Common Session 7 of module 1 for all</strong>&lt;br&gt;Discipline specific clinical placement&lt;br&gt;Regional action plan development</td>
<td><strong>Common sessions 4 &amp; 5 of module 1 for all</strong>&lt;br&gt;Post test, Regional action plan presentations.&lt;br&gt;End of course evaluation and closure</td>
</tr>
</tbody>
</table>
Indicators for IMM course

Proportion of clinicians who:-
- Take proper history
- Perform a proper physical examination
- Make a correct diagnosis
- Prescribe correct treatment
- Perform a proper patient education (counseling on adherence, prevention and follow up care)
- Negative smears treated with antimalarials

Proportion of laboratory staff who:-
- Prepare malaria blood smears correctly
- Correctly read positive blood smears
- Correctly read negative blood smears

Records
- Completeness
- Quality of the handwriting
RESULTS
Map of Uganda showing the distribution of Health Facilities where the trainees were drawn and type of course given to each facility:

- Exxon IMM Sites trained at IDI
- PMI IMM Sites trained at IDI
- Exxon Cascade IMM sites
- Exxon RDT sites

Key:
- Exxon IMM Sites trained at IDI
- PMI IMM Sites trained at IDI
- Exxon Cascade IMM sites
- Exxon RDT sites
Graph Shows total trainees to date according to course attended and year of training.

- IMM PMI funded
- Health facility -based RDT Trainees
- RDT TOT
- Cascade
- IMM TOT
- IMM

Over all total trainees: 803

- 2006: 51 (IMM), 210 (RDT TOT), 11 (Cascade), 51 (IMM PMI funded)
- 2007: 221 (IMM TOT)
- 2008: 531 (OVER ALL), 225 (IMM TOT), 49 (Cascade), 98 (RDT TOT), 8 (IMM PMI funded), 52 (IMM)
Key indicators for children under 5 years

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Pre</th>
<th>Post</th>
<th>Mean Difference</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microscopy among suspected malaria</td>
<td>38.5%</td>
<td>60%</td>
<td>16.1%</td>
<td>&lt;0.04</td>
</tr>
<tr>
<td>BS- with Malaria Tx</td>
<td>47.9%</td>
<td>19.6%</td>
<td>-28.3%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Sample Size | 8 | 8
## Key indicators for patients 5 or more years

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
<th>Mean Difference</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microscopy among suspected malaria</td>
<td>34.1%</td>
<td>53.4%</td>
<td>22%</td>
<td>0.02</td>
</tr>
<tr>
<td>BS- with Malaria Tx</td>
<td>38.8%</td>
<td>15.6%</td>
<td>-23.2%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Sample Size (no Hus) 8 8
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Baseline</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; F/Up (6weeks)</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; F/Up (6weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory (n=Number evaluated)</td>
<td>17</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>% of BS prepared correctly</td>
<td>22%</td>
<td>67%</td>
<td>63%</td>
</tr>
<tr>
<td>% of BS read correctly</td>
<td>49%</td>
<td>71%</td>
<td>70%</td>
</tr>
<tr>
<td>% of positive BS read correctly</td>
<td>49%</td>
<td>71%</td>
<td>70%</td>
</tr>
<tr>
<td>% of negative BS read correctly</td>
<td>72%</td>
<td>77%</td>
<td>91%</td>
</tr>
</tbody>
</table>
The effect of the IMM training on performance of trained health care workers

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Baseline percentage that performed task correctly</th>
<th>1st and 2nd follow-up percentage correct</th>
<th>Relative Risk (unadjusted) 1st &amp; 2nd f/up /Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size - visits observed</td>
<td>101</td>
<td>148</td>
<td>2.53</td>
</tr>
<tr>
<td>Proper history taking</td>
<td>20</td>
<td>50</td>
<td>2.53</td>
</tr>
<tr>
<td>Thorough physical exam</td>
<td>18</td>
<td>68</td>
<td>3.83</td>
</tr>
<tr>
<td>Correct diagnosis</td>
<td>47</td>
<td>96</td>
<td>2.05</td>
</tr>
<tr>
<td>Correct treatment</td>
<td>42</td>
<td>89</td>
<td>2.14</td>
</tr>
</tbody>
</table>
Performance of health care workers in the cascade trained sites (Bugembe and Buwenge HC IVs).

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>1st Follow up</th>
<th>2nd follow up</th>
<th>Mentoring visit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical (Number assessed)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of health workers that take proper history (%)</td>
<td>9.0</td>
<td>16.0</td>
<td>59.1</td>
<td>23.5</td>
</tr>
<tr>
<td>Proportion of health workers that do a thorough physical examination of patients (%)</td>
<td>0.0</td>
<td>20.0</td>
<td>27.3</td>
<td>5.9</td>
</tr>
<tr>
<td>Proportion of health workers that make a correct diagnosis (%)</td>
<td>35.2</td>
<td>68.0</td>
<td>54.5</td>
<td>64.7</td>
</tr>
<tr>
<td>Proportion of health workers that prescribe the correct treatment (%)</td>
<td>40.9</td>
<td>68.0</td>
<td>59.1</td>
<td>88.2</td>
</tr>
<tr>
<td>Proportion of health workers that give adequate and relevant patient education (%)</td>
<td>0.0</td>
<td>8.0</td>
<td>22.7</td>
<td>29.4</td>
</tr>
<tr>
<td><strong>Laboratory (Number assessed)</strong></td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Mean proportion of smears prepared correctly. (%)</td>
<td>0</td>
<td>80.0</td>
<td>66.7</td>
<td>100.</td>
</tr>
<tr>
<td>Staff mean sensitivity (%)</td>
<td>27.5</td>
<td>71.3</td>
<td>64.3</td>
<td>96.7</td>
</tr>
<tr>
<td>Staff mean specificity</td>
<td>63.0</td>
<td>92.0</td>
<td>75.7</td>
<td>85.0</td>
</tr>
</tbody>
</table>
Site assessment data for clinical staff

- Physical exam performed correctly
- Diagnosis supported by history, physical exam and lab tests
- Treatment consistent with national policy for malaria tx

Baseline n=12  |  1st Follow up n=81  |  2nd Follow up n=67
Site assessment data for laboratory staff

- Thick smear slides prepared correctly
- BS+ read correctly
- BS- read correctly

Baseline n=17, 1st followup n=16, 2nd Followup n=14
RDT course

• Done in 2 districts, trained all HCII and HCIII without functional laboratories

• 6 other HCII during the training of national trainers

• 225 health workers were trained in total

• Data is still under analysis but from general observations patients in trained health units are treated according to results unlike earlier when every fever was treated as malaria.
## Schedule for RDT

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Evaluation of patient with fever</strong></td>
<td><strong>Patient education</strong></td>
</tr>
<tr>
<td>Performing and Interpretation of RDT results</td>
<td>Practical</td>
</tr>
<tr>
<td>Treatment of uncomplicated malaria</td>
<td>Logistics Management &amp; Storage and monitoring</td>
</tr>
<tr>
<td>Management of a patient with fever but a negative RDT</td>
<td></td>
</tr>
<tr>
<td>Referral of patients with severe disease</td>
<td></td>
</tr>
</tbody>
</table>
Effect of the training on quality of care in health facilities.

- Training teams helps to cause unity in service delivery.
  - Clear evidence of team work
  - Improved utilization of the labs for confirmation of Malaria cases.
- Improvement of the quality of care
  - Improved diagnostic skills by clinicians
  - Improved laboratory diagnosis
  - More rational use of malaria treatment with significant reduction in treating negative smears
- Improved completeness and cleanliness of the records
- The improvements observed increase with continued follow-up.
Challenges

- Health system issues affect health worker performance:
  - Personnel issues at sentinel sites
    - Inadequate staffing especially in the laboratory
    - Low motivation
    - Transfers disorganize the built teams.
  - Lack of reliable source of power for microscopy
  - Shortage of drugs and medical supplies/equipment
- Inadequate funding
Lesson learnt

• Training of teams rather than individuals causes unity in service delivery

• Fever case management is better after training and further improvement observed with continued support supervision.

• Laboratory trainees need more hands-on experience to perform better.

• There are health system issues that limit further improvement.

• The cascade mode of delivery of the IMM training is cheaper and effective in improving health care worker practices and allows for easy scalability.

• On site training helps to reach wider coverage in a shorter period of time.
Achievements

- JUMP RDT curriculum has been adopted by MOH for national roll out
- IMM curriculum has been approved by national Case Management working Group
- The laboratory module has been adopted by STOP MALARIA for training laboratory staff.
- UMSP using it for the PMI supported trainings
Conclusion

Integrated team-based training with support supervision improved key indicators of malaria case management and reduced the number of unnecessary antimalarial treatments.
Acknowledgments

• Partners: UMSP; IDI, Ministry of Health, PMI (CDC & USAID), Malaria Consortium, WHO

• AMREF, Malaria Consortium for management support

• University of Washington/ I-TECH for M&E support

• ExxonMobil & PMI for the funding