Leveraging opportunities for multidisease approaches

Malaria – LF interface

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Quick overview of global landscape evaluation:

“Supplemental Vector Control to Facilitate Elimination of Lymphatic Filariasis: A Landscape Analysis”

Opportunities & priorities for multi-disease approach (Malaria-LF)
Context for Study

- Global strategy on LF elimination
- Growing evidence on utility of VC: Solomon Islands, PNG, India…
- Constrains to MDA outcomes in certain settings
- Recent action to formally recognize supplemental vector control in global LF elimination strategy

Needs

- Generate evidence to inform policy/strategy
- Develop guidance/decision tools
- Support implementation
- Ongoing refine advocacy
Introduction

Global landscape study (June 2013 - 30 April 2014)

Study Objectives

- Review and map the distribution of LF vectors
- Identify opportunities for supplemental vector control, within the context of ongoing national MDA programs
Activities

1. Secondary Review
   - LF vectors and distribution in endemic countries
   - History and current status of LF vector control
   - Co-endemicity of four VBDs: malaria, Loa loa, dengue and onchocerciasis
   - MDA coverage (2000 to 2012) and current status

2. Rapid Country Assessments
   - French Polynesia, Ghana, Haiti, Philippines and Tanzania
   - Disease burden, status of LF control and relevant country capacities for SVC

3. Vector Trapping Methods for Xenomonitoring
   - Field performance of adult vector traps/methods
   - ID additional needs for xenomonitoring (surveillance)

4. Development of Interactive Maps and Database
## LF Endemic Countries Reviewed

<table>
<thead>
<tr>
<th>Region</th>
<th>South Asia</th>
<th>Western Pacific</th>
<th>Central &amp; South America</th>
<th>Eastern Mediterranean &amp; North Africa</th>
<th>Tropical Africa</th>
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<tbody>
<tr>
<td><strong>Country List</strong></td>
<td>Bangladesh</td>
<td>American Samoa</td>
<td>Papua New Guinea</td>
<td>Egypt</td>
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<td>India</td>
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<td>Central Afr. Rep. Chad</td>
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<td>Sri Lanka</td>
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<td>Thailand</td>
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<td>Timor-Leste</td>
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<td>Wallis and Futuna</td>
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<td>Guinea</td>
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<td><strong>Total</strong></td>
<td>8</td>
<td>22</td>
<td>4</td>
<td>4</td>
<td>34</td>
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</tbody>
</table>
Interactive maps

Website address for interactive maps: http://www.healthydays.biz/lfmap8/

Website address for online database: http://www.healthydays.biz/rti1/
Interactive maps

National Level summary Display
- User can display by genera and also by individual or combination of species
Interactive maps

Summary Country Info Display
- Hovering on any country pulls up summary data on MDA coverage, LF vectors and parasites in that country

Vector Display by Genera
- Presence of vector in country. User can select display by genera and also by individual or combination of species
Interactive maps

Global distribution
- By genera (may also be displayed by individual or combination of species, as desired by user)
Interactive maps

Sub-national (district) level display
Display of vector species (done by genera and by species) and LF parasite in the district

District level Information
Hovering cursor on any district displays vector(s) and parasites present. Display may be done according to user-selected vector genera or species
User select any combination of criteria to display relevant data. Search results can be save as different outputs (word, excel etc.)
Malaria –LF interfacing
Areas of common needs
Opportunities for multi-disease VC approaches

LF vector by Region

Vector species in endemic countries

Vector distribution: Sub-national

Co-endemicity of major related VBDs
## Examples of collateral impact of malaria VC on LF

<table>
<thead>
<tr>
<th>Country</th>
<th>Collateral impact of malaria vector control on LF vectors and transmission</th>
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</table>
| Uganda                   | • LLINs and MDA (albendazole and ivermectin) given in rural, upland areas with An. gambiae sl and An. funestus (malaria and LF vector).  
                          • The reduction in LF infection was evident in areas with both MDA and LLINs, but the role played by LLINs was unclear.                           |
| (Ashton et al., 2011)    |                                                                                                                                                                                                         |
| Cambodia                 | • Treated or untreated bednets used in rural, lowland settings.  
                          • Untreated bed nets provided protection against LF morbidity; treated bed nets provided better protection (vectors unidentified).                                               |
| (Odermatt et al., 2008)  |                                                                                                                                                                                                         |
| Papua New Guinea         | • Habitual use of bed nets in rural, humid and coastal setting to protect against An. farauti (malaria and LF vector).  
                          • Those who slept under bed nets had significantly lower rates of W. bancrofti microfilariae and antigenaemia.                               |
| (Bockarie et al., 2002)  |                                                                                                                                                                                                         |
| Kenya                    | • Permethrin-treated bed nets in a rural, humid and coastal setting; no MDA.  
                          • LF vectors (An. funestus, An. gambiae, and C. quinquefasciatus), annual infective biting rate reduced by 95%; annual transmission potential reduced by 92%. |
| (Pedersen and Mukoko, 2002, Bogh et al., 1998) |                                                                                                                                                                                                         |
| Papua New Guinea         | • Permethrin-treated bed nets in a rural upland setting; weekly MDA with DEC.  
                          • W. bancrofti microfilaria rate decreased from 48% to 6%.                                                                                                                                      |
| (Prybylski et al., 1994) |                                                                                                                                                                                                         |
| Papua New Guinea         | • Untreated bednets in a rural, humid and coastal setting.  
                          • Reduction in human blood index in An. punctulatus group, and 50% decrease in filarial infection rates.                                                                                      |
| (Burkot et al., 1990)    |                                                                                                                                                                                                         |
| India                    | • Environmental management in both rural and urban areas.  
                          • W. bancrofti microfilaria rate dropped 29% overall, and 91% in children 0-4 years old in urban settings.                                                                                                |
| (Rajagopalan et al., 1988, Rajagopalan et al., 1987) |                                                                                                                                                                                                         |
| Solomon Islands          | • DDT IRS conducted in a rural, humid and coastal setting, targeting the An. punctulatus group (malaria and LF vector). No MDA.  
                          • W. bancrofti infection decreased from 22% in 1974 to 0% in 1977.                                                                                                                                  |
| (Webber, 1977a, Webber, 1979) |                                                                                                                                                                                                       |
Priorities for supplemental LF VC

Policy and strategy priorities

- Formal global policy framework and guidance
- National LF policies and strategies to adequately consider appropriate use of vector control

WHO 2013
Opportunities for VC in GELF – (2)

- **What is the status of the LF program?**
  - (i) Loiasis co-endemic
  - (ii) Heavy Burden
  - (iii) Preventing recurrence

- **Effective MDA ongoing**
  - MDA

- **(i) Loiasis co-endemic**
  - MDA + VC

- **(ii) Heavy Burden**
  - MDA + VC
  - (a) Need rapid scale-up
  - (b) Insufficient MDA impact

- **(iii) Preventing recurrence**
  - VC

WHO 2013
Status of Supplemental LF Vector Control

- Inadequate global policy framework and guidance to inform investment and country implementation.
- Universal absence of national policies or IVM strategies situating LF VC.
- Almost universal absence of functional national vector control programs deliberately targeting LF.
- Focus on single disease approaches, often driven by donor priorities.
- Significant knowledge gaps on local LF vectors of LF and inadequate technical capacity for VC implementation.
Priorities for mainstreaming effective LF VC

Technical and programmatic priorities

- Ongoing substantial investment strengthening relevant country systems
  - PMI, GFATM, DIFD, World Bank, and BMGF
  - Entomological capacities and program planning
  - Implementation of IRS and LLINs for malaria control

- More holistic approach needed for investments in country capacity strengthening

- Considerable VC capacity to reorient toward multi-disease control approaches (role of partners?)
Priorities for mainstreaming effective LF VC

Research and knowledge development priorities

- Evaluation of the impact of ongoing investments in malaria vector control on LF transmission
- Close knowledge gap on distribution of LF vectors
- Close knowledge gap on vector-parasite transmission dynamics to facilitate MDA endpoints decisions
Priorities for mainstreaming effective LF VC

Country capacity strengthening and implementation

- Reorient competencies and country programs for multi-disease control approaches

- Technical support to develop national policy and institutional frameworks for sustainable implementation

- Mentorship role for sub-regional centers of excellence, to countries (training, data generation/management)
Priorities for conducive global environment

- Decision making tools and standardized procedures (entomological, outcome and impact indicators) to guide country programming.

- Enhanced collaboration - e.g. with RBM/VCWG and WHO/VCTAG, regional partnerships/efforts targeting malaria, dengue/Chikungunya vectors; APOC/PENDA

- Promote sustainable platforms/mechanisms for collating and analyzing critical field data (e.g. repositories) to promote policy decisions and inform global agenda.
Priorities for mainstreaming effective LF VC

Vector control tools

- Develop best practices for control of aedine and culicine vectors, particularly in urban environments
- Tools targeting non-anopheline and outdoor biting
- Insecticide resistance: More suited environmental management and non-chemical methods (AFR & SEA).
Priorities for mainstreaming effective LF VC

LF vector surveillance and monitoring

- Guidance on best vector trapping tools for the different vector genera and for different areas of the world
- Standardized and simplified sampling methodologies to support country evaluations
- Further enhancement of tools and methods for mass screening of mosquitoes for xenomonitoring
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R. Williams - interactive maps and database

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