

Roll Back Malaria Vector Control Working Group (RBM VCWG)
12th Annual Meeting, 8-10th February 2017
Moevenpick Hotel, Rue de Pre Bois 20, 1215 Geneva

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2nd IVM, Evidence and Capacity Work Stream meeting
10:30-13:30, Wednesday 8th February 2017
Co-leaders: Josiane Etang and Michael Macdonald

Work stream mandate and priorities – Josiane Etang, Fraunhofer Institute for Molecular Biology and Applied Ecology, Justus Liebig University and Michael Macdonald, Consultant

The framework for the IVM E&C Work Stream is to (i) generate and share evidence on effective and efficient deployment of prior, existing and new vector control interventions and practices; (ii) generate and share evidence on integration of all vector control tools, including lessons from other regions and disease eradication programs; and (iii) work with WHO and RBM partners to build entomology and vector control capacity at all levels in endemic countries. Five potential projects were presented. These projects will be consolidated with activities from other work streams where there is overlap (e.g. capacity-building) and refined into specific work stream plans.

Project 1. Identification and networking institutions and resources for public health entomology capacity-building – Michael Macdonald, on behalf of Florence Fouque, WHO/TDR and Leonard Ortega, WHO/GMP who are leading these efforts but unable to attend the current session

As one specific activity, the work stream will collaborate with the WHO Regional Offices, GMP and TDR and partner networks, including ANVR, ALMA, ACTMalaria, APMEN/APLMA, PAMCA and AMCA, to build a directory of entomology and vector control training institutions, programs and resources. The intended outcome is to improve networking, share best practices and advocate for public health entomology.

Discussion

- It was noted that country training networks should be included as in some cases, such as India, where these resources are already well organised.

Project 2. RBM and the Global Vector Control Response – Tessa Knox, World Health Organization

It is anticipated that the GVCR will be endorsed by the World Health Assembly in May 2017. While not yet officially launched, looking forward there will be opportunities for the RBM VCWG to work with WHO to roll out the GVCR to countries at risk of the major vector-borne diseases, including *Aedes*-borne diseases.

Building on the presentation during the first day's plenary session, the GVCR includes ten priority activities where member states have reached consensus. From these ten activities, there are several areas for potential RBM VCWG contribution, e.g.:

1. National and regional vector control strategic plans developed/adapted to align with draft global vector control response

The RBM VCWG can provide technical support for the strategic plan development and help develop "business plans" for implementation.

2. National vector control needs assessment conducted or updated and resource mobilization plan developed (including for outbreak response)

The VCWG partners working at the country level can help and support the vector control needs assessment once that instrument has been finalized and disseminated.

3. National and regional institutional networks to support training and/or education in public health entomology and technical support established and functioning

There are several specific areas where the VCWG can provide significant support. This includes: exchange programmes; creating stronger linkages with the AMCA and with Industry, including equipment and insecticide manufacturers to provide training to ensure quality implementation; and to capitalise on established networks and Vector Control working groups in regions such as PAMCA, APMEN, and the "Elimination 8" as well as with the leadership networks, ALMA and APLMA.

4. National agenda for basic and applied research on entomology and vector control established and/or progress reviewed

Members of the VCWG can provide technical input to the national basic and applied research agendas.

5. National vector surveillance systems strengthened and integrated with health information systems to guide vector control

Expertise can be provided for state-of-the-art integrated entomological surveillance systems, engaging established systems such as in the "Eliminate 8" countries and systems currently under development, including. Members of the VCWG can also provide technical input to improve country-level *Aedes* surveillance.

Discussion

- While there is not yet a global working group for GVCR advocacy this might be established by the WHA if thought necessary. A key component is for Ministries of Health to have dedicated funding for national-level multi-sectoral vector control taskforces. In terms of cross-ministry cooperation, in addition to the usual collaboration with Agriculture, Education and Environment, there are opportunities to engage Ministries of Tourism and the tourism industry who often have large financial risks regarding vector-borne disease outbreaks and control.
- How will countries adapt their existing separate strategy plans for malaria, Lymphatic Filariasis, Leishmaniasis, and *Aedes*-borne diseases and realign these according to the GVCR? The feedback from countries has been very positive and they understand this may require a large amount of planning and coordination. Although the work required will vary from

country to country, there is not proscription for countries to do this; the GVCR aims to build an enabling environment.

- Will donors also welcome this change for integrated approaches that will benefit multiple vector-borne diseases, whereas now most funding channels are siloed for a single disease? It was decided that this needs to be specified in the national needs assessment to encourage for example, collaboration between malaria and dengue programmes.

Project 3. Capacity-building to manage Insecticide Resistance in the WHO Africa Region – Josiane Etang, with apologies from Birkinsh Ameneshewa, WHO AFRO who was unable to attend

The African Network on Vector Resistance (ANVR) was established in 2000, involving national malaria control programmes and supporting research institutions and coordinated by the WHO Regional Office for Africa. Among the key activities of the network's 2016-2017 roadmaps, are those related to Pillar V of GPIRM: "to ensure enabling mechanisms (advocacy, human and financial resources) are in place." Problems identified included the weak entomological capacity at the national level; insectaries and entomology laboratory facilities available in some countries were not fully operational; and collaboration among researchers and with the national control programmes was sometimes weak.

Action points that came from the November 2016 meeting include: (1) produce WHO technical guidance for countries on the minimum indicators for entomological surveillance; (2) develop a vector surveillance operational manual supported by an operational plan; (3) encourage collaboration and planning between countries in the same regional block; and (4) strengthen the collaboration with research and academic institutes.

These action points are currently being managed by WHO through ANVR. In 2016, support has been given to countries for entomological training of 163 health workers, 33 Master programmes and 21 PhD students. However, an important gap remains in terms of human and financial resources, and collaboration between training institutions and programmes.

The question raised during the presentation of this project was: How could members of the VCWG work with ANVR to reinforce country capacities and improve links among national training and research institutions and national vector borne disease control programs to monitor and manage insecticide resistance?

The priority needs previously identified were: (1) advocacy for malaria vector control research and training to become a priority of Funding Agencies at the global level; (2) put in place a mechanism for elaboration of competitive projects through consortia; and (3) produce multi-country proposals and liaise with funding agencies to mobilize the required budget.

Discussion

- It was suggested that the work stream help to improve data quality management by reviewing standardised procedures for carrying out resistance testing, and for collecting and reporting the data.
- It was remarked that the availability of materials for resistance monitoring (papers, tubes, kits) has usually been a challenge. A response was made that procurement has recently moved to an online system, which is intended to speed the process. However, WHO is maintaining a single source to ensure quality control. A suggestion was made that using WHO country offices for procurement can also help supplies move faster through the supply chain.
- An action point was suggested that the work stream create an online clearing house of the training available during the year. This would allow the information to be pooled and would help identify areas where partners from industry can contribute.

- It was suggested that basing basic entomology training within university would make courses more attractive to participants. It was remarked that finding support from universities might pose a challenge.
- It was remarked that although the training of entomologists was receiving attention, their subsequent career path was often being neglected, which will lead to the loss of these candidates from the field.
- It was suggested that the work stream aims to coordinate resistance management with agricultural sector efforts.
- An action item was suggested to review existing training documents and collate them for repurposing.

Project 4. APMEN Vector Control Working Group: Best practices for entomological monitoring and outdoor/ residual transmission across regions – Christina Rundi, Ministry of Health, Malaysia, Jetsumon Prachumsri, Mahidol University, Thailand, Michael Macdonald and Allison Tatarsky, University of California, San Francisco

A meeting was held in Bangkok in November 2016 to discuss entomology in malaria elimination across the Asia-Pacific Region. One of the goals was to share best practices to help national programs shift the entomological surveillance and vector control strategy from control to elimination. This requires capacity building (HR and systems, job opportunities, training, career pathway and mentoring), risk-area stratification (expand and decentralise, mosquito identification, increased use of GIS and remote sensing), and foci investigation (entomology links to epidemiology). For vector control, this requires adapting tool and strategies for the specific contexts including outdoor transmission, which was the subject of the second two days of the meeting.

The Asia Pacific Malaria Elimination Network (APMEN) is a network of countries (18 at present), stakeholders and partners (over 20 at present) in the Asia-Pacific region. It was started in 2010, and is a platform for collaboration, information exchange and capacity building, committed to work towards regional malaria elimination by 2030. Since last year it had been included under the Asia Pacific Malaria Leaders' Alliance (APLMA).

The Mekong Outdoor Malaria Transmission Network (MOMTN) links programs and partners to share best practices to meet the challenge of outdoor transmission across the region. The MOMTN builds upon the RBM VCWG work stream on outdoor transmission, begun in 2011 with information on previous meetings available on the VCWG website.

An action plan to aid collaboration with APMEN to meet common challenges across the regions was presented (1) strengthen vector biology research and Vector Control tool development through best practice exchange and coordinated research agenda; (2) enhance integration of anthropological approaches, community participation and engagement; (3) enhance access to necessary tools and capacity through information exchange and coordinated programming, and (4) address market and regulatory challenges through improved communication with regulators and industry.

Discussion

- There is funding for capacity building, but not for research aspects, so that is one area where funds will be sought.
- Within the Asia Pacific region there are some areas such as insecticide resistance where the current surveillance needs to be expanded and improved.
- There was a query as to whether there was any way to address the infrastructure deficiencies in certain countries, particularly in the short term. One of the activities of APMEN has for example been a pocket guide for the identification of malaria vectors.

Project 5. Vector Control in Humanitarian Emergencies – Valentina Buj, UNICEF and Richard Allan, The MENTOR Initiative

Humanitarian Emergencies cover three types of vector control settings: destroyed cities, populations within camps, and unsettled spontaneous refugee and displaced person populations. A case study on the vector control strategy used in South Sudan was presented. Two camps in South Sudan, Malakal and Bentui Internally Displaced Persons Camps faced severe malaria outbreaks in 2015 and 2016. The tools used to combat this were Indoor Residual Spraying, Larval Source Management, LLINs, fly control (to combat trachoma and diarrhoeal diseases) and IEC (information, education and communication). LLIN coverage was 100% and IRS carried out successfully, but with no effect on malaria transmission at all. In 2016, the IRS active was changed from lambda-cyhalothrin to primiphos-methyl. The result was a dramatic improvement in control in this settled camp situation.

In other emergency relief contexts, mobile communities need a different suite of tools. Some of the solutions have been tested and documented for decades as outlined in the 2013 WHO publication: “Malaria control in humanitarian emergencies – An inter-agency field handbook. Second edition” These tools include Insecticide Treated Plastic Sheeting, “Demuria” LLINs (specially designed for outdoor sleeping), permethrin-treated top sheets and blankets. Uptake of these tools has been slow, as the UN and many donors require additional WHO approval as is currently provided for more standard tools such as IRS, LLINs and larvicides. The work stream can help by (1) creating an evidence-base for the use, acceptance and performance of these additional vector control tools; (2) advocate greater use of these tools so they can be field-tested and adapted; (3) share best practices for the delivery and monitoring of the efficacy and effectiveness of these tools; and (4) build donor support for improving vector control in humanitarian emergencies.

Discussion

Action items were suggested for the following:

- Clarify the risk of vector-borne disease exposure scenarios and link these to the products that exist and are approved (IRS, LLINs, LSM) but underutilised.
- Determine the level and type of evidence required of new products used in these settings in order for them to be recommended for broader procurement and implementation.
- Develop a research framework to provide guidance on how to implement good quality monitoring alongside the intervention roll-out.
- Help manufacturers and donors to overcome market stability, regulatory and political barriers that impede the practical roll out of these tools.

Session 2: Feedback from the work stream meeting and discussions

The mandate of this work stream is to generate and share evidence to promote effective delivery and integration of malaria vector control interventions and support related country capacity strengthening. Five projects were proposed during the meeting and the work plans discussed.

1. Capacity building

Update directory of entomology and vector control training institutions, programs and resources. GMP & TDR are building a directory of institutions and facilities providing vector control training at all levels. This is aimed at practical field entomology and vector control. This work stream can contribute by helping develop a survey instrument ready for March 2017, and through subsequent dissemination via VCWG networks and partners, including the training programs offered by Industry

for their specific vector control products. The work stream will collate and link with the GVCR Needs Assessment in time for the GVCR launch at the WHA.

2. Support roll-out of Global Vector Control Response

WHO anticipates that the GVCR will be endorsed by the World Health Assembly in May 2017. Contributions to the GVCR are intended to focus on capacity-building and vector control including *Aedes* control activities. First, technical support can be provided in the national vector control strategic plan development process, including business plan development, for aligning national and regional vector control strategic plans with the GVCR. In addition, it is expected that the VCWG will participate in the vector control needs assessment. In order to support the national and regional institutional networks to support training, the work stream will seek funding for exchange programmes; promote stronger linkages with AMCA; facilitate spray equipment and insecticide manufacturers to provide training to ensure quality implementation; and to capitalise on established networks (Vector Control working groups in regions, E8, ALMA and APLMA). Technical input will be provided for basic and applied research on entomology and vector control. Expertise will be provided for state-of-the-art integrated entomological surveillance systems to help strengthen national vector surveillance systems for both malaria and *Aedes*-borne diseases.

3. AFRO/ANVR insecticide resistance

Five activities are scheduled or ongoing, these are to (1) Devise a formal process for linking national training/research institutions to vector borne disease control programs in order to facilitate capacity building; (2) Identify and fill human and infrastructure capacity gaps; (3) Reinforce the training capacities of research institutions; (4) Organize insecticide resistance management hands-on training sessions for vector borne disease control programs and other staff; and (5) Coordinate the mobilization of resources for insecticide resistance management.

Three new activities were proposed: (1) Work with Swiss Tropical Institute/Swiss Development Cooperation to support the development of a global capacity building platform in collaboration with WHO/ GMP; (2) Contact AMCA, industry associations and agricultural sector to request support for insecticide resistance management training courses; and (3) Work with academics and member countries to establish insecticide management training programs in universities.

A link will be made with the IRS IRM work stream plans for training.

Timelines, milestone, people responsible and budgets will be set up within the next month in order to guide progress over the next year.

4. Share best practices for entomological monitoring and outdoor/residual transmission across regions - Dr Christina Rundi, APMEN Vector Control Working Group

There are many common issues between APMEN and the RBM VCWG. Closer communication, possibly through on-line video conferences among key members, should be arranged.

There are three APMEN working groups that may be able to share research goals: the vector control working group, *vivax* working group, and the surveillance and response working group. APMEN is working on capacity building to address outdoor/residual transmission and vector control methods for mobile populations as well as insecticide resistance. IVM training has been supported, but additional funding, technical support and mentoring is needed for trainees after they return to their workplaces. Areas of potential collaboration with the RBM VCWG include:

- Strengthen vector biology research and tool development through exchange of best practices and coordinated research agenda.

- Enhanced integration of anthropological approaches, community participation and engagement for vector control as well as more effort to link epidemiology and entomology together in elimination efforts.
- Enhance access to necessary tools and capacity through information exchange and coordinated programming.
- IVM Training: At present the Malaysia Ministry of Health provides some funding for IVM training, but more resources are required, especially to support trainee activities after they return to their workplaces. Sumitomo also provides financial support for the training. There have been vector research grants and co-support with WHO WPRO for training workshops in vector control for elimination. Better collaboration is possible through allowing Fellows to be attached to institutions and linked with research projects. APMEN has also supported the publication of a pocketbook developed by AFRIMS for the morphological field identification of common vectors in the region. There have also been APMEN case studies and country briefings and an atlas.
- There are opportunities to address market and regulatory challenges through improved communication with regulators and industry, more market intelligence, and innovative market solutions. APMEN recognizes the importance of Industry dialogue and has traditionally invited the private sector to workshops.
- There are many individual country and programme investments in GIS, remote sensing and hazard mapping both within and outside the health sector that could be coordinated and strengthened.

5. Vector Control in Humanitarian Emergencies – Richard Allan (MENTOR)

Actions to move forward centre around the interagency working group of Health/Shelter/WASH organisations who work in humanitarian crises. These actions include: (1) expansion and improved use of standard vector control tools (IRS, LLINs, LSM), including technical support for implementation, evaluation and result dissemination; (2) improved learning around existing supplementary vector control tools for humanitarian crises (ITPS, treated blankets, etc.), including standardized evaluation SOPs, collation and dissemination to regulatory bodies and procurement agencies; and (3) provision of field platforms for evaluation of new tools and strategies, including collaboration with Industry and Product Development Consortia, academic operational research partners, WHO and regulatory authorities.

There is a need to standardise the way vector control tools are used and to make rational decisions of which are most appropriate tools for a particular context. There is a need for an evidence base for operational feasibility, use and impact. This working group can help the development of WHO vector control guidelines to ensure humanitarian emergencies are included, and to work with manufacturers to share information on the use of their existing products in the field and testing protocols for new products under development.

Products developed for humanitarian emergencies may also benefit the market for residual/outdoor protection those exposed to vectors and sleeping or working in situations where traditional LLINs, IRS or LSM may not be sufficient or may not be practical. There are opportunities for the two sectors, those working on humanitarian emergencies and those working on outdoor transmission, can collaborate.

An action point was suggested for a summary of evidence for vector control in Humanitarian Emergencies be produced. A forum such as VCWG is a place where informed practice can be formalised from the research data.

This part of the meeting closed with a request that participants interested in any of the five projects proposed in the IVM E&C works stream contact the principals to finalize the activities and help push the agenda forward.