

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

**Co-chairs: Jacob Williams and Gerhard Hesse  
Coordinator: Konstantina Boutsika  
Rapporteur: Vanessa Chen-Hussey**

**4<sup>th</sup> Housing and Malaria Work Stream meeting  
10:30-13:30, Wednesday 8<sup>th</sup> February 2017  
Co-leaders: Steve Lindsay & Lucy Tusting**

***Welcome - Steve Lindsay, Durham University***

Steve Lindsay opened the meeting. It was announced that Mariana Stephens has handed over co-chair duties to Lucy Tusting. Mariana's work was greatly appreciated and she will be missed. New attendees were asked to introduce themselves.

***Review of Work Plan 2016-2017 and Work in Progress – Lucy Tusting, University of Oxford and Steve Lindsay, Durham University***

Updates on the 2016-2017 work plan were given:

- *Advocacy for inclusion of housing in strategic plans:* The Global Vector Control Response 2017-2030 emphasises the role of housing and will be presented to the World Health Assembly in May 2017. A preliminary expression of interest to the UK BBSRC to establish a network of experts in housing and vector-borne disease was successful; full application due February 2017. The UN Conference on Housing and Sustainable Urban Development (Habitat III) was held in October 2016 in Quito, Ecuador and concluded with the adoption of the New Urban Agenda, which links with Sustainable Development Goal 11 to set global standards in sustainable urban development. Vector-borne disease was included in the New Urban Agenda. Steve Lindsay and others wrote an associated blog post on opportunities for *Aedes* control. Networking and informal discussions on housing and malaria have been ongoing.
- *Updating housing recommendations:* It was discussed last year whether the 2015 consensus statement should be updated with more specific recommendations; no action has yet been taken.
- *Visiting funders to share ideas on housing & malaria:* Work Stream members responded to a funding priority consultation at UKAID; visit to BMGF in Seattle took place in Nov/Dec 2016 to investigate potential for developing house screening products.
- *Six monthly updates:* A newsletter was circulated in December 2016 and will be continued.
- *Stakeholder visits to study sites in Tanzania and Gambia:* Successful visit from NMCP to the RooPfs study in The Gambia, June 2016.

Updates were then given on three on-going projects with discussion and questions in turn:

**1. Multi-country analysis of housing and malaria**

Lucy Tusting and colleagues' paper will be published in PLOS Medicine on Feb 21<sup>st</sup>. A cross-sectional analysis was carried out using Demographic and Health Survey and Malaria

Indicator Survey data from 21 African countries. Key findings were that improved housing was associated with reduction of 9-14% in the odds of malaria infection in children compared to unimproved housing. In comparison, ITN use was associated with a 15-16% reduction in malaria infection in children.

- It was queried whether any interaction was found between housing quality and ITN use. This was explored in the analysis, but no association was found.
- The cost of improved housing was queried and it was remarked that incremental housing improvements are occurring in many places as incomes increase, with potential to leverage these changes.
- It was stressed that the aim is not to replace LLINs with improved housing, but to use them together as complementary interventions.
- It was requested whether the group could advise on what questions on housing should be added to MIS. Further discussions were planned, but an interim response was given that the questions should include whether the eaves were open or closed, and whether there was screening on doors and windows.

## 2. *Roopfs* study in the Gambia

This is an ongoing randomised controlled trial involving 800 traditional houses, of which 400 were randomised to receive ventilated metal roofs, screened windows under the eaves and ventilated front doors with screening, and 400 remained unmodified controls.

- It was remarked that scale up of this intervention could be a challenge.
- It was remarked that there is a need to come up with new products, for example a screened door and new types of screen that are resistant to damage.

## 3. Importance of cross-ventilation

The results of Jim Sutcliffe's study on the effects of cross ventilation were presented. The key findings were that the approach of mosquitoes to ITNs is affected by airflow. In still air, mosquitoes landed on the roof of the ITN, whereas with airflow, increased landing was observed on the sides of the ITN. This has implications for assessment of net durability as holes are more often found at the sides of ITNs, and also on next generation ITNs where the roof and sides of a net may be treated with different active ingredients.

### Policy Update – Steve Lindsay, Durham University

It was proposed that the scope of the work stream should be broadened from housing and malaria to vector-borne diseases and the built environment, the primary focus remaining on housing and malaria. It was announced that a new RBM working group on multi-sectoral approaches to malaria control is planned, which would be highly relevant to this Work Stream since improving housing and the built environment is a core component of multi-sectoral intervention.

An update was also given on SDG11 and the New Urban Agenda, which focuses on sustainable urban development and building cities resilient to natural hazards. Vector borne diseases are a natural hazard that should be given consideration alongside other natural hazards such as flooding and earthquakes. *Aedes* borne diseases, which tend to be more urban, are particularly relevant.

- It was asked what connections exist between this group and urban planning organizations. No participants came forward and this was raised as a huge limitation of the Work Stream that urgently needs to be addressed by reaching out to the housing sector.
- It was asked if the work stream could produce minimum specifications for an “anti-mosquito house”.

- It was asked how advice may be tailored to different communities, when there is such variation between and within countries in terms of house design and mosquito behaviour.
- It was remarked that air flow should be a key consideration as ventilation can affect the uptake of LLINs and risk of acute respiratory infections.

### ***Housing improvements in Namibia – Tara Seethaler, Clinton Health Access Initiative***

An update was given on a small scale roll-out project aiming to test the operational feasibility of housing improvements in Namibia. The project has multiple partners and donors (CHAI, ARCHIVE global, DXA studio, MNM UK and BMGF), and was carried out in close association with government ministries. A literature review, surveys & FGDs were carried out first before the implementation of housing improvements which is currently on-going. A manual was produced on improvements including screening windows, doors and eaves, sealing gaps in walls, and mending roofs. Early results suggest that the cost per structure is \$20-29 inclusive of labour and materials. Key messages are to think carefully about building materials (using local materials as far as possible) and that community engagement is critical. The next steps are to continue roll-out and conduct monitoring and evaluation during 3 and 6 month follow-ups, including epidemiological data.

### ***Discussion***

- It was remarked that cross-ministerial engagement was implemented as early as possible in the planning of the project, and proved very important in support for scale up.
- It was remarked that community engagement was equally important and was conducted through focus group discussion, surveys, and by recruitment of technicians from within the local community.
- It was queried whether the local community pay for improvements themselves? It was responded that the interest from the local community was not necessarily in spending money, but there was a willingness to dedicate their own time. Need to choose materials and methods carefully to allow maintenance by householders themselves.

### ***Discussion: How do we strengthen links with the housing sector? - All***

Strengthening links with the housing sector is a huge challenge but is necessary for the success of the Work Stream's goals. Steve Lindsay, Lucy Tusting and others have submitted an application to the UK BBSRC to develop a network of experts in vector-borne disease and the built environment, which will include funding for small scale projects, particularly focusing on sub-Saharan Africa. The following suggestions were made by meeting participants:

- Development of strategic documents on inter-sectoral action for vector-borne disease, including the housing sector and WASH, in order to engage top-level political involvement to help gain the cooperation of different departments.
- Development of an advocacy document to encourage vector borne disease programmes to include housing improvements.
- The Work Stream could draw on lessons from Chagas work in Latin America [Martha Quinones to give names of PAHO contacts].
- The Work Stream should think about how strategies might vary between rural (engaging local populations) and urban (codes for building) areas.
- Encourage social housing providers and engineers to implement mosquito proof housing improvements, possibly through technical guidance (such as that produced by CHAI) and also vocational training for local communities.
- There must be engagement with the private as well as the public sector.

- It was asked how good the epidemiological evidence base would have to be to recommend certain improvements. Following the lead from VCAG requires Phase III Randomised Controlled Trials which are not always practical for environmental interventions.
- The Work Stream could link with the WHO Environmental and Social Determinants of Health (PHE) Unit as they have requested expert guidance on housing.
- The Work Stream could seek donor funding to kick-start inter-sectoral meetings. Co-benefits should be highlighted when trying to promote inter-sectoral cooperation.
- Local housing adaptations and indigenous house design should be incorporated within interventions to improve uptake.
- Link with vocational training institutions in country, formal and informal.
- The Work Stream should identify and engage with private sector associations and companies, e.g. screening manufacturers [Action: Sean Blaufuss].
- Solar energy providers could advocate for housing improvements alongside solar tech. Payment in instalments could make more affordable e.g. Kenya mobile phone company example [Action: Alex Hiscox].

### ***Discussion: Work Plan 2017-2018 – All***

The discussion was structured around four areas: (i) strengthening links with the housing sector (covered above), (ii) updating housing and malaria recommendations, (iii) encouraging basic and applied research on vector-borne disease and the built environment and (iv) information exchange:

#### *Updating housing and malaria recommendations*

The Work Stream released a Consensus Statement on housing and malaria in 2015 together with UNDP and UN-Habitat. Since the recommendations were not detailed, it was discussed whether the statement should now be updated.

- Specifications (for example for robust screening) and maintenance recommendations should be included.
- It was asked how housing interventions would fit with existing vector control interventions, considering for example the effect of ventilation on ITN use.
- Local situations should be taken into account; blanket recommendations may be inappropriate.
- This work is covered by two new planned WHO guideline documents on (i) housing and health, to include vector borne disease, and (ii) vector control interventions for malaria control, to include housing.
- An advocacy statement would be helpful to encourage vector borne disease programmes to include housing improvements into activities.
- Existing and past housing byelaws could be explored.
- LLIN delivery could be prioritised to communities where housing improvements had not yet been put in place.

#### *Encouraging basic and applied research on vector-borne disease and the built environment*

- Important research topics were identified: air flow, pathways for scale up, sustainable/comfortable improvements, deflection of mosquitoes from improved houses to unimproved houses, coverage required for any mass effect.
- Information on building materials and their performance in the tropics could be gathered from contacts with industry.

#### *Information exchange*

It was asked if there was a better way of keeping everyone updated and sharing work outside RBM. Suggestions included MalariaWorld.

### ***Any other business***

- Update on Lake Victoria Initiative: This was a regional initiative to improve WASH, led by multiple agencies with engagement at ministry level; currently on hold.

## **Session 2: Feedback from the work stream meeting and discussions**

A recap of work in progress was given, including: (1) a multi-country analysis of housing & malaria to be published in February 2017 in PLOS Medicine, (2) *RooPfs* study in The Gambia, (3) house construction in Namibia and (4) research on the importance of cross-ventilation, as well as relevant policy issues. The discussion of broadening the Work Stream from “malaria and housing” to “vector-borne disease and the built environment” was reported. An overview of Sustainable Development Goal 11 was given and the need to engage with the urban development/housing sector highlighted. Multi-sectoral collaboration is critical for this Work Stream.

The Work Stream meeting discussion was structured around four areas: (i) strengthening links with the housing sector (covered above), (ii) updating housing and malaria recommendations, (iii) encouraging basic and applied research on vector-borne disease and the built environment and (iv) information exchange.

A draft work plan was presented based on the meeting and also outstanding items from last year.

1. Strengthen links with housing sector
  - a. Application to UK BBSRC-MRC to develop a network of stakeholders in housing and vector-borne disease [Steve Lindsay, Lucy Tusting].
  - b. Explore opportunities to present at housing meetings; identify existing housing networks; invite housing experts to the Work Stream.
  - c. Link with manufacturers to explore potential for advocacy and intervention scale-up: (i) house screening product manufacturers [Sean Blaufuss] and (ii) solar power companies [Alex Hiscox].
  - d. Scoping study of building companies/suppliers operating in sub-Saharan Africa [Steve Lindsay].
2. Support the development of housing and vector-borne disease recommendations
  - a. Support the development of two new WHO documents: (i) WHO Housing and Health guidelines (to include vector-borne diseases) and (ii) WHO guidelines on malaria vector control (to include housing) [coordinate with Nathalie Roebbel, Christian Kraef and Martha Quinones].
  - b. Explore the need for an updated RBM consensus or advocacy statement [Steve Lindsay and Lucy Tusting].
3. Encourage basic and applied research on vector-borne diseases and the built environment
  - a. RBM members to identify potential collaborators in vector-borne diseases & the built environment [All, Martha Quinones].
  - b. RBM members to develop & submit research initiatives on vector-borne diseases & the built environment [All].
4. Information exchange
  - a. Circulate biannual update on housing and vector-borne disease.
  - b. Share information through MalariaWorld [Matt Thomas].

*Discussion*

- An update was given on a Swiss Development Corporation grant to support the development of scoping work on multi-sectoral approaches to malaria and a new RBM working group on multi-sectoral approaches; a workshop is planned for June. This would ideally incorporate the work done by this Work Stream and allow the broadening of the scope of work.
- A deck of presentations could be created for Work Stream members to use if presenting to housing groups, to ensure a coordinated message on vector-borne disease.
- There might be opportunity to incorporate vector-borne disease considerations within low-cost house building ongoing in Ghana through discussions with the Ministry of Health.
- It was queried what exactly comprises the housing sector. The definition includes architects, city planners and construction companies.
- There are likely to be many country specific bye-laws that might be integrated into larger scale recommendations.
- The Work Stream could collaborate with engineers for disaster relief as they often build permanent facilities.