Update on recently completed, ongoing and planned work

Dr Jan Kolaczinski

Head, Vector Control & Insecticide Resistance Unit

Roll Back Malaria Vector Control Working Group Meeting

15 April 2021

Global **Malaria** Programme

World Health Organization

VCR Mission & Key Activities

Mission	Support optimal resource use for malaria vector control by WHO Member States and by their implementing partners

Key activities

Support generation and reporting of data related to malaria vectors and interventions

- Track status of insecticide resistance and vector control coverage (and effectiveness), including contribution to WMR and global status updates
- Strengthen WHO, Member State and partner reporting and use of vector surveillance/control data, including development of DHIS-2 entomology module
- Manage Vector Control Advisory Group (VCAG)
- Support generation of economic data to improve resource allocation decision making

Develop or revise evidence-based WHO recommendations and programmatic guidance on vector surveillance and control, including for new tools

- Develop vector control implementation guidance, and guidance for evaluation of new vector control tools
- Support evaluation of vector surveillance or control tools, including evaluation of new tools, and associated management of VCAG
- Develop guidance on integration of resource use considerations during vector control efficacy trial and integrate economic evidence in WHO vector control guidelines
- Develop guidance on prioritization of vector control interventions applying principles of health technology assessment

Support timely dissemination of vector surveillance and control guidance and contribute to its implementation through technical support and capacity building activities based on identified priorities

Support generation and reporting of data

DHIS2 standard entomology & vector control modules

- Supports collection, collation, analysis and interpretation of entomology and vector control data
- Brings entomological and epidemiological data together
- Supports global data reporting
- Allows for online and offline data collection from mobile phones, tablets or computers
- Provides automatic calculation of indicators and generation of visualizations

Live demo
Intro video
Information page

Implementation toolkit

1- CUSTOMIZE

D2-Docker
Enables customization of standard modules to country context

2- INSTALL

MD Sync App
Facilitates import of standard modules

3- BUILD CAPACITY

Training App
Provide interactive through DHIS2.

4- INTEGRATE HISTORICAL AND PARTNER DATA

Bulk Load App
Generates excel templates to import historical data and data from external systems

5-REPORT DATA TO WHO

MD Sync App
Facilitates data reporting

Vector Control Advisory Group (VCAG)

- Advice on generation of high-quality data to inform development of WHO recommendations
- 16 intervention classes under evaluation

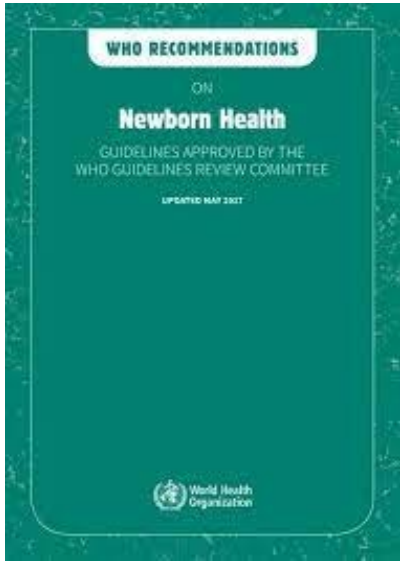
- 13th VCAG meeting 7-10 December 2020
  - Meeting report available
    https://www.who.int/publications/i/item/9789240021792
- 14th VCAG meeting 19-21 April 2021
  - Review of results for second PBO net trial

https://www.who.int/groups/vector-control-advisory-group

Economic data generation and use

Review of WHO guidelines in other disease areas

- How economic data is obtained and utilized in recommendations
- Implications for malaria vector control guidelines
- Latest: CEA review draft completed



Developing guidance to help countries improve resource allocation

- Review of existing approaches to collect and use economic data
- Developing WHO guidance for key economic data collection and utilization in malaria

Initiating discussions and a plan of work to apply principles of economics to insecticide resistance management in malaria

- Technical consultation planned for 3rd-4th quarter

WHO recommendations & programmatic guidance

Vector control: identified needs & evaluation docs

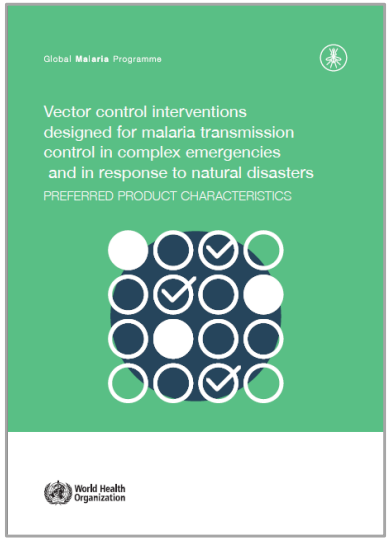
Preferred Product Characteristics

Two published:

- ITNs designed to provide improved performance against pyrethroid-resistant mosquitoes
  https://www.who.int/publications/i/item/9789240018730
- Vector control tools for complex emergencies
  https://www.who.int/publications/i/item/9789240018754

Three PPCs are planned for 2021:

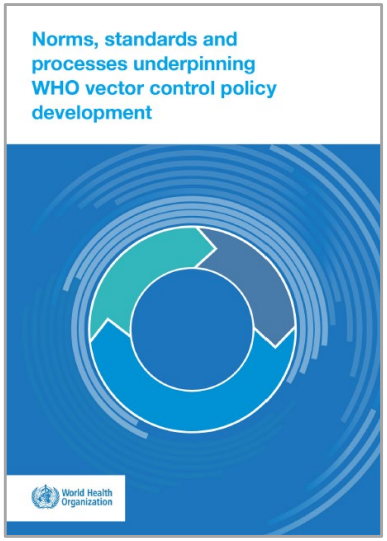
- Indoor residual spraying/ indoor wall treatments (under development)
- Interventions to combat outdoor biting of mosquitoes
- Revision of PPC on endectocides



Vector control evaluation

- *Norms, standards and processes underpinning WHO vector control policy recommendations* (2020). Collaboration with NTD + PQT
  https://www.who.int/publications/i/item/9789240017382

- To be reviewed: *How to design Vector Control Efficacy Trials* (2017)



Malaria vector control guidelines

https://app.magicapp.org/#/guideline/4870

Systematic reviews on **pyrethroid-PBO nets, IRS and ITNs, vector control in complex emergencies**

2-4 Nov 2020

GDG meeting: PICOs/identify areas for further work

16- 20 Nov 2020

GDG training, review GRADE tables and formulation of recommendations

Feb 2021

Recommendations drafted and approved by GDG

March 2021

External review group provided peer review

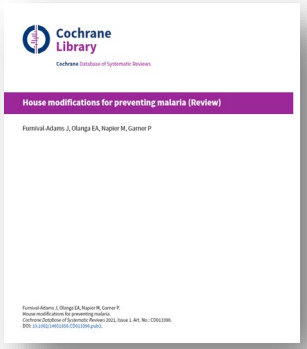
May 2021

MAGIC Evidence Ecosystem Foundation

Publication of revised recommendations in MAGICApp

21-25 June 2021

GDG review GRADE tables and formulation of recommendations



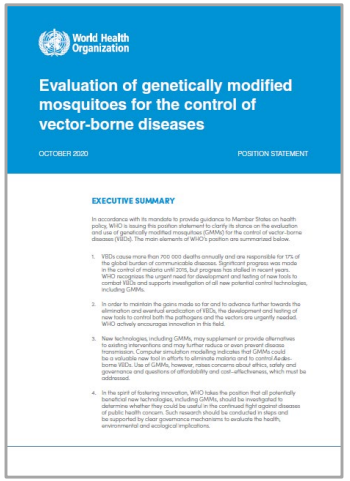
Systematic reviews on **personal and community level protection of ITNs, larval habitat modification/ manipulation, housing modifications**

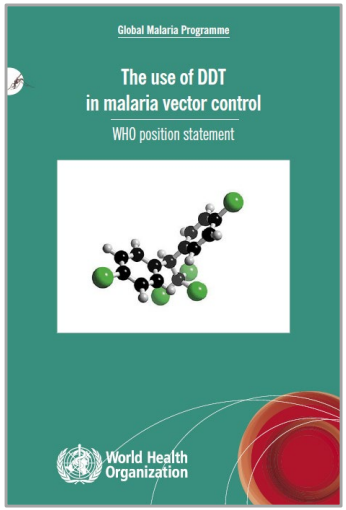
(Housing modifications for malaria prevention Cochrane published October 2020 https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013398.pub3/full)

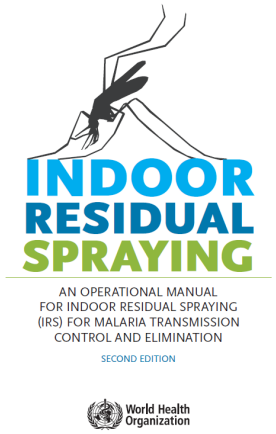
Guidance Documents

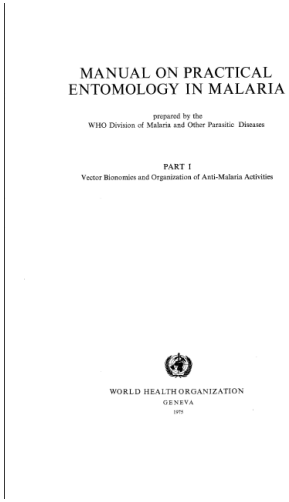
Genetically modified mosquitoes (GMMs)

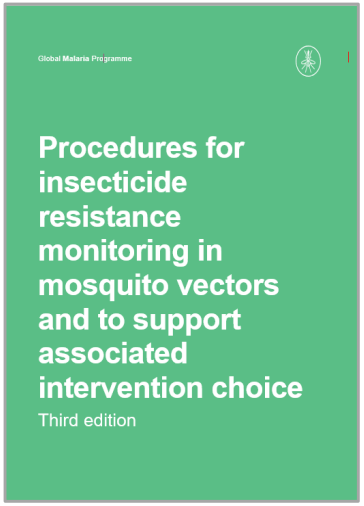
- Developed and published WHO position statement on evaluation of genetically modified mosquitoes
  https://www.who.int/publications/i/item/9789240013155
- Contributed to development of guidance on ethics and vector borne diseases
  https://www.who.int/publications/i/item/978924001273-8
- Revised framework for evaluation of GMMs jointly with FNIH

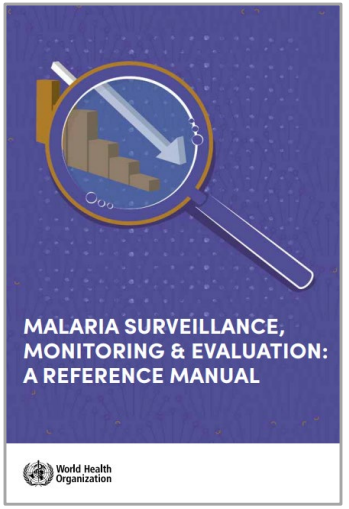










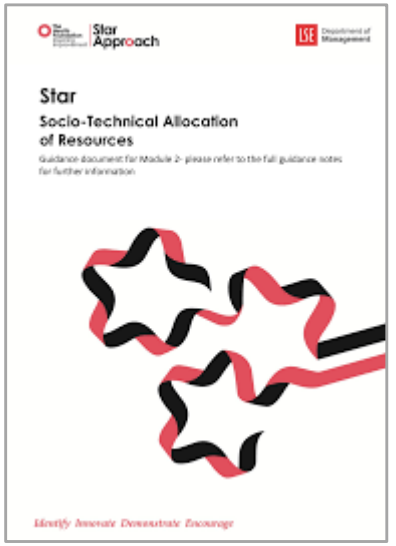


Prioritization guidance

- Countries lack practical guidance on how to prioritize resources to achieve optimal impact by means of an intervention package

- Work commenced to support WHO Member States to generate context-specific evidence to support resource prioritization processes within the area of vector control

- Guidance will be developed in several steps:
  - Landscape review of existing decision-making frameworks
  - Draft guidance developed, likely based on Socio-Technical Allocation of Resources (STAR), or similar approach
  - Testing the draft guidance by populating resource allocation modelling with country-specific data, and by conducting resource prioritization exercises in two high burden countries



Dissemination & implementation

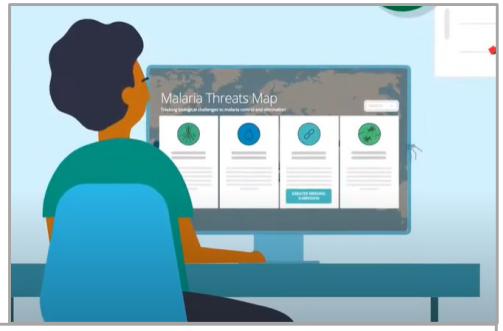
DHIS 2 modules & Malaria Threats Map

DHIS 2

- Distribution through WHO GitHub repository
- Support provided to: Mozambique, Madagascar, The Gambia, Ghana, Uganda, Venezuela, Honduras, Bhutan and through CHAI to Namibia, Southa Africa and Haiti.
- Discussions ongoing with Kenya, Tanzania, Sudan and Somalia.
- Expressions of interest by other countries being explored/followed up.
- Official information page
- Promotional video
- Map tracking use of DHIS2 for entomology and vector control worldwide

Malaria Threats Map

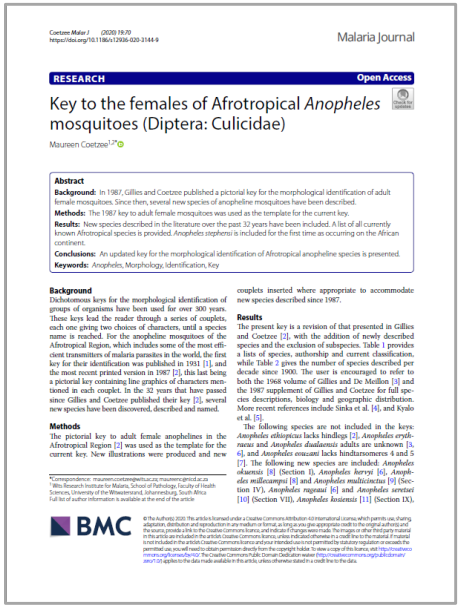
- User consultation ongoing
- Increased data availability & quality
- Increasing awareness & use, including functionality to support decision-making



Malaria Threats Map: tracking biological challenges to malaria control and elimination: https://youtu.be/dU_xrzpbupU
Malaria Threats Map: helping countries address critical threats for malaria control and elimination: https://youtu.be/mkggjD0DKwY
Malaria Threats Map: supporting research efforts: https://youtu.be/VP-pc9oN0dM

Response to *An. stephensi* invasion

- Hosted quarterly technical calls to coordinate the global response
- Translation of identification key by M. Coetze into Arabic and French completed
- Supported two countries, Sudan and Ethiopia, in developing their strategic plans for surveillance and response
- Face-to-face convening provisionally planned for Q4 2021
- Malaria Threats Map maintained up to date



Malaria Journal

RESEARCH Open Access

Key to the females of Afrotropical *Anopheles* mosquitoes (Diptera: Culicidae)

Maureen Coetzee

Abstract

Background: In 1987, Gillies and Coetzee published a pictorial key for the morphological identification of adult female mosquitoes. Since then, several new species of anopheline mosquitoes have been described.

Methods: The 1987 key to adult female mosquitoes was used as the template for the current key.

Results: New species described in the literature over the past 32 years have been included. A list of all currently known Afrotropical species is provided. *Anopheles stephensi* is included for the first time as occurring on the African continent.

Conclusions: An updated key for the morphological identification of Afrotropical anopheline species is presented.

Keywords: *Anopheles*, Morphology, Identification, Key

Background

Dichotomous keys for the morphological identification of groups of organisms have been used for over 300 years. These keys lead the reader through a series of couplets, each one giving two choices of characters, until a species name is reached. For the anopheline mosquitoes of the Afrotropical Region, which includes some of the most efficient transmitters of malaria parasites in the world, the first key for their identification was published in 1931 [1], and the most recent printed version in 1987 [2], this last being a pictorial key containing line graphics of characters mentioned in each couplet. In the 32 years that have passed since Gillies and Coetzee published their key [2], several new species have been discovered, described and named.

Methods

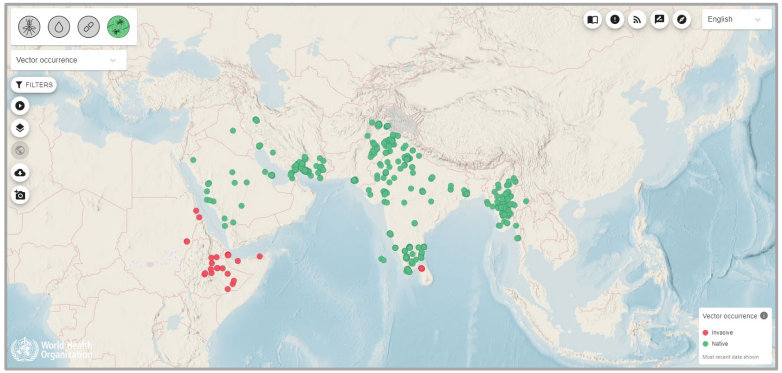
The pictorial key to adult female anophelines in the Afrotropical Region [2] was used as the template for the current key. New illustrations were produced and new couplets inserted where appropriate to accommodate new species described since 1987.

Results

The present key is a revision of that presented in Gillies and Coetzee [2], with the addition of newly described species and the exclusion of subspecies. Table 1 provides a lists of species, authorship and current classification, while Table 2 gives the number of species described per decade since 1900. The user is encouraged to refer to both the 1968 volume of Gillies and De Meillon [3] and the 1987 supplement of Gillies and Coetzee for full species descriptions, biology and geographic distribution. More recent references include Sinka et al. [4], and Kyalo et al. [5].

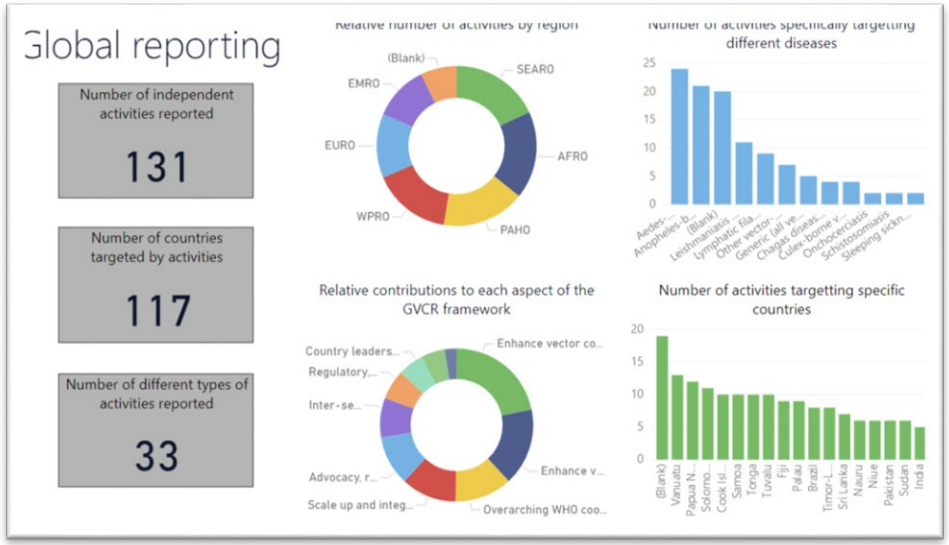
The following species are not included in the keys: *Anopheles ethiopicus* lacks hindlegs [2], *Anopheles erythraeus* and *Anopheles dualaensis* adults are unknown [3, 4], and *Anopheles evansae* lacks hindtarsomeres 4 and 5 [7]. The following new species are included: *Anopheles olcaensis* [8] (Section I), *Anopheles hervyi* [6], *Anopheles millecampsi* [8] and *Anopheles maliciectus* [9] (Section IV), *Anopheles rugaaui* [6] and *Anopheles seretsei* [10] (Section VII), *Anopheles kesiensis* [11] (Section IX).

BMC



GVCR

- Joint Action Group (JAG) meets quarterly
- GVCR Progress Report 2017-2020 published late 2020
- Online SharePoint hub for GVCR focal points
  - Launched 2020
  - Monitor implementation
  - Reports of outputs/ deliverables
  - Interactive PowerBI report (global and regional pages)
  - Tracking of VCNA completion



- Case studies: Two planned for 2021, starting with Sudan

Vector Control & Insecticide Resistance Unit

Global **Malaria** Programme

World Health Organization

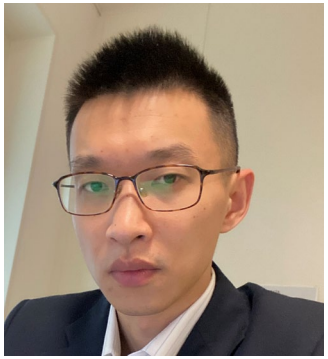
VCR Unit – Roles & Responsibilities

Jan Kolaczinski
GMMs
kolaczinskij@who.int

Jenny Stevenson
Guidelines, IRS &
Ento Manual
stevensonj@who.int

Lauren Carrington
VCAG & GVCR
carringtonl@who.int

Yevgeniy Goryakin
Economics &
Prioritization
goryakiny@who.int



Chunzhe Zhang
Mathematical modelling
zhangc@who.int

Lucia Fernandez
DHIS 2, Malaria Threats
Map, Surveillance
Guidance
fernandezl@who.int

Ayman Ahmed
GVCR Case Studies,
An. stephensi coordination
ayahmed@who.int

Izzy Abello
Unit Administrator
abelloi@who.int

To receive regular updates on GMP's vector control work:

https://confirmsubscription.com/h/d/5DDA021E5819E645

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