



Working in partnership to deliver vector control solutions

Justin McBeath, October 2023

A warm welcome to Liverpool from the entire IVCC Team





IVCC Partners



Reflects status 2021



IVCC Values: Reflecting IVCC past, present and future

PARTNERSHIP

We believe in the power of partnership, collaboration, and teamwork

We embrace ideas that drive vector control innovation, deliver impact and save lives

INNOVATION

RESPECT

We value diversity and treat each other with respect

IVCC

Purposeful design in the event agenda - aligned to our thinking

Session 1: The needs of the **countries** is the starting point (Damaris)

Session 3: An emphasis on partnering for **impact** (New Nets Project)

Session 4: Understanding and **navigating the challenges** ahead ('Navigating the perfect storm').

Session 5: Innovative mechanisms to **incentivise partners** (VERV)

Session 6: **Scientific integrity**, partnership and leadership (Partner Trial Sites)

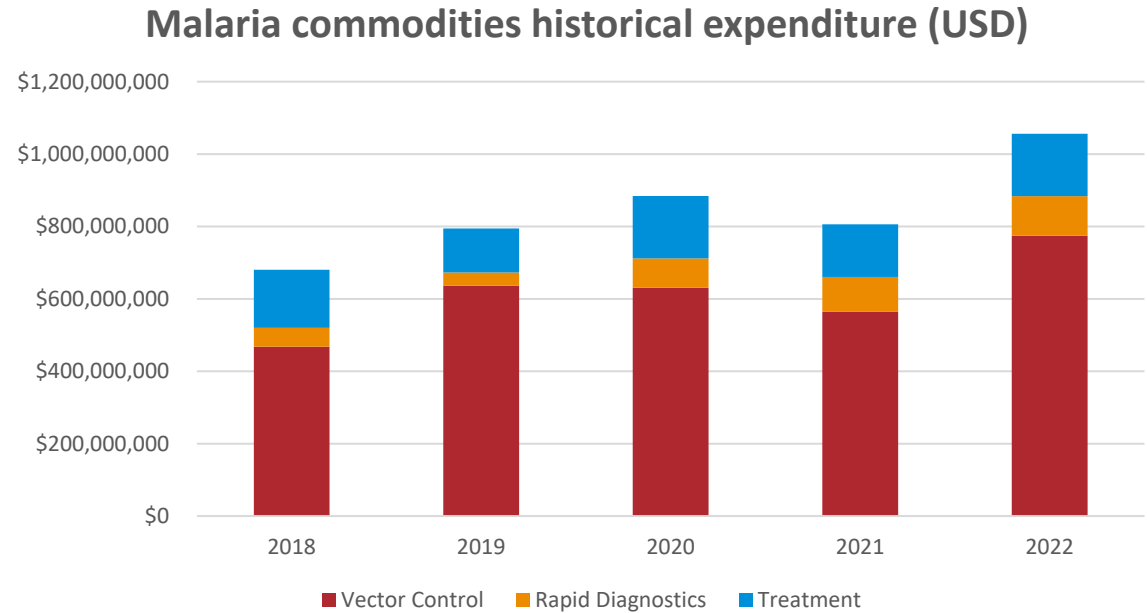
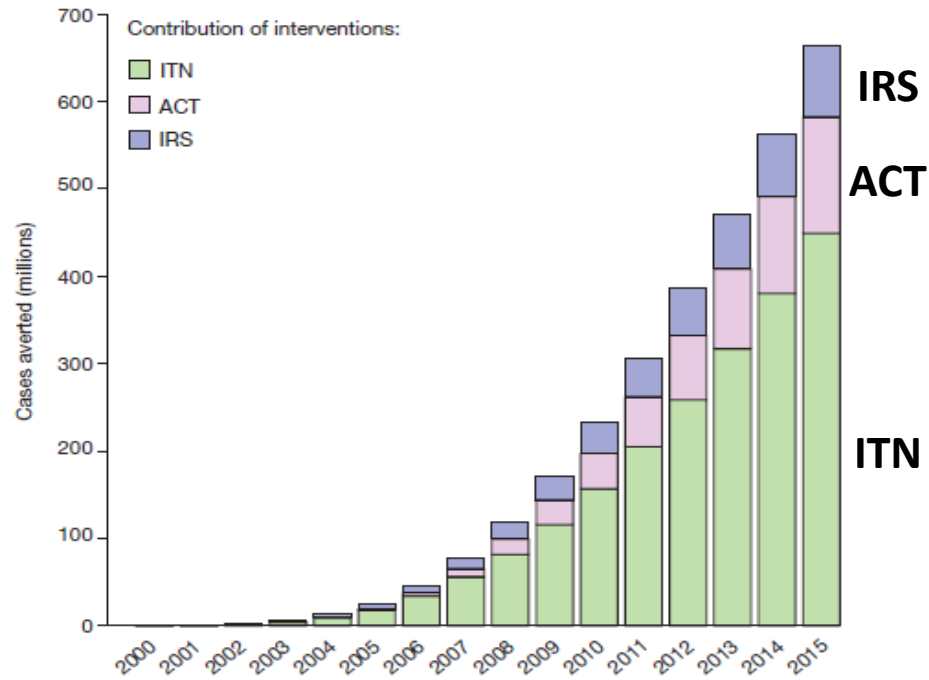
Session 7: **Recognising Industry** as key in the origin of innovation (Industry Partners)

Session 8: The need for best practice **sharing across geographies** (Indo-Pacific Initiative)

Session 9: **Operational Integrity** (Equity, Diversification and Inclusion)

Session 10: Innovation in **market access and delivery** (New Routes to Market)

Vector control is an essential part of malaria prevention!



Source: IVCC - Analysis based on historical volumes procured and donors average prices (CHAI Forecasting Project)

ARTICLE

doi:10.1038/nature15535

The effect of malaria control on *Plasmodium falciparum* in Africa between 2000 and 2015

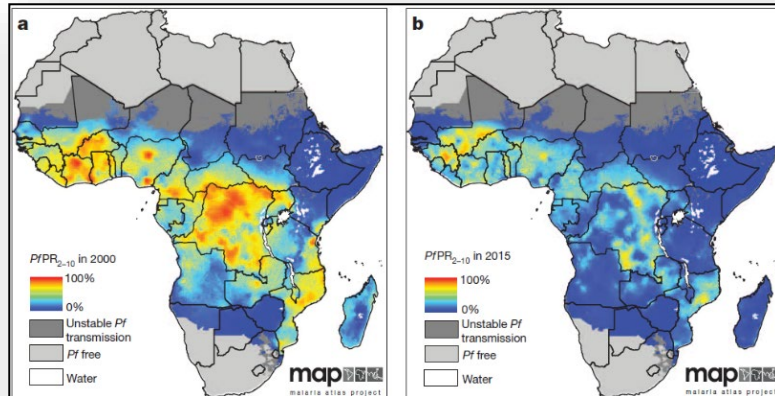
S. Bhatt^{1*}, D. J. Weiss^{2*}, E. Cameron^{3*}, D. Bisanzio⁴, B. Mappin⁵, U. Dalmtryple⁶, K. E. Battle¹, C. L. Moyes¹, A. Henry⁷, P. A. Eckhoff⁸, E. A. Wenger⁹, O. Briet¹⁰, M. A. Penny¹¹, T. A. Smith¹², A. Bennett¹³, J. Yukich¹⁴, T. P. Eisele¹⁵

But after 15 years of positive progress the trajectory for malaria cases and deaths has effectively flatlined

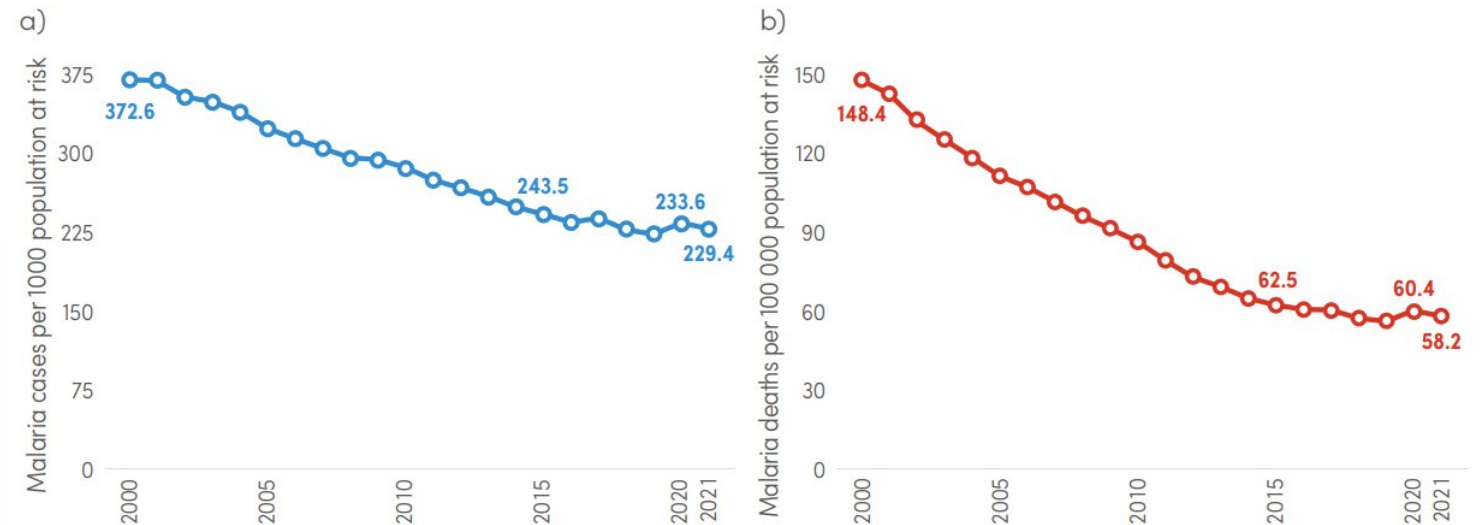
Shrinking Malaria Map

2000 – 2015

Malaria deaths globally fell from 839,000 in 2000 to an estimated 446,000 in 2016.

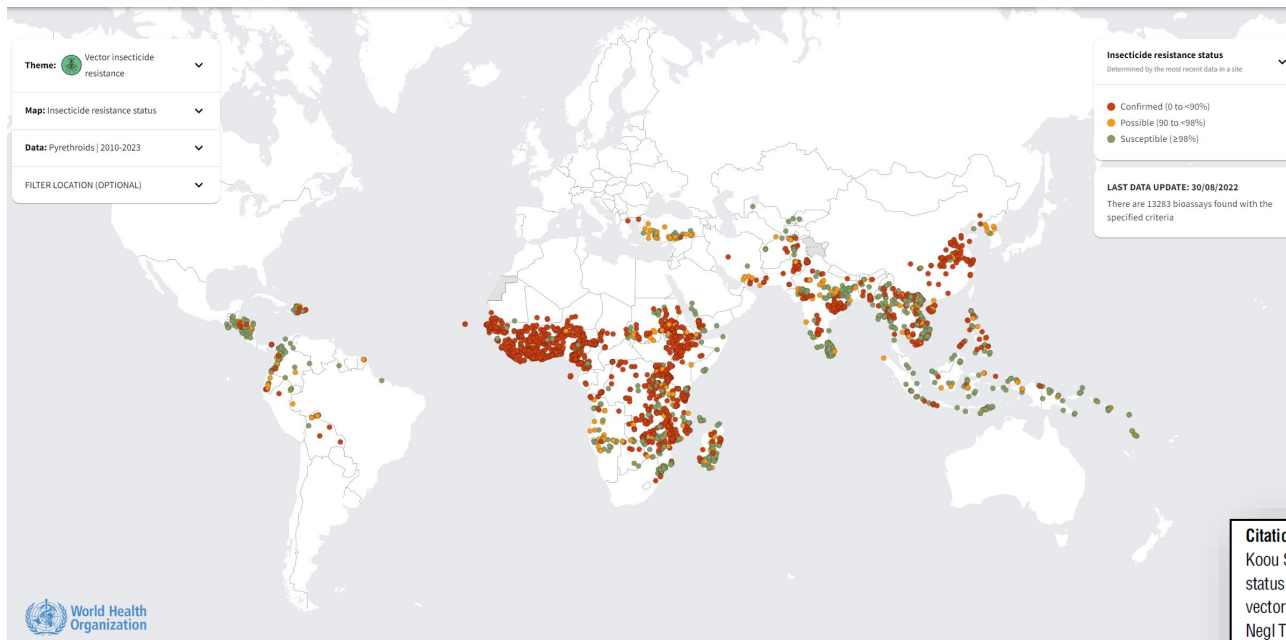


Trends in a) malaria case incidence (cases per 1000 population at risk) and b) mortality rate (deaths per 100 000 population at risk), 2000–2021; and c) malaria cases by country in the WHO African Region, 2021
Source: WHO estimates.



Insecticide resistance continues to be a major threat and is at the core of why IVCC exists

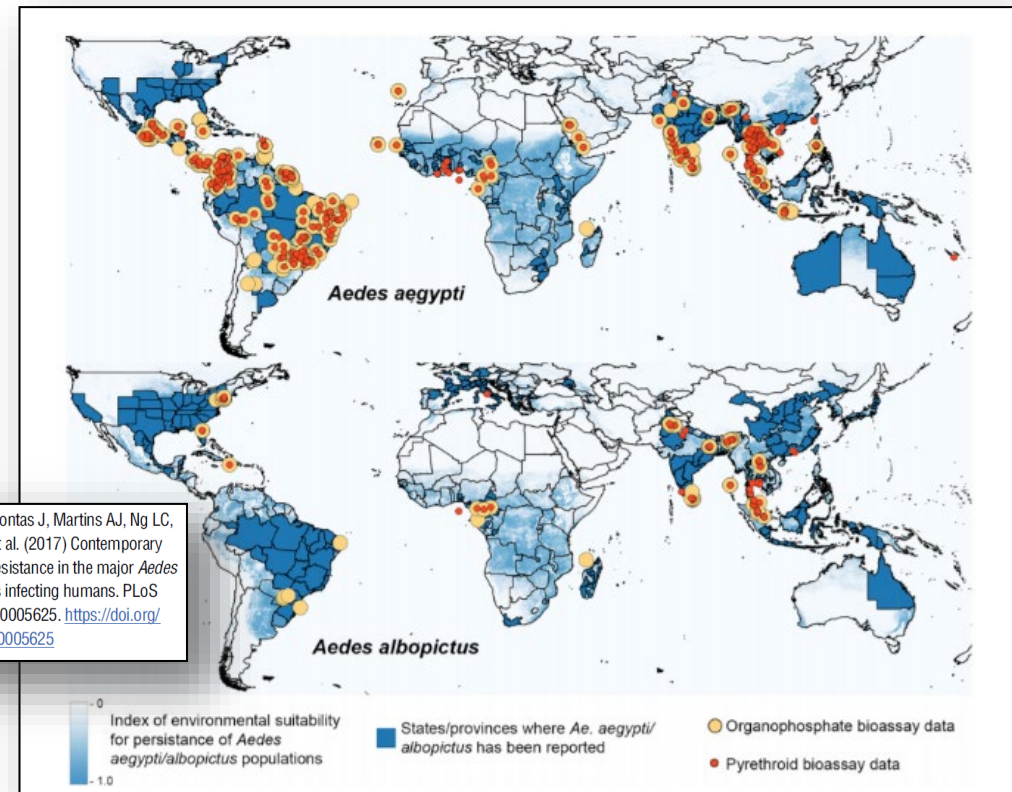
Anopheles mosquitoes (malaria)



Widespread resistance to pyrethroids in *Anopheles* mosquitoes (Source: WHO Malaria Threats Map)

89% of countries confirmed resistance to at least one insecticide in one malaria vector species and 29 countries confirmed resistance to four insecticide classes*

Aedes mosquitoes (many Arboviruses such as dengue and chikungunya)



Citation: Moyes CL, Vontas J, Martins AJ, Ng LC, Koou SY, Dusfour I, et al. (2017) Contemporary status of insecticide resistance in the major *Aedes* vectors of arboviruses infecting humans. PLoS Negl Trop Dis 11(7): e0005625. <https://doi.org/10.1371/journal.pntd.0005625>

Evidence of resistance to at least one insecticide in 87% of cases.

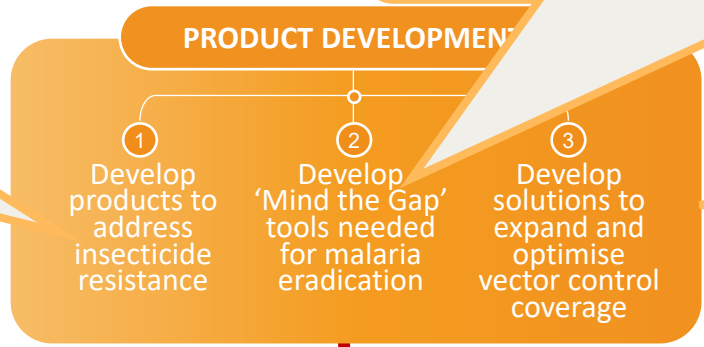


*88 countries reported insecticide resistance monitoring data to WHO between 2010 and 2020.
**WHO Guidelines for Malaria, 2023, <https://app.magicapp.org/#/guideline/6860>

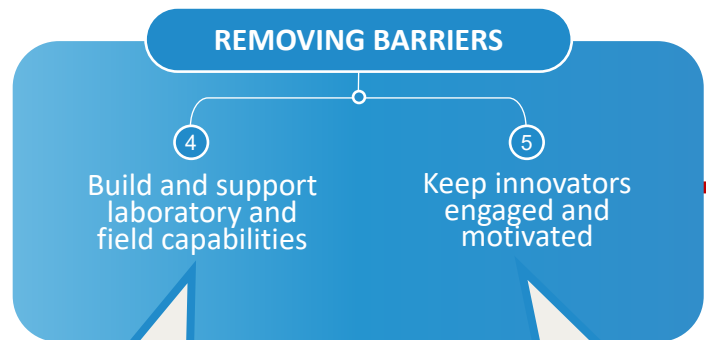
The IVCC strategy has evolved over time to tackle challenges beyond resistance

Partnership outputs:
IRS: Actellic CS, SumiShield, Fludora Fusion, Vectron T500.
ITN: IG2

ATSB under evaluation.
 Spatial emanators as part of Indo Pacific Initiative

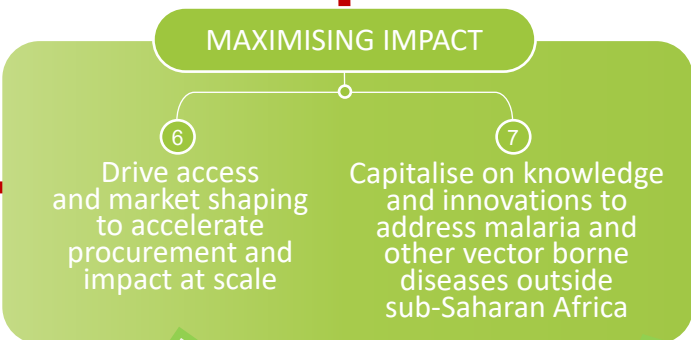


IRS program cost evaluations;
 New Routes to Market Initiative.



GLP Certification for Africa field sites; establishment of PNG Facility

New partners/registrants for pipeline chemistry and novel LLIN development identified. VERV being established.



NGenIRS and New Nets Project

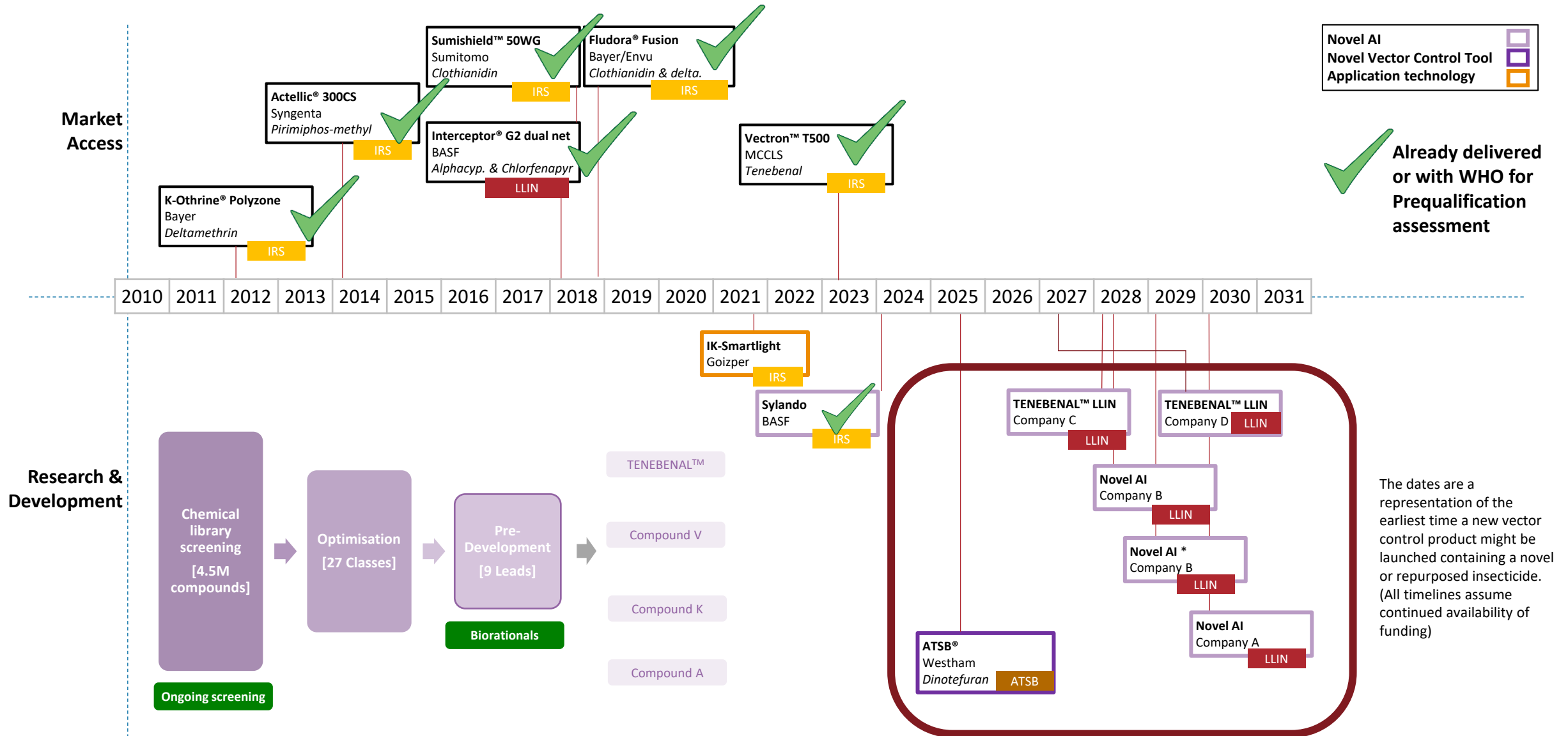


Project BITE (Cambodia/Thailand) and Project NATNAT (PNG)

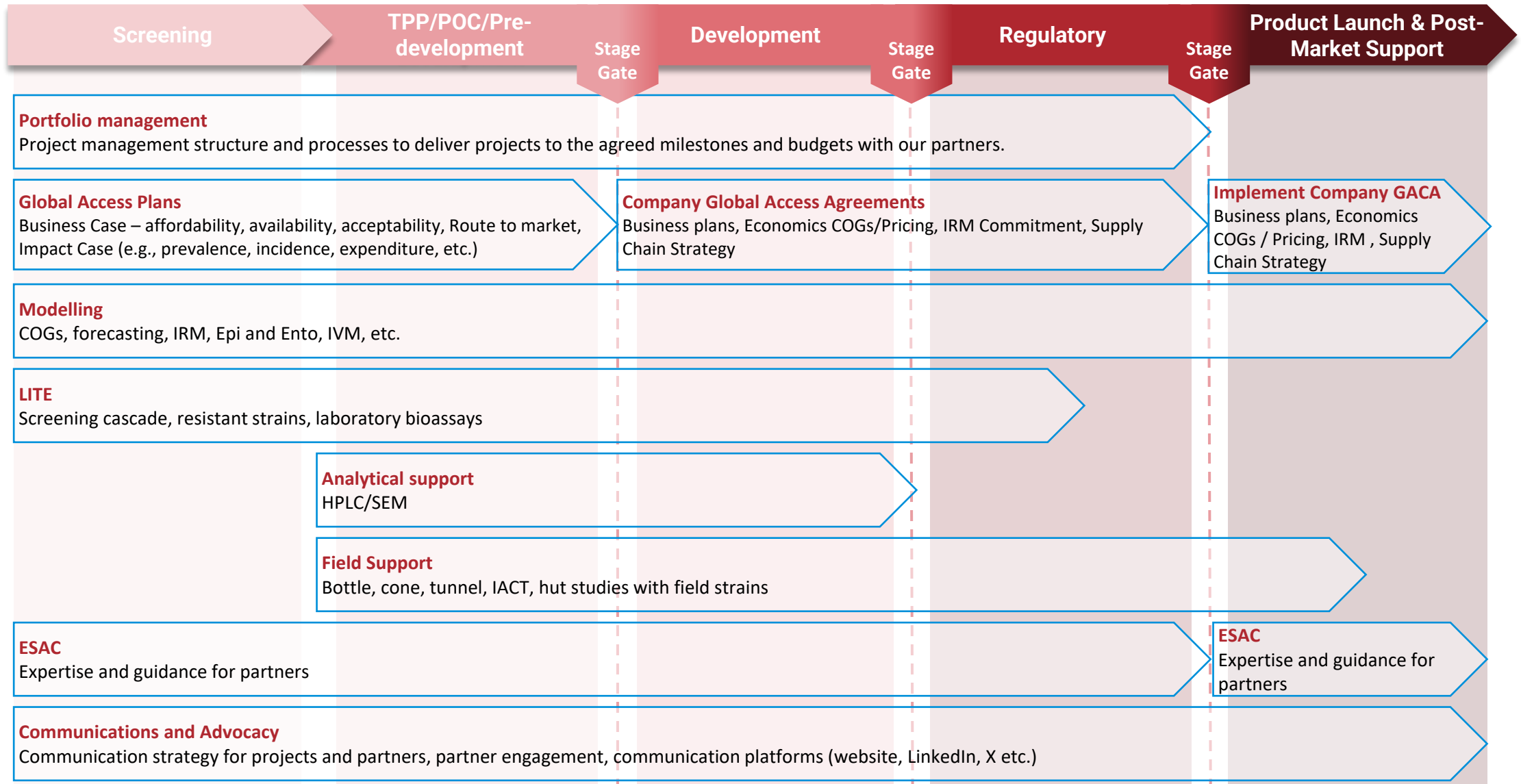
Funding support continued. Staff retention and development.



IVCC has a successful track record of partnering to deliver new tools



'Product development' at IVCC encompasses a range of different functions



Multi-Partner market-shaping interventions have been key in the introduction of new technologies in recent years

NGenIRS

(IRS market shaping intervention)

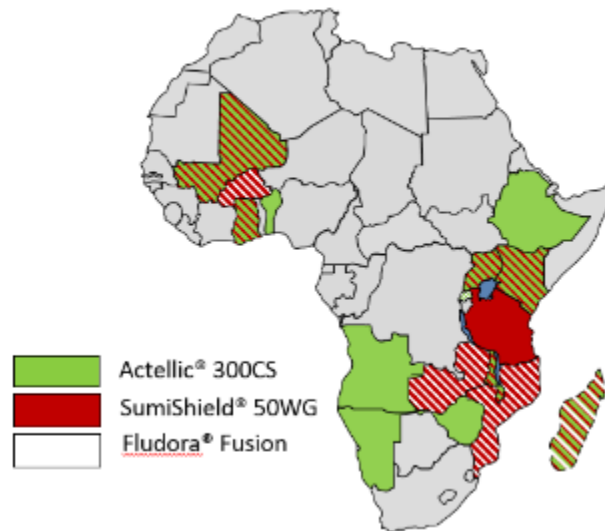
135 million people protected

22% - 47% drop in cases

5.6 million - 11.2 million cases averted

16,586 and 33,173 lives saved

10 of 16 NgenIRS partner countries sprayed multiple 3GIRS products in 2019



15.6 m - 33.2 m cases averted; 47,086 to 75,831 lives saved since 2017

New Nets Project

(LLIN market shaping intervention)

The NNP (2018-2022) is an initiative established by Unitaaid and the Global Fund in partnership with PMI and working with key stakeholders to catalyse the introduction of next generation ITNs, those with two active ingredients (aka dual AI ITNs)

NNP countries

Evaluation Pilots

- Burkina Faso ('19)
- Mali ('20)

Malaria Incidence
Interceptor G2: 44% – 46% fewer cases than pyrethroid LLIN over 2 years

- Ghana ('21)
- Liberia ('21)
- Malawi ('21)
- DRC ('21)
- Cameroon ('22)
- Niger ('22)
- Burundi ('22)

RCTs

- Benin ('20)
 - Tanzania* ('19)
- * Funded by MRC, Wellcome and BMGF

35m IG2 LLINS distributed in 13 countries; preliminary estimate of 8.5 m cases averted and 20,000 lives saved



The exact percent case reduction is going to depend on epidemiological setting as well as levels of insecticide resistance that will be taken into account in the modelling.

Building Partnerships • Creating Solutions • Saving Lives

The role of IVCC as a Product Development Partnership



Building Partnerships

- To de-risk and incentivise industry commitments for VC developments in challenging markets
- To secure and maintain funding for product development
- To enable countries to implement their mosquito borne disease elimination strategies



Creating Solutions

- To establish a pipeline of vector control solutions that address the challenge of insecticide resistance
- To address other unmet needs in the vector control toolbox for other disease transmission settings
- To meet other evolving needs of endemic countries in vector control



Saving Lives

- Through recognition that vector control is fundamental to prevention of mosquito-borne diseases
- Through rapid development and deployment of innovative vector control tools
- By ensuring products are affordable, user-friendly and facilitate correct and sustainable use

There are a range of 'new' challenges to tackle ...

> Proc Natl Acad Sci U S A. 2019 Jul 23;116(30):15086-15095. doi: 10.1073/pnas.1820646116. Epub 2019 Jul 8.

Mosquito feeding behavior and how it influences residual malaria transmission across Africa

Ellie Sherrard-Smith¹, Janetta E Skarp², Andrew D Beale^{3,4}, Christen Fornadel⁵, Laura C Norris⁵, Sarah J Moore^{6,7,8}, Selam Mihreteab⁹, Jacques Derek Charlwood¹⁰, Samir Bhatt², control. A systematic review of mosquito and human behavior is used to quantify and estimate the public health impact of outdoor biting across Africa. On average 79% of bites by the major malaria vectors occur during the time when people are in bed. This estimate is substantially lower than previous predictions, with results suggesting a nearly 10% lower proportion of bites taken at the time when people are beneath LLINs since the year 2000. Across Africa, this higher outdoor transmission is predicted to result in an estimated 10.6 million additional malaria cases annually if universal LLIN and IRS coverage was achieved. Higher outdoor biting diminishes the cases of malaria averted by vector control. This reduction in LLIN effectiveness appears to be exacerbated in areas where mosquito populations are resistant to insecticides used in bed nets, but no association was found between

Comment | [Published: 20 April 2020](#)

Climate change: an enduring challenge for vector-borne disease prevention and control

[Joacim Rocklöv](#) & [Robert Dubrow](#) 

[Nature Immunology](#) **21**, 479–483 (2020) | [Cite this article](#)

51k Accesses | **153** Citations | **333** Altmetric | [Metrics](#)




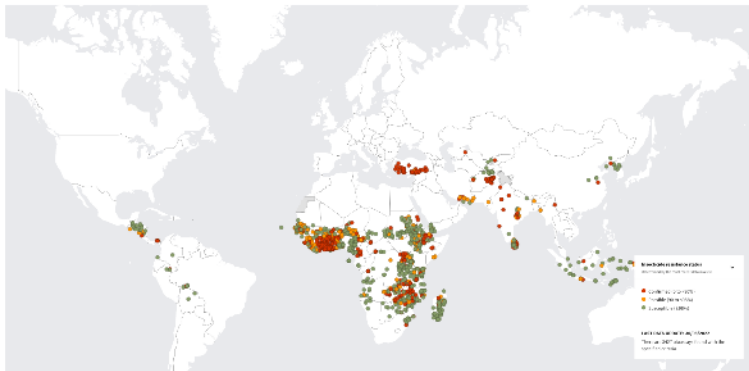
African leaders warn of deadly malaria emergency and call for urgent action to address unprecedented funding shortfall



And insecticide resistance continues to evolve..

Resistance isn't limited to synthetic pyrethroids

 Insecticide resistance status




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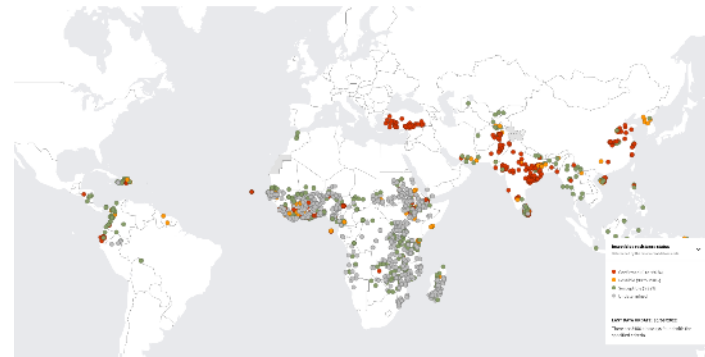
Data source: Malawi Threats Map
Map Production: Global Malaria Programme
World Health Organization



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Carbamate Insecticides (IRS)
Adopted widely since ~2010
Resistance reasonably widespread

 Insecticide resistance status




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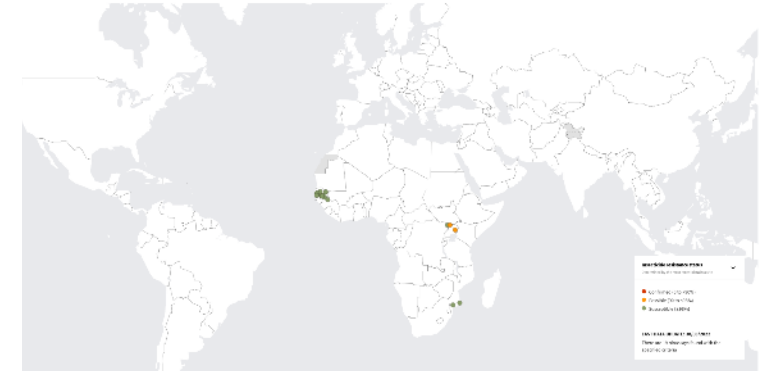
Data source: Malawi Threats Map
Map Production: Global Malaria Programme
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Organophosphate Insecticides (IRS)
Have been adopted widely since about 2015
Resistance confirmed in some areas

 Insecticide resistance status



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Neonicotinoid Insecticides (IRS)
First introduced in 2018
Already some signs of resistance emerging in East Africa

Despite the challenges we feel there is some basis for optimism

New recommendation on pyrethroid-chlorfenapyr nets vs pyrethroid-only nets



WHO Guidelines for malaria - 14 March 2023

v6.1 published on 3/14/23

Strong recommendation for, Moderate certainty evidence

Pyrethroid-chlorfenapyr ITNs vs pyrethroid-only LLINs (2023)

Pyrethroid-chlorfenapyr ITNs should be deployed instead of pyrethroid-only LLINs for prevention of malaria in adults and children in areas with pyrethroid resistance.

Note: Recommendations on deployment of pyrethroid-chlorfenapyr nets were separated into two distinct recommendations for better clarity, but share the same evidence to decision, justification, practical info and research needs. Please refer to the following section.

But ...we must anticipate the risk of resistance development and focus on the pipeline of other dual-AI nets accordingly

Promising recent results of field testing with Spatial Repellents

industry intelligence inc.

HOME PRODUCT & SERVICES MARKETS CLIENT STORIES ABOUT US LOGIN

SC Johnson Guardian, a spatial repellent made by SC Johnson, demonstrates efficacy of one year in new field testing, with potential to repel mosquitoes for multiple rainy seasons; company to start large-scale spatial repellent production in Kenya in 2024

Sample article from our [Tissue & Hygiene](#)

RACINE, Wisconsin, September 20, 2023 (press release) -

New field testing shows SC Johnson spatial repellent could repel mosquitoes for multiple rainy seasons.

New field testing shows SC Johnson Guardian™, a spatial repellent made by SC Johnson, is demonstrating a game-changing efficacy of one year. Spatial repellents are easy-to-use products that can be hung in semi-enclosed spaces (including homes, schools, and humanitarian settings) to repel mosquitoes.

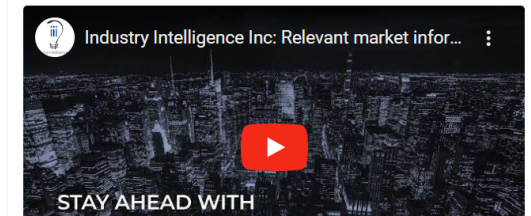
"Guardian's efficacy rate of one year is a game-changer because it covers multiple rainy seasons, when people are at higher risk for mosquito-borne disease," said SC Johnson Chairman and CEO, Fisk Johnson. "We think we can make a big difference in eradicating malaria on this planet and we are making progress. We are hopeful that having a long-lasting tool you can hang in your home, and combine with other measures, will help significantly in this fight."

f t in

More from our Tissue & Hygiene Coverage

Insecticides / Insect Control S.C. Johnson & Son Inc. (SC Johnson)

See our dashboard in action - schedule an demo



But this class of products relies on volatile pyrethroids; use pattern currently focusses on indoors....





In a year of change, what does all this mean for IVCC ?

An IVCC strategy review has been underway for the past 6 months

There have been a range of key questions/challenges taken into account...

Urgency of timelines for next dual-AI ITN. How to balance new AI development with potential repurposing?

How to ensure that there is an adequate set of tools to address outdoor transmission

PRODUCT DEVELOPMENT

- 1 Develop products to address insecticide resistance
- 2 Develop 'Mind the Gap' tools needed for malaria eradication
- 3 Develop solutions to expand and optimise vector control coverage

Is there a need to continue to innovate in IRS

REMOVING BARRIERS

- 4 Build and support laboratory and field capabilities
- 5 Keep innovators engaged and motivated

How to further expand country-leadership and capacity building

Sources of innovation are becoming more diverse

MAXIMISING IMPACT

- 6 Drive access and market shaping to accelerate procurement and impact at scale
- 7 Capitalise on knowledge and innovations to address malaria and other vector borne diseases outside sub-Saharan Africa

Increased complexity of in-country decision making when multiple intervention and product choice is available.

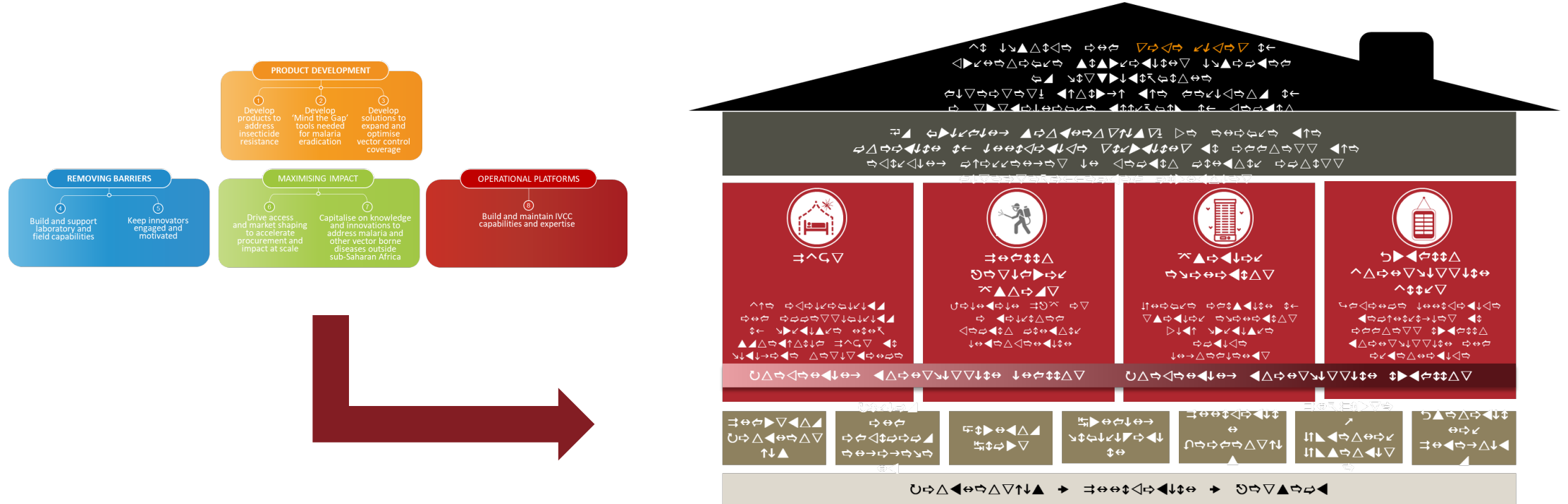
OPERATIONAL PLATFORMS

- 8 Build and maintain IVCC capabilities and expertise

How to manage funding limitations and ensure we deliver the target portfolio?

2023 will see the launch of a new IVCC Strategy

- A new strategic vision will be presented to the IVCC Board later this week
- Considerable listening/consultation as part of the process
- Some things remain constant, others will see change
- Key emphasis on **focus, clarity**; a **sense of urgency** and examining **operational efficiency**
- Further details will be shared more widely after Board endorsement



IVCC values will remain at the core.

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Thank You

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