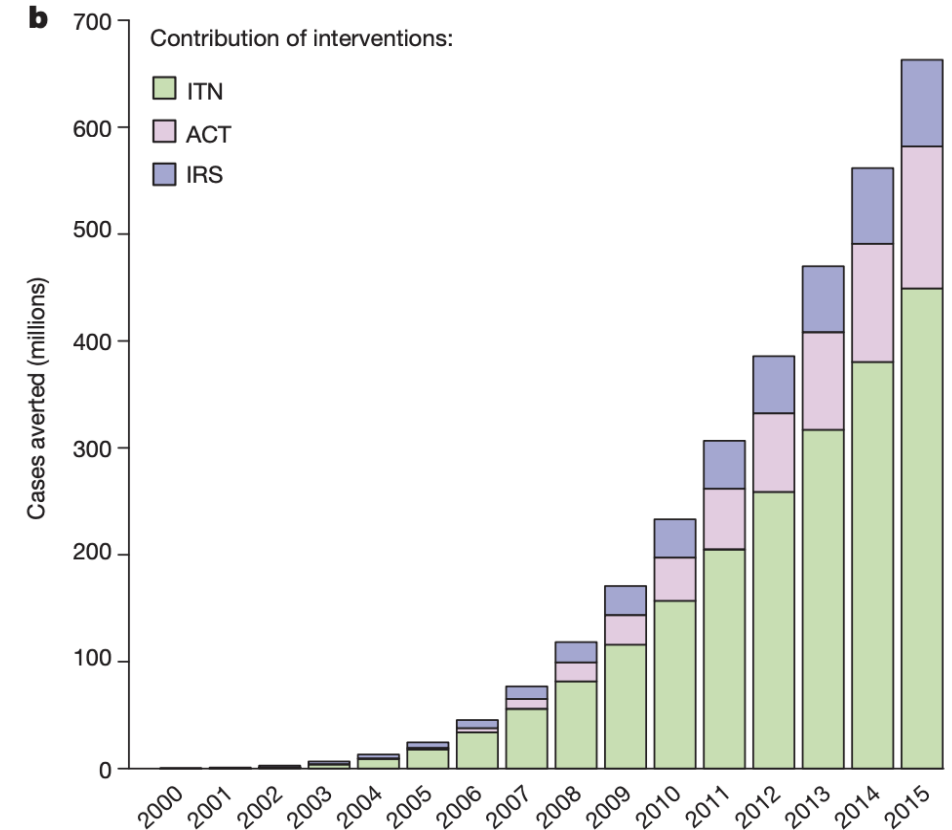
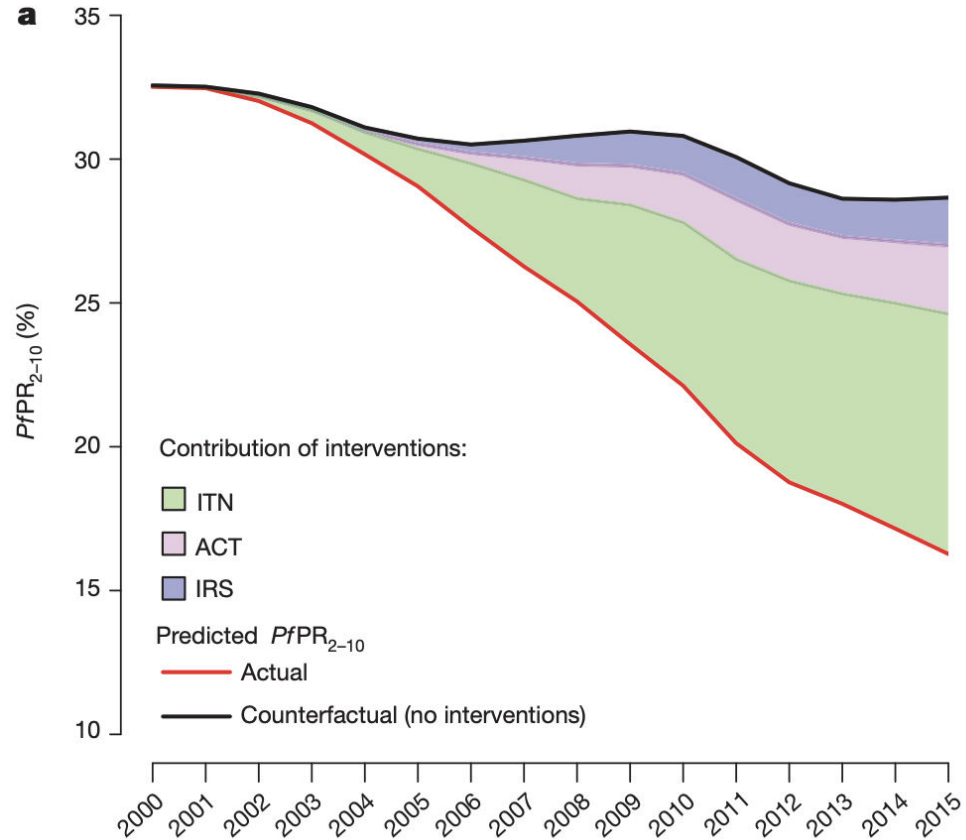

Objectives of meeting, role of ITNs and the challenges of ITN quality and durability

Dr. Corine Ngufor, VCWG co-chair

29th October 2024

ITNs and IRS – contributed substantially to decline in malaria



ITNs and IRS contributed nearly 80% reduction in malaria

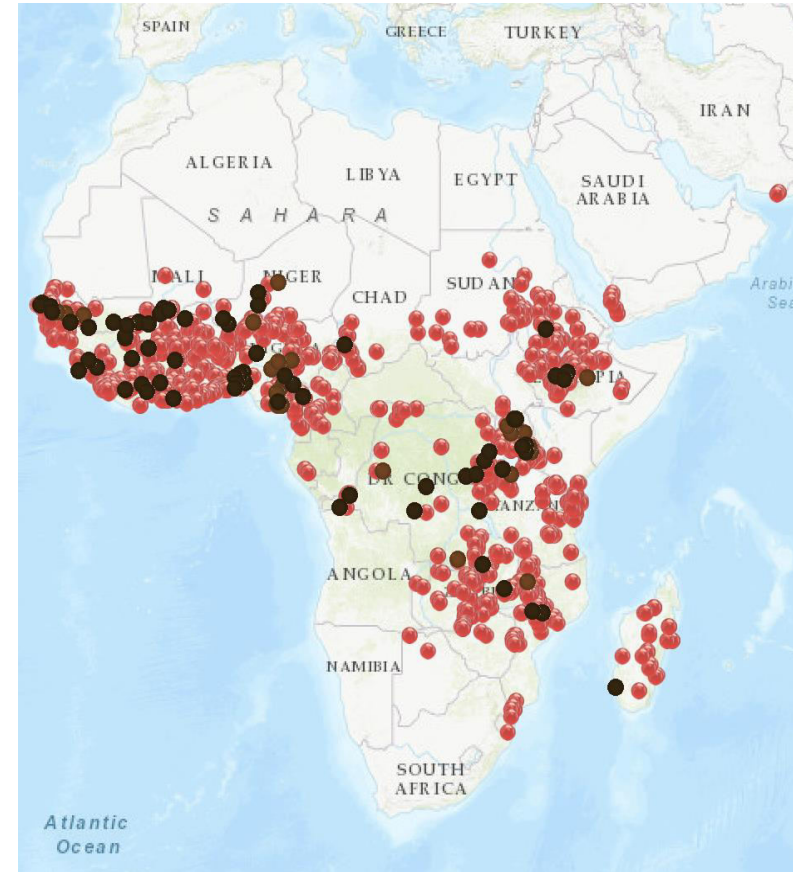
Source: Bhatt et al, 2015

Pyrethroid resistance in African malaria vectors

Source: IRMapper



Insecticide resistance: 1990 to 2005



Insecticide resistance: 2005 to 2020

Pyrethroid resistance is widespread and increasing in intensity

Epidemiological trials of next generation ITNs

Tanzania trial - published

Effectiveness and cost-effectiveness against malaria of three types of dual-active-ingredient long-lasting insecticidal nets (LLINs) compared with pyrethroid-only LLINs in Tanzania: a four-arm, cluster-randomised trial



Jacklin F Moshia*, Manisha A Kulkarni*, Eliud Lukole, Nancy S Matowo, Catherine Pitt, Louisa A Messenger, Elizabeth Mallya, Mohamed Jumanne, Tatu Aziz, Robert Kaaya, Boniface A Shirima, Gladness Isaya, Monica Taljaard, Jacklin Martin, Ramadhan Hashim, Charles Thickstun, Alphaxard Manjurano, Immo Kleinschmidt, Franklin W Moshia, Mark Rowland, Natacha Protopopoff



1. Interceptor (pyrethroid-only)
2. Olyset Plus (pyrethroid-PBO)
3. Royal Guard (pyrethroid + pyriproxyfen)
4. **Interceptor G2 (pyrethroid-CFP)**



- Interceptor G2 induced 44% reduction in malaria incidence compared to standard pyrethroid LLIN over 2 years

Benin trial – NNP –published

Efficacy of pyriproxyfen-pyrethroid long-lasting insecticidal nets (LLINs) and chlorfenapyr-pyrethroid LLINs compared with pyrethroid-only LLINs for malaria control in Benin: a cluster-randomised, superiority trial



Manfred Accrombessi*, Jackie Cook*, Edouard Dangbenon, Boulais Yovogan, Hilaire Akpovi, Arthur Sovi, Constantin Adoha, Landry Assongba, Aboubacar Sidick, Bruno Akinro, Razaki Ossè, Filémon Tokponnon, Rock Aikpon, Aurore Ogouyemi-Hounto, Germain Gil Padonou, Immo Kleinschmidt, Louisa A Messenger, Mark Rowland, Corine Ngufor, Natacha Protopopoff, Martin C Akogbetot



1. Interceptor (pyrethroid-only)
2. Royal Guard (pyrethroid + pyriproxyfen)
3. **Interceptor G2 (pyrethroid-CFP)**



- Interceptor G2 induced 46% reduction in malaria incidence compared to standard pyrethroid LLIN over 2 years

WHO recommendation of dual AI nets to mitigate insecticide resistance

WHO recommendation for new dual AI ITNs and guiding principles for prioritizing malaria interventions including ITNs

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.

Conditional recommendation for, Moderate certainty evidence

Pyrethroid-chlorfenapyr ITNs vs pyrethroid-PBO ITNs (2023)

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

Conditional recommendation for, Moderate certainty evidence

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

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

Guiding principles for prioritizing malaria interventions in resource-constrained country contexts to achieve maximum impact

Background

In line with the goals of the *Global technical strategy for malaria 2016–2030* (1) and with Sustainable Development Goal 3, to ensure healthy lives and promote well-being for all at all ages, the World Health Organization (WHO) Global Malaria Programme continues to promote the principle of leaving no one behind and to ensure access to effective malaria interventions for all those in need.

Due to the heterogeneous distribution of malaria transmission and its determinants, subnational tailoring (SNT) provides an analytical framework to facilitate the targeting of each population with appropriate intervention packages for maximum impact to inform national strategic planning and prioritization based on resources available. The WHO Global Malaria Programme recommends the use of subnational data on disease epidemiology and other relevant local contextual factors to facilitate the process of SNT. Once the strategies and intervention mixes have been defined, programmes can proceed to the prioritization of interventions for effective programming, based on available resources.

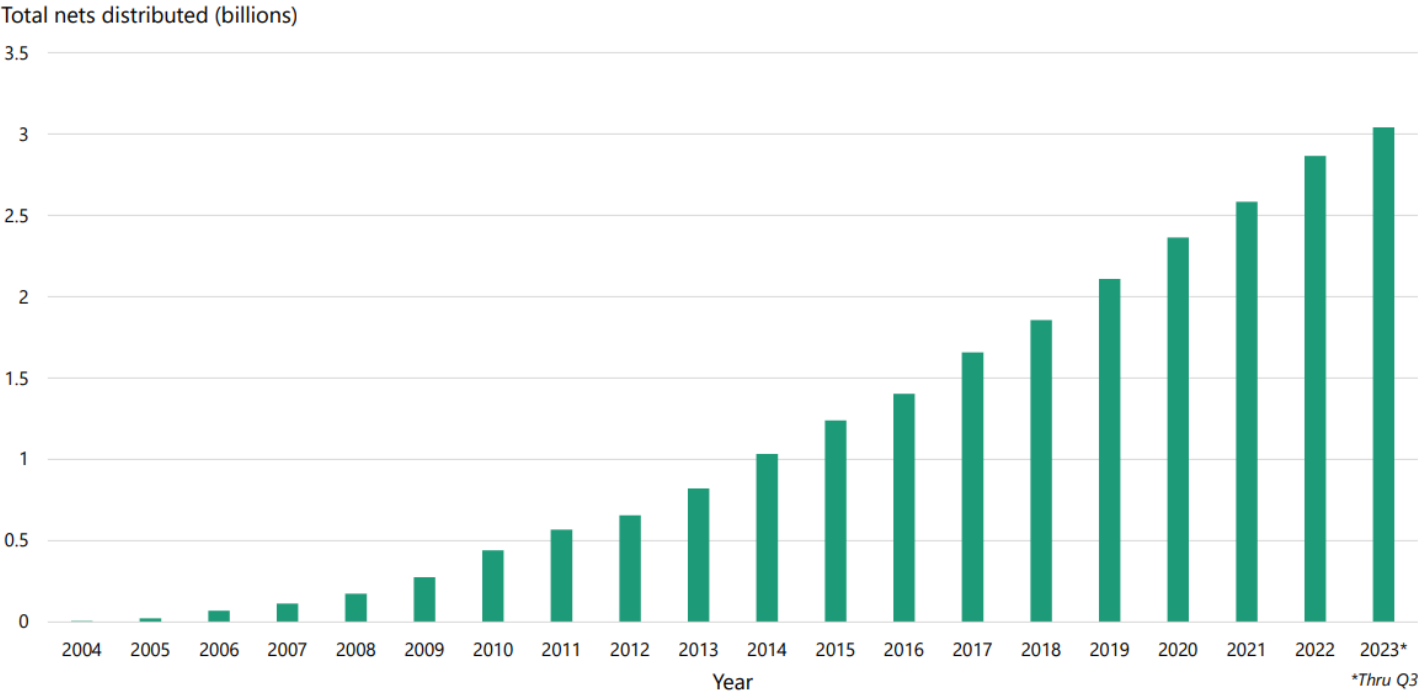
In response to ever increasing financial constraints, the WHO Global Malaria Programme and Regional Offices, in consultation with selected national malaria programme managers and technical partners, have developed these guiding principles for prioritizing interventions in resource-constrained countries to achieve maximum impact for national malaria control programmes. Prioritization is the process of subnationally selecting the most impactful mixes of interventions for implementation and de-prioritizing others because of financial constraints, considering equity and programmatic feasibility. This process requires difficult choices to be made to minimize the negative impact of withholding some interventions included in the national strategic plan. It differs from optimization – the process during planning and implementation by which programmes ensure that the strategies and effective interventions deployed achieve the maximum impact with the most efficient use of available resources.

Prioritization must be guided by the basic principles of primary health care and universal health coverage: patient-centredness, community empowerment, self-determination, accessibility, acceptability, equity, quality, intersectoral collaboration, value and sustainability, accountability and transparency. It should be aligned with the broader national health prioritization processes and the development of health benefit packages, consistent with the principles of country ownership, cost-effectiveness, financial risk protection and political acceptability (2).

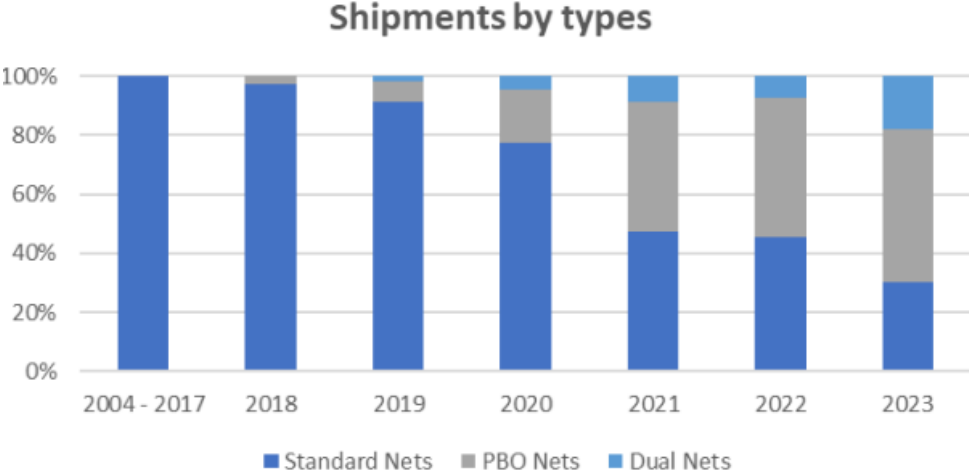


To maximize impact, pyrethroid-chlorfenapyr ITNs should be prioritized

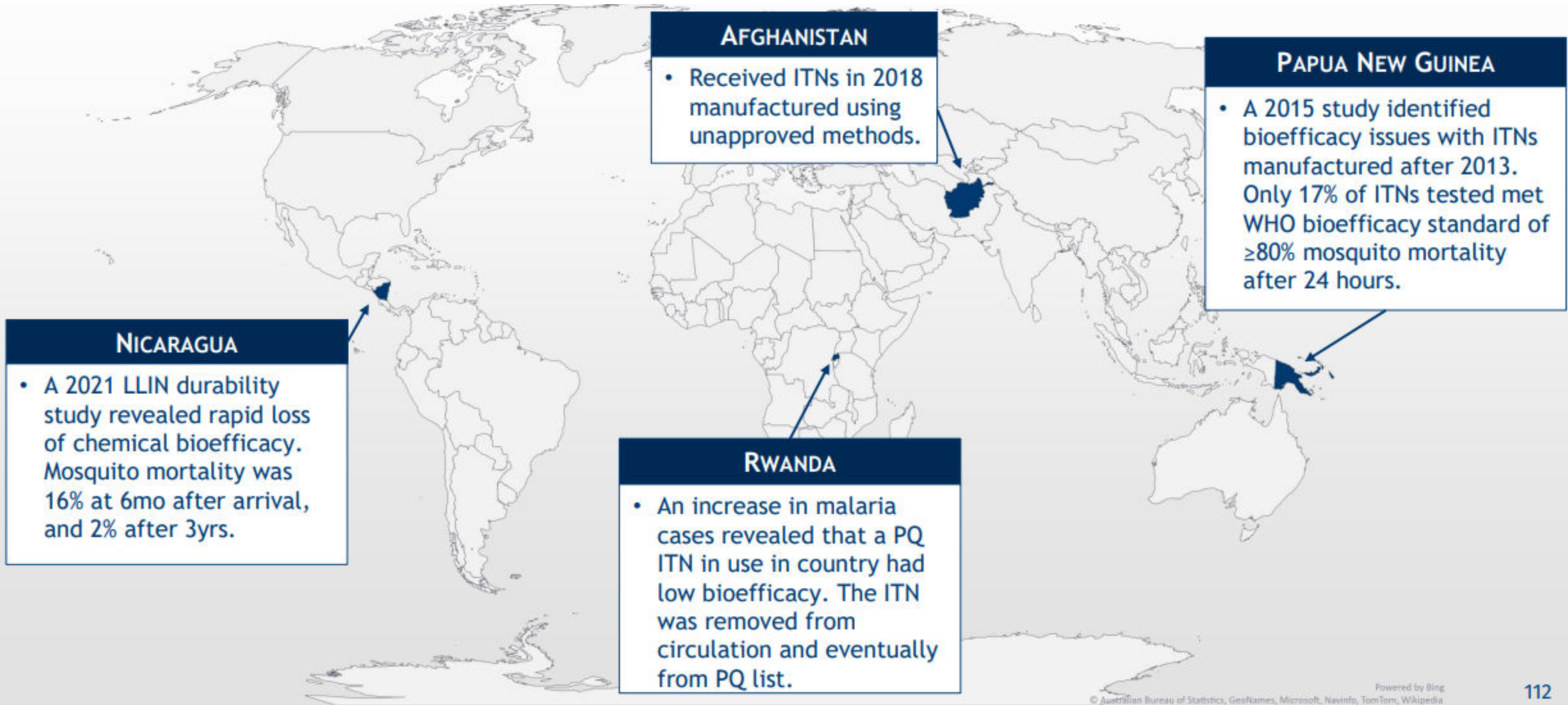
Global Insecticide treated net distribution – cumulative numbers



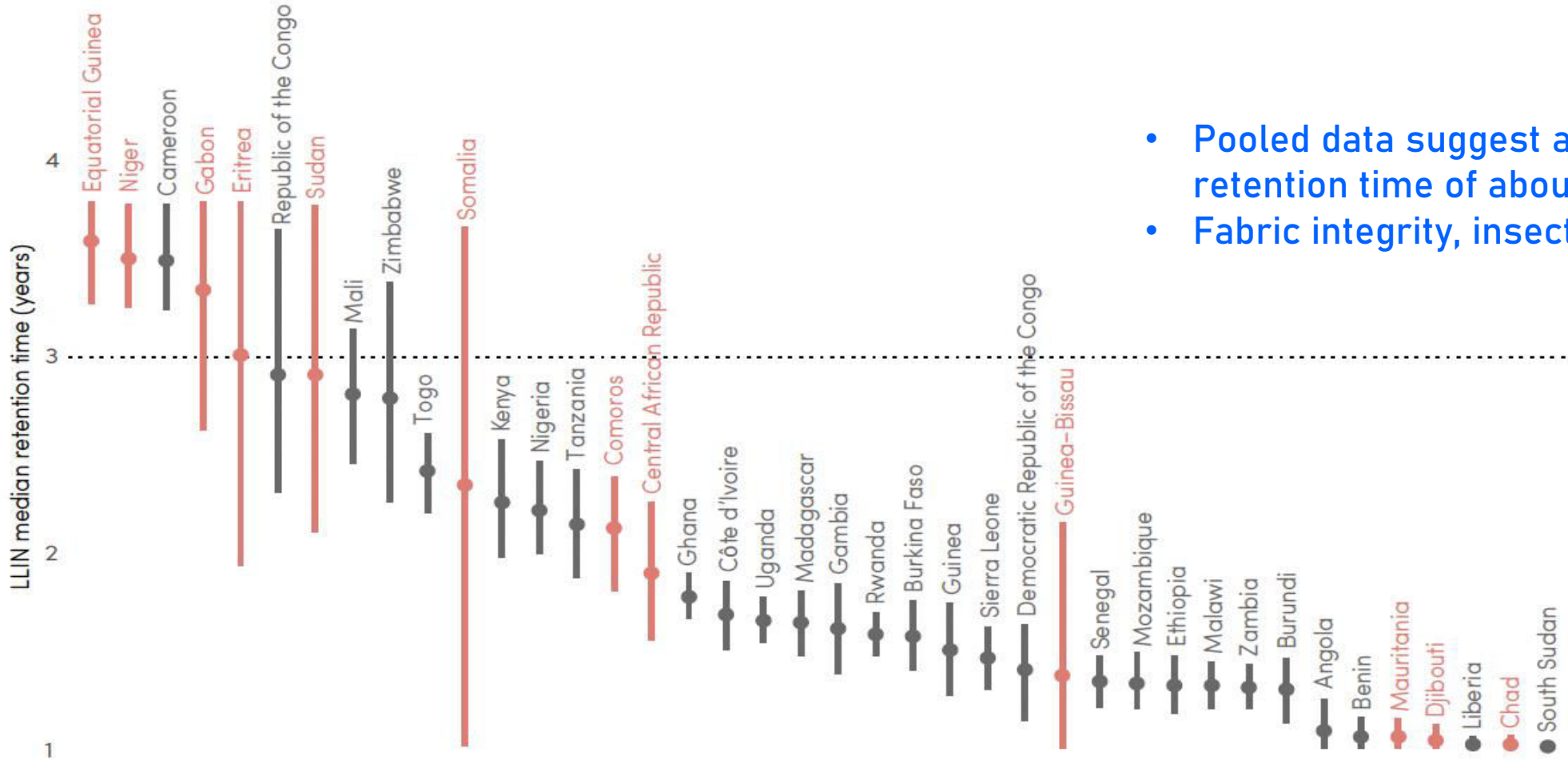
Source: Alliance for Malaria Prevention, Net Mapping Project (Q3 2023).



Reports of poor ITN quality and performance



Challenges of ITN durability



- Pooled data suggest a median retention time of about 1.9 years
- Fabric integrity, insecticide durability

CI: confidence interval; LLIN: long-lasting insecticidal net.

Challenges of ITN durability – dual AI ITNs

RESEARCH

Open Access

The attrition, physical and insecticidal durability of two dual active ingredient nets (Interceptor® G2 and Royal Guard®) in Benin, West Africa: results from a durability study embedded in a cluster randomised controlled trial



Corine Ngufor^{1,2,3*}, Josias Fagbohoun^{2,3}, Augustin Fongnikin^{2,3}, Juniace Ahoga^{2,3}, Thomas Syme^{1,2,3}, Idelphonse Ahogni^{2,3}, Manfred Accrombessi^{1,2}, Natacha Protopopoff¹, Jackie Cook¹, Edouard Dangbenon², Arthur Sovi^{1,2}, Marie Baes⁴, Olivier Pigeon⁴, Damien Todjinou^{2,3}, Renaud Govoetchan^{1,2,3}, Germain Gil Padonou² and Martin Akogbeto²



Article
Monitoring of Fabric Integrity and Attrition Rate of Dual-Active Ingredient Long-Lasting Insecticidal Nets in Tanzania: A Prospective Cohort Study Nested in a Cluster Randomized Controlled Trial

Jackline Martin^{1,2,3,*}, Eliud Lukole², Louisa A. Messenger^{3,4,5}, Tatu Aziz¹, Elizabeth Mallya¹, Edmond Bernard², Nancy S. Matowo³, Jacklin F. Mosha², Mark Rowland³, Franklin W. Mosha¹, Alphaxard Manjurano² and Natacha Protopopoff³

Dual AI nets lasts <2 years in Benin and Tanzania

Effectiveness of pyriproxyfen-pyrethroid and chlorfenapyr-pyrethroid long-lasting insecticidal nets (LLINs) compared with pyrethroid-only LLINs for malaria control in the third year post-distribution: a secondary analysis of a cluster-randomised controlled trial in Benin



Manfred Accrombessi*, Jackie Cook*, Edouard Dangbenon, Arthur Sovi, Boulais Yovogan, Landry Assongba, Constantin J Adoha, Bruno Akinro, Cyriaque Affoukou, Germain Gil Padonou, Immo Kleinschmidt, Louisa A Messenger, Mark Rowland, Corine Ngufor, Martin C Akogbeto†, Natacha Protopopoff†



Loss of improved epidemiological impact in 3rd year post-ITN distribution



Initiatives to address ITN quality



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Raising the Floor

The “Raising the Floor” initiative was established in 2022 and is a multisectoral partnership set up by I2I and CHAI to map the key drivers of ITN performance across net lifespan and systematically resolve challenges affecting ITN performance.

Our **Vision** is to create a system that incentivises continuous innovation of high quality, higher performing ITNs.

A [Convening on Raising the Floor on Nets](#) was held in Liverpool in 2022, and brought together partners from across the vector control spectrum to discuss the quality and performance of ITNs.



<https://innovationtoimpact.org/raising-the-floor/>

Addressing ITN quality – role of WHO

Purpose of RBM VCWG:

- To align RBM partners on best practices and support the implementation of Vector Control Guidance generated by WHO
- For over 50 years, WHO has worked to support the development, evaluation and adoption of new safe, effective and high-quality VCPs.
- In 2016, VCP prequalification transitioned to the newly created **Prequalification Unit Vector Control Product Assessment Team (PQT/VCP)**.
- The WHO PQT/VCP assesses VCPs and public health pesticide active ingredients to determine that they can be used safely and effectively, and are manufactured to a high-quality standard.
- This is done by assessing product dossiers and inspecting manufacturing sites.

[Vector Control Products | WHO - Prequalification of Medical Products \(IVDs, Medicines, Vaccines and Immunization Devices, Vector Control\)](#)

Addressing ITN quality – role of WHO



Prequalification of
Medical Products
IVDs, Medicines, Vaccines and Immunization
Devices, Vector Control

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VCP

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What We Do

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List of Prequalified Vector Control Products

Prequalification Pipeline

Vector Control Products



Vector control interventions are considered *health products* and have contributed substantially to preventing vector-borne diseases. The [2019 World Malaria Report](#) shows the number of countries

Information for

Manufacturers

Regulatory agencies

Quality control laboratories

Procurement agencies

Recent Highlights

- [October 18-20 Geneva, Switzerland: Consultation – WHO Guideline for Prequalification of Insecticide Treated Nets \(ITNs\)](#)
- Publication of the Second Edition of the

[Vector Control Products | WHO - Prequalification of Medical Products \(IVDs, Medicines, Vaccines and Immunization Devices, Vector Control\)](#)

VCP

Vector Control Products

Vector Control Product List

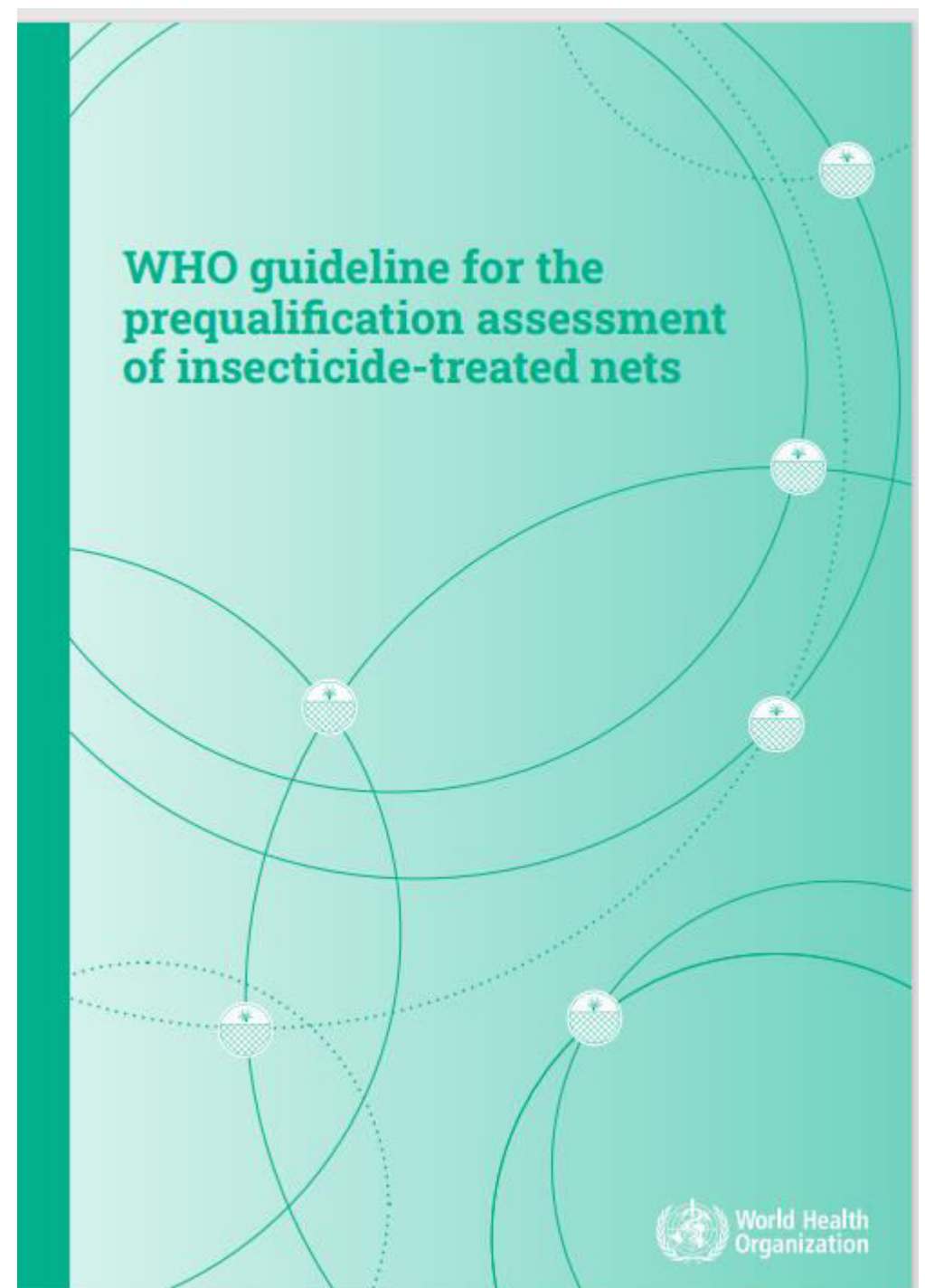
Displaying: 1 - 25 of 29

[Download list as CSV file](#)

29 WHO prequalified ITN brands

PQT/VC Ref Number	Product Name	Applicant	Product Type	Active Ingredient/Synergist	Date of Prequalification
006-001	DuraNet LN	Shobikaa Impex Private Limited	ITN	Alpha-cypermethrin	7 Dec, 2017
006-003	DuraNet Plus	Shobikaa Impex Private Limited	ITN	Alpha-cypermethrin, Piperonyl Butoxide (PBO)	13 Aug, 2020
P-00320	GreenNet	Shobikaa Impex Private Limited	ITN	Deltamethrin	16 Aug, 2024
002-001	Interceptor	BASF AGRO B.V. Arnhem (NL) Freienbach Branch	ITN	Alpha-cypermethrin	8 Dec, 2017
002-002	Interceptor G2	BASF AGRO B.V. Arnhem (NL) Freienbach Branch	ITN	Alpha-cypermethrin, Chlorfenapyr	29 Jan, 2018
014-001	MAGNet	V.K.A. Polymers Pvt. Ltd	ITN	Alpha-cypermethrin	19 Feb, 2018
009-001	MiraNet	A to Z Textile Mills Limited	ITN	Alpha-cypermethrin	21 Feb, 2018
001-004	OLYSET Net	Sumitomo Chemical Co., Ltd	ITN	Permethrin	7 Dec, 2017

- This PQVCT is continually evolving, to better support entry of new and innovative products into the market.
- Recently developed new guidelines for the prequalification assessment of ITNs and a series of implementation documents



Objectives of webinar

Objectives:

1. To provide an overview of the role of ITNs in the malaria control and the challenges associated with their durability and quality.
2. To raise awareness about latest updates in the WHO vector control product prequalification process towards ensuring the availability of high-quality ITNs.
3. To address inquiries about the WHO ITN prequalification assessment process and requirements related to quality, safety and efficacy..
4. To identify new priorities for the VCWG/WS1 Task team 2 for galvanising efforts towards enhancing the quality and durability of ITNs and offer a platform for information sharing and collaboration.

Objectives of webinar

Time	Title	Total Time	Speaker
WHO PQ Vector Control Product information session			
14:30-14:50	Overview of the activities of the WHO/PQ VCP team	20 minutes	Dominic Schuler (WHO/PQ VCP)
14:50-15:20	New ITN guidelines and implications for improved ITN quality	30 minutes	Dr Geraldine Foster (WHO/PQ VCP)
15:20-15:40	Q and A session (responses to submitted questions and some live questions from audience)	20 minutes	Dr Corine Ngufor (LSHTM)
Way forward and wrap up			
15:40-15:50	VCWG WS1 TT2 priorities for ITN quality and durability	15 minutes	Dr Christen Fornadel (IVCC)/Dr Ketty Ndhlovu (NMCP, Zambia)
15:50-16:00	Wrap up and next steps	5 minutes	Dr Corine Ngufor (LSHTM)