

INSECTICIDE-TREATED NETS (ITN) DISTRIBUTION

Best practice update

As malaria cases are increasing amidst flatlining funding, ITNs should be optimally deployed to reach all people in need

Strengthening ITN distribution, including continuous distribution, provides important options to consider for improving and sustaining ITN access

Problem statement

It has been well-established and demonstrated in recent programme experience that increasing ITN access will decrease malaria incidence¹². ITNs are one of the most cost-effective measures for preventing malaria. Yet, despite programmatic achievements to deploy more than 1.25 billion ITNs in the past five years, there has been no significant increase in access to and use of ITNs since

2015³. The reasons for this stagnation include flatlining per capita malaria funding in the face of population growth, higher commodity costs associated with the ITNs needed to address pyrethroid resistance, and variable durability of ITNs, for which the median ITN retention time does not span the expected three years between campaigns.

Strategic response

To achieve maximum impact in vector control and reduce malaria transmission, WHO's *Guiding principles for prioritizing malaria interventions in resource-constrained country contexts*⁴ advise that vector control strategies include the most effective interventions at an optimal scale and frequency. National malaria programmes are thus encouraged to align with WHO Malaria Guidelines as well as malaria donor recommendations (see box), review operational and financial data, and consider the best distribution options to maintain ITN access in their settings, noting that appropriate distribution options will likely include sub-national tailoring.

[WHO Guidelines for Malaria](#) and malaria donors recommend consideration of ITN continuous distribution (CD). For more information, consult:

- ↘ [U.S. President's Malaria Initiative \(PMI\) FY2025- Technical Guidance](#)
- ↘ [The Global Fund Applicant Guidance, Malaria Information Note](#)
- ↘ [WHO Guiding principles for prioritizing malaria interventions](#)

Actions

Selection of both ITN type and the optimal mix of ITN distribution channels is critical to maximizing impact. The most effective ITNs should continue to be selected according to insecticide resistance profiles across distribution channels. To maximize impact, and within available resources, pyrethroid-chlorfenapyr ITNs should be prioritized, followed by pyrethroid-piperonyl butoxide ITNs in areas of pyrethroid resistance⁵.

The WHO guiding principles underscore that ensuring ITN access for pregnant women and children under five through distribution via routine health services is an essential priority. As this channel alone is insufficient for scaling up or sustaining population access to ITNs given its target groups, most malaria-endemic countries have adopted one or more additional ITN distribution channels to reach the broader population. In many countries, routine ITN distribution is combined with mass campaign

1. Bhatt S, Weiss DJ, Cameron E, Bisanzio D, Mappin B, Dalrymple U, et al. The effect of malaria control on *Plasmodium falciparum* in Africa between 2000 and 2015. *Nature* 2015;526(7572):207-11.

2. Wagman, Joseph (2023). Presentation to the RBM Vector Control Working Group, 2023. The Effectiveness of Dual-AI ITNs Distributed at Scale. <https://endmalaria.org/18th-annual-meeting-vector-control-working-group>

3. WHO, World Malaria Report (2022). <https://www.who.int/teams/global-malaria-programme/reports/world-malaria-report-2022>

4. WHO (2024). Guiding principles for prioritizing malaria interventions in resource-constrained country contexts to achieve maximum impact. <https://www.who.int/publications/i/item/B09044>

5. Ibid.

distribution every three years (or variation thereof), with the objective of scaling up ITN access to all populations at risk and ensuring continuous access to ITNs for the biologically most vulnerable between campaign periods. Data from many countries show that these two channels as currently implemented are insufficient to reach and sustain targets, particularly where ITN retention time is short.

Based on data showing that more ITNs are needed to sustain access, some national malaria programmes have considered increasing the frequency of their ITN mass campaigns (for example, to two-year cycles) to account for the median retention time of ITNs. However, other options to increase or maintain ITN access should also be considered, such as ITN continuous distribution (CD) via annual distribution of ITNs to schoolchildren or through community channels to improve ITN access. These

channels may, in some settings, cost less, be more effective at sustaining ITN access, and be less disruptive to the health system than more frequent ITN mass campaigns. New modelling for ITN distribution strategies shows that “For countries with at least 2.5-year median ITN retention times, full scale continuous distribution provided better ITN access while needing 20–23 per cent fewer ITNs compared to current mass campaigns”⁶.

Definition.



ITN continuous distribution includes distribution of ITNs via routine health services such as antenatal care (ANC) or immunizations (EPI), community- and/or school-based channels.

Considerations

In exploring the inclusion of ITN CD through primary schools and community-based distribution, operational feasibility and cost-effectiveness are important considerations. Further information for decision-making and operational considerations is available [here](#).

- While mass ITN campaigns have contributed significantly to increasing ITN access, access may be high for only a short period post-campaign. As ITNs begin to wear out, overall access declines, underscoring the importance of exploring additional or alternative ITN distribution options to maintain access⁷. Recent modelling to compare mass campaigns to large-scale continuous distribution approaches and to combinations of campaigns and continuous approaches resulted in recommended approaches and population access estimates for 40 countries in sub-Saharan Africa, which concluded that, where ITN retention times are at least 2.5 years, “continuous distribution strategies are likely to offer more efficient ways to maintain ITN coverage”⁸.
- Studies have shown comparable costs for continuous distribution and mass campaigns, with a greater proportion of CD costs covered by domestic government resources compared to mass campaigns⁹.
- School- and community-based distribution of ITNs require planning and dedicated resources for their operational success. Different approaches to ITN distribution through schools and community channels have been implemented for nearly fifteen years, with both successful results and operational challenges as shown in the examples below, as well as on the Alliance for Malaria Prevention¹⁰ and the Continuous Distribution Toolkit websites¹¹.

Country examples and resources for more information

School-based distribution of ITNs: In areas with a well-functioning education system and high enrolment, school-based distribution provides an easily identified

and quantified target group. While ITNs are distributed to schoolchildren, social and behaviour change reinforces that the ITN is for the household.

6. Koenker H, Yukich J, Erskine M, Opoku R, Sternberg E, and Kilian A (2023). How many mosquito nets are needed to maintain universal coverage: an update. *Malaria Journal* (2023) 22:200. <https://malariajournal.biomedcentral.com/articles/10.1186/s12936-023-04609-z>

7. Bertozzi-Villa A, (2021). Maps and metrics of insecticide-treated net access, use, and nets-per-capita in Africa from 2000-2020. *nature communications* (2021) 12:3589. <https://doi.org/10.1038/s41467-021-23707-7>

8. Koenker H, Yukich J, Erskine M, Opoku R, Sternberg E, and Kilian A (2023). How many mosquito nets are needed to maintain universal coverage: an update. *Malaria Journal* (2023) 22:200. <https://malariajournal.biomedcentral.com/articles/10.1186/s12936-023-04609-z>

9. Ibid.

10. https://allianceformalariaprevention.com/resources/resource-library/?_sfm_res_type=Case%20Studies&_sfm_res_focus_area=Continuous%20distribution

11. <https://allianceformalariaprevention.com/resources/continuous-distribution-toolkit/>

Country examples – School-based distribution (SBD)

Brief description	For further information
<p>Ghana: Since 2012, in 15 regions, more than 10.6 million ITNs have been distributed through SBD. Working through the existing School Health Education Programme (SHEP), coordinators at national, regional, district and school levels, alongside sub-district/circuit supervisors, provide a well-established system through more than 25,000 public and private primary schools to link classrooms to households to support school-based distribution of ITNs and dissemination of key messages. Ghana has also implemented mass ITN campaign distributions in 2010–2012, 2015, 2018, 2021 and 2024 and distributes ITNs through routine health services (ANC and EPI) nationally. Ghana Health Service partners include the Ghana Education Service and SHEP, which coordinates school-based ITN distribution, reviews and approves school enrolment data and participates in planning, implementation, and supervision of activities nationwide.</p>	<p>The PMI VectorLink School-based ITN Distribution Step-by-Step Exemplar provides country profiles for Ghana and Tanzania, as well as the Democratic Republic of the Congo, Guinea and Mozambique.</p>
<p>Mainland Tanzania: Through the School Net Programme (SNP), over the 10 years between 2013 and 2023, 29,430,469 ITNs were distributed to 17,588 primary schools. Tanzania's national ITN strategy includes the SNP as the primary ITN distribution approach in moderate- and high-burden councils, alongside ITNs distributed through routine reproductive health services during ANC and child health services at EPI visits that were introduced in 2016 across all malaria transmission strata. In early 2023, ITN distribution to special, most-vulnerable, underserved and hard-to-reach populations was added via health facilities and issued 643,989 ITNs up to December 2023. Mass campaigns are deployed in high malaria burden areas on a targeted basis, triggered only when monitoring shows that the proportion of the population with access to an ITN falls below 40 per cent, to quickly scale up coverage¹².</p>	

Community-based distribution of ITNs engages communities and community actors to provide community members ongoing access to ITNs, based on criteria established by the national malaria programme. Additional information can be found in the [PMI VectorWorks Community-Based ITN Distribution Guide](#)¹³.

Country examples – Community-based distribution of ITNs

Brief description	For further information
<p>Madagascar: Following several pilot programmes, which exceeded national objectives for ITN access and use, community-based distribution was expanded. The national malaria programme has collaborated with community leaders and through established community ITN committees to develop an approach, called <i>Continuous Community Distribution</i> (DCC in French). DCC provides ITNs to households which have uncovered sleeping spaces, alongside ITN distribution through mass campaigns and routine ANC and EPI services. DCC was included in the National Malaria Strategic Plan. Weekly malaria cases decreased by 14 per cent during DCC in Toamasina District. Areas without DCC noted a 12 per cent increase in malaria cases.</p>	<p>AMP Case Study_Madagascar ITN CD</p> <p>Girond, F et al. (2018). Evaluating Effectiveness of Mass and Continuous Long-lasting Insecticidal Net Distributions Over Time in Madagascar. <i>E Clinical Medicine</i>. 2018 Jul;1:62-69. Doi: 10.1016/j.eclinm.2018.07.003.</p> <p>Zegers de Beyl et al. (2017) Evaluation of community-based continuous distribution of long-lasting insecticide-treated nets in Toamasina II District, Madagascar <i>Malaria Journal</i>, 16:327 DOI 10.1186/s12936-017-1985-7.</p>
<p>Senegal: The national malaria programme analysed potential channel options for ITN distribution and developed a comprehensive approach to CD, which includes free ITN distribution to pregnant women through routine ANC in health centres and health huts, through community health workers with community-based organizations, and social marketing in urban and peri-urban areas.</p>	<p>NMCP (2013). Guide d'orientation stratégique. Distribution des moustiquaires imprégnées à travers les organisations communautaires de base. https://allianceformalariaprevention.com/resources/continuous-distribution-toolkit/</p> <p>NMCP Plan Stratégique National de Lutte contre le Paludisme au Sénégal 2016-2020</p>
<p>Burundi: Burundi implemented a pilot programme, starting in 2021, building on their strong network of community health workers, to distribute ITNs via community channels in two districts. The evaluation of the project showed a relative decrease in malaria during the distribution as well as notable challenges, for example, in approval of the MoH Community-Based Distribution (CBD) guidelines, securing warehouses, and establishing the reporting system. Therefore, the Burundi national malaria programme recommends robust preparedness and coordination, alongside ongoing oversight and advocacy. A full evaluation is still to be carried out, but the community-based distribution is continuing, with districts receiving ITNs through this channel excluded from the planned 2025 mass campaign.</p>	<p>Sinarinzi P. (2024). Transitioning to community-based distribution in high-burden districts for a lasting net coverage: successes, challenges and recommendations from Burundi. NMCP presentation to the AMP annual meeting. https://allianceformalariaprevention.com/wp-content/uploads/2024/02/03_Burundi-Transition-to-community-based-distribution-P-Sinarazi.pdf</p>

12. Koenker, H et al (2022). Annual distributions of insecticide-treated nets to schoolchildren and other key populations to maintain higher ITN access than with mass campaigns: a modelling study for mainland Tanzania. *Malaria Journal*. <https://malariajournal.biomedcentral.com/articles/10.1186/s12936-022-04272-w>

13. <https://allianceformalariaprevention.com/resources/continuous-distribution-toolkit/>