WHO recommendations for achieving universal coverage with long-lasting insecticidal nets in malaria control

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The text below is a revised version of the recommendations issued in September 2013 and revised in March 2014. The text incorporates earlier comments for discussion.

Long-lasting insecticidal nets (LLINs) have played an important role in the remarkable success of reducing the global malaria burden over the past decade.\(^1\) They are a core prevention tool widely used by people at risk of malaria. Ensuring universal coverage of all people at risk of malaria with LLINs or indoor IRS forms part of pillar 1 of the Global Technical Strategy (GTS) for Malaria 2016 – 2030.\(^2\) Universal coverage is defined as 100% access to, and use of, either of these interventions by populations at risk of malaria.

To support implementation of the GTS pillar 1, WHO recommends the following based on current evidence:

1. In order to maintain universal coverage, countries should apply a combination of mass free distributions through campaigns and continuous\(^3\) distributions through multiple channels, in particular through antenatal care (ANC) clinics and the expanded programme on immunization (EPI). Mass campaigns are the only proven cost-effective way to rapidly achieve high and equitable coverage. However, coverage gaps start to appear almost immediately post-campaign through net deterioration, loss of nets, and population growth. Thus, complementary continuous distribution channels are required.

   • For mass campaigns, one LLIN should be distributed for every two persons at risk of malaria.

   • However, for procurement purposes, since many households have an odd number of members, the calculation of LLINs required needs to be adjusted when quantifying at the population level. Therefore, in general, an overall ratio


\(^3\) The term “continuous” is used to describe distribution systems that deliver nets continuously and without interruption over time, as opposed to “campaigns” which deliver a consignment of nets to a defined target population in a single time-limited operation. “Routine” LLIN systems deliver nets along with other routine health services.

This document was prepared as a pre-read for the meeting of the Malaria Policy Advisory Committee and is not an official document of the World Health Organization.
of 1 LLIN for every 1.8 persons in the target population should be used. This ratio can be adjusted as needed if there are data that support such adjustment.\textsuperscript{4}

2. The lifespans of LLINs vary widely between individual nets used within a single household or community, as well as between nets used in different settings. This makes it difficult to plan the rate or frequency at which replacement nets need to be procured and delivered. LLIN durability monitoring should therefore be conducted in line with available guidance \textsuperscript{5,6} by all malaria programmes that have undertaken medium- to large-scale LLIN distributions. Where there is evidence that LLINs are not being adequately cared for or used, programmes should implement behaviour change interventions aimed at improving these behaviours.

3. Mass campaigns should normally be repeated at an interval of three years unless empirical evidence is available to justify the use of a longer or shorter interval. A shorter distribution interval may also be justified in cases where humanitarian emergencies increase the risk of an epidemic.

4. Continuous distribution through ANC and EPI channels should remain functional before, during, and after the mass distribution campaigns. School-based distribution should be discontinued during campaign years to avoid duplication of resources, unless there is empirical evidence to justify continuation of LLIN distribution through both schools and campaigns channels.

5. There should be a single national plan and policy, under the leadership of the national malaria control programme, for both continuous and campaign distribution strategies. This unified plan should include a comprehensive quantification and gap analysis for all public sector LLIN distribution channels. To the extent possible, the plan should also include major LLIN contributions by the private sector.

6. Each national malaria control programme should develop its own LLIN distribution strategy, based on analysing the local context of opportunities and constraints, and identifying a combination of distribution channels to achieve universal coverage and minimize gaps. In addition to mass campaigns, the distribution strategy could include:

- ANC, EPI and child health clinics – these should be considered as high priority LLIN continuous distribution channels in countries where contact rates are high, as occurs in much of Africa south of the Sahara.

- Schools, faith- and community-based networks, and agricultural and food-security support schemes – these can also be explored as a channel for LLIN distribution in countries where this approach is feasible and equitable.


\textsuperscript{6} LLIN Durability Monitoring. Toolkit and Data Repository. The President’s Malaria Initiative. https://www.durabilitymonitoring.org/
• Occupation-related distribution channels – in some settings, particularly in Asia where transmission ecology is often patchy, the risk of malaria may be strongly associated with specific occupations, such as plantation and farm workers and their families, miners, soldiers and forest workers. Opportunities for distribution through channels, such as private sector employers, workplace programmes and farmers’ organisations, may be explored.

• The private and commercial sectors can be important supplementary channels to free LLIN distribution through public sector channels. Access to LLINs can also be expanded by drawing on the private sector for the exchange of vouchers or coupons provided through public sector channels for a free LLIN at participating retail outlets. LLIN products distributed through the private sector should be regulated by the national registrar of pesticides to ensure quality following the specifications described by the WHO Pesticide Evaluation Scheme.

7. As programmes explore a shift to different mixes of distribution methods, national malaria control programmes will need accurate tracking of LLIN coverage to district-level coverage, with triggering of sub-national responses if coverage falls below universal coverage. Tracking must differentiate the contributions of delivery channels to overall LLIN coverage.

8. Evidence available from Malaria Indicator Surveys (MIS) and Demographic and Health Surveys (DHS) in sub-Saharan Africa indicates that LLINs with different attributes (e.g., different shapes, colours and textiles) are used at similar rates regardless of the preferred net attributes indicated by intended end users. Furthermore, even if usage rates are higher in certain settings for LLINs with attributes that vary from the standard (which in most places are rectangular, white, large-sized, polyethylene or polyester LLINs), the increased use is unlikely to be sufficient to offset higher costs associated with procuring nets with non-standard attributes. Procurement of LLINs with attributes that are more costly (e.g. nets of conical shape) is therefore not recommended unless nationally-representative data clearly show that the use of LLINs with particular attributes increases significantly among at-risk populations.

9. Periodic “top-up campaigns” are not recommended.

10. In countries where untreated nets are widely available, national malaria control programmes should promote LLINs through changes to the market and techniques for treating untreated nets, including access to insecticide treatment kits.

11. Countries should generate data on defined standard indicators for coverage and access rates, to ascertain whether universal coverage has been achieved, as well as where programmatic modifications are required to improve performance toward achievement of targets. Currently the three basic survey indicators, as developed

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8 ‘Top-up’ campaigns take existing nets in households into account and each household is given only the additional number of nets needed to bring them up to the target number.
by the RBM Monitoring and Evaluation Reference Group (MERG)\(^9\) and adapted by WHO for the World Malaria Report, are:

a) Proportion of households with at least one ITN/LLIN

b) Proportion of population with access to an ITN/LLIN within their household

c) Proportion of population reporting having slept last night under an ITN/LLIN (by age (<5 years; 5-14 years; 15+ years), gender and access to ITN)

These outcome indicators are usually measured in cross-sectional Demographic and Health Surveys, Multi Indicator Cluster Surveys and Malaria Indicator Surveys. Monitoring against process indicators is also likely to be necessary to guide malaria programme implementation.

\(^9\) Household Survey Indicators for Malaria Control. June 2013