Proposed evidence review group (ERG) on the community effect of insecticide treated nets

Malaria Policy Advisory Committee Meeting

Geneva, Switzerland

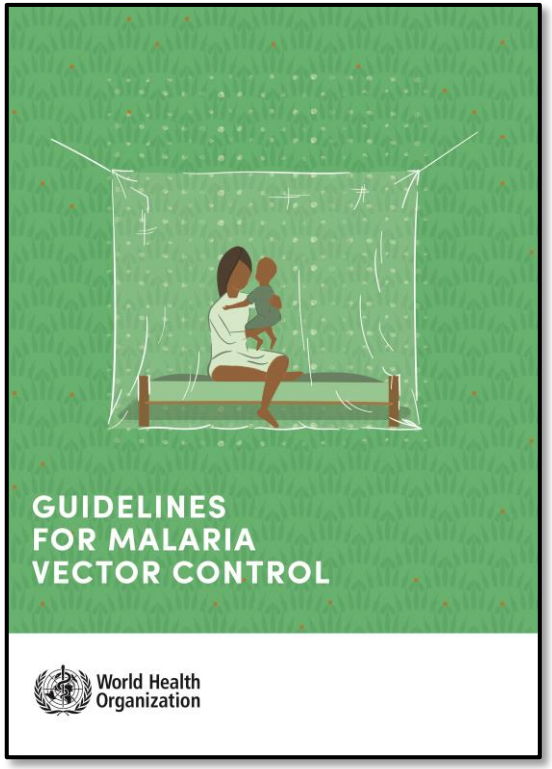
17 – 19 October 2018

Global **Malaria** Programme

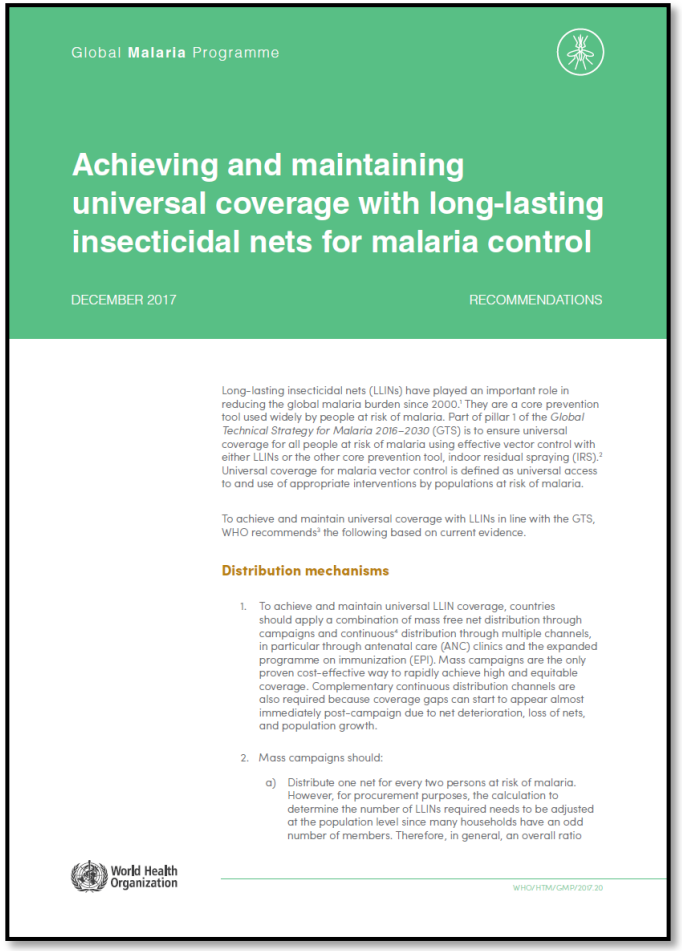
World Health Organization

Context – part 1

- Support a move from expert opinion to evidence-based recommendations
- Articulate certainty of evidence in GRADE tables
- Provide evidence-to-decision frameworks for each intervention
- Incorporate existing recommendations in attempt to condense large volume of guidance into one resources



Current recommendations



Global **Malaria** Programme

Achieving and maintaining universal coverage with long-lasting insecticidal nets for malaria control

DECEMBER 2017

RECOMMENDATIONS

Long-lasting insecticidal nets (LLINs) have played an important role in reducing the global malaria burden since 2000.[1] They are a core prevention tool used widely by people at risk of malaria. Part of pillar 1 of the *Global Technical Strategy for Malaria 2016–2030* (GTS) is to ensure universal coverage for all people at risk of malaria using effective vector control with either LLINs or the other core prevention tool, indoor residual spraying (IRS).[2] Universal coverage for malaria vector control is defined as universal access to and use of appropriate interventions by populations at risk of malaria.

To achieve and maintain universal coverage with LLINs in line with the GTS, WHO recommends[3] the following based on current evidence.

Distribution mechanisms

1. To achieve and maintain universal LLIN coverage, countries should apply a combination of mass free net distribution through campaigns and continuous[4] distribution 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. Complementary continuous distribution channels are also required because coverage gaps can start to appear almost immediately post-campaign due to net deterioration, loss of nets, and population growth.

2. Mass campaigns should:

   a) Distribute one net for every two persons at risk of malaria. However, for procurement purposes, the calculation to determine the number of LLINs required needs to be adjusted at the population level since many households have an odd number of members. Therefore, in general, an overall ratio

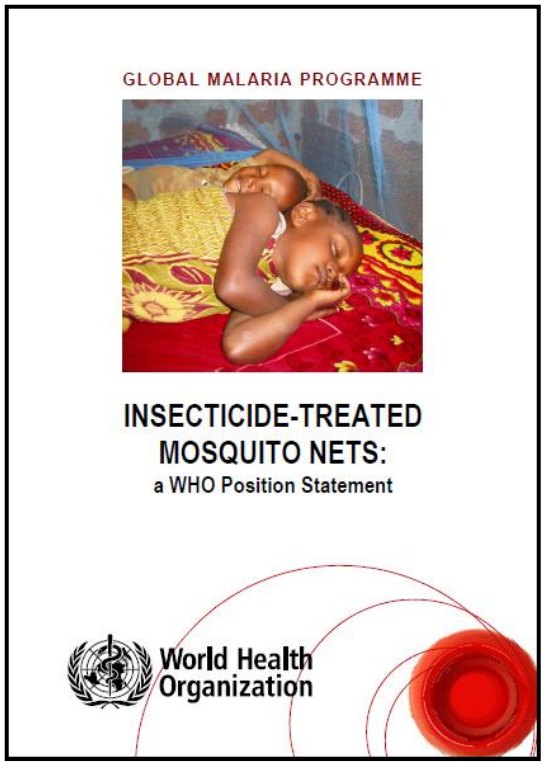
World Health Organization

WHO/HTM/GMP/2017.20

Past recommendation (2007)

Page 2. ITNs: Mode of action: By reducing the vector population in this way, ITNs, when used by a majority of the target population, provide protection for all people in the community, including those who do not themselves sleep under nets (1, 2). A recent study has shown that relatively modest coverage (**around 60%)** of all adults and children can achieve equitable **community-wide benefits** (3).

Page 8. Full coverage: Since high coverage rates are needed to realize the full potential of LLINs, GMP recommends **full coverage** of all people at risk in areas targeted for malaria prevention through ITNs, including LLINs.



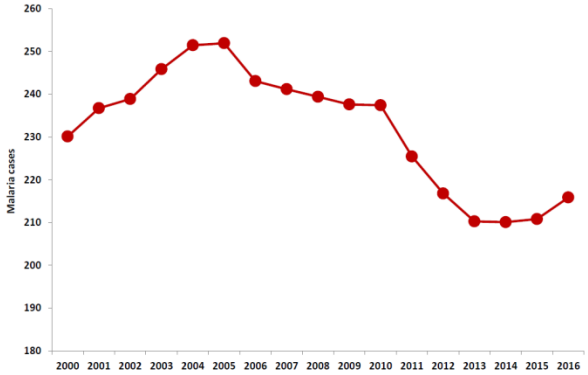
1. Binka *et al.* (1998) Impact of spatial distribution of permethrin-impregnated bed nets on child mortality in rural northern Ghana. Am J Trop Med Hyg 59: 80-5
2. Hawley *et al.* (2003) Community-wide effects of permethrin-treated bed nets on child mortality and malaria morbidity in western Kenya. Am J Trop Med Hyg 68: 121-27.
3. Killeen *et al.* (2007) Preventing childhood malaria in Africa by protecting adults from mosquitoes with insecticide-treated nets. PLoS Med 4(7): e229.

From past/current recommendations to Guidelines

- Evidence underpinning universal coverage recommendation needs to be comprehensively reviewed and be clearly laid out
- Recommendation needs to be articulated by means of an evidence-to-decision framework

Context – part 2

Dr Tedros Adhanom Ghebreyesus
Director-General
World Health Organization

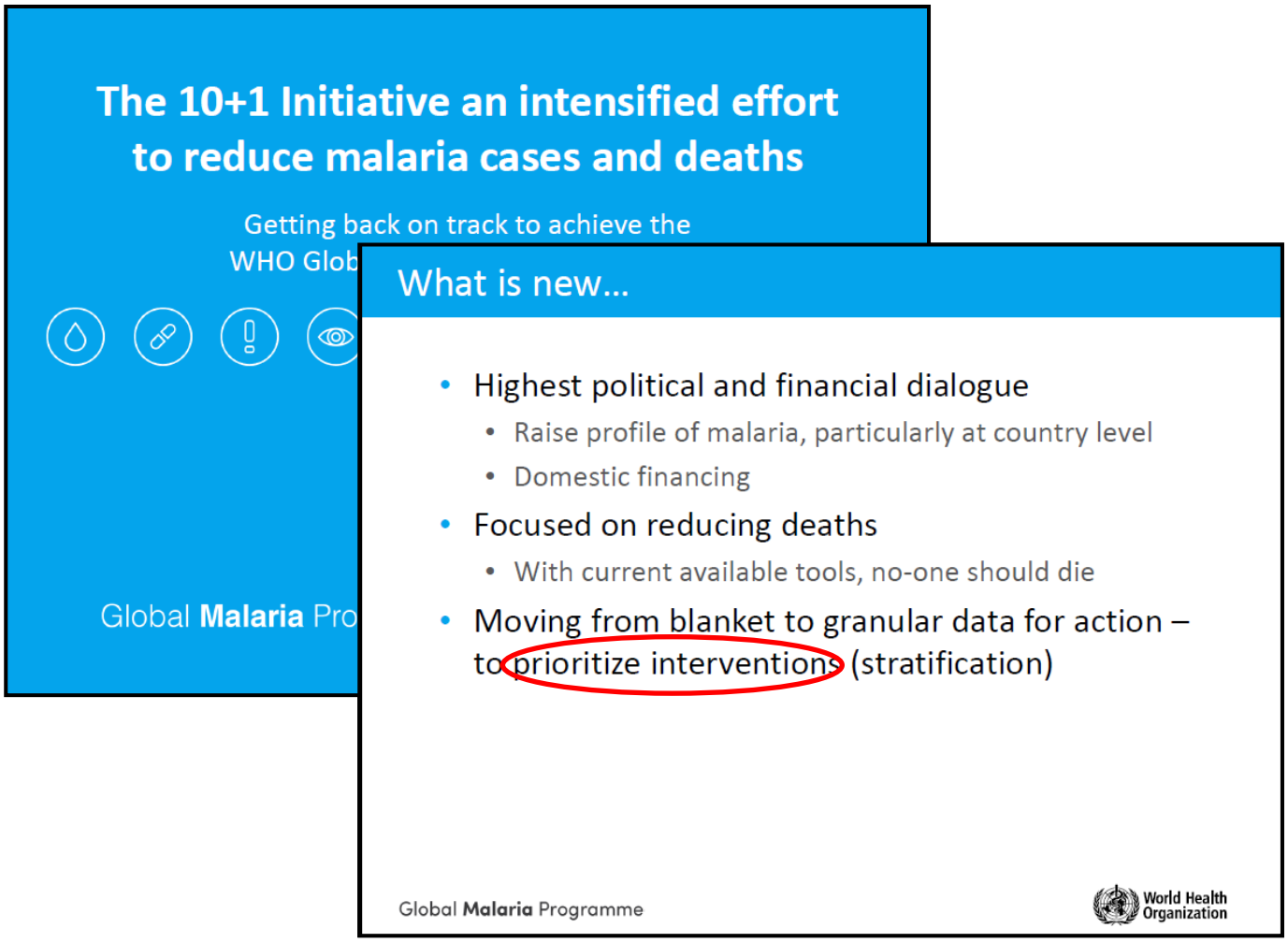


For many years, the global response to malaria was considered one of the world's great public health achievements. WHO reported time and again on the massive roll-out of effective disease-cutting tools, and on impressive reductions in cases and deaths.

Last December, we noted a troubling shift in the trajectory of this disease. The data showed that less than half of countries with ongoing transmission were on track to reach critical targets for reductions in the death and disease caused by malaria. Progress appeared to have stalled.

The *World malaria report 2017* shows that this worrying trend continues. Although there are some bright spots in the data, the overall decline in the global malaria burden has unquestionably leveled off. And, in some countries and regions, we are beginning to see reversals in the gains achieved.

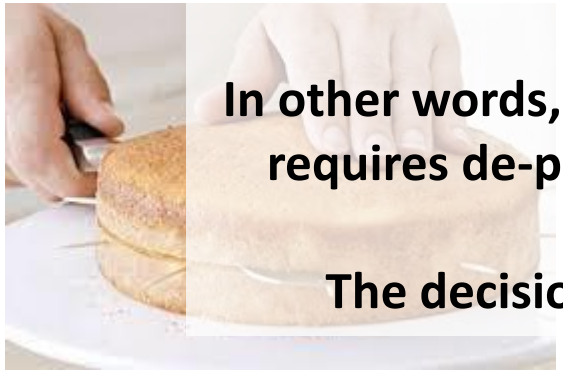
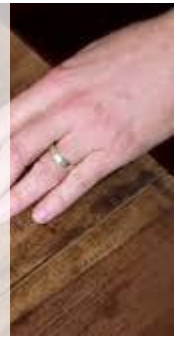
The response



Prioritization



Cutting the cake differently does not change its size

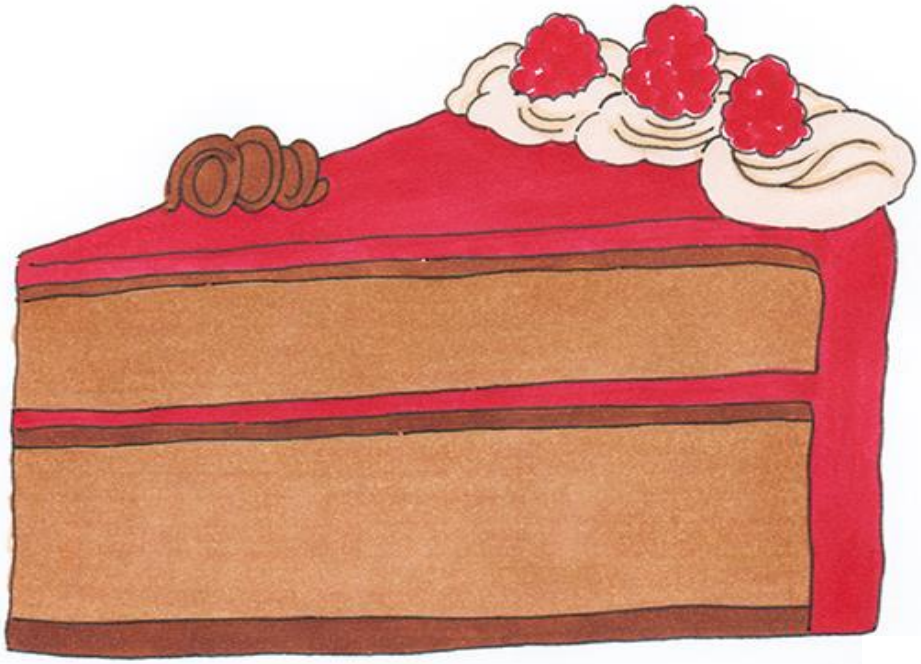
In other words, prioritizing one intervention over another requires de-prioritization of one or more alternatives.

The decision to do so should be evidence-based.



Insecticide-treated nets (ITNs)

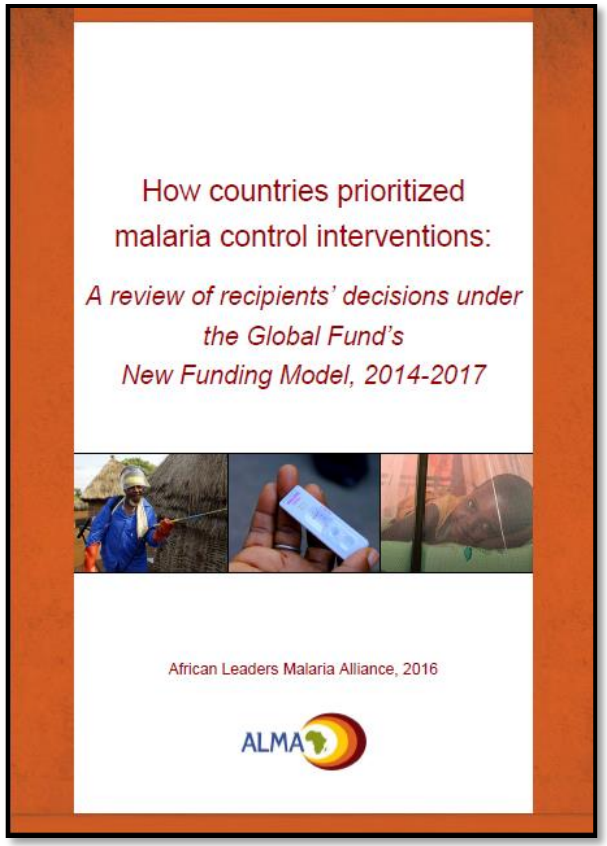
- One of two WHO recommended core vector control interventions



- Target since 2007 is universal coverage, which has significant resource implications

Note: Universal coverage is defined as universal access to and use of appropriate interventions by populations at risk of malaria.

Vector control & ITN resources



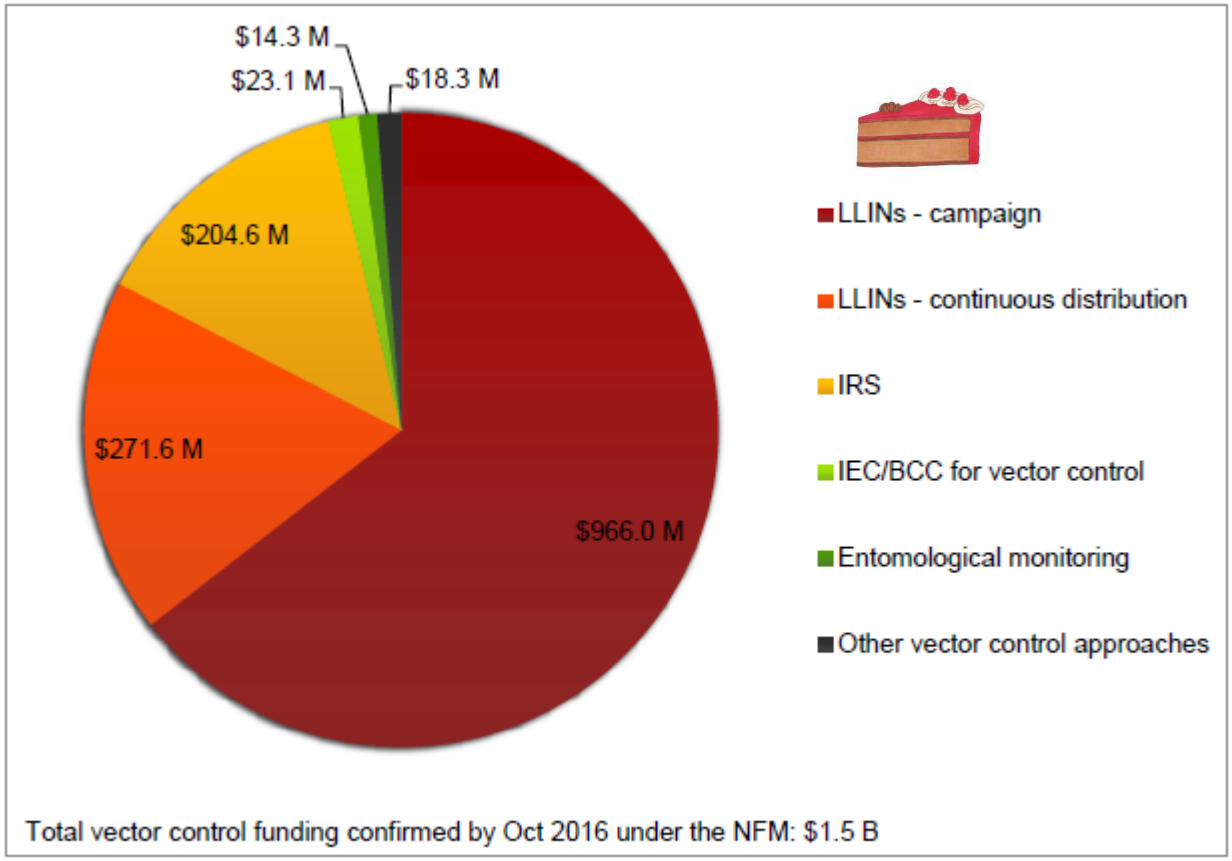
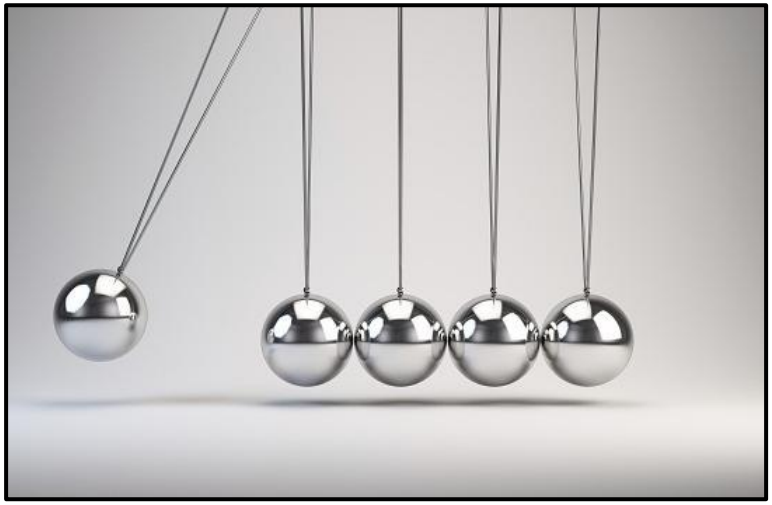


Figure 3. Value of Global F und NFM support to vector control approaches

Impact



Over 2000 – 2015, an estimated 663 million clinical cases averted, 68% of which by ITNs, at coverage levels well below universal coverage

Bhatt *et al.* (2015) The effect of malaria control on *Plasmodium falciparum* in Africa between 2000 and 2015. Nature 526(7572): 207–11.

Coverage

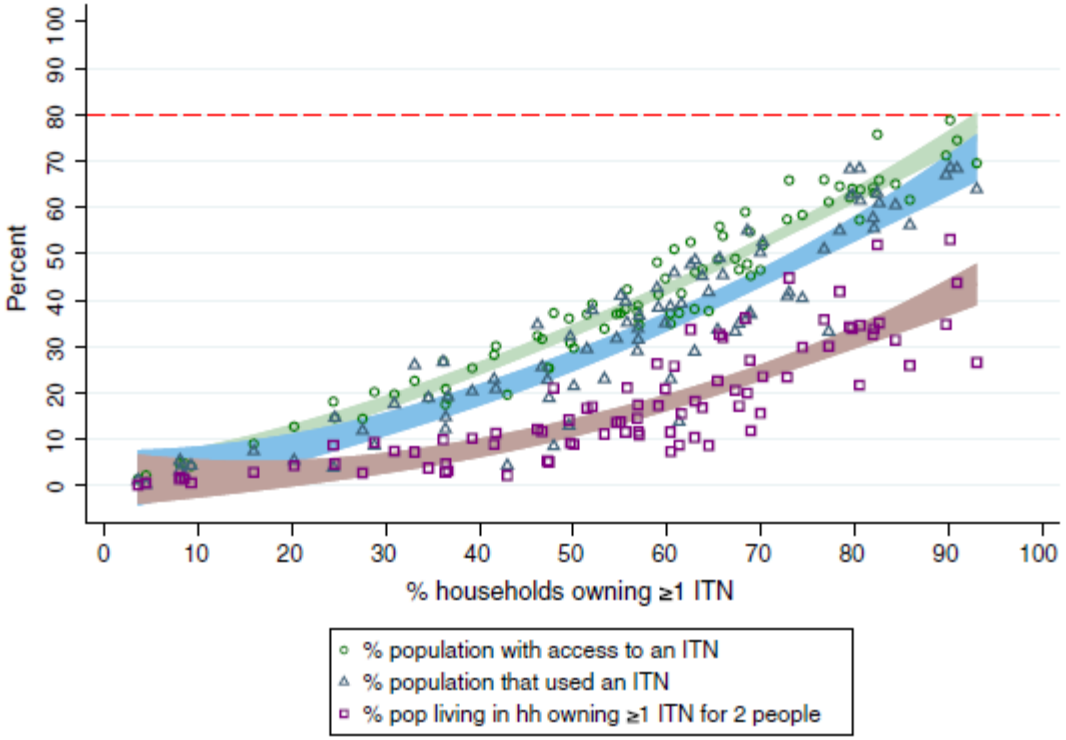
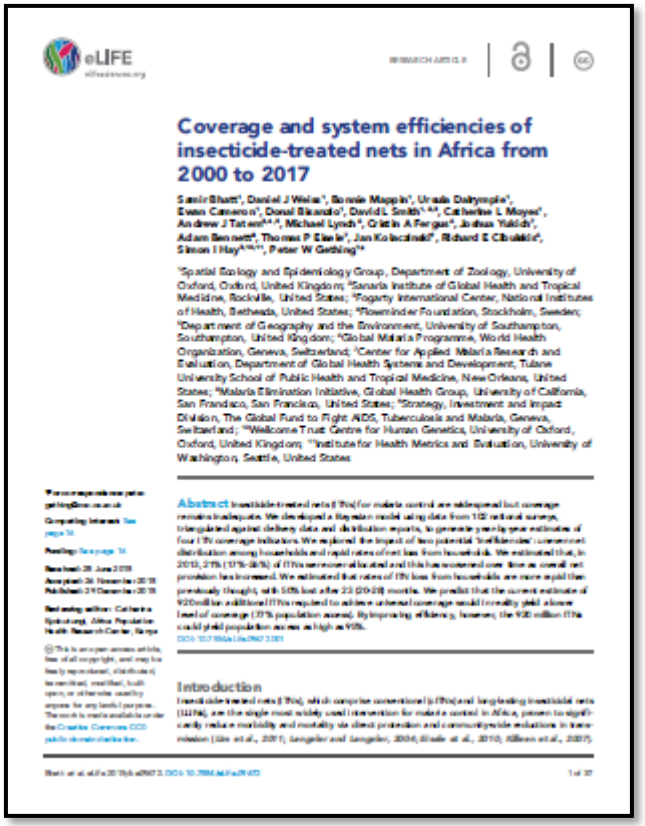


Fig. 6 The proportion of people with access to an ITN (green) and the proportion of people living in households with enough ITNs (yellow) as a function of household ownership of any ITN. The difference between the green and yellow plots is 20 percentage points on average, and the gap is on average 60% of the percentage of population ITN access

Koenker *et al.* (2018) Assessing whether universal coverage with insecticide-treated nets has been achieved: is the right indicator being used? Malaria J 17: 355.

Efficiency: observations

- Low coverage (43% in 2013)
- Uneven net distribution among households (21% over-allocated)
- Over-allocation worsened as net provision increased
- Rapid rates of net loss from households (50% lost after 23 months)



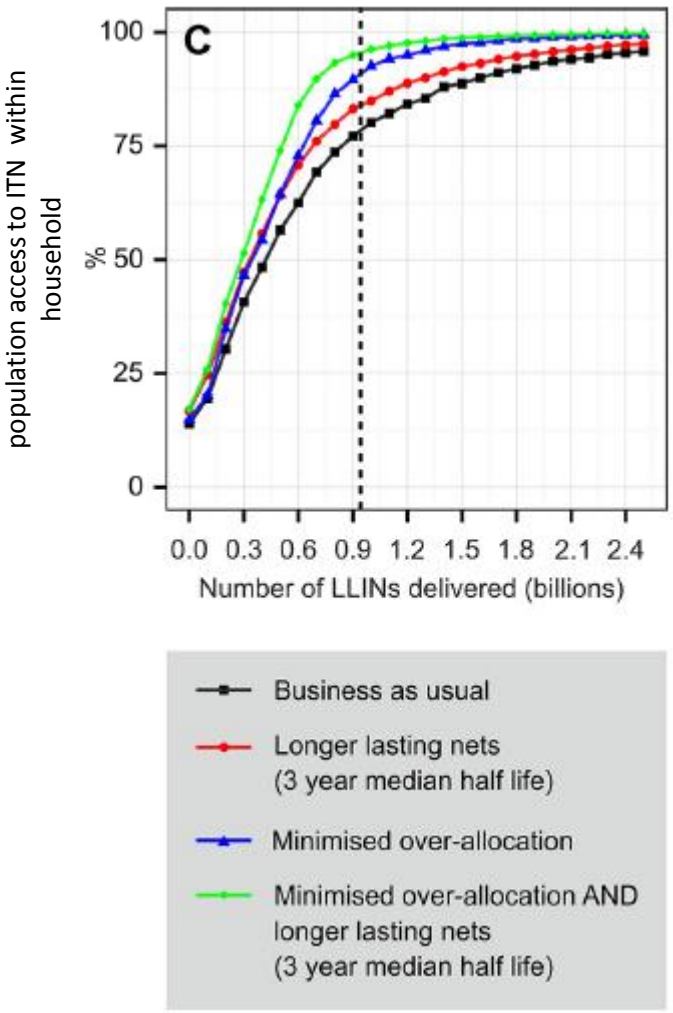
eLIFE

Coverage and system efficiencies of insecticide-treated nets in Africa from 2000 to 2017

Introduction

Bhatt *et al.* (2015) Coverage and system inefficiencies of insecticide-treated nets in Africa from 2000 to 2017. eLife 4:e09672.

Efficiency: conclusions



- Quantity estimated to achieve universal coverage would in reality yield much lower level coverage
- Identified system inefficiencies are not easily overcome
- Diminishing coverage returns for each dollar spent
- Cost-effectiveness of pursuing universal coverage rather than a lower operational target must be weighed against alternative malaria control investments

Bhatt *et al.* (2015) Coverage and system inefficiencies of insecticide-treated nets in Africa from 2000 to 2017. eLife 4:e09672.

(Some) key questions

- What is the current evidence-base underpinning WHO's universal coverage recommendation? What are the evidence gaps?
- Is the recommendation primarily driven by easier communication and operational considerations, or is there an actual threshold that is needed for ITNs to achieve maximum impact (and/or a community (mass) effect)?
- What is the relative contribution of personal protection and a community effect? How may pyrethroid resistance affect these?
- Is the community effect generalizable or only applicable in certain settings?
- Should countries unable to achieve universal coverage be concerned about this and continue to pursue this goal?
- What evidence-based recommendation should be provided to countries unable to finance universal ITN coverage of all at-risk populations?

ERG objective

- To **appraise a systematic review** of the available evidence on the community effect of ITNs, which will include an analysis of the presence/absence/variations of this effect depending on geographical setting, coverage level and the prevalence/intensity of pyrethroid resistance

- To **advise WHO** on whether the findings from the review of the evidence-base on the community effect of ITNs warrant a **revision of current WHO guidance on the deployment of ITNs**

- To **review the WHO glossary** to verify whether definitions regarding ITNs and their personal and community effect are appropriately captured. If required, the ERG will need to **recommend additions or edits** to the glossary to ensure that the definitions are valid and appropriate

For MPAC guidance

- Is the convening of the proposed ERG meeting supported in principle?

- Do the proposed objectives accurately reflect current needs or are modifications to the ERG ToRs required?