



Estimating population access to ITNs versus quantifying for procurement for mass campaigns

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The following is issued as clarification on the *WHO recommendations for achieving universal coverage with long-lasting insecticidal nets (LLINs) in malaria control*.¹ These recommendations were originally issued in September 2013 but did not address LLIN quantification. They have now been updated to address LLIN quantifications for mass campaigns in order to address confusions arising from a recent publication discussing quantification formulae for LLIN access.

Summary

- Our goal is still **universal coverage** with long-lasting insecticidal nets (LLINs) and mass campaigns remain one of the most important distribution channels for LLINs.¹
- To meet the target of **universal access**, WHO recommends that one LLIN 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 needs to be adjusted when quantifying at the population level. Therefore, for procurement WHO continues to recommend using an overall ratio of **1 LLIN for every 1.8 persons** in the target population.

Background

The paper '*Estimating population access to insecticide-treated nets from administrative data: correction factor is needed*'² analysed 35 datasets from household surveys in sub-Saharan Africa. The mean number of insecticide-treated nets (ITN) users was determined for each data set separately for households with and without enough ITNs. Analysis of users per ITN showed that the assumption of two users per net was valid overall (median 2.00); however, for those households with at least one ITN for every two people the actual number of users per ITN was somewhat lower (median 1.66). That is, estimation of population access from administrative data based on a formula of number of ITNs multiplied by 2.0 then divided by the total population generally overestimated the survey access indicator. This was particularly the case at higher coverage levels, resulting in a 30 percentage-point overestimate at survey access above 80%. Using 1.8 as the multiplier for the number of ITNs from administrative data improved the results but still showed a 19 percentage-point overestimate at access coverage above 80%. Regression analysis found that a factor of 1.64 provides the best prediction of the access indicator with slight underestimation at low access levels but good fit at levels above 55%.

1 Defined as universal access to, and use of, LLINs. See: World Health Organization. *Recommendations for achieving universal coverage with long-lasting insecticidal nets in malaria control*. Geneva, 2013. http://www.who.int/malaria/publications/atoz/who_recommendation_coverage_llin/en/

2 Kilian A, Koenker H, Paintain L (2013). Estimating population access to insecticide-treated nets from administrative data: correction factor is needed. *Malaria Journal*. Jul 26; 12:259

The paper concluded that a factor of 1.6 rather than 2.0 or 1.8 mean number of users per ITNs provides a more accurate estimation of **population access to ITNs** from administrative data accounting for discordant ITN-person pairs and a reduced number of ITN users when sufficient ITNs are available. The release of this updated access quantification formula caused some confusion amongst those involved in LLIN procurement.

Implications of using administrative data to estimate coverage of LLINs

When carrying out a universal coverage campaign, WHO recommends that nets should be given to households at the rate of one net for every two household members; where households have an uneven number of people, the number of nets issued should be rounded upwards. The overall procurement ratio must therefore be adjusted to allow for this rounding up, resulting in an overall quantification factor of 1 net per 1.8 persons.

Recently some countries have been incorrectly advised to adjust the calculation for quantification of LLINs needed for campaigns, by using a quantification factor of 1.6 rather than the recommended 1.8. This is actually an inaccurate interpretation of the findings of the paper outlined above, and where applied has resulted in over-estimation of the planned resources. The correction factor of 1.6 was primarily created to allow a more realistic estimate of **access coverage** from administrative data between surveys,³ not as a formula for quantification of nets for mass campaigns.

More importantly, this adjustment should not be used for quantification of LLIN requirements for repeat mass campaigns especially where plans are in place for continuous distributions, such as via antenatal or immunization service channels. As a general rule, the quantification of one net per 1.8 persons is still valid even when the data shows that at very high access levels the average number of users per net is below 2.0.

³ The access quantification formula always refers to the overall output of nets including all channels of distribution.