# What is the best way to distribute insecticide-treated nets to help prevent malaria?

## Background

There are some 250 million cases of malaria every year and around 900,000 deaths, most of which are of children in Africa. After a long period of neglect, recent years have seen an increase in research and control activities focused on this major infectious disease of poverty. Several "new tools" to prevent and treat malaria have become available. One of the most important of these is the use of insecticide-treated bednets (ITNs) to protect against mosquito bites. Originally the nets needed to be re-impregnated frequently but long-lasting insecticidal nets (LLINs) have now been developed. Research has shown that such nets have the potential to halve case numbers and save many lives. In addition to protecting individuals, it is hoped that the use of the nets combined with other new tools could lead to the eventual elimination of malaria.

However, it is not easy in poor countries with limited infrastructure and services to deliver LLINs to all those who need them, or indeed to ensure that the nets are actually used by people who have them. Many issues must be decided upon in designing a distribution programme, most notably whether nets will be made available free or at subsidized or full cost. Using a variety of approaches, many countries have already achieved high levels of coverage with their distribution programmes, but the question then arises how programmes can be sustained in the long term.

## Why was this review done?

In order to scale up distribution and to achieve sustainability, it is important that policy makers should know which approaches to delivering nets work best for

their purposes. A clear overall picture of this has not yet emerged from the research conducted so far.

**What did the researchers do and find?**

They conducted a systematic review, searching scientific databases and the internet for studies that had sought to determine which LLIN distribution mechanisms might be best suited for scale-up and for sustainability.

In advance of their search, the reviewers decided on criteria that the studies they found must meet before they would be included in the review. It was essential that each study should provide sufficient information on at least one aspect of the distribution, so that valid comparisons could be made. The methods used in a study (for example the design of surveys and the way in which coverage, cost etc. were measured) also needed to be of good quality.

They also drew up a classification system of distribution methods, centred on six characteristics: channel used for distribution (e.g. retail, routine services, outreach); duration of the campaign; targeted on vulnerable groups or aimed at the whole population; free, subsidized or at cost; any choice available (type or time); and which sector was involved (public, civil society or commercial). Also defined in advance were the criteria that would be used to measure net coverage rates, equity (the degree to which the poor have access to nets or ITN compared to the wealthier groups) and the cost per net delivered.

Over 300 articles were found in the electronic search but after the researchers inspected them only 174 were considered to meet the review's inclusion criteria: 48% discussed coverage outcome or impact; 20% dealt primarily with cost, equity or other economic aspects; 19% were discussion papers; 7% were survey reports (such as malaria indicator surveys) and 6% dealt with issues of net maintenance, physical condition and durability. The researchers allocated them to the six categories they had previously established and their review discusses them all in detail within those categories.

The reviewers found that different approaches had their respective advantages and disadvantages. Thus continuous distribution mechanisms that use routine services and/or retail outlets can avoid fluctuations in coverage rates, but they are much slower in building up coverage levels compared with mass campaigns. When continuous distribution involved the commercial sector alone, increases in coverage rates ranged from 3% to 5% per year, whereas combining the commercial market with the distribution of free or highly subsidized nets achieved increases in the range 6% to 25%.

Equity is problematic; high levels can be achieved once coverage reaches a high level but this can take up to eight years. Distribution campaigns seem to achieve a lower cost per net delivered than other distribution mechanisms.

The reviewers had to face difficulties in interpreting the evidence. The included studies did not address exactly the same research question and had been conducted in a variety of ways, making comparisons difficult. The reviewers also wished to consider whether campaigns would be an effective way of replacing nets when they have become damaged or the insecticide is no longer active, but uncertainty over how long the useful life of a net actually is made this impossible. The reviewers point out that some data on the effectiveness of distribution programmes may not have been published and that other studies that have been launched are not yet complete.

**What do these findings mean?**

The evidence in this review suggests that campaign distributions that target the general population are best suited for the scale-up phase of LLIN distribution. However, it is not clear how best to make sure that all the members of each household have access to a net. More research is needed on this point.

In the sustainment phase, a mix of continuous delivery mechanisms through community, routine services and retail outlets appears to be the most suitable approach, but equity issues must be addressed with subsidies.

It is known that many people with access to LLINs do not use them (or do not use them properly) but addressing this problem was not an issue addressed by this review.