Strengthening systems for distributing insecticide-treated mosquito nets in Zambia

Key messages

- Rapid distribution of massive quantities of insecticide-treated nets (ITNs) requires intensive planning for storage, transport, community distribution, and tracking.
- In testing centralized versus district-level distribution approaches, MACEPA found centralized distribution impractical due to storage and transport costs and logistics.
- District-level distribution offers significant economies of scale while also presenting opportunities for more localized, sustainable management of the process.
- Distribution directly to districts will save US$250,000 for every 300,000 ITNs.
- Since 2005, over 4.5 million ITNs have been distributed throughout Zambia.
- Nearly two-thirds of all Zambian households now own at least one ITN; the number of children under age five and pregnant women sleeping under a net has increased by 69% and 76%, respectively between 2006 and 2008.

Overview

In 2005, the government of Zambia and its Roll Back Malaria partners, including the Malaria Control and Evaluation Partnership in Africa (MACEPA), launched an unprecedented national plan for tackling malaria by rapidly making available proven interventions at a national scale to save lives, improve livelihoods, and strengthen communities. Central to this goal is reaching high rates of coverage of Zambia's population with ITNs by the end of 2008. Zambia made good progress in two years toward achieving this goal, while learning valuable lessons along the way in managing an ITN distribution effort of this magnitude.

In late 2005, MACEPA, a program at PATH, provided 526,500 ITNs to the Ministry of Health's National Malaria Control Centre (NMCC). The ITNs were shipped to Zambia for distribution to individuals in two rural, poorly accessible provinces with high rates of malaria prevalence. One year later, an additional 200,000 ITNs were delivered for distribution to health centers in Lusaka and Copperbelt Provinces to complement the existing delivery through antenatal care. In the first instance, the time between ITN arrival in country and availability in districts was approximately two months. The second shipment was available within one week. Understanding the difference offers valuable lessons for large-scale ITN distribution efforts in Zambia and other countries.

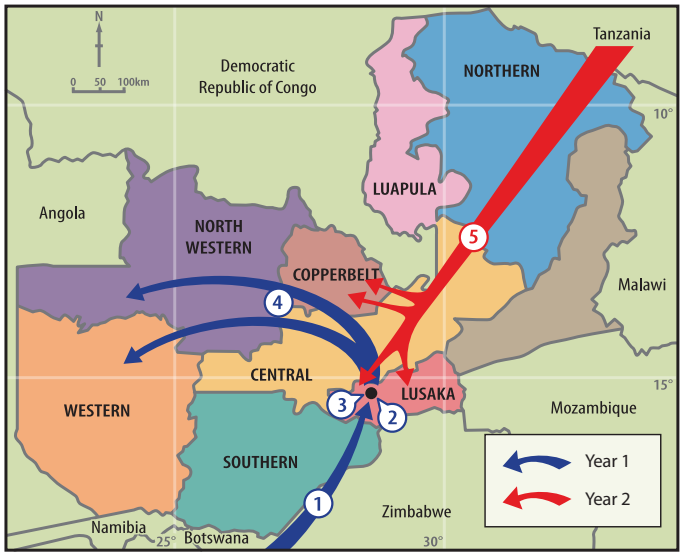
Year one: delivering 526,500 ITNs

The first shipment of 526,500 ITNs—the equivalent of sixteen 40-foot shipping containers—was delivered to Zambia's capital, Lusaka. The sheer volume of this quantity of nets made it potentially quite difficult to find a storage facility where they would be properly housed prior to their subsequent delivery, over a period of two months, to 18 district health offices. Fortunately, the owner of a local shipping company, Prime Time Freight, offered early on to provide free storage for the nets. The storage company also absorbed considerable costs for inventory control, as well as risk (the purchase value of the ITNs amounted to US$1.3 million).

Several options were explored for delivering the ITNs from Lusaka to distant reaches of the country. While some malaria control partners had the transport capacity and reach to facilitate net distribution, no agreement could be reached on the terms of collaboration that would enable the nets to be distributed in a targeted and timely manner. MACEPA ultimately engaged the Zambia Ministry of Defence to help deliver most of the ITNs. Negotiating the terms of the agreement and managing the process of transporting more than 640,000 bales of nets were time-intensive; significant costs were incurred to maintain trucks, purchase petrol, and compensate delivery staff; and delivery was halted for a few weeks when military trucks and staff had to be redeployed for famine relief efforts. And yet this innovative partnership offered a workable solution, particularly given the urgent need to deliver nets quickly as malaria transmission season was arriving.

The final step in ITN distribution is placing the nets into the hands of people who need them. Anticipating the potential logistical, management, and communications challenges of bringing large quantities of ITNs into communities for mass distribution, MACEPA and the NMCC pretested the process by initially delivering 2,100 ITNs to Luangwa District, located about three hours east of Lusaka. From this experience, it became clear that household and sleeping area estimates were necessary to more accurately quantify the number of ITNs needed; community leaders and members required adequate prior notification of net distribution efforts; and health teams needed

FIGURE 1. Two years of insecticide-treated net (ITN) distribution in Zambia



1. ITNs trucked in containers from Durban to Lusaka. **2.** Containers unloaded and ITNs stored in Lusaka. **3.** ITNs reloaded onto trucks for shipment to districts. **4.** ITNs unloaded in districts. **5.** ITNs trucked in containers from Dar es Salaam directly to districts.

additional skills and tools for explaining why and how the nets should be used. In addition to providing valuable insights into how to effectively distribute nets to end users, this exercise also starkly demonstrated the self-reliance and motivation present at the peripheral levels.

Year two: delivering 200,000 ITNs

In contrast to earlier efforts, ITN distribution in the second year was rapid and streamlined. Having learned the challenges of centralized ITN distribution and confirmed that there was no administrative requirement to do so, the second batch of nets was delivered from port directly to districts, avoiding Lusaka altogether unless necessary. Decentralized delivery required extensive planning at the provincial level to facilitate communication among districts. It also involved working with district health management teams to ensure adequate storage capacity and security, coordinate planning and transportation, and cultivate partnerships. But the strategy proved to be much more efficient in terms of time and costs involved.

Lessons learned

Decentralized mass distribution of ITNs offered economies of scale. The World Bank Booster Program estimated in 2007 that using MACEPA's model of direct distribution would result in a savings of approximately US$250,000 per 300,000 nets distributed. It is likely that these economies would also hold true for routine net delivery once scale-up goals are reached, assuming that adequate storage capacity is present at the provincial or district level.

Remarkable motivation, commitment, and resourcefulness at the district level were defining factors in success. These partners were flexible and creative in tackling potential problems and often demonstrated a willingness to perform beyond what was expected of them to ensure successful ITN distribution.

Planning was crucial to realizing these economies. Working with provinces was essential to coordinating district delivery. Engaging districts in planning for net arrival, security, and distribution promoted their ownership of and accountability for the process, managing local delivery according to their own capacities and partners' abilities. Close collaboration between districts and communities ensured that the ITN quantities delivered were sufficient (and tracked) and the community members were adequately informed.

Creative thinking and innovation opened up opportunities. Challenging the assumption that net shipments were required to pass through the capital uncovered important opportunities for streamlining and cost savings in ITN distribution. Thinking in terms of where shipping containers needed to go (which, until opened, remain insured and secure) rather than where individual nets needed to go injected logic and order into organizing distribution.

Data tracking tools were essential for documenting the location, quantity, and timing of ITN delivery. Developing these tools and training staff to use them effectively helped ensure that progress toward achieving local and national scale-up goals could be monitored and bottlenecks addressed. In addition, this information will guide routine net distribution plans once scale-up goals
are reached.