

**A CASE STUDY OF THE CAMPAIGNS FOR MASS DISTRIBUTION OF LONG-
LASTING INSECTICIDAL NETS IN KINSHASA AND EQUATEUR PROVINCE,
DEMOCRATIC REPUBLIC OF CONGO**

A REPORT TO THE WORLD BANK



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Executive summary

Malaria is the leading cause of morbidity and mortality in the Democratic Republic of Congo (DRC) and contributes to 42% of clinic consultations and around 40% of child deaths. It also impedes economic growth and development by diverting household income to costly medicines, impeding agricultural production and causing children to be absent from school. The Strategic Plan of the National Malaria Control Program (Programme National pour la Lutte contre le Palusioime- or PNLN) recognizes the importance of effective prevention and aims to have 80% of the population sleeping under Long Lasting Insecticidal Nets (LLIN) by 2011.

To assist the National Malaria Control Program in achieving this ambitious aim, The World Bank works through two structures to facilitate the distribution of LLINs. The first is the Health Sector Rehabilitation Support Project (HSRSP) known as *Projet d'Appui à la Réhabilitation du Secteur Santé (PARSS)* in French. This seeks to strengthen health services (including those relating to malaria) and health information systems in four provinces (including Equateur) and the country's capital, Kinshasa. Net distribution in Equateur province was carried out in conjunction with an Expanded Programme of Immunization (more specifically, a measles vaccination campaign) coordinated by UNICEF and the local office of the PNLN. The second Bank partner for net distribution is the Emergency Urban and Social Rehabilitation Project known in French as *Projet d'Urgence de la Réhabilitation Urbaine et Sociale (PURUS)*. This seeks to improve infrastructures such as roads, water and sanitation but also has a component which addresses malaria prevention and management. PURUS only operates in Kinshasa. Net distribution in Kinshasa was done primarily in collaboration with Population Services International and the Inspection Provinciale de la Santé – the regional health authority for the capital.

Nearly two million nets were distributed in Kinshasa between September and December 2008. The distribution was accompanied by an intensive media and communication campaign which preceded a household enumeration. The enumeration and distribution were carried out by 2286 Outreach Workers who were chosen by the local development committees which are affiliated to the community health centers. After the distribution a 'hang-up' activity was carried out when those who had not been able to suspend their nets, were helped to do so by the Outreach Workers.

In Equateur province, around 1.5 million nets were given out as part of a measles immunization campaign which also distributed mebendazole and Vitamin A to children under five years of age. Among children who were seen as part of the immunization campaign, 96.4% received a net. However, figures from the 2007 Demographic and Health Survey of DRC indicated that immunization coverage in Equateur Province was among the lowest in the whole country so it is not clear what percentage of all children in the province (not just those who came to be immunized) actually have access to a net.

Given the logistical challenges facing both distributions, particularly that in Equateur, the Bank and its partners achieved a remarkable feat in giving many people, and in particular vulnerable children, nets to which they would not have otherwise had access. Nevertheless there were some significant problems and challenges. In particular, in Kinshasa, there was a need to recruit a substantial number of additional Outreach Workers and this increased training and operational costs. The population, particularly those living on the islands, was highly mobile and difficult to enumerate, or

moved on between the enumeration and the distribution. Many of the enumeration problems and subsequent shortage of nets are related to the fact the DRC has not had a national census since 1984. The effects of changing mortality and fertility, as well as conflict-related population displacement on population growth are difficult to estimate. As a result of this, and other factors, the distribution in Kinshasa still requires another 50,000 nets. The PNLP and PSI in particular worked swiftly to quash rumors which threatened the campaign claiming that the nets were toxic. The PNLP was also active in advocating for a ratio of three nets per household. Two nets per household were given out in Kinshasa but qualitative research in the zone of Nsele indicated that this was not sufficient.

In Equateur, the main problems were of a logistical nature given that the Province has few roads and that most access is by airplane, boat or heavy lorry. Although a micro-plan for logistical implementation was developed, it was the macro-plan drawn up in Kinshasa which was used. As this was not adapted to take account of local difficulties associated with the terrain, there were some problems with transportation and net shortages in certain zones. In addition, the net distribution significantly slowed down the immunization campaign. However, there were also advantages in combining the two as the giving away of free nets motivated mothers to bring their children for vaccination.

Neither the Kinshasa distribution, nor that which took place in Equateur, was evaluated nor were there baseline surveys although the 2007 Demographic and Health Survey can, to a degree, serve as baseline data. An evaluation of the Kinshasa distribution is planned shortly and will be carried out by the School of Public Health at the University of Kinshasa. It is strongly recommended that this includes bio-markers to assess the prevalence of infection with the malaria parasite. In the meantime, an analysis of health service statistics from the Inspection Provinciale for Kinshasa does indeed seem to indicate that, since the Kinshasa campaign, reported cases of malaria have declined together with deaths from the disease. However, these only comprise cases seen in health centers and do not take into account that a great number of people self-medicate.

The main recommendations comprise making sufficient nets (three per household) available, implementing micro-plans for distribution and better estimating budgets to take account of the fact that health centre staff, as well as the Outreach Workers, need paying during the distribution. The qualitative research revealed that many people preferred nets that could be suspended at just one point (instead of at each corner). Some individuals, with the help of a tailor, had transformed the two nets they were given into one large net hung up in the centre. In the concrete houses of Kinshasa, it is often difficult to hammer four nails into the hard walls and the construction of a frame is often costly.

It is also recommended that ideally, future distributions should have a baseline study and an evaluation of impact. Finally it is emphasized that some of the Bank's partners (who pre-financed the distributions described here) would like, as soon as possible, a firm financial commitment from the Bank regarding their contributions to future campaigns elsewhere in the country.

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1.0 Background

Malaria is the leading cause of morbidity and mortality in the Democratic Republic of Congo (DRC) killing almost 200,000 people a year (World Bank, Kinshasa, 2009). More than 27 million cases of malaria occur in DRC each year, mostly among children (World Malaria Report 2008). The National Malaria Control Programme or Projet National pour la Lutte contre le Paludisme (PNLP) estimates that, among children under five, malaria accounts for 42% of clinic consultations and for 39% of deaths (PNLP Strategic Plan 2007). Reducing the prevalence and incidence of malaria will therefore greatly contribute to decreasing child mortality in DRC which has one of the highest rates in the world – 122 per 1000 in urban areas and 177 per 1000 in rural settings (EDS-RDC 2008).

Malaria also entails significant consequences for economic development costing the African continent over 12 billion dollars each year in terms of reductions to GDP (World Bank, Kinshasa, 2009). Preventing and managing malaria effectively will thus help increase economic productivity and have a multi-sectoral impact, for example, by reducing absenteeism at school and increasing agricultural production. Malaria control can thus mitigate the negative macro-economic effects of the current global financial crisis which risks increasing the number of people in Africa living on \$1.25 per day by 46 million. At a micro-level, reducing the likelihood of infection from malaria can improve nutrition and household food security and reduce costly medical expenses associated with treatment. Thus, malaria control and economic development are inextricably linked and malaria prevention, through increasing access to Long-Lasting Insecticidal Nets (LLIN), is likely to have a significant positive impact on DRC's currently fragile economy.

The 2007-11 Strategic Plan of the PNLN recognizes the importance of increasing access to bed nets and aims to enable at least 80% of the general population to sleep under treated bed nets. The Plan also seeks to have at least 80% of children under one year of age and pregnant women sleeping under bed nets. These ambitious objectives are in line with the Millennium Development Goals, especially Goal 6 ('Halt and begin to reverse the incidence of malaria and other major diseases'). In addition, the DRC adhered to the Rollback Malaria Initiative in 2001. This seeks to reduce mortality linked to malaria by 75% by 2015.

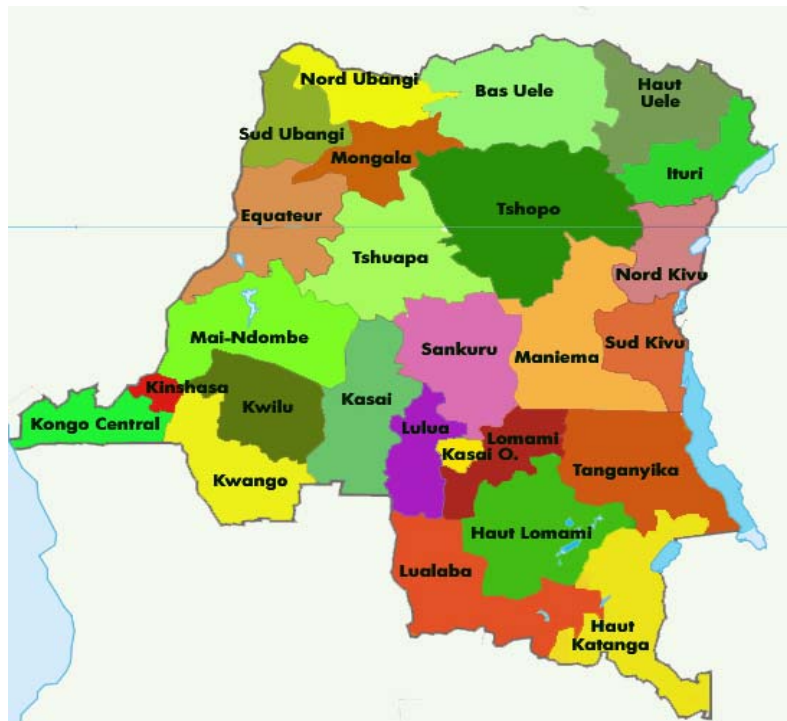
The last Demographic and Health Survey of DRC in 2007 indicated that only 5.8% of children under five slept under a treated bed net during the night before the survey (12.6% in Kinshasa and just 2.4% in Equateur Province) (EDS-RDC 2008). To respond to these poor usage figures, The World Bank intervenes through two especially set-up separate structures in DRC to facilitate the distribution of long lasting insecticidal nets. The first is through the IDA-financed Health Sector Rehabilitation Support project (HSRSP) known as Projet d'Appui à la Rehabilitation du Secteur Santé (PARSS) in French. This seeks to strengthen

health services (including those relating to malaria) and health information systems in four provinces (including Equateur) and the country's capital, Kinshasa. PARSS' governmental partner is the Ministry of Health. Net distribution in Equateur province was carried out in conjunction with an Expanded Programme of Immunization (more specifically, a measles vaccination campaign) coordinated by UNICEF and the local office of the PNLP.

The second Bank partner for net distribution is the Emergency Urban and Social Rehabilitation Project known in French as *Projet d'Urgence de la Réhabilitation Urbaine et Sociale* (PURUS). This seeks to improve infrastructures such as roads, water and sanitation but also has a component which addresses malaria prevention and management. PURUS only operates in Kinshasa. PURUS' governmental partner is the Ministry of Planning. Net distribution in Kinshasa was done primarily in collaboration with Population Services International and the *Inspection Provinciale de la Santé* – the regional health authority for the capital. The case studies presented here thus focus on the activities of PARSS in Equateur and of PURUS in Kinshasa and their collaborative relations with other governmental and non-governmental partners.

1.0 Number of nets distributed, beneficiaries and costs

Figure 1: Map of the Democratic Republic of Congo showing Equateur province in the West of the Country and Kinshasa on South-West



It should be noted that the nature of the distributions in Kinshasa and Equateur were extremely different. Kinshasa comprised a community-based, household distribution whilst Equateur integrated net distribution into a measles vaccination campaign. These contrasting approaches had different target populations and by their very nature are likely to have resulted in very different patterns of coverage.

2.1 Distribution in Kinshasa (October 2008 – December 2008)

In Kinshasa (which has an estimated population of 5,862,000), the PURUS programme seconded the 'Unité de Coordination des Projets' (UCoP) which in turn contracted PSI to coordinate the distribution. As described above, they worked in collaboration with the 'Inspection Provinciale de la Santé (IPS) – Ville de Kinshasa' which was responsible for monitoring and evaluation. In total, 1,982,014 nets were distributed out of a total of 2,000,000 allocated to the programme. The nets were distributed to 1,014,013 households on the basis of two nets per household¹ (PSI 2009). Although there were very small losses of nets due to theft or damage (less than 1%) there was still a significant lack of nets to distribute to all households in Kinshasa and to date many households have not received them. PSI estimates that an additional 36,775 nets are still needed although, with approximately 2000 needed for Government and National Assembly members, this figure has been rounded up by PSI to 40,000. Other informants in the field rounded the figure up again to 50,000. It is discussed below how, because there has not been a census in DRC since 1984, population estimates are extremely difficult to assess. The distribution was preceded by an enumeration of households but this too was frequently problematic as sometimes field agents were not let into collect information on the household. In other cases, senior household members who could provide the necessary information were often absent or out. In addition, in many areas of the city, particularly near the river and on the islands, the population is highly mobile and moved during the period between the enumeration and the distribution.

The costs of the distribution in Kinshasa, funded by the World Bank totalled \$13,000,000. The unit cost for each net distributed was \$5.50. This comprised the purchase price (\$4.75), the distribution (\$0.53) and the awareness raising activities (\$0.40) (Okito 2009).

¹ It is discussed below how the campaign was based on 2 nets per household with an estimated average household size of 6.4 people. However the PNLP now advocates 3 nets per household as some households are considerably larger. This was confirmed by fieldwork for this report presented below where the outreach workers frequently found households with over 10 and sometimes over 20 people.

2.2 Distribution in Equateur (November – December 2008)

In Equateur Province which has a total population of 5,531,000, UCoP contracted to UNICEF, who were assisted by the regional office of the PNLN to do a mass distribution of LLINs to mothers of children under five. This was carried out via an integrated campaign to vaccinate children against measles and to give them mebendazole to counter parasites, along with vitamin A. The target group comprised 1,470,279 children under five and their mothers². A report from the local office of the PNLN states that the campaign resulted in 96.4% of all children under five seen during the vaccination campaign in Equateur Province receiving a net (PNLN 2009). Immunization rates (for children seen) were similarly high with, in most zones, over 90% of the children seen receiving the measles vaccine³ (UNICEF, Equateur office 2009). However, it should be clarified that these high rates reflect the number of nets distributed to children *seen during the immunization campaign and not to all children under five in Equateur Province*. The last Demographic and Health Survey (EDS-RDC 2007) reports that, among the households surveyed, 18.8% of the individuals were under age five. If this percentage is applied to Equateur this would result in their being approximately 1,039,828 children under five in the Province. In which case it is possible that, in principle (as 1.5 million nets were distributed) that most children received one. However, it is discussed below how, in reality, stock-outs and shortages impeded distribution. For example, UNICEF's local coordinator reported that shortages meant that in four out of the 69 health zones, only about 60% of the needed nets were available. Thus, these high figures for net distribution should be interpreted with caution.

Further evidence for caution comes from the 2007 Demographic and Health Survey in RDC (EDS-DRC 2008) which showed rates of immunization in Equateur province were among the lowest in the whole country. At the time of the survey, less than half of children (41.9%) had been immunized against measles and only 14.6 % were found to be fully immunized. However, there is some likelihood that this more recent campaign improved both measles vaccination coverage and associated net distribution. The local UNICEF officer explained that there had been no EPI campaigns before 2007 and that the high rates of both net distribution and vaccination among children seen in the 2008 campaign are due to the better coordination and resources that were available. Mothers apparently are motivated to bring their children to be vaccinated if they receive a bed net and bed nets therefore facilitate mobilization for immunization. In addition, mothers are also encouraged to come to the services by the distribution of mebendazole as they can often see an immediate effect as children rapidly evacuate worms in their faeces.

² If a mother had several children under five she received just one net.

³ In some health zones, figures for vaccinated children are above 100%. Vaccinators are paid per child vaccinated and some may be counted twice (Professor Okito, personal communication)

However, it should be noted there is some bias associated with the distribution of nets around immunization campaigns in that the nets will only be found in households with young children and not in all households. It is unlikely that sufficient nets were distributed to guarantee herd immunity in most communities, nor that pregnant women would systematically receive them.

The total cost of the campaign including net distribution was \$1,458,648 for the operational costs alone including \$254,299 contributed by PARSS. It is unclear how much the actual commodities cost as the macro-budget from UNICEF (Kinshasa) groups the Provinces of Equateur and Orientale together at a total cost of \$9,586,848. It should be noted that, after the purchase of the nets, by far the highest cost (and one that is apparently routinely underestimated according to the logistician for the subsequent campaigns in Orientale and Maniema) is transport. There are no roads between Kinshasa and Equateur so the LLINs were transported by aeroplane, boat and subsequently by heavy trucks. For Equateur and Orientale together, UNICEF budgeted transport costs at \$2,384,225. In subsequent distributions \$1.20 has been allocated per net for transport costs.

2.0 Implementation

3.1 Implementation in Kinshasa

Implementation in Kinshasa was instigated by PURUS and coordinated by UCoP through PSI and the IPS. PSI was responsible for the logistics of the distribution and IPS for coordination and monitoring and evaluation. The fact that PURUS was affiliated with the Ministry of Planning, was not in and of itself a problem, but did mean that the distribution was not managed by individuals with experience in the health sector. The PNLN was not central to the distribution, as it was a local rather than national operation, and appeared to be perceived by some stakeholders to be a little marginalised. In retrospect, some partners, such as PSI, felt that the PNLN should have played a more supervisory role to add credibility to the distribution and to build upon their capacity for future campaigns. However, it was noted at the recent Aid Effectiveness Forum in Kinshasa, that the fact that the PNLN partnered with the Ministry of Planning through PURUS and Ministry of Health through PARSS, resulted in substantial benefits in terms of capacity building and collaboration for both Ministries and the PNLN itself (World Bank, Kinshasa, 2009).

At a Provincial level, the IPS for Kinshasa took a lead on implementation in collaboration with PSI. Together they closely followed activities on the ground and coordinated health center staff and Outreach Workers.

The programme was officially launched on the 7th October 2008 by the Ministry of Health and the enumeration started immediately afterwards.

3.1.1 The enumeration

On the ground the key personnel who facilitated contact with the community were the Outreach Workers. These comprise individuals recruited by the community health centers who advise about simple preventive and curative health practices and make referrals for treatment. They are paid \$5 per day on an ad hoc basis for their health-related activities and often have other parallel employment. The number of Outreach Workers budgeted for in the original proposal turned out to be insufficient and additional individuals were recruited by PSI in collaboration with the Red Cross making a total of 2286 Outreach Workers at the time of the campaign.

Figure 2: Outreach Workers at Nsele health center, Kinshasa



Figure 2 above shows four of the 72 Outreach workers in Nsele zone on the edge of Kinshasa. The Outreach Worker on the far left is also President of the Local Development Committee. Each health 'aire' (area) has a Local

Development Committee affiliated to the Health Center and it is this committee which chooses the Outreach Workers.

The Outreach Workers were trained with regard to the different aspects of the campaign – the enumeration, awareness-raising, distribution and ‘hang-up’. A training manual was produced by PSI which could be a useful tool for subsequent distributions.

The first field activity was the enumeration of households in order to estimate the number of nets needed. In principle, each household was visited by an Outreach Worker who administered a questionnaire (see Annexe 1) to ascertain the number of existing nets, number of pregnant women and children under five, numbers reporting fever in the preceding two weeks. This data is held by PSI, and although not yet entered, comprises important baseline information that could be later used for looking at impact. Problems associated with the enumeration, such as absences, migratory populations and an unwillingness to allow the Outreach Workers access, are discussed in detail below.

After completing the enumeration, the Outreach Worker gave the household head (or his/her representative) a token which they would later exchange for two free LLINs. Problematic issues associated with the tokens are discussed below.

A vital step in providing transparency and public credibility was the subsequent validation of the enumeration figures by the main partners (Ministry of Planning, PSI, IPS and the PNLP) which was widely reported in the national media.

3.1.2 The distribution

Approximately one month (depending on zone) after the enumeration and validation, the Outreach Workers proceeded with the distribution. The distribution was preceded by a communication campaign (using radio, television and ‘criers’ with megaphones) telling people when and where they could get the nets. In many cases, the distribution took longer than predicted. For example, in Nsele, the distribution was supposed to last three days but in reality it lasted one week. This was because there was a stampede on the first day requiring police intervention and subsequently heavy rains meant that it was difficult to continue within the planned time period. In most cases, the distribution was staggered over a number of days and carried out street by street to avoid chaotic scenes. The Outreach Workers opened the packets containing the nets when they gave them out to avoid resale. They advised the recipient to air the net for 24 hours before hanging it up and also gave advice about its correct suspension and use.

3.1.3 The 'hang-up'.

After the distribution (in some cases up to a month afterwards), the Outreach Workers went into the households in their communities and checked that the nets were being used correctly. They were able to ascertain reasons for non-use (such as the fact that the person had a net already or was afraid of alleged toxicity –see discussion of rumours below). For those who wanted to hang their nets up, but had been unable to do so, the Outreach Workers were able to help them put the nets in place correctly.

The graph below shows the percentage of households actively using LLINs distributed during the campaign together with the percentage who required assistance from the Outreach Workers to hang them up correctly. It clearly shows that in the zone of Nsele, visited for during the preparation of this report, the largest percentage (6%) of households required assistance. This may be that because Nsele comprises an urbano-rural zone with a population with low levels of schooling, many people required assistance if they were not able to read instructions or follow instructions in French. It was also a pilot zone for the campaign and, as such, it is possible that the population had not been exposed to the hang-up messages as much as those who were involved in later distributions. However, in general, the post-campaign hang-up sensitization did not have a great effect on encouraging those who had not put their net up to do so. Okito (2009) notes that, in some zones, the offer of 'hang-up' assistance only resulted in a small percentage of extra people using their nets indicating that there was still a reticence to use the net, perhaps due to the persistence of the rumours discussed below. For example, post-distribution visits by Outreach Workers in Funa only resulted in 3% more nets being used.

Figure 3: % of Kinshasa households with nets and % requiring assistance for 'hang-up'

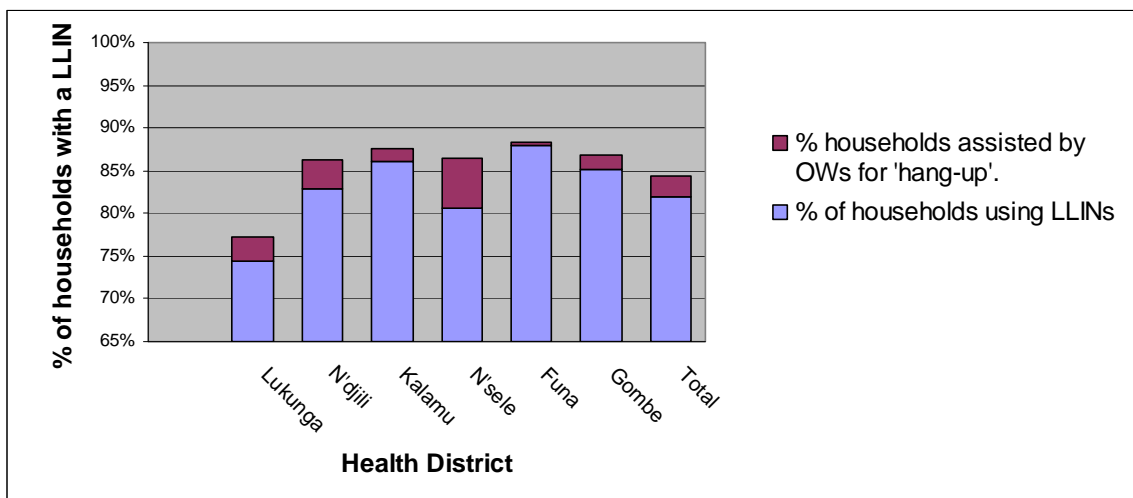


Figure 3 above shows that, with the exception of Lukunga zone, overall rates of possession (and presumably use) were around 80-85%. Net use in Lukunga is perhaps considerably lower than the other zones as it is here that the rumours about toxicity started. These are discussed in detail below.

3.2 Implementation in Equateur Province

As described above, the LLIN distribution in Equateur was 'piggy backed' on to a measles vaccination campaign. As such, it was not preceded by a household enumeration as it was not a household-level distribution, nor did it have post-distribution 'hang-up' awareness raising activities.

At a national level, the campaign was coordinated by the Ministry of Health and the PNLP in collaboration with UNICEF who facilitated activities on the ground. These and other partners formed a National Committee of Coordination which drew up a macro-plan for the logistics associated with the distribution. At the Provincial level, the local office of the Provincial Health Inspectorate, the PNLP and local UNICEF representative formed the 'Provincial Committee of Coordination' which developed a micro-plan for logistics and distribution. At the District level, there was a 'District Committee' and at the level of the 'zone' there was a 'Local Coordination Committee' which included the chief Medical Officer of the zone (Médecin chef du zone).

It should be noted that the logistics of getting nets into Equateur province were extremely challenging and costly with 1.5 million being transported by air, river, heavy lorry and even carried by people on foot into the more inaccessible areas. There were six points where the nets were stocked for distribution but some of these were very far away from the health centers where they were needed. For example, some nets left in boats from Kinshasa to Mogalo and then went by lorry to Genema which was, in turn, around 140km from the furthest village in the zone where distribution took place. This required the use of canoes, bicycles, motorbikes and people on foot. It is discussed below how there were significant differences between the micro- and macro- logistical plans. The distribution apparently used the latter, whereas in fact the former was more adapted to the local terrain. Using the macro-plan created problems in the field and severely underestimated transport costs.

Once the nets were in place in the distribution centers (which took two months longer than expected due to logistical and transport difficulties) communication (using television, radio and door to door inter-personal communication) started around the immunization campaign.

As with the Kinshasa campaign, the distribution relied heavily on Outreach Workers. In addition to carrying out awareness raising, they actively worked with health care professionals at the vaccination sites. Annex 2 shows that each team

was composed of seven individuals: 1) Someone who carried out a triage of children by age 2) A healthcare professional who administered the polio vaccination, Vitamin A and mebendazole 3) and 4) Two immunizers giving the measles vaccination 5) The distributor of the LLIN 6) An administrator who notes each intervention received and 7) The community mobilizer to get people to come to the distribution point. A regular vaccination campaign does not usually require the community mobilizer. Thus, adding in the element of net distribution increases the team size and cost of operation. It was remarked by the health care professionals who participated in the campaign that the addition of mosquito nets made the operation logistically complex. However, as described above, the free distribution of nets attracted mothers to bring their children for vaccinations. By contrast, the measles vaccination and mebendazole distribution, in particular, was a motivating factor for mothers and in all likelihood increased the target population for net distribution.

3.0 Difficulties encountered and how they were addressed

Most of the difficulties were logistical in nature and are described in detail below. A difficulty common to both sites, and one which appears to hinder most logistical operations in RDC, is a lack of accurate estimates of population numbers. As mentioned previously, the last national census in RDC was carried out in 1984. Although figures have been updated, it is very difficult to estimate how many inhabitants there actually are. In addition to changing fertility and mortality rates, large scale migration and population displacement due to conflict makes estimates even more complex. Thus, with regard to LLIN distribution, a lack of accurate population estimates not only hinders calculations of numbers of recipients, but also makes the calculation of a denominator complicated for subsequent monitoring and evaluation.

4.1 Difficulties in Kinshasa⁴

4.1.1 Problems with numbers and quality of Outreach Workers: In the original proposal, it was planned that the campaign should involve 1443 Outreach Workers who were affiliated to health centers and chosen by health center staff. However, this number turned out to be grossly insufficient and would have substantially prolonged the campaign. PSI calculated that with the original number of Outreach Workers, each one would have had to enumerate 70 households a day. To solve this problem, an additional 843 Outreach Workers were recruited among the Red Cross' volunteers to make a final number of 2286. For example, in the case of Nsele (the pilot zone) 52 Outreach Workers were

⁴ A very detailed listing of difficulties and lessons learned is available in PSI's final report about the project and also in Professor Okito's evaluation. Some of the major lessons have been repeated in this section but emphasis is put on difficulties not outlined in these two very comprehensive documents.

foreseen, but in order to realistically accomplish the tasks of enumeration and distribution they ended recruiting 72 in all. This led to the project incurring substantial extra costs as each is paid \$5 per day. In addition, throughout Kinshasa, some of the Outreach Workers recruited were subsequently found to be illiterate or too old to carry out this demanding job effectively and they had to be replaced.

4.1.2 Highly mobile population: In addition to the difficulties related to the inaccurate population estimates described above, the Outreach Workers encountered numerous difficulties related to the high mobility of the population. In particular, fishing populations living in islands in the River Congo regularly migrate and can move between the short space of time between the enumeration and the distribution. In addition, a visit to the port at Nsele during the case-study revealed many people living on boats or staying for extended periods on the quayside next to the merchandise they were selling or wanting to transport. These individuals are not in households per se and many lack any kind of structure where a mosquito net could be hung. Furthermore, in peri-urban communities like Nsele, many individuals leave their homes early in the morning to work in central Kinshasa and return late at night and are thus unable to give information about their household to the Outreach Worker.

4.1.3 Inability of Outreach Workers to access households: At the beginning of the campaign it appeared that there was great skepticism among many individuals as to whether each household was really going to receive two free mosquito nets. As a result, some Outreach Workers were denied access during the enumeration and could not give out the token. When people finally saw that they were indeed entitled to free nets, many, who had not previously allowed the Outreach Workers in to enumerate their household, wanted to claim them. However, unfortunately their households were not on the validated lists and they had not received a token. In addition, some people who had been enumerated had taken the token and then lost it or thrown it away either because of their belief in rumours about toxicity (see below) or because they did not think they were really going to get nets.

4.1.4 Problems with the availability and quality of tokens: The qualitative fieldwork for this report carried out in Nsele revealed that there were problems with the supply of the tokens people needed to exchange for nets. In Nsele they needed 20,000 tokens but received fewer than this in total and those they did receive came in dribs and drabs of 100 one day and 200 a few days later etc. A small percentage of tokens were badly printed and unusable. In all, this meant that some enumerated households did not get tokens even though they were entitled to nets. This was rectified by the fact that each household had a unique identifier and when the head came to claim the free nets, his/her household code was found in the records. However, for this and other reasons (absences etc) described above, in Nsele, although 26940 households got nets, 1650 households who had been enumerated did not.

4.1.5 Insufficient number of nets per household: The distribution was based on a premise of distributing two nets per household with an average household size of 6.4 people. The definition of a household which was used was that which grouped people who ate together and all looked to the same household head. The figure of 6.4 came from a Multiple Indicator Cluster Survey in 2006. In 2007, the Demographic and Health Survey found that the average size of a household nationally was 5.9 in urban areas and 5.2 in rural areas. This seems counter intuitive in some ways as one would expect higher household sizes in large, agricultural, rural communities. Indeed the overall figures for household size seem small for a culture where polygamy and extended patrilocal family structures are common. In Nsele, the Outreach Workers frequently found households of ten or more people. During the hang-up, people throughout Kinshasa complained that the two nets were insufficient and that there were sometime as many as five beds to cover in each household. This is substantiated by qualitative data collected during the preparation of this report presented in Section 7.0 below. The PNLP is now advocating one net for two people or 3 nets per household and this ratio should definitely be adhered to in subsequent campaigns.

4.1.6 Rumours: As the campaign got underway, a rumour began to circulate that the bed nets were toxic and would kill the person sleeping under them. It is believed that the rumour was started by Congolese opposition party members based in Europe who wished to discredit the government. The rumours became very serious and threaten to destabilize the distribution and undermine the stakeholders' credibility. People refused to take nets, to use them and even began to throw them away or burn the ones they had been given. However, the situation was managed swiftly and efficiently with the PNLP and Ministry of Health taking an effective lead using national media to dispel the rumours. They duly succeeded and the campaign resumed normally although during the 'hang up' it was found that some people were still not convinced that the nets would not harm them. Interestingly, the fieldwork in Nsele revealed that the more people had access to texts and mobile telephones and to the internet the more they appeared to believe in the rumours as they were indeed spread through the use of modern technology. Those who did not have mobile phones or were less educated were, according to the Outreach Workers interviewed, less inclined to believe them. It may be that, in future campaigns, communication strategies should also use text and the internet to reinforce the positive benefits of nets and to nip any such rumors in the bud.

It should also be noted that the 'ligne verte' (a free telephone information line that was set up to answer people's questions about bed nets) also played a key role in dispelling rumours. It has been suggested that the 'ligne verte', which was discontinued at the end of the campaign, should be reinstated as a permanent 'malaria hotline' for those with questions about preventing or curing the disease. Interestingly, the regional representative for UNICEF in Equateur said that the quick and efficient way in which the rumours were handled in Kinshasa, meant

that they did not pose a problem during the Equateur distribution which occurred shortly afterwards.

4.1.7 Arrival of nets: The two million nets were supposed to arrive in two deliveries of one million each. However, apparently they all arrived at the same time leading to problems of storage.

4.1.8 Payment of Health Center staff: From the outset it became clear that health center staff expected payment for the 'extra' activities associated with the distribution. Payments were made but they had not been budgeted for in the original proposal and so comprised extra costs.

4.1.9 Pre-financing by executing agencies: The distributions in Kinshasa and Equateur were both pre-financed by the respective executing agencies, namely, PSI and UNICEF. Although as large international organizations they were able to do this, it seems unnecessary and unacceptable. In future distributions, the Bank needs to make sure that the necessary financing is in place instead of relying on support from partners for an activity that is their fiscal responsibility. If this practice continues, it also excludes the possibility of the Bank working in other areas of DRC with smaller agencies which may not be able to pre-finance such costly campaigns.

4.1.10 Lack of evaluation: The Kinshasa distribution has yet to be evaluated but a survey to look at impact is apparently going to be carried out by the School of Public Health at the University of Kinshasa. Unfortunately there is no baseline data with which to compare post-campaign net usage but the Demographic and Health Survey from 2007 can at least give some idea of pre-distribution rates. Other behavioral information concerning nets is available from Mrs Hortense Shidi, an economist from the University of Kinshasa. Her important research is discussed below.

4.2 Difficulties in Equateur

4.2.1 Short planning period: Planning for the campaign was only started three months before its execution and, in retrospect, this was not considered long enough. The logistical challenges are such that it takes a long time to put everything in place. In Equateur, the campaign was delayed as the bed nets failed to arrive on time because the planning had not taken into account the logistical complexities of getting them up to the Province and then out to villages.

4.2.2 Use of macro-rather than micro-plan: Part of the difficulties in Equateur could be attributable to the fact that, although a micro-plan had been developed at the Provincial level which was better tailored to the realities of the terrain, for some reason it was the macro-plan (developed in Kinshasa) which was implemented. This failed to take into account some of the distribution challenges,

and particularly the heavy costs associated with them. To date, the actual spends on the campaign are unclear as in UNICEF's centralized financial system in Kinshasa, Equateur is budgeted together with Orientale Province and the costs are impossible to separate.

4.2.3 Shortage of nets: Due to the planning difficulties described, there was a shortage of nets in some zones. Four zones only received about 60% of the nets needed. The reason for this may also be due to poor population estimates. Apparently population estimates were based on those calculated at a workshop in Goma in 2007 and had not been updated to reflect population growth since then.

4.2.4 Slowing down of immunization campaign: The fact that the distribution is linked to the immunization campaign is good in the sense that it gets nets out to children under five, but it does not necessarily get them to the general population. However, another important advantage is that the EPI teams are very experienced in logistics and in the transportation of commodities and this can enhance the technical capacity of a bed net distribution programme. Nevertheless, it became clear from the Equateur experience that the adding on of bed net distribution greatly weighed down the vaccination campaign and delayed its start by almost three months. The pros and cons of combining the two should be carefully considered and there is no clear cut answer. It should be remembered that the giving out of bed nets encourages mothers to come for vaccination and vice versa so there is some economy of scale in carrying out both together. If future campaigns are not carried out in tandem with immunization there could at least be other concurrent interventions such as the distribution out of mebendazole or Vitamin A as this would be likely to increase participation.

4.2.5 Employment of extra staff: As shown in Annex 2, the adding on of the bed net distribution required a team of seven rather than six people. Ideally, the campaign needs 2-3 mobilisateurs (community mobilisers) for each health district which usually comprises 10-15 villages. In Equateur it was felt that there were not enough 'mobilisateurs' and those that did play this role were often handicapped by the fact they did not have megaphones.

4.2.6 Transport logistics: In Equateur, transport posed a major and costly problem. There are virtually no roads and most transport from Kinshasa had to be done by air or river. Such a distribution requires a skilled logistician who can think 'outside the box' and future campaigns need to budget adequately for LLIN transport as the nets are heavy and bulky. Many health centers have no means of transport, not even a motorbike, and vehicles have to be rented which incurs extra costs.

4.2.7 Absence of banks: A major problem was that after UNICEF made a bank transfer to the regional government in Equateur, that there were simply no banks

or financial institutions which had sufficient cash which project staff could withdraw. In the end the money was sent via 'Mister Cash' wiring service which does not seem like a very secure alternative. UNICEF does not authorize staff to travel with large amounts of cash but perhaps in such circumstances they could make an exception.

4.2.8 Lack of hang-up campaign: In Equateur there was no hang-up campaign to ensure that the nets were being used properly.

4.2.9 Lack of evaluation: There was no evaluation after the Equateur campaign and no pre-distribution figures are available (apart from those from the Demographic and Health Survey). An evaluation had been planned by WHO but unfortunately no money was available to fund it. Thus, it is not clear what true net usage is at a population level. There is however mention of an evaluation occurring in the first semester of 2010.

4.2.10 Nets used by fishermen: It was found that in some communities, the mosquito nets were being used by fishermen as fishing nets. However after awareness-raising by the community mobilizers, this practice stopped.

4.0 Communication and advocacy: efforts and results

Communication is the key to such campaigns and this was recognized by both distributions, although a more comprehensive communication campaign took place in Kinshasa. In Kinshasa, before the campaign started, the local press and religious leaders were briefed as to its purpose. Media spots on local television and radio preceded the enumeration to raise awareness about the nets and to prepare people for the visits by the Outreach Workers. The following spots are described in detail in PSI's final report (PSI 2009):

- i. Spot announcing the mass distribution
- ii. Spot about the advantages of using the treated nets
- iii. Spot about how to put up a treated net.
- iv. Spot announcing the impending visits of the Outreach Workers to enumerate household and give out token

Following some attempted cases of fraud, it was decided to do two additional media spots which were not foreseen in the main proposal.

- v. Spot about the token and how it entitled people to two free LLNs per household.
- vi. Spot which spoke of the fact that the token and the nets were free.

In addition, once the problem of the rumours began to emerge, the Minister of Health was featured in a broadcast on national television denouncing them and

informing the population of Kinshasa about the benefits of using LLINs. In addition, PSI and the PNL broadcast on Radio Okapi to counter the rumours. They also organized an additional 14 television spots, including one on a very popular programme called 'Lingala facile' to counter the rumours between the end of December 2008 and the end of January 2009.

In all there were 3570 spots on the television and 2805 on the radio as well as regular press briefings.

Once the enumeration had been carried out, the public validation of the results was also widely reported in the media giving credibility to the campaign.

In addition to the spots, once the campaign was underway, criers went door to door with megaphones giving out information. Furthermore, 40 large roadside panels were put up.

One of the most original and important aspects to the media campaign was telephone 'green line'. This was a free telephone line established prior to the distribution to answer questions about the campaign and the nets themselves. Its primary purpose was to discourage the Outreach Workers from selling the nets, but when the rumours stated it became a very useful tool to dispel them. During the two months it was in service, the 'green line' received 1,439 calls broken down as follows :

- 536 about problems with the distribution of the token
- 137 about exchanging the token for the nets
- 330 about rumours relating to alleged toxicity (of these 289 called asking for further information) and 41 for advice about undesirable side effects⁵)
- 436 about other issues

As the green line was so successful, it was suggested by some of those interviewed for the preparation of this report that it be reinstated as a sort of permanent hotline for information about malaria in DRC. This seems like a very useful approach. In addition, during future campaigns, it would be better if the green line was in existence right from the beginning as it acts as a key deterrent to fraud.

In addition, PSI's operations manager commented that although the TV spots had been numerous, there should have in fact been even more during the duration of the campaign. He suggested daily spots as distribution occurred to keep the population motivated and informed and to prevent fraud.

The PSI country director remarked pertinently that, because the World Bank was behind the distribution, any negative publicity, for example that associated with

⁵ Although of course the nets are not toxic, they can cause mild dermatological reactions if used before being properly aired or a person's skin touches the net for as long period.

the alleged toxicity, got very wide media coverage. She felt that somewhat inevitable problems such as the attempted selling of tokens which were handled quickly and effectively by PSI were blown out of proportion in some media due to the high profile of the Bank as the main financing agency.

In Equateur there were also radio and television campaigns but not to the same extent as in Kinshasa. Each District developed a local communication plan (involving, for example, the Outreach Workers, theatre troupes and school children) which fell under the auspices of the Provincial Communication Plan. This used Radio Okapi which covers 70% of the population and the National Television Station to communicate messages about the integrated bed net and vaccination campaign. In addition, the Outreach Workers went from house to house and physically showed people how to use the nets. Indeed, discussions with Outreach Workers in Kinshasa noted that that, in fact, people prefer one-to-one communication and that future campaigns should place an emphasis on it rather than mass media which people perceive to be politically manipulated.

5.0 Monitoring and Evaluation

One major weakness of the distributions programmes is that there has been no systematic evaluation either in Kinshasa or in Equateur. As described above, it is planned that the School of Public Health at the University of Kinshasa will carry out an evaluation but a contract with them is yet to be signed. It would be useful if their survey comprised questions about net use similar to those found in the DHS so that comparisons can be made. If biomarkers such as rapid malaria test results could be collected, this would be extremely useful and interesting in terms of epidemiological monitoring.

In Mali, PSI also carried out free bed net distribution in the north of the country. They then followed it up with a household survey to see who actually slept under the nets distributed and whether pregnant women and children got priority (which is not guaranteed in cultural settings where gender and age prioritize men and elders). The questionnaire is shown in Annex 3 and the results indicated that indeed over 80% of the nets were allocated to these groups who most needed them (pregnant women and children under five). It would be interesting to see via the evaluation survey if, in Kinshasa, the at-risk groups were indeed sleeping under the nets especially as, as described above, there appear to be too few nets per household.

The Demographic and Health Survey of 2007 could be considered a sort of baseline as it was carried out shortly before the distribution. It would also be very useful if the data from the household enumeration in Kinshasa (see Annex 1) were entered and analysed as they too would provide important baseline information about prevalence of perceived fever, pre-distribution net numbers etc.

Mrs Hortense Shidi, an economist from the Faculty of Economic Sciences and Management at the University of Kinshasa, is currently preparing her Masters thesis on behavioral aspects of net use and malaria prevention. She has some extremely interesting data which was collected among 930 households in Kinshasa in September and October 2008 (at the beginning of the distribution). She asked about net use (of all nets, not necessarily nets distributed in the campaign) and although 79% of respondents (who were in most cases the household head) replied that they liked sleeping under nets, 3.1% thought that nets were 'suffocating' and nearly 4% that they were toxic. Mrs Shidi commented that many people, especially children, slept together in small rooms and hanging up a net made the room seem even smaller.

Table 1 below shows that the 380 respondents in Mrs Shidi's survey (nearly one third of those surveyed) who did not sleep under nets, gave a variety of reasons mainly a lack of money and the fact that they made people hot.

Table 1: Reasons for non-use of nets (N=380)

	% respondents
Room is too small	4.4
Finds net suffocating	3.2
Finds net too hot	14.7
Lack of money	41.2
Doesn't like the insecticide	2.9
Negligent	0.5
Thinks net is toxic	3.7
Don't know/other	29.4

Source : Hortense Shidi 2009

Another important finding discussed by Mrs Shidi is that, when asked, over 80% of households said they had a curtain behind their front door. However, very few households shut their main door at 6pm at night when it gets dark, thus allowing mosquitoes to enter the house. Mrs Shidi suggests that, in order to solve the problem of people feeling suffocated by the nets, impregnated curtains may be a solution, and these have indeed be used in other areas of Africa. It is strongly suggested that PARSS and other partners connect with Mrs Shidi. She has some important and original data which could shed light on behavior-related issues to do with nets and which could inform programmatic responses to improve use.

With regard to impact, there seems to be some anecdotal and epidemiological evidence that the bed net distribution has decreased the number of cases of malaria seen in health centers, and in particular, severe cases. The Country Representative of PSI had been told on three or four occasions by Medecins Chefs and other health center personnel that the number of cases of malaria had decreased.

Figure 4 shows data from the Inspection Provinciale de la Santé from Kinshasa also indicates that in the first half of 2009 there were fewer case of malaria compared with the same period in 2008.

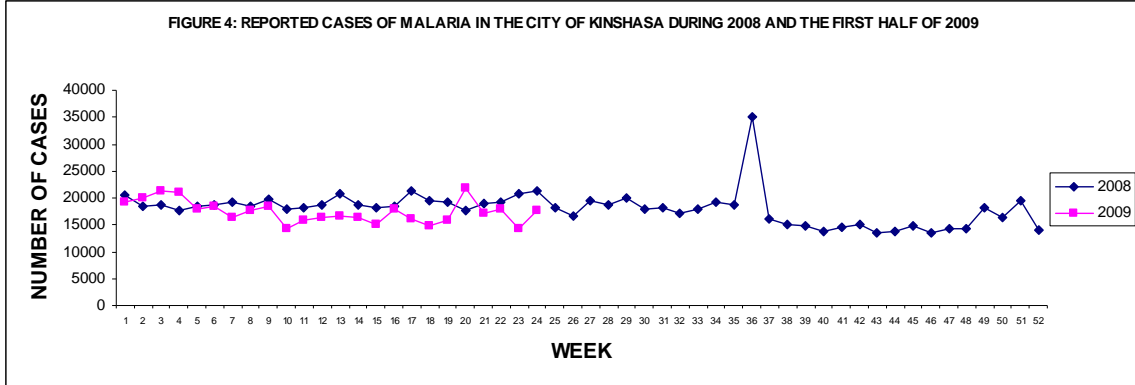
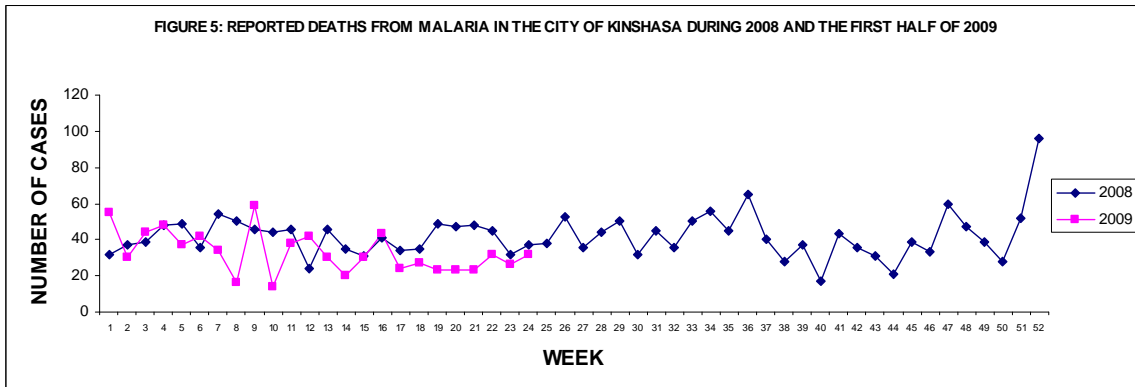


Figure 5 shows that there were also fewer deaths from malaria during the first half of 2009 compared with 2008 maybe indicating that prevention was effective and averted fewer serious cases.



It will be interesting to see how the graphs evolve from September to December 2009 as this is the rainy season in Kinshasa when malaria is most prevalent. If cases and deaths remain low, then the distribution campaign will have had a significant impact

These data only pertain of course to cases and deaths that were seen in health centers. Evidence strongly suggests that many people (up to 40% according to Mrs Shidi) self-medicate and these cases, together with untreated cases, will not be noted in health center records. The data do also not distinguish between cases among more susceptible children and the general population.

It is strongly recommended that an evaluation is carried out in Equateur and after each subsequent distribution. In the absence of an evaluation (and indeed of

baseline data), the analysis of health service statistics pertaining to malaria cases and deaths attributed to malaria can give some notion of impact.

6.0 Perceptions of beneficiaries and policy makers

7.1 Perceptions of beneficiaries

Discussions with the Outreach Workers and project beneficiaries in Nsele raised some important issues. In terms of local capacity, the campaign left an important legacy in that the enumeration of the households in the community has proved useful for other health related activities. It strengthened the outreach activities in other domains, such as immunization, by allowing the Outreach Workers and other health personnel to know exactly who was living in their community and to call them up for other interventions. This is a considerable benefit and likely to have an impact in other health-related areas.

With regard to the household enumeration, the Outreach Workers reported that they had come across many households larger than the 6.4 'average' on which the campaign was based. This was confirmed by our visits into a number of households in the community. In the standard houses in this zone, there was a sitting room and two bedrooms – one for adults and one for children. Some children appeared to sleep in bunk beds as the rooms were very small. The respondent shown below said that her three younger children slept in the top bunk and the two older ones below.

Figure 6: Children's sleeping arrangements in Nsele household (3 children in upper bunk and two in lower)



She had actively noted that the older ones who slept below (without a net) regularly had fevers whilst the younger ones who slept under the net had

stopped having fevers since they started using it. Her other net was used by her and her husband - she did not have enough nets for the whole family.

Another issue was that in these concrete houses it is very difficult to find four points where nails can be knocked into the walls which are very hard. In addition, in some bedrooms, there were many people who slept on one large mattress that was too big to be covered by the standard net the campaign distributed. To solve this problem, one Outreach Worker, had taken the two nets she was given and gone to a tailor and had him sew them together in a way that they became one large net suspended by just one point. As she was an Outreach Worker, her house was somewhat of a showcase for the community and she reported that people had started to copy her.

Figure 7: Outreach Worker with net suspended from single point (made from two nets distributed during campaign)



It may be better in future campaigns, to distribute nets which can be suspended at a single point as those which have to be suspended at each corner are difficult to hang up. This is either because, as described above, the walls are too hard to insert nails easily or, as shown on the cover photograph, it necessitates the construction of a frame which is an extra expense. Clearly, two nets per household are insufficient and a minimum of three, as recommended by the PNLS are needed. It is recommended that qualitative research is carried out to ascertain other concerns of local recipients before other campaigns are undertaken.

7.2 Perceptions of Policy Makers

The campaigns were well received by policy makers, including the Director of PARSS. His main concern was that the campaign in Equateur may not have attained universal coverage and that a new mass distribution was needed to target women who had become pregnant or children who had been born since the last distribution. The UNICEF regional representative for Equateur felt that the distribution associated with the PEV had been a 'total success'. Regarding the Kinshasa distribution, the PNLN was satisfied with the campaign but wanted to be more involved in subsequent mass distributions as their role in the Kinshasa campaign had been quite peripheral. Their representative explained that if they are more heavily involved then they could learn from the experience and build capacity for future campaigns. The Medecin Inspecteur Provincial for Kinshasa was very satisfied with the Kinshasa campaign and seemed to have played a very active role coordinating activities in the field. All policy makers interviewed recognized the need for better monitoring and evaluation in order to assess impact.

7.0 Main achievements and lessons learned

8.1 Main achievements

The main achievement in Kinshasa was the execution of a campaign that, on the whole, went smoothly, got nets out to the majority of the population and dealt swiftly and effectively with problems such as rumours or fraud. The data from the Inspection Provinciale de la Santé presented in Figures 4 and 5 above indicate that the campaign has probably had a real impact on morbidity and mortality associated with malaria. Other important achievements comprise the building of capacity at a local level, particularly via the enumeration which, it seems may be useful for other health-related activities, as it allowed the health center staff and outreach workers to better know the size and composition of the local population.

In Equateur, the teams overcame immense logistical hurdles to distribute the nets to the vast majority of children coming for immunization. It is not clear what percentage of *all* children received nets or what percentage of the general population were covered. The fact that the distribution occurred in tandem with immunization is very positive in that the regional office of the PNLN (and indeed other partners) could learn significant lessons from the EPI team's experience with logistics which could be applied to future campaigns.

These achievements all fall within the goals of the PNLN's strategic plan, Millennium Development Goal 6 and those of Roll Back Malaria. Although there are still challenges ahead, DRC has come a long way in enhancing capacity for malaria prevention and future campaigns can definitely capitalize on the important experiences described here.

8.2 Lessons learned

The lessons learned are comprehensively outlined in the reports by PSI and Professor Okito. The main ones will be discussed briefly here along with others which were not so prominent in the two reports.

8.2.1 Lessons learned in Kinshasa:

Difficulty of getting accurate population estimates: As discussed above, DRC has not had a national census since 1984 and population estimates are based on projects from data that is over 20 years old. In a country which has not just high mortality and fertility rates, but significant migration and displacement, the estimates are extremely difficult to calculate. Poor estimates for net distribution in Kinshasa mean that there is a gap of 50,000 nets still to be distributed which will have significant budget implications. The country is in desperate need of a census, which although costly to implement, would save donors a lot of extra time and money in the long term which is currently spent on bridging gaps because population estimates were inaccurate.

Insufficiency of two LLINs per household: As the PNLN advocates there is a clear need for three nets per household as two are insufficient and leave some household members unprotected. Mothers were having to make difficult choices as to which children sleep under the nets. Some children sleeping in the same room were covered whilst others were not, leading to a differential risk of malaria morbidity in the same household. Regarding the nets, it may be better, during future campaigns to distribute nets that have only one point of suspension as having four points makes them difficult (and sometimes costly if a frame is needed) to put up.

Necessity to pay health center staff: The initial proposal did not budget for paying the health center staff for their 'extra' work and significant extra costs were incurred in the field. In addition, many of the Outreach Workers worked longer than the three days which were scheduled for the distribution, again incurring financial implications.

Need to establish the green line (telephone hotline) from the beginning: It became clear that telephone hotline (which was a valuable tool to counter fraud and dispel rumours) should have been set up from the very beginning of the campaign. Indeed, the line would be a very useful resource if it were permanently available so that people could answer questions about malaria prevention and treatment.

Need for the PNLN to have a more active role in the campaign: Because of the way that the campaign was structured, the PNLN was not a central player in the Kinshasa campaign although they played a central role in dispelling the

rumors. In future campaigns, the PNLN needs to be a primary partner and stakeholder so that it can enhance its capacity to replicate and coordinate successful campaigns in each of the Provinces.

8.2.2 Lessons learned in Equateur

Need for early preparation: There needs to be earlier preparation for such a campaign at least six months in advance. The delays in getting the nets from Kinshasa to the points of distribution delayed the start of the immunization campaign by three months.

Need to use micro-plan rather than macro-plan: For some reason in Equateur, although a micro-plan which had been developed at the Provincial level was available, it was not used. The macro-plan which was implemented did not allow for the difficulties of the terrain and in particular, for the complex and costly logistics associated with transport and distribution. For example, the macro-plan allowed for one central point of distribution whereas in reality there were six. This obviously has budgetary and organizational implications.

Need for means of transferring cash to finance operations: As described above, there were problems in that the banks or financial institutions of the province did not have enough available cash to honor the checks written by UNICEF. Money was sent through the Mister Money wiring service which no doubt charges a substantial commission. In the future, maybe UNICEF staff could be authorized to transport money from Kinshasa.

Carrying out LLIN distribution with an immunization campaign makes the latter very 'heavy': Because of the need for 'mobilizateurs' (community mobilizers) and other personnel and because of the difficulty of transporting many bulky, heavy nets into inaccessible areas, the addition of the net distribution slowed down the immunization campaign considerably. However, as described, there are certain advantages of combining the two in that the immunization campaign personnel are very experienced in the logistics of vaccine transport and community mobilization. By contrast, mothers are motivated to come for vaccines if there are free nets. In particular, mothers appear to be motivated by the anti-parasitic medication mebendazole. In the future, during net distribution campaigns it might be worth adding a component where children are also given mebendazole as this is likely to increase mothers' motivation to attend net distribution.

Need for comprehensive evaluation of numbers receiving nets and of the campaign impact: The available data tell us what percentage of children seen in the integrated campaign received nets (96.4%) but not what proportion of *all* children in Equateur province received nets. In order to evaluate the impact of the distribution, a pre-and post distribution survey needs to be ideally part of

each campaign. It would be interesting to compare, for example, the numbers of under fives sleeping under nets after an integrated campaign, such as the one in Equateur, and following a community distribution, such as the one in Kinshasa.

8.0 Recommendations

9.1 Recommendations with regard to planning

Carry out census: It is highly recommended that the Bank discusses with other partners the feasibility of carrying out a Census. As it stands, population estimates are based on updated census data from 1984. As shown in the Kinshasa distribution which was based on these figures, not enough nets were made available and extra time and money is now needed to distribute the extra 50,000 needed.

Give a greater role to the PNLP: The PNLP needs to be at the heart of the planning mechanisms, as to date they have played a rather peripheral role. In this way, they can develop their own capacity to coordinate mass distributions and carry out such campaigns in other Provinces in DRC.

Start logistical planning at least three months in advance: The general consensus from those involved in the Equateur distribution was that planning to move nets to central distribution points was left until the last minute (one or two months before start date). UNICEF's local and national representatives made a plea for planning to start at least six months before the nets were supposed to be in place.

Use micro-plan not macro-plan in the field: Part of the problem with the Equateur distribution was that the implementation was based on the macro-plan devised in Kinshasa which, unlike the micro-plan, did not take into account the realities of the field. Transport and logistical difficulties were under-estimated along with costs of getting nets to extremely remote areas.

9.2 Recommendations with regard to costing

Need for commitment from Bank to finance future distributions: It became clear during discussions that there was a certain amount of frustration on the part of the Bank's partners about a perceived lack of financial commitment for future activities. The Global Fund proposal (round 8) relies on a contribution from the Bank of \$100m which has not yet been committed. Even within PARSS there is a lack of funds to finance activities such as the routine distribution in Equateur, for which, to date there are no nets. On the 19th June a tele-conference between the Bank and its DRC partners and the UN Special Envoy noted a total gap for 2009 and 2010 of \$ 96,000,000. It is recommended that the Booster fund and other

monies are released as soon as possible to close this considerable gap. Continued hesitancy or uncertainty risks undermining partners' confidence in the Bank's commitment to finance malaria-related activities. Both implementing agencies (UNICEF and PSI) pre-financed the most recent distributions which seems unsatisfactory and precludes the Bank working with smaller agencies elsewhere who would be unable to do this.

Lack of financial input from Ministry of Health : It was noted that although the Ministry of Health nominally coordinates the campaigns and that the IPS and PNLN play active roles, the Ministry makes no financial contribution to the campaigns. It was felt that they could at least take some degree of leadership and perhaps support the health workers modest salaries or the supplementary salaries needed for their participation in distributions.

Budget sufficient money for transport costs and for a logistician: Because of the poor quality of the transport networks which characterize DRC, moving nets (which are extremely bulky) to remote areas requires transport by air, boat or heavy lorry and this can be extremely costly, Both the campaigns underestimated transport costs and both PSI and UNICEF strongly recommend the involvement of a logistician from the outset who can find the most efficient and economical ways of getting the nets to where they are needed for distribution.

Increase budget for health center staff: Budget estimates need to take into account that health center staff need paying to participate in the distributions, This was not allowed for in the budgets for Kinshasa or Equateur.

Increase budget for training : In Kinshasa the budget for training was insufficient because of the increased numbers of Outreach Workers who had to be recruited. Future budgets need to allow for a realistic number of Outreach Workers and adapt training and implementation budgets accordingly.

9.3 Recommendations with regard to implementation

Need for three nets per household: It became clear from talking to those implementing the distribution as well as net recipients, that two nets per household was not sufficient. Recipients also indicated that they would have preferred the kind of net that is suspended from just one point. The kind of nets distributed are suspended from all four corners and can be difficult to use in houses made of hard concrete, or they require the construction of a frame which can be costly.

Reflect on advantages and disadvantages of distribution with immunization campaign: As described above, there are pros and cons of distributing on the back of an immunization campaign. Net distribution makes the immunization

campaign very 'heavy' and requires extra personnel and therefore costs. However, EPI teams are very experienced in the logistics of getting commodities to remote areas and in successful mobilising local populations. Mothers particularly like their children to be vaccinated against measles and for them to be given mebendazole. By contrast, the giving out of nets attracts mothers to come for immunization. It should be noted that distributions in tandem with immunization are not going to get nets to the general population so overall coverage will be lower. Nevertheless, a higher proportion of children under five are likely to end up with a net than in a mass distribution. Even if subsequent distributions are not carried out in conjunction with immunization an 'extra' medical commodity such as mebendazole could be included to motivate mothers to come and get nets.

Start the 'ligne verte' at the beginning of the campaign and establish it permanently: The ligne verte (free telephone information line) proved to be very successful especially in countering fraud and dispelling rumours. It is recommended that one is started right at the beginning of the next campaign and kept functioning permanently as a malaria hot line for DRC to answer people's questions about prevention and treatment.

Daily communication throughout the campaign: Although there were substantial numbers of media spots announcing the campaign and at different stages of its implementation, there is a need for sustained, daily media coverage during the immediately precede, during and just after the distribution. Spots in the mass media (radio, television, newspaper) appear to be useful but the fieldwork in Nsele revealed that people also like word of mouth and individual awareness-raising by the Outreach Workers. Future communication strategies should also take account of modern technologies such as internet and text messaging.

9.4 Recommendations with regard to evaluation

Enter data from household enumeration: Although there was no baseline survey for either distribution the 2007 DHS can, to some extent, serve as baseline data. In addition, the data from the household enumeration in Kinshasa should definitely be entered and analyzed to see the extent of net use and prevalence of perceived fever before the campaign.

Need for post-campaign survey: The School of Public Health at the University of Kinshasa is due to undertake a post-campaign survey. The contract should be signed with them as soon as possible to enable them to start the work. The survey should include questions on behavior and perceptions with regard to the nets, management of fevers and perceived cases of malaria, as well a bio-makers to indicate the prevalence of infection. It would also be interesting to look at who actually slept under the nets distributed (see Annex 3).

Analysis of health service statistics: In the absence of pre-and post-distribution survey data, it recommended that a detailed analysis takes place of reported cases of malaria and deaths attributed to malaria from routine reporting by health services. If possible, it would be good to have the data broken down by age and sex. It should be noted, however, that these data do not tell us about the vast numbers of people self-medicating and what their outcomes were. It maybe that only the most serious cases were seen at health centers and so there is an associated bias in reporting.

Collaboration with Mrs Hortense Shidi, Department of Economics, University of Kinshasa: It is highly recommended that PARSS and the Bank's partners contact economist Mrs Hortense Shidi. For her Masters' thesis, Mrs Shidi collected some fascinating and useful information in over 900 Kinshasa households at the start of the distribution. Her data could serve as a substitute baseline survey and provide important insights into reasons for non-use of nets, potential to use insecticide treated curtains etc

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