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Community-directed interventions for major health problems in Africa

A multi-country study
Final Report

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Executive Summary

There is an urgent need to develop and scale up strategies that can ensure improved access of poor populations to existing, efficacious health interventions.

One strategy with an already-demonstrated track record of success in reaching rural African populations is community-directed treatment with ivermectin (CDTi). In a little more than a decade, CDTi, in which community members themselves lead the process of drug delivery and treatment, has extended annual ivermectin treatment to nearly 60 million Africans, significantly ensuring sustained high treatment coverage and advancing the process of disease elimination.

The experience with CDTi, coupled with the larger need to improve overall access for Africa's poor to other critical health care tools, prompted the Board of the African Programme for Onchocerciasis Control (APOC) to commission a study examining whether an expanded strategy of "community-directed interventions" (CDI) might be used to combat other diseases in communities with prior experience with CDTi. Health ministers of 19 onchocerciasis-endemic countries are represented on the APOC Board, and the study was thus viewed as having significant relevance both to national level policy-makers as well as to health professionals in the field.

Process and Methods

In 2005, the three-year multi-country study was launched, examining to what extent the CDI process can be used for the integrated delivery of other health interventions with varying degrees of complexity, alongside ivermectin. Four additional interventions were selected to examine this question. They ranged in complexity from relatively "simple" interventions such as Vitamin A supplementation, to more complex, such as distribution of insecticide-treated nets (ITN), directly-observed treatment of tuberculosis, short course (DOTS), and home-management of malaria.

The study was remarkable for its demographic scope covering a total of 2.35 million people with an average of 380 000-530 000 people living in the area defined by each study site. The results from seven research sites in three countries (Cameroon, Nigeria and Uganda) are reported here. Each research site included five participating health districts – one a comparison district and four trial districts – for a total of 35 health districts in all. All sites already had several years of experience with community-directed treatment with ivermectin. During the first year of the study, one new intervention was added at each trial district – within each research site, a different intervention was introduced at every one of the four trial districts. A second new intervention was then added in the same manner during the second study year. In the third year, all five interventions (including the ongoing ivermectin treatment) were delivered through the CDI process in all trial districts. In the comparison districts, meanwhile, all interventions continued to be delivered in the conventional manner throughout the study period. The implementation process and the effectiveness and efficiency of integrated delivery through the CDI process was evaluated during each study phase using accepted quantitative indicators and measures of coverage, as well as qualitative tools. In addition, cost-assessment of the CDI delivery, versus conventional delivery, was performed.

Results

The CDI approach was shown to be much more effective than currently used delivery approaches for all studied interventions except DOTS.

- **Malaria treatment:** More than twice as many children with fever received appropriate antimalarial treatment in CDI study districts, so that the percentage receiving appropriate treatment, on average, exceeded the 60% target set for 2005 by Roll Back Malaria in the Abuja Declaration.
- **ITNs for malaria prevention:** Possession and utilization of ITNs was two times higher in the CDI districts, despite shortages of ITNs in most research sites. In the CDI study districts, the proportion of households possessing at least one ITN approached the 60% target set for 2005 by Roll Back Malaria in the Abuja Declaration.
- **Vitamin A:** Vitamin A coverage was significantly higher in the CDI districts than in the comparison districts, with 90%, on average, of eligible children receiving the supplements in the CDI districts.
- **DOTS treatment for TB:** Only in the case of DOTS were no significant differences noted in coverage for CDI districts and comparison districts; satisfactory completion of DOTS treatment was around 90% in both cases.
- **Ivermectin for onchocerciasis:** The addition of multiple interventions to the CDI package did not have any negative effect on treatment for onchocerciasis, but in fact boosted ivermectin treatment by an additional 10%.
- **Integrated delivery of interventions:** At least four to five interventions could effectively be implemented through CDI strategies. The coverage with the different interventions generally increased over time in the CDI districts, reflecting "maturation" of the CDI process.

With respect to costs to the health system, CDI was also more efficient than conventional delivery systems. Without any increase in implementation costs at the health district and first line health facility (FLHF) level, the CDI process achieved higher coverage for different interventions. At the community level there was an increase in 'opportunity costs' with CDI, reflecting greater time commitment from community implementers who generally volunteered their time, thus forgoing other remunerative activities. Intrinsic incentives, however (e.g. recognition, status, knowledge and skills gain, etc.), were generally perceived as more powerful motivators in the process than material incentives.

There were no specific technical limitations that prevented community implementation of any of the interventions. When given the necessary training and support, community implementers demonstrated that they could effectively implement each of the five study interventions, irrespective of their level of complexity, and were indeed eager to use the approach and sustain it over a period of time. However, the major observed constraints were social constraints (acceptability and appropriateness of the intervention) and health system constraints (e.g. shortage of supplies; reluctance of health workers to empower community implementers to manage TB drug administration; and, in some isolated cases, health policies restricting distribution of antimalarials by anyone other than certified health services staff).

Conclusions

Integrated delivery (also called co-implementation) of different interventions through the CDI process proved perfectly feasible. The study showed that integrated delivery was greatly facilitated by the demonstrated engagement of communities, and the willingness and ability of community implementers to deliver multiple interventions. Health workers, policy-makers and other stakeholders also displayed significant support and their buy-in increased over time.

The largest single factor, however, observed to hinder effective integrated delivery of interventions through community-directed strategies was the lack of supplies of drugs and other intervention materials. A major lesson of the study, therefore, is that provision of an integrated package of interventions will require extra efforts to ensure that intervention materials are available at the FLHF level.

Based on the study results, it is recommended that in areas with experience in community-directed treatment for onchocerciasis control, the CDI approach should be used for integrated, community level delivery of a broader range of appropriate health interventions. This may include the interventions tested in this study, especially for malaria, or other packages of interventions, chosen on the basis of the criteria for interventions appropriate to CDI, which were developed in the study.



PART I

STUDY DESIGN

1. INTRODUCTION
2. STUDY OBJECTIVES
3. METHODOLOGY

1 INTRODUCTION



A. Rationale for the study

A major gap exists between the development of new health intervention tools and their delivery to communities in the developing world (Madon et al., 2007). Many potentially effective disease control products have had only limited impact on the burden of disease because inadequate implementation of distribution programmes results in poor access even to very simple and affordable products (TDR, 2003). It has meanwhile been estimated that there are over 14 000 deaths daily from such controllable diseases as HIV, malaria, and diarrhea in countries of the developing world (Lopez et al., 2006), despite scientific advances that make prevention, treatment, and, in some cases, elimination of these diseases possible. There is therefore an urgent need for more effective strategies that can ensure improved access of poor populations to existing, efficacious health interventions. One such strategy, in which communities themselves play a leading role, has been used very successfully for onchocerciasis control in Africa over the last decade.

A critical challenge for onchocerciasis control is the delivery of annual ivermectin (Mectizan®) treatment to all target communities and sustaining high treatment coverage over a very long period. To achieve this, the African Programme

for Onchocerciasis Control (APOC) adopted the strategy of community-directed treatment with ivermectin (CDTi) in the mid-1990s (TDR, 1996). The CDTi strategy has since been widely recognized as instrumental to the tremendous progress achieved in the control and elimination of onchocerciasis (Seketeli et al., 2002; Amazigo et al., 2007). On the grassroots level, ivermectin treatment is highly popular and communities have responded enthusiastically to the concept of community-directed intervention in which they themselves are in charge of planning and implementation. An external evaluation of APOC concluded:

"CDTi has been a timely and innovative strategy... and communities have been deeply involved in their own health care on a massive scale. ...CDTi is a strategy, which could be used as a model in developing other community-based health programmes and is also a potential entry point in the fight against other diseases" (Burmeister et al., 2005).

National and international policymakers are therefore increasingly interested in how the CDTi approach might be applied to interventions against other diseases (Homeida et al., 2002). This interest provides an important opportunity and momentum to integrate ivermectin treatment with other disease control activities and to contribute to health care development for some of the poorest populations in Africa. But to ensure that this opportunity is properly exploited, there is an urgent need for good scientific evidence on the effectiveness of the CDTi process for interventions against other diseases, as well as evidence

regarding effectiveness of integrated disease control at the community level.

In view of these factors, the Board of APOC, on which Health Ministers of 19 onchocerciasis-endemic African countries are represented, requested that TDR undertake, in collaboration with APOC, a multi-country study on the use of the community-directed treatment approach for other diseases. TDR and APOC responded positively to this request and preparations for a multi-country study started in 2003.

Because of the complexity of the issues involved, it was decided to prepare the study through a series of consultative meetings with key partners interested in a multi-disease approach to community-directed treatment, in order to identify



the principal research questions to be addressed. An important finding of these consultations was that despite the very clear progress in disease control that has been made on the ground, attitudes within the scientific and expert community towards the community-directed treatment approach vary widely. These range from the very positive responses of those experienced in using CDTi for onchocerciasis control to the more ambivalent attitude of experts engaged in other disease control efforts – who are both less familiar with the CDTi approach and unsure about its potential to address the diseases that concern them. It thus became very clear that a scientific comparison of community-directed and alternative approaches for delivery of specific health interventions at the community level in Africa, including those used for onchocerciasis control, was very much needed to provide clear, measurable, and objective evidence to scientists, control officers and policymakers about the specific advantages and disadvantages of a community-directed intervention strategy.

B. Community participation in disease control

Many new interventions fail to produce results when transferred to communities in developing countries, largely because their implementation is untested, unsuitable or incomplete (Madon et al., 2007). For example, rigorous studies have shown that appropriate use of insecticide-treated bednets can prevent malaria, yet in 2002, fewer

than 10% of children in 28 sub-Saharan African countries regularly slept under bednets (Monasch et al., 2004; Madon et al., 2007). Interventions such as directly observed treatment, short-course (DOTS) in tuberculosis control, and prophylactic antiretroviral therapy and replacement feeding in prevention of mother-to-child transmission of HIV, may work well in hospitals and clinics. However, in the case of rural areas where people have limited access to formal health care, increasing coverage for control and prevention of many major diseases may require novel approaches. One approach receiving increased attention in many countries and at many levels of health policy-making, is community management of disease control interventions (Kagaayi et al., 2005; Jackson et al., 2007).

Community participation as a key component of Primary Health Care

Community participation is a key principle in Primary Health Care, a concept that emerged from the International Conference on Primary Health Care organized by WHO and UNICEF at Alma Ata, USSR (now Almaty, Kazakhstan) in 1978. The Alma Ata Declaration issued at the Conference stressed the importance of Primary Health Care in achieving the overall goal of “Health for All”. Following the conference, many WHO member states adopted health policies to promote Primary Health Care strategies. Primary Health Care services typically include: family planning, nutrition, immunization, health education and mobilization, as well as monitoring and evaluation of health activities. Essentially, Primary Health Care

as conceptualized in the 1978 Alma Ata declaration has been defined as: *health care based on practical, scientifically sound, and socially acceptable methods and technology, made universally accessible to individuals and families in their community through their full participation, and at a cost the community can afford* (Korte et al., 1992). The success of disease control through Primary Health Care systems is thus predicated on a high level of community involvement and participation.

In the Primary Health Care paradigm, disease control programmes are to be rooted in communities and are supposed to serve the health and disease control needs of members of the community. This increases the access of community members to health care services and provides them with more opportunities to participate actively in the design of such services, from planning to execution. Such community involvement and participation also are understood to generate a greater sense of ownership over, and sustainability of, various disease control activities.

Community participation in health development

In health development, there are three distinct forms of community participation. These have been defined as: marginal, substantive and structural (Marsden and Oakley, 1990).

Marginal participation is limited in scope and implies a very limited influence on the development process.

Substantive participation affords community members the opportunity of determining their needs, contributing to the activities and receiving the benefits. Nevertheless, they have no role in decision-making. The scope and nature of participation here is externally controlled.

Structural participation is the third and perhaps most broadly-based expression of the community participation concept. In this case, community members play an active and direct role in project development. Members of disease-endemic communities are expected, within the disease control framework, to play major roles in decision-making with respect to the distribution of particular health services and tools (e.g. drugs, diagnostics and preventive measures). As implied by the term, there is a shift in power and decision-making, which allows for communities to play a more substantive role with support from the health system and other facilitators. Within the paradigm of structural participation, some analysts distinguish between “direct participation” and “social participation”. The former relates to the mere implementation of projects that have been defined by the formal health system through the mobilization of community resources, while the latter refers to scenarios whereby communities decide what health issues to address and thus take control over the factors that they regard as most critical to determining their health. This implies community involvement in health planning functions.

Community participation: a key to disease control in Africa

It has been argued that community involvement and participation form the anchor around which a new paradigm for disease control efforts in Africa must revolve. In terms of community participation in primary health care and disease control, Nakajima noted that for health care systems to be successful, a majority of those affected must feel themselves to be *in charge*, rather than being *passive recipients* of other people's decisions (Nakajima, 1993). This also recognizes the inherent relationship between the infusion of individuals with a sense of their own self-worth and their empowerment to tackle problems within their communities.



This was the underlying concept behind the approach to community-directed treatment with ivermectin (CDTi), developed and tested in a TDR multi-country study in the mid-1990s (TDR, 1996; Remme, 2004), and subsequently adopted by APOC for the control of onchocerciasis in Africa (Seketeli et al., 2002).

C. Community-directed treatment with ivermectin

CDTi is based on the principle of active, structural community participation (TDR, 1996; Brieger, 2000; Remme, 2004), consistent with the aforementioned definitions and goals of primary health care (PHC) provision for sustainable development (Korte et al., 1992; Amazigo et al., 2007). In the CDTi process, the community itself plans and carries out treatment of its members. The process empowers community members to make major decisions and direct the distribution of ivermectin for a sustained period of years. Examples of community decisions made with respect to mass treatment include: dates of distribution; mode of distribution (e.g. house-to-house, central place); persons who will guide distribution; and selection of the community implementers, also known as community-directed distributors (CDDs). In addition to making such planning decisions, communities take responsibility for: conducting a community census; collecting drug supplies; mobilizing members during the drug distribution process, as well as recording treatments provided and coverage attained (Amazigo et al., 2002b).

In the year 2005, the CDTi strategy was used by 95 000 communities in 16 sub-Saharan countries to distribute more than 98 million ivermectin tablets (Amazigo et al., 2007). Some of these communities have successfully conducted seven or more rounds of treatment since APOC's inception in 1995. Studies have thus demonstrated the success of this strategy in not only ensuring equity and wider coverage among community members, but also sustainability (Braide et al., 1990; Katarbarwa et al., 2000; Akogun et al., 2001).

The success of CDTi in onchocerciasis control naturally has drawn the attention of other disease control programmes, stimulating various attempts to duplicate CDTi systems and structures for other health interventions. A preliminary assessment indicated that a large number of CDDs are already involved in other health and development activities (e.g. distribution of Vitamin A, malaria treatment, polio immunization, guinea worm eradication, nutrition, water protection, serving as community health workers, etc.) (Homeida et al., 2002; Okeibunor et al., 2004).

However, since CDTi is based on a well-articulated system of community involvement and participation (Brieger, 2000), such ad hoc and informal participation of other health programmes in the CDTi process may also encounter difficulties – for reasons ranging from poor conceptualization, to problems with practical initiation, implementation and sustainability. Other health programmes also may lack genuine support for a participatory process by health workers and health managers, or

they may operate incentive systems that does not encourage volunteerism along the model of CDTi (Walsh and Warren, 1979; Brieger, 1996; Brieger et al., 1997; Schwab and Syme, 1997). Furthermore, diseases differ in terms of their complexity of treatment and their overall suitability to the CDTi process. This makes it imperative to systematically examine what other interventions or health programmes might most successfully be integrated into a community-directed delivery process – the underlying rationale for this study.

In response to the need for systematic examination of how CDTi could be harnessed to other health interventions, a new paradigm of community-directed interventions (CDI) was therefore defined. In the CDI concept, the health services and its partners introduce in a participatory manner the range of possible interventions that could be potentially delivered through CDI, and the means by which the community-directed concept can ensure community ownership. From then on, the community takes charge of the process, usually through a series of community meetings for decision-making on implementation. The CDI process is described in detail in Chapter 4.



2

STUDY OBJECTIVES

2 STUDY OBJECTIVES

A. Main objective

To determine the extent to which the community-directed intervention (CDI) process currently being used for ivermectin treatment of onchocerciasis in Africa can be used for the delivery of other health interventions with differing degrees of complexity.

B. Specific objectives

- a) To document the CDI process for the integrated delivery of ivermectin treatment, Vitamin A, insecticide treated nets (ITNs), directly observed treatment, short-course (DOTS) for tuberculosis, and home-management of malaria.
- b) To determine the effectiveness¹ of the CDI process for the delivery of interventions with different degrees of complexity, i.e. ivermectin treatment, Vitamin A, ITN, DOTS, home-management of malaria.
- c) To determine the efficiency using CDI for integrated delivery of the above interventions, as compared to delivery through current delivery systems.
- d) To identify the critical factors that facilitate or hinder the CDI process from achieving the desired outcomes for the delivery of the above interventions.
- e) To identify the critical factors that facilitate or hinder integration of the above interventions through the CDI process.



¹ In the present study, effectiveness is measured by the coverage of the target population with the study interventions.

3 METHODOLOGY



A. Study design

A multi-country community intervention study was undertaken and is reported upon in this document, describing and evaluating the process, effectiveness and efficiency of progressively introducing various health interventions of increasing complexity to the CDI process.

As CDI has already proven effective for the delivery of ivermectin in onchocerciasis control, the aim of this study was to investigate to what extent the CDI process can be used for the delivery of the following interventions, which range in complexity in terms of the effort, skills and resources needed for delivery at the community level:

- Vitamin A supplementation (Vit A);
- distribution and retreatment of insecticide-treated nets (ITN);
- tuberculosis: case-detection and referral, and directly-observed treatment (DOTS);
- home-management of malaria (HMM);

in addition to:

- Community-directed treatment of onchocerciasis with ivermectin (CDTI).

Table 1: Complexity of the selected interventions

Characteristics of interventions	CDTi	Vit A	Malaria (ITN)	DOTS	Malaria (HMM)
Frequency of intervention / intervention cycle	S	S	S	C	C
Duration of intervention and follow-up period	S	S	S	C	C
Need for basic diagnostic skills	S	S	S	C	C
Cost of intervention to end user	S	S	C	S/C ²	C/S ³
Monitoring and supervision mechanisms	S	S	C	C	C

C=complex, S=simple

Prior to the study, interventions were ranked by their level of complexity according to a number of key characteristics relating to the assumed effort and skill level needed by community implementers to deliver the intervention, and the cost of the intervention to the end user (Table 1).

Based on these characteristics, the five interventions were hypothetically ranked in terms of complexity as follows:

CDTi < Vit A < ITN < DOTS ~ HMM

Thus, in the initial framing of the study design, CDTi was considered the least complex intervention for implementation at the community level, and home management of malaria was regarded as the most complex.

The study involved eight multi-disciplinary research teams from both anglophone and francophone

West, Central and East Africa. Nigeria was strongly represented with 4 teams from the northwest, northeast and southwest of the country (Nigeria is also by far the most populous country in Africa and over 50% of the population treated with ivermectin in 2004 lived in Nigeria). Cameroon was represented by two teams and Uganda by one. At the time of the writing of this report, data collection was still ongoing in one research site in Tanzania and the results in this report reflect therefore only the findings from the seven sites in Nigeria, Cameroon and Uganda. The results for the Tanzania study will be reported separately at a later stage.

The studies reported on here were carried out between 2005 and 2007 in seven research sites comprising a total of 35 health districts in Cameroon, Nigeria, and Uganda, where community-directed treatment with ivermectin for onchocerciasis control had already been implemented for several years.

² Paid for in Cameroon (complex)

³ Simple for Uganda

- **Buea research site:** Western Province, Cameroon, covering the districts of Dschang, Foumbot, Bafang, Bangangté and Mbouda.
- **Yaoundé research site:** Littoral Province, Cameroon, covering the districts of Yabassi, Nkondjock, Pouma, Ndom and Ngambe.
- **Ibadan 1 research site:** Oyo State (north-western), Nigeria, covering the Local Government Areas (LGA) of Iwajowa, Iseyin, Kajola, Ibarapa North and Ibarapa Central.
- **Ibadan 2 research site:** Oyo State (north-central), Nigeria, covering the Local Government Areas (LGA) of Oyo East, Saki West, Irepo, Atiba and Atisbo.
- **Kaduna research site:** Kaduna State, Nigeria, covering the Local Government Areas (LGA) of Lere, Jemaa, Kachia, Kaura and Kauru.
- **Yola research site:** Taraba State, Nigeria, covering the Local Government Areas (LGA) of Pantisawa, Garbache, Pupule, Bali and Yakoko.
- **Uganda research site:** Western, eastern and northern regions, Uganda, covering the districts of Arua, Sironko, Kyenjojo, Kanungu and Nebbi.

Each site focused their research efforts on five health districts of similar size. Each site randomly selected four districts to be CDI intervention

districts and one comparison district where all interventions were delivered through the regular, non-integrated procedures currently employed by the health systems in the participating countries. Among the selection criteria for health districts to be included in the study were that all five intervention programmes (CDTi, DOTS, ITN, HMM and Vit A) should be operating in the district or be planned to be implemented before the commencement of the study. Other criteria were performance of CDTi (that ivermectin treatment coverage reaches at least 65% of the total population) and population composition (that the district should include at least 50 communities).

A second dimension of complexity was the number of interventions that were combined in CDI and the overall effort needed at the community level for the combined delivery of these interventions. To study this dimension, the research was undertaken in three phases. Phase I (Year 1) consisted of introducing one additional intervention in each study district to the CDI process for ivermectin treatment, with each of the four new interventions added in a different study district in each study site (Table 2). During Phase II (Year 2), one of the other interventions was added, and during Phase III (Year 3) the remaining two interventions were added so that all five interventions were delivered through the CDI process in all study sites in the final study year. The implementation process and the effectiveness and efficiency of integrated delivery through the CDI process was evaluated during each study phase.

Table 2: Intervention design and phases

Study Phase	Interventions delivered through the CDI process				Comparison District
	CDI District 1	CDI District 2	CDI District 3	CDI District 4	
Phase I (Year 1)	CDTi + Vit A	CDTi + DOTS	CDTi + ITN	CDTi + HMM	Traditional, non-integrated delivery of the five interventions
Phase II (Year 2)	CDTi + Vit A + ITN	CDTi + DOTS + HMM	CDTi + ITN + Vit A	CDTi + HMM + DOTS	Traditional, non-integrated delivery of the five interventions
Phase III (Year 3)	CDTi + Vit A + ITN + DOTS + HMM	CDTi + DOTS + HMM + ITN + Vit A	CDTi + ITN + Vit A + DOTS + HMM	CDTi + HMM + DOTS + ITN + Vit A	Traditional, non-integrated delivery of the five interventions

B. Study sites and research groups

Teams in all seven sites implemented the study according to a jointly developed, standard research protocol with a common set of research instruments (Annex A). Each team was composed of investigators with different, mutually complementary disciplinary backgrounds, including community health and medicine, epidemiology, health economics and other health social sciences such as medical anthropology, sociology and health education research.

The research sites are briefly described here:

Research Site Ibadan 1: northwestern Oyo State, Nigeria

The study was carried out in five randomly selected districts, commonly known as Local Government Areas (LGAs), including: Iwajowa, Iseyin, Kajola, Ibarapa North and Ibarapa Central in northwestern Oyo State, which is located in southwestern Nigeria. All share common geographical features with undulating topography traversed by four major rivers (Ogun, Ofiki, Oyan and Opeki rivers) and their tributaries. The main vegetation is guinea savannah with patches of forest along river courses. All are rural LGAs

with the majority of the population living in small towns and farm hamlets locally called “abule”. About one third of the population lives in big towns. All the LGAs are predominated by the Yoruba ethnic group who speak “onko”, one of the Yoruba dialects. The major religions are Christianity and Islam but traditional religion still exists, especially in rural communities. Most people are farmers. Each LGA has a health department which coordinates primary health care (PHC) activities through a number of PHC health facilities: Iwajowa (18), Iseyin (26), Kajola (13), Ibarapa North (10) and Ibarapa Central (25). Each LGA has one or two secondary health care facilities (general hospitals). However, access to quality treatment is limited in these facilities. Onchocerciasis, malaria, schistosomiasis and guinea worm, among others, are the most prevalent tropical diseases, but tuberculosis is fast-emerging as a disease of concern. Ongoing health interventions include the promotion of Vitamin A supplementation for children over 5 years of age, control of onchocerciasis (CDTi), malaria (HMM and ITN) and tuberculosis through DOTS. APOC, the Damien Foundation and UNICEF facilitated the supply of ivermectin, TB drugs and Vitamin A, while community-based organizations played a minor role in these programmes. The Federal Ministry of Health played a very active role in facilitating distribution of ITNs and Coartem®, while the Oyo State Ministry of Health actively participated in the training of implementers. The combined population of the study LGAs was 488 759 in 2006, with 16% under five years of age.

Research Site Ibadan 2: north-central Oyo State, Nigeria

The Ibadan 2 site was situated in the north-central area of Oyo State which is located in the rainforest and savannah belts of southwestern Nigeria. The research site covered the LGAs of Oyo East, Saki West, Irepo, Atiba and Atisbo. Oyo State is made up of 33 districts (LGAs) each divided into a minimum of 10 wards which is the lowest political structure consisting of a geographical area with a population range of 10 000 to 20 000 people. The rural/urban population of Oyo State is 31% and 69% respectively (NDHS, 2003). The study site is a predominantly Yoruba settlement. The economy of the districts is closely tied to its agricultural sector that provides gainful employment to over half of the communities. Major religions in the study communities are Christianity and Islam which significantly influenced stakeholder processes for CDI implementation. The health system in each district is made up of both formal and informal systems which constitute arms of health care delivery in the community because of access, method of payment and perceived quality and effectiveness of treatment. CDTi was introduced about six to ten years ago in the communities studied in all the districts in Ibadan 2 through the collaborative efforts of the state, district government and international partners. Malaria is recognized as the most serious health problem posing the greatest risk for children less than 5 years and pregnant women. Other key health problems include measles, cough, tuberculosis, onchocerciasis, typhoid and blindness.

**Research Site Kaduna:
Kaduna State, north-central Nigeria**

Kaduna State, with 23 LGAs, is situated in the north-central part of the country. The study areas – Jema'a, Kachia, Kaura and Kuru and Lere – are LGAs located in the southern part of the state. The vegetation in the LGAs is a mixture of forest mosaic and savannah grassland. The areas are mountainous with fast flowing rivers. They share boundaries with Katsina and Kano States to the north, Plateau State to the east, Nassarawa State to the south-east, Niger State to the west and Federal Capital Territory (Abuja) to the south. The area covers a landmass of 43 565 square kilometres, forming 4.6% of the total landmass of Nigeria. Most of the population is homogenous and community leaders (chiefs), who take decisions in consultation with their council of elders, govern communities. The predominant religions are Christianity and Islam, along with some traditionalist practices. The majority of the inhabitants are subsistence farmers. Health care infrastructure is not fully developed. Village health committees, traditional birth attendants, community-directed distributors and volunteers are passively involved in community-based programme and activities. Ivermectin distribution has been ongoing in 2590 communities within 16 LGAs since 1989. It is given free of charge to eligible persons annually. In the five study LGAs, 826 communities were implementing CDTi. The overall therapeutic coverage for 2005 was 87% while in the five study LGAs, the coverage rate was 89%. Onchocerciasis is meso-endemic in the state with some hypo-endemic communities. The majority of the population is rural.

**Research Site Yola:
Taraba State, Nigeria**

Taraba State is divided into 16 local government council areas, which are further divided into districts. The study was conducted in the districts of Pantisawa, Garbachede, Pupule, Bali and Yakoko. These five districts are comprised of 631 communities, and each district has a population ranging from around 87 010 residents (Yakoko) to 152 420 residents (Bali). The communities themselves range in size from 250 to 2000 people, with some seasonal fluctuations. Taraba State has the largest number of rural communities engaged in farming and large-scale food production in the country and has one of the weakest social and health services infrastructure in the country. Dispensaries and health posts, which are administered by the local government councils, provide primary health



service and are managed by Community Health Assistants (CHAs). Each local council area has between 12 and 27 health facilities; these may be as far as 10 km from some communities while in some cases the nearest referral facility may be more than 60 kilometers away. General hospitals, comprehensive health centres and private hospitals managed by medical doctors or Community Health Officers provide routine laboratory services, basic health services and receive referrals from primary health care facilities. The State has more than 10 years of experience in community-directed treatment with ivermectin; however, it has yet to commence large scale implementation of home management of malaria using the new antimalaria drugs. Old malaria treatment practices with chloroquine purchased from vendors and local stores thus still prevail. Mosquito nets are uncommon, and are sometimes found in shops and markets while the demand for them has caused local tailors to develop and sell improvised forms of bednets from netted materials. Vitamin A supplements and polio vaccines are given to children under the age of five who are ineligible for ivermectin during immunization campaigns.

Research site Yaoundé: Littoral Province, Cameroon

The study was carried out in five health districts in the Littoral Province, Cameroon: Ngambe, Yabassi, Nkondjock, Pouma, and Ndom, where it was implemented in all villages of the latter four districts. Most of the inhabitants live in rural areas. The main ethnic groups are the Bassa, Bakoko and Douala who are mostly Christians or follow,

to some extent, traditional religious beliefs. Few people practice Islam. The agricultural sector is based on the production of cocoa, and various subsistence food crops such as cocoyams, cassava, corn and tomatoes. Palm oil is produced both by traditional and modern industrial means. The province is irrigated by the Sanaga and Nkam rivers where fishing is practiced. The health and management committees (COSA and COGE) represent the communities in interaction with health workers. The NGO *Perspectives* is the major non-governmental organization involved in healthcare delivery, and there also are a number of cultural community-based and political associations involved. The study districts are endemic for Loa loa and several cases of severe adverse events have been reported. Malaria is the leading cause of morbidity, and there is a resurgence of tuberculosis. All target interventions had functional national control programmes, with mass distribution of Vitamin A carried out twice yearly.

Research site Buea: West Province, Cameroon

The West Province of Cameroon is comprised of eight subdivisions, namely Nde (Bangangte), Bamoutos (Mbouda), Menoua (Dshang), Mifi (Bafoussam), Haut-Nkam (Bafang), Koung-Khi (Bandjoun), Haut-Plateaux (Baham) and Noun (Foumban). The climate is tropical of the Soudano-Guinea type with ample rainfall (2000 to 3000 mm annual mean) favouring a green landscape which nourishes mountainous forests, fringe raffia forests, and savannahs. Agriculture as well as animal husbandry are the main sources of income. Major

products include coffee, cocoa and tea for export as well as subsistence and commercial crops such as cereals (maize, rice, beans, groundnut), tubers (yam, cassava, cocoyam, potato), banana and plantain, vegetables (tomato, carrot, cabbage, okra) and fruits (pear, palm oil, mango, orange, papaw, etc.). The rainy season lasts up to nine months (mid-February to mid-November), and the dry season lasts only from mid-November to mid-February. The annual mean temperature is about 18°C but the climate is generally cold. This temperate climate, relatively fertile volcanic soil, as well as the technical aptitude (as evidenced by impressive handicrafts) and the strong work ethic of the local population all combine to make the Western Highlands the productive granary of Cameroon. The West Province of Cameroon has 19 health districts, configured so as to cover the entire territory geographically, as well as accounting for population density. Each health district comprises several "health areas" and at the level of health areas, there are provincial hospitals, district hospitals, and integrated health centres, along with some community-owned or privately-owned health centers. Altogether, there are 190 health areas in the West Province of Cameroon. A population of at least 5000 inhabitants is the threshold for delimitation of a health area. To empower the communities and foster their participation and partnership in health care provision, there are community-level dialogue and management committees. The communities appoint these health committee members and the dialogue structures serve as the interface between the formal health system and the communities.

Research site Uganda: Kanungu, Kyenjojo, Sironko and Arua sub-counties, Uganda

The study was conducted in Kanungu and Kyenjojo in the southwest, Sironko in the east, and Arua in the West Nile region. Nebbi, also located in the West Nile region, was the control district. It should be noted that in each of these districts, the study area was a sub-county with an average number of about 65 villages/communities. The study districts were far removed from the capital city, Kampala, and predominantly rural with a majority of residents (+95%) involved in subsistence agriculture. Other than Arua, the study districts are hilly with poor road infrastructure. Kanungu and Kyenjojo districts are nonetheless distinctive for their tea plantations and export-oriented economies. Hence, in addition to subsistence agriculture, residents of these districts derive some cash income from employment in the plantations, tea manufacturing or commerce. In each of the study's sub-counties, there were at least two government first line health facilities. However, in addition, there is a significant private and informal market of health care providers, including drug shops, private clinics, market drug vendors, traditional birth attendants and traditional healers.

Combined population covered by all study areas

A remarkable feature of this study was its enormous demographic size. Overall, the study covered some 2.35 million people, with an average of 380 000-530 000 per study site.

Table 3: Study demographic size

	Buea	Yaoundé	Ibadan 1	Ibadan 2	Kaduna	Yola	Uganda	Total
District 1	47 907	16 620	119 044	123 208	25 504	96 175	50 475	478 933
District 2	34 923	24 431	117 871	109 029	65 659	124 360	56 370	532 643
District 3	51 317	10 419	119 844	106 635	28 103	96 090	51 644	464 052
District 4	47 652	27 823	72 000	120 590	19 386	152 420	59 314	499 185
Comparison	38 066	17 562	60 000	103 354	26 029	87 010	47 860	379 881
Total	219 865	96 855	488 759	562 816	164 681	556 055	265 663	2 354 694

C. Methods of analysis

The study employed a multi-method approach to data collection, focusing on qualitative (textual and visual) data for process evaluation and on quantitative (numerical) data for the evaluation of effectiveness and efficiency.

1. ASSESSMENT OF EFFECTIVENESS THROUGH COVERAGE DATA

Standardized survey research techniques were employed by all research teams to assess the effectiveness of the CDI intervention by estimating effects on key coverage indicators. At the end of each study phase, each research site conducted a household survey in 250 randomly selected households within 50 randomly selected communities on the key coverage indicators noted below. Results of this analysis are presented in Chapter 5.

Ivermectin distribution:

- % of population treated with ivermectin during the last year.

DOTS:

- Treatment completion rate.

ITN:

- % of households with at least one treated net
- % of <5 sleeping under nets
- % of pregnant women sleeping under nets.

Home management of malaria:

- % of <5 year old children who had fever in the last two weeks and received appropriate treatment within 24 hours of onset of fever.

Vitamin A:

- % of children 6 to 59 months who received Vit A during the last treatment round.

Table 4: Sampling frame for evaluation

District/LGA	CDI Interventions and sequence of inclusion in CDI	Health districts/ LGAs	Evaluation villages per health district	Evaluation households per village	Total evaluation households per district
1	IVM + Vit A ^a + ITN ^b + (HMM + DOTS) ^c	1	10	5	50
2	IVM + DOTS ^a + HMM ^b + (Vit A + ITN) ^c	1	10	5	50
3	IVM + ITN ^a + Vit A ^b + (HMM + DOTS) ^c	1	10	5	50
4	IVM + HMM ^a + DOTS ^b + (Vit A + ITN) ^c	1	10	5	50
Comparison	IVM + Regular delivery of others	1	10	5	50
Total per site		5	50	25	250
Total across sites		35	350	175	1750

^aadded to CDI in study Year 1, ^badded to CDI in study Year 2, ^cadded to CDI in study Year 3

For evaluation purposes, 10 communities were randomly selected from the 50+ communities in each study district. A total of five households were randomly selected for each of the ten communities in each unit, giving a total of 50 evaluation villages and 250 evaluation households per study site (Table 4). The number of persons interviewed in these households depended on the target population for the different indicators and ranged from a low of 313 interviews on ITN utilization among pregnant women to more than 10 000 interviews for ivermectin treatment coverage.

2. MEASURING COST

Delivery costs of the integrated health interventions through CDI were estimated using 'step-down' accounting techniques, to value services provided at both district and First Line Health Facility (FLHF) levels. Step-down costing involves disaggregating total expenditure to units of services such as those provided in the integrated package of health services (CDTi + DOTS + ITN + HMM + Vit A) under CDI. There was: 1) determination of the units of service per integrated package of health services, and then 2) allocation of costs to those units of service.

The CDI costing method identified both tangible (direct and indirect) and intangible costs. Tangible costs were those that were incurred during the intervention process, such as: personnel (wages for labour), materials (supplies, such as drugs and other consumable materials), social mobilization, training, travel and transportation, capital goods used in the intervention process (rents/depreciations), supervision, monitoring and evaluation, etc.

Intangible costs also were quantified. In the CDI process these included inputs for which no payment was made (e.g. volunteer time) but for which opportunity costs (e.g. of time foregone for other productive activities) can indeed be quantified. The opportunity cost of volunteer contributions to CDI activities was calculated using the minimum wage in each of the participating countries.

Data on CDI delivery costs were tabulated at each level of the health system that contributed to the final delivery of the CDI activities. Across these different levels, costs of the following goods and services were measured:

- personnel salaries and allowances, as well as the cost of time devoted by non-salaried workers at the community, household and volunteer levels;
- expenses committed to facilitating social mobilization personnel to adequately access the intervention services;
- expense of conduct and attendance of training activities relevant to the intervention;

- expense of supervision and monitoring of the intervention activities at the district and first line health facility levels;
- expense of maintenance of capital equipments and utilities;
- consultancy fees;
- transportation expenses.

Results of this analysis are presented in Chapter 6.

3. QUALITATIVE ANALYSIS OF CDI PROCESS FACTORS INFLUENCING INTERVENTION OUTCOMES

In order to analyse factors contributing to the outcome of the CDI process, social scientists on each research team employed standard methods in qualitative social science research. These included individual and group interview techniques based on interview guides, key informant interviews with partners, in-depth interviews with CDI implementers and health workers, focus group discussions with community groups, focused discussions during stakeholder briefings and consultations, and unstructured observations. One site (Buea) used photography and video-recording to document the process by visual means. All seven teams used common instruments, including interview guides for key-informant and focus group interviews and structured observation checklists.

At the beginning of the project, a conceptual framework was hypothesized to describe qualitatively which factors in the CDI process would impact the successful implementation of CDI interventions as measured through coverage and

cost-effectiveness. As the project proceeded, researchers were constantly challenged, particularly at annual meetings, to share data and experiences that would validate or negate the relative importance of various components of the conceptual framework. The CDI process is described in Chapter 4 and results of the analysis of factors influencing the process are presented in Chapter 7.

D. Data management and analysis

Quantitative and qualitative data were processed and analysed on the basis of standardized approaches to data entry and analysis, which were used at each individual study site and in the cross-site analysis. In order to ensure high quality standards for data processing and entry, each team had a data manager in charge of data entry and processing. In addition, a field site monitor routinely visited all research sites.

Standardized data entry templates using Epi Info™ Version 6 (CDC 2001) were used for the entry of quantitative data. All site-specific data was pooled into a cross-site database. Statistical analysis on cross-site data was conducted using SPSS 15 software (SPSS Inc. 2007).

The analysis of cost data used the following steps:

- The annual total expenditure on each particular recurrent input (e.g. personnel) was

calculated for each integrated package of health services.

- Information in relation to the allocation of shared resources was gathered during the fieldwork by asking the persons in charge to indicate what portion of each individual (recurrent and capital) input was used for CDI interventions in the year (e.g. proportion of time of each staff member spent on DOTS related activities). This information was then used to allocate a percentage of the total costs of each individual (recurrent and capital) input to CDI interventions.
- The opportunity costs were estimated as the loss of productive labour time due to CDI activities. This implied using the proportion of income a volunteer lost when they were involved in CDI activities. Since CDI activities were mainly implemented in rural areas, data on income was not available and the costing analysis used the minimum wage to ascribe a monetary value to free time devoted by volunteers to CDI activities. Volunteers' times were converted and measured in full hours, and then this was divided by 8 to give the number of equivalent 8-hour working days devoted to CDI activities.
- Cost data was converted to US dollars at the exchange rate that existed at the time the cost was incurred. Then, all costs were inflated upwards to 2005 US dollars by using the national consumer price index. This allowed all comparisons between sites and countries to be in the same monetary units.

Qualitative data consisted of textual and audio-visual data, including transcripts of key informant and in-depth interviews, translated transcripts of audio-taped community meetings, field notes on observations and other intervention-specific insights, notes and reports from meetings, transcripts of focus group discussions (FGDs), and audio and visual data (i.e. electronic photographs and recordings of community meetings). Interviews were transcribed and partially translated into English using standardized transcription and annotation guidelines. All qualitative data were processed using AtlasTi 5.2, a qualitative data analysis (QDA) software programme (AtlasTi GMBH 2006). Coding of textual data was performed on the basis of a cross-site code-list. Memos were added to the codes and data checks conducted by code and code families to elicit

emerging themes. Single site data were merged into a cross-site database. Qualitative data were written up initially by site, using a uniform report structure adopted by all sites. Focused discussions on emerging single and cross intervention arm/cross-site themes were held at three cross-site data analysis workshops allowing the development and refinement of an overall CDI process model (see section 4).

E. Research ethics

All research procedures involving human subjects carried out in this multi-country research project were conducted according to international research ethics standards. The common study protocol, including the informed consent forms (ICFs), was reviewed and approved by WHO's Research Ethics Review Committee (ERC). In addition, each site obtained approval from the National Ethical Review Committee or an Institutional Review Board as appropriate. Informed consent was obtained from all persons interviewed during the process evaluations, and the coverage and cost surveys.

F. Limitations of the study

The present study is one of the largest studies ever undertaken on health intervention delivery strategies in Africa, covering as many as 2.4 million people in 35 health districts in seven study sites in three countries. Nevertheless, these



three countries have relatively well developed health systems and this should be considered when assessing the relevance of the study findings for other countries in Africa where the health systems are much weaker.

A major question in this type of implementation research is the extent to which research findings truly reflect 'real-life' experiences and to what extent results have been influenced by the research process. According to the study design, the researchers were only to introduce the CDI process to the health system, and then to withdraw from implementation, and only observe and evaluate. However, as reported in the next section, the implementation ran into several severe problems due to shortage of intervention materials that were expected to be available for distribution. After consultation between the research teams, additional action was undertaken by the researchers to overcome these problems through additional advocacy at the national level, e.g. for ITNs in Nigeria. This led to an increased supply for the study sites (with the additional ITNs equally divided between all districts, with an equal share going to the comparison districts). Except from these additional advocacy efforts, the research teams did not interfere with the implementation of CDI which was undertaken in all sites by the district health team, supported by FLHF staff, and implemented by the communities themselves. Below the district level, researchers only observed and evaluated without interference, and this principle was strongly reinforced during annual review meetings and sites visits by the external monitor.

The study was very complex, and so were the research methodologies and instruments. As a result, there was initially some variation among the sites in the application of the instruments, leading to certain inconsistencies in the pooled data, especially during the first year of the study. Through regular monitoring visits, most of these variations were ironed out during the second and third year of the study. A few problems remained following turnover of research staff in some teams, but these did not affect the results of this report, unless specifically indicated. The costing methodology evolved significantly during the study, and was greatly simplified after the first and second year, refocusing the costing on the provider costs for CDI. Hence, this report only provides costing data for Year 3, as the results for the previous two years are not comparable because of differences in costing instruments.





PART II RESULTS

4. COMMUNITY-DIRECTED
INTERVENTION PROCESS
5. EFFECTIVENESS OF CDI
6. COST OF CDI
7. CRITICAL FACTORS
IN THE CDI PROCESS
8. CONCLUSIONS AND
RECOMMENDATIONS
9. ANNEXES

4 COMMUNITY-DIRECTED INTERVENTION PROCESS



Initial description of the CDI process

One initial objective of the study was to document the CDI process for the integrated delivery of the five interventions being examined. For clarity, a brief schematic of the CDI process is thus provided here, including a definition of CDI, roles played by various stakeholders and the actual steps that were taken in implementation. The detailed qualitative analysis of the factors that influenced the process, positively or negatively, is provided in Chapter 7.

Definitions

A community-directed intervention is a health intervention that is undertaken at the community level under the direction of the community itself. The health services and its partners introduce in a participatory manner the range of possible intervention(s), and the means by which the community-direction concept can ensure community ownership from the onset. From then on, the community takes charge of the process, usually through a series of community meetings for decision-making on implementation.

Roles

The community, the health services and other partners have the following roles in CDI:

Role of community

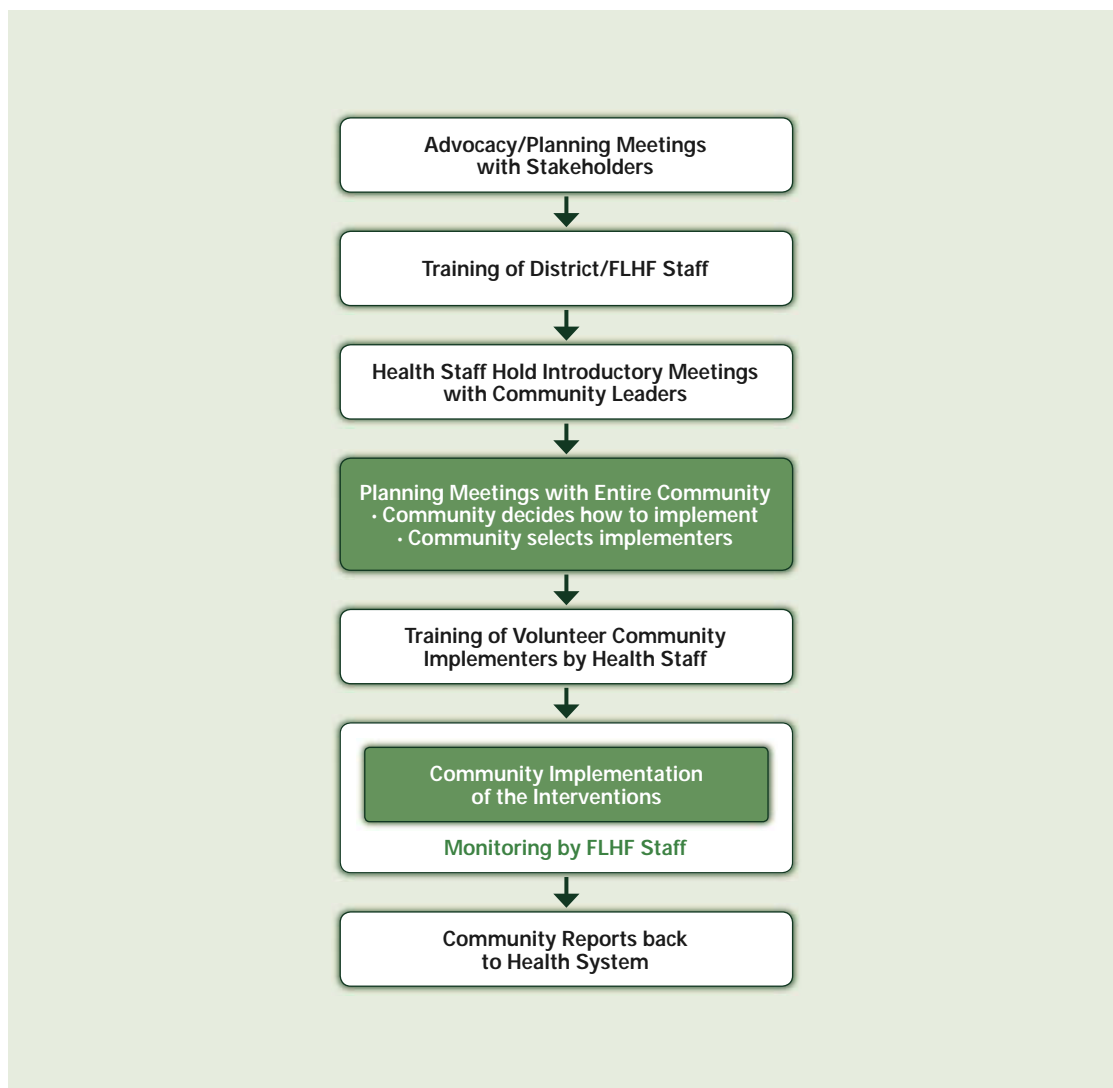
- Community members collectively discuss the health problem from their own perspective, as well as possible interventions, taking into account relevant community knowledge and additional information provided to them.
- Community members collectively decide whether they want the health intervention to be delivered at the community level and if they want to take the responsibility for its implementation.
- Community members collectively design the approach to implementing the intervention in the community and identify the resources within the community.
- Community members collectively plan how, when, where and by whom the intervention will be implemented, as well as how it will be supervised, what support shall be provided to the implementers, and how the process will be monitored.
- Community-directed implementers execute the intervention.
- Following its execution, community members collectively discuss the results of the intervention in light of monitored results, and adjust the implementation strategy accordingly.

Role of health services/partners

- Identify community leadership structure and socio-cultural organization, and take this into account in all interactions with the community.
- Introduce to the community the concept of CDI and technical aspects of the intervention(s).
- Provide and facilitate capacity-building and technical support as required by the interventions.
- Provide and support supervision on the basis of procedures and criteria of the interventions that are agreed upon with the community.
- Ensure adequate provision of the necessary supplies, i.e. drugs, ITNs and other intervention materials.
- Generate health policies for CDI and clear policy guidelines for the integration of specific interventions in the CDI package.

In the CDI process, it is essential that all partners be committed to the empowerment process of the community and try not to control, but rather contribute according to their roles and responsibilities, as well as understanding that they share a common objective.

Main steps in the CDI process



Main steps in implementing CDI

The CDI process involves the following implementation stages and steps:

- (I) **Meetings with partners** at national, sub-national and district levels (health system and others, including private sector) to plan, define and agree upon a CDI strategy, and the roles and responsibilities of the different partners. This should include:
 - a. selection of interventions to be offered through the CDI package;
 - b. plan for continuous advocacy and health education using appropriate IEC strategies and materials at all levels;
 - c. plan for training of health personnel at all levels on CDI and available interventions.
- (II) **Training of district health staff and first line health facility staff:**
 - a. introduction to the CDI process and its effectiveness;
 - b. training in the available CDI interventions as required.
- (III) **Approaching and meeting with community leaders:**
 - a. discussion of target diseases and interventions:
 - i. definition of the health problems and discussion of community experiences with the diseases;
 - ii. information on the benefits of the available interventions;
 - iii. availability of help from health service and contributions of other partners for the interventions.
 - b. discussion on roles and responsibilities of the community:

community members collectively decide whether they want the proposed interventions to be delivered at the community level. If this is agreed, they then decide how, when, where and by whom the interventions are to be implemented; decide what support to provide to implementers; and how to supervise and monitor the process, including the specific steps below:

 - i. identification of specific tasks and resources;
 - ii. collective selection of community implementers;
 - iii. authority to make decisions on timing of intervention;

- iv. decisions on suitable methods for intervention delivery;
- v. flexibility to change the timing and methods of delivery of the interventions if found to be necessary;
- vi. collection of intervention materials;
- vii. supervision of implementers by community members;
- viii. management of side effects (if any) and referral of serious cases to the nearest health posts;
- ix. decide on support (financial or otherwise) to implementers.

(IV) Approaching and meeting with the entire community including:

- a. health education of entire community on the interventions and their benefits, conducted annually prior to beginning of intervention activities;
- b. discussion of roles and responsibilities of the community in the CDI process (repeat the steps described above in III.b.i –ix);
- c. community decision-making on how, when, where and by whom the intervention is implemented;
- d. collective selection of community implementers.

(V) Training of community implementers by the health services.

(VI) Implementation of the interventions by community implementers:

- a. census-taking for information on quantity of intervention materials required;
- b. collection of intervention materials;
- c. delivery of the interventions;
- d. record keeping.

(VII) Monitoring and reporting:

- a. supervision and monitoring by community and health care services;
- b. reporting by community implementers to the health services.

5

EFFECTIVENESS OF CDI

5 EFFECTIVENESS OF CDI



The aim of CDI is to improve the delivery of public health interventions and to help ensure that these interventions reach the populations that need them. The ultimate test of CDI effectiveness, therefore, is whether it can improve and sustain the coverage of the target populations with the interventions. This chapter reports the results of the coverage evaluations that were done for each of the study interventions. Initially, coverage evaluations were planned for each of the three study years. But as mentioned above, there were major problems with the supply of intervention materials

during the first year of the study. This prevented the implementation of some interventions in some study sites and hence, coverage evaluations were not undertaken in all sites during Year 1. However, in Years 2 and 3, complete coverage evaluations were undertaken in all sites and a summary of the main results is presented below.

A. Vitamin A distribution

Vitamin A supplementation was initially selected as the least complex intervention which, in terms of complexity of delivery, was considered similar to ivermectin treatment. Vitamin A is currently delivered through National Immunization Day (NID) campaigns. However, in the period of the study, Vitamin A programmes were interested in exploring the use of the CDI process because of the anticipated need for new delivery mechanisms. They anticipated that progress in polio eradication might lead to the future phasing out of annual NID campaigns, in which the vitamins are also distributed. CDI was thus regarded as an alternative mechanism of particular interest. Table 5 shows the Vitamin A coverage results obtained during the final coverage survey that was completed at the end of Year 3.

Table 5: Vitamin A coverage among children 6-59 months of age (final evaluation, Year 3)

Study site	COMPARISON			VIT A THROUGH CDI IN YEAR 3 ONLY			VIT A THROUGH CDI IN YEAR 2 AND YEAR 3		
	Total N° surveyed	Vit A received		Total N° surveyed	Vit A received		Total N° surveyed	Vit A received	
		N°	%		N°	%		N°	%
Buea	80	71	89%	190	160	84%	163	154	94%
Yaoundé	71	52	73%	154	125	81%	139	108	78%
Ibadan 1	102	74	73%	241	190	79%	227	207	91%
Ibadan 2	108	91	84%	242	237	98%	351	343	98%
Kaduna	74	71	96%	144	141	98%	172	159	92%
Yola	98	88	90%	204	175	86%	170	168	99%
Uganda	87	55	63%	155	150	97%	192	135	70%
Total	620	502	81.0	1330	1178	88.6	1414	1274	90.1

Vitamin A coverage data is portrayed by study site, for each of 3 groups of study districts. The left hand column represents the “comparison districts” where Vitamin A was delivered through the traditional vehicle of NID campaigns throughout the study period. The second column portrays results for districts where Vitamin A was delivered through the CDI process during the third year of the study, but through NID campaigns in Years 1 and 2. The third column shows the coverage data for that group of districts where Vitamin A was included in the CDI package both in Years 2 and 3 of the study, and thus had the most prolonged experience with the CDI delivery method.

Comparisons across Year 3 of the study show Vitamin A distribution in the comparison districts achieving a coverage of 81% of children through the traditional means of delivery by NID campaigns (ranging from 63% in Uganda to 96% in Kaduna). Although this achievement is commendable, it nonetheless falls short of the policy target of 90%. In comparison, in the group of districts where Vitamin A was delivered through CDI, coverage was comparatively higher (89%). Finally, in those districts where Vitamin A was provided through CDI for at least two years of

the study period, coverage in Year 3 was 90%. The difference in Vitamin A coverage between comparison districts and CDI districts is statistically significant (χ^2 -test; $P < 0.01$).

Figure 1:

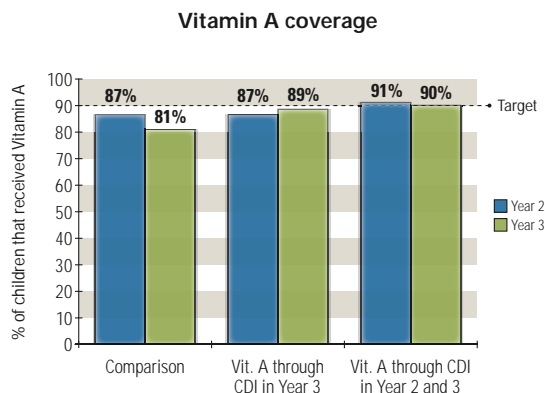


Figure 1 shows the summary results for the coverage surveys done in Years 2 and 3. The figures for Year 3 are the same as the totals noted in Table 5. In Year 2, Vitamin A was only delivered through CDI in the third group of districts where a coverage of 91.2% was achieved. Although this is not more than 4 to 5% higher than the coverage achieved through NIDs (86.7% in the

comparison districts and 86.6% in the second group), the difference was nevertheless statistically significant.

Overall, the coverage data indicated that CDI is an effective alternative to NIDs for delivery of Vitamin A, and that it can even achieve a higher coverage.

Reports from the field help explain how Vitamin A distribution was responsive to CDI. In Kaduna, respondents noted that, *"Vitamin A is easy because it is easy to dispense"*. In a similar light, *"Vitamin A is easier (to implement) because of the ease of administration"*. A respondent from Uganda explained that, *"I think ivermectin distribution and Vitamin A are easy to implement because the supplies are brought to us and our role is just to distribute them simultaneously. Moreover, their distribution is once a year unlike HOMAPAK (pre-packaged malaria medicine) which is (distributed) throughout the year."* Although there were initial difficulties, a respondent from Buea, Cameroon, noted that it became easy to implement Vitamin A because, *"Vitamin A was disassociated from EPI and coupled with CDTi in the CDI health areas."* At the field site near Yaoundé, Cameroon, a respondent observed that preparations undertaken helped

ease the implementation of Vitamin A. *"The two-day training session and the refresher course provided CDI implementers appropriate skills, as they did not express any technical difficulties during their involvement in the distribution of Vitamin A capsules."*

B. Insecticide Treated Nets (ITNs)

Insecticide treated nets (ITNs) are a core intervention of the global malaria control strategy. They are used to prevent infection and disease, especially among high-risk groups, e.g. children under the age of five years and pregnant women. During the design of the study, ITNs were classified as intermediate in terms of complexity of delivery. In comparison to ivermectin and Vitamin A, ITNs are bulky in size and they are not always provided free of charge by the health system. On the other hand, their distribution does not involve individual case detection and follow-up that would be required for malaria and tuberculosis treatment. In the analysis of study results, coverage with ITNs was assessed using three Roll Back Malaria indicators: 1) availability of ITNs at the household level; 2) utilization of ITNs by children; and 3) utilization by pregnant

Table 6: Households that have at least one ITN (final evaluation, Year 3)

Study site	COMPARISON			ITN THROUGH CDI IN YEAR 3 ONLY			ITN THROUGH CDI IN YEAR 2 AND YEAR 3		
	Total N° surveyed	HHs w/ITN		Total N° surveyed	HHs w/ITN		Total N° surveyed	HHs w/ITN	
		N°	%		N°	%		N°	%
Buea	49	19	39%	98	38	39%	100	39	39%
Yaoundé	50	19	38%	100	41	41%	100	33	33%
Ibadan 1	49	1	2%	93	19	20%	100	54	54%
Ibadan 2	45	29	64%	75	63	84%	61	54	89%
Kaduna	50	15	30%	100	90	90%	100	92	92%
Yola	50	3	6%	98	16	16%	100	45	45%
Uganda	50	19	38%	88	72	82%	82	46	56%
Total	343	105	30.6	652	339	52.0	643	363	56.5

women. For each of these three indicators, RBM has set a target of 60% by the year 2005 (WHO, 2003).

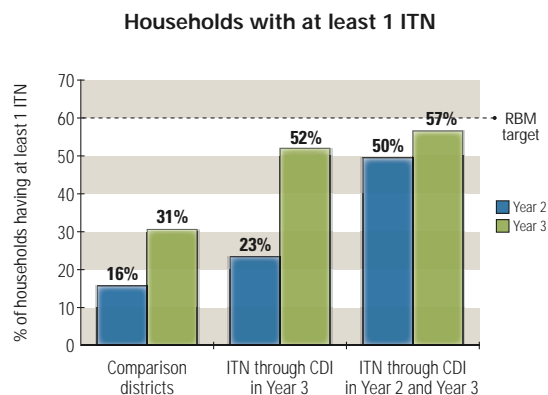
Table 6 shows the proportion of households owning at least one ITN, by study sites, in each of the three groups of districts. These include: comparison districts where ITNs were distributed through the regular channels; districts where ITNs were distributed through the regular channels during Years 1 and 2 of the study, but through CDI during Year 3; and the group of districts where ITNs were distributed through CDI for at least two years, e.g. Years 2 and 3. In the comparison districts, only 31% of the households had at least one ITN. In general, the availability of ITNs was significantly higher and closer to the RBM target

of 60% in the districts where ITNs had been part of the CDI package for at least two years. In the case of Cameroon, however (unlike the sites in Nigeria and Uganda), there was no significant difference in terms of household availability of ITNs between the CDI and comparison districts.

Figure 2 compares overall coverage figures in Years 2 and 3, by the three types of study districts. During Year 2, coverage of 50% was achieved in those districts where ITNs were delivered through CDI. This was more than double the coverage achieved through regular distribution channels in the other districts (16% and 23%) in Year 2. Between Year 2 and Year 3, the availability of ITNs at the household level increased in all districts, including in the comparison districts.



Figure 2:



However, wherever ITNs were delivered through CDI, the coverage was significantly higher.

Having ITNs is one step and proper utilization is another; this is reflected in the next two indicators. Table 7 portrays the results of the final coverage survey, which measured the percentage of children under the age of five years who slept under an ITN during the night before the interview. In the comparison districts, only 16% of children slept under an ITN, but in the CDI districts the coverage was twice as high at around 35%, although this is

still far below the RBM target of 60%.

Figure 3 shows that also during the survey done at the end of Year 2, the coverage was significantly higher in districts where ITNs were delivered through CDI (35%) as compared to districts with regular delivery (9% and 11%). Between Years 2 and 3, there was a modest increase in coverage in the comparison districts but a much more significant increase from 11% to 36% in the districts that had switched from regular ITN delivery to delivery through CDI. Overall, more than two to three times as many children slept under ITNs where delivery was done through CDI.

Figure 3:

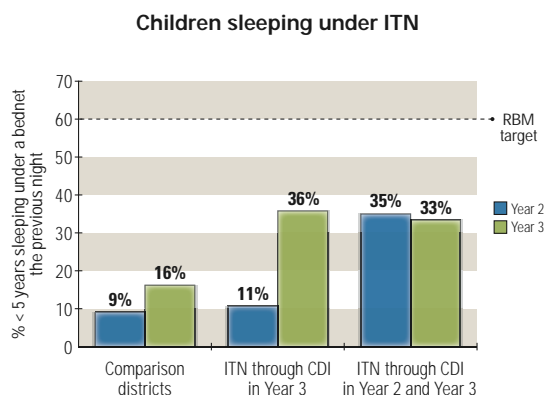


Table 7: Children sleeping under ITN the previous night (final evaluation, Year 3)

Study site	COMPARISON			ITN THROUGH CDI IN YEAR 3 ONLY			ITN THROUGH CDI IN YEAR 2 AND YEAR 3		
	Total N° surveyed	Slept under ITN		Total N° surveyed	Slept under ITN		Total N° surveyed	Slept under ITN	
		N°	%		N°	%		N°	%
Buea	79	11	14%	169	41	24%	171	39	23%
Yaoundé	80	7	9%	190	33	17%	151	7	5%
Ibadan 1	33	0	0%	168	14	8%	56	16	29%
Ibadan 2	57	35	61%	95	63	66%	97	44	45%
Kaduna	86	11	13%	158	111	70%	178	132	74%
Yola	66	1	2%	138	18	13%	100	28	28%
Uganda	105	17	16%	170	110	65%	191	49	26%
Total	506	82	16.2	1088	390	35.8	944	315	33.4

Table 8: Pregnant women sleeping under ITNs the previous night (final evaluation, Year 3)

Study site	COMPARISON			ITN THROUGH CDI IN YEAR 3 ONLY			ITN THROUGH CDI IN YEAR 2 AND YEAR 3		
	Total N° surveyed	Slept under ITN		Total N° surveyed	Slept under ITN		Total N° surveyed	Slept under ITN	
		N°	%		N°	%		N°	%
Buea	13	4	31%	30	12	40%	26	4	15%
Yaoundé	5	0	0%	9	1	11%	10	0	0%
Ibadan 1	4	0	0%	20	2	10%	25	13	52%
Ibadan 2	15	11	73%	18	17	94%	36	18	50%
Kaduna	9	3	33%	18	16	89%	15	13	87%
Yola	4	0	0%	1	0	0%	3	1	33%
Uganda	10	2	20%	19	17	89%	23	18	78%
Total	60	20	33.3	115	65	56.5	138	67	48.6

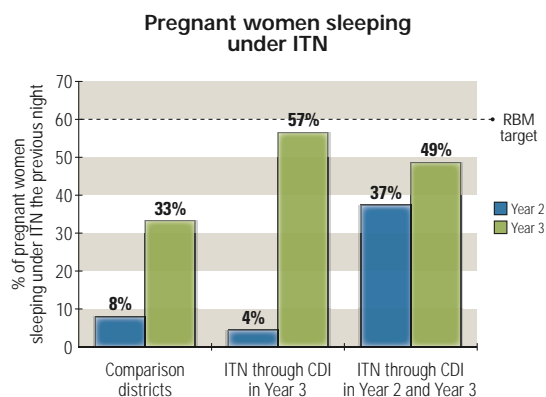
Table 8 portrays the percentage of pregnant women who slept under an ITN during the night before the interview. Again, the percentage of those sleeping under ITNs was much higher in the CDI districts (57% and 49%) than in the comparison districts (33%) and much closer to the RBM target of 60% than for children. Although the sample size for pregnant women was much smaller, the difference between the CDI districts and the comparison districts are statistically significant.

During the second year of the study, the difference between the percentage of pregnant women sleeping under ITNs in districts where they were delivered through CDI (37%) and in districts with regular delivery (4%-8%) was even more pronounced (see Figure 4). Between Years 2 and 3, there was a major increase in ITN utilization in all districts, including the comparison districts, reflecting a general trend of improved availability of ITNs. But wherever the ITNs were delivered through CDI, the coverage was 20% to 30% higher than in the comparison districts.

The initial classification of ITNs as intermediate in terms of complexity seems appropriate according to feedback from community implementers. Several community implementers reported that ITN

delivery was easy and “just a question of issuing out nets based on eligibility”. However, the number of ITNs that were available at the district level were grossly inadequate to meet the increased demand and other community implementers found ITNs difficult because of community reactions resulting from shortage of nets: “I had difficulties, people who would not get nets due to shortage of nets accused me of keeping their nets” and “ITN distribution is difficult because of the shortage, it creates many problems and people quarrel with me.” Also, the cost of ITNs and retreatment kits were an issue in some sites, which reported comments such as the following: “The community members

Figure 4:



would like the prices of ITNs and malaria kits for adults to be reduced;" and "Les difficultés sont la disponibilité des moustiquaires, les communautés pensent que les moustiquaires sont trop chères, ils pensent que la réimprégnation est trop chère, bon malgré que certains savent que la moustiquaire est salubre, ça protège contre le paludisme" (Buea). The available evidence suggests that with better availability and affordability of ITNs, the increase in coverage in the CDI districts would have been even greater.

C. Home management of malaria (HMM)

Prompt and effective treatment with the recommended antimalarials is key for effective malaria control, especially where it is needed most: in the community, close to the home. Home management of malaria (HMM) is a core element of the global malaria strategy, but its scaling up has proven to be a major challenge and the majority of children with fever in Africa still do not get appropriate antimalarial treatment in time. As the home management approach fits closely with the community empowerment philosophy of CDI, there was particular interest in the study countries to investigate whether

integration of home management of malaria into CDI could help to improve the coverage of appropriate treatment for malaria. During the design of the study, home management of malaria was ranked as one of the two most complex interventions as it would require basic diagnostic skills and individual case management throughout the year.

The coverage was assessed using the corresponding RBM indicator for appropriate treatment, i.e. the percentage of under five children with fever who received a nationally recommended antimalarial drug within 24 hours of onset of symptoms. Roll Back Malaria has set for this indicator a target of 60% by the year 2005 (WHO, 2003).

Table 9 shows for the final survey in each study site, the total number of children reported to have had fever during the two weeks before the survey, and the number and percentage of those children who received appropriate treatment with the officially recommended antimalarial drug within 24 hours of onset of symptoms. The results are again presented by three groups of districts: the comparison districts, the group of districts where HMM was integrated into CDI during the third year of the study, and the group of districts where HMM was part of the CDI package for at least two years.

Table 9: Appropriate treatment in children with fever (final survey, Year 3)

Study site	COMPARISON			HMM THROUGH CDI IN YEAR 3 ONLY			HMM THROUGH CDI IN YEAR 2 AND YEAR 3		
	Total N° surveyed	Appropriate Rx		Total N° surveyed	Appropriate Rx		Total N° surveyed	Appropriate Rx	
		N°	%		N°	%		N°	%
Buea	4	0	0%	35	10	29%	37	15	41%
Yaoundé	15	2	13%	40	3	8%	31	4	13%
Ibadan 1*	68	10	15%	100	40	40%	108	83	77%
Ibadan 2	50	28	56%	97	66	68%	65	56	86%
Kaduna	43	11	26%	89	71	80%	101	80	79%
Yola	34	10	29%	63	41	65%	63	41	65%
Uganda	17	5	29%	53	31	58%	30	23	77%
Total	231	66	28.6	477	262	54.9	435	302	69.4

* no information if Rx was given within 24 hours

Across all study sites, the health systems in comparison districts already had policies supporting home management of malaria. However, the level of implementation varied from mere articulation of the policy position, as in the comparison district in Kaduna, to more explicit health system implementation activities in Uganda. With the exception of Ibadan 2, where the random selection of districts resulted in the selection of an exceptional comparison district with a heavily-funded community development and community health care programme, coverage for home management of malaria in the comparison districts remained very low during the study period, ranging from 0% to 29%. In the CDI districts, the coverage attained was much higher. In districts where HMM was delivered through CDI for one year, 55% of children with fever received appropriate treatment. In districts where HMM had been integrated in CDI for at least two years, 69.4% received appropriate treatment. That was nearly 10% more than the RBM target.

Figure 5:

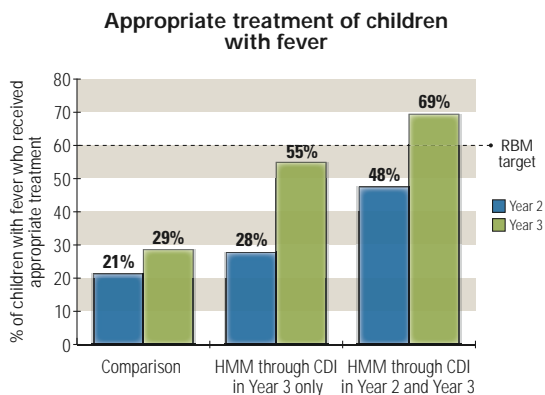


Figure 5 portrays the overall coverage results for the three groups of districts in Years 2 and 3. In Year 2, twice as many children with fever (48% overall) received appropriate treatment for malaria when HMM was integrated into a CDI approach,

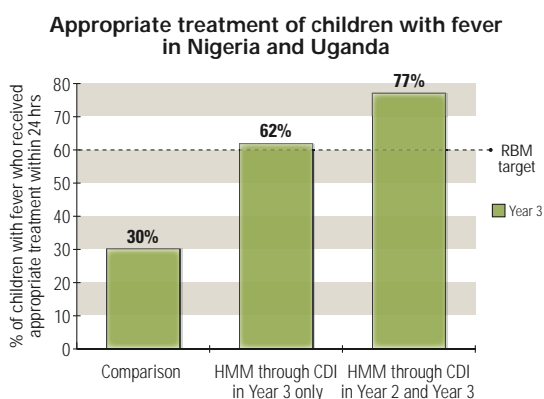
as compared to districts that implemented HMM through other means, where coverage was 21% and 28% respectively. Between Years 2 and 3, there was a slight, non-significant increase in coverage in the comparison districts, but a doubling of coverage in the second group of districts that switched to delivery of HMM through CDI strategies. In the districts where HMM was delivered through CDI for two years running, there was also a major increase in coverage between Years 2 and 3. This is presumably because of the increased awareness of communities as delivery of HMM through CDI became more established.

Impressive as those statistics are, they still underestimate the potential impact of HMM delivery through CDI methods. As further described in Chapter 7, during the study period Cameroon set forth a new malaria treatment policy, which stipulated that Coartem®, the leading anti-malarial drug available, be prescribed only after a patient was positively diagnosed with malaria. This served to limit its distribution at community level in the Cameroonian CDI study districts, resulting in very low HMM treatment coverage in all study districts, especially the Yaoundé site. It is therefore also relevant to look comparatively at the coverage data for Nigeria and Uganda, where there were no such policy restrictions in place for the community distribution of antimalarials. Figure 6 portrays HMM treatment coverage for Year 3 in Nigeria and Uganda combined. In these comparison districts, only 30% of the children with fever received appropriate treatment, but in the districts with at least two years of experience with HMM delivery through CDI, the percentage of appropriate treatment was 77%, i.e. two and a half times higher than in the comparison district and exceeding the RBM target by as much as 17%.

Although HMM was initially classified as one of the two most complex interventions of the

study, the coverage data suggests that it is the intervention which has most benefited from the CDI approach. One of the main reasons is the importance the communities attach to malaria and its control. The Kaduna team observed that “at the community level, perception of priority among target diseases was malaria. The community perceived HMM and ITN intervention as effectively tackling malaria in their community.”

Figure 6:



With respect to complexity, the opinions of the community implementers were mixed. Many considered it easy because: “the signs for treatment are known to all and people respond; once people knew of the availability of drugs, the CDIs were sought;” and “the drugs were colour coded.” But it was also seen as more time consuming: “HOMAPAK was also generally considered easy but the only problem has to do with time; it is a 24 hours service.” And as was the case for ITNs, the community implementer may be placed in a difficult position when there is a shortage of antimalarials: “shortages of the commodity is also another difficulty I face and when this happens, I have to keep explaining to the community members that the drug has finished;” and “The difficulty is situated at the level of supply in Coartem®. From time to time, when

we get to CAPP, they impose rates on us. For instance, if you command about 1000 tablets, you may be supplied 100. Sometimes you are asked to call round another day. This somehow disturbs the process because in the field there is a very high demand.”

D. DOTS

The global tuberculosis control strategy is based on early case detection and directly observed treatment, short-course (DOTS) of diagnosed patients. Though treatment was initially provided only in health facilities, recent years have seen a shift of some components of the treatment strategy to the community level. Family or other selected community members keep the drugs and ensure through “directly observed treatment” that individual patients take their daily treatment dose. Hence, the suggestion to test whether DOTS could be effectively integrated in CDI was considered timely by several partners.

However, as mentioned in Chapter 7, in several study sites the TB control programmes were not convinced that community members could be entrusted with handling the drugs. Control officers were thus only willing to allow community members to help with case detection, and to some extent, encouraging patients to complete treatment. As a result, the DOTS component of CDI varied considerably between sites, and included with varying degrees three separate components: (i) TB case detection and referral, (ii) handling of drugs and directly observed treatment, and (iii) encouragement to complete treatment. The degree to which these three components were applied through CDI in the different sites is shown in Table 10.

Table 10: DOTS treatment components applied through CDI

Site	Detect	Treat	Encourage
Buea*	✓	C*	✓
Yaoundé	✓	✓	✓
Ibadan 1	✓	X	✓
Ibadan 2	✓	X	✓
Kaduna	✓	✓	✓
Yola	X	X	X
Uganda*	✓	C*	X
Overall (7)	6	2	5

* Treatment actually reached community level (C) in Buea, Cameroon and Uganda where patients took drugs home themselves

The main indicator for DOTS coverage was the treatment completion rate, i.e. the percentage of patients registered between 6 and 18 months before the survey, who had completed treatment according to their treatment card. The completion rates are given in the table below, again for three groups of districts: the comparison districts with regular DOTS, the group of districts where DOTS was included in the CDI package in Year 3, and a group of districts where DOTS was part of the CDI package for two years.

The treatment completion rate was high and exceeded the Stop TB target of 85% (Raviglione

et al., 1997) in all three groups of districts. Contrary to the findings for the other interventions, there was no significant difference in completion rates between the three groups of districts, and the treatment completion rate was not higher in CDI districts.

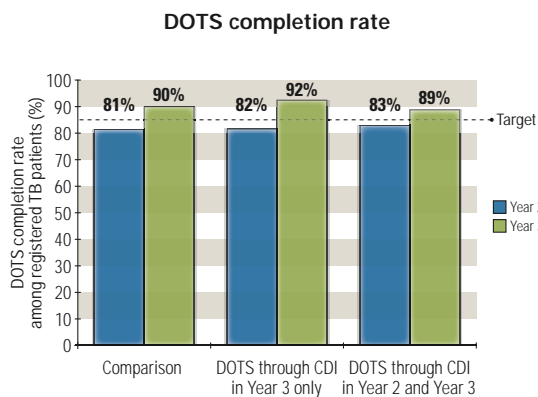
Between Years 2 and 3, there was an increase in treatment completion rates in all three district groups, but within each year there was no significant difference between the completion rates in comparison districts and CDI districts.

During the analysis workshop of Year 2, some implementers reported that they had the impression that the inclusion of DOTS in CDI had led to improved case detection and referral. To test this hypothesis, data on newly-registered and confirmed TB cases were systematically collected from all TB clinics in all sites during Year 3. Based on this information, the annual case detection rate was estimated at 13.9 new TB cases per 100 000 in the comparison districts, 15.0 per 100 000 in the districts where DOTS had been included in CDI for one year, and 12.9 per 100 000 where adults have been part of the CDI package for two years. Again, the difference between these three groups of districts was not statistically significant.

Table 11: DOTS completion rate among registered TB patients (final evaluation, Year 3)

Study site	COMPARISON			DOTS THROUGH CDI IN YEAR 3 ONLY			DOTS THROUGH CDI IN YEAR 2 AND YEAR 3		
	Total N° surveyed	Rx completed		Total N° surveyed	Rx completed		Total N° surveyed	Rx completed	
		N°	%		N°	%		N°	%
Buea	1	1	100%	15	15	100%	8	8	100%
Yaoundé	2	2	100%	14	11	79%	4	4	100%
Ibadan 1	18	18	100%	12	12	100%	28	27	96%
Ibadan 2	8	4	50%	5	5	100%	56	49	88%
Kaduna	4	4	100%	32	28	88%	34	28	82%
Yola	1	1	100%	4	3	75%	7	3	43%
Uganda	6	6	100%	14	14	100%	8	8	100%
Total	40	36	90.0	96	88	91.7	145	127	87.6

Figure 7:



DOTS was initially classified as one of the two most complex interventions given the need for intense daily follow-up of individual patients for six months. The experience of the study confirms that it was definitely the most complex of the CDI interventions but for reasons other than those reflected in the original complexity scale. It was the intervention for which there was the greatest reluctance from the health system to fully empower the community for its implementation (see Chapter 7), and the full community DOTS package was only effectively implemented through CDI in one of the seven study sites.

DOTS was also more complex in other ways. Community implementers considered it difficult because of the stigma of tuberculosis: *“DOTS was considered the most difficult. The treatment takes a long time and again, the fear that one can contract in the process was raised;”* and *“TB is more difficult. There is stigma and discrimination attached and it also lacks facilitation;”* and *“The only difficulty we still have is with DOTS because of stigma. Some people still have fear to open up with some diseases fearing that people will reject them and they can only talk to health workers, maybe like doctors. But these doctors are not always with them so a fellow community worker*

would be more helpful. So this is still difficult, but with other sicknesses, which are general, people have no problem opening up and then implementation is easy for the community.” [Uganda]; and *“Concerning stigmatization, it should be noted that in some communities, notably in Foubot, tuberculosis is still a dreaded disease. Due to the introvert culture of the people that does not really expose them to some realities, and their low level of education as compared to those in the other districts, they still consider tuberculosis as a shameful disease. This explains why in this district, a few TB patients are still afraid to present themselves openly. Many people do not accept that they have tuberculosis. Generally, they think that they are victims of a curse. Others feel ashamed of be identified as tuberculosis patient. Some are afraid of been rejected in the community.”* [Buea]

This combination of reluctance of TB programmes to delegate responsibility to the community level and the stigma of tuberculosis made it very difficult to effectively implement DOTS through CDI.

The Yola team observed that, *“Although implementers were trained to identify suspected cases of TB, refer them to test centres, then daily observe compliance to the treatment schedule, the implementer’s role was restricted to case detection and referral to clinic but even this was hampered by the stigma associated with the disease so very few implementers detected cases of TB.”* Community implementers said the following: *“TB is more complex because it is difficult to know that a person has TB. The person may not tell you that he has TB so it is more difficult to know. People with TB often keep it a secret. Also it is difficult observing his treatment too;”* and *“Though I received training on how to detect TB people do not like to admit to have the disease so I have not been able to refer anyone.”*

The only exception was Kaduna where CDI communities reported positive experience with giving the drugs to patients at home thus saving community members the cost of travelling to the centres to get their drugs. This was perceived by programme managers at all levels to be feasible and beneficial to community members: *“Well it has been part of our programme activity to initiate community DOTS services at the community level. When the CDI was introduced however, it came at the right time and the decision to join came at the right time, it was the base we needed to commence community DOTS as part of our programme.”* [In-depth interview with DOTS programme manager Kaduna State].

E. Ivermectin

The evaluations also included an assessment of ivermectin coverage. However, in this study, the objective was not to test whether ivermectin could be effectively delivered through CDI (15 years of large-scale experience with ivermectin treatment of 50 million people annually has provided ample evidence for its effectiveness), but rather if the addition of other interventions to ivermectin treatment would have a negative effect on ivermectin coverage. This was a major concern of APOC’s

governing board (JAF), which sought to ensure that the inclusion of other interventions would not be detrimental to the ongoing community-directed ivermectin treatment programmes that have been so successfully established over the years.

Table 12 below shows that, according to the study, there is no reason for concern about a detrimental effect, in fact, quite the contrary. In the comparison districts, where there was only community-directed treatment with ivermectin and no other CDI interventions, the overall ivermectin treatment coverage in Year 3 was 63.8%, slightly below the target of 65% (Amazigo et al., 2002a). But in the CDI districts, where four other interventions were added to the CDI process in Year 3, the coverage was 10% higher.

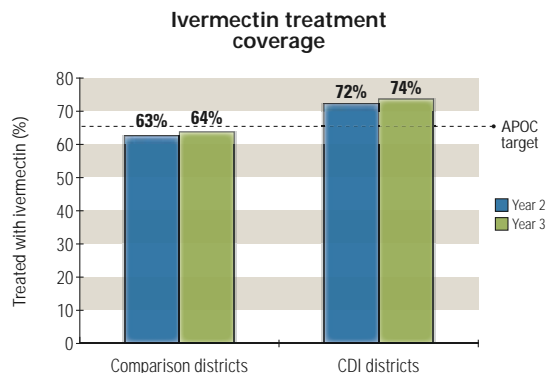
The same increase in ivermectin coverage was seen in Year 2, suggesting that the addition of other interventions to CDI may significantly boost ivermectin coverage, probably because of an increase in momentum and greater community commitment to the total CDI package.

During the design of the study, ivermectin treatment was classified as the least complex of all interventions. Community implementers, who were interviewed during the study, generally agreed that

Table 12: Ivermectin treatment coverage (final survey, Year 3)

Study site	COMPARISON			CDI DISTRICTS		
	Total N° surveyed	Treated		Total N° surveyed	Treated	
		N°	%		N°	%
Buea	309	208	67%	1326	918	69%
Yaoundé	284	159	56%	1212	649	54%
Ibadan 1	250	112	45%	1135	908	80%
Ibadan 2	199	154	77%	1143	1039	91%
Kaduna	287	164	57%	1226	971	79%
Yola	317	270	85%	1258	947	75%
Uganda	300	175	58%	1235	856	69%
Total	1946	1242	63.8	8535	6288	73.7

Figure 8:



ivermectin distribution was easy “because of the dosing based on height determination.” Although others noted that distribution still involved considerable work “because it had wider eligibility criteria and because they had to deal with the issue of follow up of community members who were not at home during the first visit.” [Kaduna]



General impressions on the complexity of the interventions:

Overall, the community implementers did not consider the interventions difficult to deliver as evidenced from the following comments:

“The interventions are all easy other than consuming much of our time. I do not find any difficult. They also first trained us to enable implement them.” [Uganda]

“I find none is difficult because I think I have been managing all of them. They are easy, it is only interest and commitment one needs to have. I think even other fellow community implementers acknowledge the same.” [Uganda]

“All the diseases were well known in the CDI communities and they have their equivalent names in the local tongues.” [Buea]

Some community implementers think that carrying out five interventions is just a matter of willingness: *“Ce n’est pas lourd parce que quand ils rentrent du champ, ils font cela comme divertissement,”* but others think that five interventions are too much for one person to assume and that more persons should be trained: *“Certainement il faut plusieurs personnes, si on pouvait spécialiser, c’est lourd.”* [Yaoundé]

6

COST OF CDI

6 COST OF CDI

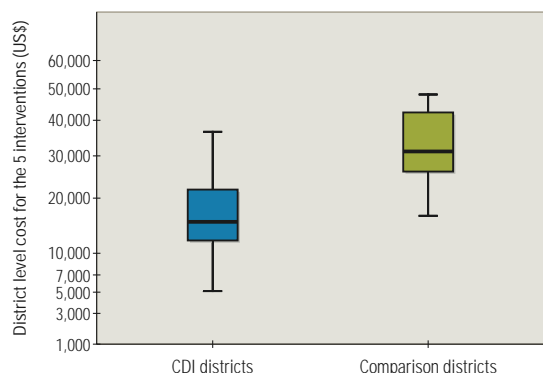


This chapter presents the cost analysis of the provision of the five interventions. The results presented here are based upon the collection of provider cost data at different implementation levels of the health system, i.e. the district level, the First Line Health Facility (FLHF) level, and the community level, focusing on opportunity costs of time and effort of community implementers.

A. District level

At the district level, the cost information enquiries were specifically directed at the programme officers for each of the five interventions. For each of the five districts covered by the study for all the sites, data were collected with respect to eight different, but related, cost items: staff salaries, allowances paid to volunteers, consultant fees, training, mobilization, transportation, maintenance and utilities cost, and supervision and monitoring cost. Although cost data were collected based on the local currency of each country, the final costs computations for each site were converted into current dollar value, using each country's 2005 dollar exchange rate.

Figure 9:



Mann-Whitney U Test ($P=0.007$)

The overall cost analysis at the district level supports the assertion that it is relatively cost efficient to deliver health care interventions through the CDI process when compared to conventional delivery (Figure 9). In the CDI districts, the median costs per district of implementing and delivering the five study interventions was a little above US\$ 15 000, while in the comparison districts the median costs was about US\$ 30 000, and the difference is statistically significant ($P=0.007$).

Individually, all of the sites exhibit the same pattern, with the mean costs per CDI district being generally less than the mean costs for the comparison districts (Table 13). For both the CDI and the comparison districts, the least cost is recorded among the Kaduna districts (CDI: US\$ 11 661, Comparison: US\$ 16 427), while the highest cost is observed in Ugandan districts (CDI: US\$ 29 331, Comparison: US\$ 48 139). Overall, the mean cost for the integrated delivery of the five interventions in the CDI districts is estimated to be 40% lower than the mean cost of the delivery of the five interventions in the comparison districts.

The delivery costs of the interventions are made up of eight cost components (Figure 10). The bulk

of the cost at the district level is committed to payment of staff salaries (50.4%), while maintenance and utilities, training and social mobilization accounts for 15.3%, 15.1%, and 10.1%, respectively, representing together 40.5% of total cost. The remaining 9.3% of the costs are for transport, supervision, volunteers' allowances and consultants' expenses.

Comparing the share of the cost components between the CDI and comparison districts, there appears to be little difference in the relative shares of each component (Figure 11). The bulk of the cost is staff salaries in both CDI and comparison districts, even though the share is slightly higher in the CDI districts (51.2% vs. 48.6%). The cost of items, such as maintenance, training, and social mobilization, continued to account for a substantial percentage, of about 10% or more. The cost of transport is less than 3% in the CDI districts while it accounts for about 8% in the comparison districts. The contribution to total cost of volunteer allowance, consultant fees and supervision expenses remains insignificant in both the CDI and comparison districts.

Table 13: Mean cost per district for the five interventions (US\$ dollars)

Study site	CDI districts (N=4 per site)	Comparison districts (N=1 per site)	All districts
Buea	23 252	45 861	27 774
Yaoundé	27 170	23 649	26 466
Ibadan 1	22 584	28 590	23 785
Ibadan 2	13 920	39 038	18 944
Kaduna	11 661	16 427	12 614
Yola	12 085	31 169	15 902
Uganda	29 331	48 139	33 092
Total	20 001	33 267	22 654

Figure 10: Proportional distribution of cost components at district level

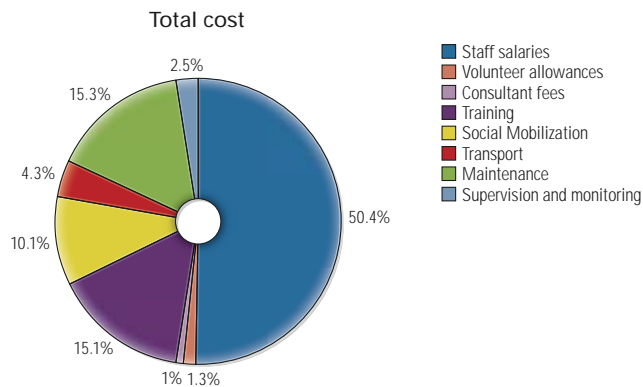


Figure 11: Proportional distribution of cost components in CDI and comparison district

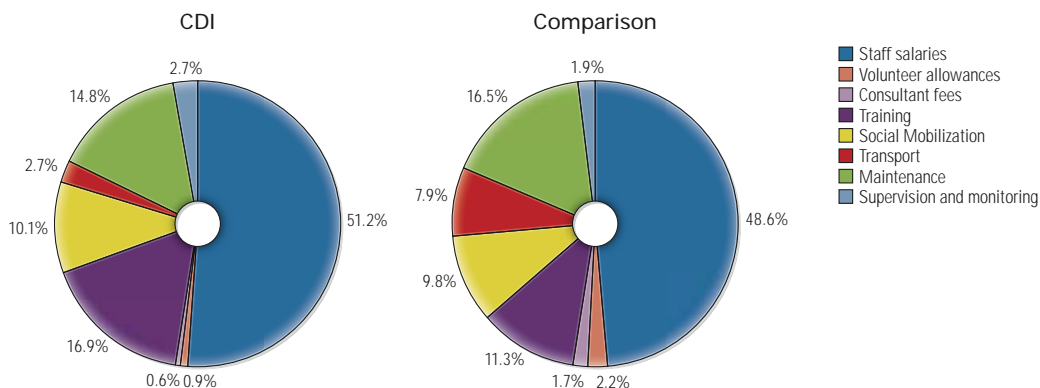
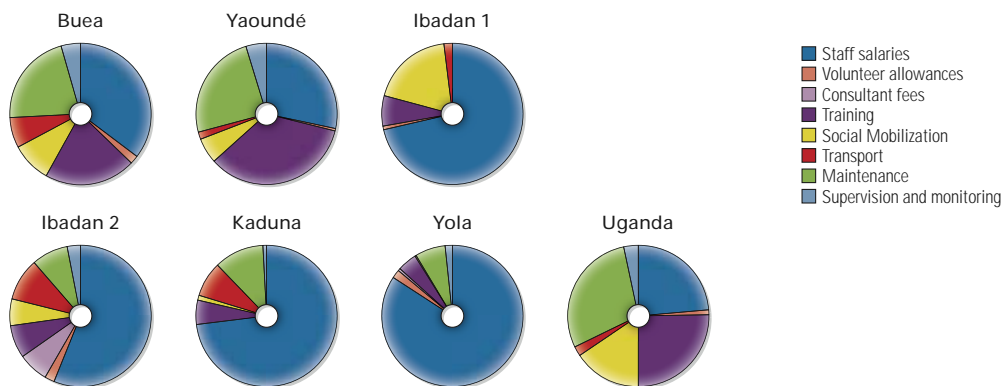


Figure 12: Proportional distribution of cost components at district level across sites



Considering the share of cost components across the sites, wide variations exist in their proportional distributions. Staff salaries account from around 25% of total cost in Uganda to over 80% in Yola, and maintenance costs exceed the staff salary costs in Uganda, and training costs exceed the staff salaries in Yaoundé. One obvious pattern is that the bulk of the total costs at the district level in the four Nigerian sites are committed to staff salaries (Figure 12), ranging from more than 60% in Ibadan 2 to more than 80% in Yola. This finding is not unexpected, given the dominant proportion of the total expenditure in public establishment in Nigeria committed to personnel cost.

Training cost was reported to play a major role in only three of the sites: Yaoundé, Uganda and Buea, while social mobilization costs are only significant in two sites: Ibadan 1 and Uganda. Maintenance costs play a notable part of total costs in four of the sites: Uganda, Buea, Yaoundé and Kaduna. The rest of the cost components, such as volunteers' allowances, consultants' fees, supervision, and transportation played a minimal role in influencing the total costs at the district level.

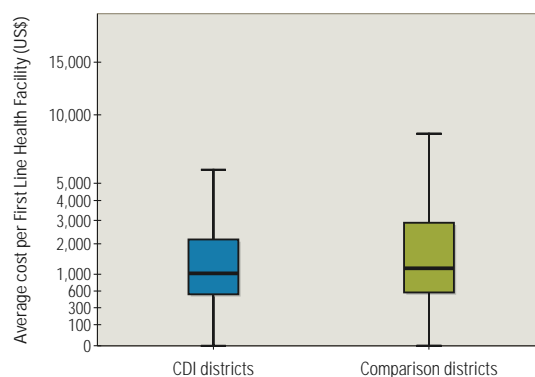


B. First line health facility level

At the first line health facilities (FLHF) level, the cost information was obtained from the officer-in-charge of the facility. For each FLHF, cost information was obtained on the same cost items as at the district level except for consultant fees, which is considered not be applicable at this level. The cost items included salaries of facilities' personnel, volunteers' allowances, training, social mobilization, transportation, maintenance and utilities, and supervision and monitoring. As for the district level, the data were converted from local currency to dollar values to allow for cross-country comparison, using the same 2005 exchange rate noted previously.

The significant cost difference at the district level appears not to be applicable at the FLHF level (Figure 13). The cost for delivering the five interventions at the FLHF level was 12% lower in the CDI districts (median US\$ 1025) than in the comparison districts (median US\$ 1170), but the difference was not statistically significant.

Figure 13: Distribution of costs at FLHF in CDI and comparison districts



Mann-Whitney U Test ($P=0.51$)

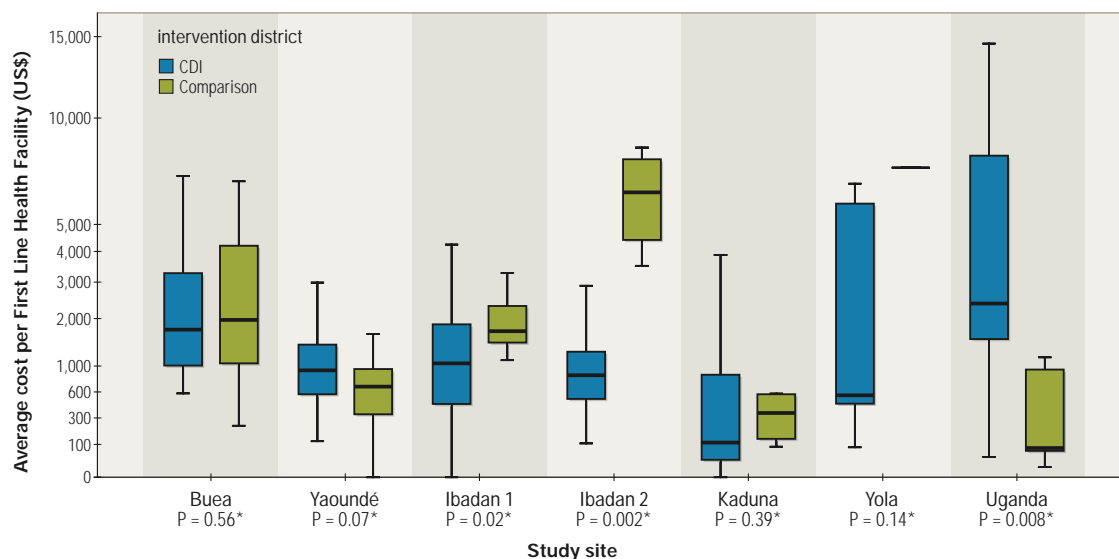
Furthermore, the observation that the FLHF cost for delivering the five study interventions was lower in the CDI districts does not hold for all the sites. Figure 14 shows that the cost at the FLHF level is lower in the CDI districts than in the comparison districts in five sites, but that the opposite was true in Yaoundé and Uganda.

The data from Ibadan 2 revealed an enormous gap between the cost for the FLHFs in the CDI districts and the comparison district, and this difference is statistically significant ($P=0.002$). The reason is the exceptionally high level of cost in the comparison district where, as mentioned in Chapter 5, there was a heavily funded community development and community health care programme, strongly supported by the district chairman. This resulted in intensification of all intervention activities at different levels, including for the five study interventions at the

FLHF in this district. Such political support was absent in the other districts in this site. This exceptional result was balanced by an extreme difference in the opposite direction in Uganda where there were virtually no expenditures in the comparison district for the study interventions at the FLHF level. This is a district in northern Uganda that, following prolonged war, is now part of the Northern Uganda Reconstruction Programme which involves many NGOs, which are under pressure to produce rapid results, and they are bypassing the FLHF and delivering support and supplies directly to the communities.

At the FLHF level, the main share of the total delivery cost of the five interventions was staff salaries: more than 66% of the total cost was attributable to salaries. Training and maintenance costs also played an appreciable role in

Figure 14: FLHF level costs by type of district and study site



* Mann-Whitney U Test (P-value)

total cost – more than 11% each. The engagement of volunteers at the FLHF level was at near zero cost. Other cost items such as social mobilization, transport, and supervision and monitoring, each generally accounted for less than 3% of the total cost (Figure 15).

Examining the composition of the cost components in the CDI district FLHFs and the comparison district FLHFs, not much difference is noticed. While personnel salaries remains the dominant cost component in both the CDI and comparison districts, 67.7% and 62%, respectively, the relative share of total costs attributed to maintenance drops from 13.8% in the CDI FLHFs to 5.1% in comparison FLHFs. On the other hand, the share of total cost attributed to both training and social mobilization increased from 9.2% and 2.7% in the intervention FLHFs,

to 17.5% and 7% in the comparison FLHFs, respectively (Figure 16).

Cost distribution exhibited wide disparity across all of the sites. In the four Nigeria sites, staff salaries crowded out other costs, implying that the bulk of delivery cost of health care interventions at the FLHF is used to pay staff salaries. For the two sites in Cameroon, the pattern is markedly different from what was obtained in Nigeria. In both sites, staff costs are second to the maintenance and training cost in Buea and Yaoundé, respectively. Supervision, monitoring and social mobilization accounted for a relatively small share of the cost. In the case of the Uganda site (Figure 17), only three cost components drive the total distribution cost: personnel salaries (60%), maintenance costs (25%) and training costs (11%).



Figure 15: Proportional distribution of cost components at FLHF level

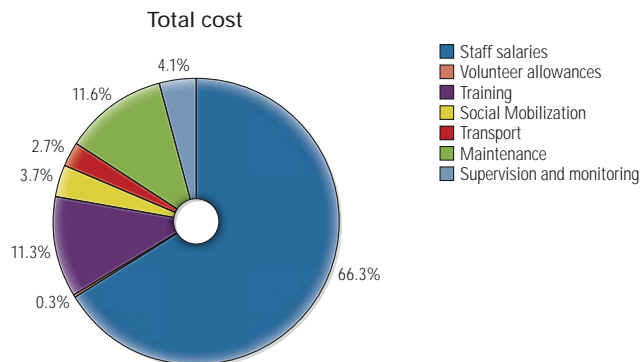


Figure 16: Proportional distribution of cost components in CDI and comparison districts

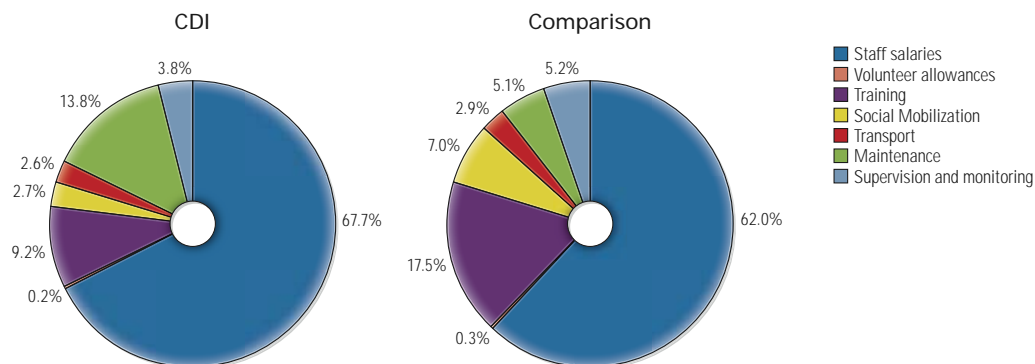
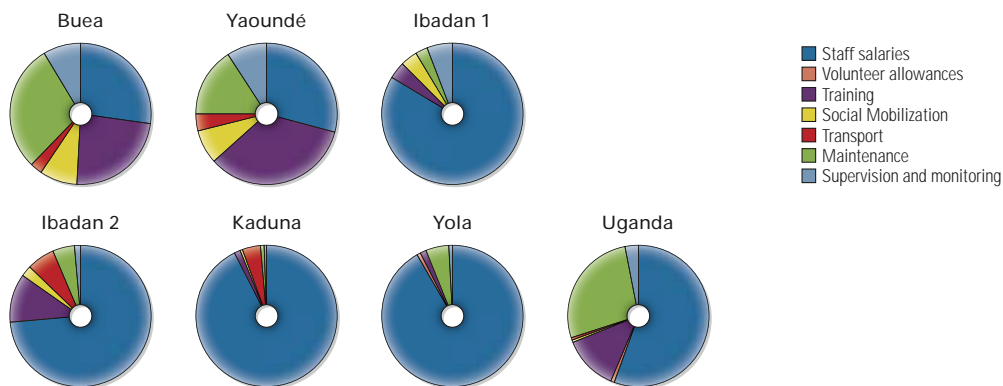


Figure 17: Proportional distribution of cost components at FLHF level across sites



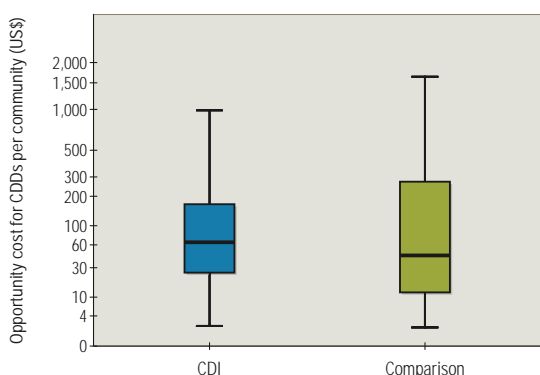
C. Volunteer cost

At the community level, the provider costs are the opportunity costs in term of the monetary value of the time the community implementers devoted to the delivery of the interventions. The distributions of the opportunity cost per community are shown in Figure 18 for the CDI and the comparison districts⁴.

The median opportunity cost for community implementers per community is US\$ 65 in the CDI communities and US\$ 44 in the comparison communities. This suggests that, on average, there was a 50% increase in opportunity cost for volunteers in the districts where CDI was implemented over the comparison districts where there was only a programme of community-directed treatment with ivermectin. However, there was a wide range in estimated opportunity cost per community and the difference between CDI and comparison districts is not statistically significant.

The distribution of the community volunteer opportunity costs per community for CDI and comparison districts is shown for each of the study sites in Figure 19.

Figure 18: Opportunity cost for community implementers in CDI and comparison districts



Mann-Whitney U Test ($P=0.24$)

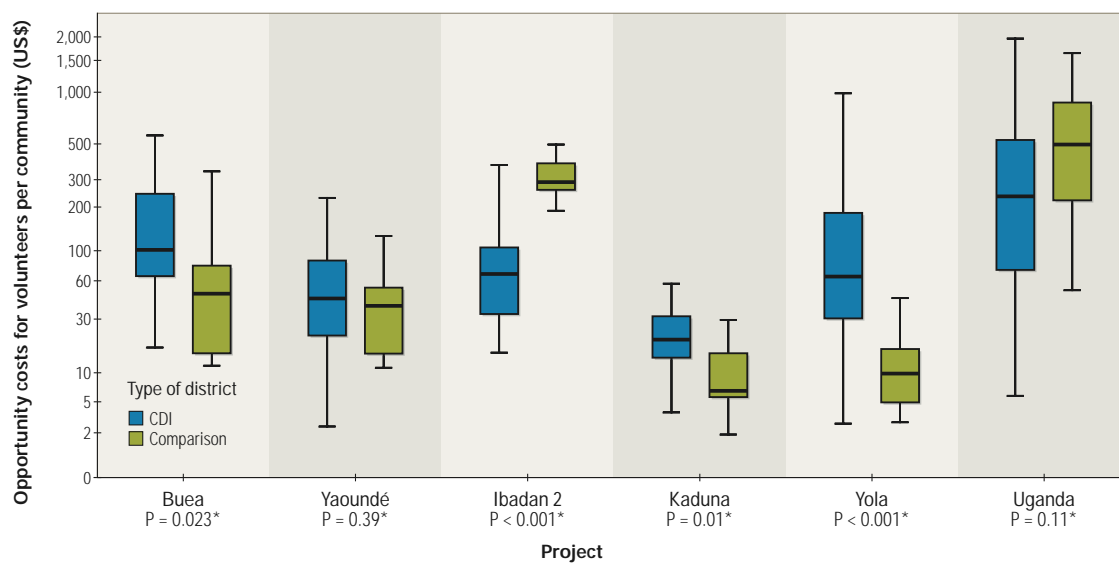
For four sites, the median opportunity cost is higher in the CDI communities than in the comparison communities, and for three of them the difference is statistically significant. The exceptions are again Ibadan 2 and Uganda, for the same reasons as mentioned above, i.e. the heavily funded community development programme and strong political support in the comparison districts in Ibadan 2, and the NGO activities at the community level in the comparison district in Uganda under the auspices of the Northern Uganda Development Programme. If Ibadan 2 and Uganda are excluded from the calculation, the median opportunity costs were US\$ 15 per community in the comparison districts and US\$ 49 per community in the CDI districts, i.e. a three times greater contribution in community volunteer time in the CDI districts.

Summary

In summary, the total cost of delivering integrated health interventions at the district level was significantly less in districts that used the CDI approach, in relation to comparison districts. At the FLHF level, the cost differential is not significant, although it remains slightly lower in CDI districts. However, the provider cost at the community level was generally higher in the CDI districts, reflecting a greater contribution in terms of opportunity costs by community volunteers.

⁴ Excluding community implementer costs for Ibadan 1 which were not available at the time of analysis

Figure 19: Opportunity cost for community implementers in CDI and comparison districts



* Mann-Whitney U Test (P-value)

7 CRITICAL FACTORS IN THE CDI PROCESS



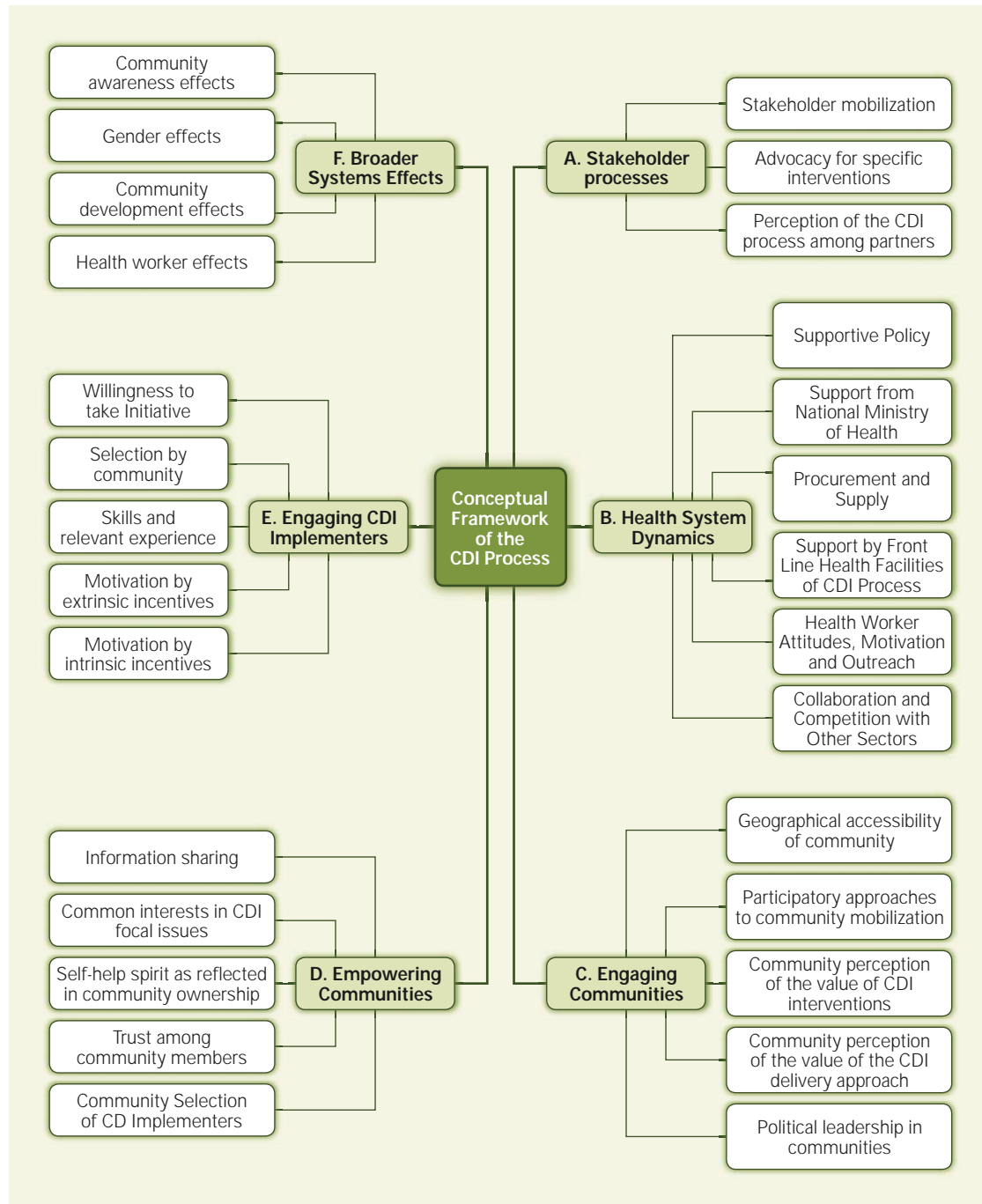
As noted in the Methodology section, a conceptual framework describing factors key to the CDI process was developed at the beginning of the investigation, and then continuously refined during the two-year process. At the final meeting in Douala, Cameroon, research teams produced detailed reports of the CDI process in their study area, drawing from the in-depth interviews, focus group discussions, field monitoring and management data, and final results from the quantitative analysis. Through a process of collective brainstorming and sharing of site reports, team members then identified the factors they had observed to make a difference, positively or negatively, in programme implementation. The collective group then reviewed the original conceptual framework (Figure 20) in light of all data and experiences gathered. Factors affecting the outcome of each component of the process (A-F below) were then rated as being of very high, high, moderate, low or very low importance to outcomes. Results of this analysis, as well as descriptive detail, are presented in this chapter.

Conceptual framework of critical factors in the CDI process

Implementation of CDI across five health interventions involved addressing six major processes, which were regarded as having relatively equal importance to outcomes. These are listed in the chronological order they assumed in the process, and then analysed in further detail in the chapter.

- A. Stakeholder processes:** the broad commitment of various stakeholders from national to community level was secured.
- B. Health system dynamics:** health systems, particularly at the front line, needed to be engaged in specific commitments and tasks related to CDI implementation.
- C. Engaging communities:** from a base of commitment in the health system, outreach followed in order to engage and mobilize communities.
- D. Empowering communities:** community engagement needed to mature into community empowerment to sustain the interventions.
- E. Engaging CDI implementers:** community and health system actors became involved in a process of recruitment, support and maintenance of a pool of community volunteer implementers.
- F. Broader system effects:** broader community and health systems changes were triggered, such that the inherent value of community involvement and empowerment could be internalized by communities and health workers, leading to a more responsive health system overall.

Figure 20: Conceptual framework of critical factors in the CDI process



A. Stakeholder processes

Identifying and gaining acceptance of multiple stakeholders at different levels of decision-making (e.g. international, national and local) was an essential step in initiating the CDI process. Stakeholder analysis identified both the specific groups engaged (e.g. government health departments/programmes and donor agencies), and the level at which the institution or groups operated, including:

- national level
- sub-national level (state, provincial, region)
- district level (local government area)
- community level.

Successful stakeholder mobilization, successful advocacy regarding the delivery of specific interventions through CDI (e.g. Vitamin A distribution); and successful engagement with health system partners and donors, were noted as the three fundamental elements of stakeholder processes affecting a successful outcome of CDI delivery. These are described generally below, with further details on site-specific stakeholder analyses provided in Annex C.



1. STAKEHOLDER MOBILIZATION AT MULTIPLE LEVELS

In Year 1, prior to implementing the intervention, all sites embarked on widespread information efforts and consultations with stakeholder groups at all levels. Of crucial importance during the set-up phase of the CDI scheme, were emerging partnerships with representatives of national health programmes, services and health authorities with varying (and at times potentially opposing or competing), interests in the CDI model of integrated delivery. Because the interventions being addressed by CDI had not been run in an integrated manner before, many stakeholders (e.g. government, NGO and donor agencies) had vested interests in particular delivery approaches that they perceived as meeting their own programme targets. These views had to be harmonized at national, sub-national and district/local government levels.

A list of the major stakeholders who were mobilized is presented in Table 14. An analysis of the various roles for different stakeholders in the CDI process showed that at national level, key stakeholders were primarily ministries of health, particularly the national coordinators of targeted health programmes (malaria, tuberculosis, onchocerciasis and nutrition); non-governmental organizations (NGOs) and private voluntary organizations (PVOs) (e.g. Sight Savers, Helen Keller International, Carter Center), international agencies (WHO and UNICEF); and donor agencies. At the sub-national level, major stakeholders included ministries of health, particularly directors of interventions. At the district level, the primary health care coordinators and programme officers were major stakeholders while at the community level, community members and the community-based organizations (CBOs) were the major stakeholders.

Stakeholder engagement was a continual process. Year-end briefing meetings were arranged with stakeholders throughout the study, both to provide interim feedback on successes and difficulties of the CDI process, as well as to discuss and address any new changes in policies or programmes at national, sub-national or district level. Examples of issues thus addressed included the transition to long-lasting impregnated bednets in Nigeria, or the de-linking of

Vitamin A distribution from National Immunization Day Campaigns, and their integration into CDI.

Overall, the research teams found it equally important to gain consensus and support from stakeholders at all four levels (national, sub-national, district/local government and community), as reflected in the matrix below.

Table 14: Examples of major stakeholders involved in the implementation of the CDI process across the sites

Stakeholders	Project Sites							COMMENTS
	BUE	YAO	IB1	IB2	KAD	YOL	UGA	
Ministries of Health	✓	✓	✓	✓	✓	✓	✓	Positive disposition
UNICEF	✓	✓	–	✓	✓	✓	✓	Positive disposition
WHO	✓	✓	✓	✓	✓	✓	–	Positive disposition
USAID	✓	–	✓	✓	✓	✓	✓	Positive disposition
Int. NGOs*	✓	–	✓	✓	✓	✓	✓	Positive disposition
CBOs	–	–	✓	✓	✓	✓	–	Positive disposition
Local Politicians	–	–	✓	✓	✓	✓	–	Low commitment
Yakubu Gowon Centre**	–	–	✓	✓	✓	✓	–	Positive disposition

* Carter Centre, Helen Keller International, Damien Foundation, etc.

** a Nigerian national NGO

Table 15: Critical contributing factors to stakeholder support

Critical Factors	Level of Importance Based on Process Data						Uganda	Overall Importance
	Cameroon		Nigeria					
	BUE	YAO	IB1	IB2	KAD	YOL		
Consensus reached in 2007 at national level	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high
Consensus reached in 2007 at subnational	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high
Consensus reached in 2007 at district level	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high
Consensus reached in 2007 at community level	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high

The following is a more detailed description of the stakeholder engagement process at the different levels and the factors that positively influenced stakeholder engagement with CDI.

a. National level

In the first year of the study, all sites embarked on advocacy meetings at the national level to gain initial support for the CDI study. During the second and third years, results of the previous phases were presented to the various national level stakeholders, and efforts were made to engage them in concrete collaborations and commitments that would facilitate the next phase of CDI operations. This focused advocacy process yielded significant concrete results in two domains:

- National stakeholders agreed to incorporate Vitamin A distribution in the CDI study – recognizing that exploration of alternative delivery vehicles was necessary in light of the possible phase-out of National Immunization Days (NIDs), as noted previously in Chapter 5.A.
- Stakeholder commitment to facilitate the CDI process downstream at various operational levels also was obtained.

It should be noted that even in cases where stakeholders made concrete commitments to CDI, attitudes towards the integrated approach were often negative at the outset, and shifted gradually. For instance, Vitamin A stakeholders, as previously noted, originally favoured their link with national immunization campaigns, but by the third year of the CDI trial, they were convinced through sustained advocacy and visible results. On the other hand TB/DOTS stakeholders maintained a suspicion of community distributors in all but one site.

b. Sub-national level

Engagement and advocacy at the sub-national level was the second step of the mobilization

process. (In Cameroon, the sub-national level is the provincial level, in Nigeria there is a state system at sub-national level, and in Uganda there is no explicit sub-national government layer, only national and district). Engagement with stakeholders at this level followed the same pattern as the national level, including an initial round of meetings at the beginning of the first year to introduce the project, and then follow-up meetings at the conclusion of each year to provide feedback on results and gain commitment to the next phase of the trial, e.g. to introduce new interventions, provide the calendar of activities for the coming phase, and plan for advocacy and training at the district level. Stakeholder mobilization also involved delineation of roles and responsibilities of all actors at this level of government, and getting formal approval for the planned activities from the appropriate authorities. For instance, at Yola Site, Taraba State, Nigeria, stakeholders engaged at sub-national level included the Commissioner of Health, and the Permanent Secretary and the Director of Disease Control in the State Ministry of Health. In Cameroon's Western Province, support from the Provincial Coordinator for the Malaria Control Programme was regarded as significant: "The CDI process is quite efficient and effective in the improvement of the population's health because it helps empower the communities in the delivery of health programmes. I think this research can be a start-up point for the sustainability of health programmes in the province."

c. District level

In all study sites, this district level of government (Local Government Area or LGA in Nigeria) was directly responsible for the delivery of primary health care services, including all the interventions tested in this study. In each district health department, staff are designated to handle the various interventions, e.g. onchocerciasis and malaria, although such "programme managers" often had multiple responsibilities. So at this level

of government, health programmes that are operated separately at the national level in fact begin to naturally converge due to lack of personnel. Another key group of district health staff were those who managed the Front Line Health Facilities (FLHFs), including community-based health centres and clinics. These FLHF staff maintained stocks of the basic CDI intervention commodities, assisted in community implementer training and supervision, and coordinated record keeping. Engagement of these district health stakeholders was thus particularly important.

In Nigeria, mobilization at the LGA level included meetings with the LGA Chairman, the Supervisory Councillor for Health, the Primary Health Care Coordinator and the Director of Personnel. Political commitments to support the programme were obtained as an outcome of these meetings.

In Uganda, Health District as well as Health Sub-District (HSD) stakeholder meetings were held. At this level, district health staff and politicians were briefed about the intervention programme and asked to support the process.



In Cameroon, the district level meetings included FLHF workers, the health workers at district levels, the lead staff of the district hospital, and managers of the existing community-directed programme for ivermectin.

d. Community level

Community members are the primary stakeholders, and consensus-building at the community level is perhaps the most fundamental step in the CDI process. In all sites, community mobilization was facilitated by district health staff. Responsible managers for the different interventions at the district level introduced the interventions to the participating communities in advocacy visits. Issues discussed at the community meetings were: the general CDI process and specific issues relating to the addition of new interventions to existing CDTi programmes; the selection of community implementers; record keeping; and management of possible side effects. The issue of remuneration was also raised for discussion by community members, particularly in light of the fact that other programmes, e.g. polio immunization campaigns, often have provided tangible incentives for community members to take part in mobilization and door-to-door delivery of antigens.

In Uganda, following the district-level advocacy meetings, the district health staff, together with the first line government health facility staff, conducted meetings with community leaders to engage support and plan implementation. Following this, community leaders mobilized their respective communities, and meetings were held in local villages to actually plan a schedule of interventions and select community implementers. In liaison with the district health staff, training of implementers was then scheduled, and conducted by the district health and FLHF staff.

In Nigeria, community leaders were supportive of CDI from the start and they helped disseminate

information, and identify and engage stakeholders, e.g. market women's associations or networks. These stepwise consultations set the foundation for the community ownership of CDI programmes and their sustainability in Nigeria. It was observed over time that community leaders and members had developed a true vested interest in supporting integrated programmes that they perceived as bringing more interventions to their doorstep in a timely fashion.

2. ADVOCACY FOR SPECIFIC INTERVENTIONS

Advocacy for incorporating specific interventions into CDI was another element key to the success of the overall stakeholder process. All interventions tested in CDI had previously been delivered through other established mechanisms. In some cases, certain stakeholders already had a strong sense of ownership or investment in existing modes of delivery, e.g. Vitamin A delivery through immunization programmes and DOTS through clinical settings. Thus, it was necessary to engage stakeholders in targeted discussion on issues specific to each intervention in order to advance an integrated approach through CDI.

Advocacy for Vitamin A distribution

The case of Vitamin A distribution provided a vivid example of how stakeholder opinion shifted over time, as a result of targeted advocacy on a specific issue. As noted in (Chapter 5) Vitamin A distribution in most African countries has been linked to National Immunization Day (NID) campaigns, often conducted door-to-door. Considerable resources are invested in these campaigns, especially at the district level, fostering certain vested interests, e.g. local health staff and politicians have an opportunity to 'buy' political capital by involving their friends and relatives as immunization outreach 'volunteers', who in turn receive small monetary stipends or other incentives (e.g. T-shirts).

In the first year of the CDI study, health system and NGO stakeholders in many study areas thus refused to incorporate Vitamin A in CDI delivery, or to relinquish vitamin supplies from the NID campaigns to CDI. In the second year of the study, the national and sub-national levels were targeted for an issue-specific advocacy effort. Here, the value of the new approach was emphasized in light of the fact that international and even national programme planners have envisioned an eventual phasing-out of immunization day campaigns, especially when polio is eradicated. There is thus a long-term need to find other Vitamin A distribution mechanisms, and this need has indeed been recognized by policymakers in various fora. The result was a clear policy directive from the national and sub-national levels to the study areas that Vitamin A should be delivered through CDI, at least for the term of the study. This is an instance when advocacy to a targeted stakeholder group on a specific issue proved instrumental in overcoming significant barriers of vested interests and testing the integrated approach to delivery.

Advocacy for ITN distribution

The proposal to incorporate ITN distribution into CDI study programmes generally received initial support from all levels of stakeholders. In the Ibadan 1 Nigeria's site, for example, all stakeholders expressed support for the community-directed process for ITNs, using the CDTi approach. They perceived that it would reduce the burden of malaria, but were unsure about its functionality at the community level due to the shortage of ITNs and supply chain problems. In Nigeria, bednet supplies are received at national level from donors, then distributed to the states, which in turn are supposed to deliver them to the districts.

The concept of community-based distribution of nets was new, insofar as net distribution had been typically managed by the health system, and usually in the context of immunization campaigns. In

addition, some local governments had instituted cost-recovery schemes, requiring a nominal payment to cover operational costs. Some initial resistance was observed where districts did not want to forfeit the income from cost recovery. At the same time, community leaders and members expressed strong interest in the distribution scheme for nets to prevent malaria, which they considered a major disease in the community.

Strong community interest in obtaining nets eventually overcame health system resistance, particularly that of district-level programme managers, to community-based distribution through CDI. At the same time, the availability of ITNs to carry out the CDI intervention became a major issue in Year 1, particularly in Nigeria, due to supply chain problems. To overcome this, the four Nigerian research sites collaborated with Nigeria's National Malaria Control Programme on a joint advocacy initiative aimed at overcoming bottlenecks in the system and to ensure that adequate supplies of ITNs eventually reached the local governments.

Advocacy for home management of malaria (HMM)

Malaria was the most widely recognized health problem by communities in all study sites. Very little community advocacy was required to introduce home management of malaria into the CDI process, since the community awareness of malaria and demand for antimalarial drugs was already very high. Households had traditionally managed malaria at home, although often with inappropriate drugs and dosages, obtained from private vendors or traditional healers.

In terms of the health system, advocacy focused on educating district level health programme managers about how CDI supported existing national policies. For instance, in Uganda a programme for home management of malaria had already been instituted, giving village volunteers the authority to distribute prepackaged anti-malarial drugs for children. In Nigeria, the national malaria control programme had already adopted a programme called "role model mothers" whereby women



volunteers in the community would help promote home management.

The major obstacle encountered was ensuring that adequate drug supplies reached the study areas, and for this, high-level advocacy at national and subnational level was sometimes initiated. In the case of the Yola site in Taraba State, Nigeria, for instance, communities were delighted to have prepackaged drugs at low cost supplied through the health system. The supplies were provided by the Federal Ministry of Health through the national-level NGO, Yakubu Gowon Centre, which was the principal recipient of a Global Fund for AIDS, Tuberculosis and Malaria (GFATM) malaria grant. This arrangement was agreed upon following a high-level advocacy meeting involving key health system representatives and NGO stakeholders at national level.

In Cameroon, however, serious problems emerged in the third year of the study when the national health authorities suddenly issued an “instruction” that the ACT Coartem® be prescribed only following a positive diagnosis of malaria. This severely hindered the distribution of ACTs through community channels, a problem that was not resolved prior to the completion of the study. As reported by the study team at Buea site: *“The instruction from the national health authorities, whereby Coartem® should only be prescribed after a patient has received a positive diagnosis of malaria, significantly hindered HMM.”*

Advocacy for DOTS

In the case of DOTS, there was stakeholder consensus around the utility of the CDI approach. At the same time, local health authorities in charge of TB programmes along with their NGO partners, generally expressed doubts about whether community implementers could be trusted to handle drugs and supervise DOTS treatment, even

though their potential role in case detection and referral was acknowledged. Targeted advocacy did not succeed in overcoming these reservations. Partly as a result of this issue, community-level stakeholder support for DOTS implementation through CDI varied widely between sites throughout the duration of the study.

At the Ibadan 2 site in Nigeria, for example, a DOTS related advocacy meeting was held with district health policy makers and officers representing the communities where the CDI study was being undertaken. They stressed their position that lay community members could be involved in case detection and referral, but that all aspects of case management should be left to health system staff.

In Cameroon, inclusion of DOTS in CDI encountered similar ambivalence. On the one hand, the new Provincial Coordinator of the DOTS programme asserted that *“the CDI has proven its efficiency in the referral of cases”*. However, the same coordinator, as well as other health authorities, were pessimistic about more extensive applications of CDI to DOTS. They supported centralization of DOTS at the district level, as compared to decentralization of TB treatment to communities.

On the other hand, Nigeria's Kaduna site effectively introduced the CDI approach to DOTS to programme managers and to major NGOs, such as Netherlands Leprosy Relief. All partners expressed support to include DOTS in the CDI model, which they perceived would reduce the burden of tuberculosis. One oft-heard assertion was that such an approach would also help reduce disease-associated stigmas, whereby TB-infected community members may be forced to cook from separate utensils, or be otherwise isolated, due to fears of other community-members becoming infected.

In Uganda, health workers were, on the other hand, willing to permit TB drugs to be administered outside of the clinic, but would only release medicines directly to the patient or to an individual specifically designated by the patient to help him/her comply with DOTS at home (e.g. a close relative). Health staff believed that involving community implementers might expose the patient's TB status publicly to the broader community and subject him/her to being stigmatized by neighbors.

3. PERCEPTION OF THE CDI PROCESS AMONG HEALTH SYSTEM, DONOR AND NGO PARTNERS

Partners engaged as stakeholders at the outset of the CDI process became gradually more positive about CDI's methods and strategies through the course of the three-year study and, in turn, these positive perceptions, were a reinforcing factor in stakeholder engagement and the success of the study.

A list of the project "partners" is noted in Annex B. In general, partners came to perceive community management of the targeted interventions as a mechanism to simplify the task of

the health sector, and significantly contribute to the reduction of disease burden, particularly from recurrent illnesses such as malaria. With fewer children sick from malaria being referred to health centres, for example, health workers explained that they had time for other responsibilities. A provincial coordinator of the Carter Center in Cameroon stated, *"CDI is a very important project to our communities. It is just necessary that the machine be greased for all to go on well (...) The project has health advantages, it is for the good of the population that the project is developing strategies for their benefit."*

In Cameroon's Buea site, a member of the National Programme for the Fight Against Malaria offered a similar view, saying, *"The CDI process is an efficient and effective strategy in the amelioration of the health of the population because it renders the population responsible for the management of health programmes. The role of HMM is to try and facilitate access of the population to good quality drug."*

The dynamics affecting health system processes as part of the overall CDI process are explored in further detail in Section B.

Main findings – Stakeholder processes

- ❖ By the final year of the study, stakeholder consensus regarding inclusion of additional interventions within the CDI process was achieved at national, sub-national, district and community levels.
- ❖ The experience over the three years of the study showed that stakeholder identification and consultation at all levels of the health system is critically important for the success of the CDI process.
- ❖ The degree of consensus increased over time reflecting the maturing of the CDI process.
- ❖ Seeing results, such as reduced case load, reinforced the commitment of stakeholders commitment to CDI.

B. Health system dynamics

The CDI process is embedded in the health system and all levels of the health system play an important role in its implementation. Table 16 lists the essential health system factors that influenced the successful implementation of the CDI package, each of which is further described and analysed in this section.

1. SUPPORTIVE POLICY

By Year 3, health systems attitudes had evolved and most sites were clearly providing an enabling environment for CDI processes to occur. Still, challenges remained. Contradictory and changing policies, as well as guidelines and regulations can hamper the CDI process. Malaria drug policies are a case in point. For example, in Cameroon, the new policy requiring Coartem's® distribution only after diagnosis negatively affected the CDI process at both of Cameroon's research sites, insofar as community drug distributors could not freely hand out the ACT. The Buea team thus reported

that “the good start-up was soon seriously upset by a circular from the national health authority who through the provincial and district health authorities recommended that Coartem® could be sold only through consultation and to those who are diagnosed sick. The disparity between the message spread during the mobilization campaigns and the new recommendation of the health authorities seriously frustrated the CDI implementers and the members of the community and led to a total confusion. The research team reacted by getting in touch with the health authorities, but the policy remained unchanged although it was only partially implemented in CDI health areas.”

In Nigeria, the malaria policy and guideline changes also had some effects on commodity acquisition and distribution. Although Nigeria officially changed its malaria treatment policy from chloroquine to ACTs just prior to the launch of the CDI study, pre-packaged chloroquine tablets for children were still the norm in the first year. These were being produced inexpensively in the country in large

Table 16: Critical contributing factors to health systems dynamics

Critical Factors	Level of Importance Based on Process Data						Uganda	Overall Importance
	Cameroon		Nigeria					
	BUE	YAO	IB1	IB2	KAD	YOL		
Existence of a supportive health policy	High	Very high	Very high	Very high	Very high	Very high	Very high	Very high
Support from national (MOH) level	Mod	High	Very high	Very high	Very high	Very high	Very high	High
Procurement and supply	Mod	Very high	High	High	Very high	High	High	High
Health workers' attitude and ability to reach out to communities	High	High	High	Mod	High	Mod	Mod	High
Support by First Line Health Facilities	Very high	Very high	High	High	High	High	High	High
Competing vertical programmes and strategies, including the informal sector	Very low	Mod	Very low	Very low	Very low	Mod	Very low	Low

quantities, and subsidized by donor programmes. When national policy shifted to recommend ACTs, however, both drug prices and access problems emerged. Fortunately, all four Nigerian sites were located in states that benefited from donated GFATM supplies of child doses of imported Coartem®. The challenge was that these supplies were not adequate to cover the whole population, and so negotiation was needed to get supplies to the project districts, and to ensure their equal division across the five districts in each study site (including the comparison district). A commercially and locally-produced alternative ACT also was available, but districts did not generally chose to use their health budgets to buy this drug, since it was not subsidized and therefore was more expensive.

As in the case of malaria drugs, Nigeria's national strategies for ITNs also shifted during the study period. At the beginning of the CDI process, most study sites acquired and distributed bundled nets and insecticide treatment packets produced locally under programmes that had been initiated by the national government to stimulate bednet production by local textile and chemical manufacturers. Then, a large stock of donated nets was identified, and efforts had to be made to acquire adequate retreatment kits on their own. Then, there was a shift to Long Lasting Insecticide treated Nets (LLINs), supplied by the GFATM and other donor support systems. Overall, the shift to LLINs has made this programme component easier to manage, although competition for available nets among project and non-project districts arose, especially when LLIN distribution was also incorporated into politically-sensitive immunization campaigns.

2. SUPPORT FROM NATIONAL MINISTRIES OF HEALTH (MOH)

As already articulated in Section A, support of national ministries of health was vital. Some further detail is provided here on the roles and con-

tributions that were made, including: supportive policies and guidelines, basic capacity building and training, and managing and coordinating commodity procurement and supply processes.

As observed in Cameroon, development of the programme and community implementer training drew heavily on "national protocols for DOTS, Vitamin A and Malaria". The national MOH also played a key advocacy role, ensuring that intervention roles of other stakeholders were fulfilled.

Furthermore, as pointed out by the Uganda team, the national MOH partners made an important human resource contribution, insofar as they are civil servants and paid by the government. The fact that MOH personnel also were critical to the steady procurement and supply of essential materials was underlined in Uganda by a district health staff member who pointed out that, *"We are sure of sustainable supply of materials from the Ministry."*

The planning and coordinating roles of the MOH were underlined by a scientific officer from the Federal MOH in Nigeria, who noted that the MOH convened regular meetings where *"issues are discussed; plans are rolled out for activities relating to different programmes. We also coordinate the technical issues/plans for Roll Back Malaria, provide ITNs for the community, while also deliberating with all partners for the progress of the programme."*

Obstacles to support were also apparent at times, however. For instance, in Nigeria, the National Malaria Control Programme had been expected to make advocacy visits for CDI to the states, but as of the conclusion of the study, not all had been reached. The lack of advocacy and prompting from the federal level seemed to weaken the commitment at state level. For instance, the Yola study team in Taraba State, Nigeria, noted that the state

MOH had not followed through with the development of detailed budgets and implementation plans for CDI-related needs and activities. The team reported that *“the Taraba State Ministry of Health has a manager for each of the interventions but has neither workplans nor implementation schedules. There are no budget lines for their control.”*

3. PROCUREMENT AND SUPPLY

It is one thing for the national MOH to coordinate the initial procurement processes and another for the supply chain to work smoothly from national level all the way to a First Line Health Facility. All teams observed challenges concerning the procurement of commodities, which highlighted the importance of ensuring a good supply chain for a successful CDI programme.

In Cameroon, the Buea team reported a problem common to commodity procurement: a national shortage of ITNs available. This was attributed to the fact that the last national distribution campaign was in 2005, and recent supplies had been targeted to the northern part of the country only. The District Medical Officer of Foumbot summarized the problem saying, *“Presently, we are waiting for the deployment of materials, and the only problem resides in the fact that donor organizations are very exigent, and at times impose decisions regarding the distribution of ITNs. This has the inconveniency of perturbing the distribution thus provoking shortages in stock. (For example there was) the case of last year when ITNs were redeployed to the North for the polio campaign.”*

In terms of policies, the GFATM grants were supposed to ensure procurement of ample quantities of malaria commodities in all Nigerian project sites. However, for teams working in some sites, the reality was somewhat different. For instance, the Oyo State team experienced shortages of both nets and malaria drugs, though not as severe as those that had been experienced in Cameroon.

This arose partly because of changes in national malaria control strategies and guidelines during the term of the study, as well as the slow and uneven distribution of supplies among GFATM recipient states.

4. SUPPORT BY FRONT LINE HEALTH FACILITIES (FLHF) OF CDI PROCESS

The FLHFs were indispensable to the effective implementation of the CDI process. These front-line health centres indeed serve as the final link in the chain from the national, sub-national and district health system level to the communities.

Front line health workers thus have a pivotal role to play in engagement and follow up of the CDI process. They are the initial informants to the community about the CDI process and the nature of the interventions being made available. They must be the ones to obtain whole-hearted support of the community to engage in CDI, and initially mobilize community leadership. They follow and support the process, whereby community leaders mobilize members to take responsibility for acquisition and distribution of intervention materials. In addition, the health staff workers must report back to the FLHF. Further dialogue and discussion with the communities follow, and are crucial for obtaining ongoing commitment to CDI.

It was found that in study sites where there were clear policies and directives handed down from the national, subnational and district levels of the health system, as well as adequate intervention materials, then the FLHFs expressed a clear and purposeful sense of direction about the CDI process. One FLHF officer at the Yaoundé site in Cameroon recounted, *“As far as the distribution of Vitamin A is concerned, I am a mediator. On a technical stand point, I represent the Ministry of Health here. When I receive instructions, training, from the intermediate level, I have them implemented here, by establishing dialogue between*

the community and us technicians. ... So I share the training that I receive with the representatives of the community, the dialogue structure ... Then together, we mobilize the entire community."

For instance, in the evaluation phase in Cameroon's Buea study site, it was observed that most of the FLHFs had indeed been equipped with the resources needed to handle the different interventions, and this, combined with the appropriate technical skills and a positive attitude among personnel, insured a generally smooth process of implementation. As expressed by one FLHF staff member, *"In the area of sensitization and social mobilization, the nurse in charge of the Tonga health centre dispatched invitations calling on all the CDDs to mobilize their various communities according to a specific calendar he had established. This arrangement greatly facilitated things for us because on our arrival in the communities, the CDDs had regrouped people in their various community halls."*



At the same time, barriers to FLHF implementation that had to be overcome in some sites included:

- **Personnel shortages:** In some health facilities, there were inadequate personnel to carry out the process. As noted by the DMO in Cameroon's Foumbot District, *"There are so many difficulties. You know, the health personnel working in the different health institutions, notably the public health institutions, are not all that many. Most often, it is either one or two persons who work in the health centres, and considering the number of interventions to administer, it should be noted that these health personnel are overworked. Due to this overload, they find it difficult to freely manage most of the interventions notably CDI. During distribution periods, they are at times obliged to sacrifice health activities in the centres in order to properly administer these interventions on the field."*
- **Motivational factors:** Health staff who had been involved in ivermectin distribution generally appreciated the importance of community involvement. However, in some cases, local health system staff recruited to CDI from other disease control programmes still had to be sensitized to the importance of this outreach effort to communities that are often remote, thus difficult to access. Factors affecting health worker attitudes and motivation are explored in more detail in the following section.

5. HEALTH WORKER ATTITUDES, MOTIVATION FOR OUTREACH

The importance of motivating and enabling health workers at the FLHF level was crucial in rural settings where health workers receive low and irregular pay. Teams observed that not only must health workers have the staff, supplies and logistical support for reaching to communities beyond the end of the road, but they must also have a positive attitude to outreach.

Barriers to motivation and health worker performance were nonetheless described as being largely linked to material issues: inadequate salaries and inadequate subsidies for things like food and transport while on the job. *"We may not have enough fuel to reach everywhere,"* said one health worker from Uganda *"because health workers are few, we are overworked and may not have adequate time supervision of the activities. We lack allowances."* In addition, periodic local health system reorganization and chronic shifts in personnel and staffing also posed challenges. As one health worker explained, *"Being a new district, there has been a lot of recruitment and transfers. The new staff do not understand and appreciate the approach and consequently may not offer necessary support it deserves from the health workers. Staff do not know how to*

relate to community implementers. Some see them as useless because they are new in the system." Such problems, the CDI study teams recommended, need to be addressed when CDI is taken to scale throughout a province, state or region.

At the same time, health workers appeared to be strongly motivated by a range of intangible incentives. These included: their own involvement in planning meetings and workshops that allowed them to see that the CDI mode of delivery was feasible, the enthusiasm of communities about the CDI process and positive feedback received, the chance to acquire more knowledge, observed reductions in burden of disease over time, and their own internal sense of purposefulness and honor about a job well done.

Health worker motivation and attitudes: Field site experiences

"These planning meetings and workshops have helped us to see that the community can implement these programmes and also to know their health problem and try to solve it, e.g. distribution of ITNs, Coartem to prevent and cure malaria fever." [ITN programme manager, Kaduna study site, Nigeria]

"The response on part of the volunteers has been a motivating factor. They come to pick the drugs. When they are informed that the drugs are available they respond quickly. That's very encouraging." [Health worker, Uganda study site]

"Several indicators were in red when I was taking over the province. For practically two years that we are here, things are ameliorating." [Health worker, Buea study site, Cameroon]

"I am willing to continue to carry out these activities because I want to acquire more knowledge. The community does not motivate me. I am motivated by the urge to acquire more knowledge." [Health staff worker, Kaduna study site, Nigeria]

6. COLLABORATION AND COMPETITION WITH THE PRIVATE HEALTH SECTOR AND THE NGO SECTOR

Interactions between the public health sector and NGOs engaged in health service delivery, as well as interactions with the private, for-profit health services, were also factors to be addressed. In the case of NGOs, mostly positive collaborations were observed. Basic community-directed treatment with ivermectin has always been anchored in operational partnerships between a national or sub-national health authority and the international non-governmental development organizations that often operate in the field.

In Cameroon's Buea site, for instance, not only did such NGOs support interventions like CDI but, in addition, they funded home management of malaria during the CDI study process. Similarly, in Uganda, non-profit mission hospitals which share costs with clients, are typically well-stocked with drugs and other supplies when compared both to public and private, for-profit services. Recently,

there also have been moves by government to fund such non-profit health facilities, and/or contract with these facilities as they complement efforts of government, especially in areas where there are no government facilities. These services then, were well-positioned to collaborate in the CDI process.

On the other hand, competition between the public sector or NGO-supported CDI programmes and other actors in the informal, for-profit health sector, were also observed. For instance, CDI outreach to remote communities was sometimes viewed as competition with merchants also selling medicines and anti-malarial tools in those same areas. This was the experience in Nigeria's Yola site, for instance, where informal sector merchants are the ones to reach the most remote areas with their wares, ranging from home-crafted bednets, to anti-malaria drugs and vitamins (although not drugs for tuberculosis whose distribution is highly controlled).

Main findings – Health system dynamics

- ❖ Year 1: The CDI approach was generally appreciated in the context of the positive CDTi experience. Availability, procurement, supply and distribution of intervention materials proved difficult for most interventions.
- ❖ Year 2: The participatory consultation and sensitization process, and the improved availability of intervention materials, led to an increased commitment of the health system to the CDI process at all levels in all seven sites. Training for health staff at first-line health facilities played a crucial role. It takes more than one year to set up a CDI process.
- ❖ Year 3: Health systems in all sites were beginning to provide an enabling environment for CDI processes to occur. The supply of malaria-related intervention materials has greatly improved in Nigeria and Uganda but not in Cameroon where the logistics of distribution faced problems.

C. Engaging communities

An obvious but understated factor in establishing CDI at the community level is the process by which communities are mobilized. In onchocerciasis programmes, CDI intervention typically takes place in remote communities beyond the reach of modern transport systems. The first point of contact with these communities is the FLHF workers, and thus their role in engaging community support, as previously discussed, is pivotal.

Beyond the dynamics of the health worker contact, critical factors that made community engagement successful were analysed and identified throughout the CDI process. They are listed in Table 17 and then described in further detail.

1. YEAR-ROUND GEOGRAPHICAL ACCESSIBILITY OF COMMUNITY

CDI implementers from the communities need to be able to access health facilities to obtain intervention materials, and health workers need to be able to access communities for supervi-

sion. Good year-round accessibility thus facilitates the process, and reduced accessibility, particularly during the rainy season, was seen as a critical limiting factor in terms of community engagement. In this CDI study, all project sites had basic access to their community study sites throughout the year. However, accessibility during the rainy season was indeed reduced in some sites as was vividly captured by the Yaoundé site team who reported that broken bridges, poor quality of roads and infrastructure impeded implementation during the wet season. This barrier can be overcome by planning to commence interventions such as ivermectin distribution before the rains start, but less so in the case of other interventions, such as home management of malaria, which are required on a year-round basis.

2. PARTICIPATORY APPROACHES TO COMMUNITY MOBILIZATION

Communities were mobilized and sensitized to the CDI process, first by meetings between the local health officials and the community leaders, after which the community leaders mobilized the entire community for a general meeting. In this

Table 17: Critical contributing factors to engaging the community

Critical Factors	Level of Importance Based on Process Data						Uganda	Overall Importance
	Cameroon		Nigeria					
	BUE	YAO	IB1	IB2	KAD	YOL		
Year-round geographical accessibility of community	High	High	High	High	High	High	High	High
Participatory approaches to community mobilization	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high
Community perceives value of interventions	Very high	Very high	High	High	Very high	Very high	Very high	High
Community perceives value of community-directed approach	Very high	Very high	Very high	Very high	Very high	Very high	High	Very high
Political leadership in communities	High	Very low	Very high	Very high	Very high	Very low	High	High

meeting, members collectively discussed health problems and possible interventions, as well as what interventions they wanted to adopt and whether they would indeed take responsibility for implementation. The community would then discuss how, when, where and by whom the interventions would be implemented, and what support should be provided to the implementers.

The smooth and rigorous execution of a genuinely participatory process was in fact critical to ensuring community engagement. Facilitating factors described in the sites below included: oral presentations in local languages; sufficient opportunities at meetings for community members to express their concerns and also support for the process; selection, presentation and installation of community implementers at mass meetings; routine monthly meetings of community implementers, leaders and members for follow-up; specific engagement with traditional opinion leaders and networks; consideration of gender and religious factors influencing engagement, etc.

In Cameroon's Buea site, community implementers chosen by the communities at mobilization meetings, were installed. Presentations were done in the local languages (Bamileke-medumba in Bangangte, Yemba in Dschang, and Fefe in Bafang and Bamoun in Foumbot) to foster understanding given that most of the participants were illiterate. The meeting also discussed the responsibility of the communities in the motivation of the community implementers. Community members expressed their adhesion to the CDI process by their attitude, their contribution and their massive presence at mobilization and sensitization meetings. Community members thus perceived the CDI interventions as addressing the major health problems they face.

In Nigeria's Ibadan 2 site, traditional political and social leaders were engaged, to facilitate wider community involvement. These leaders included the chief-in-council, heads of households, women's representatives such as the 'iyaloja' or market women leadership, and other key opinion leaders. This leadership expressed their commitment to the CDI process via actions such as: dissemination of traditional council meeting outcomes to community members; coordination of CDD selection processes; provision of logistical support; and recruitment of community members, particularly children, for malaria treatment and Vitamin A distribution. In addition, addressing the existing gender and religious networks proved to be key to community mobilization. As noted by one female informant: *"Our husbands are the ones attending meetings and taking the decisions. They only come home to inform us of the decisions taken;"* and the youth groups also said that *"We do not take part in decision making, it is the elders who take decisions."* Religious institutions were used for community mobilization, as noted by one informant: *"We pass the information across to people during prayers in the morning at the mosque."*

In Nigeria's Ibadan 1 site, monthly meetings were held in each of the implementing communities which enabled the CDI implementers, community members and community leaders to interact and discuss problems and progress. Community leaders provided logistical assistance to the programme whenever necessary.

In the Ugandan study sites, community mobilization was done mainly through community meetings where decisions were made. States a female community leader in Kanungu district, Uganda, *"A community meeting was held to decide who could help in distributing the drugs of onchocerciasis. Two people were at first selected and trained, but later two others were*

added as other interventions were established. Thus in total, we have four functioning volunteers in this village.” Adds a male health official in the same district, “The community members decide on how they want the drugs delivered to them in a given community. Community members elect and decide on how to receive the drugs.”

3. COMMUNITY PERCEPTION OF THE VALUE OF CDI INTERVENTIONS

The community's perception of the value of the interventions was another factor in the success of the CDI process. Usually that perception was expressed positively, although there was some variance, site to site. This perception was expressed largely in terms of the tangible improvements experienced by individuals in their own health and that of their neighbors, particularly malaria and filaria, as well as in terms of the increased availability of tools such as bednets and anti-malarial drugs. Local opinion-leaders, however, tended to refer, as well, to data such as school absenteeism, referrals to health facilities or economic benefits.

For instance, in Uganda's sites, perception of value was based on the way drugs such as ivermectin reduced the skin-related conditions of onchocerciasis: *“Some people had bad skins, but now there's remarkable improvement. We no longer suffer from itching,”* said one female key informant from Ad Arua, Uganda.

In Nigeria's Kaduna site, however, value, as perceived in an interview with a youth development leader, was described in terms of broader socio-economic trends and benefits: *“The benefits are numerous. We were the most endemic community for onchocerciasis in this LGA and since its introduction in 1989, we have benefited from the drug, now the disease is almost gone. The other benefits are improved health,*

particularly of children. I now see fewer absentees in school due to malaria. The strategy has also helped us to save money from medication due to ill health.” [In-Depth Interview with Youth Leader, Dan Alhaji community, Lere LGA]; *“The economic benefit is that we now have free drugs, so we use our money to buy fertilizer. In terms of social benefits, our kids are healthier now and hardly one day absent from school. The intervention has also reduced the number of patients going to the health facility for malaria. This has also improved economic productivity in the community.”* [Interview with a community implementer, Kurmin Baba community, Kachia LGA].

In Cameroon's Buea site, community members and decision-makers perceived the value of CDI interventions in terms of the decline in disease burden from filaria and malaria, which they regard as two of the area's most serious problems. *“If you glance on my consultation register, you will notice that since the implementation of this (CDI) programme, the number of people consulting for malaria is only decreasing. This means that many are putting into practice the advice they received,”* said the Chief of the Kassang Health Centre. Another community member, speaking during a focus group discussion in Lepia, stated, *“...filaria is really a serious problem in this community. If not for the main Catholic mission hospital in Dschang, (which treated onchocerciasis prior to the introduction of CDI), and now the CDI process, which has been successfully fighting these diseases, most people would have gone blind in this community.”*

Meanwhile, in Nigeria's Ibadan 1 site, testimonials by some community members stimulated others to try new devices like bednets, and thus increased the demand for bednet purchases. As noted by one CDI project field officer: *“Mr Ajayi asked whether more nets will be supplied for*

sale because those who had purchased the two brought to the community have testified that the nets are good, especially for rural dwellers...". The same field officer reported that according to a local implementer, "Many people have registered their names against next batch of ITNs and were also 'troubling' the local implementer to go collect more nets at the Local Government Secretariat."

4. COMMUNITY PERCEPTION OF THE VALUE OF THE CDI DELIVERY APPROACH

Since the trial of CDI was initiated in communities already experienced in the community-directed distribution of ivermectin, community members were predisposed to seeing the inherent value of the CDI delivery approach in light of their experiences with CDTi. Focus group discussions sought to examine these perceptions and also identify how the new integrated CDI system was perceived by community members. Generally, responses to CDI were positive. CDI

was seen as extending treatment benefits more broadly than the single-intervention programme with ivermectin, since in any annual ivermectin distribution, not all community members are qualified to receive treatment (e.g. children under the age of five). Members who might otherwise perceive themselves or their children as excluded from the benefit of ivermectin distribution, could, under the CDI system, benefit from the distribution of tools such as Vitamin A, antimalarials and bednets.

In addition, the fact that the drugs and tools were free made a difference to community perceptions: *"Because the drugs are given free and we wish the programme continue so that we will benefit more,"* stated community members at a focus group discussion in the Ibadan 2 study site in Nigeria.

However, even in cases where CDI systems required payment, community members were generally positive about the greater availability of tools and medicines. As Mr Orimolade Moses stated in the Ibadan 1 study area, *"We thanked 'government' for remembering this community in their programme."*

Other focus group participants relayed that, on the whole, the implementation of the CDI philosophy by community members had yielded other indirect benefits, such as the opportunity to learn about health habits which prevent exposure to diseases.

The perception of the effectiveness of CDI was summed up in various ways by young male focus group discussion participants at Nigeria's Ibadan 2 site: *"Drugs distribution is better under CDI than CDTi;"* and *"CDI process is functioning well;"* and *"It's still on, it has not stopped;"* and *"The effect is felt in the community, and everybody appreciates the CDI process."*



5. POLITICAL LEADERSHIP IN COMMUNITIES

Engagement of political leaders was a critical factor to community support in each of the study sites, as the leaders also facilitated mobilization and logistical support for the CDI process. In some settings, traditional village leaders were the key actors, whereas in others, it was government-associated political leaders, as evidenced in the two examples below.

In Cameroon's Buea site, the authority of the village or community chief is supreme. He stands as the first judge and the first ambassador of the community. In concert with his notables, he governs the village, and no major communal decisions or actions can be taken without his support. Mindful of this authority, the health personnel in the CDI districts took the necessary steps to involve traditional communal chiefs and leaders in the introduction of the CDI process, and this greatly facilitated the acceptance of the interventions in the communities. Dialogue thus established also constituted an indispensable asset in overcoming any subsequent problems or barriers that might emerge in the community to the CDI process.

The importance chiefs ascribed to their own role in the process is evident in the declaration made by one such leader: *"Being the chief of centre of Baboutcheu-Ngaleu that constitutes four villages, I regrouped the chiefs and notables and we discussed in relation to the different interventions on the field and the choice of community implementers."*

In Nigeria's Ibadan 2 site, on the other hand, political actors associated with the government wielded greater communal leadership and influence, sometimes with mixed results. On the one hand, political leaders in the study districts generally regarded public health as a priority, and were supportive of the CDI initiative, which they also saw as cost-effective. On the other hand, political leaders sometimes would use their influence to gain personal benefit from the CDI process. For instance, in one district, the wife of the district chairman stockpiled bednet supplies intended for CDI distribution, and would give them away as gifts to friends, relatives and visitors.

Main findings – Engaging communities

- ❖ Participatory, consensus-building approaches to community mobilization are critically important.
- ❖ High perceived value of malaria interventions (esp. HMM with ACTs) facilitates CDI.
- ❖ Communities value implementers residing in the community.
- ❖ CDI implementers need to access health facilities and health workers need to be able to access communities: reduced accessibility during rainy season hampers the CDI process.

D. Empowering communities

The key long-term aim of CDI is to empower communities. This means empowering them not only to manage the immediate distribution of essential health commodities, but also to progressively assume more responsibility for CDI activities. Empowerment is regarded as having been achieved when communities can sustain implementation of existing interventions, and also expand into other areas of perceived need. “Empowered communities” thus not only take charge of existing interventions but take initiative on new interventions.

Empowerment is the result of a long-term process and commitment to the cause of community health. Introducing CDI through community meetings in a participatory manner was a crucial first step in empowerment during Phase I of the study. The critical contributing factors for community empowerment as identified at the end of three years of intervention are portrayed in Table 18, and then described further in the following section.

1. INFORMATION SHARING

Making information widely available was regarded as critical to empowerment, as was the training of community members. In general, information and training opportunities increased the awareness and ability of more members to participate and gradually take more initiative in the CDI process. To facilitate information sharing, it was important to work through traditional political structures and hierarchies. In the Ibadan 2 research site, for example, the chiefs and their respective village councils were instrumental. Traditional leaders’ commitment to support the CDI process was then backed by dissemination of council meeting outcomes to community members through the traditional ‘town-crier’.

2. COMMUNAL INTEREST IN CDI FOCAL ISSUES

Communities are more likely to take and sustain action on issues if they perceive a clear and vested public interest. As in the initial phases of engagement, longer-term community empowerment was facilitated by actions taken around a

Table 18: Critical contributing factors to empowering communities

Critical Factors	Level of Importance Based on Process Data						Uganda	Overall Importance
	Cameroon		Nigeria					
	BUE	YAO	IB1	IB2	KAD	YOL		
Wide availability of information and training	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high
Common interest	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high
Self-help spirit	High	High	Very high	Very high	Very high	Very high	High	High
Trust among community members	High	Very high	Very high	Very high	High	High	High	High
Community selection of CDI implementers	High	High	High	High	Very high	Very high	High	High
Long-term commitment and frequent encouragement by FLHF staff	High	Very high	Very high	Very high	High	Very high	Mod	High
Continued participatory approach	Very high	Very high	Very high	Very high	Very high	Very high	Very high	Very high

perceived common interest, where it was clear that tangible health and economic benefits could be derived for the community.

For instance, in Cameroon's Buea site, focus group discussion members and key informants observed that: *"CDI communities are satisfied with the effectiveness and the efficiency of Mectizan®, antimalaria drugs, tuberculosis treatments, and of Vitamin A. In effect, ivermectin (Mectizan®) and Vitamin A are free of charge. Antimalaria kits and tuberculosis treatment are so efficient that even the poorest villager can have access to it." The CDD of Beyana (Koupare) explained that, "The fact that Mectizan® is free of charge has protected us from many things. The money that we would have spent on the treatment of filaria in the hospital is used in doing other things. The efficiency and the effectiveness of anti-malaria kits maintain us in good health condition."*

3. SELF-HELP SPIRIT AS REFLECTED IN COMMUNITY OWNERSHIP

The fostering of community ownership was anchored first of all in consultative meetings at community level, where roles to be played by communities and the health system in the CDI process were discussed and determined by agreement. This naturally stimulated community member expressions of support for the process in which they had a determining voice, and gave disadvantaged groups (e.g. women) a chance to express themselves. In Nigeria's Yola site, for instance, mothers asserted their desire in community meetings to replace men in managing distribution of antimalarial commodities in their communities. In the Ibadan 1 site, people in the communities sometimes provided money for implementers' transportation. Some community members supported CDI implementers through the provision of in-kind labour, assisting in tilling their farms and harvesting crops (e.g. cassava) during the time that implementers were busy with CDI activities.

4. TRUST AMONG COMMUNITY MEMBERS

Trust among community members facilitated the sustained implementation of the CDI process, and thus community empowerment. In Uganda, a key motivational factor for CDI implementers was the confidence displayed by the community. Most community implementers felt that abandoning the task would betray the people who had entrusted them with the responsibility. An example of the effect of trust was expressed by an implementer from Uganda's Arua site, who said that, *"I cannot let down my community since they chose with trust."* Another implementer echoed this by saying, *"I am willing to continue to serve because people still trust me and I think am doing it well. It does not make tired. I do it here in the village."*

Community implementers in Nigeria's Yola site are highly respected among the community members, and the political capital generated through their efforts reinforces their commitment to their task. Despite complaints of working without compensation in cash, the CDI implementers were thus reluctant to abandon their responsibility. For their part, the community members in interviews and focus group discussions, praised the CDI implementers, describing how they occasionally pray for them and their families in appreciation.

5. COMMUNITY SELECTION OF CDI IMPLEMENTERS

While CDI does not require the designation of specific implementers, the involvement of local volunteers is seen by most communities as an appropriate way to ensure the work gets done. The recommended approach is that if the communities decide they want volunteer implementers, they should discuss appropriate selection criteria and then carry through with the selection.

Part of the process of engaging and empowering the community involves the encouragement of community members to select their own imple-

menters in a manner that best suits their interests. In some villages, one implementer might handle all interventions, while in others, people may think it best to divide the workload. In the latter case, some interventions were perceived as more appropriate for female implementers while others were more often assigned to males. What is important is that the community makes these decisions. True community decision-making and follow-through with support of the implementers by the community is visible evidence of empowerment.

In Phase I of the study, all sites embarked on a major effort to help communities to identify and select CDI implementers. In Nigeria's Yola site, implementer selection was a decision made by community members and their leaders, through community consensus-building.

In Nigeria's Ibadan 2 site, the selection of implementers was done during community meetings after prior notice to that effect. The criteria set for selection included: skill, experience with previous programmes, literacy level, gender and integrity. In the Ibadan 1 site, a uniform method of selection was adopted across all communities implementing Vitamin A distribution, which involved meetings where implementers were chosen. However, there were variations in the process of selection.

In some communities, local leaders simply chose those whom they perceived to be capable, and this decision was approved by communities because, *"We always support the decisions of our elders so as not to put them to shame."* In others, the selection was more a result of popular opinion, whereby implementers were selected because they were perceived to have attributes such as faithfulness and honesty. In other cases, implementers volunteered to serve.

Sometimes in the same community there were different perceptions of the same process. In Balogun Community of Iwajowa LGA (Ibadan 1) in Oyo State, Nigeria, older male participants of focus group discussions were more likely to say that implementers were popularly selected, while younger male participants and women were more likely to say that they were chosen by community leaders, e.g. *"It is the community leaders including kings,"* who performed the selection. Nonetheless, some of the reported criteria for selection included statements like, *"They are educated, intelligent, sharp and diligent."*

All research teams observed that when the whole community participated in the selection process, they subsequently also gave greater support to the volunteers to carry out CDI tasks.

Main findings – Empowering communities

- ❖ Information and training increased awareness and ability to participate.
- ❖ Common interests facilitate collective action.
- ❖ Community selection of CDI implementers important to enhance ownership and continuity. Selection not always achieved.
- ❖ Long-term commitment and frequent encouragement by FLHF staff critical but needs to be maintained.
- ❖ Continued participatory approaches remain necessary.

E. Engaging CDI implementers

Engagement of CDI implementers refers to the process not only of selection, but also to training, enabling, remuneration, motivation and supervision. These various tasks proved to be a critical, albeit complex and time-consuming, aspect of the CDI process.

Research teams agreed that the following critical factors were key to the successful engagement of implementers. These are noted here in Table 19 and described further below.

1. WILLINGNESS TO TAKE INITIATIVE

In Nigeria's Yola site, women were not initially involved as CDI implementers because past experiences with ivermectin distribution had involved moving from one house to the other, a task that was regarded inappropriate for women in this particular area. However, the management of malaria was considered more suitable as it involved the treatment of children, an area which women were considered more knowledgeable. Male implementers also were not always available when a mother with a child

with fever was looking for help. In some communities, women then took the initiative to meet and discuss this issue, and subsequently insisted that women should handle the anti-malarial drugs after appropriate training. In this study, as well as in the original CDTi research on ivermectin distribution, it was observed that the initiative displayed by CDI participants not only to participate in CDI at the outset, but also to fine-tune CDI systems in light of lessons learned over time, was an important indicator of programmatic effectiveness.

2. SELECTION BY COMMUNITY

Just as community selection of implementers contributed to empowerment of communities, community involvement in selection of community implementers also was more likely to result in successful engagement of implementers who were appropriate and motivated for the task. In Nigeria's Oyo State, community implementer selection, through community consensus-building, was based on traits such as popularity, education (secondary school, diploma in community health), honesty, work ethic, interest and previous experience, e.g. persons who

Table 19: Critical contributing factors to CDI implementers

Critical Contributing Factors to CDI Implementers	Level of Importance Based on Process Data						Uganda	Overall Importance
	Cameroon		Nigeria					
	BUE	YAO	IB1	IB2	KAD	YOL		
Willingness to take Initiative	High	High	High	High	Very high	Very high	Very high	High
Selection by community	High	High	Very high	Very high	Very high	Very high	High	High
Skills and relevant experience	Very high	Very high	Very high	Very high	High	Very high	Mod	High
Motivation by extrinsic (material) incentives	Mod	High	Mod	High	Low	Mod	Low	Moderate
Motivation by intrinsic incentives	High	Very high	Mod	High	High	High	High	High

took part in a previous CDTi programme. Community members saw the implementers who were selected as suitable to their tasks. This was reflected in focus group discussions; participants made comments such as the following: *“They were selected in a meeting in which every member of the community participated in the selection; we selected them because of their various experiences in health and because they are respectful and God-fearing; they were chosen because they have time for it; they are the set of people who can endure, no matter how people insult them.”*

In cases where community implementers were not selected by the community as part of a broad and consensual process, then problems of divided allegiances or lack of commitment to community service emerged over time.

3. SKILLS AND RELEVANT EXPERIENCE

Generally it was observed that the community implementers demonstrated ability, dexterity and know-how in the management of the five CDI interventions. This can be attributed to the training they received at the various health centres, which built appropriate skills to support their engagement and commitment. Following training, supervision of the CDI implementers is usually carried out by the health worker in the frontline health facility. In the case of Vitamin A, supervision occurs twice a year during the routine distribution of the drug.

During the final review of CDI study results in Douala, Cameroon, the study teams agreed that community implementers had generally demonstrated great proficiency in implementation of the different interventions, from the initial phases of social mobilization and sensitization to drug distribution, record-keeping and evaluation processes.

The team in Cameroon's Buea site documented the training experience extensively so as to provide evidence of the relationship between training and implementer engagement. Training was based on a manual entitled *Guide pratique destiné aux relais communautaires* developed by the Buea site study team. Rate of attendance was above 80% in all of the health districts for the first round of training. A second round of training was organized for those who were absent and the participation rate rose to 98%. Pre- and post-tests in Buea indicated that the training methodology had been embedded in the implementers as well as understanding of the CDI philosophy, principles of an integrated approach, and specific knowledge of each particular intervention. This was also an indicator of the quality of methodology and training.

4. MOTIVATION BY EXTRINSIC (MATERIAL) INCENTIVES

Overall, motivation by extrinsic (material) incentives was certainly noted as an issue for implementers in several sites. At the same time, material incentives were not perceived as carrying the same overall weight as intrinsic incentives, discussed in the next section.

Expectations that the CDI programme would yield monetary incentives existed, partly due to the fact that past NGO, state and donor-supported health efforts frequently involved such rewards. For instance, allowances were often given to “volunteers” who participated in National Immunization Day campaigns.

In the case of CDI, however, there is no external (donor or state) support or provision for material incentives to implementers. As a result, communities themselves must decide what kind of incentives they want and can afford to provide implementers. In practice, there was wide variation in the kinds of incentives communities

offered to implementers: some communities provided material rewards such as coverage of transportation costs, while others provided non-monetary incentives such as prayers and greetings, while still others provided in-kind support of farm produce or labour, e.g. help with farm work.

In Nigeria's Yola site, monetary remuneration of community implementers was not part of the project, but transportation fare and money for refreshments were provided during the training. Participating communities, however, provided forms of motivational incentives for implementers. These were usually household gifts and ranged from monetary incentives of 10 to 20 Naira (US\$ 0.08-0.16) per household to non-monetary, in-kind incentives such as yams, corn and groundnuts, or as appreciation from the community, such as thank you's and commendation for work well done. These incentives were usually voluntary and were not enforced.

In Nigeria's Kaduna site, financial incentives for implementers were not approved at community meetings. However, in communities where certain implementers were already enrolled by the health district as "guides" for a parallel Vitamin A distribution scheme, they received a one-time payment of 2000 Naira (US\$ 16.67), which they shared with other community implementers.

Incentives were not always deemed to be sufficient. In Nigeria's Oyo State, the Ibadan 2 team found that some implementers had contemplated dropping out of the process because, in their words, *"the incentive is not enough."* In Cameroon's Buea research site, focus group discussion respondents reported that a number of community implementers had resigned partly due to lack of financial motivation. However, other implementers then rapidly stepped in as replacements despite the frustration with a lack of material incentives. As one community imple-

menter stated: *"If we not do act now, we will still find ourselves absenting from our farm work because this or that person is dead. The excess malaria in this community kills so many people. I have therefore decided to do the work even if I am not given anything. I will do it till I die. We have to help our village."*

5. MOTIVATION BY INTRINSIC INCENTIVES

Although mention of material or extrinsic incentives was an issue, the intrinsic motivators, such as recognition, feeling of making a contribution and knowledge gained, were more often highlighted by the implementers as motivational issues in focus group discussions and evaluations.

Important forms of motivation often cited included pride in the services provided, community recognition derived, a sense of motivation to give service, and the positive sorts of feedback that community members provided to implementers.

Examples of intrinsic disincentives were also noted on occasion. In Oyo State, one community member



cited the “uncooperative attitude of some people in the community,” and “inadequate number of drugs, costly nets and frequent journeys to the hospital under DOTS.”

However, the positive reinforcement given and received by implementers were more frequently mentioned. In terms of citations of achievement and recognition, CDI implementers at Cameroon’s Buea site, as well as in other study sites, noted that their ID badges were a source of pride and also lent them credibility when mobilizing communities and providing information on HMM to household members. In Pouma District, Cameroon, participants cited the importance they ascribed to dialogue between community implementers and the health team in maintaining interest and commitment.

Community implementers in their conversations and reports to project field officers, also referred to the verbal expressions of appreciation they had received from community members as a motivating force. Implementers also cited their own feelings of connection to their communities, as well as a sense that they shared the same problems and vulnerabilities to disease, as being motivational factors.

As one implementer from Nigeria’s Ibadan 1 field site noted to the project field officer: “I am working to improve the life of my people because we don’t have a health centre or health officers in our village.” Another implementer from Nigeria’s Oyo State, was reported as saying: “I am willing because of love I have for my community, and this programme also will improve the health of individuals in the community.”

In Ibarapa North LGA of Nigeria’s Oyo State, the implementers also cited incentives such as encouragement and appreciation, and said that while such incentives may not always be adequate, they were also driven by a sense of community service: Said one informant: “I am intentionally and voluntarily ready to serve my community.”

In other cases, community implementers noted that they, too, derived benefits directly and indirectly from their participation in the programme, for their own families and children: As stated by one implementer in Uganda: “I am willing to continue because I also have a family and children. When my children fall sick, I do not have to run anywhere. I just pick a HOMAPAK and give to my children. In most cases, they have always responded.”

Main findings – Engaging CDI implementers

- ❖ Selection of CDI implementers by communities is critical.
- ❖ CDI implementers are committed to serving their communities.
- ❖ CDI implementers are generally motivated by intrinsic incentives.
- ❖ CDI implementers mention desire for extrinsic incentives, however this has not significantly affected their willingness to serve.

F. Broader systems effects

The true embedding of CDI in communities also was conditioned upon, and reinforcing of, broader changes in the ways communities and health service related to each other, e.g. broader 'systems' effects. These went beyond the narrow range of introduction of the various interventions into CDI and health systems. Four examples of the broader effects are:

1. COMMUNITY AWARENESS EFFECTS

Communities became increasingly aware of public health issues, health commodities and their rights to access health services as a result of the CDI process. This awareness, in turn, reinforced their commitment to CDI and other health measures.

Once aware of the extent of their rights and responsibilities, they were more assertive about receiving adequate services from health authorities. For instance, in the village of Garbacede in Nigeria's Taraba State, a blind cleric led a community protest for antimalaria commodities to be supplied in adequate quantity. In Ibadan 1, when community members were informed that Coartem® would be made available for HMM, implementers were consistently pressured by community members to bring the promised drugs, until supplies began to arrive.

2. GENDER EFFECTS

Over the course of the study, more women attended meetings, spoke out and were selected as CDI implementers, particularly as a result of growing awareness of their potential role in malaria treatment. Over time, women became more outspoken, participated more actively, and demanded that responsibilities be assigned to them.

3. COMMUNITY DEVELOPMENT EFFECTS

Community-based organizations, including women's groups, became more involved over time. For

instance, in Nigerian communities covered by the Ibadan 1 site, the market women's association now plays an active role in CDI activities, mobilizing members to obtain CDI services. Interest in community development stimulated initially by CDI, gradually was observed to expand to other development efforts.

4. HEALTH WORKER EFFECTS

Health workers became more engaged in outreach activities as a result of CDI. Health workers came to see community implementers as partners, involving them in other outreach activities as well, for example in prevention of sexually transmitted infections. Health workers also reported that they enjoyed the stimulation of training and supervising CDI implementers.

Other impacts that strengthened the health system were noted by programme coordinators for onchocerciasis and Vitamin A distribution, particularly: more advanced and coherent planning; dialogue between health system workers respon-



sible for different interventions; and more interaction with community stakeholders. For instance, a CDTi coordinator (for ivermectin distribution) from Nigeria's Kaduna site explained how the more integrated CDI process helped general health planning in the district. *"We have put in place arrangements for problem solving. We hold only one meeting. We also have planning meetings where budgets are written for the year. The meetings allow members to give feedback to the LGA coordinator on their past activities, and it also helps us to know the way forward. The entire process of distribution is being looked at, problems identified and solutions to these problems produced."*

In terms of interactions with communities, a health worker from Uganda noted that CDI had strengthened the health system by building capacity in communities, e.g. in the form of community implementers (also sometimes called community drug distributors). *"We have built capacity of the CDDs and since we work with them, they see us as partners and we can easily request them to do any programme that comes up. Some dedicated CDDs have been promoted to become nursing aids. It's easy in that they can easily distribute the drugs to their homes. No more moving long distances seeking medication."*

8 CONCLUSIONS AND RECOMMENDATIONS



A. Conclusions

Based on the extensive, ‘real-life’ evidence generated during the three years of the study, the research teams arrived at the following conclusions with respect to the effectiveness and efficiency of CDI, and the critical factors that influence the process.

Effectiveness of CDI for interventions with different degrees of complexity

The CDI approach was much more effective than currently used delivery approaches for all studied interventions, except DOTS:

- More than twice as many children with fever received appropriate antimalarial treatment in districts where home management of malaria was integrated in the CDI package, with the percentage receiving appropriate treatment largely exceeding the RBM target of 60%.
- Possession and utilization of ITNs was two times higher in the CDI districts, in spite of shortage of ITNs in most study sites.
- Vitamin A coverage was significantly higher in the CDI districts than in the comparison districts.

The addition of multiple interventions to the CDI package did not have any negative effect on ivermectin treatment but boosted ivermectin treatment coverage by an additional 10%.

At least 4 to 5 interventions could be effectively implemented through the CDI process. The effectiveness of integrated CDI increased over time following the “maturation” of the CDI process.

Types of interventions that can be appropriately delivered through CDI

When given the opportunity and necessary support, communities and community implementers could effectively implement each of the five study interventions, irrespective of their level of complexity as initially defined at the start of the study. There were no intervention-specific technical limitations that prevented implementation by community volunteers. The only constraints observed were social constraints, e.g. stigma in the case of DOTS, and health system constraints, especially with respect to health policies and supplies.

Hence, it is concluded that the CDI process is an appropriate model for the delivery of health interventions that have the following characteristics:

- interventions for which the community can be engaged and empowered to take control of implementation;
- interventions for which the health system agrees to empower communities for implementation;
- interventions that can be adequately delivered by lay health workers without extensive training;
- interventions for diseases perceived as an important health problem that affects all sections of the community;
- interventions that have a clearly perceived benefit;

- interventions for which materials are expected to be adequately accessible to the community.

Provider cost of CDI for integrated delivery of interventions

With respect to costs to the health system, CDI is more efficient than conventional delivery systems because with lower implementation costs at the health district and first line health facility level, the CDI process achieves higher coverage for different interventions.

At the community level, there is an increase in opportunity costs with CDI, reflecting greater time commitment from community volunteers, who are largely motivated by intrinsic incentives such as recognition, status, knowledge and skills gained, etc.

Factors critical to facilitating the CDI process

Based on the aforementioned points, as well as the findings in Chapters 5, 6 and 7, the most critical factors observed to facilitate the CDI process are:

- extensive stakeholder consultation and consensus-building;
- health policies, tacit or explicit, that support community-based delivery of the intervention, or at least do not create barriers to such delivery;
- health systems support to community empowerment;
- buy-in from health workers at all levels in the CDI process;
- community engagement in the design and implementation of CDI;
- broad-based community involvement in the selection of implementers;
- regular, adequate and timely supply of materials.

Critical factors that facilitate integration

The study has provided unique information on the feasibility and effectiveness of integrated delivery of interventions at the community level. Integrated delivery (also called co-implementation) of different interventions through the CDI process proved perfectly feasible, and based on the lessons learned, it is concluded that integration through CDI will be greatly facilitated by the following factors:

- proven willingness and ability of community implementers to deliver multiple interventions;
- proven efficiency of CDI leading to cost savings at health systems level;
- increasing interest of the health system in CDI;
- interest of health workers in the process of planning integrated, community-based interventions;
- motivation of health workers by positive feedback from the community;
- increasing interest and openness of stakeholders to integrated approaches.

The primary factor seen to hinder effective integrated delivery, nonetheless, was a shortage of supplies for any one material item. An integrated strategy that brings together several interventions will require extra efforts to ensure that intervention materials for all interventions are available at the FLHF level.

Factors facilitating the CDI process and facilitating integrated delivery of interventions can thus be summarized as involving: an appropriate choice of interventions at a level of complexity compatible with the needs of the community and their capacity to deliver, as well as with the policies and functionality of the health system, from national to local levels.

B. Recommendations

- Where already established for onchocerciasis control, the CDI approach should be used for the integrated, community-level delivery of appropriate health interventions.
- CDI packages should be developed on the basis of local considerations and criteria derived from this study regarding the type of interventions that are appropriate for CDI. These include:
 - malaria interventions – the CDI approach should be used to overcome the current obstacles in getting antimalarials and ITNs to the people who need them;
 - Vitamin A – The CDI approach should be considered as an effective alternative mechanism for Vitamin A distribution.
- Special advocacy will be needed to ensure reliable supplies and supportive policies.
- Priorities for future research should include the following:
 - implementation research on how to efficiently introduce CDI in areas where onchocerciasis is not endemic;
 - health systems research on issues of supply;
 - implementation research on scaling up CDI.

9

ANNEXES

A. Research instruments

A total of 20 instruments have been developed for the collection of data. A short description of these instruments, and to whom they were administered, is given in the table below.

Table 20: List of study instruments

	Instrument	To be administered to	Timing
1	Survey questionnaire for ivermectin coverage	Every member of selected five sample households in each of the 10 sample evaluation villages in each district	One month after delivery
2	Survey questionnaire for Vitamin A coverage	Women/child minders with children less than five years old in five sample households with under five children in each of the 10 sample evaluation villages in each district	One month after last delivery
3	Survey questionnaire for ITN coverage	Household head or other persons who can provide information of five sample households with under five children in each of the 10 sample evaluation villages in each district Information to be collected on every household member	End of year
4	Survey questionnaire for HMM coverage	Women/child minders with children less than five years-old in five sample households with under-five children in each of the 10 sample evaluation villages in each district	End of year
5	Survey questionnaire for DOTS	All TB patients in the study communities who are registered with the health facilities and who should have been under treatment within the last 12 months	End of year
6	Factor questionnaire for programme coordinators	Programme managers for each intervention at district level	End of year
7	Factor questionnaire for community leaders	One traditional leader; one women leader; and two community development leaders, CBO leader or religious group leader in each of the 10 sample evaluation villages in each district	End of year
8	Checklist for community level	Traditional leader assisted by community agent in each of the 10 sample evaluation villages in each district	End of year
9	Checklist for district level	Programme manager in each district	End of year
10	Checklist at NGO level	One focal person for each NGO involved in the delivery of intervention in study areas	End of year
11	In-depth interview for CDI implementers	One male and one female implementer in each village; one male and one female formal health workers per village	End of year
12	In-depth interview for partners	One focal person per NGO, donor, MoH, UN agencies, CBOs and other relevant community groups in each district	End of year
13	Community level focus group discussion (FGD)	Two youth male FGDs, two youth female FGDs, two adult male FGDs and two adult female FGDs per study district	End of year
14	Background costing data sheet	Information to be obtained for relevant documents	End of year
15	Cost questionnaire for programme coordinators	Programme coordinators for the five interventions at district, regional and national levels	End of year
16	Cost questionnaire for in-charge at district level	Officer in-charge at district level	End of year
17	Cost questionnaire for first line health facility	Officer in-charge at first line health facility	End of year
18	Cost questionnaire for community leaders	Community leaders/key informant in 10 evaluation villages in each district	End of year
19	Cost questionnaire for community volunteers	Volunteers for the study interventions in 10 evaluation villages in each district	End of year
20	Cost questionnaire for households	Head of households of five sample households in each of 10 sample evaluation villages in each district	End of year

B Table of major CDI partners

Type	Oncho	TB	Vitamin A	Malaria
International NGO, PVO	The Carter Center, Helen Keller International, Sightsavers International, Christian Blind Mission	German Leprosy Relief Association Damien Foundation Netherlands Leprosy Relief	Helen Keller International, Sightsavers International, Christian Blind Mission, The Carter Center	Tul sai Charai Foundation
Donor, Technical Assistance Provider	APOC Mectizan Donation Program	USAID STOP TB	UNICEF Canadian International Development Agency	RBM Partnership USAID UNICEF WHO
National Public Sector	National/Federal Ministry of Health – specific program units State/Regional Ministry of Health District Health Departments	National/Federal Ministry of Health – specific program units State/Regional Ministry of Health District Health Departments	National/Federal Ministry of Health – specific program units State/Regional Ministry of Health District Health Departments	National/Federal Ministry of Health – specific program units State/Regional Ministry of Health District Health Departments
National NGO, PVO	MITOSATH Mojes Foundation			Yakubu Gowan Center Society for Family Health

* This list is not meant to represent all possible partners for each health issue but those who were observed to be most active in the specific project sites in this study

C Stakeholder analyses

Buea stakeholder analysis

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Ministry of Health and targeted health programmes (Malaria Control Programme, TB, Vitamin A, Onchocerciasis)	Plays key role in supplying intervention materials; ivermectin, Vitamin A and TB drugs free of charge	High – pressure through APOC to meet coverage target for ivermectin distribution	Instructs the CDI health districts for policy changes with respect to the dissociation of Vitamin A from NID	Community participation through primary health care from the Bamako Initiative Provincial TB co-ordinator who was skeptical about CDDs was finally convinced for CDI-DOTS	High – CDI helping targeted health programmes to achieve their goals	Programme directors attended advocacy and debriefing meetings
Provincial delegation of Ministry of Health and its programmes (Onchocerciasis, Vitamin A, TB, Malaria Control Programme)	Facilitate the supply of materials and training of district health personnel by provincial programme coordinators	Very High – relevance of CDI to bring health services to communities	Give directives to health districts to adopt the CDI strategy in their plan of activities	Very favorable CDI is more or less the continuation of the Bamako Initiative	Acceptance of CDI strategies for other interventions apart from TB	Advocacy meeting Feedback on project
Health districts	Facilitate the supply of materials and training of health area personnel by the district team	High-unit of integration of health services	Give directives to health areas to adopt the CDI strategy in their plan of activities	Very favorable, play critical role for the intervention of CDI activities	Motivation remains high despite the overload	Advocacy meetings and training activities
UNICEF	Responsible for Vitamin A supply	High	High	Vitamin A is still strongly linked to polio immunization in non-CDI areas	Increases coverage of 6-59 month old children	Attended CDI debriefing meetings

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
WHO	Highly involved - the initiator of the project	High - advocating for the project at the national level	WHO assists national governments to see the interventions as priorities and to formulate appropriate policies	Successful implementations of CDI interventions to improve the targeted health indicators	CDI may be a better channel to improve some health indicators of high priority for WHO	Reporting to the World Health Assembly, JAF and APOC TCC meetings
Global Fund for AIDS, Tuberculosis and Malaria	Scaling up of RBM interventions through public private partnership for HMM	Very positive Appropriate treatment of children and pregnant women with malaria at home	Making funding available	Second round of GFATM grant under execution in Cameroon	An avenue for effective distribution of ITNs and Coartem®	Use of GFATM guidelines
Association Camerounaise pour le marketing Social (ACMS)	Promoting the use of ITNs through social marketing	Very positive	Importing huge quantity of ITNs into the country	Encouraging community participation	CDI seen as a better channel to ensure ITNs reach remote communities	Social dialogue
Fondation Moje	Supporting community mobilization and training of CDDs	High	With its track record on community-based activities, has great credibility among community members	Very favorable for CDI	Its participation in CDI activities seen as sign of recognition for several years of community-based activities	Good mastering of local culture and tradition
Association of community health implementers of Bamena	Help CDD to be well organized for the implementation of CDI activities within communities	High - reduction of TB morbidity and mortality	Have staff working on the programme in collaboration with the SMOH	Objectives of the national TB programme are to increase detection rate of TB to 70% and attain a cure rate of at least 85%	The CDI process has improved the detection rate and reduced stigmatization	Consultation Advocacy Community mobilization
Community-based organization (Community Association of Zern)	Help CDD in mobilization and sensitization of communities	To develop group spirit for the fight against health problems in the community	Have authority with community leaders to enforce regulations that promote general welfare of the community	Every community member should support CDI	Facilitate CDD distributors	Meetings with Village Development Committees Feedback Mobilization

Yaoundé stakeholder analysis

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Ministry of Health and its programmes (Malaria Control Programme, TB, Vitamin A, onchocerciasis)	Very instrumental in terms of directly availing all the supplies of ivermectin, Vitamin A and TB drugs free of charge As a stated policy, Treated nets are given free of charge to pregnant women and to children below five years old The side effects of Mectizan® are treated free of charge Organization of bi-annual child health days where Vitamin A capsules are distributed	High - pressure to meet coverage targets, particularly in the HMM results Since this year, implementation of Home Management of Malaria through CDI process	Collaboration with NGO (Helen Keller International) which facilitates the distribution in CDTi projects	Community participation through PHC enshrined in national health policy Bicycles given to community implementers to facilitate their work Regional TB co-ordinators who were skeptical about CDDs over-seeing DOTs	High - controls major delivery mechanisms of commodities and sets national policy	Guidance, directives to implementers, collates nationwide coverage data
UNICEF	Key in promoting and supporting Child Health Days in which Vitamin A is distributed	Interest in improving child survival	Facilitation and supply of Vitamin A capsules	Increasing coverage for children 12-59 months	Increased involvement of health personnel Increased accessibility to Vitamin A capsules	Supply of Vitamin A capsules
GFATM PR Malaria	Presumed to supply ITNs Supplied a subvention to facilitate access to ACTs drugs Implementation of HMM nationwide	High coverage of ITNs Increased access to ACTs	Financial influence	Agrees with the HMM through CDI	Parallel activities with greater incentives to implementers	Facilitate access to ACTs and ITNs
Community-based organizations (PersPectives)	Supporting CDI process in terms of training in ivermectin distribution					

Ibadan 1 stakeholder analysis

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Federal/State Ministry of Health and its programmes (Malaria Control Programme)	Very instrumental in terms of directly availing all the supplies of Coartem® and ITN. They facilitate the procurement process of ITNs and Coartem®	High - pressure to meet coverage targets	High They have political power and design the policy which has to be followed	Community participation through PHC enshrined in national health policy Regional TB co-ordinators skeptical about CDDs over-seeing DOTS	High - controls major delivery mechanisms of commodities and sets national policy	Advocacy meeting Debriefing meeting Catalyzing the involvement and support from both the federal and state governments for CDI process
Yakubu Gowon Foundation	It provided Coartem® for malaria treatment through endorsement by the Federal Ministry of Health. However, it could not deliver the long lasting ITN/ chemicals for net treatment due to supply shortage	High - pressure to meet coverage targets	Moderate		High impact because they provide the commodities	Collaborative
Damien Foundation	Assisted in providing TB drugs, training materials, vehicles and field allowances for the DOTS TB programme	High - pressure to meet coverage targets	Low during the first year but higher in subsequent years	Ensure adequate and timely supply of drugs, materials and transport	High - provided drugs, materials and equipment	Collaborative and involvement in the project
Local government chairmen, supervisory counsellors for health and PHC coordinator/ programme managers	Policy makers approved selection of PHC workers to attend stakeholders' meetings. PHC workers participated in CDI training. Provided storage facility for the commodities at the district level before deploying them to various villages for distribution by CDI	Moderate to high - to ensure positive image of the district in project participation. Ensured that district policy in respect to product distribution is maintained by the CDI project	Moderate	Mixed	Medium - they followed the directives of the State MOH	Collaborative and monitoring of the training and distribution
Community-based organizations (Farmers association)	Supported community mobilization and training of CDIs, attended monthly meetings	High and supportive - they attended meetings, selected their CDIs, provided incentives	High at the village level but lower at the LGA level	Supportive	High	Community visit and meetings
WHO	Provided technical and financial support, and supervision. Facilitated debriefing meetings with the FMOH and other stakeholders	High - provides project financial support and implementation of debriefing meetings	High	Supportive	High	Collaborative and involvement

Ibadan 2 stakeholder analysis

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Federal Ministry of Health and NPHCDA	Policy support for CDI by giving the directive for the direct supply of intervention materials to Districts through the States Launching of ITN and Coartem® as national recommended malaria drug	High - potential of CDI to boost coverage for the interventions which was then low and source of worry	Direction given to states for policy changes with respect to Vitamin A distribution by making it available outside of the NID	Skeptical in the beginning but built up after the first year demonstration of CDI effectiveness, they became enthusiastic	Coverage was close to set national targets	Advocacy meeting feedback on project Yearly debriefing consultation
State Ministry of Health and its programmes (Onchocerciasis, Vitamin A, TB, Malaria Control Programme)	Supply of materials and training of LGA programme officers by State programme coordinators Training of Role Model Mothers on malaria Launching of ITN intervention at the state level	High - relevance of interventions to the implementation of Alma Ata PHC elements	Direct and closer supervision of interventions through PHCs in LGAs	Initially the State was waiting for directive from the FMOH and would not want to go outside the national policy on the interventions	Acceptance of CDI strategies for other interventions apart from ivermectin	Advocacy meeting Feedback on project
Local Governments and its programmes (Onchocerciasis, Vitamin A, TB, Malaria Control Programme)	Training of CDDs, community mobilization, advocacy, logistics for the distribution of intervention materials Supervision and monitoring of interventions Launching of ITN at the community level	Medium - interventions addressed priority health problems among pregnant women and children under five Availability of free materials seen as a poverty alleviation strategy	Better supervision and monitoring of intervention delivery	LGA waiting for directive from State MOH Frictions between frontline health workers and implementers based on perception that community implementer would take their jobs	LGA was proud to be delivering the interventions	Advocacy meetings PHC management committee meeting Community campaign for DOTS Media publicity
UNICEF	Key in promoting and supporting Child Health Days in which Vitamin A is distributed	High - interventions on childhood communicable diseases except DOTS Previously carried out interventions on malaria and Vitamin A and have been looking for ways of increasing coverage	International donor agency highly recognized by the national government Have materials	UNICEF was looking for an alternative strategy and were watching for the success of the intervention	Pleased to have supported CDI as a process for increasing the coverage of childhood interventions	Advocacy Yearly debriefing Consultation

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
WHO	Assurance of international commitment to the interventions and World Health Assembly approval	High - building credibility of the project to governments	WHO assists national governments to see interventions as priorities and to formulate appropriate policies	Successful implementation of this intervention will reduce morbidity and mortality in childhood	CDI is a breakthrough process for solving the low coverage dilemma of interventions on which WHO has successfully influenced support of major donors across the world	Feedback to the World Health Assembly Debriefing at JAF meeting and APOC Feedback to donors
GFATM PR Malaria	Scaling up of RBM interventions through public-private partnership for HMIM	High - prompt and appropriate treatment of children and pregnant women with malaria with pre-packaged drugs	Yakubu Gowon centre is a national NGO with influential leadership by former Head of State Dr Yakubu Gowon	Two rounds of GFATM grants have been received by the Yakubu Gowon Center	An avenue for effective distribution of ITNs and Coartem®	Consultation Promise of following GFATM guidelines Evidence of distribution of drugs
GFATM SR Malaria	Central coordination and facilitating materials distribution	High - production of guidelines on distribution of ITNs and Coartem® to States	Policy formulation and implementation	Sub-Recipient is the National Malaria Control Programme, Federal Ministry of Health	CDI as an innovative way of ensuring efficient distribution and accountability	Consultation Debriefing Advocacy
Damien Foundation	Supply of drugs	High - reduction of TB morbidity and mortality	Have staff working on the programme in collaboration with the SMOH	Objectives of the national TB programme are to increase the detection rate of TB to 70% and attain a cure rate of at least 85%	The CDI process has improved the detection rate and reduced stigmatization	Consultation Advocacy Community mobilization
Community groups (Ward Development Committees)	Selection of distributors, provision of incentives and mobilization of communities for access and acceptance of mobilization	High - reduction of morbidity and mortality attributable to the diseases in the communities	Leadership, decision making and enforcement	CDI is voluntary but useful to the community and therefore obligatory	Sense of ownership of CDI interventions Increase capacity of communities to develop self-reliance and self-help	Meetings with ward and village development committees Feedback Mobilization

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Community-based organizations (Kisi Progressive Union, Saki Parapo)	Health is an asset for the general welfare of the community	High - communities should take advantage of health interventions that are distributing free materials	Authority to union leaders to enforce regulations that promote general welfare of the community	Every community member should support CDI	Associations were proud to support a feasible health intervention in their communities	Meetings with Ward and village development committees Feedback Mobilization

Kaduna stakeholder analysis

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Federal Ministry of Health and its programmes (Malaria Control Programme, TB, Vitamin A, Onchocerciasis)	Involved in setting policies, provision of drugs (Ivermectin, Vitamin A and TB drugs free of charge) Organization of Polio plus and integration of Vitamin A and ITNs into immunization	High - pressure to meet RBM and MDGs coverage targets	High	Community participation through PHC in national health policy Regional TB co-ordinators who were skeptical about CDDs over-seeing DOTS	High - controls major delivery mechanisms of commodities and sets national policy	Advocacy workshops, debriefing meetings, pilot studies, JAF meetings, lobbying
National Primary Health Care Development Agency	Involved in implementation of Vitamin A and nutrition policy	High - pressure to meet MDGs and FAO targets	High	Promoting vitamin supplementation as a child survival mechanism	High - controls vaccines delivery and interested in alternative mechanisms of Vitamin A delivery	Advocacy workshops, debriefing meetings, pilot studies
National Planning Commission	Involved in implementation of Vitamin A and nutrition policy	High - pressure to meet FAO targets	High	Promoting vitamin supplementation as a child survival mechanism	High - controls major delivery mechanisms of commodities and sets national policy	Advocacy workshops, debriefing meetings, pilot studies

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Kaduna State Ministry of Health	Involved in setting/modifying policies, provision of drugs (ivermectin, Vitamin A and TB drugs free of charge) Organization of Polio plus and integration of Vitamin A and ITNs into immunization	High - pressure to meet RBM and MDGs coverage targets	High	Community participation through PHC in state health policy of state	High - controls major delivery mechanisms of commodities in state and sets state policies	Advocacy workshops, debriefing meetings, pilot studies, media
Local Governments	Implementing programmes	High - pressure to meet RBM and MDGs coverage targets	Medium	Community participation through PHC in implementation programmes of public health importance	High - controls major delivery mechanisms of commodities and sets national policy	Advocacy workshops, debriefing meetings, pilot studies, media
Senate, National and State Houses of Assembly/ Committees on Health	Debate and policies on health	High - pressure to meet RBM and MDGs coverage targets	High	Would want to be seen as supporting attainment of RBM and MDGs targets	High - can contribute to performance of these houses and public perception	Media publications, advocacy workshops, debriefing meetings, pilot studies, World Health Assembly, lobbying, media
UNICEF	Key in promoting and supporting child survival and maternal health in which Vitamin A and ITNs are distributed	High - pressure to meet RBM and MDGs coverage targets	High	Community participation through PHC in national health policy Regional TB co-ordinators who were skeptical about CDDs over-seeing DOTS	High - controls major procurement of commodities	Advocacy workshops, debriefing meetings, pilot studies
WHO	Supporting health care delivery, PHC development and sustainability	High - pressure to meet RBM and MDGs coverage targets	High	Community participation through PHC in national health policy Regional TB co-ordinators who were skeptical about CDDs over-seeing DOTS	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
The Carter Centre	Supporting community mobilization and training for onchocerciasis, ITN, NTDs	High - control diseases of public health importance	Medium	Volunteers can distribute commodities and have conducted pilot studies on integration of schisto and LF	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
DFID	Key in promoting and supporting child survival and maternal health in which and ITNs are distributed	High - pressure to improve coverage of ITNs, reduce child mortality and maternal health	High	Need partners to support its programmes	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
Society for Family Health	Key in promoting and supporting child survival and maternal health in which ITNs are distributed	High - pressure to improve coverage of ITNs, reduce child mortality and maternal health	High	Need partners to support its programmes	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
Sightsavers International	Promoting prevention of blindness	High-sustainability of CDTi	Medium	CDI works and integration of other interventions drives CDTi	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
The Netherlands Leprosy Relief Organization	Promote training and control of TB	High-sustainability of CDTi	Medium	CDI works and can be used to improve TB	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
MITOSATH	Supporting community mobilization and training for onchocerciasis	High-sustainability of CDTi	Medium	CDI works and can be used to improve coverage	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
Helen Keller International	Promoting prevention of blindness	High - sustainability of CDTi	Medium	CDI works and can be used to improve coverage	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Christoffel Blinden Mission	Promoting prevention of blindness	High - sustainability of CDTi	Medium	CDI works and can be used to improve coverage	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
Global Fund for Malaria, Tuberculosis and AIDS	Major funder of malaria, HIV/AIDS and TB control in the world	High - pressure to meet RBM and MDGs coverage targets	High	Willing to partner with organizations that can support scale up and improvement of coverage	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
Yakubu Gowon Centre	Managing GFATM funds in Nigeria Succeeded in getting the second round of funding	High - pressure to meet RBM and MDGs coverage targets	High	Willing to partner with organizations that can support scale up and improvement of coverage	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
USAID	Funding Vitamin A supplementation, malaria and maternal and child health in Nigeria	High - pressure to meet RBM and MDGs coverage targets	High	Have made funding available but progress is slow	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
Tulsi Chanrai Foundation	Promoting PHC in Kaduna State, provision of potable water and prevention of blindness Pays its volunteers	High - to meet targets and raise additional funding	Medium	Health care needs to be brought close to the communities but does not believe in compensating CDIs	High - attainment of country strategic plan	Advocacy workshops, debriefing meetings, pilot studies
Nigeria Medical Association, Nigerian Medical and Dental Council	Promote health care delivery	Low - want improved health care delivery but through clinic based treatment	Medium	Promoting facility based treatment Need permission of NMDC	High - change of curriculum	Advocacy workshops, debriefing meetings, pilot studies, lobbying
Nigerian Society for Parasitology	Promote community-directed interventions	High - want to promote use of CDI for control of diseases of public health importance	Medium	Want Nigeria to improve health care delivery through communities and promote community-based interventions	High - change of curriculum	Advocacy workshops, debriefing meetings, pilot studies

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Media	Promote health care delivery	Medium - promote attainment of RBM and MDGs targets	High	Willing to promote health care delivery in the communities, support attainment of RBM and MDGs targets	High	Advocacy meetings, debriefing meeting, lobbying
CBOs (FOMWAN, development associations, farmers clubs, etc.)	Community participation	High - to ensure access to drugs for priority diseases	Low	Willing to support to community-directed programmes	High - support community participation and compliance	Health education, mobilization using IEC materials

Yola stakeholder analysis

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Taraba State Ministry of Health – units on Malaria, TB, Onchocerciasis and MCH/EPI	Highly instrumental in directly availing of ivermectin	High - under pressure by APOC to meet target	High	Community participation through PHC contained in national health policy Supportive and interested in the community directed approach Anticipate incorporation to the health system but skeptical about community members handling TB drugs	High - controls major delivery mechanisms of commodities and sets national policy	The director of disease control is a member of the research team and signatory to the collaborating NGO project account

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
District/ LGA Health Departments	Provide training, health education and mobilization, monitoring and supervision of CDTi, Vitamin A and DOTS	High - under pressure to meet targets	Moderate They depend on the State for implementation of health programmes	Supportive Interested in the use of CDI approach for the management of some health problems at the community level	The approach ensures delivery of commodities to health facilities and involvement of community members	Planning meetings with desk officers of the different interventions
UNICEF	Responsible for Vitamin A supply	High	High	Passive - Vitamin A is still strongly linked to polio immunization	Increases coverage of children which is of major interest to stakeholder	
MITOSATH	Ivermectin and Vitamin A delivery	High	Moderate	Unsure	Increases coverage at a much reduced effort (time, NGO personnel)	Invitation to stakeholders meetings
Common Heritage Foundation	Advocacy and sensitization of communities Supported State planning meetings Responsible for training health personnel, facilitated procurement of supplies	High	Limited to State	Enthusiastic support Close collaboration with Federal, State and Local Government councils Has MOU with councils	Helps to meet the objectives of community-participation in health and complements ongoing development programmes in the State	Invitation to collaborate at the onset and be responsible for technical support, monitoring and supervision
Netherlands Leprosy Relief	Responsible for supply of TB drugs to treatment centres, training, monitoring and funding	High	High	Skeptical about the use of CDI process for the delivery of TB drugs	Increases awareness of treatment centres and outposts	Invitation to stakeholders meetings
Society for Family Health	Responsible for supply of pre-packaged chloroquine at discount rate (first year)	High	High	Supportive The programme manager visited the project	Raises awareness of the organization's work in promoting prepackaged antimalarials	Invitation to stakeholders meetings

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
National Malaria Control Programme, FMOH: GFATM SR for Malaria	Supplied Coartem® and ITN to project	High	High	Enthusiastic Visited the project area and office		Invitation to visit the project and seminar
Harvest Field	Supplied treatment kits at discount rate to project	High - since the approach increased the patronage	Low	Passive	Increased network, sales	Intensive negotiations and guarantee of cost recovery
United Methodist Church of Nigeria	Provided storage facilities, channel of delivery and reporting	High - actively involved in rural health care in the project area	High - limited to the State	Highly enthusiastic	The approach compliments their rural healthcare activities and reduces programme cost	Involvement in stakeholders and planning meetings
Local politicians	Community mobilization, sensitization and awareness Influence project location and extent of service utilization	High - since they use opportunity for reaching a large number of people	High at the local level and has major effect on use of service	Highly enthusiastic	Involvement raises personality profile and fast-tracks attainment of political goals of emerging politicians	Sought them out for specific role in advocacy and awareness raising
Patent medicine storekeepers and vendors	Sale of commodities that is being promoted for profit	High - supplies of free or low cost items compete with their sales Opportunity for purchasing at low cost for sale within or outside community for large profit	Moderate - limited to countering the health education component of the project and also raising community doubts about the real intention of the project	High - anxiety about the impact on their trade and thus very much critical about the approach	Conflicts with economic interest of the stakeholders	Close monitoring of their activities and disbursement of supplies at the health facilities to the CDDs

Uganda stakeholder analysis

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
Ministry of Health and its programmes (Malaria Control Programme, TB, Vitamin A, Onchocerciasis)	Very instrumental to directly availing the supplies (HOMAPAK ivermectin, Vitamin A and TB drugs free of charge) Organization of bi-annual child health days where ITNs and Vitamin A are distributed	High - has goal to meet coverage targets	Gives direction on policy changes	Community participation through PHC enshrined in national health policy Regional TB co-ordinators were skeptical about CDDs over-seeing DOTS	High - controls major delivery mechanisms of commodities and sets national policy	Involve departments that are positive towards community participation Advocacy meeting Feedback on project Consultation
UNICEF	Funding Child Health Days Plus in which Vitamin A is distributed to children and pregnant women	High - interventions are on child survival Previously carrying out interventions on malaria and Vitamin A and looking for ways to increase coverage	International donor agency highly recognized by the government	Supportive of any child survival interventions	Happy to have supported CDI as a process for increasing the coverage of childhood interventions	Advocacy Consultation Feedback on project
WHO	Funding Child Health Days Plus in which Vitamin A is distributed to children and pregnant women HOMAPAK ivermectin distribution and TB	High - building project credibility with the government	WHO assists MoH to implement interventions as priorities and to formulate appropriate policies/guidelines	Successful implementations of this intervention will reduce morbidity and mortality especially among children	CDI is a breakthrough process for solving the dilemma of low coverage of these interventions on which WHO has successfully influenced support of major donors across the world	Feedback to the World Health Assembly Debriefing at JAF meeting and APOC Feedback on the project Advocacy
Carter Center	Supporting community mobilization and training for onchocerciasis in which CDDs receive about 2000 shillings as lunch allowance	High - because helps the MoH in the control of neglected tropical diseases	Financial influence	Successful implementations of this intervention will reduce morbidity	CDI is a breakthrough process for solving the dilemma of low coverage of such interventions	Advocacy Consultation Feedback on the project

Stakeholders*	Characteristics					Strategies
	Involvement in the issue	Interest in the issue	Power - influence	Position on the issue	Impact of issue on the stakeholder	
UPHOLD	Instrumental in supporting CMDs for refresher trainings and incentives such as a bar of soap, badge, T-shirt and lunch allowance	High - because helps the MoH in its efforts to fight malaria	Financial influence	Successful implementations of this intervention will reduce morbidity and mortality among children and pregnant women	CDI is seen as a strategy to improve access to HOMAPAK	Advocacy Consultation Feedback on the project
AFFORD (USAID)	ITNs were distributed in other sub-counties outside the study areas other than in Nebbi and Arua Two systems of distribution have been used; through a health facility and local leaders	High - because helps the MoH in its efforts to malaria	Financial influence	Successful implementations of this intervention will reduce morbidity and mortality among children and pregnant women	CDI is a breakthrough process for solving the dilemma of low coverage of these interventions	Advocacy Consultation Feedback on the project
Quality Chemicals	Manufacture of ITNs and HOMAPAK	High - since they use opportunity to increase output and make more profits	High - it is the sole local manufacturer of these health commodities	Availability of adequate stocks	Raises awareness of the organization's work in promoting prepackaged anti-malarials	Advocacy

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