INTERNATIONAL RESCUE COMMITTEE

Kisangani Health Care Support Project
Orientale Province
DEMOCRATIC REPUBLIC OF CONGO

Final Report
1 July 2000 to 31 October 2003
including the period 1 August – 31 October 2003

Submitted to OFDA
Grant No. AOT-G-00-00-00183-00

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Executive Summary

Organization:	International Rescue Committee
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Program Title:	Kisangani Health Care Support Project
Grant No.:	AOT-G-00-00-00183-00
Country/Region:	Democratic Republic of Congo
Time Period of Report:	1 July 2000 – 31 October 2003

Overall Goal/Purpose

To reduce morbidity and mortality among the inhabitants of Lubunga HZ.

IRC had measured the baseline Crude Mortality Rate (CMR) in Lubunga and Kisangani Health Zones at 3.1 deaths per 1,000 persons per month in 2000. Activities conducted through this OFDA funded health intervention saw this rate fall to 2.4 deaths per 1,000 persons per month (IRC survey September 2002). **The most recent mortality survey, conducted in October 2003 to coincide with the end of this program, showed a further reduction in the CMR to 1.66 deaths per 1,000 persons per month.** This represents a **86.7%** reduction from the baseline CMR measured at the beginning of the project in May 2000.

Targeted Population:

Beneficiaries for Primary Health Care			
Health Zone	*Activities*	*Target Sites*	*Beneficiary Population*
Lubunga	Provision of essential drugs and supplies, indigent support, reinforcement of EPI, and training.	St. Andre	6,899
		Pecheur d'Men	7,534
		Bambole	9,699
		Losoko	11,299
		Bandu	4,239
		Isangi	5,427
		Kubagu	8,213
		Mako	11,424
		Osio 16	7,077
		Osio 21	9,116
		Biaro	2,835
		St. Kazimir	4,956
		Yalisombo	7,336
		Yatonge	5,148
		Yambela	4,748
		Yalikanda	5,428
		Yainelo	5,559
		Bokuma	4,650
		Yaolonga	7,065
		Biaro Embouchure	2,500
		Total Health Beneficiaries	**131,152**

Beneficiaries for Safe Blood Transfusion			
Health Zone	*Activities*	*Target Sites: General Reference Hospitals*	*Beneficiary Population*
Lubunga, Kabondo and Kisangani	Provision of essential materials, equipment and training	Kabondo Hospital Laboratory	400
		Kisangani Hospital Laboratory	600
		Lubunga Hospital Laboratory	200
		Total Transfusion Screening	**1,200**

Geographic Location:

All comprehensive health care activities took place throughout the health zone of Lubunga, in the urban district of Kisangani town. Laboratory activities took place at the hospitals of Kisangani, Kabondo and Lubunga.

Background

Kisangani Town is the capital of Orientale Province, which is the largest province in the Democratic Republic of Congo. With an area of over 500,000 km^2 and a population of approximately 7 million, Orientale Province is divided into five administrative districts (Kisangani Town, Bas-Uélé, Haut-Uélé, Ituri and Tshopo) and 47 health zones. Kisangani Town itself is divided into three health zones; Kisangani, Kabondo and Lubunga.

Kisangani Town is a river port city and, before the war, was a center of commercial traffic. Since the rebellion in August 1998, commercial and passenger traffic on the river between Kisangani and Kinshasa has completely stopped; the lifeline to the city has been cut, and the economic and social infrastructure has collapsed. All roads to Kisangani are impassable due to neglect and insecurity, and most basic goods must be delivered to the city by airplane, which can result in incredibly high prices. Traders ride ridiculously overloaded, broken-down bicycles for hundreds of kilometres along rocky paths, just to deliver simple goods, such as charcoal or cassava. Electricity and running water are scarce, and simple social services, not to mention health care, are the rarest of luxuries. Because of the ongoing war, each day is a struggle to survive for the average citizen of this once booming provincial capital.

Kisangani was and still remains strategically important, both economically and militarily, to the different armed factions in this war. The army that controls Kisangani also controls an area rich in mineral resources, such as diamonds, gold and coltan. Since May 2000, Rwandan and Ugandan forces have fought on at least three occasions for control of Kisangani, resulting in over 2,000 civilian casualties and causing severe structural damage to many parts of town. Although Rwandan and Ugandan troops have long since withdrawn from the city and surrounding areas, the continued presence of Rwandan-backed RCD soldiers within Kisangani contributed to constant tension and psychological tension among the population. On May 14, 2002, RCD forces violently extinguished an attempted uprising by dissident soldiers in Kisangani. A UN fact-finding mission carried out shortly afterwards concluded that following the attempted mutiny, over 200 soldiers and civilians were executed, and their bodies dumped into the river, and several hundred other residents fled into the surrounding countryside, fearing for their lives.

Prior to this intervention, the Ministry of Health in Orientale Province estimated that only 35% of the population had access to health services and WHO estimated that less than 20% of children under five had full immunisation coverage. Malnutrition rates in Orientale were also high; MSF-Holland reported 13.2% global malnutrition with 9.5% severe malnutrition among children under five in rural areas (August 1999) and 9.2% global malnutrition with 5.2% severe malnutrition among children under five in Kisangani Town itself. The low vaccination coverage in combination with poor nutrition put the under-five population of Kisangani Town and Orientale Province at higher risk for death during a measles outbreak. In 2000 and 2001, IRC carried out mortality studies in Lubunga and Kisangani health zones, and found a Crude Mortality Rate (CMR) of 3.1/1000/month. This was significantly higher than the baseline mortality rate for sub-Saharan Africa (1.5/1000/month) and in danger of increasing.

With support from OFDA, IRC opened an office in Kisangani in July 2000 and began a health and water program in response to the tremendous humanitarian needs faced by this large, isolated population. IRC has supported the 20 health centers in Lubunga health zone since this time through the provision of essential medicine, supplies, and training, and through water, sanitation, and construction interventions to ensure access to potable water and sanitation facilities. In addition, this intervention has ensured the provision of support to laboratory-testing facilities at the three district hospitals in Kisangani Town, which serve Kabondo, Kisangani, and Lubunga health zones, by training technicians to screen blood transfusions for HIV and other pathogens, and by supplying test equipment.

<u>Project Activities</u>: Phase I, 1 July 2000 – 30 September 2002

In September 2000, IRC began supervising health facilities in Lubunga health zone and supporting them with regular supplies of essential medicine and equipment. **Together, these 20 facilities were providing primary health care services for 131, 152 people.** Unfortunately, due to security constraints IRC was initially able to access and support only 12 of the 20 health centers, however all activities were extended to the remaining eight health centers as conditions improved and they became accessible.

Objective 1:

To improve the quality of services provided by primary health care professionals and health committee members in Lubunga health zone through training.

Training of health care professionals in Lubunga was planned to be carried out in accordance with the national Standard Diagnosis and Treatment Guidelines (SDTG), which were created at a conference in 1997 (pre-Kabila) with the intention that they would be distributed nationally. IRC assisted in disseminating them in South Kivu province, where the SDTG was published and accepted by the Provincial Health Inspection and the Head Physicians of each health zone. However, this process was never completed in Orientale province. The Provincial Health Inspection requested that IRC not publish and distribute the SDTG in Lubunga health zone until the Provincial Health Inspector and the Head Physicians of each health zone were able to review the SDTG and make any changes that they deemed necessary to suit their regional capacities. IRC agreed to this, however, upon closer assessment of the knowledge and skills level of the health center staff in Lubunga health zone, the IRC Health Program Manager determined that the SDTG is written at a technical level that surpassed that of most Lubunga health center staff. In September 2000 the Health Program Manager devised a series of training sessions to gradually bring the Lubunga staff up to an appropriate level at which they could follow the SDTG. The training plan designed initially focused on more basic issues such as case definitions and lines of treatment as interviews with health center staff indicated that there was confusion about certain case definitions, particularly cholera.

In October 2000, IRC began a series of bi-weekly training sessions for IRC health monitors and bi-monthly sessions for the health center staff, designed to improve their skills and increase their knowledge until they were able to follow the SDTG. Six full day training sessions (two per month) were attended by nurses from 15 health centers, 2 nurses from the hospital, and 2 health monitors from the *Bureau Central de Zone* (BCZS) office. The MCZ (Medecin Chef de Zone) also attended and served as the moderator for each session. Diagnostic and treatment protocols were the focus of the trainings, and the diseases were chosen based on their prevalence in the area. Topics covered included: Respiratory Infections, sexually transmitted diseases (STDs), Measles, Typhoid Fever, and Cerebro-Spinal Meningitis.

Following the training, IRC health monitors began conducting weekly visits to the health centers to ensure that the nurses were incorporating the protocols discussed at the training sessions into the treatment of their patients and directly supervise the treatment provided by the head nurses and the other health center staff. The monitors also assisted the head nurses in the formal and informal training of the other health center staff. In addition, the head nurses began to fill out cards each week summarizing their curative and preventative care activities and morbidity and mortality statistics for the week. Together, these cards allowed IRC to follow diagnostic and prescription trends and to address any problems the cards reveal. Finally, IRC began asking the centers to complete daily drug registries to allow the health center staff to monitor their own stocks.

Copies of the SDTG were distributed to the health monitors in October 2000 and two copies were distributed to each of the 12 accessible health centers in January 2001. As access to other health centers improved and IRC expanded health project activities, copies of the SDTG were included with the initial drug

distributions. IRC continued to use the SDTG as the guide for all formal and informal health center staff training throughout the program to improve the quality of care provided by health center staff.

The next formal training session was held in October 2001, when IRC trained 43 nurses (at least two from each health center) in primary health care concepts based on lessons from the SDTG. The health center at Yaolonga was unable to send a representative due to the long distance. Participants were given a pre-test on the first day of the training, in which 4 out of 38 (10.5%) passed. A post-test was held on the final day of the training, in which 38 out of 43 (88.3%) passed. Subsequent trainings included a session in April 2002 attended by 40 nurses (2 from each health center) on the new national protocol for treating malaria. In May 2002, IRC conducted a brief training to prepare vaccination agents for a measles vaccination campaign (May 30 – June 7) in Lubunga health zone.

In September 2002, IRC and BCZS supervisors attended a training workshop on the mortality survey that IRC conducted that quarter, and a workshop on vaccination coverage in the health zone. Following this, IRC and the BCZS also planned and conducted a workshop on breastfeeding and child nutrition.

Throughout the program IRC health monitors, who continued to make supervisory visits and to conduct informal on-the-job trainings for health center staff, followed all of the training conducted up. This included assisting the head nurses in the formal and informal training of their staff and verifying that they were passing on the skills and knowledge acquired through the more formal training sessions through reviews of the diagnosis and treatment of the most frequently occurring diseases in the area in group staff training sessions at the health centers.

On the 7th and 8th of November 2000, and from the 8th to the 10th of December 2000 IRC held training sessions in vaccination techniques at the General Hospital of Lubunga, attended by vaccinators from all twenty health centers, supervisors from the hospital, and health monitors from the BCZS. The two training sessions had a total attendance of 46 persons. Topics covered included:

1. Assessing the vaccination needs of a health center.
2. Forming a list of the materials and equipment necessary for a vaccination campaign.
3. Storage of vaccines in a cold box.
4. Storage of vaccines in a refrigerator.
5. Maintenance of cold chain equipment.
6. Preparation of powdered vaccines.
7. Preparation of liquid vaccines.
8. Administration of Tuberculosis vaccines.
9. Administration of Diphtheria, Pertussis, and Tetanus (DPT) vaccines.
10. Administration of Measles vaccines.
11. Administration of Antenatal Tetanus vaccines.
12. Administration of Polio vaccines.
13. Vaccination schedules.
14. Reducing the risks associated with vaccinations.
15. The History of the Expanded Program of Immunization (*Program Elargi de Vaccination or PEV*) in Congo.
16. General Vaccination Protocols.

A representative from the BCZS-Lubunga explains vaccination techniques at a training session arranged by IRC.

The second training was conducted in collaboration with a team of six trainers from the IPS, including a doctor from Kisangani, the MCZ-Kisangani, a representative from the Office of Primary Health Care, a representative from the Office Epidemiological Surveillance, the manager of the cold-chain equipment for Lubunga, and a nurse supervisor from the BCZ-Lubunga. For this session, IRC brought in a community animator to explain to

the vaccinators how to mobilize parents in small villages to bring their children in to be vaccinated, keeping in mind their limited means. After this training, each health center received administrative and office materials promoting vaccination.

IRC also organized two days of training, the 17th and 18th of November 2000, for approximately 50 members of the committees that manage the health centers (Comites de Santé, or COSA) of Lubunga (including, in most cases, the President, Vice President, Secretary, and Treasurer from each health center). The sessions were held in both French and Swahili, and covered the following subjects:

1. Introduction: Why a COSA?
2. Community Participation.
3. Role of the population in the policies of primary health care.
4. The constitution of a COSA.
5. The management of health center resources.
6. Follow-up of activities and motivational factors.
7. Administrative policies for the health center.
8. Holding COSA meetings.

On December 20th, IRC held a meeting with COSA representatives and head nurses from Lubunga to facilitate the sharing of experiences on their working relationships. During the meeting, IRC also reviewed the criteria for selecting indigents, the appropriate use of medicines, and the management of medical supplies.

Following the intitial training and follow up planning sessions with the COSAs, in March 2001 IRC hired and trained community mobilizers to improve community mobilization for projects in the sectors of health, water, and sanitation. They finished their training in April and began working with the health committees in May 2001. However, in July 2001 IRC decided to postpone the organization of further formal training sessions for the COSA members until fixed and stable committees were in place at all 19 health centers then being supported, as frequent turnover in COSA membership and the conflicts between the COSAs and the head nurses would undermine the benefits of any seminar. In the meantime, IRC community mobilizers and health monitors continued to work with COSAs from all the supported health centers to improve their prioritization of projects. The COSAs continued to be responsible for the identification of indigent community members (see Objective 2), referring patients to the health centers, managing the supply of drugs at the health center, maintaining and improving the health center facilities, and mobilizing the community for vaccination (see Objective 2). IRC mobilizers also worked with the COSAs to mobilize their communities to clean roads and participate in IRC water and sanitation projects.

After several months of informal training, in November 2001, 57 representatives from 19 COSA's in the Lubunga health zone attended a four-day training on community mobilization and sanitary education. Facilitators administered a pre-test on the first day of the training, which 18 out of 47 (38%) participants passed. Out of the 57 participants, 10 were illiterate and unable to take the test. Pre-test scores ranged from 0/10 – 8.5/10. Facilitators gave a post-test on the final day of the training, and 46 of 49 (93%) representatives passed. Post-test scores ranged from 1.5/10 – 10/10.

During a measles vaccination campaign conducted towards the end of the first phase of the program in May – June 2002, IRC remarked that there was a great deal of approval, acceptance, and cooperation from communities, which is evidence of good community mobilization and education on the part of the COSAs. COSAs were also been implicated in effective community mobilization during national JNV polio vaccination campaigns.

Objective 2:

To increase access to primary health care for the population of Lubunga health zone, through the provision of essential inputs and supervision.

At the beginning of the program, IRC consulted with the BCZ-Lubunga to determine the essential drug and equipment needs of the health centers in Lubunga health zone. The comprehensive list developed was used as the basis for subsequent distributions and was reviewed and updated periodically. Due to delays in the drug procurement and customs clearing processes, the first batch of drugs arrived in Kisangani in mid-September, with the first distribution to the twelve health centers initially targeted taking place at the end of September 2000. The provision and distribution of drugs was extended to the remaining eight HCs by June 2001, following improved access and security in the *aires de santé* concerned. The needs of the final eight HCs were determined in collaboration with the BCZS based on drug consumption trends at the twelve centers where IRC had already been working since the beginning of the program in addition to assessments of the eight remaining health centers.

COSA members and the head nurse at Yalisombo health center receive supplies delivered by IRC.

A system of monitoring the distribution and use of essential drugs was established by the BCZS and the IRC health team at the beginning of the program, and was used throughout the project period. Each of the supported health centers submitted an itemized requisition listing their specific needs every month or when they reached their minimum stock of 25%. This requisition had to have been signed by the president of the COSA, the head nurse, and the IRC health monitor who supervised the health center and reviewed by the *Médecin Chef de Zone*. IRC health staff then checked the requisitions against the allocation for the previous month and morbidity records to ensure that it would meet the center's needs. Once the requisition was approved, IRC health monitors distributed the drugs and other equipment to the health centers, and followed-up on their use on a weekly basis (bi-weekly for the furthest health centers). This monitoring is closely linked to epidemiological surveillance and verification of health center staff adherence to the national Standard Diagnostic and Treatment Guidelines.

Beginning August 2000, IRC health monitors collected morbidity and mortality statistics from each of the twelve accessible health centers, extending to the remaining eight HCs by mid 2001. The major sources of disease were found to be Malaria, Respiratory Infections, Diarrheal Diseases, and Sexually Transmitted Diseases. In addition, IRC Health Monitors identified several cases of Meningitis, Typhoid Fever, River Blindness, Measles, and Neo-natal Tetanus, particularly in the first year of the program. Although these were few cases reported for each of these diseases, their epidemic potential and the difficulty health workers have in identifying and treating them presents a continued cause for concern. Furthermore, IRC has specifically tracked cases of Cholera, in order to identify health centers in need of supplies such as Oral Rehydration Solution and Ringers Lactate, and also to determine the appropriateness of emergency Water and Sanitation interventions (as detailed in Objective 4).

In collaboration with the MIP and BCZ, IRC conducted a REMO (Rapid Epidemiological Mapping of Onchocerciasis) survey in Lubunga health zone during the month of May 2001. It was found out that the disease was hyper-endemic in the zone. Out of the 600 persons who were examined, 468 were found to be positive (had nodules). IRC collaborated with NGOs that are able to provide the medicine in order to reduce the incidence of River Blindness in Lubunga, as the only feasible long-term strategy for combating the disease is massive community education and treatment with Ivermectin.

In September 2001 IRC began working with the COSAs to establish indigent lists in each health center catchment area. Although initially some COSAs were claiming that all of the families in their catchment area were indigent because of the difficult economic situation, eventually the COSAs agreed to certain criteria and began to discuss and formulate the selection of indigents, the role of indigents in an auto-recovery health care system, and the links between indigent community members, the COSA, head nurses and IRC.

After these discussions, COSA members began identifying the most vulnerable members of their communities through house visits, verified by visits from IRC health monitors. The system developed meant that community members identified by the COSA as indigent were able to receive free health care by obtaining a voucher from the President of the COSA and providing it to the nurse at the health center. At the end of the month IRC reimbursed each center based on the number of vouchers given out. The initial criteria for indigent status chosen by the health committees are:

Records for the targeted Health Centres reveal that attendance rates rose by as much as 940% in the first year of the program

- The poor without support
- Widows
- The severely malnourished and malnourished children and adults with associated illnesses
- Orphans and unaccompanied minors
- The Physically and Mentally Handicapped without support
- Unemployed people without a garden or land to farm
- Unaccompanied elderly people
- The chronically ill, e.g. patients with TB or Diabetes, and Internally Displaced Persons

Since the beginning of the program these criteria have been systematically reviewed and updated in accordance with the changing context of needs and the status of the population in the health zone.

Following the recruitment and training of the IRC community health mobilisers, they assisted in the verifying the status of community members designated as indigent by the COSAs. This task was found to be quite time-consuming, however to avoid any community members missing out on the free health care that they were entitled to those community members whose indigent status had not yet been verified by IRC health staff were also able to receive free health care at the center by informing the nurse and a representative of the COSA of their indigent status. If the nurse and COSA accepted the patient as indigent, they were treated and IRC health monitors then visited them in order to verify their status. If, after being treated, their status could not be verified by IRC, they had to reimburse the center for the treatment received.

With support from IRC, the HCs also began monitoring attendance rates to provide a glimpse at the impact of the program. Although IRC has not been able to obtain monthly attendance figures for the months prior to the program for the majority of the HCs in Lubunga, the BCZS-Lubunga was able to provide quarterly attendance figures for a few of the centers, which show that in the first year of implementation the HCs saw increases in attendance of up to 940% (Pecheur d'Hommes HC). The attendance rates increased most dramatically at the five "urban" health centers in Lubunga, as a result of greater population density and proximity to the neighboring Kisangani Health Zone. The IRC health team noted that residents of the two other urban health zones (Kisangani and Kabondo) started attending the health canters in Lubunga because the health centers have a regular supply of high quality medicines and medical equipment.

In September 2000, the IRC health team supplied the HCs in Lubunga health zone with cool-boxes and syringes and began working together with the BCZS-Lubunga to determine vaccination schedules and logistics of vaccine provision to the health centers. As part of their countrywide vaccination strategy, UNICEF undertook to provide cold chain equipment for the health zone. In spite of IRC's efforts, ruptures of stock have occurred due to the inadequacy of cold chain equipment, underestimation of local vaccine needs, and poor logistical planning. IRC continued to work with all the responsible parties to implement an effective means of vaccine distribution and preservation, whilst finding other solutions such as delivering refrigerators to two health centers (St. Casimir and Yambela) to serve as vaccine storage sites for the most distant health centers.

Initial discussions with the BCZS, health center staff and COSAs revealed that due to frequent ruptures of stock and public fears regarding the content and effects of vaccines, previous vaccination campaigns in Lubunga have often failed because the population was unwilling to participate. IRC therefore focused its vaccination efforts in the first six months of the program on highlighting to health center staff the efficacy and safety of vaccination and simply encouraging the greatest number of people to come to the health center for vaccination (in order to dispel myths regarding the harmful effects of vaccines and in order to start people on a schedule of vaccinations). Moreover, IRC has focused specifically on the vaccination of children under the age of one, who are most vulnerable to illness. This strategy has been effective; the community has been mobilized to bring their children to the health centers to receive vaccinations. In the first three months, the percentage of children under 1 visiting the health center to receive at least one dose of one vaccine more than tripled, from 25% in October 2000, to 90% in December. These numbers should not be misconstrued to suggest that the same number of children were fully immunized against a given disease, but it suggests that the foundation of an effective program of routine vaccination of children was built.

Throughout the program, IRC continued to build on this foundation, assisting the BCZS-Lubunga in its routine vaccination efforts by transporting vaccines to the health centers. IRC also provided single-use syringes and vaccination cards for both children and the pregnant women. Since IRC started assisting the BCZS, vaccination activities have improved considerably in IRC supported health centers, and few ruptures of stock have occurred. The support has also dramatically increased the number of New CPS (*Consultations Pré-Scolaires*) and CPN (*Consultations Pré-Natals*) Cases in the health centers targeted. IRC mobilizers and monitors, working with the COSAs, publicized the vaccination days at each center, in advance, to ensure the population was informed. Though this mobilization and support increased the number of people seeking preventative care (New CPN/CPS cases), vaccination rates remained inadequate. As a result, IRC modified its strategy. Rather than asking women and children come to the health centers to be vaccinated, IRC health monitors began making home visits to vaccinate the population in July 2001. Unfortunately, this strategy did not lead to notable increases in vaccination coverage. The health monitors reported that, in spite of community education activities carried out during the previous quarters, suspicions persist that vaccines are poison rather than medicine, and parents hide their children to prevent them from being vaccinated. These fears are especially pronounced in the more urbanized areas of Lubunga, and where there is a strong church influence. The same pattern was observed during all three stages of the JNV against Polio.

IRC therefore began a new stage of community mobilization, which entailed identifying and organizing seminars for key individuals and opinion makers (e.g. traditional and religious leaders) in Lubunga. These seminars aimed to dispel the rumors that persist about the dangers of vaccination and explain the importance of vaccinating children and pregnant women. By increasing demand (through better mobilization of the community) and continuing to ensure an adequate supply and the proper conservation of vaccines, IRC continued to improve coverage rates throughout the program

Objective 3:

To improve diagnostic services by providing the resources to allow the three reference laboratories in Kisangani Town to test blood for HIV, as well as to isolate shigella and type meningitis species.

The program manager for the safe blood transfusion and associated laboratory activities was recruited and started work in July 2001, when assessments of the laboratory facilities at the reference hospitals in Lubunga, Kisangani, and Kabondo health zones were carried out and a Memorandum of Understanding signed with the IPS, authorizing IRC to work in these hospitals.

Prior to this intervention, none of these laboratories had any form of cold chain equipment, laboratory technicians had received no formal training in at least six years, and laboratories were conducting blood transfusions without testing for HIV/AIDS. IRC therefore began the process of drawing up a curriculum for the "in-house" training of the personnel at each center in the proper use and storage of the HIV kits, stock control, and reporting formats for statistical analysis. In addition, IRC started to procure the necessary microbiological equipment, including incubators, autoclaves, and scales, and supplies, such as staining reagents, as well as refrigerators to allow the storage of the HIV testing kits at the required temperature of between 2 and 8 degrees Celsius.

A laboratory technician from Kisangani hospital examines pathogen reactions during a refresher course on laboratory diagnostics.

In December 2001, fourteen laboratory technicians, selected by the three Hospital Directors and the Provincial Health Inspector (PHI), attended a two-week training at Kabondo General Hospital. The training included:

- Proper use and storage of the HIV kits and other heat sensitive reagents like blood grouping sera, hepatitis B surface antigen kits, VDRL and rapid malaria testing kits.
- Preparation, storage, use and quality control of culture media, field stain and gram stain reagent.
- Accurate-quality isolation and identification of the pathogenic microbes responsible for shigellosis and meningitis.

In addition, each laboratory received a refrigerator with a surge control unit to monitor erratic voltage and IRC began the distribution of kits to test for HIV, syphilis, hepatitis B and malaria.

IRC carried out some rehabilitation work at Kisangani laboratory in cooperation with the hospital administration in March 2002. New windows were put-in to prevent burglaries, electrical wiring was installed, and the walls, doors and windows were repainted. IRC donated new equipment for the laboratory, including a refrigerator, microbiological incubator, microscope and rotator. The seven laboratory technicians received training on the use, care and maintenance of the incubator, microscope and rotator. Kabondo and Lubunga hospitals received similar equipment in the previous quarter.

IRC conducted two further training sessions for laboratory technicians in early 2002, the first of which being a one-week, on-the-job training for the seven laboratory technicians at Kisangani General Hospital on the proper use, care and maintenance of equipment (refrigerators, microscopes, microbiological incubators) and the use, quality control, storage and inventory of reagents (rapid HIV kits, malaria kits, hepatitis B surface antigens). This was followed by a 10-day training (March 11 – 20) for 20 laboratory technicians (participants were chosen by the BCZS) from health centers in Lubunga health zone, covering detection and identification of blood, urine and stool parasites, anemia detection, basic haematology and proper laboratory practices.

Training-of-Trainers (TOT) workshops were then organized in June 2002 to continue reinforcing capacity of the district hospital laboratories. IRC conducted a weeklong TOT workshop for 5 laboratory technicians at Lubunga hospital, focusing on quality diagnostics procedures and microbiological investigations. The training was also to familiarize the technicians with newly delivered equipment, including an autoclave and scientific weighing scales. Similar workshops were subsequently held at the two other district hospitals. Before the end of the first phase of the program, a refresher training session was conducted for 16 laboratory technicians from all 3 reference hospitals on diagnostic skills, including blood transfusion, microbiology and safe laboratory practices.

Throughout the program, the IRC laboratory support manager and his staff made weekly visits to each hospital reference laboratory, to provide supervision and technical support, to gather data on blood donors and recipients, and to monitor laboratory test results. IRC also keeps track of donated equipment, such as blood-screening devices and cold-chain equipment, to make sure that laboratory technicians are maintaining them properly, and monitors refrigerator temperature to ensure the integrity of temperature-sensitive reagents. The IRC laboratory support team also works with hospital administrations to encourage proper financial management and cost-recovery for the reference laboratories.

Objective 4:

To improve hygiene and sanitation at 20 health centers in Lubunga health zone in Lubunga health zone through targeted water and sanitation interventions and community training.

In September 2000 the IRC Emergency Response Team assessed the water and sanitation requirements for five health centers that had been reporting the most number of cholera cases, and a standard design for a 6-hole latrine and an underground water reservoir was produced. However, after attempting to implement the design at the first health center (C.S. Pecheur d'Hommes), it became clear that the design was not well suited to the realities of Lubunga health zone. The design was too complicated for the local technical staff to follow, required large amounts of materials not easily available in Lubunga (like cement, timber and metalwork) and was not entirely appropriate for the local population, as the health centers may not have been able to find or purchase the above-mentioned materials with their limited resources when they need to carry out repairs.

IRC technicians and mobilizers working with the community to construct rings for the construction of wells at Yalisombo health center.

As the cholera outbreak was by then under control and no longer posed a serious health threat to the population of Lubunga health zone, IRC took the decision to suspend construction of latrines and water reservoirs in order to work on community mobilization. The idea behind this thinking was that if the community is mobilized to participate in the construction of latrines and water reservoirs at their health centers, then they will be more likely to clean and maintain them. Also, the latrines and water reservoirs will be designed with the communities in order to include as much locally available materials as possible, so that the local population

a) will be able to repair the latrines and water reservoirs more easily
b) will be able to replicate the designs on a smaller scale at their homes, if they choose

The model for the hand-washing stations was also redesigned to include locally appropriate materials, such as plastic buckets and taps. A hand-washing station had been produced for and installed at each health center by mid-January 2001.

IRC held meetings with the COSAs at each of the health centers in order to increase community participation in the design and implementation of the projects and to identify and train latrine technicians and water committees. As further health centers targeted for primary health care activities became accessible, IRC community mobilizers began working with the COSAs to identify their water and sanitation priorities and to determine what kind of contribution they could make to the projects. As a result, the communities agreed to provide locally available material (sand, gravel, sticks and stones) and unskilled labor for the projects, as well as to transport construction materials from IRC's Lubunga warehouse to the project sites and to make bricks for the planned latrines and water reservoirs. Mobilizers also carried out trainings in these communities on the causes and prevention of water and sanitation related diseases. Local communities were consulted on and involved in all of the rehabilitation and construction activities, which were completed in April 2002.

Outcomes and Successes: **Phase I, 1 July 2000 – 30 September 2002**

- ✓ IRC health monitors and BCZS supervisors were trained on mortality survey methods, vaccination coverage and community mobilisation techniques, with weekly supervisory visits to 20 health centers conducted throughout the program.
- ✓ 20 health centers received essential drugs and supplies throughout the initial phase of the program.
- ✓ 39,711 indigent patients treated since IRC intervention.
- ✓ 5447 indigents registered by COSAs since IRC intervention
- ✓ Refrigerators delivered to 2 health centers, to serve as vaccine storage sites
- ✓ **26% decrease in the crude mortality rate, and a 50% decrease in the excess mortality rate since the beginning of IRC activities in July 2000**

Due to high levels of community participation, IRC was able to complete the following water and sanitation projects:

- ✓ 12 water sources protected and 2 hand pumps installed at health centers in Lubunga health zone.
- ✓ hand-washing stations constructed and installed at 20 health centers in Lubunga health zone.
- ✓ latrines and showers constructed at 19 health centers in Lubunga health zone.
- ✓ incinerators constructed at 19 health centers
- ✓ rehabilitation of Kubagu Bridge (inaugurated April 2002)

In addition, in April 2002, IRC trained 40 water committee members (2 from each committee) on water, hygiene, sanitation and IEC. Pre-training test results averaged 45%, post-training test results averaged 95%.

<u>Project Activities</u>: Phase II, 1 October 2002 – 31 October 2003

This project was originally supposed to end September 30, 2002. However, IRC received a grant from Development Cooperation Ireland (DCI) to continue project support activities to Lubunga health zone and requested and received a no-cost extension from OFDA for this project until October 2003. Ongoing activities throughout the period of the no-cost extension focused on the following objectives and activities:

Objective 1:

To increase access to primary health care for the population of Lubunga health zone, through the provision of essential inputs and supervision.

- During November 2002 through to October 2003, IRC continued to work closely with the head nurses and health center staff, COSAs, and the BCZS to ensure the continued and uninterrupted supply of essential drugs, equipment and medical supplies to the 20 targeted health centers in Lubunga health zone.
- Dedicated in-depth refresher training sessions were carried out in collaboration with the BCZS, focussing on treatment protocols, usage and prescription of drugs, vaccination techniques, epidemiological surveillance techniques, community health, reproductive health, nutrition and HIV/AIDS.
- IRC health center monitors and community mobilisers carried out supervisory visits and also conducted on the job training sessions with health center staff throughout the final project period.
- Also in collaboration with the BCZS, training has been provided to COSA (community health committee) on community mobilization techniques and on the principles of community health education.
- IRC has worked closely with the COSAs to review and update the indigent criteria and has also continued to provide financial support to ensure that the indigent population of Lubunga receives quality health care services.

During the final 13-month project period, the percentage of children under 5 years of age receiving the six standard childhood immunizations has increased from 18% to 58.3%

Objective 2:

To improve diagnostic services by providing the resources to allow the three reference laboratories in Kisangani Town to test blood for HIV, as well as to isolate shigella and type meningitis species.

- IRC worked closely with technicians in the three general reference hospital laboratories that serve Kabondo, Kisangani and Lubunga health zones to identify training needs and programs.
- Technicians from the three hospitals received both in-depth and ongoing refresher training on the screening of blood transfusions for HIV and other pathogens.
- HIV test kits and other materials such as syphilis, malaria and hepatitis testing kits, single use blood lancets, surgical gloves and syringes were supplied to all of the laboratories throughout the project period.
- Further training was provided on the correct storage and use of the equipment, with IRC staff carrying out supervisory visits to ensure proper storage techniques and quality control monitoring.
- IRC also ensured the provision of equipment for health center laboratories and training for key staff to enable them to carry out basic tests.

Outcomes and Successes: Phase II

- ✓ Throughout the final 13-month implementation period an average of 95% of the 20 health centers maintained an uninterrupted supply of essential drugs and supplies through the project period, in addition to EPI inputs (vaccines, syringes, cold chain equipment).
- ✓ The head nurses from all 20 of the health centers were trained in the management of primary health care by May 2003.
- ✓ Training and guidance provided in the early identification of health care issues enabled Bambole health center staff to react to and contain a measles outbreak in December 2003, and this combined with the continued vaccination campaigns has ensured that there have been no cases of measles in Losoko for the past 2 years.
- ✓ Through the combination of ongoing training and supervision, the program has raised the treatment of patients in accordance with the national standard guidelines from 56% in February 2003 to 70% by the end of the project.
- ✓ In terms of improving diagnostic services, throughout the project-implementing period (November 2002 – October 2003) 100% of all transfusion blood tests were negative for HIV, VDRL, Hepatitis B and Malaria.
- ✓ 100% of laboratory personnel were trained to carry out tests for HIV, malaria, shigellosis and meningitis.
- ✓ During this time, at all three of the reference laboratories, none of the testing kits became unusable due to poor storage.
- ✓ By the end of the program 70% of the health centers were conducting at least 5 of the 7 basic tests (HB, Malaria, Wet Blood Smear, Urine, Stool); this figure has risen from 45% at the beginning of the program in November 2002.

Project Performance by Objective: Phase II, October 2002 – October 2003

In order to track our effectiveness in this and other interventions, we use S.M.A.R.T. indicators, for which we assemble data through a variety of sources, each meant to balance and, when necessary, counter-balance the others. For example, the overall reduction in mortality rates is determined by mortality surveys conducted through random sampling. Attendance records are maintained by the health centers and reviewed by the IRC, as are the decisions and products of the COSA groups. The results and comments for the final quarter of the project period (August – October 2003), which have not previously been reported, are included here in addition to information relating to the final 13 months of the project period (October 2002– October 2003).

OBJECTIVE 1

To increase access to primary health care for the population of Lubunga health zone, through the provision of essential inputs, training and supervision.

Crude Mortality Rate													
Crude Mortality Rate for Lubunga	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	2.4												1.66

health zone reduced by 12% from baseline CMR measured at the beginning of the project.	Baseline CMR measured at 3.1/1000/month in 1999; and 2.4 /1000/month in September 2002. **The mortality survey conducted at the end of the program in October 2003 showed a further reduction in the CMR to 1.66 deaths per 1,000 persons per month.** This represents a **86.7%** reduction from the baseline CMR measured prior to the beginning of the project in May 2000.

Treatment as per STDG

80% of all patients receive treatment in accordance to national standard diagnosis and treatment guidelines (SDTG).

2002			2003									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
				56%	55%	62%	65%	65%	70%	72.6 %	78%	70%

The percentage of patients receiving treatment in accordance with the STDG increased and remained constant throughout the final reporting period.

An average of 66% of all patients received treatment in accordance with the STDG throughout the last year of the program, and whereas this is below the target of 80%, these figures demonstrate a steady and marked improvement in the quality of care provided by the health center staff.

There are several factors that can explain the difficulty in raising the standards of primary health care services within the health centers. Many of the health center staff received training on the national treatment protocols earlier on in the intervention but were subsequently transferred to other health zones by the authorities, therefore renewed in-depth training sessions were required for the new and promoted staff. In addition, the Health Center staff are often unqualified or have very minimum qualifications when recruited by the BCZS.

Attendance Rates

Attendance rates at the health centers are within the WHO standard (target: 5,350/month)

2002			2003									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	4453	4395	3419	4033	4796	3931	3085	4068	4581	4136	4114	4223

The attendance rates at the health centers have been maintained throughout the last 12 months of the program, except for slight decreases in April and May following the absence of the head nurses for training programs and the subsequent reduced capacity of remaining staff to handle the patient load.

Although the attendance rates do not fall within the WHO standard, there has been an increase in the number of new patients who are able to pay for their healthcare and a significant decrease in the number of patients classified as 'indigent', from 65% in November 2002 to 20% in October 2003 (further details below). This is partly due to the training that the head nurses received in April on HC management and patient handling.

Vaccination of Children

40% of all children under

2002			2003									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct

5 years of age received the six standard childhood immunizations (as recommended by WHO).		18%			39%	11%	0%	74%	63%	64%	44%	40%	58.3 %
	Baseline is taken from the vaccination study that took place in mid-September 2002. In order to achieve 40% full coverage for children between 0-11 months, and 12-23 months, IRC has calculated that 177 children, as 4% of a target population of 131,152, need to be fully vaccinated each month until the end of the program. During the final year of the project period, the percentage of children under 5 years of age receiving the six standard childhood immunizations has increased from 18% to 58.3%. IRC was due to conduct a vaccination coverage survey at the end of the program in October 2003, however the BCZS have now put the national Enlarged Program of Immunisation/Program Elargi de Vaccination (EPI/PEV) in place, allowing close monitoring of the situation each month so this is no longer necessary. Of those children who remain unvaccinated, one of the chief causes is that mothers bring them for the first one or two immunisations but then do not complete the vaccination calendars for their children because of the associated side-effects (fever, pain, swellings).												

Identification of Indigents													
75% of all new indigent consultations are verified by IRC.	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
				100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
	IRC conducted monthly household visits in order to verify indigent lists from the COSA.												

Supply of Essential Drugs and Materials													
80% of all health centers have an uninterrupted supply of essential drugs and supplies through the project period.	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	95%	100 %	90%	90%	100 %	85%	100 %	95%	100 %	95%	95%	100 %	95%
	Throughout the last 13-month implementation period an average of 95% of the 20 health centers have maintained an uninterrupted supply of essential drugs and supplies. In the rare cases where health centers have run out of stock this has normally been due to personnel management issues which the BCZS has consequently resolved.												

Supply of EPI Inputs													
80% of all health centers maintain an uninterrupted supply of EPI inputs (vaccines, syringes, cold chain equipment).	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
					80%	100 %	90%	100 %	100 %	95%	85%	100 %	95%
	From February 2003 onwards an average of 94% of the 20 health centers have maintained an uninterrupted supply of EPI inputs. The PEV antenna of the BCZS experienced a stock-out of vaccines in the health zone between November and January, since which time the IRC has ensured that vaccinations can continue should this situation arise again by maintaining an emergency stock of EPI supplies. Other minor interruptions to supplies have been due to some health centers not justifying their use of the vaccines received, a shipment of supplies being received late following transport problems and health center staff failing to collect the vaccines from the stock sites.												

Training of Health Center Staff													
90% of health center staff members trained on key primary health care concepts.	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
							100 %	100 %	100 %	100 %	100 %	100 %	100 %
	The head nurses from each of the 20 health centers received training in the management of primary health care between 31 March and 9 April 2003. This was followed by continued on the job refresher training provided during supervisory visits of IRC health center monitors.												

Training of COSA Members													
90% of COSA members trained in, and understand, community mobilization and community health education.	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
												100 %	100 %
	At the end of 2002 many of the COSA members relinquished their roles in order to take jobs as casual labourers for a road construction program being carried out by another INGO in the health zone. IRC has worked with the BCZS to rebuild the COSAs and make them operational. From March 2003 new COSAs have been elected and IRC conducted an intensive training workshop with them in September. 40 COSA members attended the training – 2 from each health area – along with the Medecin Chef de Zone (MCZ), BCZS staff and IRC community mobilisers. Subjects covered included Primary Health Care Management, Partnership for Health and Public Sensitisation techniques. 38 of the participants took part in a pre-training test to gauge their knowledge, of whom one scored 70%, the majority (16) scored between 45% and 20% and the remaining twenty obtained less than 20%. Following the training a further test was conducted, with 33 of the trained COSA members taking part. This time 2 people scored over 80%, six obtained a result between 50% and 65% and the remainder (25 people) also showed a marked improvement by scoring over 40%.												

Treatment of Indigents													
Indigents do not exceed 40% of consultations at each health center.	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
		65%	66%	39%	54%	44%	32%	27%	23%	30%	24%	18%	20%
	A significant decrease in the number of patients classed as indigent receiving treatment can be noted. As the population gradually recovers from the war, trade routes begin to open up and become more accessible and those who had fled to the bush are starting to return home, so the number of people previously meeting the indigent criteria has begun to diminish. In response IRC has been working with the BCZS, health centers and COSAs to reduce and adapt the indigent criteria accordingly. Furthermore, an increased number of patients are now able to pay for the health care they receive and in addition indigent consultations are being more strictly monitored.												

OBJECTIVE 2

To improve diagnostic services by providing the resources to allow the three reference laboratories in Kisangani Town to test blood for HIV, as well as to isolate shigelloses and type meningitis species.

Safe Blood Transfusions: HIV

100% of all transfusion blood tests negative for HIV.

2002			2003									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

- During the final reporting period (Aug – Oct 2003), the program facilitated delivery of 343 blood units to the same number of patients.
- About 71.4% of these patients are children under 5 years of age

The program facilitated the delivery of a total of 1,437 units of blood to the same number of recipients throughout the final 13-month implementation period.

Safe Blood Transfusions: VDRL, Hepatitis B, Malaria

100% of all transfusion blood tests negative for VDRL, Hep B and Malaria

2002			2003									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

- In the final quarter the reference laboratories conducted 765 VDRL tests, 177 of which tested positive, indicating a 23% prevalence rate.
- 10 donor cases were rejected for being positive

The three reference laboratories conducted a total of 2,984 VDRL tests during the last13 months of the program. Of these, 1,064 tested positive indicating a 36% prevalence rate for syphilis in Kisangani Town and highlighting the serious problem of sexually transmitted infections (STIs) among the blood donor population as well as other patients. A total of 197 potential blood donors were rejected for testing positive for syphilis.

100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

- Hepatitis B surface antigen is also tested for all the donors since it is transfusion transmissible.
- In the reporting period the reference laboratories conducted 478 tests.
- 15 potential donor cases were rejected for testing positive for Hepatitis B.

The program enabled the laboratories to carry out 1,807 tests on transfusion blood for Hepatitis B. 72 (4%) of these were consequently rejected for testing positive.

100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

- The reference laboratories conducted 2,306 blood smears for malaria diagnosis during the final reporting period, amongst which 851 (37%) were positive.
- 5 potential blood donors were rejected for testing positive for malaria and a further three for micro filaires.

A total of 8,127 blood smears for malaria diagnosis were carried out by the reference laboratories and the health centers throughout the last year of the program, with a total of 41 potential blood donors rejected for testing positive.

Supplies of Essential Testing Kits													
Each reference laboratory has an appropriate supply of HIV testing kits during each month of the project.	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
		500	400		400	100	500	400	200	400	0	200	300
	• IRC program received 1500 HIV tests in July and carried distribution of 500 tests to the reference laboratories during the final reporting period. All three reference laboratories have had sufficient supplies of HIV testing kits throughout the program. In addition, adequate supplies of blood grouping sera sets were supplied to the laboratories.												

Storage of Essential Testing Kits													
100% of kits do not become unusable due to poor storage techniques.	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
	• No kits were reported unusable during the final quarter The program has ensured that each laboratory adheres to the guidelines for the storage of the kits, which all laboratory staff have received training on. Temperature chartings are used as monitors for efficiency of the fridges where the reagents are stored. IRC measures this indicator on weekly basis through random testing of kits in use and temperature charting. The fridge at Lubunga HGR has not been functioning for the past few months because the hospital has been without a power supply. However, IRC ensured that no kits were wasted by recalling perishable supplies for storage at the program's fridge in Kisangani and re-distributing them back to the hospital regularly using temporary cold storage facilities. The cold chain has been further reinforced through the reparation and maintenance of the two refrigerators at Kabondo and Kisangani hospitals following their breakdown, however it is evident that further support for the cold chain is needed to ensure the continued good storage of perishable supplies.												

% HIV+ Blood Rejected													
Random testing indicates that 100% of HIV+ donated blood is	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

donated blood is rejected.	• During the final reporting period, the 3 reference laboratories conducted 864 HIV tests, of which 176 cases tested positive. • Further rejection of the potential donors is dictated by three other tests: syphilis, hepatitis and malaria. In event that a donor is HIV negative, yet positive for any of these 3 tests, the donation is rejected. • 22 potential donors were rejected for testing positive for HIV between August and September. Those rejected for testing positive for other diseases included 10 VDRL (syphilis) cases, and 15 hepatitis cases. • The ratio for donors to recipients stands at about 1.2:1 • The HIV prevalence rate stands at 5.6% amongst potential blood donors and at 20.4% for all HIV tests conducted during the final reporting period. Throughout the last 13 months of the program, 100% of HIV+ donated blood was rejected and the 3 reference laboratories conducted a total of 3,088 HIV tests, of which 521 – **17%** - tested positive, indicating extremely high prevalence rates. 319 of these were potential blood donors, who were subsequently rejected and a further 197 people were rejected for testing positive for syphilis, 71 for Hepatitis and 41 for malaria. The average ratio of donors to recipients for the 13-month period is 1.4:1, however it should be noted that whilst in the first reporting period this figure stood at 2:1, at the end of the intervention it had decreased to 1.2:1.

Essential Supplies and Equipment													
Each laboratory has supplies to adequately carry out other routine tests for blood donors (VDRL, Hep B, malaria, lancets, gloves and syringes)	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	100%	100%	100 %	100 %	100 %	75%	75%	75%	75%	100%	100 %	100 %	100 %
	• 100% means that all laboratories have adequate stock of reagents or kits. • During the final reporting period 600 HbsAg tests, 500 HIV tests, 700 VDRL tests, 11 rolls of cotton wool and 2,200 surgical gloves were distributed to the reference laboratories. The 3 reference laboratories had adequate supplies to safely carry out all necessary tests throughout the last 13-month implementation period, however for some months they were supplied the bare minimum required due to problems with transport which delayed delivery. In total, the following supplies were distributed to the reference laboratories; 7,000 pairs of surgical gloves, 2,500 HbsAg tests, 3,000 HIV tests, 5,400 VDRL tests, 27 rolls of cotton wool, 2,000 single use blood lancets, 2,000 syringes and 2,400 blood grouping tests.												

Isolation of Shigellosis and Type Meningitis													
Reference laboratories are capable of	2002			2003									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	94	101	143	124	99	138	94	119	132	176	152	136	240

capable of isolating shigellosis and typing meningitis.	• 528 microbiological tests were done during the final reporting period. 46% (243) of the pathogens identified were Gram Negative bacteria. However, none of these were shigellosis or meningitis. Laboratory staff received training (see below) and this along with the provision of all necessary materials and equipment has ensured that the 3 reference hospitals now have the capacity to accurately isolate, detect and identify pathogens responsible for diarrhea and meningitis. During this last 12-month period Kisangani HGR was the only laboratory to isolate 3 agents of meningitis (1 case: diplococcal gram positive, 1 case of yeast and 1 case of gram negative rod). So far, the identified pathogens have shown a degree of resistance to most common antibiotics. This results from availability of drugs without prescriptions, incorrect dosages on personal prescription and failure to complete the doses of the prescribed antibiotics by the patients.

% Laboratory Personnel Trained

100% of laboratory personnel are trained to carry out tests for HIV, malaria, shigellosis and meningitis.

2002			2003									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

- During the final reporting period IRC carried out supervisory visits to monitor the progress of the laboratory staff and to train technicians in all 3 hospitals on carrying out blood compatibility tests and in information management, particularly updating and maintaining records in line with the national protocols.

In the first reporting period, technical tutorials were provided to 18 laboratory technicians based in the three reference laboratories. The training was based on the IRC-MIP developed curriculum and conducted over 2 days in each of the HGRs. The practical areas covered included blood screening for proper blood grouping, HIV, syphilis, hepatitis and malaria. Blood grouping is carried out for both donors and recipients, whilst the other tests are conducted only for donors. Similar tutorials were subsequently conducted with the laboratory staff for the diagnosis of shigellosis and meningitis causing pathogens. Refresher training sessions were carried out in the second quarter, revisiting the areas already covered and also covering microbiology investigation with an emphasis on rapid gram stain technique and isolation of pathogens responsible for meningitis and shigellosis.

% of Health Centers Conducting Basic Tests

80% of health centers conduct at least 5 of the 7

2002			2003									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
40%	45%	50%	50%	50%	40%	70%	80%	70%	75%	70%	75%	70%

basic tests (HB, Malaria, Wet Blood Smear, Urine, Stool).	• 8,845 basic tests for malaria, haemoglobin estimation, wet blood smears for microfilariae diagnosis, urine analysis and abdominal parasite diagnosis in stool were carried out by the health centers during this reporting period. • The health center laboratories for malaria diagnosis conducted 2494 blood smears. The prevalence was 74.8% (1865). Basic assistance to the health center laboratories began in late September 2002, when materials such as glass slides, malaria staining reagents, gloves, urine strips reagents for protein and glucose testing and other limited supplies were distributed. In October 2002 the first report indicated that 8 of the health centers had successfully started basic diagnosis for malaria, haemoglobin estimation, wet blood smears for microfilariae diagnosis, urinalysis and abdominal parasite diagnosis in stool. Since then, the number of laboratories conducting basic tests has gradually increased and IRC has continued to provide further basic equipment and apparatus including manual centrifuge, centrifuge tubes, lab coats, surgical gloves, blood lancets, gram stain kits, registers and haemoglobinometres. In addition, continuous training and supervision has been carried out with health center staff. The number of laboratories conducting the basic tests has fluctuated as some health centers broke equipment and materials. The IRC reacted by sending representatives of the logistics team to investigate and find solutions with the laboratories concerned.

Coordination and Networking

Coordination with Bureau Central de Zone de Santé (BCZS):
IRC has worked closely with the BCZS, the Ministry of Health office for Lubunga Health Zone, for the past 3 years. Training materials and modules for health center staff and COSAs have been developed and delivered jointly by the BCZS and the IRC health team, and the two have also worked hand in hand to increase the number of children under 5 years old receiving vaccinations and put epidemiological surveillance systems in place. Throughout the program the IRC team have however been largely responsible for the ongoing supervision and support of the health centers as the BCZS, having not received material or technical support from the central Ministry of Health for years, lacks the proper experience, training or means to supervise and build the capacity of the health service providers in Lubunga. To begin to address this, shortly after the end of this program, in December 2003, the BCZS - in collaboration with the DPS - organized a 3 day Annual Review of activities in Lubunga Health Zone. The workshop was attended by the head nurse and President of the COSA of each of the 20 health centers, and presided over by the *Medecin Chef de Zone* (MCZ). Key members of the DPS, BCZS and the IRC implementation team also participated. All of the parties concerned were involved in work groups and open discussions to examine those problems presenting a major obstacle to the continuation of activities; clarification as to the co-management and maintenance of the health centers, the need to standardize fixed tariffs for treatment and drugs, confirmation of who will be responsible for the continued provision and management of drugs and supplies, the need to re-establish indigent criteria and to ensure their continued health care, the development of mechanisms to increase vaccination coverage, increased human resource management and support for supervision.

Dr Lola, the Medecin Chef de Zone for Lubunga, addresses head nurses and COSA presidents during the joint health review held in December 2003

Coordination with Division Provinciale de la Santé (Provincial Health Inspection Office):
IRC continued to build on the developing relationship with the Division Provinciale de la Sante (DPS) - formally known as the Inspection Provinciale de la Sante (IPS) – the regional representation of the Ministry of Health in Orientale Province. Throughout the program, the DPS collaborated with the BCZS, the health centers, COSAs and IRC on the standardization of tariffs and on the revision of the standard diagnosis and treatment guidelines. The DPS and IRC also worked in partnership to devise and deliver the training sessions for laboratory technicians in the three general reference hospitals.

Coordination with Comités de Santé (COSA) / Community Health Committees:
COSAs are elected village health committees in each health center catchment area. Members are elected for a one-year term and can be re-elected only once. COSAs link the health center and the community through public information campaigns, the identification of indigents, and the collection of health related data. COSA members are also responsible for spreading health education messages and other important health information (such as dates for upcoming vaccination campaigns). Throughout the program the IRC health team worked in collaboration with the BCZS to provide training and support to the COSAs of the 20 health centers.

Adjustments

Between the time of proposal submission and approval fighting broke out between Rwandan and Ugandan troops based in Kisangani causing many casualties, wounded, and displaced persons, and damage to public and private buildings and homes. Once funding was received IRC sent an emergency response team (ERT) to Kisangani to set-up the IRC office and evaluate if the planned interventions were still relevant and appropriate. This initial office start-up and evaluation took approximately 6 weeks to accomplish. In light of this evaluation, IRC changed objective 2 from a health objective assisting the regional laboratories in conducting various medical tests to that of a water/sanitation objective designed to improve water and sanitation facilities at select health centers. The permanent expatriate team arrived in early September 2000 and full implementation of project activities began at that time.

When the project began, there were seventeen functioning health centers in Lubunga health zone. Three centers subsequently reopened, bringing the total to twenty. Unfortunately, due to security constraints, specifically limited radio coverage, IRC could initially support only twelve of the twenty health centers. Once an additional antenna was placed in Lubunga radio coverage, and therefore access to the other health centers, improved.

In March 2002 the Kisangani water and sanitation team sent some emergency materials to Goma to aid displaced peoples following the volcanic eruption on 17th January. The Kisangani water and sanitation manager traveled to Goma in order to assist other IRC staff during the emergency. IRC supplied approximately 500,000L of drinking water per day from 14 water bladders.

In June 2002, IRC discovered that Kabondo laboratory had been secretly sharing their HIV test kits with the St. Joseph clinic in the Tshopo district of Kisangani. Both Kabondo hospital and the St. Joseph clinic fall under the same administration, and the reason given for this arrangement was that the HIV test kits were due to expire in September, so it was decided to share them to prevent wastage. IRC investigated the matter and found that the St. Joseph clinic actually carries out more blood transfusions than either Kisangani or Lubunga hospitals, and the clinic reports a higher HIV prevalence than in any of the hospital laboratories. Kabondo hospital had been reporting laboratory results from the St. Joseph clinic, which explains why Kabondo consistently reports higher numbers of tests, transfusions, and HIV+ donors. IRC also found that the St. Joseph clinic has competent staff with proper knowledge in using HIV kits. IRC laboratory support staff actually reviewed screening protocols and difficulties encountered with two laboratory technicians, then gave a quick tutorial for on HIV and hepatitis testing, and translated test-kit instructions for them. While the arrangement between the hospital and the clinic may be beneficial for residents of Kisangani, IRC was dismayed that the hospital hid these arrangements. As a result, IRC strengthened purchasing procedures for new blood test kits to ensure that they are not in danger of expiring, and to avoid providing surplus kits to hospital laboratories.

Constraints, Lessons Learned and Recommendations

One of the constant challenges to the continued quality of health care provided by the health centers is the high staff turnover. During one three month reporting period alone (April – June 2001), six of the head nurses at health centers where IRC is working (Losoko, Bambole, Pêcheur d'Hommes, Mako, Biaro and Osio 21) were transferred and replaced by nurses with of a lower grade (A2 and A3, as opposed to A1) and with less training. IRC health monitors thus had to devote extra attention to the training and supervision of these nurses.

The fluctuating security situation has also affected the smooth running of activities. On May 14 2002, there was an attempted uprising in Kisangani by RCD dissenters. The short-lived mutiny was quickly and violently extinguished, resulting in the executions of over 200 soldiers and civilians implicated in the rebellion. IRC suspended program activities for 1 week, but was luckily able to quickly resume

most activities by the end of the month. On a slightly different note, Following a theft from the IRC pharmacy in early 2002, IRC conducted an investigation and subsequent reorganization of the pharmacy, requiring the cooperation of most IRC Kisangani staff. This operation interrupted program activities in February, but IRC was able to resume normal activities in March, distributing drugs and equipment to 20 health centers in Lubunga health zone.

The procurement and clearing through customs of essential materials and supplies from overseas is a problem over which IRC has little control that has plagued this program and which continues to do so to this day, with serious repercussions. Unfortunately, IRC was unable to carry out regular distributions of essential drugs in Lubunga in June 2001 due to delays in the delivery and clearing of the drugs in Kisangani. The medicine was received in the IRC warehouse but could not be distributed until it was released by customs, which took approximately one month. These delays lead to ruptures of stock at the health centers, which in turn depressed attendance figures for the month of June. The drugs were subsequently cleared and regular distributions recommenced. But this affected attendance rates as the word spread through the communities that the health centers had insufficient stocks of medicine.

As mentioned in the above coordination section, the BCZS and DPS currently lack the capacity to be able to independently continue the provision of quality primary health care services in Lubunga health zone. The IRC therefore considers it essential that the BCZS is now reinforced to be able to provide support and supervision in the next program of activities for Lubunga. Health Center staff are also often unqualified or have very minimum qualifications when recruited by the BCZS and therefore further supervision will be essential to ensure the sustained treatment of patients within the national standard diagnosis and treatment guidelines.

The 20 health centers involved in the program have been receiving a constant supply of essential drugs, equipment and medical supplies throughout the project period, the only interruption to this being the periods when staff were participating in training and delayed their requests for supplies. Whilst the number of qualified staff available to work in the health centers remains low and human resources continue to be stretched, any future training programs organized should take into account the need for the health centers to be able to continue the day to day running of their facilities even when key staff members are away. More focus could be directed to providing on-the-job training, more thorough and frequent supervisory visits from BCZS staff and even the secondment of BCZS staff members to health centers to provide intensive training and support to staff.

Despite community sensitization and awareness raising sessions, many mothers are still not ensuring that their children complete the full vaccination calendar. These women live in a patriarchal society, where most, if not all, of the COSA members and health center staff are men, as are those who attend community sensitization sessions. Often vaccination campaign messages do not reach wives and mothers and sometimes male COSA members and health center staff do not take into account such things as market days when planning vaccination days. Despite IRCs intervention the number of children not receiving the full set of vaccinations is still high. Future programming should consider the use of focus groups for women and other more targeted community campaigns.

As can be seen from the statistics in the results section of this report and the following annexes, syphilis is a major problem and continues to show increase in the prevalence among the blood donor population as well as other patients. Of the 2,984 VDRL tests conducted by the reference laboratories throughout the last 12 months of the project period, 36% (1064) tested positive. Other sexually transmitted infections (STIs) are also becoming increasingly more common and this program also revealed that the prevalence rate for HIV amongst the population of Lubunga, Kabondo and Kisangani health zones stands at around 17%.

The reference laboratories have been able to maintain all of their stocks of HIV test kits throughout the program. However, power cuts are frequent throughout the country and the hospitals do not have sufficient funds for fuel to power their generators. Aside from moving the kits to the IRC's fridge, the

hospitals can use iceboxes to maintain the temperature of the kits, however this is a temporary solution as kits can only be stored in the iceboxes for up to 24 hours. The cold chain is in need of reinforcement if the safe blood transfusion services established within this program are to continue.

Conclusion

The Kisangani Health Care Support Project funded by OFDA, has greatly contributed to the improved provision of primary health care services in Lubunga health zone and to safe blood transfusion facilities in Kisangani Town. The reduction in the Crude Mortality Rate from 3.1/1,000/month to 2.4/1,000/month to 1.66/1,000/month and the identification and rejection of hundreds of potential blood donors who tested positive for HIV are figures that speak for themselves. However, whilst the considerable progress in the field of health services cannot be denied, the focus must now shift to increasing the capacity of the local health authorities and their structures to be able to support, supervise and manage the health centers and hospitals, and thereby ensure the continued provision of health care services following the departure of the IRC. The joint annual health review attended by DPS, BCZS, MCZ, COSA Presidents, Head Nurses and IRC staff alike laid the foundations of a collaborative transfer plan which will permit the local health authorities to assume overall responsibility for the management and supervision of quality primary health care facilities. IRC and the DPS/BCZS now look to the implementation of this plan and the continued support of partners such as OFDA.

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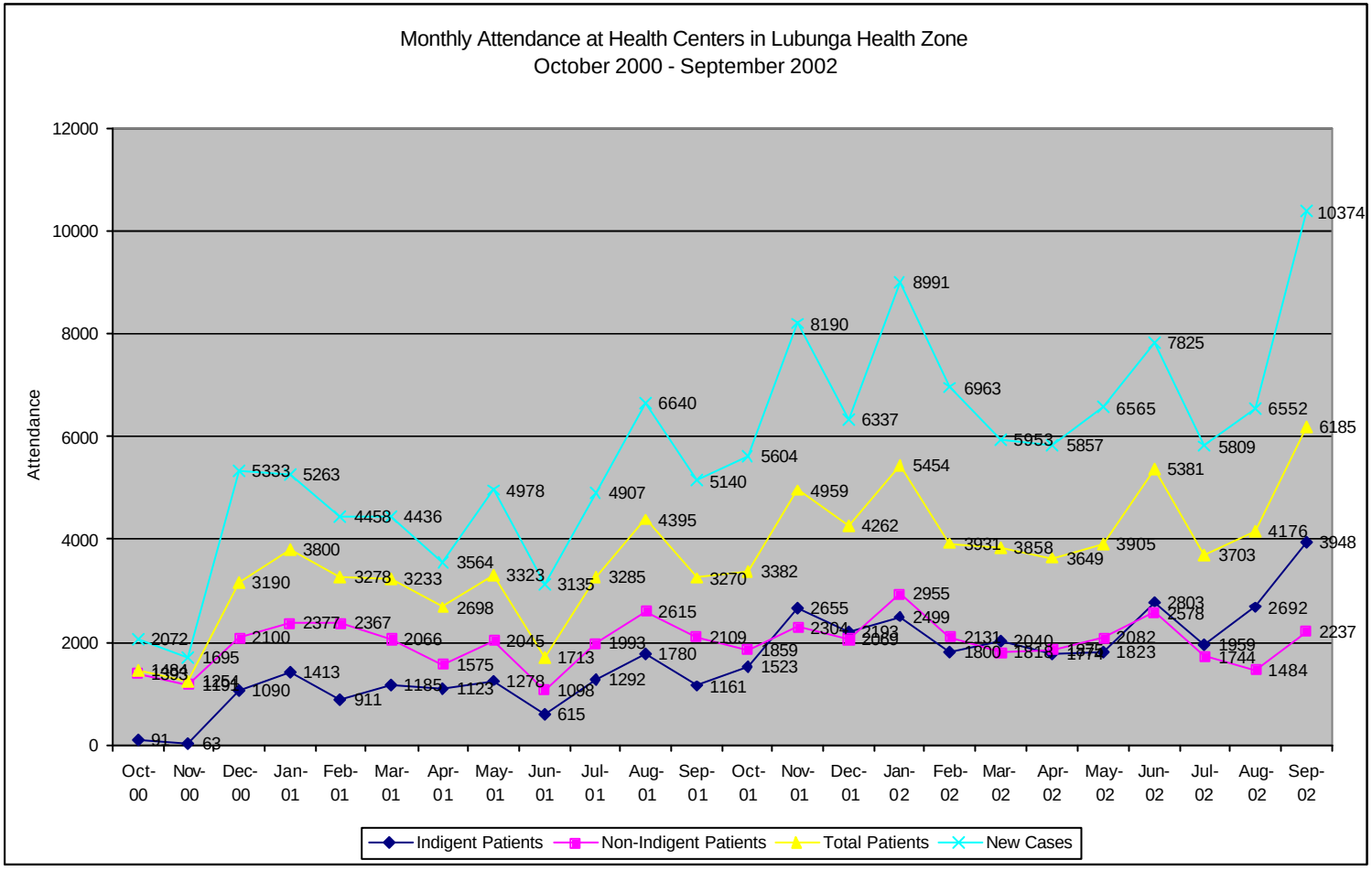
ANNEXES

Demographics of 20 health catchment areas in Lubunga Health Zone

No	Health Center	Local Population	Distance from BCZ S (km)	GPS	
1	Bambole	9,699	0	N 00º30'47.0"	E 25º11'43.0"
2	Bandu	4,239	12	N 00º24'53.4"	E 25º13'07.4"
3	Biaro	2,835	41	N 00º19'18.7"	E 25º14'06.5"
4	Biaro-Embouchure	2,500	N/A	N/A	N/A
5	Bokuma	4,650	101	N 00º01'26.5"	E 24º39'29.7"
6	Isangi	5,427	25	N 00º21'44.8"	E 25º19'18.7"
7	Kubagu	8,213	14	N 00º23'09.0"	E 25º08'08.1"
8	Losoko	11,299	5	N 00º29'50.8"	E 25º10'05.3"
9	Mako	11,424	1.5	N 00º29'36.8"	E 25º11'16.7"
10	Osio 16	7,077	16	N 00º34'14.0"	E 25º13'40.2"
11	Osio 21	9,116	21	N 00º34'27.9"	E 25º10'25.8"
12	Pecheur d'Hommes	7,534	2	N 00º29'47.7"	E 25º11'43.1"
13	St. Casimir	4,956	25	N 00º19'21.8"	E 25º15'08.7"
14	St. Andre	6,889	3	N 00º29'22.1"	E 25º12'04.0"
15	Yainelo	5,559	82	N/A	N/A
16	Yalikanda	5,428	65	N 00º22'26.9"	E 24º43'30.4"
17	Yalisombo	7,336	25	N 00º33'07.6"	E 25º00'17.9"
18	Yambela	4,748	52	N 00º19'36.2"	E 24º49'37.6"
19	Yaolonga	7,065	165	N 00º12'10.7"	E 24º27'03.1"
20	Yatange	5,148	36	N 00º22'04.7"	E 24º57'22.0"
	Total	**131,152**			

PHASE I: JULY 2000 – SEPTEMBER 2002

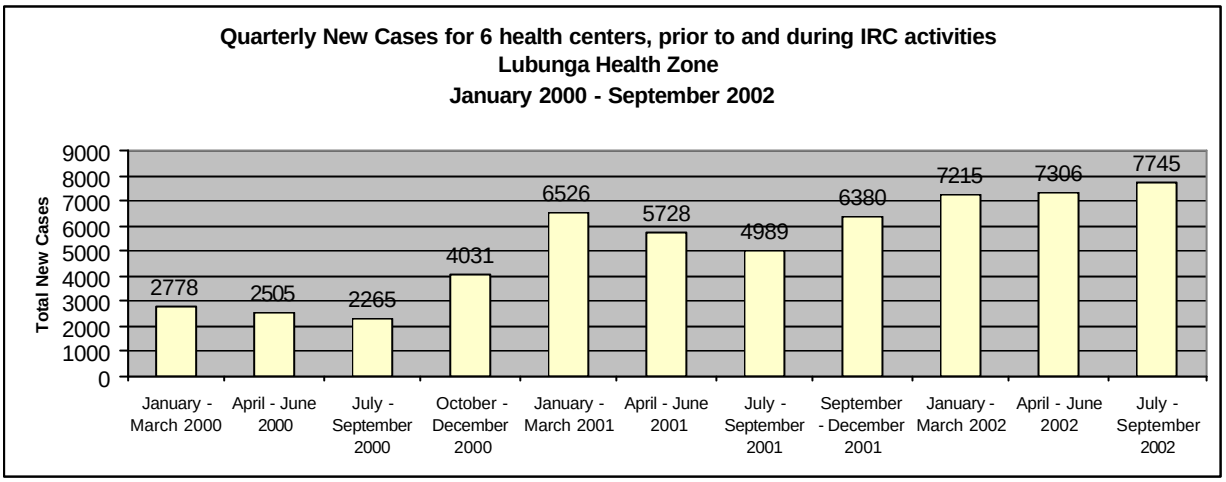
Attendance Summary



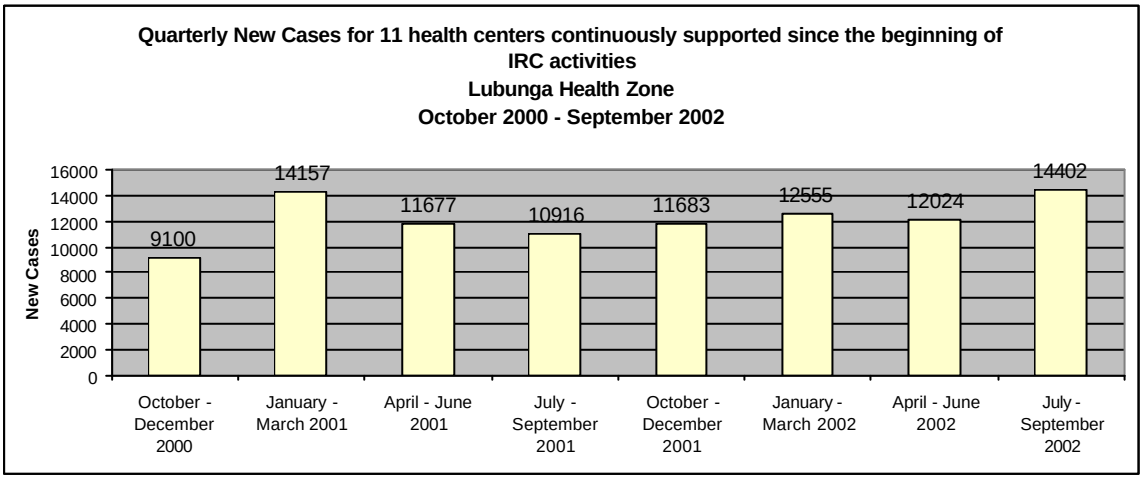
Total Patient Attendance (yellow) is the sum of Indigent (blue) and Non-Indigent (purple) patient attendance. IRC uses two indicators for measuring health center activity: **attendance** and **new cases**. Attendance records the number of people who receive treatment, and is separated into indigents and non-indigents to show whether the project is benefiting the indigent community members. New cases count patients each time they present a different illness, and may include patients who receive treatment for multiple diseases; this shows the increases and decreases of health center activity. Neither indicator includes old cases: patients who visit the health center multiple times in the same month for the treatment of a single disease. Example: a patient arrives at a health center seeking treatment for malaria and anemia. The patient is counted **once in attendance**, but the illness are recorded as **two new cases**. New cases will always be equal to or greater than attendance. Figures from October 2000 - June 2001 refer to only 12 health centers, figures from July 2001 - October 2001 refer to 19 health centers and figures from November 2001 - March 2002 refer to 20 health centers.

New Cases Summary

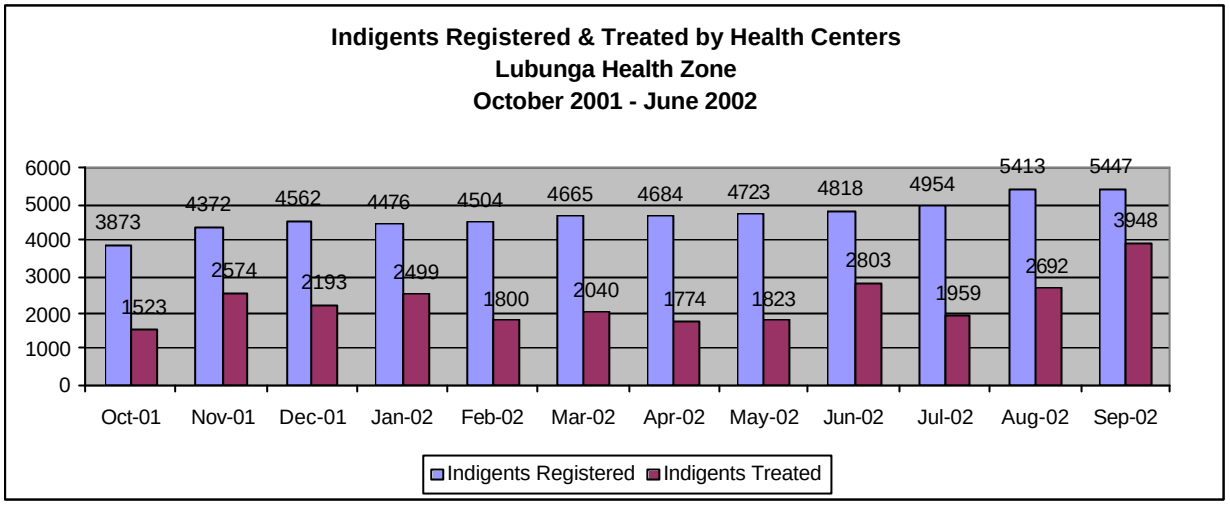
A. The only attendance figures for Lubunga health zone, covering the period before the project began, are new cases for seven health centers: SNCC, OSIO, Kubagu, Losoko, Bandu, Yalisombo, and Pêcheur d'Hommes (SNCC closed in March 2001). In order to provide a long-term comparison with pre-project attendance, IRC has compiled the quarterly new cases for the six health centers where IRC has maintained operations since the project began.



B. These figures are for twelve health centers (SNCC, Osio 21, Kubagu, Bambole, Losoko, Bandu, Biaro, St. Andre, Yalisombo, Isangi, St. Casimir and Pecheur d'Hommes) that have been continuously supported since the beginning of the project (SNCC closed in March 2001).

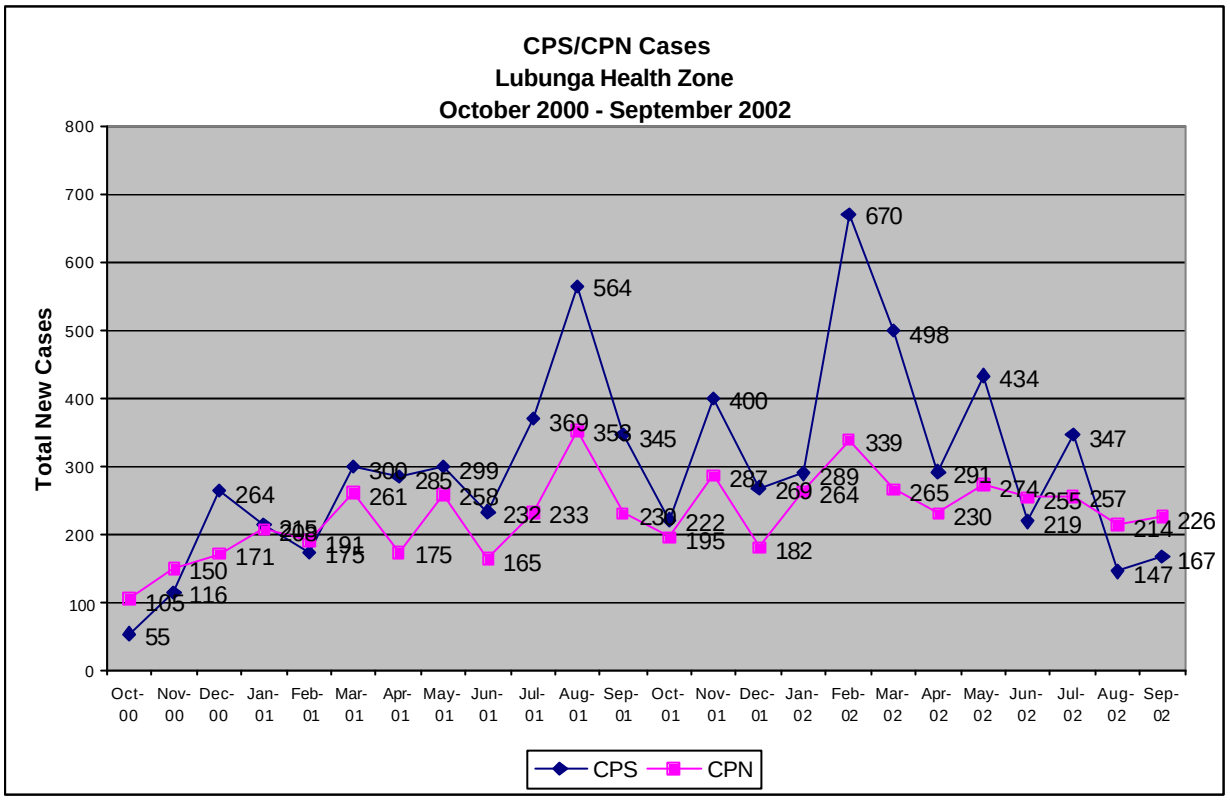


Indigents Registered and Treated



Indigent Community Members are identified by COSAs and verified by IRC health monitors. The number of indigent patients treated is based on indigent patient attendance.

CPN/CPS Cases



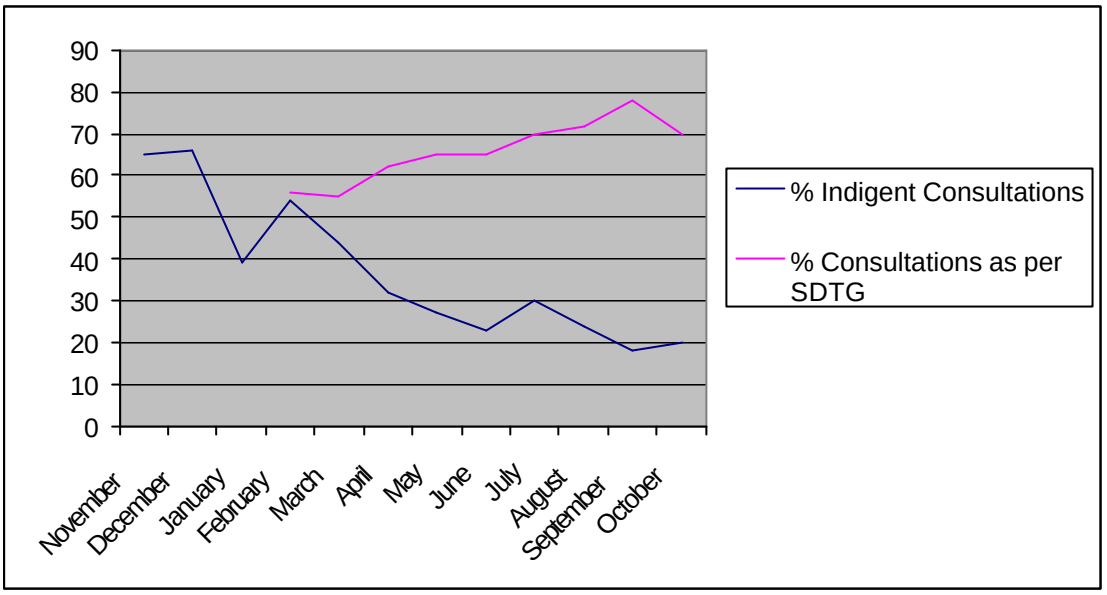
IRC monitors the EPI program in Lubunga health zone by tracking New CPN/CPS (Pre-Natal Consultations/Pre-School Consultations) and vaccine series completed each month at each health center. New CPS Cases represent the number of children who arrived for vaccination at the health center for the first time, filled out a vaccination card, and received at least one dose of one vaccine (VAR, VPO, BCG, or DCT) in the month. New CPN Cases reports the number of pregnant women who received a pre-natal consultation at the health center in a month and includes women who did and did not receive the VAT vaccine. These indicators show that the number of people seeking out preventative care, including vaccinations, in Lubunga increased significantly between October 2000 and June 2001, and then again following the support provided to seven new centers in July 2001.

Note: Figures from October 2000 – June 2001 refer to only 12 health centers. Figures from July – September 2001 refer to 19 health centers. Figures from November 2001 – March 2002 refer to 20 health centers.

Phase II: October 2002 – October 2003

PRIMARY HEALTH CARE ACTIVITIES RESULTS

% INDIGENT CONSULTATIONS/% CONSULTATIONS ADHERING TO SDTG



HIV TEST RESULTS: OCTOBER 2002 – OCTOBER 2003

KABONDO GENERAL REFERENCE HOSPITAL LABORATORY:

	Age	Male		Female		Total
		POSITIVE	NEGATIVE	POSITIVE	NEGATIVE	
	15 – 39 years	38	446	55	361	900
	Over 40 years	13	140	10	56	219
No. affected by illness		40	96	63	170	369
Total HIV Tests Conducted		91	682	128	587	1488
Prevalence:		**6.12%**		**8.60%**		

KISANGANI GENERAL REFERENCE HOSPITAL LABORATORY:

	Age	Male		Female		Total
		POSITIVE	NEGATIVE	POSITIVE	NEGATIVE	
	15 – 39 years	8	166	7	92	270
	Over 40 years	3	82	3	34	122
No. affected by illness		65	240	126	318	749
Total HIV Tests Conducted		76	485	136	444	1141
Prevalence:		**6.66%**		**11.91%**		

LUNBUNGA GENERAL REFERENCE HOSPITAL LABORATORY:

	Age	Male		Female		Total
		POSITIVE	NEGATIVE	POSITIVE	NEGATIVE	
	15 – 39 years	0	36	1	12	49
	Over 40 years	0	20	0	1	21
No. affected by illness		25	77	25	34	161
Total HIV Tests Conducted		25	133	26	47	231
Prevalence:		**10.82%**		**11.25%**		

BLOOD TRANSFUSION RECIPIENTS: OCTOBER 2002 – OCTOBER 2003

KABONDO GENERAL REFERENCE HOSPITAL:

Age	Male	Female	TOTAL
under 5 years	373	337	710
6-10 years	13	10	23
11-15 years	0	7	7
16-20 years	17	43	60
over 21 years	40	88	128
TOTAL	**443**	**485**	**928**

KISANGANI GENERAL REFERENCE HOSPITAL:

Age	Male	Female	TOTAL
under 5 years	72	68	140
6-10 years	8	7	15
11-15 years	7	5	12
16-20 years	11	29	40
over 21 years	42	82	124
TOTAL	**140**	**191**	**331**

LUBUNGA GENERAL REFERENCE HOSPITAL:

Age	Male	Female	TOTAL
under 5 years	28	13	41
6-10 years	4	2	6
11-15 years	1	1	2
16-20 years	0	5	5
over 21 years	3	7	10
TOTAL	**36**	**28**	**64**

OTHER TESTS CARRIED OUT AT THE THREE GENERAL REFERENCE HOPITAL LABORATORIES : OCTOBER 2002 – OCTOBER 2003

	KABONDO		*KISANGANI*		*LUBUNGA*	
	Positive	Negative	Positive	Negative	Positive	Negative
Rapid Malaria Test	9	646	6	370	2	70
VDRL (Syphilis)	65	797	967	804	5	170
Hepatitis	23	633	81	783	14	135
Blood Group	1124	7	2509	37	275	13
Blood Drop Test	410	1922	1775	2069	964	987
Coloration Gram	472	263	165	1034	395	169
Total No. of Tests Conducted:	**6371**		**10600**		**3199**	

TESTS CARRIED OUT AT THE 20 HEALTH CENTERS, OCTOBER 2002 – OCTOBER 2003:

	Hb	**VS**	**GE**		**GF**		**URINE**		**SELLES**		**GRAM**		**TOTAL TESTS**
Health Centers:.			*POS*	*NEG*	*POS*	*NEG*	*POS*	*NEG*	*POS*	*NEG*	*POS*	*NEG*	
BIARO EMBOUC.	81	7	143	103	3	7	54	18	125	105	8	3	**657**
BAMBOLE	2200	32	2098	125	46	29	576	217	1899	148	135	1	**7506**
BANDU	683	142	423	180	173	120	314	247	591	222	47	14	**3173**
BIARO RAIL	188	2	379	79	128	27	20	35	272	77	12	1	**1220**
BOKUMA	170	68	98	27	13	11	28	14	124	21	1	0	**575**
CASIMIR	79	13	172	10	1	1	16	9	62	13	0	0	**376**
ISANGI MAK.	541	11	301	45	71	33	58	26	273	85	14	0	**1458**
KUBAGU	709	15	619	208	193	135	306	94	714	177	3	4	**3177**
LOSOKO	1218	46	576	619	39	39	383	339	572	816	2	1	**4650**
MAKO	85	21	127	55	24	24	1	2	65	35	0	0	**439**
OSIO 16	0	0	0	0	0	0	0	0	0	0	0	0	**0**
OSIO 21	424	34	117	45	15	4	110	307	61	57	1	0	**1175**
PEC. D'HOMMES	827	226	994	221	223	32	333	47	1177	317	57	14	**4465**
St ANDRE	773	35	371	101	2	23	86	1336	1074	192	13	0	**4006**
YAINELO	285	3	137	50	72	39	474	267	111	49	22	8	**1517**
YALIKANDA	390	7	145	84	134	82	350	35	288	183	4	0	**1702**
YALISOMBO	51	5	192	59	4	8	32	47	144	48	0	0	**590**
YAMBELA	311	25	207	17	106	13	53	121	267	97	4	0	**1221**
YAOLONGA	177	6	45	5	127	0	54	18	441	2	0	0	**875**
YATANGE	228	22	156	53	21	5	66	32	130	44	17	3	**777**
TOTAL	**9420**	**720**	**7300**	**2086**	**1395**	**632**	**3314**	**3211**	**8390**	**2688**	**340**	**49**	**39559**