

1 Executive Summary

Final Report

Organization International Rescue Committee

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Program Title	Emergency Measles Vaccination Campaign
Grant No	AOT-G-00-99-00075-00
Country/Region	Democratic Republic of Congo (South Kivu province)
Disaster/Hazard	Measles Epidemic
Time Period of Report	1 April - 31 May (extended to 31 August) 1999

Objective 1 To vaccinate 80,000 children between 9 months and 5 years of age in a mass measles campaign in Katana and Kabare health zones in order to reduce the number of cases for this age group and to prevent measles-related deaths

The emergency measles vaccination campaign was conducted in two phases. As Katana health zone was experiencing a measles epidemic, the first phase was held throughout Katana health zone from April 26-29, 1999. The Vaccination Coordination Committee (chaired by the a member of the Ministry of Health) decided that due to the seriousness of the outbreak, the minimum age for vaccination should be dropped from nine to six months (based on WHO protocol). A pre-campaign vaccination coverage survey indicated coverage rates of 20% for measles and 24% for polio. During this campaign, 46,373 children between the ages of 6-59 months were vaccinated against measles, indicating a vaccination coverage rate of 91.8% (based on Ministry of Health population statistics). 54,444 children from the ages of 0-59 months were vaccinated against polio and received an appropriate dose for age of Vitamin A, indicating a 96.8% vaccination coverage rate (based on Ministry of Health population statistics). A post-campaign vaccination coverage survey indicated a 91.4% coverage rate (card-confirmed) for both measles and polio.

The second phase of the vaccination campaign was carried out in Kabare health zone from May 31-June 2, 1999. The campaign was to have been conducted in mid-May, but representatives from the Ministry of Health, UNICEF and WHO were called to Nairobi to participate in planning activities for the National Polio Vaccination Days (to be held in August-October 1999 in DR Congo). A pre-campaign vaccination coverage survey indicated coverage rates of 13.6% for measles and 18.2% for polio. During this second phase of the campaign, 22,604 children between the ages of 9-59 months were vaccinated against measles, indicating a vaccination coverage rate of 113.6% (based on Ministry of Health population statistics). 26,415 children between the ages of 0-59 months were vaccinated against polio and received and age-appropriate dose of Vitamin A, indicating a 110.8% vaccination coverage rate. The reason for coverage

rates exceeding population estimates is that many mothers from neighboring health zones brought their children to health centers in Kabare to be vaccinated, as routine vaccinations are not happening in most of South Kivu. A post-campaign vaccination coverage survey in Kabare health zone itself indicated a 97.9% coverage rate (card-confirmed) for both measles and polio.

Indicator and Current Measure

68,977 children vaccinated against measles (6-59 months in Katana, 9-59 months in Kabare)

80,859 children vaccinated against polio and given Vitamin A (0-59 months)

Katana Vaccination Coverage Rate **91.4% card-confirmed**

Kabare Vaccination Coverage Rate **97.9% card-confirmed**

Ministry of Health Epidemiological Surveillance statistics indicate reduction in measles cases and deaths in Katana from 105 cases and 3 deaths in April 1999 to 6 cases and 0 deaths in June 1999.

II Program Overview

Goal To prevent measles-related deaths in Katana and Kabare health zones

Objective 1 To vaccinate 80,000 children between 9 months and 5 years of age in a mass measles campaign in Katana and Kabare health zones in order to reduce the number of cases for this age group and to prevent measles-related deaths

Targeted Population

The beneficiaries of this project are children between the ages of 0-59 months in Katana and Kabare health zones. Although the original target was children between the ages of 9-59 months, the Vaccination Coordination Committee decided that it would be best to add polio vaccines (originally intended for the August 1998 National Vaccination Days) and Vitamin A supplements to the measles vaccination campaign. Therefore the precise targeted population was 56,216 children in Katana and 21,538 children in Kabare, a total of 77,754 children in both zones.

Geographic Location

The two phases of the measles vaccination campaign occurred in Katana health zone (Phase I) and Kabare health zone (Phase II). Vaccination sites were set up at health centers and other facilities that could accommodate large numbers of people, such as schools and churches.

III Program Performance

Objective 1 To vaccinate 80,000 children between 9 months and 5 years of age in a mass measles campaign in Katana and Kabare health zones in order to reduce the number of cases for this age group and to prevent measles-related deaths

A Program Performance and Actual Accomplishments please see attached Project Report

B Success Stories 77,754 children vaccinated!

C Unforeseen Circumstances none

IV Resource Use/Expenditures

Please see Financial Report

**Emergency Vaccination Campaign
Katana and Kabare Health Zones
South-Kivu Province, Democratic Republic of Congo (DR Congo)
March-June 1999
IRC/OFDA/WHO/Mellon Foundation**

Background

The eastern part of the Democratic Republic of Congo (DRC) has been severely affected by regional events of the past few years. After more than thirty years of governmental neglect of social services, the population found its limited resources further stretched by the influx of over one million Rwandan and Burundian refugees into the region during 1994. The events in neighboring countries sparked off a civil war in South Kivu in late 1996 which eventually spread throughout the country and resulted in the overthrow of long-time dictator Mobutu Sese Seko. Another war erupted in the Kivus in August 1998 which has resulted in the de facto division of the country into two parts, with the west still under control of the government of Laurent-Desire Kabila and the east under the control of the rebel faction, Rassemblement Congolaise pour la Democratie (RCD). The war continues to divert resources away from social services and public works, leaving the population grossly underserved in the areas of health care, as well as water, sanitation and others.

The province of South Kivu has been particularly hard hit since the war of 1996, and outbreak of fighting again in August 1998 only exacerbated the difficulties. The economic situation in the rural zones plummeted as the heightened insecurity curtailed movement, thus cutting the rural populations off from the main city markets. As a result, the lack of commerce led to sharp decreases in purchasing power of the local communities. This lack of purchasing power has severely limited the population's ability to procure sufficient amounts of food. Little, if any, disposable income is available to the rural population, thus limiting their ability to support health care costs for family members.

The difficulties in accessing health care have been further exacerbated by the increased unavailability of proper medical care and supplies, due to lack of funds at the local level. The impact in the rural health zones, in particular Katana and Kabare, has been much greater than in the provincial capital of Bukavu. For six months following the events in August 1998, areas in Katana (55 Kms from Bukavu) and Kabare (35 Kms from Bukavu) were off limits to staff of international NGOs due to the unreliable security situation, yet reports of deteriorating health status filtered into Bukavu. Malnutrition has been on the rise in rural zones, making children more vulnerable to disease and death. Since the events in August there have been pockets of outbreaks of various preventable diseases. In October 1998, an alarming number of measles cases, one of the most deadly of the preventable childhood diseases, were reported in Katana health zone. Preliminary figures of 111 measles cases and 44 deaths for the month of October (case-fatality rate of 39.6%)¹, trickled into Bukavu in early November 1998. Unfortunately, reliable epidemiological information never followed this initial report, which hampered any efforts to seek support for an intervention to arrest this outbreak. It was only after the results of mortality survey carried out by IRC in February 1999 were analysed that the magnitude of the outbreak became apparent.

In February 1999, IRC undertook a mortality survey in Katana health zone, under the supervision of Les Roberts Ph.D, a water and sanitation engineering consultant who is also an experienced epidemiologist. The purpose of the survey was to establish the crude mortality rate (CMR) in the zone and to determine the major causes of mortality, in order to define and determine the magnitude of the health crisis. This information would assist IRC and other agencies in establishing appropriate interventions, if necessary. The CMR for the general population was estimated to be 4.0/1000/month over a 13.6 month period. This figure in itself is alarming, as it is more than twice the baseline mortality of 1.5/1000/month for Sub-Saharan Africa. Even more alarming was the U5 CMR, which

¹ Hospital and clinic based cases

was estimated at 10 1/1000/month² Survey results indicated that measles accounted for 20% of all deaths of children under the age of 5 years (U5) Survey results also estimated 1400 children in this same age group died over a six-month period as a result of measles These compelling results prompted IRC to carry out a vaccination (EPI) coverage survey and measles mortality survey in Katana Health zone The measles mortality survey estimated that 1,420 children under 5 had died of measles, a result almost identical to IRC's findings in the initial mortality survey in Katana According to these results, approximately 45,000 children were still at risk for contracting measles

KATANA HEALTH ZONE

Katana Health Zone, population 281,078³, is located in both Kabare and Kalehe administrative zones and is situated approximately 55 Km from the provincial capital of Bukavu There are 33 health centers, one reference hospital, one pediatric hospital and one general hospital located in this zone This zone has traditionally been heavily supported by outside funding (mostly from Belgium) and was considered to be one of the "model" health zones in South-Kivu However, outside funding has decreased significantly since 1996 and the local health authority's ability to meet the needs of its population has been severely compromised

EPI Coverage And Measles Mortality Survey Results⁴

IRC conducted an EPI coverage survey 10-12 March 1999 under the supervision of Dr Les Roberts and with the assistance of Dr Rick Brennan, the Director of the IRC Health Unit in New York Students from the *Institute Supérieur pour Développement Rural* (ISDR) were trained as surveyors The IRC team used the WHO 30 X 7 cluster methodology for determining EPI coverage Surveyors visited 210 households and took both card and verbal vaccination histories of 614 children under the age of 15 from their mothers or another adult family member who was able to provide the vaccination history Survey results indicated low vaccination coverage rates for those diseases targeted⁵ under the DR Congo routine EPI program In addition, surveyors took measles histories of all children under 15 Although it is standard practice to take only histories of children under 5, IRC surveyors chose to take histories of children under the age of 15 for the following reasons

- 1) There was concern that there may have been low vaccination coverage in the older age groups because services were disrupted over the last several years due to refugee influxes and two wars since 1996
- 2) IRC wanted to get an estimation of attack rates, measles-specific mortality and case-fatality rates for each age group

Surveyors documented 38 measles cases and 6 measles-related deaths among the 614 children over a one year period In addition to the 6 children who died of measles, a 25-year old was recorded as having died of measles during the period under investigation

The EPI portion of the survey indicated low coverage rates for all four of the targeted vaccinations⁶, with measles having the lowest coverage rate of 20 % (card confirmation) This indicated that a large proportion of the Under 5 population, approximately 45,000 children, were still at risk for contracting measles and needed to be vaccinated

One explanation given by the Regional Health Inspection and the Medecin Chef de Zone (MCZ) of Katana for low card-confirmed coverage was that the distribution of vaccination cards to family members is not a routine practice throughout the zone because of lack of supplies and funds Most health centers keep the only record of vaccination coverage on site However, data from the survey also indicated that children who were verbally confirmed as being vaccinated were 2.6 times more likely to experience measles than children who were card-

² For survey methodology see report *IRC Mortality Survey in Katana Health Zone South Kivu Province Dem Rep Of the Congo (DRC) Feb 16 20 1999*

³ Census by BCZ Katana 1997

⁴ Report EPI Coverage and Measles Survey Katana, DRC March 10 12 1999

⁵ Childhood diseases targeted in DR Congo tuberculosis polio diphtheria pertussis tetanus and measles

⁶ Diphtheria, pertussis and tetanus vaccines are combined into one injection

confirmed as vaccinated, which suggests that those children who were verbally confirmed may not actually have been vaccinated at all

Table 1 Katana EPI Coverage Survey 10-12 March 1999
Number and % of 307 children < 5 years old in 210 households interviewed considered to be vaccinated

Vaccine	# Card Confirmed	% Card Confirmed	# Card or Verbal Confirmation	% Card or Verbal Confirmation
1) Measles	62	20%	172	56%
2) Polio	75	24%	191	62%
3) DPT	69	22.5%	186	61%
4) BCG	117	38%	223	73%

Preparation

Following the dissemination of the vaccination coverage survey results, the UNICEF Representative (based in Goma) and the Regional Health Inspection of South Kivu called an initial meeting on 16 March 1999 to discuss a possible intervention in Katana and to determine which agencies had the capacity to respond. Insecurity in the northern region of Katana and insufficient cold chain equipment were seen as major constraints in carrying out any type of intervention. Apart from UNICEF-Goma and the Regional Health Inspection, WHO-Bukavu, UNICEF-Bukavu, Save the Children Fund (SCF)-UK, and IRC participated in this initial meeting⁷. The final committee was made up of seven members:

Committee Coordinator: Regional EPI Program Manager
 Members: MCZ-Katana
 WHO-Bukavu
 UNICEF-Bukavu
 SCF-UK
 IRC
 Medecins Sans Frontieres (MSF)-Holland

During this meeting, it became apparent that none of the participating agencies had any funding or supplies that they could contribute to an emergency campaign. The committee agreed that if any agency was able to generate donor interest in carrying out the emergency campaign, it would make sense to also include vitamin A supplements and polio vaccines as additional components to the campaign⁸. Over 600,000 UNICEF polio vaccines were available in Bukavu, which had been intended for use in a mass polio campaign in August 1998. However, fighting between Kabila's forces and the RCD rebel army at the beginning of August 1998 prompted the cancellation of this campaign.

As a result of survey data and following several discussions with the Regional Health Inspection EPI Program office, IRC pursued various donors to fund an emergency mass measles campaign, in order to assist the Regional Health Inspection to address the epidemic in Katana health zone and to prevent the epidemic from spreading to Kabare health zone, which borders Katana to the south and Bukavu to the north. During the first week of April 1999, IRC received funding from OFDA and emergency funds from the Mellon Foundation to carry out an emergency mass measles vaccination campaign in Katana and Kabare health zones.

The lack of vitamin A in the region prompted MSF-H to order 70,000 doses from their office in Amsterdam. UNICEF Bukavu donated 26,500 doses to the Regional Health Inspection, which were made available as contingency stocks, in addition to IRC stocks of 4,950 doses. The original shipment of vitamin A from MSF was sent in error to Kinshasa, the capital of DR Congo, which is more than 2000 Km from Bukavu. As the eastern part

⁷ MSF H had not received an invitation to this meeting due to an oversight.

⁸ Vitamin A supplementation reduces under five mortality rates and decreases measles case fatality rates.

of DR Congo has been controlled by rebel forces since August 1998, authorization was not given in Kinshasa to have the shipment sent directly to the east, which caused further delay in the procurement of vitamin A

UNICEF cold chain equipment, ordered several months previously and meant for the routine immunization program in South Kivu, had arrived in the province and was temporarily moved to Katana as some of the equipment in that health zone had been stolen during the war

Neither UNICEF nor the Regional Health Inspection had adequate stocks of vaccination cards to be distributed to each child receiving a vaccine. IRC modified the MSF standard vaccination card with the approval of the Regional Health Inspection EPI Program and had a total of 110,000 cards printed for use in Katana and Kabare health zones

IRC provided fuel for both cold chain equipment and vehicles, financial support for all vaccination teams, and logistical support during the entire Katana campaign. MSF-H and SCF-UK provided one vehicle and driver each to assist IRC in the logistical support of the campaign

Procuring vaccines was an issue in terms of initiating a quick response. It was envisioned that the mobilization campaign would reach a large proportion of the population by commencing on Easter Sunday, but the unavailability of measles vaccines and other supplies caused a delay in initiating the campaign. After many contacts and discussions, WHO-Harare arranged for IRC and the Regional Health Inspection to borrow 100,000 doses of measles vaccines from the Rwandan Ministry of Health, to be replaced by WHO-Geneva emergency stocks. In addition, WHO-Harare made arrangements for WHO-Geneva to supply 100,000 auto-block syringes and 1000 safety boxes for the campaign. All of these supplies arrived in Bukavu on 14 April 1999

CAMPAIGN RESULTS

The mobilization campaign commenced on Sunday 18 April 1999. Churches in Katana participated by announcing the campaign during church services and encouraging community members to bring their children to be vaccinated. School teachers also made announcements to their students, reminding them to inform their parents to have younger brothers and sisters vaccinated during the campaign. Radio B E S T-Kahuzi and Radio Maendeleo (independent Bukavu radio stations) ran public service announcements four to five times per day from 18-29 April announcing the campaign in the local languages of Swahili and Mashiki. Banners and posters were placed throughout the zone. Community mobilizers, in most cases members of local health committees, traveled by foot to villages in their catchment areas. They made announcements about the vaccination campaign using battery-powered megaphones and encouraged families to have their children vaccinated during the campaign

The vaccination campaign was originally scheduled for three days, from 26-28 April 1999, but mid-morning results on the 28th indicated less than 80% coverage had been achieved. A joint decision was made between the MCZ-Katana and IRC to extend the campaign an additional day. The vaccination campaign was carried out simultaneously at 35 fixed sites for the entire four days. For the second through the fourth day, mobile sites were created by various health centers in order to reach a larger proportion of the population

Each fixed site had the following vaccination teams

- 1 supervisor (per every 5 sites)
- 4 vaccinators
- 3 secretaries (to tally and fill out vaccination cards)
- 1 crowd controller (member of the health committee)
- 1 mobilizer (with megaphone)

During the 11 day period, over 322 community members of Katana health zone, both health and non-health care staff, participated in the vaccination campaign

Polio

The targeted population for polio, 56,216⁹ children between the ages of 0-59 months, make up approximately 20% of the total population in Katana. The objective of the Regional Health Inspection EPI program was to vaccinate 44,973 children against polio in order to achieve a minimum of 80% coverage for this age group. During the four-day campaign, teams vaccinated 54,444 children against polio. In addition, all children under the age of 5 received an age-appropriate dose of vitamin A. Based on the administrative figures provided, it is estimated that 96.8% coverage was achieved for the age group 0-59 months for polio and vitamin A. Estimated coverage varied significantly from site to site, with the lowest coverage at Bushushu (site 4) at 38.2% versus an estimated 144.3% coverage at Mushweshwe (site 19) (see table 2).

Table 2 Polio Vitamin A Mass Vaccination Campaign
Katana Health Zone 26-29 April 1999 Ages 0-59 Months
Daily Report

N	Vaccination sites	Total Population	Target Population 20/	Children Vaccinated day 1	% Coverage day 1	Children Vaccinated Day 2	% Coverage day 2	% Coverage d1/d2	Children Vaccinated day 3	% Coverage day 3	Children Vaccinated day 4	% Coverage day 4	Total Children Vaccin	Total Coverage %
1	Nyabibwe	4 877	975	522	53.5	318	32.6	86.1	346	35.5	19	1.9	1 205	123.5
2	Lusherebere	6 170	1 234	646	52.4	557	45.1	97.5	181	14.7	100	8.1	1 484	120.3
3	Cigera	8 625	1 725	463	26.8	334	19.4	46.2	274	15.9	34	2.0	1 105	64.1
4	Bushushu	17 000	3 400	222	6.5	342	10.1	16.6	640	18.8	95	2.8	1 299	38.2
5	Kalehe	19 875	3 975	635	28.6	793	28.2	56.8	375	13.2	209	5.7	3 008	75.7
6	Bushulishuli	In Kalehe		500		328			149		19			
7	Ishovu	3 027	605	300	49.6	220	36.3	85.9	128	21.1	100	16.5	748	123.6
8	Kashaka	7 500	1 500	583	38.9	493	32.9	71.7	211	14.1	94	6.3	1 381	92.1
9	Lemera	6 000	1 200	600	50.0	428	35.7	85.7	401	33.4	53	4.4	1 482	123.5
10	Ihimbi	12 900	2 580	643	41.3	857	47.6	89.0	654	33.3	214	10.9	3 435	133.1
11	Mabingu	In Ihimbi		423		372			206		66			
12	Kabushwa	11 639	2 328	271	11.6	695	29.9	41.5	556	23.9	372	16.0	1 894	81.4
13	Mugen	12 700	2 540	803	53.5	542	44.1	97.6	344	25.3	69	6.6	3 288	129.4
14	Kabamba	In Mugen		555		578			299		98			
15	Ciranga	7 520	1 504	309	20.5	346	23.0	43.6	584	38.8	134	8.9	1 373	91.3
16	Iko	3 250	650	287	44.2	307	47.2	91.4	98	15.1	46	7.1	738	113.5
17	Luhuhu	13 000	2 600	496	30.6	308	20.3	50.9	321	22.1	124	8.3	2 113	81.3
18	Izmero	In Luhuhu		300		219			253		92			
19	Mushweshwe	3 750	750	273	36.4	292	38.9	75.3	382	50.9	135	18.0	1 082	144.3
20	Lwiro	17 179	3 436	418	20.4	412	21.2	41.6	437	26.0	369	16.6	3 013	87.7
21	Kahungu	In Lwiro		284		436			457		200			
22	Buhandahanda	4 776	955	362	37.9	329	34.4	72.3	320	33.5	71	7.4	1 082	113.3
23	Kavumu	19 765	3 953	649	25.2	491	22.7	47.8	854	35.2	1 395	39.9	4 862	123.0
24	Mbayo	In Kavumu		346		405			539		183			
25	Mushungurhi	6 362	1 272	343	27.0	213	16.7	43.7	600	47.2	184	14.5	1 340	105.3
26	Bushumba	11 406	2 281	654	28.7	941	41.3	69.9	719	31.5	262	11.5	2 576	112.9
27	Birava	17 500	3 500	874	34.3	417	24.9	59.3	801	30.5	535	17.0	3 734	106.7
28	Muliashe	In Birava		328		455			265		59			
29	Ibinja	7 500	1 500	769	51.3	462	30.8	82.1	199	13.3	7	0.5	1 437	95.8
30	Lugendo	11 128	2 226	519	23.3	389	17.5	40.8	791	35.5	434	19.5	2 133	95.8
31	Ishungu	5 875	1 175	399	34.0	423	36.0	70.0	234	19.9	28	2.4	1 084	92.3
32	Mulungu	11 050	2 210	470	21.3	505	22.9	44.1	454	20.5	530	24.0	1 959	88.6
33	Kajeje	9 007	1 801	682	37.9	628	34.9	72.7	552	30.6	70	9.0	1 932	107.2
34	Cifuma	6 978	1 396	363	26.0	370	26.5	52.5	434	31.1	125	9.0	1 282	92.6
35	Murhesa	14 719	2 944	1000	34.0	500	17.0	51.0	536	18.2	329	11.2	2 365	80.3
	Total	281 078	56 216	17 291	30.8	15 705	27.9	58.7	14 594	26.0	6 854	12.2	54 444	96.8

Measles

The targeted population for the measles vaccination campaign, 50,594 children between the ages of 6-59 months, represents approximately 18% of the total population in Katana. Taking into consideration pre-campaign vaccination coverage rates and epidemiological data, the target age was reduced from 9 to 6 months to help control the outbreak¹⁰. The objective of the Regional Health Inspection EPI program for measles was to vaccinate 40,475 children in order to achieve a minimum of 80% coverage for children between 6 and 59 months. For the total estimated target population (6-59 months) a coverage of 91.8% was achieved. For the 6-9 months age group, 2,928 children out of an estimated 2,811 were vaccinated during the four days, which exceeded the estimated target population. The figures for this target group may have been underestimated, which would explain results exceeding 100% coverage. Vaccination teams reminded mothers that children between 6-9 months must be re-vaccinated at the age of 9 months. For the 9-59 month age group, 43,445 children were vaccinated out of an

⁹ Determined by administrative figures provided by the BCZ Katana April 1999

¹⁰ WHO protocol and Sphere Project standards

estimated 47,783, indicating a 90% coverage rate for this specific group. Similar to the vaccination coverage results for polio, the coverage rates at different sites varied.

**Table 3 Measles Mass Vaccination Campaign
Katana Health Zone 26 29 April 1999 Ages 6 59
Months
Daily Reports**

N	Vaccination sites	Total Population	Target Pop 18 /	Children Vaccinated day 1	% Coverage day 1	Children Vaccinated Day 2	% Coverage day 2	% Coverage d1/d2	Children Vaccinated day 3	% Coverage day 3	Children Vaccinated day 4	% Coverage day 4	Total Children Vaccinated	Total Coverage /
1	Nyabibwe	4 877	878	406	46.2	281	32.0	78.3	302	34.4	16	1.8	1 005	114.5
2	Lushebere	6 170	1 111	548	49.3	529	47.6	97.0	163	14.7	85	7.7	1 325	119.3
3	Cigera	8 625	1 553	443	28.5	283	18.2	46.8	234	15.1	33	2.1	993	64.0
4	Bushushu	17 000	3 050	195	6.4	282	9.2	15.6	560	18.3	81	2.6	1 118	36.5
5	Kalehe	19 875	3 578	514	26.5	711	28.1	54.6	328	12.9	174	5.4	2 606	67.5
6	Bushulishuli	In Kalehe		435		294			132		18			
7	Ishovu	3 027	545	300	55.1	220	40.4	95.4	114	20.9	96	17.6	730	134.0
8	Kasheke	7 500	1 350	511	37.9	443	32.8	70.7	181	13.4	75	5.6	1 210	89.6
9	Lemera	6 000	1 080	285	26.4	330	30.6	56.9	324	30.0	34	3.1	973	90.1
10	Ihimb	12 900	2 322	614	38.9	823	49.9	88.3	232	18.0	265	13.4	2 778	106.3
11	Mabingu	In Ihimb		289		324			186		45			
12	Kabushwa	11 639	2 095	241	11.5	622	29.7	41.2	504	24.1	334	15.9	1 701	81.2
13	Mugen	12 700	2 286	704	52.5	477	43.7	96.2	282	24.1	58	6.3	2 894	120.3
14	Kabamba	In Mugen		497		521			266		87			
15	Ciranga	7 520	1 354	272	20.1	304	22.5	42.6	225	16.6	116	8.6	917	67.7
16	Iko	3 250	585	250	42.7	260	44.4	87.2	89	15.2	28	4.8	627	107.2
17	Luhih	13 000	2 340	443	29.2	264	20.0	49.1	275	20.4	103	8.0	1 815	69.6
18	Izimero	In Luhih		240		203			203		84			
19	Mushweshwe	3 750	675	238	35.3	250	37.0	72.3	351	52.0	121	17.9	960	142.2
20	Lwiro	17 179	3 092	358	22.2	377	24.8	47.1	399	26.3	319	16.2	2 768	73.3
21	Kahungu	In Lwiro		330		390			414		181			
22	Buhandahanda	4 776	860	325	37.8	282	32.8	70.6	270	31.4	65	7.6	942	109.6
23	Kavumu	19 785	3 558	554	24.0	362	20.3	44.3	748	34.1	1241	39.5	4 192	78.4
24	Mbayo	In Kavumu		300		359			465		163			
25	Mushungurhi	6 362	1 145	325	28.4	220	19.2	47.6	518	45.2	120	10.5	1 183	103.3
26	Bushumba	11 406	2 053	604	29.4	310	15.1	44.5	332	16.2	98	4.8	1 344	65.5
27	Birava	17 500	3 150	777	33.6	385	19.5	53.0	703	30.6	466	16.4	3 150	83.6
28	Mulashe	In Birava		280		229			260		50			
29	Ibinja	7 500	1 350	662	50.5	414	30.7	81.2	175	13.0	8	0.6	1 279	94.7
30	Lugendo	11 128	2 003	456	22.8	356	17.8	40.5	714	35.6	450	22.5	1 976	98.7
31	Ishungu	5 875	1 058	354	33.5	387	36.6	70.1	218	20.6	34	3.2	993	93.9
32	Mulungu	11 050	1 989	407	20.5	457	23.0	43.4	404	20.3	484	24.3	1 752	88.1
33	Kajeje	9 007	1 621	641	39.5	556	34.3	73.8	505	31.1	65	4.0	1 767	109.0
34	Cifuma	6 978	1 256	320	25.5	336	26.8	52.2	385	30.7	111	8.8	1 152	91.7
35	Murhesa	14 719	2 649	1000	37.7	425	16.0	53.8	476	18.0	322	12.2	2 223	83.9
	Total	281 078	50 594	15 138	29.9	13 266	26.2	56.1	11 939	23.6	6 030	11.9	46 373	91.7

During the preliminary planning phase there were some major concerns regarding security in Katana health zone, particularly in the northern region of the zone. Security was monitored during the entire planning phase, and as no incidents had been reported, the committee decided to carry out the campaign in the entire health zone of Katana. Before the campaign, Nyabibwe health center (site 1) in the far north of the health zone, had not been accessible since August 1998 and Kajeje (site 33) in the west and bordering the Kahuzi-Biega National Park, had not been accessible for almost a year. However, both health centers participated in the campaign and had extremely successful results. Both health centers remain accessible at the time of writing.

Cigera health center (site 3) located in the northeast of the zone only achieved an estimated coverage of 64%. This health center is located on a peninsula and requires some of the catchment population to walk more than four hours to reach the health center.

Bushushu health center (site 4) and Kalehe health center (site 5) had extremely low coverage rates for their catchment populations, but local health authorities are confident that their catchment populations were covered by other sites in the zone, which may explain why 10 health centers exceeded 100% coverage rates. Bushushu and Kalehe are both located in areas where security has been a major issue, and many families have relocated to other areas in Katana health zone.

Katana Post-Vaccination Campaign Coverage Survey

From 5-7 May 1999, the IRC team and three staff from the Regional Health Inspection supervised surveyors as they conducted a post-vaccination campaign coverage survey, again using the WHO 30 X 7 cluster methodology. The survey took into account three possible scenarios:

- 1) Children who received polio and/or measles vaccine (card-confirmed specific to the campaign April 26-29, 1999)
- 2) Children whose mothers verbally reported that they participated in campaign, but did not have a card¹¹
- 3) Scenarios 1 and 2, as well as children who possessed other vaccination cards indicating they were vaccinated (in order to get an overall vaccination rate, not specific to this campaign)

Table 4 Katana post-campaign vaccination coverage survey Number and % of 371 children <5 years old in Katana interviewed in 210 households considered vaccinated for polio and/or measles

# Card Confirmed (specific to campaign)	% Card Confirmed (specific to campaign)	# Card or Verbal Confirmation	% Card or Verbal Confirmation	# Cards or Verbal Confirmation	% Card or Verbal Confirmation (history any vaccination card)
339	91.4%	353	95%*	358	96.4%

Results from the post campaign survey (card confirmation only) indicated an estimated 91.4% coverage rate for both polio and measles. Pre- and post-survey results for polio indicated that coverage went from an estimated 24% to 91.4% (card-confirmed). Pre- and post-survey results for measles indicated that coverage went from an estimated 20% to 91.4% coverage (card-confirmed).

KABARE HEALTH ZONE

Kabare health zone (population 110,888¹²) is located approximately 35 Km from the provincial capital, Bukavu. It is bordered by Lake Kivu to the east and five other health zones: Katana to the north, Bunyakiri to the west, Bukavu to the south east and Walungu and Nyangezi to the south. There are 13 health centers, one reference hospital and one general hospital in this zone. The reference hospital and general hospital also have maternity centers.

EPI Coverage And Measles Mortality Survey Results

IRC conducted an initial EPI coverage survey and measles mortality survey from 22-24 April 1999 in Kabare health zone, in collaboration with the office of the Regional Health Inspection. Surveyors took vaccination histories of 351 children under five years old from 210 households using the WHO 30 X 7 cluster methodology. Histories were either card-confirmed or verbal. For BCG vaccination, surveyors also looked for a BCG scar on the child's arm.

In addition to vaccination histories, measles histories were also taken. Surveyors recorded no cases of measles in the under 5 age group, but one measles-related death of an 8 year-old child was reported.

Card-confirmed results were extremely low for all four vaccinations, but in particular for measles, with an estimated coverage of 13.6%.

The Regional Health Inspection and the MCZ-Kabare suggested that low coverage rates (card-confirmed) was again due to the fact that vaccination cards are not routinely given to the family (as in Katana) because of lack of supplies and funds.

¹¹ Two health centers in the north reported that they did not distribute the vaccination cards as it had not been the normal practice during the routine program.

¹² Census by BCZ Kabare 1998.

Table 5 Kabare EPI Coverage survey 22-24 April 1999 Number and % of 351 children in Kabare Health Zone <5 years old interviewed in 210 households considered vaccinated

Vaccine	# Card Confirmed	% Card Confirmed	# Card or verbal confirmation	% Card or verbal confirmation
1) Measles	48	13.6	258	73.5
2) Polio	64	18.2	224	64.0
3) DPT	55	16.0	272	77.4
4) BCG	71	20.2	325	92.5

Preparation

Immediately following the Katana vaccination campaign, the Regional Health Inspection commenced discussion to plan a measles vaccination campaign in Baraka, an area in Fizi health zone located in the south of the province, rather than to vaccinate in Kabare health zone as originally discussed. At that time, the area around Baraka was being contested by the RCD forces, as well as several other regional factions and few NGOs were willing to travel there for security reasons. The Regional Medical Inspector called a meeting between the Regional EPI program, BOM¹³, the MCZ Kabare, and IRC to discuss the issue. (It is not clear why, but the Regional Health Inspection did not include UNICEF/Bukavu or WHO/Bukavu in these discussions, neither did these UN agencies participate in the planning or implementing stages of the Kabare campaign). However, IRC made it clear to the Regional Health Inspection that the OFDA funds had been intended for a vaccination campaign in Kabare health zone to prevent the outbreak from spreading to Bukavu. Even had funds been available for a campaign in Baraka, IRC was not willing to send its staff (national or international) into an area of heavy insecurity. After a long discussion, the Regional Health Inspection reluctantly agreed to carry on with the vaccination campaign for Kabare.

The coordination committee was made up of the following

Committee Coordinator Regional EPI Program Manager
 Members MCZ-Kabare
 IRC

Although there had not been any signs of an epidemic in Kabare, all involved agreed a campaign should be carried out to prevent a possible outbreak. This decision was based on several factors

- 1) the proximity of Kabare to Katana health zone
- 2) global prevalence of malnutrition in Kabare was estimated at 11.2%¹⁴, indicating that a significant proportion of the under 5 population was in a weakened state and more susceptible to measles
- 3) the MCZ-Kabare questioned the efficacy of any routine vaccination since August 1998, as he was not convinced the cold chain had been respected
- 4) low coverage rate based on survey results

It is interesting to note that four days before the vaccination campaign started, two health centers in the northern part of Kabare health zone, Mulengeza and N'Shanga, reported 21 cases of measles during the two-week period before the campaign. Previous epidemiological reports for the six-month period of October 1998-April 1999 indicated only 13 measles cases for the entire zone.

The Regional Health Inspection authorized the actual vaccination campaign to take place 31 May-2 June 1999, rather than earlier in the month as anticipated because the Regional EPI staff was attending a meeting in Nairobi to discuss the re-scheduling of the mass polio vaccination campaign in DR Congo (Journées Nationales de Vaccination).

As in the campaign in Katana, polio and an age-appropriate dose of vitamin A were again included in the campaign. IRC again supported all vaccination teams, fuel for cold chain equipment and vehicles, and provided

¹³ BOM (Bureau des Oeuvres Médicales) is a Catholic NGO working in Kabare Health zone & other zones throughout DR Congo

¹⁴ Results of a nutritional survey carried out by the Regional Health Inspection and SCF-UK April/May 1999

all logistical support throughout the campaign MSF-H and SCF-UK did not participate in this campaign, as it was not seen as an emergency intervention, but as a preventative one

CAMPAIGN RESULTS

The mobilization campaign commenced on Sunday 23 May 1999, and was similar to that of Katana Churches in Kabare health zone participated by announcing the campaign during church services and encouraged community members to bring their children to be vaccinated School teachers also made announcements to their students, reminding them to inform their parents to have younger brothers and sisters vaccinated during the campaign Radio B E S T-Kahuzi and Radio Maendeleo (independent Bukavu radio stations) ran public service announcements four to five times per day from 31 May-2 June 1999 announcing the campaign in the local languages of Swahili and Mashiki Banners and posters were placed throughout the zone Community mobilizers, in most cases members of local health committees, traveled by foot to villages in their catchment areas They made announcements about the vaccination campaign using battery-powered megaphones and encouraged families to have their children vaccinated during the campaign

- Each site had the following vaccination teams
- 1 supervisor (per every 5 sites)
- 4 vaccinators
- 3 secretaries (to tally and fill out vaccination cards)
- 1 crowd controller (member of the health committee)
- 1 mobilizer (with megaphone)

During the 10 day period, over 273 community members of Kabare health zone, both health and non-health staff, participated in the vaccination campaign

Polio

The population targeted for polio, 23,841 children between the ages of 0-59 months, represents approximately 21.5% of the population in Kabare Health zone. The objective of the Regional Health Inspection EPI program for the polio was to vaccinate 19,073 children, in order to achieve a minimum of 80% coverage for this age group. From 31 May-2 June 1999, IRC assisted the Kabare health zone to vaccinate 26,415 children against polio. All children in this age group also received vitamin A supplementation. The number of children exceeded the estimated target population by 2,574 children, which indicated a 110.8% coverage rate for polio. There are a couple of possible explanations why the coverage rate exceeded 100%:

- 1) Children from neighboring zones were vaccinated. Teams at Kalulu (site 9) health center reported vaccinating children from Walungu health zone. Mulengeza (site 21) and N'shanga (site 6) health centers in the north reported vaccinating children from southern Katana who did not participate in the campaign in April 1999. Mushweshwe health center (site 19) also reported children coming from Bukavu health zone. These particular populations live closer to health facilities in Kabare than to the health facilities in their respective zones. Mothers also indicated that it was not clear whether their health zones (Walungu and Bukavu) would carry out a vaccination campaign and wanted to take advantage of the opportunity.
- 2) Population figures for nomadic populations (mostly in the west) are not well estimated.

**Table 6 Polio Vitamin A Mass Vaccination Campaign
Kabare Health Zone 31 May 2 June 1999 Ages 0-59 Months
Daily Report**

N	Vaccination sites	Total Population	Target Population 21.5%	Children Vaccinated day 1	% Coverage day 1	Children Vaccinated Day 2	% Coverage day 2	% Coverage d1/d2	Children Vaccinated day 3	% Coverage day 3	Total Children Vaccinated	Total Coverage %
1	Cidjo	3 855	786	453	57.6	148	18.8	76.5	33	4.2	634	80.7
2	Mukongola	2 575	554	292	52.7	188	34.0	86.7	140	25.3	620	112.0
3	Mulege	3 180	684	490	71.7	248	36.0	107.6	142	20.8	878	128.4
4	Kagabi Ctr	3 650	785	336	42.8	260	33.1	75.9	77	9.8	673	85.8
5	Bwirembe	6 670	1 434	520	36.3	512	35.7	72.0	173	12.1	1 205	84.0
6	Nshaga	4 550	978	388	39.7	320	32.7	72.4	206	21.1	914	93.4
7	Mbiza	4 940	1 062	476	44.8	557	52.4	97.3	352	33.1	1 385	130.4
8	Kinjuba	4 680	1 006	440	43.7	281	27.9	71.7	91	9.0	812	80.7
9	Kalulu	2 880	619	613	99.0	496	80.1	179.1	429	69.3	1 538	248.4
10	Mwera	3 580	770	488	63.4	400	52.0	115.4	94	12.2	982	127.6
11	Cifuma	2 360	507	338	66.6	250	49.3	115.9	42	8.3	630	124.2
12	Nyunda	3 175	683	422	61.8	333	48.8	110.6	91	13.3	846	123.9
13	Bugobe	4 805	1 033	345	33.4	336	32.5	65.9	130	12.6	811	78.5
14	Cirunga	5 025	1 080	457	42.3	440	40.7	83.0	199	18.4	1 096	101.4
15	Mbonobono	2 740	589	313	53.1	219	37.2	90.3	51	8.7	583	99.0
16	Karambi	4 375	941	287	30.5	242	25.7	58.2	63	6.7	592	62.9
17	Cibingu	4 100	882	317	36.0	466	52.9	88.8	107	12.1	890	101.0
18	Lubugu	2 990	643	314	48.8	301	46.8	95.7	59	9.2	674	104.8
19	Mushweshwe	5 453	1 172	473	40.3	627	53.5	93.8	595	50.8	1 695	144.6
20	Comuhini	4 450	957	380	39.7	509	53.2	92.9	544	56.9	1 433	149.8
21	Mulengeza	3 600	774	424	54.8	462	59.7	114.5	155	20.0	1 041	134.5
22	Mugurthu	2 855	614	413	67.3	222	36.2	103.4	66	11.1	703	114.5
23	Mpembe	2 075	446	268	60.1	135	30.3	90.3	185	41.5	588	131.8
24	Citungano	3 420	735	546	74.3	168	22.8	97.1	33	4.5	747	101.8
25	Cazi	2 705	582	377	64.8	104	17.9	82.7	21	3.6	502	86.3
26	Chirendo	3 675	790	562	71.1	352	44.5	115.7	110	13.9	1 024	129.6
27	Ludaha	6 300	1 355	570	42.1	399	29.5	71.5	155	11.4	1 124	83.0
28	Cidaho	2 620	563	436	77.4	287	50.9	128.4	201	35.7	924	164.0
29	Cirangiro	3 905	818	474	57.9	292	35.7	93.6	105	12.8	871	105.5
	Total	110 888	23 841	12 212	51.2	9 552	40.1	91.3	4 651	19.5	26 415	110.8

Measles

The targeted population for the measles vaccination campaign, 19,960 children between the ages of 9-59 months, represents 18% of the population in Kabare health zone. The objective of the Regional Health Inspection EPI program for measles was to vaccinate 18,083 children in order to achieve 80% coverage for the ages between 9 and 59 months. During the campaign 22,604 children were vaccinated in Kabare against measles, which indicates an estimated coverage rate of 113.6%. The reasons for coverage rates exceeding 100% are due to the same reasons as stated above for polio (children from other zones).

**Table 7 Measles Mass Vaccination Campaign
Kabare Health Zone 31 May-2 June 1999 Ages 9-59 Months
Daily Report**

N	Vaccination sites	Total Population	Target Population 18%	Children Vaccinated day 1	% Coverage day 1	Children Vaccinated Day 2	% Coverage day 2	% Coverage d1/d2	Children Vaccinated day 3	% Coverage day 3	Total Children Vaccinated	Total Coverage /
1	Cidjo	3 655	658	315	47.9	117	17.8	65.7	26	4.0	458	69.6
2	Mukongola	2 575	464	231	49.8	156	33.7	83.5	80	17.3	467	100.8
3	Mulege	3 180	572	414	72.3	231	40.4	112.7	117	20.4	762	133.1
4	Kagabi Ctr	3 650	657	234	35.6	221	33.6	69.3	63	9.6	518	78.8
5	Bwirembe	6 670	1 201	450	37.5	435	36.2	73.7	146	12.2	1 031	85.9
6	Nshaga	4 550	819	332	40.5	262	32.0	72.5	172	21.0	766	93.5
7	Mbriza	4 940	889	382	43.0	476	53.5	96.5	318	35.8	1 176	132.3
8	Kinjuba	4 680	842	436	51.8	270	32.1	83.8	81	9.6	787	93.4
9	Kalulu	2 880	518	543	104.7	441	85.1	189.8	394	76.0	1 378	265.8
10	Mwera	3 580	644	378	58.7	349	54.2	112.8	80	12.4	807	125.2
11	Cifuma	2 360	425	294	69.2	215	50.6	119.8	41	9.7	550	129.5
12	Nyunda	3 175	572	374	65.4	292	51.1	116.5	73	12.8	739	129.3
13	Bugobe	4 805	865	299	34.6	290	33.5	68.1	111	12.8	700	80.9
14	Cirunga	5 025	905	373	41.2	379	41.9	83.1	175	19.3	927	102.5
15	Mbonobono	2 740	493	266	53.9	192	38.9	92.9	46	9.3	504	102.2
16	Karambi	4 375	788	247	31.4	212	26.9	58.3	55	7.0	514	65.3
17	Cibingu	4 100	738	284	38.5	405	54.9	93.4	95	12.9	784	106.2
18	Lubugu	2 990	538	301	55.9	237	44.0	100.0	54	10.0	592	110.0
19	Mushwestwe	5 453	982	386	39.3	538	54.8	94.1	522	53.2	1 446	147.3
20	Comuhini	4 450	801	320	40.0	442	55.2	95.1	474	59.2	1 236	154.3
21	Mulengeza	3 600	648	359	55.4	406	62.7	118.1	137	21.1	902	139.2
22	Mugurhu	2 855	514	360	70.1	185	36.0	106.1	56	10.9	601	116.9
23	Mpembe	2 075	374	240	64.3	125	33.5	97.7	100	26.8	465	124.5
24	Citungano	3 420	616	462	75.0	150	24.4	99.4	25	4.1	637	103.5
25	Cazi	2 705	487	323	66.3	98	20.1	86.5	21	4.3	442	90.8
26	Chirendo	3 675	662	481	72.7	295	44.6	117.3	100	15.1	876	132.4
27	Ludaha	6 300	1 134	466	41.1	350	30.9	72.0	131	11.6	947	83.5
28	Cidaho	2 620	472	375	79.5	262	55.6	135.1	179	38.0	816	173.0
29	Cirangiro	3 805	685	420	61.3	263	38.4	99.7	93	13.6	776	113.3
	Total	110 888	19 960	10 345	51.8	8 294	41.6	93.4	3 965	19.9	22 604	113.2

Kabare Post-Vaccination Campaign Coverage Survey

From 3-4 June 1999 IRC carried out a vaccination coverage survey in collaboration with the Regional Health Inspection. This survey only looked at measles and polio coverage. The WHO 30 X 7 methodology was again used. Surveyors interviewed 388 children in 210 households. Results from this survey indicated 97.9% coverage, which was based on card-confirmed histories (cards particular to the 31 May-2 June 1999 campaign). The surveyors also interviewed mothers who said their children were vaccinated during this particular campaign, but their cards had already been lost. Taking into consideration both card and verbal confirmation, the estimated vaccination coverage for measles and polio in Kabare health zone was 99%. No other vaccination cards besides those given out during the May-June campaign were presented during this particular survey.

Table 8 Kabare post vaccination campaign coverage survey 3-4 June 1999 Number and % of 388 children in Kabare Health Zone <5 years old interviewed in 210 households considered vaccinated

# Card Confirmed (specific to campaign)	% Card Confirmed (specific to campaign)	# Card or Verbal Confirmation	% Card or Verbal Confirmation
380	97.9%	384	99%

Results from the post-campaign survey (card confirmation only) indicated an estimated 97.9% coverage for both polio and measles. Results from pre- and post-vaccination coverage surveys indicated that polio coverage went

from an estimated 18.2% to 97.9% (card-confirmed). Results from pre- and post-vaccination coverage surveys indicated measles coverage went from an estimated 13.6% to an estimated 97.9% (card-confirmed).

Summary of Katana and Kabare Vaccination Campaigns

IRC's objective was to vaccinate a total of 80,000 children between 9 months and 5 years of age in a mass measles campaign in Katana and Kabare health zones in order to reduce the number of cases for this age group and to prevent measles-related deaths.

A total of 68,977 children were vaccinated against measles, 2,811 between the ages of 6-8 months and 66,186 children between the ages of 9 and 59 months. Only Katana health zone reduced age of the target population for measles from 9 to 6 months of age as a result of the epidemic. During the initial planning phases, the target age group for measles for the two zones was over-estimated. The total target population for the two zones was previously estimated to be 80,000 children, but administrative figures later indicated the target population to be approximately 18% of the population or 70,554 children between the ages of 9-59 months.

During the campaigns in Katana and Kabare health zones, a total of 80,859 children between the ages of 0 and 59 months were vaccinated against polio and received an age-appropriate dose of vitamin A. This was an added component to the emergency measles vaccination campaign.

Based on EPI cluster survey results, Katana health zone achieved a 91.4% coverage rate (card-confirmed) for both polio and measles, and Kabare health zone achieved a 97.9% coverage rate for both polio and measles (card-confirmed).

IRC collected data from 32 of 33 health centers in Katana for the period 1 April to 22 July 1999 on measles cases (vaccinated and non-vaccinated cases) and deaths. IRC was not able to collect data from Cigera health center due to the logistical constraints of getting to the peninsula during the days of the assessment. In April 1999 there were a total of 142 cases reported (122 non-vaccinated and 20 vaccinated), compared to 20 cases in July (17 non-vaccinated and 3 vaccinated). This indicates an 86% decrease in the number of measles cases in Katana.

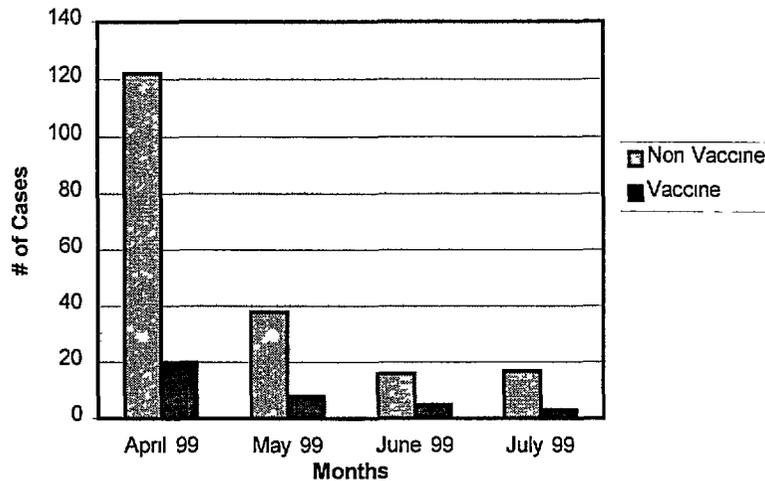
There was a slight increase in the number of non-vaccinated measles cases from June to July in Katana health zone (see table 9, graph 1). Five health centers in the same region reported the cases, but these centers are located close to Kahuzi-Biega National Park in the west of the zone, where there are significant number of internally displaced families living in the forest. It was also reported that many of these cases are coming from Bunyakiri health zone (located just to the west of Katana health zone) where insecurity remains an issue and routine immunizations have not been conducted for over two years.

During the investigation period of 1 April-22 July 1999 there were only three measles-related deaths recorded. These deaths occurred during the month of April at Cifuma health center. It was reported by the health care staff that all three children had not received treatment at the health center, but had received traditional medicines before being brought in.

**Table 9 Measles Vaccinated and Non-Vaccinated Cases
Katana Health Zone, South-Kivu, DR Congo,
1 April-22 July 1999**

Month	Non-Vaccinated	Vaccinated	Total # Cases
April	122	20	142
May	38	8	46
June	16	5	21
July	17	3	20
	193	36	229

Graph 1
Measles Vaccinated and Non-Vaccinated Cases
Katana Health Zone, South-Kivu, DR Congo
April 1999- 21 July 1999



Constraints and Recommendations

Following the Katana campaign, the MCZ-Katana organized an evaluation meeting which was held to identify any problems and constraints, in addition to identifying interventions that worked or changes that should be implemented for future campaigns. This meeting was attended by

MCZ-Katana and BCZ site supervisors
 Regional EPI Program Manager
 UNICEF-Bukavu representative
 IRC Health and Logistics staff
 MSF-H

Following the Kabare campaign, the MCZ-Kabare also organized an evaluation meeting, but the Office of the Regional Health Inspection rejected the invitation, decided not to participate in the meeting and requested IRC to pay a fee of \$25 for 6 people for 6 days to cover costs of a “coordination committee” that nobody knew existed. The Regional Health Inspection wrote to IRC, claiming that they had not been informed about the campaign and were not directly involved in the overall planning of the campaign, even though a member of the Regional Health Inspection staff, the EPI Program Manager, chaired several working meetings concerning the Kabare campaign. Regardless of the position of the Regional Health Inspection, the MCZ-Kabare felt that the evaluation meeting was an important tool and requested that IRC and the BCZ-Kabare proceed with the evaluation meeting to discuss how future campaigns could be improved, even if the Regional Health Inspection did not want to participate. This meeting was held only between the BCZ-Kabare and IRC.

The constraints, lessons learned and recommendations based on experiences during the planning and implementing stages, in addition to the results of the evaluation meetings held in both Katana and Kabare health zones, are summarized below

Constraints	Lessons Learned/Recommendations
1 The Regional Health Inspection contested results from IRC s initial mortality survey EPI coverage and measles mortality survey conducted in Katana health zone Although the Regional Health Inspection was informed before the surveys were conducted they were not directly involved with carrying out these initial surveys because of exorbitant financial demands associated with involving their staff This caused some delays in the planning stages for campaigns in both Katana and Kabare The Regional Health Inspection did participate in surveys that were carried out in Kabare health zone but they showed very little interest during the surveys (slept in the vehicle complained that they had to walk too far)	NGOs need to continue carrying out on going needs assessments and evaluations to identify the true needs of the population Most NGOs working in the South Kivu province have found working directly with the MCZs to identify needs and develop appropriate interventions works best The MCZs are part of the overall health structure and should act as an intermediary between NGOs and the Regional Health Inspection
2 As UN organizations are currently not operating at full capacity in South Kivu as the result of a non recognized government controlling the east UNICEF Bukavu and WHO Bukavu do not have the capacity to respond to emergencies (i e epidemics) when their assistance is most needed It was not IRC who initially announced a potential measles epidemic but the UN agencies which led IRC to further investigate once it was clear neither the UN nor any other agency was going to intervene The unavailability of necessary supplies and the inability of UNICEF to take any action delayed an intervention that should have taken place at least four months previously Local UN offices played little if any role in the vaccination campaign The IRC Water and Sanitation Consultant had to use his own network to make necessary contacts with WHO Harare and WHO Geneva, in order to procure the needed vaccines and supplies	Local UNICEF and WHO offices need to play a more active role in assisting NGOs on the ground Local offices need to offer their assistance in contacting their own regional offices to explore and facilitate the possibility of borrowing regional stocks Although these agencies are non operational they do continue to maintain a presence in the province Local UN offices need to receive some regional support and guidance from their headquarters in Kinshasa that will allow them to provide humanitarian assistance when most needed
3 Rainy weather conditions during the Katana campaign made it difficult for supervisors using motorcycles to arrive at sites as planned	As there was an epidemic it was impossible to get around the weather factor However National Vaccination Days campaigns should be planned during the dry season to avoid logistic constraints There are areas of both Katana and Kabare health zone that have the potential of becoming inaccessible during the rainy season If weather is an issue only 4 wheel drive vehicles should be used
4 In Katana the Regional EPI Program Manager the MCZ Katana and IRC held a workshop for site supervisors covering responsibilities of each vaccination team member immunization protocols universal precautions and technical information IRC was assured by the Regional Health Inspection that staff were already well trained as they had already participated in several National Vaccination Days Supervisors were given the responsibility for holding a workshop for their respective teams but it was clear at several sites during the vaccination campaign that teams were unsure of protocols for mass vaccination campaigns and proceeded routine immunization practices For example vaccination teams at some sites did not distribute vaccination cards and other team members did not know how to read age tables	As a result of the experience in Katana, the teaching method of the workshop was changed for the Kabare campaign A workshop was again given by a staff member of the regional EPI program the MCZ Kabare and IRC staff to site supervisors covering the same information but using role plays requiring participation from the supervisors Guides were prepared and given to each supervisor Responsibility was again given to the site supervisor to conduct workshops for their teams but this time each of the six workshops was attended by a member of the coordination committee and IRC Health staff IRC prepared hand outs which were given to all members of the vaccination teams clearly outlining all aspects of the campaign Role plays and various other teaching methods were used during the workshops to encourage participation and questions from the team members During the evaluation meeting it was suggested by zonal nurse supervisors that funding be obtained to focus on immunization procedures and protocols for staff Due to the lack of funding most health care staff have received little training beyond their formal education
5 The number of fixed vaccination sites (35) was not sufficient in Katana health zone Some vaccination teams reported mothers travelling four hours by foot to reach sites and there were several sites where mothers had to wait 6 hours before their children were vaccinated Using only health centers as vaccination sites was not the most efficient way of carrying out the campaign	For future campaigns the number of vaccination sites for Katana health zone should be doubled This will allow a greater proportion of the target population to be vaccinated in three days reducing the amount of time it would taken for people to arrive at the sites as well as reducing the number of beneficiaries at each site
6 During the Katana campaign mobile teams were set up for the second through the fourth day at various health centers to reach a larger proportion of the population However the need for additional site team members was not taken into consideration Health center vaccination teams were divided up reducing the teams capacity to respond to the number of people who presented at their sites It was not made clear during the planning phase the role and needs of these mobile teams Some health center sites closed and the entire team became mobile This was probably not the best solution to improving vaccination coverage	The addition of fixed sites as opposed to mobile vaccination teams in this type of setting is recommended and this option should be considered carefully during the initial planning phase As a result of the experience gained from the Katana campaign Kabare health zone doubled the amount of sites originally previewed from 14 to 29 fixed sites The additional fixed sites could be one of the reasons why the Kabare campaign was even more successful than the Katana campaign as it resulted in nearly 98% coverage in the three days allotted (without having to use any mobile teams)
7 Cigera health center (site 3) which is located in the northeast of Katana health zone only achieved an estimated coverage of 64%	It is recommended for future campaigns that two additional fixed sites be located on the peninsula to reach more of the population

<p>This health center is located on a peninsula and requires some of the catchment population to walk more than four hours to reach the health center</p>	
<p style="text-align: center;">Constraints (cont)</p>	<p style="text-align: center;">Lessons Learned/Recommendations (cont)</p>
<p>8 On site ruptures of vaccination supplies (vaccines auto block syringes and vaccination cards) occurred despite each site having 140% of the vaccines and supplies on site the first day of the campaign</p>	<p>Although 140% of vaccines and supplies were delivered at each site it was difficult to determine actual site needs as a result of displaced and refugee populations throughout the zone Although there were ruptures at various sites causing some delays in the vaccination campaign mothers waited patiently until supplies were delivered to the sites</p>
<p>9 In Katana there were ruptures in stock of vitamin A on day 2 of the campaign Vitamin A ordered by MSF H had not arrived in Bukavu before the mobilization campaign started but MSF H assured the delivery of vitamin A before the start of the vaccination campaign itself as the MSF Bukavu team had been informed that the shipment had arrived in Rwanda There was an additional delay at customs which postponed the shipment until the second day of the vaccination campaign The Regional Health Inspection had 30 000 doses which were reserved as contingency stocks but were used the first and second day in lieu of the MSF shipment Immediately upon arrival in Bukavu the MSF vitamin A shipment was delivered to Katana Although there was a two hour delay at some sites mothers did not leave and waited for vitamin A to arrive at the sites before taking their children home</p>	<p>As vitamin A is recognized as an important component of a measles vaccination campaign it is recommended to delay the campaign until sufficient stocks have arrived However as the campaign was initiated as a response to an epidemic and had already been delayed several times the coordination committee decided to take the chance that sufficient vitamin A stocks would be in place before the campaign started Although the late arrival of the stock caused delays of a few hours at the vaccination sites all the children did get their vitamin A supplement that day</p>
<p>10 Communications in Katana health zone between supply sites and vaccination sites was difficult despite the fact that each site supervisor and logistics team member had a Motorola hand-set (supplied by IRC) The communications problems caused additional delays of supply deliveries</p>	<p>It is virtually impossible to control for the communications problems that were encountered in Katana, as they were due to weather conditions and mountainous terrain The use of Motorola hand sets is still recommended as messages were relayed by supervisors who were able to capture the message and pass it on Hand sets were extremely useful during the Kabare campaign</p>
<p>11 In Katana health zone the coordination committee was not able to identify problems or issues in a timely manner because site supervisors did not submit their daily reports on time Security was a constraint in this zone as supervisors could not travel after a time of day to the office of the BCZ where members of the coordination committee were staying Various sites closed late so supervisors could not travel get their daily information in on time This made it difficult for issues and problems to be rectified in a timely and efficient manner for the next day s work</p>	<p>It is extremely important that site supervisors submit daily reports from their respective sites conveying any issues or problems encountered so that these can be dealt with in a timely manner Based on recommendations from the evaluation meeting following the Katana campaign the coordination committee for Kabare health zone held a meeting every night following the day s vaccination activities This worked very well in Kabare health zone and allowed for positive changes for the following days</p>
<p>12 Many of the staff in South Kivu have not received any refresher courses beyond their initial training The Regional Health Inspection does not have the means to conduct refresher training even though many of health care professionals working in the rural health zones would benefit from skills update in areas such as EPI universal precautions and case management</p>	<p>Following the campaign both health zones requested EPI training for their staff Donors should be encouraged to support training of staff currently working at health care facilities</p>
<p>13 Ice packs had to be brought from Bukavu to the health zones on a daily basis because neither of the health zones have freezer capacity This caused some delays particularly in Katana health zone</p>	<p>Each zone should have some central freezer capacity During previous campaigns the local bottling company provided blocks of ice but due to looting during the war the company is no longer capable of producing ice There was a committed logistic support for the two campaigns but without this support, it would have been impossible to travel to the provincial capital to retrieve ice blocks and ice packs</p>
<p>14 One of the main contributing factors to the measles epidemic is the irregular supplies of vaccines for the routine EPI program It is not clear why areas of security still suffer from ruptures of vaccine stock vaccination cards and cold chain equipment There are many areas in South Kivu that have not vaccinated children in over two years The UN agencies responsible for assisting the implementation of routine immunization programs and the current authorities are clearly not committed to supporting vaccination efforts</p>	<p>Routine immunization programs need to become a priority Money is often made available for massive campaigns which are expensive while routine programs which would prevent outbreaks are often overlooked During this period of instability NGOs working in the health sector need to include routine immunization programs into their activities as the current authorities and the responsible UN agencies are unwilling or unable to provide vaccines and other related supplies necessary to carry out the routine EPI program It is recommended that funding be made available to set up mobile vaccination teams which could carry out routine vaccinations in areas where lack of cold chain equipment long distances between health centers and transport is still a problem until such time as the routine EPI program becomes a priority in this region</p> <p>Mobile vaccination units should be set up for the northern axis of Katana where the distance from health centers without cold chain equipment to</p>

	health centers with cold chain equipment and vaccines prohibits routine immunizations. For example Nyabibwe health center is 61 km from the general hospital and 36 km from Kalehe health center where there is refrigerator. This is a long distance to travel over mountainous terrain on a bicycle carrying a coolbox with vaccines. With transportation being a problem for the zone, it has been difficult for centers that have no other means of transportation to retrieve vaccination supplies on a regular basis.
15	Almost the entire IRC Bukavu Office staff participated in the vaccination campaign as additional support members to the vaccination teams in both zones. The IRC staff members were there to offer any type of additional assistance to vaccination teams in an effort to show support to the zonal health teams in vaccinating their population. This was positive for many IRC staff members who rarely get a chance to work in the field, as well as for those involved in other projects who do not get a chance to really understand the work of other departments. It was very positive for the health care staff at vaccination sites as they felt they had additional support, which led to increased motivation on their part.
16	The mobilization campaign started one week before the actual campaign and used churches, schools, banners, radio announcements, and health committee members on foot with megaphones to announce the vaccination campaign. As a result of this tremendous mobilization effort in both zones, a larger proportion of the population was reached and vaccination sites had commendable turn outs. It is recommended that other mobilization campaigns use as many means of communication as possible to reach a larger proportion of the population.

Annex 1 Balance and loss of materials

Commodity (unit)	Total # Available	Amount Administered	Balance	Loss	% loss
Measles vaccines (doses)	100,000	68,977	<ul style="list-style-type: none"> • 5,000 left in Katana • 3,750 doses left in Kabare • 7,700 doses at the regional EPI office <hr style="width: 10%; margin: 5px auto;"/> 16,450	14,573	14.5
Vitamin A (capsules)	101,450	80,859	15,429	5,162	5
Auto-block syringes	100,000	68,977	22,728 Office of Regional EPI Program-Bukavu	8,295	8.3

The number of vaccines needed for a mass measles vaccination campaign is estimated in the following manner:

- 100% of the target population (to achieve the goal of 100% coverage)
- 15% loss (proportion of vaccine lost during a mass campaign)
- 25% reserve (to be held in stock)

IRC recorded a 14.5% loss of measles vaccines, which is just under the 15% estimate. Remaining supplies were either left in Katana or Kabare health zones to be used as part of their routine EPI programs, or at the Regional EPI Office in Bukavu to be used in other zones.